

2

AD-A255 370



AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

AFOSR

TECHNICAL REPORT SUMMARIES

DTIC
ELECTE
AUG 27 1992
S A



This document has been approved
for public release and sale; its
distribution is unlimited

92-23783



JULY - SEPTEMBER 1991

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION			1b. RESTRICTIVE MARKINGS			
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release ; distribution unlimited.			
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE						
4. PERFORMING ORGANIZATION REPORT NUMBER(S)			5. MONITORING ORGANIZATION REPORT NUMBER(S) AFOSR-TR- 13			
6a. NAME OF PERFORMING ORGANIZATION AFOSR		6b. OFFICE SYMBOL (if applicable)	7a. NAME OF MONITORING ORGANIZATION AFOSR/XOTD			
6c. ADDRESS (City, State, and ZIP Code) BUILDING 410 BOLLING AFB DC 20332-6448			7b. ADDRESS (City, State, and ZIP Code) BUILDING 410 BOLLING AFB DC 20332-6448			
8a. NAME OF FUNDING / SPONSORING ORGANIZATION AFOSR		8b. OFFICE SYMBOL (if applicable) XOTD	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER IN-HOUSE			
8c. ADDRESS (City, State, and ZIP Code) BUILDING 410 BOLLING AFB DC 20332-6448			10. SOURCE OF FUNDING NUMBERS			
			PROGRAM ELEMENT NO. N/A	PROJECT NO. N/A	TASK NO. N/A	WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) AFOSR TECHICAL REPORT SUMMARIES						
12. PERSONAL AUTHOR(S) DEBRA L. TYRRELL						
13a. TYPE OF REPORT QUARTERLY		13b. TIME COVERED FRON. JUL 10 1981		14. DATE OF REPORT (Year Month, Day) 1981	15. PAGE COUNT	
16. SUPPLEMENTARY NOTATION						
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)			
FIELD	GROUP	SUB-GROUP				
19. ABSTRACT (Continue on reverse if necessary and identify by block number) The AFOSR Technical Report Summaries are published quarterly of each calendar year They consist of a brief summary of each AFOSR technical report received in the Technical Information Division and submitted to the Defense Technical Information Center for that quarter.						
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION unclassified			
22a. NAME OF RESPONSIBLE INDIVIDUAL DEBRA L. TYRRELL			22b. TELEPHONE (Include Area Code) (202) 767-4912		22c. OFFICE SYMBOL XOTD	

AFOSR

TECHNICAL REPORT SUMMARIES

THIRD QUARTER 1991

100-3

Accession For	
NTIS GRA&I	
DTIC TAB	
Unannounced	
Justification	
By	
Date	
A-1	

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH SCIENTIFIC STAFF DIRECTORY
 BOLLING AIR FORCE BASE, DC 20332

CC/CD - OFFICE OF THE DIRECTOR

Dr Helmut W. Hellwig, Director 5017
 Col Arthur L. Pavel, Deputy Director 5017

NA - DIRECTORATE OF AEROSPACE SCIENCES

Dr C I Jim Chang (Director)	EXT 4987
Dr Mitat Birkan	4938
Dr Leonidas Sakell	4935
Dr Amrutur Srinivasan	0463
Dr John Botsis	4937
Dr Dan Fant	0471
Lt Col Steven Boyce	6963
Dr James McMichael	4936
Dr Spencer Wu	6962
Dr Julian Tishkoff	0465

NI - EDUCATION, ACADEMIC & INDUSTRIAL AFFAIRS

Lt Col V Claude Cavender, Jr (Director)	EXT 4970
Dr Dale Boland	4969

NL - DIRECTORATE OF LIFE SCIENCES

Dr William O. Berry (Director)	EXT 4278
Dr Genevieve Haddad	5021
Dr Alfred R. Fregly	5021
Lt Col Jan Cerveny	5021

NC - DIRECTORATE OF CHEMICAL AND ATMOSPHERIC SCIENCES

Dr Donald Ball (Director)	4960
Capt Thomas Erstfeld	4960
Dr Michael Berman	4963
Lt Col James Stoble	4960
Lt Col Larry W Burggraf	4960
Dr Fred Hedberg	4963
Dr Joh Wilkes	4963

NM - DIRECTORATE OF MATHEMATICAL & INFORMATION SCIENCES

Dr Charles J. Holland (Director)	5025
Dr Neal Glassman	5026
Dr Marc Jacobs	5027
Dr Arje Nachman	4939
Dr Jon Sjogren	4940
Dr Abraham Waksman	5028

NE - DIRECTORATE OF ELECTRONIC AND MATERIAL SCIENCES

Dr Horst R. Wittmann (Director)	4984
Capt Steve Suddarth	4931
Dr Alan Rosenstein (Dep Director)	4984
Dr Liselotte Schioler	4933
Dr Harold Weinstock	4933
Dr Alan Craig	4931
Maj Gernot Pomrenke	4931
Dr Gerald Witt	4931

NP - DIRECTORATE OF PHYSICAL AND GEOPHYSICAL SCIENCE

Col Jerry J. Perrizo (Director)	4904
Dr Ralph Kelley	4908
Dr Robert Barker	5011
Dr Howard Schlossberg	4906
Dr Henry R. Radoski	4906
Lt Col James A. Lupo	4908

Commerical (202) 767-XXXX
 Autovon 297-XXXX

INTRODUCTION

The Air Force Office of Scientific Research Technical Report Summaries is published quarterly (March, June, September, and December). It contains a brief summary of each technical report received in the Technical Information Division and submitted to the Defense Technical Information Center (DTIC) for that quarter. Three indexes, subject, personal author and title are provided to help the user locate reports that may be of interest.

AFOSR does not maintain copies of technical reports for distribution. However, you may obtain any of these reports if you are registered with DTIC, by requesting the AD number of that report from the DTIC, Cameron Station, Alexandria, Virginia, 22314.

PURPOSE

The purpose of this report is to inform Air Force Laboratories about the science that the Air Force Office of Scientific Research is supporting.

AFOSR MISSION

The Air Force Office of Scientific Research (AFOSR) is the Single Manager of the Air Force Defense Research Sciences Program (Program Element 61102F) and the primary Air Force agency for the extramural support of fundamental scientific research. The AFOSR is organized under the Air Force Systems Command, DCS/Technology.

AFOSR awards grants and contracts for research in areas of science relevant to the needs of the Air Force. Research is selected for support from proposals received in response to the Broad Agency Announcement originating from scientists investigating problems involving the search for new knowledge and the expansion of scientific principles. Selection is on the basis of scientific potential for improving Air Force operational capabilities, originality, significance to science, the qualification of the principal investigators, and the reasonableness of the proposed budget.

KEY TO READING THE DATA

The summaries consist of three indexes and the abstracts. From one of the indexes, locate the AD number of the report that is of interest to you. Use this number to locate the abstract of the report in the abstracts section. The first report submitted to DTIC during the quarter (the one with the lowest AD number) appears on the last page of the abstracts section. The last report submitted to DTIC during the quarter (the one with the highest DTIC number) appears on the first page of the abstracts section. The following terms will give you a brief description of the elements used in each summary of this report.

DTIC Report Bibliography - DTIC's brief description of a technical report.

Search Control Number - A number assigned by DTIC at the time a bibliography is printed.

AD Number - A number assigned to each technical report when received by the DTIC.

Field & Group Numbers - (appearing after the AD number) First number is the subject field, and the second number is the particular group under that subject field.

Corporate Author/Performing Organization - The organization; e.g., college/university, company, etc., at which the research is conducted.

Title - The title of the technical report.

Descriptive Note - Gives the type of report; e.g., final, interim, etc., and the period of the time of the research.

Date - Date of the technical report.

Pages - Total number of pages contained in the technical report.

Personal Author - Person or persons who wrote the report.

Contract/Grant Number - The instrument control number identifying the contracting activity and funding year under which the research is initiated.

Project Number - A number unique to a particular area of science; e.g., 2304 is the project number for mathematics.

Task Number - An alphanumeric number unique to a specific field of the main area of science; e.g., 2304 is the project number for mathematics and A3 is the task number for computational sciences.

Monitor Number - The number assigned to a particular report by the government agency monitoring the research. The number consists of the government monitor acronym, the present calendar year and the technical report assigned consecutively; e.g., AFOSR-TR-83-0001 is the first number used for the first technical report processed for Calendar Year 1983.

Supplementary Note - A variety of statements pertaining to a report. For example, if the report is a journal article, the supplementary note might give you the journal citation, which will include the name of the journal the article it appears in, and the volume number, date, and the page numbers of the journal.

Abstract - A brief summary describing the research of the report.

Descriptors - Key words describing the research.

Identifiers - Commonly used designators, such as names of equipment, names of projects or acronyms, the AFOSR project and task number, and the Air Force Research Program Element number.

CONTRACT INDEX

UNCLASSIFIED

CONTRACT INDEX

*AFOSR-84-0132
DUKE UNIV DURHAM NC DEPT OF
COMPUTER SCIENCE
(AFOSR-TR-90-0984)
AD-A238 258

*AFOSR-84-0164
MISSOURI UNIV-ROLLA DEPT OF
MATHEMATICS AND STATISTICS
(AFOSR-TR-91-0618)
F AD-A237 850

*AFOSR-85-0154
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF MATERIALS
SCIENCE AND ENGINEERING
(AFOSR-TR-91-0573)
A AD-A237 783

*AFOSR-85-0250
VIRGINIA POLYTECHNIC INST AND
STATE UNIV BLACKSBURG DEPT OF
COMPUTER SCIENCE
(AFOSR-TR-91-0581)
AD-A237 893
(AFOSR-TR-91-0580)
AD-A238 010

*AFOSR-86-0019
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF AERONAUTICS AND
ASTRONAUTICS
(AFOSR-TR-91-0634)
F AD-A238 859

*AFOSR-86-0269
DELAWARE UNIV NEWARK DEPT OF
MATHEMATICS
(AFOSR-TR-91-0719)
F AD-A240 044

*AFOSR-86-0337
STUTTGART UNIV (GERMANY F R) INST
FUER RAUMFAHRTSYSTEME
(AFOSR-TR-91-0635)
F AD-A238 858

*AFOSR-86-0357
YALE UNIV NEW HAVEN CT DEPT OF
PSYCHOLOGY
(AFOSR-TR-91-0553)

F AD-A237 798

*AFOSR-87-0087
IDAHO UNIV MOSCOW DEPT OF
CHEMISTRY
(AFOSR-TR-91-0701)
F AD-A239 267

*AFOSR-87-0089
INDIANA UNIV AT BLOOMINGTON
(AFOSR-TR-91-0584)
F AD-A237 767

*AFOSR87-0114
WASHINGTON UNIV SEATTLE DEPT OF
MATERIALS SCIENCE AND ENGINEERING
(AFOSR-TR-91-0610)
F AD-A238 935

*AFOSR-87-0122
STEVENS INST OF TECH HOBOKEN NJ
DEPT OF PHYSICS AND ENGINEERING
PHYSICS
(AFOSR-TR-91-0693)
F AD-A239 340

*AFOSR-87-0145
PENNSYLVANIA STATE UNIV
UNIVERSITY PARK DEPT OF
MECHANICAL ENGINEERING
(AFOSR-TR-91-0541)
AD-A237 892
(AFOSR-TR-91-0677)
A AD-A239 157

*AFOSR-87-0196
MICHIGAN UNIV ANN ARBOR DEPT OF
ELECTRICAL ENGINEERING AND
COMPUTER SCIENCE
(AFOSR-TR-91-0638)
F AD-A238 788

*AFOSR-87-0248
PENNSYLVANIA STATE UNIV
UNIVERSITY PARK LAB FOR
ELEMENTARY PARTICLE SCIENCE
(AFOSR-TR-91-0641)
F AD-A238 789

*AFOSR-87-0248
GEORGIA UNIV ATHENS DEPT OF

PHARMACOLOGY AND TOXICOLOGY
(AFOSR-TR-91-0735)
F AD-A240 058

*AFOSR-87-0251
WEST VIRGINIA UNIV MORGANTOWN
DEPT OF PHYSICS
(AFOSR-TR-91-0657)
F AD-A238 908

*AFOSR-87-0258
WISCONSIN UNIV-MADISON
(AFOSR-TR-91-0720)
F AD-A240 042

*AFOSR-87-0277
RUTGERS - THE STATE UNIV
PISCATAWAY NJ
(AFOSR-TR-91-0729)
F AD-A240 041

*AFOSR-87-0304
STANFORD UNIV CA THERMOSCIENCES
DIV
(AFOSR-TR-91-0692)
F AD-A239 268

*AFOSR-87-0315
WISCONSIN UNIV-MADISON CENTER
FOR MATHEMATICAL SCIENCES
(AFOSR-TR-91-0594)
F AD-A237 844

*AFOSR-87-0338
YALE UNIV NEW HAVEN CT DEPT OF
PSYCHIATRY
(AFOSR-TR-91-0749)
F AD-A239 994

*AFOSR-87-0343
PENNSYLVANIA STATE UNIV
UNIVERSITY PARK MATERIALS
RESEARCH LAB
(AFOSR-TR-91-0582)
F AD-B158 201L

*AFOSR-87-0353
DUKE UNIV DURHAM NC DEPT OF
PSYCHOLOGY
(AFOSR-TR-91-0731)
F AD-A240 008

CONTRACT INDEX-1

UNCLASSIFIED T85002

UNCLASSIFIED

*AFOSR-87-0373
CALIFORNIA UNIV LOS ANGELES DEPT
OF MECHANICAL AEROSPACE AND
NUCLEAR ENGINEERING
(AFOSR-TR-91-0890)
F AD-A239 175

*AFOSR-87-0378
ARIZONA STATE UNIV TEMPE DEPT OF
PHYSICS
(AFOSR-TR-91-0581)
F AD-A237 788

*AFOSR-88-0013
ALABAMA UNIV IN HUNTSVILLE DEPT OF
MECHANICAL ENGINEERING
CSPARS31791WJ
(AFOSR-TR-19-0842)
F AD-A238 708

*AFOSR-88-0018
GEORGE WASHINGTON UNIV MEDICAL
CENTER WASHINGTON DC DEPT OF
MEDICINE
(AFOSR-TR-91-0832)
F AD-A238 790

*AFOSR-88-0038
AUBURN UNIV AL
(AFOSR-TR-91-0654)
F AD-A238 787

*AFOSR-88-0047
CONNECTICUT UNIV STORRS DEPT OF
MATHEMATICS
(AFOSR-TR-91-0750)
F AD-A240 288

*AFOSR-88-0053
STANFORD UNIV CA DEPT OF
MATHEMATICS
(AFOSR-TR-91-0887)
F AD-A239 222

*AFOSR-88-0054
YALE UNIV NEW HAVEN CT CENTER FOR
SOLAR AND SPACE RESEARCH
(AFOSR-TR-91-0728)
F AD-A240 359

*AFOSR-88-0068
CALIFORNIA UNIV LOS ANGELES DEPT
OF MATERIALS SCIENCE AND
ENGINEERING
(AFOSR-TR-91-0814)
F AD-A238 095

*AFOSR-88-0076
ARIZONA UNIV TUCSON DEPT OF
SYSTEMS AND INDUSTRIAL
ENGINEERING
(AFOSR-TR-91-0815)
F AD-A238 229

*AFOSR-88-0092
CALIFORNIA UNIV RIVERSIDE
(AFOSR-TR-91-0547)
F AD-A237 790

*AFOSR-88-0098
MARYLAND UNIV COLLEGE PARK INST
FOR PHYSICAL SCIENCE AND
TECHNOLOGY
(AFOSR-TR-91-0593)
F AD-A238 231

*AFOSR-88-0100
YALE UNIV NEW HAVEN CT
(AFOSR-TR-91-0599)
F AD-A238 028

*AFOSR-88-0107
YALE UNIV NEW HAVEN CT DEPT OF
APPLIED PHYSICS
(AFOSR-TR-91-0537)
AD-A237 894

*AFOSR-88-0108
YALE UNIV NEW HAVEN CT DEPT OF
APPLIED PHYSICS
(AFOSR-TR-91-0538)
AD-A237 895

*AFOSR-88-0109
YALE UNIV NEW HAVEN CT DEPT OF
APPLIED PHYSICS
(AFOSR-TR-91-0538)
AD-A237 896

*AFOSR-88-0110
YALE UNIV NEW HAVEN CT DEPT OF
APPLIED PHYSICS
(AFOSR-TR-91-0540)
AD-A237 897

*AFOSR-88-0111
YALE UNIV NEW HAVEN CT DEPT OF
APPLIED PHYSICS
(AFOSR-TR-91-0540)
AD-A237 898

*AFOSR-88-0124
NORTHWESTERN UNIV EVANSTON IL
CENTER FOR QUALITY ENGINEERING
AND FAILURE PREVENTION
C447-3
(AFOSR-TR-91-0882)
F AD-A239 162

*AFOSR-88-0132
CALIFORNIA UNIV LOS ANGELES DEPT
OF MATERIALS SCIENCE AND
ENGINEERING
(AFOSR-TR-91-0814)
F AD-A238 095

*AFOSR-88-0140
NEW YORK UNIV NY DEPT OF
PSYCHOLOGY
(AFOSR-TR-91-0757)
F AD-A240 133

*AFOSR-88-0142
BAYLOR COLL OF MEDICINE HOUSTON
TX
(AFOSR-TR-91-0598)
F AD-A238 027

*AFOSR-88-0160
NORTH CAROLINA STATE UNIV AT
RALEIGH DEPT OF ELECTRICAL AND
COMPUTER ENGINEERING
(AFOSR-TR-91-0584)
F AD-A237 710

*AFOSR-88-0164
OHIO STATE UNIV COLUMBUS DEPT OF
MATHEMATICS
(AFOSR-TR-91-0684)
F AD-A239 174

*AFOSR-88-0187
MINNESOTA UNIV MINNEAPOLIS INST
OF CHILD DEVELOPMENT
(AFOSR-TR-91-0590)
F AD-A238 026

*AFOSR-88-0195
OHIO STATE UNIV COLUMBUS DEPT OF
MATHEMATICS
(AFOSR-TR-91-0694)
F AD-A239 264

*AFOSR-88-0227
PRINCETON UNIV NJ DEPT OF
ELECTRICAL ENGINEERING AND
COMPUTER SCIENCE
(AFOSR-TR-91-0554)
F AD-A237 858

*AFOSR-88-0237
ILLINOIS UNIV AT CHICAGO CIRCLE

CONTRACT INDEX-2 T85002
UNCLASSIFIED

AFO-AFO

DEPT OF MATHEMATICS STATISTICS
 AND COMPUTER SCIENCE
 (AFOSR-TR-91-0683)
 F AD-A238 284

*AFOSR-88-0247
 CALIFORNIA INST OF TECH PASADENA
 DEPT OF ELECTRICAL ENGINEERING
 (AFOSR-TR-91-0616)
 F AD-A238 233

*AFOSR-88-0269
 CALIFORNIA INST OF TECH PASADENA
 FIRESTONE FLIGHT SCIENCES LAB
 (AFOSR-TR-91-0557)
 F AD-A237 722

*AFOSR-88-0270
 YALE UNIV NEW HAVEN CT DEPT OF
 APPLIED PHYSICS
 (AFOSR-TR-91-0746)
 F AD-A240 158

*AFOSR-88-0275
 NEW YORK UNIV MEDICAL CENTER NY
 DEPT OF PSYCHIATRY
 (AFOSR-TR-91-0631)
 A AD-A238 786

*AFOSR-88-0277
 GEORGIA UNIV ATHENS DEPT OF
 PHARMACOLOGY AND TOXICOLOGY
 (AFOSR-TR-91-0660)
 A AD-A238 573

*AFOSR-88-0284
 NORTHERN ILLINOIS UNIV DE KALB
 DEPT OF MATHEMATICAL SCIENCES
 (AFOSR-TR-91-0617)
 F AD-A237 847

*AFOSR-88-0326
 SMITH-KETTELWELL EYE RESEARCH
 INST SAN FRANCISCO CA
 (AFOSR-TR-91-0639)
 F AD-A238 663

*AFOSR-88-0327
 STANFORD UNIV CA DEPT OF
 ELECTRICAL ENGINEERING
 (AFOSR-TR-90-0985)

AD-A238 975

*AFOSR-88-03271
 STANFORD UNIV CA DEPT OF
 ELECTRICAL ENGINEERING
 (AFOSR-TR-90-0988)
 AD-A239 040

*AFOSR-89-0002
 PURDUE UNIV LAFAYETTE IN SCHOOL
 OF MECHANICAL ENGINEERING
 (AFOSR-TR-91-0551)
 F AD-A237 805

*AFOSR-89-0017
 MICHIGAN UNIV ANN ARBOR DEPT OF
 ELECTRICAL ENGINEERING AND
 COMPUTER SCIENCE
 (AFOSR-91-0741)
 F AD-A240 249

*AFOSR-89-0035
 SMITH-KETTELWELL EYE RESEARCH
 INST SAN FRANCISCO CA
 (AFOSR-TR-91-0608)
 AD-A238 607
 (AFOSR-TR-91-0609)
 AD-A238 608

*AFOSR-89-0047
 YALE UNIV NEW HAVEN CT DEPT OF
 PSYCHOLOGY
 (AFOSR-TR-91-0727)
 A AD-A240 368

*AFOSR-89-0063
 NOTRE DAME UNIV IN DEPT OF
 PHYSICS
 (AFOSR-TR-91-0583)
 F AD-A237 785

*AFOSR-89-0085
 LEHIGH UNIV BETHLEHEM PA PACKARD
 LAB
 (AFOSR-TR-91-0504)
 F AD-A237 413

*AFOSR-89-0070
 PRINCETON UNIV NJ
 (AFOSR-TR-91-0714)
 F AD-A240 195

*AFOSR-89-0071
 COLLEGE OF WILLIAM AND MARY
 WILLIAMSBURG VA DEPT OF
 MATHEMATICS AND COMPUTER SCIENCE
 (AFOSR-TR-91-0717)
 F AD-A240 365

*AFOSR-89-0078
 MISSOURI UNIV-COLUMBIA DEPT OF
 MATHEMATICS
 (AFOSR-TR-91-0722)
 F AD-A240 046

*AFOSR-89-0138
 MINNESOTA UNIV MINNEAPOLIS
 (AFOSR-TR-91-0745)
 F AD-A240 157

*AFOSR-89-0152
 ILLINOIS INST OF TECH CHICAGO
 DEPT OF MECHANICAL ENGINEERING
 (AFOSR-TR-91-0855)
 F AD-A239 059

*AFOSR-89-0163
 YALE UNIV NEW HAVEN CT DEPT OF
 MECHANICAL ENGINEERING
 (AFOSR-TR-91-0718)
 F AD-A240 043

*AFOSR-89-0174
 CALIFORNIA UNIV SAN DIEGO LA
 JOLLA DEPT OF CHEMISTRY
 (AFOSR-TR-91-0637)
 F AD-A238 791

*AFOSR-89-0182
 TRI-CITIES UNIVERSITY CENTER
 RICHLAND WA
 (AFOSR-TR-91-0653)
 F AD-A238 718

*AFOSR-89-0186
 INDIANA UNIV AT BLOOMINGTON DEPT
 OF COMPUTER SCIENCE
 (AFOSR-TR-91-0548)
 F AD-A237 789

*AFOSR-89-0197
 PITTSBURGH UNIV PA
 (AFOSR-TR-91-0672)

CONTRACT INDEX-3
 UNCLASSIFIED T85002

AFO-AFO

UNCLASSIFIED

A AD-A238 615
 *AFOSR-89-0231
 SAN FRANCISCO STATE UNIV TIBURON
 CA TIBURON CENTER FOR
 ENVIRONMENTAL STUDIES
 (AFOSR-TR-91-0806)
 AD-A238 605 (AFOSR-TR-91-0807)
 AD-A238 606 (AFOSR-TR-91-0850)
 AD-A238 711

*AFOSR-89-0234
 PENNSYLVANIA UNIV PHILADELPHIA
 DEPT OF CHEMISTRY
 (AFOSR-TR-91-0849)
 AD-A238 719

*AFOSR-89-0255
 NORTHWESTERN UNIV EVANSTON IL
 DEPT OF CIVIL ENGINEERING
 (AFOSR-TR-91-0874)
 F AD-A239 019

*AFOSR-89-0277
 MICHIGAN UNIV ANN ARBOR
 ARTIFICIAL INTELLIGENCE LAB
 (AFOSR-TR-91-0880)
 F AD-A239 328

*AFOSR-89-0290
 GEORGIA INST OF TECH ATLANTA
 SCHOOL OF AEROSPACE ENGINEERING
 (AFOSR-TR-91-0800)
 F AD-A237 851

*AFOSR-89-0295
 TULANE UNIV NEW ORLEANS LA DEPT
 OF MATHEMATICS
 (AFOSR-TR-91-0730)
 F AD-A240 048

*AFOSR-89-0299
 GORDON RESEARCH CONFERENCES INC
 KINGSTON RI
 (AFOSR-TR-91-0838)
 F AD-A238 781

*AFOSR-89-0301
 PRINCETON UNIV NJ

F AD-A239 220 (AFOSR-TR-91-0881)
 *AFOSR-89-0304
 HARVARD UNIV CAMBRIDGE MA DIV OF
 APPLIED SCIENCES
 (AFOSR-TR-91-0544)
 A AD-A237 794

*AFOSR-89-0309
 OREGON STATE UNIV CORVALLIS DEPT
 OF ELECTRICAL AND COMPUTER
 ENGINEERING
 (AFOSR-TR-91-0574)
 A AD-A238 260

*AFOSR-89-0312
 PENNSYLVANIA STATE UNIV
 UNIVERSITY PARK DEPT OF
 MECHANICAL ENGINEERING
 (AFOSR-TR-91-0715)
 F AD-A240 004

*AFOSR-89-0335
 LOYOLA UNIV OF CHICAGO IL PARMLY
 HEARING INST
 (AFOSR-TR-91-0804)
 A AD-A238 023

*AFOSR-89-0346
 CORNELL UNIV ITHACA NY
 (AFOSR-TR-91-0833)
 F AD-A239 060

*AFOSR-89-0347
 NATIONAL RESEARCH COUNCIL
 WASHINGTON DC COMMISSION ON
 ENGINEERING AND TECHNIC AL
 SYSTEMS
 (AFOSR-TR-91-0564)
 F AD-A238 261

*AFOSR-89-0350
 RENNELAER POLYTECHNIC INST TROY
 NY DEPT OF CIVIL ENGINEERING
 (AFOSR-TR-91-0819)
 F AD-A238 091
 (AFOSR-TR-91-0820)
 F AD-A238 092 (AFOSR-TR-91-0621)
 F AD-A238 158

*AFOSR-89-0362
 YALE UNIV NEW HAVEN CT
 598A-31-41183
 A AD-A240 120

*AFOSR-89-0367
 WISCONSIN UNIV-MADISON
 (AFOSR-TR-91-0707)
 A AD-A240 153

*AFOSR-89-0374
 ISRAEL ATOMIC ENERGY COMMISSION
 YAVNE SOREQ NUCLEAR RESEARCH
 CENTRE
 CONTR-103/90
 (AFOSR-TR-91-0659)
 A AD-A240 310

*AFOSR-89-0377
 EYE RESEARCH INST OF RETINA
 FOUNDATION BOSTON MA
 (AFOSR-TR-91-0651)
 A AD-A238 664

*AFOSR-89-0383
 CALIFORNIA UNIV IRVINE CENTER FOR
 THE NEUROBIOLOGY OF LEARNING AND
 MEMORY
 (AFOSR-TR-91-0708)
 A AD-A240 121

*AFOSR-89-0391
 MASSACHUSETTS UNIV AMHERST
 (AFOSR-TR-91-0644)
 A AD-A238 861

*AFOSR-89-0416
 MISSOURI UNIV-ST LOUIS DEPT OF
 PHYSICS
 (AFOSR-TR-91-0742)
 A AD-A240 152

*AFOSR-89-0439
 RENNELAER POLYTECHNIC INST TROY
 NY DEPT OF CHEMISTRY
 (AFOSR-TR-91-0586)
 F AD-A237 753
 (AFOSR-TR-91-0624)
 AD-A238 208 (AFOSR-TR-91-0829)

CONTRACT INDEX-4
 UNCLASSIFIED T85002

AFO-AFO

UNCLASSIFIED

AD-A238 209
(AFOSR-TR-91-0825)
AD-A238 604

*AFOSR-89-0442
NEW YORK UNIV NY DEPT OF
PSYCHOLOGY
(AFOSR-TR-91-0739)
A AD-A240 364

*AFOSR-89-0447
ILLINOIS UNIV AT URBANA DEPT OF
PSYCHOLOGY
(AFOSR-TR-91-0758)
A AD-A240 370

*AFOSR-89-0470
VIRGINIA UNIV CHARLOTTESVILLE
(AFOSR-TR-91-0751)
F AD-A240 369

*AFOSR-89-0486
CINCINNATI UNIV OH DEPT OF
AEROSPACE ENGINEERING
(AFOSR-TR-91-0716)
F AD-A240 049

*AFOSR-89-0494
MINNESOTA UNIV MINNEAPOLIS DEPT
OF ELECTRICAL ENGINEERING
(AFOSR-TR-91-0575)
AD-A237 798

*AFOSR-89-0497
VIRGINIA POLYTECHNIC INST AND
STATE UNIV BLACKSBURG DEPT OF
COMPUTER SCIENCE
(AFOSR-TR-91-0558)
AD-A238 008
(AFOSR-TR-91-0559)
AD-A238 009

*AFOSR-89-0503
ILLINOIS UNIV AT CHICAGO CIRCLE
DEPT OF CIVIL ENGINEERING
MECHANICS AND METALL URGY
(AFOSR-TR-91-0671)
F AD-A238 811

*AFOSR-89-0504
MASSACHUSETTS INST OF TECH

CAMBRIDGE DEPT OF BRAIN AND
COGNITIVE SCIENCES
(AFOSR-TR-91-0597)
A AD-A238 235

*AFOSR-89-0530
SOUTHEASTERN OKLAHOMA STATE UNIV
DURANT DEPT OF PHYSICAL SCIENCES
(AFOSR-TR-91-0756)
F AD-A240 009

*AFOSR-89-0541
COLORADO UNIV AT BOULDER DEPT OF
MECHANICAL ENGINEERING
(AFOSR-TR-91-0713)
AD-A240 057

*AFOSR-89-0549
CALIFORNIA UNIV SANTA BARBARA
DEPT OF ELECTRICAL AND COMPUTER
ENGINEERING
ECE-TR-91-11
(AFOSR-TR-91-0662)
A AD-A238 701

*AFOSR-90-0027
MARYLAND UNIV COLLEGE PARK DEPT
OF COMPUTER SCIENCE
(AFOSR-TR-91-0689)
F AD-A239 228

*AFOSR-90-0049
COLUMBIA UNIV NEW YORK DEPT OF
CHEMISTRY
(AFOSR-TR-91-0628)
AD-A238 205
(AFOSR-TR-91-0627)
AD-A238 206
(AFOSR-TR-91-0630)
AD-A238 207
COLUMBIA UNIV NEW YORK LOWELL
MEMORIAL LIBRARY
(AFOSR-TR-91-0647)
AD-A238 792

*AFOSR-90-0061
ILLINOIS UNIV AT URBANA
COORDINATED SCIENCE LAB
(AFOSR-TR-91-0721)
F AD-A240 358

*AFOSR-90-0072
YALE UNIV NEW HAVEN CT SCHOOL OF
MEDICINE
(AFOSR-TR-91-0704)
A AD-A240 119

*AFOSR-90-0118
ARIZONA STATE UNIV TEMPE DEPT OF
ELECTRICAL AND COMPUTER
ENGINEERING
(AFOSR-TR-91-0570)
A AD-A238 149

*AFOSR-90-0162
GEORGIA INST OF TECH ATLANTA
SCHOOL OF MATERIALS ENGINEERING
(AFOSR-TR-91-0699)
A AD-A239 221

*AFOSR-90-0165
TEXAS CHRISTIAN UNIV FORT WORTH
DEPT OF PHYSICS
(AFOSR-TR-91-0648)
AD-A238 732

*AFOSR-90-0166
JOINT INST FOR LAB ASTROPHYSICS
BOULDER CO
(AFOSR-TR-91-0572)
A AD-A237 795

*AFOSR-90-0167
CALIFORNIA UNIV BERKELEY DEPT OF
MATERIALS SCIENCE AND MINERAL
ENGINEERING
UCB/R/91/A1072
(AFOSR-TR-91-0576)
A AD-A238 151

*AFOSR-90-0200
MASSACHUSETTS INST OF TECH
CAMBRIDGE RESEARCH LAB OF
ELECTRONICS
(AFOSR-TR-90-0200)
AD-A240 154

*AFOSR-90-0205
ILLINOIS UNIV AT URBANA
(AFOSR-TR-91-0543)
A AD-A237 788

CONTRACT INDEX-5
UNCLASSIFIED T85002

AFO-1FO

UNCLASSIFIED

*AFOSR-90-0212
SOUTH CAROLINA UNIV COLUMBIA
(AFOSR-TR-91-0737-VOL)

F AD-A240 328
(AFOSR-TR-91-0738-VOL)

F AD-A240 329

*AFOSR-90-0215
INSTITUTE FOR THE STUDY OF HUMAN
CAPABILITIES BLOOMINGTON IN
(AFOSR-TR-91-0697)

A AD-A239 323

*AFOSR-90-0219
ARKANSAS UNIV FOR MEDICAL SCIENCES
LITTLE ROCK
(AFOSR-TR-91-0724)

F AD-A240 095

*AFOSR-90-0221
NEW YORK UNIV NY NEUROMAGNETISM
LAB
(AFOSR-TR-91-0571)

A AD-A237 846

*AFOSR-90-0240
NORTHWESTERN UNIV EVANSTON IL
COLL OF ARTS AND SCIENCES
(AFOSR-TR-91-0623)

A AD-A237 849

*AFOSR-90-0246
NORTHWESTERN UNIV EVANSTON IL
(AFOSR-TR-91-0700)

A AD-A239 219

*AFOSR-90-0264
INTERNATIONAL SOCIETY FOR
CHRONOBIOLOGY BELTSVILLE MD
(AFOSR-TR-91-0550)

AD-A238 827

*AFOSR-90-0270
NORTHWESTERN UNIV EVANSTON IL
(AFOSR-TR-91-0725)

F AD-A240 007

*AFOSR-90-0271
KENTUCKY UNIV LEXINGTON DEPT OF
MECHANICAL ENGINEERING
(AFOSR-TR-91-0733)

F AD-A240 131

*AFOSR-90-0278
CREIGHTON UNIV HEALTH SCIENCES
CENTER OMAHA NE
(AFOSR-TR-91-0678)

A AD-A239 263

*AFOSR-90-0287
TRINITY UNIV SAN ANTONIO TX DEPT
OF BIOLOGY
(AFOSR-TR-91-0592)

F AD-A238 230

*AFOSR-90-0290
CENTER FOR ADVANCED CEMENT-BASED
MATERIALS EVANSTON IL
(AFOSR-TR-91-0546)

F AD-A238 289

*AFOSR-90-0291
RUTGERS - THE STATE UNIV NEW
BRUNSWICK NJ
(AFOSR-TR-91-0658)

F AD-A238 574

*AFOSR-90-0303
ILLINOIS UNIV AT URBANA DEPT OF
VETERINARY BIOSCIENCES
(AFOSR-TR-91-0752)

A AD-A240 363

*AFOSR-90-0308
YALE UNIV NEW HAVEN CT DEPT OF
APPLIED PHYSICS
(AFOSR-TR-91-0744)

A AD-A240 118

*AFOSR-90-0310
PITTSBURGH UNIV PA DEPT OF
ELECTRICAL ENGINEERING
TR-SP-01-05
(AFOSR-TR-91-0679)

A AD-A239 196

*AFOSR-90-0318
KANSAS STATE UNIV MANHATTAN DEPT
OF PHYSICS
(AFOSR-TR-91-0582)

F AD-A237 792

*AFOSR-90-0327
MONTANA STATE UNIV BOZEMAN DEPT
OF CHEMISTRY
(AFOSR-TR-91-0753)

A AD-A240 222

*AFOSR-90-0344
JOHNS HOPKINS UNIV BALTIMORE MD
DEPT OF ENVIRONMENTAL HEALTH
SCIENCES
(AFOSR-TR-91-0732)

F AD-A240 045

*AFOSR-90-0371
OHIO STATE UNIV RESEARCH
FOUNDATION COLUMBUS
OSURF-723582
(AFOSR-TR-91-0542)

A AD-A237 787

*AFOSR-91-0088
MATERIALS RESEARCH SOCIETY
PITTSBURGH PA
(AFOSR-TR-91-0652)

F AD-A238 725

*AFOSR-91-0113
DELAWARE UNIV NEWARK DEPT OF
MATHEMATICAL SCIENCES
(AFOSR-TR-91-0688)

F AD-A239 292

*AFOSR-91-0689
DREXEL UNIV PHILADELPHIA PA
(AFOSR-TR-91-0669)

F AD-A238 641

*AFOSR-ISSA-88-0012
OAK RIDGE NATIONAL LAB TN
(AFOSR-TR-91-0579)

F AD-B156 176L

*AFOSR-ISSA-89-0015
OAK RIDGE NATIONAL LAB TN
(AFOSR-TR-91-0579)

F AD-B156 176L

*AFOSR-PD-90-0001
MASSACHUSETTS INST OF TECH
LEXINGTON LINCOLN LAB
(AFOSR-TR-91-0643)

CONTRACT INDEX-B
UNCLASSIFIED T85002

AFO-AFO

A AD-A238 782
 *SDAA03-90-G-0103
 FLORIDA STATE UNIV TALLAHASSEE
 DEPT OF STATISTICS
 FSU-STATISTICS-TR-M-853
 (ARO-27888.10-MA)
 AD-A239 822

*DAAL03-88-G-0204
 FLORIDA STATE UNIV TALLAHASSEE
 DEPT OF STATISTICS
 FSU-STATISTICS-TR-M-853
 (ARO-27888.10-MA)
 AD-A239 822

*DARPA ORDER-6155
 PITTSBURGH UNIV PA DEPT OF
 MATERIALS SCIENCE AND ENGINEERING
 (AFOSR-TR-91-0588)
 F AD-A237 535

*\$DARPA ORDER-7450
 MARTIN MARIETTA ELECTRONICS AND
 MISSILES GROUP ORLANDO FL
 MISSILE SYSTEMS
 OA-11808
 (AFOSR-TR-91-0688)
 F AD-A239 287

*F49820-88-C-0064
 UKAEA CULHAM LAB ABINGDON (UNITED
 KINGDOM) AEA INDUSTRIAL
 TECHNOLOGY
 AEA-INTEC-0514
 (AFOSR-TR-91-0591)
 F AD-B156 558L

*F49820-88-C-0133
 ILLINOIS INST OF TECH CHICAGO
 FLUID DYNAMICS RESEARCH CENTER
 (AFOSR-TR-91-0728)
 F AD-A240 050

*F49820-88-K-0020
 STANFORD UNIV CA
 (AFOSR-TR-91-0645)
 F AD-A238 855

*F49820-87-C-0108
 MASSACHUSETTS INST OF TECH
 CAMBRIDGE
 (AFOSR-TR-91-0580)
 F AD-A237 458

*F49620-87-C-0108
 HARRIS CORP MELBOURNE FL
 GOVERNMENT AEROSPACE SYSTEMS DIV
 (AFOSR-TR-91-0232)
 F AD-A237 864

*F49620-88-C-0011
 NORTHWESTERN UNIV EVANSTON IL
 DEPT OF CIVIL ENGINEERING
 (AFOSR-TR-91-0602)
 F AD-A238 029

*F49620-88-C-0013
 PITTSBURGH UNIV PA DEPT OF
 MATERIALS SCIENCE AND ENGINEERING
 (AFOSR-TR-91-0588)
 F AD-A237 535

*F49620-88-C-0040
 FLORIDA INST OF TECH MELBOURNE
 (AFOSR-TR-91-0867)
 AD-A238 814

*F49620-88-C-0043
 VIRGINIA POLYTECHNIC INST AND
 STATE UNIV BLACKSBURG DEPT OF
 AEROSPACE AND OCE AN ENGINEERING
 VPI-AOE-179
 (AFOSR-TR-91-0848)
 F AD-A238 857

*F49620-88-C-0047
 MCDONNELL DOUGLAS MISSILE SYSTEMS
 CO ST LOUIS MO
 MDC-ATN-EBE4-020
 (AFOSR-TR-91-0601)
 F AD-B156 878L

*F49620-88-C-0051
 UNITED TECHNOLOGIES RESEARCH
 CENTER EAST HARTFORD CT
 UTRC91-21
 (AFOSR-TR-91-0736)
 F AD-A240 005

*F49620-88-C-0052
 GE AIRCRAFT ENGINES CINCINNATI OH
 CONTRACT INDEX-7
 UNCLASSIFIED T85002

F AD-A240 151
 (AFOSR-TR-91-0743)

*F49620-88-C-0067
 UNIVERSITY OF SOUTHERN CALIFORNIA
 LOS ANGELES ELECTRONIC SCIENCES
 LAB
 (AFOSR-TR-91-0748)
 F AD-A240 155

*F49620-88-C-0077
 HONEYWELL SYSTEMS AND RESEARCH
 CENTER MINNEAPOLIS MN
 HSRC-C910684
 (AFOSR-TR-91-0740)
 F AD-A240 221

*F49620-88-C-0083
 VISION SCIENCES RESEARCH CORP SAN
 RAMON CA
 (AFOSR-TR-91-0696)
 F AD-A239 445

*F49620-88-K-0002
 STANFORD UNIV CA DEPT OF APPLIED
 PHYSICS
 (AFOSR-TR-91-0695)
 F AD-A239 265

*F49620-89-C-0009
 CRYSTALLUME MENLO PARK CA
 (AFOSR-TR-91-0569)
 F AD-A237 793

*F49620-89-C-0010
 NORTH CAROLINA AGRICULTURAL AND
 TECHNICAL STATE UNIV GREENSBORO
 (AFOSR-TR-91-0685)
 F AD-A239 163

*F49620-89-C-0011
 HARRIS CORP MELBOURNE FL
 GOVERNMENT AEROSPACE SYSTEMS DIV
 (AFOSR-TR-91-0754)
 F AD-A240 372

F AD-A240 373
 (AFOSR-TR-91-0755)

*F49620-89-C-0015
 COMPUTATIONAL MECHANICS CO INC
 AUSTIN TX

UNCLASSIFIED

TR-91-08 (AFOSR-TR-91-0603)
 F AD-A238 322

*F49620-89-C-0018
 FOSTER-MILLER INC WALTHAM MA
 AFB-0018-FM-8961-454
 (AFOSR-TR-91-0811)
 F AD-B158 087L

*F49620-89-C-0047
 UNITED TECHNOLOGIES RESEARCH
 CENTER EAST HARTFORD CT
 R91-917992-2
 (AFOSR-TR91-0668)
 A AD-A238 888

*F49620-89-C-0048
 ROCKWELL INTERNATIONAL THOUSAND
 OAKS CA SCIENCE CENTER
 SC71004.FR
 (AFOSR-TR-91-0612)
 F AD-A238 262

*F49620-89-C-0052
 MEHARRY MEDICAL COLL NASHVILLE TN
 (AFOSR-TR-91-0605)
 A AD-A238 232

*F49620-89-C-0058
 MEHARRY MEDICAL COLL NASHVILLE TN
 (AFOSR-TR-91-0613)
 A AD-B158 502L

*F49620-89-C-0071
 ARKANSAS UNIV AT PINE BLUFF SPACE
 AND ENVIRONMENT STUDIES LAB
 SGC5L-UAPB-04-91
 (AFOSR-TR-91-0711)
 AD-A240 056
 SGC5L-UAPB-03-91
 (AFOSR-TR-91-0710)
 AD-A240 208
 SGC5L-UAPB-02-91
 (AFOSR-TR-91-0709)
 AD-A240 208

*F49620-89-C-0073
 MASSACHUSETTS UNIV AMHERST DEPT
 OF POLYMER SCIENCE AND
 ENGINEERING

(AFOSR-TR-91-0668)
 F AD-A238 643

*F49620-89-C-0090
 PURDUE UNIV LAFAYETTE IN SCHOOL
 OF CIVIL ENGINEERING
 (AFOSR-TR-91-0670)
 A AD-A239 137

*F49620-89-C-0114
 ILLINOIS UNIV AT CHICAGO CIRCLE
 DEPT OF MECHANICAL ENGINEERING
 (AFOSR-TR-91-0535)
 F AD-A237 857

*F49620-90-C-0017
 QUALCOMM INC SAN DIEGO CA
 (AFOSR-TR-91-0596)
 F AD-A238 234

*F49620-90-C-0044
 SRI INTERNATIONAL MENLO PARK CA
 SRI-MP-91-160
 (AFOSR-TR-91-0706)
 A AD-A240 193

*F49620-90-C-0049
 NETROLOGIC INC DAYTON OH
 (AFOSR-TR-91-0685)
 F AD-A238 755

*F49620-90-C-0050
 MARTIN MARIETTA ELECTRONICS AND
 MISSILES GROUP ORLANDO FL
 MISSILE SYSTEMS
 OA-11606
 (AFOSR-TR-91-0686)
 F AD-A239 287

*F49620-90-C-0052
 LASER PHOTONICS TECHNOLOGY INC
 AMHERST NY
 AF010-FROLPT(91)
 (AFOSR-TR-91-0588)
 F AD-B158 243L

*F49620-90-C-0060
 TERRA TEK INC SALT LAKE CITY UT
 TR-91-107
 (AFOSR-TR-91-0555)
 F AD-A237 708

*F49620-90-C-0062
 EPIR LTD OAKBROOK IL
 (AFOSR-TR-91-0578)
 F AD-A238 602

*F49620-90-C-0068
 PHYSICAL OPTICS CORP TORRANCE CA
 (AFOSR-TR-91-0664)
 F AD-A238 642

*F49620-90-C-0082
 LASER PHOTONICS TECHNOLOGY INC
 AMHERST NY
 AFO11-FR-LPT91
 (AFOSR-TR-91-0587)
 F AD-A237 716

UNCLASSIFIED
 CONTRACT INDEX-8
 T85002

F49-F49

SUBJECT INDEX

UNCLASSIFIED
SUBJECT INDEX

*AIR FORCE RESEARCH
Air Force Office of Scientific
Research Technical Report Summaries
January - March 1991.*
AD-A238 020

*ALGORITHMS
Reprint: Least-Change Secant
Update Methods for Underdetermined
Systems.
AD-A237 893

*ALUMINUM COMPOUNDS
Reprint: Synthesis, Structure,
and Pyrolysis of Organoaluminum
Amides Derived from the Reactions
of Trialkylaluminum Compounds with
Ethylenediamine in a 3:2 Ratio.
AD-A238 208
Reprint: Effects of Ring
Substituents, Preferential
Solvation, and Added Amine on the
Trimer-Dimer Equilibrium in Cyclic
Diakylaluminum Amide Compounds.
AD-A238 209

*AMIDES
Reprint: Synthesis, Structure,
and Pyrolysis of Organoaluminum
Amides Derived from the Reactions
of Trialkylaluminum Compounds with
Ethylenediamine in a 3:2 Ratio.
AD-A238 208
Reprint: Effects of Ring
Substituents, Preferential
Solvation, and Added Amine on the
Trimer-Dimer Equilibrium in Cyclic
Diakylaluminum Amide Compounds.
AD-A238 209

*ANALOG COMPUTERS
Analog Computation in Neutral
Systems: Architectures and
Complexity.*
AD-A237 856

*ARCHITECTURE
Analog Computation in Neutral
Systems: Architectures and
Complexity.*
AD-A237 856

*BRAIN
Cognition and the Brain.*
AD-A237 848

*BUOYANCY
Reprint: Short Communication:
Isolation of Buoyancy Effects in
Jet Diffusion Flame Experiments.
AD-A237 892

*CABLES
Reprint: Large Deformations of a
Whirling Elastic Cable.
AD-A238 009

*CHEMICAL EQUILIBRIUM
Reprint: Effects of Ring
Substituents, Preferential
Solvation, and Added Amine on the
Trimer-Dimer Equilibrium in Cyclic
Diakylaluminum Amide Compounds.
AD-A238 209

*CHEMICAL RADICALS
Reprint: Investigation of the
Kinetic Window for Generation of
13C T(O)-S CIDNP Derived from Long-
Chain Biradicals by Tuning the
Rates of Bimolecular Scavenging and
Intersystem Crossing.
AD-A238 207

*COGNITION
Cognition and the Brain.*
AD-A237 848

*COMBINATORIAL ANALYSIS
Reprint: A Hierarchical,
Combinatorial-Markov Method of
Solving Complex Reliability Models.
AD-A238 258

*COMMAND AND CONTROL SYSTEMS
Feasibility Study of Developing
a Meaningful and Implementable
Methodology for Assessing JTC3A
effectiveness.*
AD-A238 574

*COMPREHENSION
Pictures and Anaphora.*

AD-A240 153
*CYCLOALKANES

Reprint: Investigation of the
Kinetic Window for Generation of
13C T(O)-S CIDNP Derived from Long-
Chain Biradicals by Tuning the
Rates of Bimolecular Scavenging and
Intersystem Crossing.
AD-A238 207

*DEFORMATION
Reprint: Large Deformations of a
Whirling Elastic Cable.
AD-A238 009

*DETERMINANTS(MATHEMATICS)
Reprint: Least-Change Secant
Update Methods for Underdetermined
Systems.
AD-A237 893

*DROPS
Reprint: Pumping of Stimulated
Raman Scattering by Stimulated
Brillouin Scattering Within a
Single Liquid Droplet: Input Laser
Linewidth Effects.
AD-A237 894

Quenching of Stimulated Raman
Scattering in Transparent Liquid
Droplets.
AD-A237 895
Reprint: Fluorescence Imaging of
CO2 Laser-Heated Droplets.
AD-A237 898

*ELASTIC PROPERTIES
Reprint: Large Deformations of a
Whirling Elastic Cable.
AD-A238 009

*ELECTRON TRANSFER
Reprint: Photoelectron Transfer
between Molecules Adsorbed in
Restricted Spaces.
AD-A238 208

*ELECTROSTRICTION
Reprint: Shape Distortion of a

SUBJECT INDEX-1
UNCLASSIFIED T85002

UNCLASSIFIED

Single Water Droplet by Laser-Induced Electrostriction.
AD-A237 897

*FLOW VISUALIZATION

(DURIP) Two and Three Dimensional Imaging of Turbulent and Unsteady Flows.*
AD-A240 043

*FLUORESCENCE

Reprint: Fluorescence Imaging of CO₂ Laser-Heated Droplets.
AD-A237 898

*IMAGES

Reprint: Fluorescence Imaging of CO₂ Laser-Heated Droplets.
AD-A237 898

*ISOMERS

Reprint: Diastereoselective Induction in Radical Coupling Reactions: Photolysis of 2,4-diphenylpentan-3-ones Adsorbed on Faujasite Zeolites.
AD-A238 205

*JET FLAMES

Reprint: Short Communication: Isolation of Buoyancy Effects in Jet Diffusion Flame Experiments.
AD-A237 892

*JET FLOW

Reprint: Asymptotic Analysis of the Fully Developed Region of an Incompressible, Free, Turbulent, Round Jet.
AD-A238 614
Modeling of Free Viscoelastic Jets and Instability Mechanisms.*
AD-A239 174

*LASER PUMPING

Reprint: Temporally and Spatially Resolved Spectroscopy of Laser-Induced Plasma from a Droplet.
AD-A237 896

*LIGHT SCATTERING

Reprint: Pumping of Stimulated Raman Scattering by Stimulated Brillouin Scattering Within a Single Liquid Droplet: Input Laser Linewidth Effects.
AD-A237 894

Reprint: Growth, Decay, and Quenching of Stimulated Raman Scattering in Transparent Liquid Droplets.
AD-A237 895

*MARKOV PROCESSES

Reprint: A Hierarchical, Combinatorial-Markov Method of Solving Complex Reliability Models.
AD-A238 258

*MATHEMATICAL MODELS

Reprint: A Hierarchical, Combinatorial-Markov Method of Solving Complex Reliability Models.
AD-A238 258

*METAL COMPLEXES

Reprint: Photoelectron Transfer between Molecules Adsorbed in Restricted Spaces.
AD-A238 206

*NEURAL NETS

Analog Computation in Neutral Systems: Architectures and Complexity.*
AD-A237 856
Reprint: Neural Coding of Local and Global Motion.
AD-A238 607

*NEUROCHEMICAL TRANSMISSION

Reprint: Neural Coding of Local and Global Motion.
AD-A238 607

*NONNEWTONIAN FLUIDS

Modeling of Free Viscoelastic Jets and Instability Mechanisms.*
AD-A239 174

*NUCLEAR SPINS

Reprint: Investigation of the Kinetic Window for Generation of ¹³C T(0)-S CIDNP Derived from Long-Chain Biradicals by Tuning the Rates of Bimolecular Scavenging and Intersystem Crossing.
AD-A238 207

*NUMERICAL ANALYSIS

Reprint: Large Deformations of a Whirling Elastic Cable.
AD-A238 009

*ORGANOMETALLIC COMPOUNDS

Reprint: Synthesis, Structure, and Pyrolysis of Organoaluminum Amides Derived from the Reactions of Trialkylaluminum Compounds with Ethylenediamine in a 3:2 Ratio.
AD-A238 208

Reprint: Effects of Ring

Substituents, Preferential Silylation, and Added Amine on the Trimer-Dimer Equilibrium in Cyclic Dialkylaluminum Amide Compounds.
AD-A238 209

*PENTANONES

Reprint: Diastereoselective Induction in Radical Coupling Reactions: Photolysis of 2,4-diphenylpentan-3-ones Adsorbed on Faujasite Zeolites.
AD-A238 205

*PERFORMANCE (HUMAN)

Institute for the Study of Human Capabilities: Summary Descriptions of Research for the Period December 1988 through September 1990.*
AD-A237 787

*PHOTOELECTRONS

Reprint: Photoelectron Transfer between Molecules Adsorbed in Restricted Spaces.
AD-A238 206

*PHOTOLYSIS

Reprint: Diastereoselective Induction in Radical Coupling

SUBJECT INDEX-2
UNCLASSIFIED T85002

FLO-PHO

Amides Derived from the Reactions
of Trialkylaluminum Compounds with
Ethylenediamine in a 3:2 Ratio.
AD-A238 208

Reactions: Photolysis of 2,4-
diphenylpentan-3-ones Adsorbed on
Faujasite Zeolites.

AD-A238 205

Reprint: Investigation of the
Kinetic Window for Generation of
13C T(O)-S CIDNP Derived from Long-
Chain Biradicals by Tuning the
Rates of Bimolecular Scavenging and
Intersystem Crossing.

AD-A238 207

*PICTURES

Pictures and Anaphora.*

AD-A240 153

*PLASMAS(PHYSICS)

Reprint: Temporally and
Spatially Resolved Spectroscopy of
Laser-Induced Plasma from a
Droplet.

AD-A237 896

*POLARIZATION

Reprint: Investigation of the
Kinetic Window for Generation of
13C T(O)-S CIDNP Derived from Long-
Chain Biradicals by Tuning the
Rates of Bimolecular Scavenging and
Intersystem Crossing.

AD-A238 207

*PSYCHOLOGY

Reprint: Neural Coding of Local
and Global Motion.

AD-A238 607

*PSYCHOPHYSIOLOGY

Institute for the Study of Human
Capabilities: Summary Descriptions
of Research for the Period December
1989 through September 1990.*

AD-A237 767

*READING

Pictures and Anaphora.*

AD-A240 153

*SYNTHESIS(CHEMISTRY)

Reprint: Synthesis, Structure,
and Pyrolysis of Organoaluminum

UNCLASSIFIED
SUBJECT INDEX-3
T85002

PIC-SYN

PERSONAL AUTHOR INDEX

UNCLASSIFIED

PERSONAL AUTHOR INDEX

- *ACHARYA, MUKUND * * *
Management and Control of Unsteady
and Turbulent Flows.
AD-A240 050
- *ACHENBACH, J. D * * *
Heterogeneous Characterization of
Composite Materials with
Progressive Damage.
AD-A239 162
- *AMUJA, NARENDRA * * *
Perceptual Grouping and Shape from
Texture.
AD-A240 358
- *AKSAY, I. A * * *
Microdesigning of Lightweight/High
Strength Ceramic Materials.
AD-A238 935
- *ALLCOCK, HARRY R * * *
Photochromic Polyphosphazenes with
Spiropyran Units.
AD-A238 719
- *AMIROUCHE, FARID M. * * *
Performance and Stability in High
Speed Articulated Structures
Undergoing Quick Maneuvers - Theory
and Applications.
AD-A237 857
- *ANGELL, THOMAS S * * *
Optimization Methods in Control of
Electromagnetic Fields.
AD-A240 044
- *ANTOLOVICH, STEPHEN D * * *
Deformation, Constitutive Behavior
and Damage of Advanced Structural
Materials under Multiaxial Loading.
AD-A238 221
- *AREND, LAWRENCE E * * *
Eye Movements and Spatial Pattern
Vision.
AD-A238 884
- *AUGERI, MARK * * *
Expert System Control of
Orientation in Ordered Polymers for
NLO Applications.
AD-B158 087L
- *AVI-ITZHAK, BENJAMIN * * *
Feasibility Study of Developing a
Meaningful and Implementable
Methodology for Assessing JTC3A
effectiveness.
AD-A238 574
- *BAIN, LEE J * * *
Reliability Assessment for One-Shot
Devices Based on Repeated Samples.
AD-A237 850
- *BAJAJ, A. K. * * *
Vibrations of Bladed Disk
Assemblies.
AD-A237 805
- *BAJAJ, KRISHAN K. * * *
Spatial Light Modulators with
Arbitrary Quantum Well Profiles.
AD-A238 149
- *BARTON, JACQUELINE K * * *
Photoelectron Transfer between
Molecules Adsorbed in Restricted
Spaces.
AD-A238 206
- *BASS, J. M * * *
Non-Algorithmic Issues in Automated
Computational Mechanics.
AD-A238 322
- *BAUER, PAL I * * *
Suppression of Dexamethasone-
Stimulated DNA Synthesis in an
Oncogene Construct Containing Rat
Cell Line by a DNA Site-Oriented
Ligand of Poly-ADP-Ribose
Polymerase: 6-Amino-1,2-
Benzopyrone.
AD-A238 605
- * * *
Apparent Role of Adenosine
Diphosphoribosyl Transferase in the
Development of Mytilus edulis and
the Inhibition of Differentiation
by Ligands of the Enzyme Protein.
AD-A238 608
- * * *
Cellular Regulation of ADP-
Ribosylation of Proteins. 4.
Conversion of Poly(ADP-Ribose)
Polymerase Activity to NAD-
Glycohydrolase during Retinoic Acid-
Induced Differentiation of HL60
Cells.
AD-A238 711
- *BECHTEL, STEPHEN * * *
Modeling of Free Viscoelastic Jets
and Instability Mechanisms.
AD-A239 174
- *BEDAIR, SALAH * * *
Defect Reductions in Epitaxial
Growth Using Superlattice Buffer
Layers.
AD-A237 710
- *BELYTSCHKO, TEDE * * *
Fission-Fusion Adaptivity in Finite
Elements for Nonlinear Dynamics of
Shells.
AD-A238 029
- *BENNETT, PETER A * * *
In-Situ Diffraction and Imaging
Studies of Heteroepitaxial Growth

PERSONAL AUTHOR INDEX-1
UNCLASSIFIED T85002

of Semi-Conductors.
AD-A237 786

*BERGER, THEODORE W. e e e e e
* * *

A Systems Theoretic Investigation
of Neuronal Network Properties of
the Hippocampal Formation.
AD-A238 815

*BERNSTEIN, DENNIS S
* * *

OPUS: Optimal Projection for
Uncertain Systems. Volume 1.
AD-A240 372

* * *
OPUS: Optimal Projection for
Uncertain Systems. Volume 2.
AD-A240 373

*BHATTACHARYYA, GOURI K. e e e e
* * *

Life Testing and Reliability with
Application in Engineering Systems.
AD-A240 042

*BIRKAN, M. A
* * *

Contractors Meeting in Propulsion
Held in Boulder Colorado on June 10-
14, 1991.
AD-A240 057

*BIXLER, J. P
* * *

Continuous Homotopies for the
Linear Complementarity Problems.
AD-A238 010

*BLAKE, ROBERT, III
* * *

Transformation and Precipitation of
Toxic Metals by 'Pseudomonas
maltophilia'.
AD-A238 232

*BLAKENEY, ROBERT D. e e e e
* * *

Research in Mathematics and
Computer Science: Calculation of
the Probability of Undetected Error

for Certain Error Detection Codes.
Phase 2.
AD-A238 234

*BLYSTONE, ROBERT V. e e e e e
* * *

Image Analysis of Viral-Expressing
Mouse Macrophage Cells.
AD-A238 230

*BOMBICK, D. D
* * *

A Study of the Effect of
Hydrocarbon Structure on the
Induction of Male Rat Nephropathy
and Metabolite Structure.
AD-A237 848

*BORAH, BOLINDRA N
* * *

Numerical and Analytical Studies of
Stefan Problems.
AD-A239 163

*BRISTOWE, PAUL D
* * *

Defects in Materials. Materials
Research Society Symposium
Proceedings. Volume 209.
AD-A238 725

*BROWN, THOMAS H. e e
* * *

Long Term Synaptic Plasticity and
Learning in Neuronal Networks.
AD-A240 366

*BROWNE, SAMUEL F
* * *

Coherence Determines Speed
Discrimination.
AD-A238 608

*BRUCKNER, J. V
* * *

Bioavailability of Volatile
Organics and Other Hydrocarbons
from Environmental Media: Ingestion
in Drinking Water.
AD-A238 573

*BURZYNSKI, RYSZARD
* * *

Chemical Processing of Novel
Multifunctional Materials for
Sensor Protection against Laser
Threats.
AD-A237 718
* * *
A Novel Second Harmonic Generator
for Photonics Using Multifunctional
Nonlinear Waveguides.
AD-B156 243L

*BUSH, W. B
* * *

Asymptotic Analysis of the Fully
Developed Region of an
Incompressible, Free, Turbulent,
Round Jet.
AD-A238 614

*CAREW, THOMAS J. e e
* * *

A Circuit Analysis and
Computational Model of Operant
Conditioning in Aplysia.
AD-A240 120

*CASSTEVENS, MARTIN e e
* * *

A Novel Second Harmonic Generator
for Photonics Using Multifunctional
Nonlinear Waveguides.
AD-B156 243L

*CASSTEVENS, MARTIN K. e e e e
* * *

Chemical Processing of Novel
Multifunctional Materials for
Sensor Protection against Laser
Threats.
AD-A237 716

*CHAMEAU, J. L. e e e e
* * *

Anisotropic Behavior of Soils and
Pressuremeter Tests.
AD-A239 137

*CHAN, MATTHEW T
* * *

PERSONAL AUTHOR INDEX-2
UNCLASSIFIED T85002

BER-CHA

UNCLASSIFIED

An Additive Turbulent Decomposition of the Navier-Stokes Equations Implemented on Highly Parallel Computer Systems.
AD-A240 131

*CHAN, TONY F * * *

An Additive Turbulent Decomposition of the Navier-Stokes Equations Implemented on Highly Parallel Computer Systems.
AD-A240 131

*CHANG, LOUIS W. * * *

The Asian Toxicology Conference Tour.
AD-A240 095

*CHANG, RICHARD K * * *

Growth, Decay, and Quenching of Stimulated Raman Scattering in Transparent Liquid Droplets.
AD-A237 895

* * *

Temporally and Spatially Resolved Spectroscopy of Laser-Induced Plasma from a Droplet.
AD-A237 896

* * *

Nonlinear Spectroscopy of Multicomponent Droplets and Two-Dimensional Measurements in Flames.
AD-A238 028

*CHANG, RICHARD K. * * *

Pumping of Stimulated Raman Scattering by Stimulated Brillouin Scattering Within a Single Liquid Droplet: Input Laser Linewidth Effects.
AD-A237 894

* * *

Fluorescence Imaging of CO2 Laser-Heated Droplets.
AD-A237 898

*CHANG, RICHARD K. * * *

Shape Distortion of a Single Water Droplet by Laser-Induced Electrostriction.
AD-A237 897

*CHEN, GANG

* * *

Pumping of Stimulated Raman Scattering by Stimulated Brillouin Scattering Within a Single Liquid Droplet: Input Laser Linewidth Effects.
AD-A237 894

*CHEN, RAY * * *

* * *

An Optically Activated Modulator and GaAs-GaAlAs Compound Semiconductor Channel Waveguide.
AD-A238 842

*CHEN, SHU-CHI * * *

* * *

Growth, Decay, and Quenching of Stimulated Raman Scattering in Transparent Liquid Droplets.
AD-A237 895

* * *

Temporally and Spatially Resolved Spectroscopy of Laser-Induced Plasma from a Droplet.
AD-A237 896

*CHICONE, CARMEN * * *

* * *

Applications of Multiparameter Bifurcations of Period Functions.
AD-A240 048

*CHIN, BRYAN A * * *

* * *

Investigation of the Properties of Titanium-Carbon Hybrid Alloys.
AD-A238 787

*CHUN, JOOHWANE * * *

* * *

Fast Array Algorithms for Structured Matrices.

AD-A238 977

*CLARK, C. W. * * *

* * *

Laser-Atom Interaction at High Intensities.
AD-A238 231

*CLEMENS, J. M * * *

* * *

A Study of the Effect of Hydrocarbon Structure on the Induction of Male Rat Nephropathy and Metabolite Structure.
AD-A237 848

*COHEN, DONALD S. * * *

* * *

Differential Equations and Continuum Mechanics.
AD-A237 722

*COHEN, P. I * * *

* * *

The Growth of Ultrathin Epitaxial Intermetallic Films.
AD-A237 798

*COLDREN, L. A * * *

* * *

Efficient Optical Logic, Interconnections and Processing Using Quantum Confined Structures.
AD-A238 701

*COLKET, M. B., III * * *

* * *

The Determination of Rate-Limiting Steps during Soot Formation.
AD-A240 005

*COMBS, J * * *

* * *

Non-Algorithmic Issues in Automated Computational Mechanics.
AD-A238 322

*COOK-IOANNIDIS, L. P. * * *

* * *

Mathematical Problems in Transonic Flow.

PERSONAL AUTHOR INDEX-3
UNCLASSIFIED T85002

CHA-C00

- AD-A239 292
- *COOPER, BERNARD R * * *
High Temperature Properties of
Ceramic/Carbon Systems in an
Oxidizing Environment.
AD-A238 908
- *COOPER, C. V * * *
Fatigue and Fracture of
Intermetallic Alloys.
AD-A238 886
- *CORKE, THOMAS C * * *
Management and Control of Unsteady
and Turbulent Flows.
AD-A240 050
- *CRUICKSHANK, ALEXANDER M. * * * * *
The Gordon Conference on Inorganic
Chemistry Held in Wolfboro, New
Hampshire on 30 July-3 August 1990.
AD-A238 781
- *CUNNINGHAM, R. K. * * * * *
Parametric Study of Diffusion-
Enhancement Networks for
Spatiotemporal Grouping in Real-
Time Artificial Vision.
AD-A238 782
- *CZEKAJ, CORINNA L * * * * *
Effects of Ring Substituents,
Preferential Solvation, and Added
Amine on the Trimer-Dimer
Equilibrium in Cyclic
Dialkylaluminum Amide Compounds.
AD-A238 209
- *DABBS, D. M * * * * *
Microdesigning of Lightweight/High
Strength Ceramic Materials.
AD-A238 935
- *DAHLBERG, E. D. * * * * *
Ultra High Vacuum Sputtering
System.
AD-A240 157
- *DALLAS, C. E * * * * *
Bioavailability of Volatile
Organics and Other Hydrocarbons
from Environmental Media: Ingestion
in Drinking Water.
AD-A238 573
- *DALLAS, CHAM E. * * * * *
Validation and Application of
Pharmacokinetic Models for
Interspecies Extrapolations in
Toxicity Risk Assessments of
Volatile Organics.
AD-A240 058
- *DANCYGIER, AVRAHAM N. * * * * *
Dynamic Response of Embedded
Structures.
AD-A239 019
- *DANIEL, BRADY R * * * * *
Investigation of the Flame-Acoustic
Wave Interaction during Axial Solid
Rocket Instabilities.
AD-A237 851
- *DANIEL, I. M * * * * *
Heterogeneous Characterization of
Composite Materials with
Progressive Damage.
AD-A239 182
- *DAROLIA, R * * * * *
Alloy Modeling and Experimental
Correlation for Ductility
Enhancement in Near Stoichiometric
Single Crystal Nickel Aluminate.
AD-A240 151
- *DAVIS, MICHAEL * * * * *
Fear-Potentiated Startle as a Model
System for Analyzing Learning and
Memory.
AD-A239 994
- *DAVIS, R. W * * * * *
Short Communication: Isolation of
Buoyancy Effects in Jet Diffusion
Flame Experiments.
AD-A237 892
- *DEJONGHE, L. C. * * * * *
Micromechanisms of Monotonic and
Cyclic Subcritical Crack Growth in
Advanced High Melting Point Low-
Ductility Intermetallics.
AD-A238 151
- *DICKENS, BENJAMIN F. * * * * *
Free Radical Mechanisms of
Xenobiotic Mammalian
Cytotoxicities.
AD-A238 790
- *DICKINSON, BRADLEY W. * * * * *
Analog Computation in Neutral
Systems: Architectures and
Complexity.
AD-A237 856
- *DOBRY, RICARDO * * * * *
A Study of the Behavior and
Micromechanical Modelling of
Granular Soil. Volume 1. A
Constitutive Relation for Granular
Materials Based on the Contact Law
Between Two Spheres.
AD-A238 091
- *DOBRY, RICARDO * * * * *
A Study of the Behavior and
Micromechanical Modelling of
Granular Soil. Volume 2. An
Experimental Investigation of the
Behavior of Granular Media Under

UNCLASSIFIED

- Load.
AD-A238 092
- * * *
A Study of the Behavior and
Micromechanical Modelling of
Granular Soil. Volume 3. A
numerical Investigation of the
Behavior of Granular Media Using
Nonlinear Discrete Element
Simulation.
AD-A238 158
- *DOUBLEDAY, CHARLES, JR. * * *
Investigation of the Kinetic Window
for Generation of 13C t(O)-S CIDNP
Derived from Long-Chain Biradicals
by Tuning the Rates of Bimolecular
Scavenging and Intersystem
Crossing.
AD-A238 207
- *DOW, JOHN * * *
Vibrational, Mechanical, and Thermal
Properties of III-V Semiconductors.
AD-A237 785
- *DOYLE, JOHN * * *
New Methods in Robust Control.
AD-A240 221
- *DRUY, MARK A * * *
Expert System Control of
Orientation in Ordered Polymers for
NLO Applications.
AD-B156 087L
- *DRYER, FREDRICK * * *
A Systematic Approach to Combustion
Model Reduction and Lumping.
AD-A240 195
- *DURLACH, NATHANIEL I. * * *
RLE Progress Report No 133.
AD-A240 154
- *DYE, RAYMOND H * * *
Auditory Processing of Complex
Sounds across Frequency Channels.
AD-A238 023
- *ELGERSMA, MIKE * * *
New Methods in Robust Control.
AD-A240 221
- *EL-MASRY, N. * * *
Defect Reductions in Epitaxial
Growth Using Superlattice Buffer
Layers.
AD-A237 710
- *ENGELHARDT, MAX * * *
Reliability Assessment for One-Shot
Devices Based on Repeated Samples.
AD-A237 850
- *ENGLMAN, R * * *
A Statistical Physics Analysis of
Rock and Concrete Damage Response.
AD-A240 310
- *ENGIJST, BJORN * * *
Numerical Methods for Scattering
from Electrically Large Objects.
AD-A238 282
- *EPPERSON, J. E * * *
Defects in Materials. Materials
Research Society Symposium
Proceedings, Volume 209.
AD-A238 725
- *ESKEWM, R. T., JR * * *
The Effects of Luminance Boundaries
on Color Perception.
AD-A237 794
- *EURELL, THOMAS E. * * *
A Comparative Study Regarding the
Association of Alpha-2U Globulin
with the Nephrotoxic Mechanism of
Certain Petroleum-Based Air Force
Fuels.
AD-A240 363
- *FARIS, GREGORY W * * *
Novel Nonlinear Laser Diagnostic
Techniques.
AD-A240 193
- *FAUCI, LISA J. * * *
A Grid-Free Method for High-
Reynolds Number Flow Around an
Immersed Elastic Structure.
AD-A240 048
- *FAURIE, JEAN-PIERRE * * *
Evaluation of the Feasibility and
the Cost of HgCdTe Epitaxial Layers
Grown by Molecular Beam Epitaxy on
CdTe, CdZnTe and GaAs Substrates.
AD-A238 602
- *FAVROW, L. H. * * *
Fatigue and Fracture of
Intermetallic Alloys.
AD-A238 686
- *FECHTER, LAWRENCE D. * * *
International Conference on
Combined Effect of Environmental
Factors (4th).
AD-A240 045
- *FIELD, R. D * * *
Alloy Modeling and Experimental
Correlation for Ductility
Enhancement in Near Stoichiometric
Single Crystal Nickel Aluminate.
AD-A240 151
- *FOREST, GREG * * *
PERSONAL AUTHOR INDEX-5
UNCLASSIFIED T85002

DOJ-FOR

- *FRANCO, JOHN * * *
Modeling of Free Viscoelastic Jets
and Instability Mechanisms.
AD-A239 174
- *FRANCO, JOHN * * *
Data Compilation: Its Design and
Analysis.
AD-A237 789
- *FRAZIER, DONALD E * * *
Investigation of the Hepatotoxic
and Immunotoxic Effects of the
Peroxisome Proliferator
Perfluorodecanoic Acid.
AD-A237 787
- *FREDRICKSON, LYLE J * * *
Research in Mathematics and
Computer Science: Calculation of
the Probability of Undetected Error
for Certain Error Detection Codes.
Phase 2.
AD-A238 234
- *FREEMAN, A. J. eeeee * * *
Alloy Modeling and Experimental
Correlation for Ductility
Enhancement in Near Stoichiometric
Single Crystal Nickel Aluminate.
AD-A240 151
- *FRIEDMAN, DANIEL P. eeeee * * *
Data Compilation: Its Design and
Analysis.
AD-A237 789
- *GALLO, J. M * * *
Bioavailability of Volatile
Organics and Other Hydrocarbons
from Environmental Media: Ingestion
in Drinking Water.
AD-A238 573
- *GEBALLE, THEODORE H. eeee * * *
Detectors of Infrared Radiation
Based on High T(c) Superconducting
YBCO Films.
AD-A239 285
- *GHATLIA, NARESH D * * *
Diastereoselective Induction in
Radical Coupling Reactions:
Photolysis of 2,4-diphenylpentan-3-
ones Adsorbed on Faujasite
Zeolites.
AD-A238 205
- *GHOSH, SUBIR e * * *
Study of Various Problems in
Statistical Planning.
AD-A237 790
- *GIAMEI, A. F * * *
Fatigue and Fracture of
Intermetallic Alloys.
AD-A238 886
- *GIBSON, J. S. eeeee * * *
Digital Control and Identification
of Distributed Systems.
AD-A239 175
- *GILLETTE, MARTHA U * * *
The Organization of the
Suprachiasmatic Circadian Pacemaker
of the Rat and its Regulation by
Neurotransmitters and Modulators.
AD-A237 788
- *GINSBURG, ARTHUR P. eeeee * * *
Suprathreshold Contrast Sensitivity
Vision Test Chart.
AD-A239 445
- *GLENBERG, ARTHUR M * * *
Pictures and Anaphora.
AD-A240 153
- *GOEKMEN, M. eeee * * *
Wavelet Transforms and Parallel
Image Processing.
AD-A239 196
- *GOSSARD, A. C * * *
Efficient Optical Logic,
Interconnections and Processing
Using Quantum Confined Structures.
AD-A238 701
- *GRIFFITH, JOSEPH E * * *
Defects in Materials. Materials
Research Society Symposium
Proceedings. Volume 209.
AD-A238 725
- *GUBSER, JOHN L * * *
Chaotic Response of Aerosurfaces
with Structural Nonlinearities.
AD-B156 876L
- *HADDAD, WASSIM M. eeee * * *
OPUS: Optimal Projection for
Uncertain Systems. Volume 1.
AD-A240 372
- *HADDAD, WASSIM M. eeee * * *
OPUS: Optimal Projection for
Uncertain Systems. Volume 2.
AD-A240 373
- *HALL, R. J * * *
The Determination of Rate-Limiting
Steps during Soot Formation.
AD-A240 005
- *HALL, RICHARD W * * *
Wavelet Transforms and Parallel
Image Processing.
AD-A239 196
- *HAN, NIANHE * * *
Photochemistry of Large-Ring 2-

UNCLASSIFIED

- Phenylcycloalkanes in Various Environments. Intramolecular Para Coupling Products of Acyl Benzyl Biradicals, AD-A238 792
- *HANDEL, PETER H.@@ * * *
Quantum 1/f Noise in High Technology Applications Including Ultrasmall Structures and Devices. AD-A240 152
- *HANSEN, PIERRE@@ * * *
Feasibility Study of Developing a Meaningful and Implementable Methodology for Assessing JTC3A effectiveness. AD-A238 574
- *HAUENSTEIN, ANTHONY J.@@@ * * *
Chaotic Response of Aerosurfaces with Structural Nonlinearities. AD-B156 876L
- *HIGLE, JULIA L.@@@ * * *
Heuristic Methods in Applied Probability. AD-A238 229
- *HORGAN, CORNELIUS O.@@@@ * * *
Large Deformation Induced Failures in Nonlinear Solids. AD-A240 369
- *HSIEH, WEN-FENG * * *
Growth, Decay, and Quenching of Stimulated Raman Scattering in Transparent Liquid Droplets. AD-A237 895
- * * *
Temporally and Spatially Resolved Spectroscopy of Laser-Induced Plasma from a Droplet. AD-A237 896
- *HUESTIS, D. L.@@@ * * *
Novel Nonlinear Laser Diagnostic Techniques. AD-A240 193
- *HWANG, KUO C * * *
Investigation of the Kinetic Window for Generation of 13C t(O)-S CIDNP Derived from Long-Chain Biradicals by Tuning the Rates of Bimolecular Scavenging and Intersystem Crossing. AD-A238 207
- *HYLAND, DAVID C.@@ * * *
Experimental Verification of an Innovative Performance-Validation Methodology for Large Space Systems. AD-A237 884
- *HYLIN, E. C * * *
An Additive Turbulent Decomposition of the Navier-Stokes Equations Implemented on Highly Parallel Computer Systems. AD-A240 131
- *INOUE, H. R * * *
Fatigue and Fracture of Intermetallic Alloys. AD-A238 688
- *INTERRANTE, L. V.@@@@ * * *
N,N'-Bis(triethylaluminio)ethylenediamine- and N,N'-Bis(trimethylaluminio)ethylenediamine-Derived Organometallic Precursors to Aluminum Nitride: Syntheses, Structures, and Pyrolyses. AD-A238 604
- *INTERRANTE, LEONARD V * * *
Synthesis, Structure, and Pyrolysis
- of Organoaluminum Amides Derived from the Reactions of Trialkylaluminum Compounds with Ethylenediamine in a 3:2 Ratio. AD-A238 208
- *INTERRANTE, LEONARD V.@@@ * * *
Effects of Ring Substituents, Preferential Solvation, and Added Amine on the Trimer-Dimer Equilibrium in Cyclic Dialkylaluminum Amide Compounds. AD-A238 209
- *INTERRANTE, LEONARD V.@@ * * *
Organometallic Precursor Routes to Si-C-Al-O-N Ceramics. AD-A237 753
- *JAEGER, Z.@@@@ * * *
A Statistical Physics Analysis of Rock and Concrete Damage Response. AD-A240 310
- *JAIN, RAMESH@@ * * *
Object Recognition in Range Images Using CAD Databases. AD-A239 328
- *JEFFRIES, JAY B * * *
Novel Nonlinear Laser Diagnostic Techniques. AD-A240 193
- *JIANG, ZHIPING * * *
Synthesis, Structure, and Pyrolysis of Organoaluminum Amides Derived from the Reactions of Trialkylaluminum Compounds with Ethylenediamine in a 3:2 Ratio. AD-A238 208
- * * *
N,N'-Bis(triethylaluminio)ethylenediamine- and N,N'-Bis(trimethylaluminio)ethylenediamin
- PERSONAL AUTHOR INDEX-7
UNCLASSIFIED T85002
- HAN-JIA

- e-Derived Organometallic Precursors to Aluminum Nitride: Syntheses, Structures, and Pyrolyses.
AD-A238 604
- *JING, HONGXING * * *
Persistent Photoconductivity in II-VI Mixed Semiconductors Related Critical Phenomena and Applications.
AD-A237 792
- *JOHNSON, RICHARD A * * *
Life Testing and Reliability with Application in Engineering Systems.
AD-A240 042
- *JOHNSTON, DANIELE * * *
Heterosynaptic Modulation of Long-Term Potentiation at Mossy Fiber Synapses in Hippocampus.
AD-A238 027
- *KAPUR, DEEPA * * *
A Workshop on the Integration of Numerical and Symbolic Computing Methods Held in Saratoga Springs, New York on July 9-11, 1980.
AD-A238 601
- *KAUFMAN, LLOYD * * *
Cognition and the Brain.
AD-A237 846
- *KEER, L. M. * * *
Heterogeneous Characterization of Composite Materials with Progressive Damage.
AD-A239 182
- *KEER, LEON M * * *
Dynamic Response of Embedded Structures.
AD-A239 019
- *KELLER, JOSEPH * * *
Mathematical Problems of Nonlinear Wave Propagation and of Waves in Heterogeneous Media.
AD-A239 222
- *KIM, CHULHEE * * *
Photochromic Polyphosphazenes with Spiropyran Units.
AD-A238 719
- *KIRSTEN, EVA * * *
Suppression of Dexamethasone-Stimulated DNA Synthesis in an Oncogene Construct Containing Rat Cell Line by a DNA Site-Oriented Ligand of Poly-ADP-Ribose Polymerase: 8-Amino-1,2-Benzopyrone.
AD-A238 605
- * * *
Cellular Regulation of ADP-Ribosylation of Proteins. 4. Conversion of Poly(ADP-Ribose) Polymerase Activity to NAD-Glycohydrolase during Retinoic Acid-Induced Differentiation of HL60 Cells.
AD-A238 711
- *KLEINMAN, RALPH E. * * *
Optimization Methods in Control of Electromagnetic Fields.
AD-A240 044
- *KLINE, KURT * * *
Apparent Role of Adenosine Diphosphoribosyl Transferase in the Development of Mytilus edulis and the Inhibition of Differentiation by Ligands of the Enzyme Protein.
AD-A238 606
- *KLINE, STEPHEN J. * * *
Investigation of the Turbulence
- e-Derived Organometallic Precursors to Aluminum Nitride: Syntheses, Structures, and Pyrolyses.
AD-A238 604
- *KUN, ERNEST * * *
Apparent Role of Adenosine Diphosphoribosyl Transferase in the Development of Mytilus edulis and the Inhibition of Differentiation by Ligands of the Enzyme Protein.
AD-A238 606
- *KULLNIG, RUDOLPH * * *
Synthesis, Structure, and Pyrolysis of Organoaluminum Amides Derived from the Reactions of Trialkylaluminum Compounds with Ethylenediamine in a 3:2 Ratio.
AD-A238 208
- Producing Structures in the Boundary Layer.
AD-A239 286
- *KOTSAMPOULOS, PANOS * * *
A Study of the Behavior and Micromechanical Modelling of Granular Soil. Volume 2. An Experimental Investigation of the Behavior of Granular Media Under Load.
AD-A238 092
- *KRISHNAMURTHY, L. * * *
Asymptotic Analysis of the Fully Developed Region of an Incompressible, Free, Turbulent, Round Jet.
AD-A238 614
- *KRONAUER, RICHARD E * * *
The Effects of Luminance Boundaries on Color Perception.
AD-A237 794
- *KRULEY, PETER * * *
Pictures and Anaphora.
AD-A240 153
- *KUN, ERNEST * * *
Apparent Role of Adenosine Diphosphoribosyl Transferase in the Development of Mytilus edulis and the Inhibition of Differentiation by Ligands of the Enzyme Protein.
AD-A238 606

- *KUN, ERNEST * * *
Suppression of Dexamethasone-Stimulated DNA Synthesis in an Oncogene Construct Containing Rat Cell Line by a DNA Site-Oriented Ligand of Poly-ADP-Ribose Polymerase: 6-Amino-1,2-Benzopyrone,
AD-A238 805
- * * *
Cellular Regulation of ADP-Ribosylation of Proteins. 4. Conversion of Poly(ADP-Ribose) Polymerase Activity to NAD-Glycohydrolase during Retinoic Acid-Induced Differentiation of HL60 Cells.
AD-A238 711
- *KURTZ, HELMUT * * *
Basic Processes of Plasma Propulsion.
AD-A238 858
- *KWOK, ALFRED S * * *
Fluorescence Imaging of CO2 Laser-Heated Droplets.
AD-A237 898
- *KWON, DAEKEUN * * *
Synthesis, Structure, and Pyrolysis of Organoaluminum Amides Derived from the Reactions of Trialkylaluminum Compounds with Ethylenediamine in a 3:2 Ratio.
AD-A238 208
- *KYRILLIDIS, ARCHIMEDES J. * * *
Numerical and Analytical Studies of Stefan Problems.
AD-A238 183
- *LABRECQUE, G * * *
Annual Review of Chronopharmacology. Volume 7.
AD-A238 234
- *LAHRMAN, D. F * * *
Alloy Modeling and Experimental Correlation for Ductility Enhancement in Near Stoichiometric Single Crystal Nickel Aluminate.
AD-A240 151
- *LAW, K. K. * * *
Efficient Optical Logic, Interconnections and Processing Using Quantum Confined Structures.
AD-A238 701
- *LEI, XUEGONG * * *
Photochemistry of Large-Ring 2-Phenylcycloalkanones in Various Environments. Intramolecular Para Coupling Products of Acyl Benzyl Biradicals.
AD-A238 792
- *LEIBOVICH, IDNEY * * *
Vortex Dynamics.
AD-A239 060
- *LEONE, STEPHEN R. * * *
Laser Probing of the Kinetics and Dynamics of III - V Semiconductor Growth.
AD-A237 795
- *LEVIN, JEFF A * * *
Research in Mathematics and Computer Science: Calculation of the Probability of Undetected Error for Certain Error Detection Codes. Phase 2.
AD-A238 234
- *LEVIN, PHILIP * * *
Expert System Control of Orientation in Ordered Polymers for NLO Applications.
AD-B158 087L
- *LI, CHING-CHUNG * * *
Wavelet Transforms and Parallel Image Processing.
AD-A239 198
- *LILIENTAL-WEBER, ZUZANNA * * *
Defects in Materials. Materials Research Society Symposium Proceedings, Volume 209.
AD-A238 725
- *LIU, LIE * * *
A Study of the Behavior and Micromechanical Modelling of Granular Soil. Volume 3. A numerical Investigation of the Behavior of Granular Media Using Nonlinear Discrete Element Simulation.
AD-A238 158
- *LOCKHEAD, GREGORY R. * * *
On Categorizing Sounds.
AD-A240 006
- *LONG, MARSHALL B * * *
Nonlinear Spectroscopy of Multicomponent Droplets and Two- and Three-Dimensional Measurements in Flames.
AD-A238 028
- *LYNCH, GARY * * *
Synaptic Plasticity and Memory Formation.
AD-A240 121
- *MACKENZIE, JOHN D

* * *
Preparation and Properties of New
Inorganic Glasses and Gel-Derived
Solids.
AD-A238 095

*MANNING, R. O

* * *
Bioavailability of Volatile
Organics and Other Hydrocarbons
from Environmental Media: Ingestion
in Drinking Water.
AD-A238 573

*MARACAS, GEORGE N

* * *
Spatial Light Modulators with
Arbitrary Quantum Well Profiles.
AD-A238 149

*MARCHAND, ALAN P.e

* * *
Synthesis of Novel, Substituted
Polycyclic Cage Systems.
AD-A239 325

*MARTIN, J. W

* * *
Compressive Stress-Induced
Microcracks and Effective Elastic
Properties of Limestone and
Concrete. Phase 1.
AD-A237 708

*MARTINEZ-SANCHEZ, MANUEL

* * *
Non-Equilibrium and Radiation in
MPD Plasmas.
AD-A238 859

*MATTIE, DAVID R

* * *
A Study of the Effect of
Hydrocarbon Structure on the
Induction of Male Rat Nephropathy
and Metabolite Structure.
AD-A237 848

*MAZUMDER, JYOTIRMOYE

* * *
Scientific Imaging System.

AD-A239 059

*MCADAMS, R.e

* * *
Particle Beams for Defence.
AD-B156 558L

*MCDONALD, GAYLE A

* * *
A Study of the Effect of
Hydrocarbon Structure on the
Induction of Male Rat Nephropathy
and Metabolite Structure.
AD-A237 848

*MCDONOUGH, J. M

* * *
An Additive Turbulent Decomposition
of the Navier-Stokes Equations
Implemented on Highly Parallel
Computer Systems.
AD-A240 131

*MCELIECE, ROBERT J.eee

* * *
Coding for Spread-Spectrum Channels
in the Presence of Jamming.
AD-A238 233

*MCLIRATH, T. J

* * *
Laser-Atom Interaction at High
Intensities.
AD-A238 231

*MCKEAGUE, IAN W

* * *
Identification of Nonlinear Times
Series from First Order Cumulative
Characteristics.
AD-A239 822

*MCKEE, R. A.eeee

* * *
Structures and Properties of
Compositionally Modulated Ceramics.
AD-B156 176L

*MCKEE, SUZANNE P.eeeee

* * *
Neural Coding of Local and Global

Motion,
AD-A238 607

*MCKOON, GAIL

* * *
Reading: Interactions with Memory.
AD-A239 219

*MCLENNAN, JOHN D

* * *
Compressive Stress-Induced
Microcracks and Effective Elastic
Properties of Limestone and
Concrete. Phase 1.
AD-A237 708

*MEDANIC, MARIJA

* * *
The Organization of the
Suprachiasmatic Circadian Pacemaker
of the Rat and its Regulation by
Neurotransmitters and Modulators.
AD-A237 788

*MEIER, G. H

* * *
Environmental Effects in Niobium
Base Alloys and Other Selected
Intermetallic Compounds.
AD-A237 535

*MERKLE, CHARLES L

* * *
Coupling between Radiation and Gas
Dynamics.
AD-A240 004

*MESSIER, RUSSELLeeee

* * *
Quantitative Analysis of Thin Film
Morphology.
AD-B156 201L

*MIAH, M. A.e

* * *
Observation of Z>1 Particles Below
300 km Near the Geomagnetic
Equator.
AD-A240 058

The ONR-602 Experiment and

PERSONAL AUTHOR INDEX-10
UNCLASSIFIED T85002

MAN-MIA

UNCLASSIFIED

- Investigation of Particle
Precipitation Near the Equator.
AD-A240 208 * * *
- Global Peak Flux Profile of Proton
Precipitation in the Equatorial
Zone.
AD-A240 209
- *MICCI, MICHAEL M. eeeee
* * *
Coupling between Radiation and Gas
Dynamics.
AD-A240 004
- *MICHEL, ANN-MARIE
* * *
The Organization of the
Suprachiasmatic Circadian Pacemaker
of the Rat and its Regulation by
Neurotransmitters and Modulators.
AD-A237 788
- *MINKER, ee
* * *
Parallellogic Programming and
Parallel System Software and
Hardware.
AD-A239 228
- *MONTANO, PEDRO A. eeeee
* * *
High Temperature Properties of
Ceramic/Carbon Systems in an
Oxidizing Environment.
AD-A238 908
- *MOORE, E. F
* * *
Short Communication: Isolation of
Buoyancy Effects in Jet Diffusion
Flame Experiments.
AD-A237 892
- *MOORE, JOHN W. eeee
* * *
Biological and Theoretical Studies
of Adaptive Networks: The
Conditioned Response.
AD-A238 881
- *MORTON, BLAISE * * *
* * *
New Methods in Robust Control.
AD-A240 221
- *MROTEK, JAMES T. ee
* * *
Assaying the Effects of Sublethal
Industrial Toxicant Concentrations
on Cultured Adrenal Cells.
AD-B158 502L
- *MURPHY, W. D * * *
* * *
Numerical Methods for Scattering
from Electrically Large Objects.
AD-A238 282
- *MURUGESH, L * * *
* * *
Micromechanisms of Monotonic and
Cyclic Subcritical Crack Growth in
Advanced High Melting Point Low-
Ductility Intermetallics.
AD-A238 151
- *NAGIB, HASSAN M * * *
* * *
Management and Control of Unsteady
and Turbulent Flows.
AD-A240 050
- *NAKAYAMA, KEN* * *
* * *
Psychophysical Studies of Visual
Cortical Function.
AD-A238 883
- *NESS, J. R. eeeee
* * *
Short Communication: Isolation of
Buoyancy Effects in Jet Diffusion
Flame Experiments.
AD-A237 892
- *NEUMANN, MICHAEL eeee
* * *
Convergence and Performance of
Synchronous and Asynchronous
Parallel and Conventional Iterative
Methods.
- AD-A240 286
- *NG, TANG-TAG * * *
* * *
A Study of the Behavior and
Micromechanical Modelling of
Granular Soil. Volume 3. A
Numerical Investigation of the
Behavior of Granular Media Using
Nonlinear Discrete Element
Simulation.
AD-A238 158
- *NIKIEL, L * * *
* * *
Adsorption of Pyridine on Silica
Gels.
AD-A238 732
- *NMOKAH, O. D * * *
* * *
Vibrations of Bladed Disk
Assemblies.
AD-A237 805
- *ODEN, J. T * * *
* * *
Non-Algorithmic Issues in Automated
Computational Mechanics.
AD-A238 322
- *OLSEN, LAWRENCE eeeee
* * *
Investigation of High Efficiency
Monolithic Multibandgap Solar
Cells.
AD-A238 718
- *OVERMAN, EDWARD eeeee
* * *
Coherence and Chaos in Integrable
PDEs (Partial Differential
Equations).
AD-A239 284
- *PAL, DEBAJOYTI * * *
* * *
Fast Algorithms for Structured
Matrices with Arbitrary Rank
Profile.
AD-A238 975

PERSONAL AUTHOR INDEX-11
UNCLASSIFIED T85002

MIC-PAL

- *PETRAKIS, EMMANUEL * * *
 A Study of the Behavior and
 Micromechanical Modelling of
 Granular Soil. Volume 1. A
 constitutive Relation for Granular
 Materials Based on the Contact Law
 Between Two Spheres.
 AD-A238 091
- *POORE, AUBREY B. eeeee * * *
 Continuous Homotopies for the
 Linear Complementarity Problems.
 AD-A238 010
- *POURARIAN, F. e * * *
 Low-Cost, High Torque-to-Weight
 Ratio Permanent Magnet Motors,
 Actuators and Sensors.
 AD-8156 503L
- *POURAHMADI, MOSHENEe * * *
 Analysis of Nongaussian, Nonlinear
 Time Series with Long -Memory.
 AD-A237 847
- *PROBER, DANIEL E. e * * *
 Preparation and Characterization of
 High Temperature Superconductor
 Film Surfaces.
 AD-A240 118
- *PICK, HERBERT L., JR * * *
 Topographic Map Reading.
 AD-A238 028
- *PLANO, LINDA S. eee * * *
 Thermochemistry of Hydrocarbon
 Decomposition and Relationship to
 Properties of PECVD Diamond Films.
 AD-A237 793
- *PLESS, VERAeee * * *
 Error Correcting Codes and Related
 Designs.
 AD-A238 284
- *POL, VAN D. e * * *
 Cytochemical Organization of the
 Retino-Suprachiasmatic System.
 AD-A240 118
- *REINBERG, A * * *
 Annual Review of
 Chronopharmacology. Volume 7.
 Biological Rhythms and Medications.
 Proceedings of the Conference of
 Chronopharmacology Held in Nice,
 France on 12-15 March 1990.
 AD-A238 827
- *REISENTHAL, PATRICK H * * *
 Management and Control of Unsteady
 and Turbulent Flows.
 AD-A240 050
- *REYNOLDS, W. C. eee * * *
 Flow Control.
 AD-A238 855
- *RICHARDS, WHITMANeee * * *
 Top-Down Influences on Bottom-Up
 Processing.
 AD-A238 235
- *ROKHLIN, VLADIMIR * * *
 Numerical Methods for Scattering
 from Electrically Large Objects.
 AD-A238 282
- *ROSE, MILTON E * * *
 Numerical and Analytical Studies of
 Stefan Problems.
 AD-A239 163
- *ROSS, BRIAN H. eeee * * *
 Reminding-Based Learning.
 AD-A240 370
- *ROUTTENBERG, ARYEHee * * *
 Phosphoprotein Regulation of
 Synaptic Reactivity.
 AD-A237 849
- *SAFNER, ROBIN A * * *
 Continuous Homotopies for the
 Linear Complementarity Problems.
 AD-A238 010
- *POURARIAN, F. e * * *
 Low-Cost, High Torque-to-Weight
 Ratio Permanent Magnet Motors,
 Actuators and Sensors.
 AD-8156 503L
- *POURAHMADI, MOSHENEe * * *
 Analysis of Nongaussian, Nonlinear
 Time Series with Long -Memory.
 AD-A237 847
- *PROBER, DANIEL E. e * * *
 Preparation and Characterization of
 High Temperature Superconductor
 Film Surfaces.
 AD-A240 118
- *RABITZ, HERSCHEL * * *
 Physics of Ultrasmall
 Superconducting Circuits.
 AD-A240 158
- *RAO, K. T * * *
 A Systematic Approach to Combustion
 Model Reduction and Lumping.
 AD-A240 195
- *RAO, K. T * * *
 Micromechanisms of Monotonic and
 Cyclic Subcritical Crack Growth in
 Advanced High Melting Point Low-
 Ductility Intermetallics.
 AD-A238 151
- *REA, MICHAEL * * *
 The Organization of the
 Suprachiasmatic Circadian Pacemaker
 of the Rat and its Regulation by
 Neurotransmitters and Modulators.
 AD-A237 788
- *REINBERG, A * * *
 Annual Review of
 Chronopharmacology. Volume 7.
 Biological Rhythms and Medications.
 Proceedings of the Conference of
 Chronopharmacology Held in Nice,
 France on 12-15 March 1990.
 AD-A238 827
- *REISENTHAL, PATRICK H * * *
 Management and Control of Unsteady
 and Turbulent Flows.
 AD-A240 050
- *REYNOLDS, W. C. eee * * *
 Flow Control.
 AD-A238 855
- *RICHARDS, WHITMANeee * * *
 Top-Down Influences on Bottom-Up
 Processing.
 AD-A238 235
- *ROKHLIN, VLADIMIR * * *
 Numerical Methods for Scattering
 from Electrically Large Objects.
 AD-A238 282
- *ROSE, MILTON E * * *
 Numerical and Analytical Studies of
 Stefan Problems.
 AD-A239 163
- *ROSS, BRIAN H. eeee * * *
 Reminding-Based Learning.
 AD-A240 370
- *ROUTTENBERG, ARYEHee * * *
 Phosphoprotein Regulation of
 Synaptic Reactivity.
 AD-A237 849
- *SAFNER, ROBIN A * * *

UNCLASSIFIED

- * * *
A Hierarchical, Combinatorial-
Markov Method of Solving Complex
Reliability Models,
AD-A238 296
- *SAMJEL, ARTHUR G. e
* * *
Levels of Processing of Speech and
Non-Speech.
AD-A237 796
- *SANGIOVANNI, J. J * * *
The Determination of Rate-Limiting
Steps during Soot Formation.
AD-A240 005
- *SANKAR, S. G * * *
Low-Cost, High Torque-to-Weight
Ratio Permanent Magnet Motors,
Actuators and Sensors.
AD-B158 503L
- *SANTORO, R. J * * *
Short Communication: Isolation of
Buoyancy Effects in Jet Diffusion
Flame Experiments,
AD-A237 892
- *SANTORO, ROBERT J * * *
Soot Particle Inception and Growth
Processes in Combustion.
AD-A239 157
- *SARIKAYA, M * * *
Microdesigning of Lightweight/High
Strength Ceramic Materials.
AD-A238 935
- *SAULS, FREDERICK C * * *
Effects of Ring Substituents,
Preferential Solvation, and Added
Amine on the Trimer-Dimer
Equilibrium in Cyclic
Diakylaluminum Amide Compounds.
- AD-A238 209
- *SCHMIDT, GEORGE e e e e e
* * *
Universal Transition from Order to
Chaos and Applications in Plasma
Physics.
AD-A239 340
- *SCHRADE, HERBERT O * * *
Basic Processes of Plasma
Propulsion.
AD-A238 858
- *SCHWARTZ, ERIC L. e * * *
Computing With Neural Maps:
Application to Perceptual and
Cognitive Functions.
AD-A238 786
- *SEERY, D. J * * *
The Determination of Rate-Limiting
Steps during Soot Formation.
AD-A240 005
- *SERVE, M. P * * *
A Study of the Effect of
Hydrocarbon Structure on the
Induction of Male Rat Nephropathy
and Metabolite Structure.
AD-A237 848
- *SHAH, SURENDRA P * * *
Dynamic Response of Embedded
Structures.
AD-A239 019
- *SHAH, SURENDRA P. e * * *
Workshop Proceedings: Toughening
Mechanisms in Quasi-Brittle
Materials Held on 16-20 July 1990
in Evanston, Illinois.
AD-A238 289
- *SHANNON, ROBERT R * * *
Center for Thin Film Studies.
AD-A237 457
- *SHEFT, STANLEY e e e e e
* * *
Auditory Processing of Complex
Sounds across Frequency Channels.
AD-A238 023
- *SHEIKH, S. e e e e e * * *
Non-Algorithmic Issues in Automated
Computational Mechanics.
AD-A238 322
- *SHIER, DOUGLAS R. e * * *
Algebraic Aspects of Network
Reliability Problems.
AD-A240 365
- *SHINPAUGH, KEVIN A * * *
Three-Dimensional Rapidly Scanning
Laser Doppler Velocimeter with Low
SNR Signal Processing.
AD-A238 857
- *SHOFNER, WILLIAM P * * *
Auditory Processing of Complex
Sounds across Frequency Channels.
AD-A238 023
- *SHREEVE, JEAN NE M. e e e e e
* * *
Highly Fluorinated Nitrogen-
Containing Compounds. New Stable
Fluids.
AD-A239 267
- *SIMES, R. J * * *
Efficient Optical Logic,
Interconnections and Processing
Using Quantum Confined Structures.
AD-A238 701
- *SIMIZU, S * * *

PERSONAL AUTHOR INDEX-13
UNCLASSIFIED T85002

SAM-SIM

- Low-Cost, High Torque-to-Weight Ratio Permanent Magnet Motors, Actuators and Sensors.
AD-B158 503L
- *SIMPSON, ROGER L. e e e e e
* * * * *
Three-Dimensional Rapidly Scanning Laser Doppler Velocimeter with Low SNR Signal Processing.
AD-A238 857
- *SLEMROD, MARSHALL e e e e e
* * * * *
Problems in Nonlinear Continuum Dynamics.
AD-A237 844
- *SLEZIONA, P. C. * * * * *
Basic Processes of Plasma Propulsion.
AD-A238 858
- *SLOCK, DIRK T. M. e e e e e
* * * * *
Fast Algorithms for Fixed-Order Recursive Least-Squares Parameter Estimation.
AD-A239 040
- *SMEALLIE, PETER e e e e e
* * * * *
The Geotechnical Board, National Research Council Activities Report.
AD-A238 281
- *SMITH, C. R. * * * * *
Three-Dimensional Vortex Dynamics and Interactions in Near-Wall Turbulent Boundary Layers.
AD-A237 413
- *SMITH, GERALD A. e e
* * * * *
A Measurement of Charged and Neutral Elementary Particles Emitted from Antiproton Annihilation at Rest in Heavy Nuclei.
- AD-A238 789
- *SMOLENSKY, M. * * * * *
Annual Review of Chronopharmacology. Volume 7. Biological Rhythms and Medications. Proceedings of the Conference of Chronopharmacology Held in Nice, France on 12-15 March 1980.
AD-A238 827
- *SNOGRASS, JOAN G. * * * * *
Perception and Memory of Pictures.
AD-A240 384
- *SOFIA, SABATINO e e e e e
* * * * *
Development of a System for Accurate Forecasting of Solar Activity.
AD-A240 359
- *SPERLING, GEORGE e e e e e
* * * * *
Visual Motion Perception.
AD-A240 133
- *SREENIVASAN, K. R. * * * * *
(DURIP) Two and Three Dimensional Imaging of Turbulent and Unsteady Flows.
AD-A240 043
- *SRICHANDER, RAMASWAMY e e e e e
* * * * *
Approximate Evaluation of Reliability and Related Quantities via Perturbation Techniques.
AD-A240 049
- *STANGLE, G. C. * * * * *
Microdesigning of Lightweight/High Strength Ceramic Materials.
AD-A238 935
- *STEELE, J. M. e e e e e
* * * * *
- AD-A239 220
- Probability and Statistics Applied to the Theory of Algorithms.
- *STEIER, W. H. e e e e e
* * * * *
Joint Services Electronics Program Research in Electronics.
AD-A240 155
- *STIRMAN, CHARLES e e e e e
* * * * *
Applications of Wavelets to Radar Data Processing.
AD-A239 297
- *STOHS, SIDNEY J. e e
* * * * *
Production of Reactive Oxygen Species by Polyhalogenated Cyclic Hydrocarbons (PCH).
AD-A239 263
- *STOUT, QUENTIN F. e
* * * * *
Distributed Memory Computing Conference (5th) Held in Charleston, South Carolina on April 8-12, 1990. Proceedings Volume 1. Applications.
AD-A240 328
- *STOUT, QUENTIN F. e
* * * * *
Distributed Memory Computing Conference (5th) Held in Charleston, South Carolina on April 8-12, 1990. Proceedings Volume 2. Architectures, Software Tools and Other General Issues.
AD-A240 329
- *STROMEYER, C. F., III e e e e e
* * * * *
The Effects of Luminance Boundaries on Color Perception.
AD-A237 794
- *TARR, MELINDA J. * * * * *
Investigation of the Hepatotoxic and Immunotoxic Effects of the Peroxisome Proliferator

UNCLASSIFIED

- Perfluorodecanoic Acid.
AD-A237 787
- *TAYLOR, JEAN E. * * *
Geometry of Energy Minimizing.
AD-A240 041
- *TCHENG, THOMAS * * *
The Organization of the
Suprachiasmatic Circadian Pacemaker
of the Rat and its Regulation by
Neurotransmitters and Modulators.
AD-A237 788
- *THAM, FOOK S * * *
Synthesis, Structure, and Pyrolysis
of Organoaluminum Amides Derived
from the Reactions of
Trialkylaluminum Compounds with
Ethylenediamine in a 3:2 Ratio.
AD-A238 208
- *THOMAS, EDWIN L. * * *
Phase Transformations,
Ultrastructure and Properties of
Rigid-Rod Polymers.
AD-A238 643
- *THOMPSON, A. W. * * *
Environmental Effects in Niobium
Base Alloys and Other Selected
Intermetallic Compounds.
AD-A237 535
- *THOMPSON, CARL V. * * *
Post-Nucleation Heteroepitaxy in
Poorly Lattice Matched Systems.
AD-A237 783
- *THOMPSON, WILLIAM B. * * *
Topographic Map Reading.
AD-A238 026
- *TILLEY, T. D. * * *
DURIP Synthesis and Study of
Pre-ceramic Polymers/Ceramic
Precursors, Metal Silicides, and
Polymers with Unique Optical and
Electronic Properties.
AD-A238 791
- *TISHKOFF, J. M. * * *
Contractors Meeting in Propulsion
Held in Boulder Colorado on June 10-
14, 1991.
AD-A240 057
- *TOMALIA, DONALD * * *
Photoelectron Transfer between
Molecules Adsorbed in Restricted
Spaces.
AD-A238 208
- *TRIVEDI, KISBOR S. * * *
A Hierarchical, Combinatorial-
Markov Method of Solving Complex
Reliability Models.
AD-A238 258
- *TUREK, FRED W. * * *
Program and Abstracts of the
Society for Research on Biological
Rhythms (2nd) Held in Jacksonville,
Florida on 9-13 May 1990.
AD-A240 007
- *TURRO, NICHOLAS J. * * *
Photoelectron Transfer between
Molecules Adsorbed in Restricted
Spaces.
AD-A238 206
- Investigation of the Kinetic Window
for Generation of 13C t(O)-S CIDNP
Derived from Long-Chain Biradicals
by Tuning the Rates of Bimolecular
Scavenging and Intersystem
Crossing.
AD-A238 207
- *TURRO, NICHOLAS J. * * *
Diastereoselective Induction in
Radical Coupling Reactions:
Photolysis of 2,4-diphenylpentan-3-
ones Adsorbed on Faujasite
Zeolites.
AD-A238 205
- *TURRO, NICHOLAS J. * * *
Photochemistry of Large-Ring 2-
Phenylcycloalkanones in Various
Environments. Intramolecular Para
Coupling Products of Acyl Benzy
Biradicals.
AD-A238 792
- *TWORZYDLO, W. W. * * *
Non-Algorithmic Issues in Automated
Computational Mechanics.
AD-A238 322
- *TYRRELL, DEBRA L. * * *
Air Force Office of Scientific
Research Technical Report Summaries
January - March 1991.
AD-A239 020
- *VAN KUIJK, FREDERIK J. * * *
Development of Methods for
Detection of Lipid Peroxidation
Products in Human Tissues Generated
by Environmental Toxins.
AD-A240 222
- *VAN LAAK, PAUL * * *
A Study of the Behavior and
Micromechanical Modelling of
Granular Soil. Volume 2. An
Experimental Investigation of the
Behavior of Granular Media Under
Load.
AD-A238 092
- *VAN VECHTEN, JAMES A. * * *
Perfluorodecanoic Acid.
AD-A237 787

Atomic Approaches to Defect
Thermochemistry.
AD-A238 280

*VASSILIOU, MARIUS S

Numerical Methods for Scattering
from Electrically Large Objects.
AD-A238 282

*VENABLES, JOHN A

In-Situ Diffraction and Imaging
Studies of Heteroepitaxial Growth
of Semi-Conductors.
AD-A237 786

*VITERBI, ANDREW J

Research in Mathematics and
Computer Science: Calculation of
the Probability of Undetected Error
for Certain Error Detection Codes.
Phase 2.
AD-A238 234

*WAGER, JOHN F.***

Atomic Approaches to Defect
Thermochemistry.
AD-A238 280

*WAKEFIELD, GREGORY**

Time-Frequency Factors in Auditory
Perception.
AD-A238 788

*WALKER, BRUCE K

Approximate Evaluation of
Reliability and Related Quantities
via Perturbation Techniques.
AD-A240 049

*WALKER, DAVID W

Distributed Memory Computing
Conference (5th) Held in
Charleston, South Carolina on April
8-12, 1990. Proceedings Volume 1.

Applications.
AD-A240 328

Distributed Memory Computing

Conference (5th) Held in
Charleston, South Carolina on April
8-12, 1990. Proceedings Volume 2.
Architectures, Software Tools and
Other General Issues.
AD-A240 329

*WALKER, HOMER F

Least-Change Secant Update Methods
for Underdetermined Systems.
AD-A237 893

*WALKER, J. D.***

Three-Dimensional Cortex Dynamics
and Interactions: Near-Wall
Turbulent Boundary Layers.
AD-A237 413

*WANG, C.-Y

Large Deformations of a Whirling
Elastic Cable.
AD-A238 009

*WARK, CANDACE C.*****

Management and Control of Unsteady
and Turbulent Flows.
AD-A240 050

*WATSON, CHARLES S

Institute for the Study of Human
Capabilities: Summary Descriptions
of Research for the Period December
1989 through September 1990.
AD-A237 787

Institute for the Study of Human

Capabilities: Summary Descriptions
of Research for the Period June 1,
1990 through May 31, 1991.
AD-A239 323

*WATSON, L. T.****

Large Deformations of a Whirling
Elastic Cable.
AD-A238 009

*WATSON, LAYNE T

Continuous Homotopies for the
Linear Complementarity Problems.
AD-A238 010

*WATSON, LAYNE T.***

Least-Change Secant Update Methods
for Underdetermined Systems.
AD-A237 893

Globally Convergent Homotopy

Algorithms for Nonlinear Systems of
Equations.
AD-A238 008

*WAXMAN, A. M

Parametric Study of Diffusion-
Enhancement Networks for
Spatiotemporal Grouping in Real-
Time Artificial Vision.
AD-A238 782

*WEBB, GRAHAM***

Deformation, Constitutive Behavior
and Damage of Advanced Structural
Materials under Multiaxial Loading.
AD-A239 221

*WELCH, LESLIE

Coherence Determines Speed
Discrimination,
AD-A238 608

*WHITE, ROBERT E

Numerical and Analytical Studies of
Stefan Problems.
AD-A239 163

*WILLIAMSON, SAMUEL J.***

PERSONAL AUTHOR INDEX-18
UNCLASSIFIED T85002

VAS-WIL

UNCLASSIFIED

- Cognition and the Brain.
AD-A237 846
- *WITT, AUGUST F.***
Development of Model Based Magnetic LP-LEC Growth Large Diameter GaAs.
AD-A237 488
- *WOLF, JACK K ***
Research in Mathematics and Computer Science: Calculation of the Probability of Undetected Error for Certain Error Detection Codes. Phase 2.
AD-A238 234
- *WOOD, CAROL F ***
Fluorescence Imaging of CO2 Laser-Heated Droplets.
AD-A237 888
- *WRIGHT, JOHN R.***
NMR Characterization of Products Formed in Diazotizing Mixtures of LuminoI and 3-Amino-L-Tryosine.
AD-A240 008
- *WU, CHIEN H ***
Eshelby Forces Associated with an Advancing Crack Surrounded by Vanishingly Small Inhomogeneity.
AD-A238 811
- *WU, S. T.***
A Study of Coronal-Interplanetary Coupling Mechanisms.
AD-A238 706
- *YAGLE, ANDREW E.***
Fast Algorithms for Linear Least-Squares Estimation of Multi-Dimensional Random Fields.
AD-A240 248
- *YAN, R. H ***
Efficient Optical Logic, Interconnections and Processing Using Quantum Confined Structures.
AD-A238 701
- *YANG, Y.*****
An Additive Turbulent Decomposition of the Navier-Stokes Equations Implemented on Highly Parallel Computer Systems.
AD-A240 131
- *YOST, WILLIAM A ***
Auditory Processing of Complex Sounds across Frequency Channels.
AD-A238 023
- *ZEE, RALPH H.***
Investigation of the Properties of Titanium-Carbon Hybrid Alloys.
AD-A238 787
- *ZERDA, T. W.***
Adsorption of Pyridine on Silica Gels.
AD-A238 732
- *ZHANG, JIAN-ZHI ***
Pumping of Stimulated Raman Scattering by Stimulated Brillouin Scattering Within a Single Liquid Droplet: Input Laser Linewidth Effects.
AD-A237 894
- Shape Distortion of a Single Water Droplet by Laser-Induced Electrostriction.
AD-A237 897
- *ZHANG, MEI-JIE***
Identification of Nonlinear Times Series from First Order Cumulative
- Characteristics.
AD-A239 822
- *ZHENG, JIA-BIAO ***
Growth, Decay, and Quenching of Stimulated Raman Scattering in Transparent Liquid Droplets.
AD-A237 895
- Temporally and Spatially Resolved Spectroscopy of Laser-Induced Plasma from a Droplet.
AD-A237 898
- *ZHENG, ZIQIONG ***
Compressive Stress-Induced Microcracks and Effective Elastic Properties of Limestone and Concrete. Phase 1.
AD-A237 708
- *ZINN, BEN T ***
Investigation of the Flame-Acoustic Wave Interaction during Axial Solid Rocket Instabilities.
AD-A237 851
- *ZUCKERMAN, DROR*****
Optimal Maintenance Strategies for Repairable Systems with General Degree of Repair.
AD-A238 641

PERSONAL AUTHOR INDEX-17
UNCLASSIFIED T85002

MIT-ZUC

TITLE INDEX

UNCLASSIFIED

TITLE INDEX

- An Additive Turbulent Decomposition of the Navier-Stokes Equations Implemented on Highly Parallel Computer Systems.
AD-A240 131
- Adsorption of Pyridine on Silica Gels.
AD-A238 732
- Air Force Office of Scientific Research Technical Report Summaries January - March 1991.
AD-A239 020
- Algebraic Aspects of Network Reliability Problems.
AD-A240 385
- Alloy Modeling and Experimental Correlation for Ductility Enhancement in Near Stoichiometric Single Crystal Nickel Aluminumide.
AD-A240 151
- Analog Computation in Neutral Systems: Architectures and Complexity.
AD-A237 856
- Analysis of Nongaussian, Nonlinear Time Series With Long -Memory.
AD-A237 847
- Anisotropic Behavior of Soils and Pressuremeter Tests.
AD-A238 137
- Annual Review of Chronopharmacology. Volume 7. Biological Rhythms and Medications. Proceedings of the Conference of Chronopharmacology Held in Nice, France on 12-15 March 1990.
AD-A238 827
- Apparent Role of Adenosine Diphosphoribosyl Transferase in the Development of Mytilus edulis and the Inhibition of Differentiation by Ligands of the Enzyme Protein.
AD-A238 861
- Cellular Regulation of ADP-Ribosylation of Proteins. 4. Conversion of Poly(ADP-Ribose) Polymerase Activity to NAD-Glycohydrolase during Retinoic Acid-Induced Differentiation of HL60 Cells.
AD-A238 711
- Center for Thin Film Studies.
AD-A237 457
- Chaotic Response of Aerosurfaces with Structural Nonlinearities.
AD-B156 876L
- Chemical Processing of Novel Multifunctional Materials for Sensor Protection against Laser Threats.
AD-A237 716
- A Circuit Analysis and Computational Model of Operant Conditioning in Aplysia.
AD-A240 120
- Coding for Spread-Spectrum Channels in the Presence of Jamming.
AD-A238 233
- Cognition and the Brain.
AD-A237 846
- Coherence and Chaos in Integrable PDEs (Partial Differential Equations).
AD-A238 264
- Coherence Determines Speed Discrimination.
AD-A238 808
- A Comparative Study Regarding the Association of Alpha-2U Globulin with the Nephrotoxic Mechanism of Certain Petroleum-Based Air Force Fuels.
AD-A240 363
- AD-A238 606
- Applications of Multiparameter Bifurcations of Period Functions.
AD-A240 046
- Applications of Wavelets to Radar Data Processing.
AD-A239 297
- Approximate Evaluation of Reliability and Related Quantities via Perturbation Techniques.
AD-A240 049
- The Asian Toxicology Conference Tour.
AD-A240 095
- Assaying the Effects of Sublethal Industrial Toxicant Concentrations on Cultured Adrenal Cells.
AD-B158 502L
- Asymptotic Analysis of the Fully Developed Region of an Incompressible, Free, Turbulent, Round Jet.
AD-A238 614
- Atomic Approaches to Defect Thermochemistry.
AD-A238 280
- Auditory Processing of Complex Sounds across Frequency Channels.
AD-A238 023
- Basic Processes of Plasma Propulsion.
AD-A238 858
- Bioavailability of Volatile Organics and Other Hydrocarbons from Environmental Media: Ingestion in Drinking Water.
AD-A238 573
- Biological and Theoretical Studies of Adaptive Networks: The Conditioned Response.

TITLE INDEX-1
UNCLASSIFIED T85002

UNCLASSIFIED

- Compressive Stress-Induced Microcracks and Effective Elastic Properties of Limestone and Concrete. Phase 1.
AD-A237 708
- Computing With Neural Maps: Application to Perceptual and Cognitive Functions.
AD-A238 786
- Continuous Homotopies for the Linear Complementarity Problems.
AD-A238 010
- Contractors Meeting in Propulsion Held in Boulder Colorado on June 10-14, 1991.
AD-A240 057
- Convergence and Performance of Synchronous and Asynchronous Parallel and Conventional Iterative Methods.
AD-A240 286
- Coupling between Radiation and Gas Dynamics.
AD-A240 004
- Cytochemical Organization of the Retino-Suprachiasmatic System.
AD-A240 119
- Data Compilation: Its Design and Analysis.
AD-A237 789
- Defect Reductions in Epitaxial Growth Using Superlattice Buffer Layers.
AD-A237 710
- Defects in Materials. Materials Research Society Symposium Proceedings, Volume 209.
AD-A238 725
- Deformation, Constitutive Behavior and Damage of Advanced Structural Materials under Multiaxial Loading.
AD-A239 221
- Detectors of Infrared Radiation Based on High T(c) Superconducting YBCO Films.
AD-A239 265
- The Determination of Rate-Limiting Steps during Soot Formation.
AD-A240 005
- Development of a System for Accurate Forecasting of Solar Activity.
AD-A240 359
- Development of Methods for Detection of Lipid Peroxidation Products in Human Tissues Generated by Environmental Toxins.
AD-A240 222
- Development of Model Based Magnetic LP-LEC Growth Large Diameter GaAs.
AD-A237 458
- Diastereoselective Induction in Radical Coupling Reactions: Photolysis of 2,4-diphenylpentan-3-ones Adsorbed on Faujasite Zeolites.
AD-A238 205
- Differential Equations and Continuum Mechanics.
AD-A237 722
- Digital Control and Identification of Distributed Systems.
AD-A239 175
- Distributed Memory Computing Conference (5th) Held in Charleston, South Carolina on April 8-12, 1990. Proceedings Volume 1. Applications.
AD-A240 328
- Distributed Memory Computing Conference (5th) Held in Charleston, South Carolina on April 8-12, 1990. Proceedings Volume 2. Architectures, Software Tools and Other General Issues.
AD-A240 329
- DURIP Synthesis and Study of Preceramic Polymers/Ceramic Precursors, Metal Silicides, and Polymers with Unique Optical and Electronic Properties.
AD-A238 791
- (DURIP) Two and Three Dimensional Imaging of Turbulent and Unsteady Flows.
AD-A240 043
- Dynamic Response of Embedded Structures.
AD-A239 019
- The Effects of Luminance Boundaries on Color Perception.
AD-A237 794
- Effects of Ring Substituents, Preferential Solvation, and Added Amine on the Trimer-Dimer Equilibrium in Cyclic Dialkylaluminum Amide Compounds.
AD-A238 209
- Efficient Optical Logic, Interconnections and Processing Using Quantum Confined Structures.
AD-A238 701
- Environmental Effects in Niobium Base Alloys and Other Selected Intermetallic Compounds.
AD-A237 535
- Error Correcting Codes and Related Designs.
AD-A239 284
- Esheby Forces Associated with an Advancing Crack Surrounded by Vanishingly Small Inhomogeneity.
AD-A238 811

TITLE INDEX-2
UNCLASSIFIED T85002

COM-ESH

- Evaluation of the Feasibility and the Cost of HgCdTe Epitaxial Layers Grown by Molecular Beam Epitaxy on CdTe, CdZnTe and GaAs Substrates.
AD-A238 602
- Experimental Verification of an Innovative Performance-Validation Methodology for Large Space Systems.
AD-A237 884
- Expert System Control of Orientation in Ordered Polymers for NLO Applications.
AD-B156 087L
- Eye Movements and Spatial Pattern Vision.
AD-A238 884
- Fast Algorithms for Fixed-Order Recursive Least-Squares Parameter Estimation.
AD-A239 040
- Fast Algorithms for Linear Least-Squares Estimation of Multi-Dimensional Random Fields.
AD-A240 249
- Fast Algorithms for Structured Matrices with Arbitrary Rank Profile.
AD-A238 975
- Fast Array Algorithms for Structured Matrices.
AD-A238 977
- Fatigue and Fracture of Intermetallic Alloys.
AD-A238 686
- Fear-Potentiated Startle as a Model System for Analyzing Learning and Memory.
AD-A239 994
- Feasibility Study of Developing a Meaningful and Implementable Methodology for Assessing JTC3A Effectiveness.
AD-A238 574
- Fission-Fusion Adaptivity in Finite Elements for Nonlinear Dynamics of Shells.
AD-A238 029
- Flow Control.
AD-A238 855
- Fluorescence Imaging of CO₂ Laser-Heated Droplets.
AD-A237 898
- Free Radical Mechanisms of Xenobiotic Mammalian Cytotoxicities.
AD-A238 790
- Geometry of Energy Minimizing.
AD-A240 041
- The Geotechnical Board, National Research Council Activities Report.
AD-A238 281
- Globally Convergent Homotopy Algorithms for Nonlinear Systems of Equations.
AD-A238 008
- Global Peak Flux Profile of Proton Precipitation in the Equatorial Zone.
AD-A240 209
- The Gordon Conference on Inorganic Chemistry Held in Wolfboro, New Hampshire on 30 July-3 August 1990.
AD-A238 781
- A Grid-Free Method for High Reynolds Number Flow Around an Immersed Elastic Structure.
AD-A240 048
- Growth, Decay, and Quenching of Stimulated Raman Scattering in Transparent Liquid Droplets.
- AD-A237 895
- The Growth of Ultrathin Epitaxial Intermetallic Films.
AD-A237 798
- Heterogeneous Characterization of Composite Materials With Progressive Damage.
AD-A239 162
- Heterosynaptic Modulation of Long-Term Potentiation at Mossy Fiber Synapses in Hippocampus.
AD-A238 027
- Heuristic Methods in Applied Probability.
AD-A238 229
- A Hierarchical, Combinatorial-Markov Method of Solving Complex Reliability Models.
AD-A238 256
- High Temperature Properties of Ceramic/Carbon Systems in an Oxidizing Environment.
AD-A238 908
- Highly Fluorinated Nitrogen-Containing Compounds. New Stable Fluids.
AD-A239 267
- Identification of Nonlinear Times Series from First Order Cumulative Characteristics.
AD-A239 822
- Image Analysis of Viral-Expressing Mouse Macrophage Cells.
AD-A238 230
- In-Situ Diffraction and Imaging Studies of Heteroepitaxial Growth of Semi-Conductors.
AD-A237 786
- Institute for the Study of Human Capabilities: Summary Descriptions

TITLE INDEX-3
UNCLASSIFIED T85002

EVA-INS

UNCLASSIFIED

- of Research for the Period December 1989 through September 1990.
AD-A237 787
- Institute for the Study of Human Capabilities: Summary Descriptions of Research for the Period June 1, 1990 through May 31, 1991.
AD-A239 323
- International Conference on Combined Effect of Environmental Factors (4th).
AD-A240 045
- Investigation of High Efficiency Monolithic Multibandgap Solar Cells.
AD-A238 718
- Investigation of the Flame-Acoustic Wave Interaction during Axial Solid Rocket Instabilities.
AD-A237 851
- Investigation of the Hepatotoxic and Immunotoxic Effects of the Peroxisome Proliferator Perfluorodecanoic Acid.
AD-A237 787
- Investigation of the Kinetic Window for Generation of $^{13}\text{C t(O)-S CIDMP}$ Derived from Long-Chain Biradicals by Tuning the Rates of Bimolecular Scavenging and Intersystem Crossing.
AD-A238 207
- Investigation of the Properties of Titanium-Carbon Hybrid Alloys.
AD-A238 787
- Investigation of the Turbulence Producing Structures in the Boundary Layer.
AD-A239 266
- Joint Services Electronics Program Research in Electronics.
AD-A240 155
- Large Deformation Induced Failures in Nonlinear Solids.
AD-A240 369
- Large Deformations of a Whirling Elastic Cable.
AD-A238 009
- Laser-Atom Interaction at High Intensities.
AD-A238 231
- Laser Probing of the Kinetics and Dynamics of III - V Semiconductor Growth.
AD-A237 795
- Least-Change Secant Update Methods for Underdetermined Systems.
AD-A237 893
- Levels of Processing of Speech and Non-Speech.
AD-A237 798
- Life Testing and Reliability with Application in Engineering Systems.
AD-A240 042
- Long Term Synaptic Plasticity and Learning in Neuronal Networks.
AD-A240 368
- Low-Cost, High Torque-to-Weight Ratio Permanent Magnet Motors, Actuators and Sensors.
AD-B158 503L
- Management and Control of Unsteady and Turbulent Flows.
AD-A240 050
- Mathematical Problems in Transonic Flow.
AD-A239 292
- Mathematical Problems of Nonlinear Wave Propagation and of Waves in Heterogeneous Media.
AD-A238 222
- A Measurement of Charged and Neutral Elementary Particles Emitted from Antiproton Annihilation at Rest in Heavy Nuclei.
AD-A238 789
- Microcomputer-Based Vehicle Routing and Scheduling.
AD-A238 755
- Microdesigning of Lightweight/High Strength Ceramic Materials.
AD-A238 935
- Micromechanisms of Monotonic and Cyclic Subcritical Crack Growth in Advanced High Melting Point Low-Ductility Intermetallics.
AD-A238 151
- Modeling of Free Viscoelastic Jets and Instability Mechanisms.
AD-A239 174
- N,N'-Bis(triethylaluminio)ethylenediamine- and N,N'-Bis(trimethylaluminio)ethylenediamine-Derived Organometallic Precursors to Aluminum Nitride: Syntheses, Structures, and Pyrolyses.
AD-A238 804
- Neural Coding of Local and Global Motion.
AD-A238 807
- New Methods in Robust Control.
AD-A240 221
- NMR Characterization of Products Formed in Diazotizing Mixtures of LuminoI and 3-Amino-L-Tyrosine.
AD-A240 009
- Non-Algorithmic Issues in Automated Computational Mechanics.
AD-A238 322
- Non-Equilibrium and Radiation in MPD Plasmas.

TITLE INDEX-4
UNCLASSIFIED T85002

INS-NON

AD-A238 859
 Nonlinear Spectroscopy of
 Multicomponent Droplets and Two-
 and Three-Dimensional Measurements
 in Flames.
 AD-A238 028

AD-A238 859
 Repairable Systems with General
 Degree of Repair.
 AD-A238 641

AD-A238 859
 Persistent Photoconductivity in II-
 VI Mixed Semiconductors Related
 Critical Phenomena and
 Applications.
 AD-A237 792

AD-A238 859
 Novel Nonlinear Laser Diagnostic
 Techniques.
 AD-A240 193

AD-A238 859
 Phase Transformations,
 Ultrastructure and Properties of
 Rigid-Rod Polymers.
 AD-A238 643

AD-A238 859
 A Novel Second Harmonic Generator
 for Photonics Using Multifunctional
 Nonlinear Waveguides.
 AD-B158 243L

AD-A238 859
 Numerical and Analytical Studies of
 Stefan Problems.
 AD-A239 183

AD-A238 859
 Numerical Methods for Scattering
 from Electrically Large Objects.
 AD-A238 282

AD-A238 859
 Object Recognition in Range Images
 Using CAD Databases.
 AD-A239 328

AD-A238 859
 Observation of $Z > 1$ Particles Below
 300 km Near the Geomagnetic
 Equator.
 AD-A240 058

AD-A238 859
 On Categorizing Sounds.
 AD-A240 006

AD-A238 859
 The ONR-602 Experiment and
 Investigation of Particle
 Precipitation Near the Equator.
 AD-A240 208

AD-A238 859
 Optical Computing Research.
 AD-A239 081

AD-A238 859
 An Optically Activated Modulator
 and GaAs-GaAlAs Compound
 Semiconductor Channel Waveguide.
 AD-A238 642

AD-A238 859
 Optimal Maintenance Strategies for

AD-A238 859
 The Organization of the
 Suprachiasmatic Circadian Pacemaker
 of the Rat and its Regulation by
 Neurotransmitters and Modulators.
 AD-A237 788

AD-A238 859
 Organometallic Precursor Routes to
 Si-C-Al-O-N Ceramics.
 AD-A237 753

AD-A238 859
 Parametric Study of Diffusion-
 Enhancement Networks for
 Spatiotemporal Grouping in Real-
 Time Artificial Vision.
 AD-A238 782

AD-A238 859
 Particle Beams for Defence.
 AD-B156 558L

AD-A238 859
 Perception and Memory of Pictures.
 AD-A240 364

AD-A238 859
 Perceptual Grouping and Shape from
 Texture.
 AD-A240 358

AD-A238 859
 Performance and Stability in High
 Speed Articulated Structures
 Undergoing Quick Maneuvers - Theory
 and Applications.

AD-A238 859
 Photochemistry of Large-Ring 2-
 Phenylcycloalkanones in Various
 Environments. Intramolecular Para
 Coupling Products of Acyl Benzyl
 Biradicals.
 AD-A238 792

AD-A238 859
 Photochromic Polyphosphazenes with
 Spiropyran Units.
 AD-A238 719

AD-A238 859
 Photoelectron Transfer between
 Molecules Adsorbed in Restricted
 Spaces.
 AD-A238 206

AD-A238 859
 Physics of Ultrasmall
 Superconducting Circuits.
 AD-A240 156

AD-A238 859
 Pictures and Anaphora.
 AD-A240 153

AD-A238 859
 Post-Nucleation Heteroepitaxy in
 Poorly Lattice Matched Systems.
 AD-A237 783

AD-A238 859
 Preparation and Characterization of
 High Temperature Superconductor
 Film Surfaces.
 AD-A240 118

AD-A238 859
 Preparation and Properties of New
 Inorganic Glasses and Gel-Derived

TITLE INDEX-5
 UNCLASSIFIED T85002

NON-PRE

UNCLASSIFIED

- Solids.
AD-A238 095
- Probability and Statistics Applied to the Theory of Algorithms.
AD-A239 220
- Problems in Nonlinear Continuum Dynamics.
AD-A237 844
- Production of Reactive Oxygen Species by Polyhalogenated Cyclic Hydrocarbons (PCH).
AD-A239 263
- Program and Abstracts of the Society for Research on Biological Rhythms (2nd) Held in Jacksonville, Florida on 9-13 May 1990.
AD-A240 007
- Psychophysical Studies of Visual Cortical Function.
AD-A238 863
- Pumping of Stimulated Raman Scattering by Stimulated Brillouin Scattering Within a Single Liquid Droplet: Input Laser Linewidth Effects.
AD-A237 894
- Quantitative Analysis of Thin Film Morphology.
AD-B158 201L
- Quantum 1/f Noise in High Technology Applications Including Ultrasmall Structures and Devices.
AD-A240 152
- Reading: Interactions with Memory.
AD-A239 219
- Reliability Assessment for One-Shot Devices Based on Repeated Samples.
AD-A237 850
- Reminding-Based Learning.
AD-A240 370
- Research in Mathematics and Computer Science: Calculation of the Probability of Undetected Error for Certain Error Detection Codes. Phase 2.
AD-A238 234
- RLE Progress Report No 133.
AD-A240 154
- Scientific Imaging System.
AD-A239 059
- Shape Distortion of a Single Water Droplet by Laser-Induced Electrostriction.
AD-A237 897
- Short Communication: Isolation of Buoyancy Effects in Jet Diffusion Flame Experiments.
AD-A237 892
- Soot Particle Inception and Growth Processes in Combustion.
AD-A239 157
- Spatial Light Modulators with Arbitrary Quantum Well Profiles.
AD-A238 149
- A Statistical Physics Analysis of Rock and Concrete Damage Response.
AD-A240 310
- Structures and Properties of Compositionally Modulated Ceramics.
AD-B158 176L
- A Study of Coronal-Interplanetary Coupling Mechanisms.
AD-A238 708
- A Study of the Behavior and Micromechanical Modelling of Granular Soil. Volume 1. A Constitutive Relation for Granular Materials Based on the Contact Law Between Two Spheres.
AD-A238 091
- A Study of the Behavior and Micromechanical Modelling of Granular Soil. Volume 2. An Experimental Investigation of the Behavior of Granular Media Under Load.
AD-A238 092
- A Study of the Behavior and Micromechanical Modelling of Granular Soil. Volume 3. A Numerical Investigation of the Behavior of Granular Media Using Nonlinear Discrete Element Simulation.
AD-A238 158
- A Study of the Effect of Hydrocarbon Structure on the Induction of Male Rat Nephropathy and Metabolite Structure.
AD-A237 848
- Study of Various Problems in Statistical Planning.
AD-A237 790
- Suppression of Dexamethasone-Stimulated DNA Synthesis in an Oncogene Construct Containing Rat Cell Line by a DNA Site-Oriented Ligand of Poly-ADP-Ribose Polymerase: 6-Amino-1,2-Benzopyrone.
AD-A238 805
- Suprathreshold Contrast Sensitivity Vision Test Chart.
AD-A239 445
- Synaptic Plasticity and Memory Formation.
AD-A240 121
- Synthesis of Novel, Substituted Polycyclic Cage Systems.
AD-A239 325
- Synthesis, Structure, and Pyrolysis of Organoaluminum Amides Derived from the Reactions of

TITLE INDEX-6
UNCLASSIFIED T85002

PRO-SYN

- Trialkylaluminum Compounds with Ethylenediamine in a 3:2 Ratio, AD-A238 208
- A Systematic Approach to Combustion Model Reduction and Lumping, AD-A240 185
- A Systems Theoretic Investigation of Neuronal Network Properties of the Hippocampal Formation, AD-A238 815
- Temporally and Spatially Resolved Spectroscopy of Laser-Induced Plasma from a Droplet, AD-A237 896
- Thermochemistry of Hydrocarbon Decomposition and Relationship to Properties of PECVD Diamond Films, AD-A237 793
- Three-Dimensional Rapidly Scanning Laser Doppler Velocimeter with Low SNR Signal Processing, AD-A238 857
- Three-Dimensional Vortex Dynamics and Interactions in Near-Wall Turbulent Boundary Layers, AD-A237 413
- Time-Frequency Factors in Auditory Perception, AD-A238 788
- Top-Down Influences on Bottom-Up Processing, AD-A238 235
- Topographic Map Reading, AD-A238 026
- Transformation and Precipitation of Toxic Metals by 'Pseudomonas maltophilia', AD-A238 232
- Ultra High Vacuum Sputtering System, AD-A238 289
- AD-A240 157
- Universal Transition from Order to Chaos and Applications in Plasma Physics, AD-A239 340
- Validation and Application of Pharmacokinetic Models for Interspecies Extrapolations in Toxicity Risk Assessments of Volatile Organics, AD-A240 058
- Vibrational, Mechanical, and Thermal Properties of III-V Semiconductors, AD-A237 785
- Vibrations of Bladed Disk Assemblies, AD-A237 805
- Visual Motion Perception, AD-A240 133
- Vortex Dynamics, AD-A239 060
- Wavelet Transforms and Parallel Image Processing, AD-A239 198
- A Workshop on the Integration of Numerical and Symbolic Computing Methods Held in Saratoga Springs, New York on July 9-11, 1990, AD-A238 801
- Workshop Proceedings: Toughening Mechanisms in Quasi-Brittle Materials Held on 16-20 July 1990 in Evanston, Illinois, AD-A238 289

UNCLASSIFIED

TITLE INDEX

An Additive Turbulent Decomposition of the Navier-Stokes Equations Implemented on Highly Parallel Computer Systems.
AD-A240131 REPORT DATE: 05 AUG 91 FINAL REPORT

Adsorption of Pyridine on Silica Gels. 91 FINAL REPORT
AD-A238732 REPORT DATE:

Air Force Office of Scientific Research Technical Report Summaries January - March 1991.
AD-A239020 REPORT DATE: APR 91 FINAL REPORT

Algebraic Aspects of Network Reliability Problems.
AD-A240365 REPORT DATE: 31 MAY 91 FINAL REPORT

Alloy Modelling and Experimental Correlation for Ductility Enhancement in Near Stoichiometric Single Crystal Nickel
Aluminide.
AD-A240151 REPORT DATE: 31 JUL 91 FINAL REPORT

Analog Computation in Neutral Systems: Architectures and Complexity.
AD-A237858 REPORT DATE: 17 MAY 91 FINAL REPORT

Analysis of Nongaussian, Nonlinear Time Series with Long-Memory.
AD-A237847 REPORT DATE: 31 MAR 91 FINAL REPORT

Anisotropic Behavior of Soils and Pressuremeter Tests.
AD-A239137 REPORT DATE: 23 JUL 90 ANNUAL REPORT

Annual Review of Chronopharmacology. Volume 7. Biological Rhythms and Medications. Proceedings of the Conference of
Chronopharmacology Held in Nice, France on 12-15 March 1990.
AD-A238827 REPORT DATE:

Apparent Role of Adenosine Diphosphoribosyl Transferase in the Development of Mytilus edulis and the Inhibition of
Differentiation by Ligands of the Enzyme Protein.
AD-A238608 REPORT DATE: 91 ANNUAL REPORT

Applications of Multiparameter Bifurcations of Period Functions.
AD-A240046 REPORT DATE: 24 JUL 91 FINAL REPORT

Applications of Wavelets to Radar Data Processing.
AD-A239297 REPORT DATE: JUL 91 FINAL REPORT

Approximate Evaluation of Reliability and Related Quantities via Perturbation Techniques.
AD-A240049 REPORT DATE: DEC 90 FINAL REPORT

The Asian Toxicology Conference Tour.
AD-A240085 REPORT DATE: 30 JUL 91 FINAL REPORT

Assaying the Effects of Sublethal Industrial Toxicant Concentrations on Cultured Adrenal Cells.
AD-B156502L REPORT DATE: 13 JUN 91 ANNUAL REPORT

Asymptotic Analysis of the Fully Developed Region of an Incompressible, Free, Turbulent, Round Jet.
AD-A238614 REPORT DATE: 91 ANNUAL REPORT

Atomic Approaches to Defect Thermochemistry.
AD-A238260 REPORT DATE: 15 APR 91 ANNUAL REPORT

Auditory Processing of Complex Sounds across Frequency Channels.
AD-A238023 REPORT DATE: 31 MAY 91 ANNUAL REPORT

Basic Processes of Plasma Propulsion.
AD-A238858 REPORT DATE: APR 91 FINAL REPORT

Bioavailability of Volatile Organics and Other Hydrocarbons from Environmental Media: Ingestion in Drinking Water.
AD-A238573 REPORT DATE: 19 NOV 90 ANNUAL REPORT

Biological and Theoretical Studies of Adaptive Networks: The Conditioned Response.
AD-A238861 REPORT DATE: 28 JUN 91 ANNUAL REPORT

Cellular Regulation of ADP-Ribosylation of Proteins. 4. Conversion of Poly(ADP-Ribose) Polymerase Activity to NAD-Glycohydrolase during Retinoic Acid-Induced Differentiation of HL60 Cells.
AD-A238711 REPORT DATE: 91 FINAL REPORT

Center for Thin Film Studies.
AD-A237457 REPORT DATE: 22 JAN 91 FINAL REPORT

Chaotic Response of Aerosurfaces with Structural Nonlinearities.
AD-B156876L REPORT DATE: 30 APR 91 FINAL REPORT

Chemical Processing of Novel Multifunctional Materials for Sensor Protection against Laser Threats.
AD-A237716 REPORT DATE: 14 MAY 91 FINAL REPORT

A Circuit Analysis and Computational Model of Operant Conditioning in Aplysia.
AD-A240120 REPORT DATE: 01 JUL 91 ANNUAL REPORT

Coding for Spread-Spectrum Channels in the Presence of Jamming.
AD-A238233 REPORT DATE: 30 SEP 90 FINAL REPORT

Cognition and the Brain.
AD-A237846 REPORT DATE: 10 MAY 91 ANNUAL REPORT

Coherence and Chaos in Integrable PDEs (Partial Differential Equations).
AD-A239264 REPORT DATE: MAR 91 FINAL REPORT

Coherence Determines Speed Discrimination.
AD-A238608 REPORT DATE: 90 ANNUAL REPORT

A Comparative Study Regarding the Association of Alpha-2U Globulin with the Nephrotoxic Mechanism of Certain Petroleum-Based Air Force Fuels.
AD-A240363 REPORT DATE: 14 AUG 91 ANNUAL REPORT

Compressive Stress-Induced Microcracks and Effective Elastic Properties of Limestone and Concrete. Phase 1.
AD-A237708 REPORT DATE: 19 APR 91 FINAL REPORT

UNCLASSIFIED

TITLE INDEX

Computing With Neural Maps: Application to Perceptual and Cognitive Functions.
AD-A238786 REPORT DATE: 03 JUL 91 ANNUAL REPORT

Continuous Homotopies for the Linear Complementarity Problems.
AD-A238010 REPORT DATE: APR 89 ANNUAL REPORT

Contractors Meeting in Propulsion Held in Boulder Colorado on June 10-14, 1991.
AD-A240057 REPORT DATE: 02 AUG 91 FINAL REPORT

Convergence and Performance of Synchronous and Asynchronous Parallel and Conventional Iterative Methods.
AD-A240286 REPORT DATE: AUG 91 FINAL REPORT

Coupling between Radiation and Gas Dynamics.
AD-A240004 REPORT DATE: 31 MAY 91 FINAL REPORT

Cytochemical Organization of the Retino-Suprachiasmatic System.
AD-A240119 REPORT DATE: 07 AUG 91 ANNUAL REPORT

Data Compilation: Its Design and Analysis.
AD-A237789 REPORT DATE: 14 JUN 90 FINAL REPORT

Defect Reductions in Epitaxial Growth Using Superlattice Buffer Layers.
AD-A237710 REPORT DATE: DEC 90 FINAL REPORT

Defects in Materials. Materials Research Society Symposium Proceedings, Volume 209.
AD-A238725 REPORT DATE: 91 FINAL REPORT

Deformation, Constitutive Behavior and Damage of Advanced Structural Materials under Multiaxial Loading.
AD-A239221 REPORT DATE: 14 JUN 91 ANNUAL REPORT

Detectors of Infrared Radiation Based on High T(c) Superconducting YBCO Films.
AD-A239285 REPORT DATE: JUN 91 FINAL REPORT

The Determination of Rate-Limiting Steps during Soot Formation.
AD-A240005 REPORT DATE: 14 AUG 91 FINAL REPORT

Development of a System for Accurate Forecasting of Solar Activity.
AD-A240359 REPORT DATE: 11 JUL 91 FINAL REPORT

Development of Methods for Detection of Lipid Peroxidation Products in Human Tissues Generated by Environmental Toxins.
AD-A240222 REPORT DATE: 30 JUL 91 ANNUAL REPORT

Development of Model Based Magnetic LP-LEC Growth Large Diameter GaAs.
AD-A237456 REPORT DATE: 28 NOV 90 FINAL REPORT

Diastereoselective Induction in Radical Coupling Reactions: Photolysis of 2,4-diphenylpentan-3-ones Adsorbed on Faujasite Zeolites.
AD-A238205 REPORT DATE: 91 FINAL REPORT

TITLE INDEX

3

COM - DIA

UNCLASSIFIED

T85002

- Differential Equations and Continuum Mechanics.
AD-A237722 REPORT DATE: 10 MAY 91 FINAL REPORT
- Digital Control and Identification of Distributed Systems.
AD-A239175 REPORT DATE: 14 AUG 90 FINAL REPORT
- Distributed Memory Computing Conference (5th) Held in Charleston, South Carolina on April 8-12, 1990. Proceedings Volume 1.
Applications.
AD-A240328 REPORT DATE: APR 90 FINAL REPORT
- Distributed Memory Computing Conference (5th) Held in Charleston, South Carolina on April 8-12, 1990. Proceedings Volume 2.
Architectures, Software Tools and Other General Issues.
AD-A240329 REPORT DATE: APR 90 FINAL REPORT
- DURIP Synthesis and Study of Pre ceramic Polymers/Ceramic Precursors, Metal Silicides, and Polymers with Unique Optical and Electronic Properties.
AD-A238791 REPORT DATE: 23 MAY 91 FINAL REPORT
- DURIP) Two and Three Dimensional Imaging of Turbulent and Unsteady Flows.
AD-A240043 REPORT DATE: JUL 91 FINAL REPORT
- Dynamic Response of Embedded Structures.
AD-A239019 REPORT DATE: 15 JUL 91 FINAL REPORT
- The Effects of Luminance Boundaries on Color Perception.
AD-A237794 REPORT DATE: 24 APR 91 ANNUAL REPORT
- Effects of Ring Substituents, Preferential Solvation, and Added Amine on the Trimer-Dimer Equilibrium in Cyclic Dialkylaluminum Amide Compounds.
AD-A238209 REPORT DATE: 90 FINAL REPORT
- Efficient Optical Logic, Interconnections and Processing Using Quantum Confined Structures.
AD-A238701 REPORT DATE: MAY 91 ANNUAL REPORT
- Environmental Effects in Niobium Base Alloys and Other Selected Intermetallic Compounds.
AD-A237535 REPORT DATE: 30 APR 91 FINAL REPORT
- Error Correcting Codes and Related Designs.
AD-A239284 REPORT DATE: 30 SEP 90 FINAL REPORT
- Esheby Forces Associated with an Advancing Crack Surrounded by Vanishingly Small Inhomogeneity.
AD-A238811 REPORT DATE: MAY 91 FINAL REPORT
- Evaluation of the Feasibility and the Cost of HgCdTe Epitaxial Layers Grown by Molecular Beam Epitaxy on CdTe, CdZnTe and GaAs Substrates.
AD-A238602 REPORT DATE: 14 JAN 91 FINAL REPORT
- Experimental Verification of an Innovative Performance-Validation Methodology for Large Space Systems.
AD-A237864 REPORT DATE: 09 FEB 91 FINAL REPORT

UNCLASSIFIED

TITLE INDEX

Expert System Control of Orientation in Ordered Polymers for NLO Applications.
AD-B156087L REPORT DATE: 08 APR 91 FINAL REPORT

Eye Movements and Spatial Pattern Vision.
AD-A238664 REPORT DATE: 01 JUL 91 ANNUAL REPORT

Fast Algorithms for Fixed-Order Recursive Least-Squares Parameter Estimation.
AD-A239040 REPORT DATE: SEP 89 FINAL REPORT

Fast Algorithms for Linear Least-Squares Estimation of Multi-Dimensional Random Fields.
AD-A240249 REPORT DATE: 31 JUL 91 FINAL REPORT

Fast Algorithms for Structured Matrices with Arbitrary Rank Profile.
AD-A238975 REPORT DATE: MAY 90 FINAL REPORT

Fast Array Algorithms for Structured Matrices.
AD-A238977 REPORT DATE: JUN 89 FINAL REPORT

Fatigue and Fracture of Intermetallic Alloys.
AD-A238686 REPORT DATE: 22 MAY 91 ANNUAL REPORT

Fear-Potentiated Startle as a Model System for Analyzing Learning and Memory.
AD-A238994 REPORT DATE: 31 JAN 91 FINAL REPORT

Feasibility Study of Developing a Meaningful and Implementable Methodology for Assessing JTC3A Effectiveness.
AD-A238574 REPORT DATE: DEC 90 FINAL REPORT

Fission-Fusion Adaptivity in Finite Elements for Nonlinear Dynamics of Shells.
AD-A238029 REPORT DATE: 30 AUG 90 FINAL REPORT

Flow Control.
AD-A238855 REPORT DATE: 30 APR 91 FINAL REPORT

Fluorescence Imaging of CO₂ Laser-Heated Droplets.
AD-A237898 REPORT DATE: 15 JUN 90 ANNUAL REPORT

Free Radical Mechanisms of Xenobiotic Mammalian Cytotoxicities.
AD-A238790 REPORT DATE: 30 JUN 91 FINAL REPORT

Geometry of Energy Minimizing.
AD-A240041 REPORT DATE: 30 SEP 90 FINAL REPORT

The Geotechnical Board, National Research Council Activities Report.
AD-A238261 REPORT DATE: 17 MAY 91 FINAL REPORT

Global Peak Flux Profile of Proton Precipitation in the Equatorial Zone.
AD-A240209 REPORT DATE: APR 91 FINAL REPORT

Globally Convergent Homotopy Algorithms for Nonlinear Systems of Equations.
AD-A238008 REPORT DATE: 90 ANNUAL REPORT

EXP - GLO

TITLE INDEX 5

UNCLASSIFIED T85002

The Gordon Conference on Inorganic Chemistry Held in Wolfboro, New Hampshire on 30 July-3 August 1990.
AD-A238781 REPORT DATE: JUN 91 FINAL REPORT

A Grid-Free Method for High Reynolds Number Flow Around an Immersed Elastic Structure.
AD-A240048 REPORT DATE: 31 JUL 90 FINAL REPORT

The Growth of Ultrathin Epitaxial Intermetallic Films.
AD-A237798 REPORT DATE: 11 FEB 91 FINAL REPORT

Growth, Decay, and Quenching of Stimulated Raman Scattering in Transparent Liquid Droplets.
AD-A237895 REPORT DATE: 89 ANNUAL REPORT

Heterogeneous Characterization of Composite Materials with Progressive Damage.
AD-A239182 REPORT DATE: JUN 91 FINAL REPORT

Heterosynaptic Modulation of Long-Term Potentiation at Mossy Fiber Synapses in Hippocampus.
AD-A238027 REPORT DATE: 31 MAY 91 FINAL REPORT

Heuristic Methods in Applied Probability.
AD-A238229 REPORT DATE: 30 MAY 91 FINAL REPORT

A Hierarchical, Combinatorial-Markov Method of Solving Complex Reliability Models.
AD-A238258 REPORT DATE: 86 ANNUAL REPORT

High Temperature Properties of Ceramic/Carbon Systems in an Oxidizing Environment.
AD-A238908 REPORT DATE: 10 MAY 91 FINAL REPORT

Highly Fluorinated Nitrogen-Containing Compounds. New Stable Fluids.
AD-A239287 REPORT DATE: 25 JUL 91 FINAL REPORT

Identification of Nonlinear Times Series from First Order Cumulative Characteristics.
AD-A239822 REPORT DATE: AUG 91 FINAL REPORT

Image Analysis of Viral-Expressing Mouse Macrophage Cells.
AD-A238230 REPORT DATE: 31 MAY 91 FINAL REPORT

Institute for the Study of Human Capabilities: Summary Descriptions of Research for the Period December 1989 through September 1990.
AD-A237767 REPORT DATE: 30 MAY 91 FINAL REPORT

Institute for the Study of Human Capabilities: Summary Descriptions of Research for the Period June 1, 1990 through May 31, 1991.
AD-A239323 REPORT DATE: 23 JUL 91 ANNUAL REPORT

International Conference on Combined Effect of Environmental Factors (4th).
AD-A240045 REPORT DATE: 09 AUG 91 FINAL REPORT

Investigation of High Efficiency Monolithic Multibandgap Solar Cells.
AD-A238718 REPORT DATE: 25 JUN 91 FINAL REPORT

UNCLASSIFIED

TITLE INDEX

Investigation of the Flame-Acoustic Wave Interaction during Axial Solid Rocket Instabilities.
 AD-A237851 REPORT DATE: 30 APR 91 FINAL REPORT

Investigation of the Hepatotoxic and Immunotoxic Effects of the Peroxisome Proliferator Perfluorodecanoic Acid.
 AD-A237787 REPORT DATE: 30 APR 91 ANNUAL REPORT

Investigation of the Kinetic Window for Generation of 13C t(O)-S CIDNP Derived from Long-Chain Biradicals by Tuning the Rates of Bimolecular Scavenging and Intersystem Crossing.
 AD-A238207 REPORT DATE: 91 FINAL REPORT

Investigation of the Properties of Titanium-Carbon Hybrid Alloys.
 AD-A238787 REPORT DATE: 15 JUN 91 FINAL REPORT

Investigation of the Turbulence Producing Structures in the Boundary Layer.
 AD-A239266 REPORT DATE: 15 JUL 91 FINAL REPORT

In-Situ Diffraction and Imaging Studies of Heteroepitaxial Growth of Semi-Conductors.
 AD-A237786 REPORT DATE: 17 OCT 90 FINAL REPORT

Joint Services Electronics Program Research in Electronics.
 AD-A240155 REPORT DATE: 31 MAY 91 FINAL REPORT

Large Deformation Induced Failures in Nonlinear Solids.
 AD-A240369 REPORT DATE: 31 JUL 91 FINAL REPORT

Large Deformations of a Whirling Elastic Cable.
 AD-A238009 REPORT DATE: 91 ANNUAL REPORT

Laser Probing of the Kinetics and Dynamics of III - V Semiconductor Growth.
 AD-A237795 REPORT DATE: 31 JAN 91 ANNUAL REPORT

Laser-Atom Interaction at High Intensities.
 AD-A238231 REPORT DATE: 20 MAY 91 FINAL REPORT

Least-Change Secant Update Methods for Underdetermined Systems.
 AD-A237883 REPORT DATE: OCT 90 ANNUAL REPORT

Levels of Processing of Speech and Non-Speech.
 AD-A237796 REPORT DATE: 10 MAY 91 FINAL REPORT

Life Testing and Reliability with Application in Engineering Systems.
 AD-A240042 REPORT DATE: 14 OCT 90 FINAL REPORT

Long Term Synaptic Plasticity and Learning in Neuronal Networks.
 AD-A240366 REPORT DATE: 05 AUG 91 ANNUAL REPORT

Low-Cost, High Torque-to-Weight Ratio Permanent Magnet Motors, Actuators and Sensors.
 AD-B156503L REPORT DATE: 31 JAN 91 ANNUAL REPORT

Management and Control of Unsteady and Turbulent Flows.
AD-A240050 REPORT DATE: JUL 91 FINAL REPORT

Mathematical Problems in Transonic Flow.
AD-A239292 REPORT DATE: 15 JUL 91 FINAL REPORT

Mathematical Problems of Nonlinear Wave Propagation and of Waves in Heterogeneous Media.
AD-A239222 REPORT DATE: 31 OCT 90 FINAL REPORT

A Measurement of Charged and Neutral Elementary Particles Emitted from Antiproton Annihilation at Rest in Heavy Nuclei.
AD-A238789 REPORT DATE: 25 JUN 89 FINAL REPORT

Microcomputer-Based Vehicle Routing and Scheduling.
AD-A238755 REPORT DATE: 17 JUN 81 FINAL REPORT

Microdesigning of Lightweight/High Strength Ceramic Materials.
AD-A238935 REPORT DATE: 31 JUL 89 FINAL REPORT

Micromechanisms of Monotonic and Cyclic Subcritical Crack Growth in Advanced High Melting Point Low-Ductility Intermetallics.
AD-A238151 REPORT DATE: 01 MAY 91 ANNUAL REPORT

Modeling of Free Viscoelastic Jets and Instability Mechanisms.
AD-A239174 REPORT DATE: 31 DEC 80 FINAL REPORT

Neural Coding of Local and Global Motion.
AD-A238607 REPORT DATE: 91 ANNUAL REPORT

New Methods in Robust Control.
AD-A240221 REPORT DATE: 14 AUG 91 FINAL REPORT

NMR Characterization of Products Formed in Diazotizing Mixtures of Luminal and 3-Amino-L-Tyrosine.
AD-A240009 REPORT DATE: 25 AUG 91 FINAL REPORT

Nonlinear Spectroscopy of Multicomponent Droplets and Two- and Three-Dimensional Measurements in Flames.
AD-A238028 REPORT DATE: 15 MAY 91 FINAL REPORT

Non-Algorithmic Issues in Automated Computational Mechanics.
AD-A238322 REPORT DATE: 30 APR 91 FINAL REPORT

Non-Equilibrium and Radiation in MPD Plasmas.
AD-A238859 REPORT DATE: 31 MAY 91 FINAL REPORT

Novel Nonlinear Laser Diagnostic Techniques.
AD-A240193 REPORT DATE: 28 JUN 91 ANNUAL REPORT

A Novel Second Harmonic Generator for Photonics Using Multifunctional Nonlinear Waveguides.
AD-B158243L REPORT DATE: 15 MAY 91 FINAL REPORT

Parametric Study of Diffusion-Enhancement Networks for Spatiotemporal Grouping in Real-Time Artificial Vision.
AD-A238782 REPORT DATE: 04 JUN 91 ANNUAL REPORT

Particle Beams for Defence.
AD-B156558L REPORT DATE: 30 MAY 91 FINAL REPORT

Perception and Memory of Pictures.
AD-A240364 REPORT DATE: 13 AUG 91 ANNUAL REPORT

Perceptual Grouping and Shape from Texture.
AD-A240358 REPORT DATE: 30 NOV 90 FINAL REPORT

Performance and Stability in High Speed Articulated Structures Undergoing Quick Manuevers - Theory and Applications.
AD-A237857 REPORT DATE: JAN 91 FINAL REPORT

Persistent Photoconductivity in II-VI Mixed Semiconductors Related Critical Phenomena and Applications.
AD-A237792 REPORT DATE: 31 MAR 91 FINAL REPORT

Phase Transformations, Ultrastructure and Properties of Rigid-Rod Polymers.
AD-A238643 REPORT DATE: MAY 91 FINAL REPORT

Phosphoprotein Regulation of Synaptic Reactivity.
AD-A237848 REPORT DATE: 01 MAY 91 ANNUAL REPORT

Photochemistry of Large-Ring 2-Phenylcycloalkanones in Various Environments. Intramolecular Para Coupling Products of Acyl Benzyl Biradicals.
AD-A238792 REPORT DATE: 91 FINAL REPORT

Photochromic Polyphosphazenes with Spiropyran Units.
AD-A238719 REPORT DATE: 91 FINAL REPORT

Photoelectron Transfer between Molecules Adsorbed in Restricted Spaces.
AD-A238208 REPORT DATE: 91 FINAL REPORT

Physics of Ultrasmall Superconducting Circuits.
AD-A240158 REPORT DATE: 30 JUN 91 FINAL REPORT

Pictures and Anaphora.
AD-A240153 REPORT DATE: 29 JUL 91 ANNUAL REPORT

Post-Nucleation Heteroepitaxy in Poorly Lattice Matched Systems.
AD-A237783 REPORT DATE: 15 NOV 90 ANNUAL REPORT

Preparation and Characterization of High Temperature Superconductor Film Surfaces.
AD-A240118 REPORT DATE: 31 MAR 91 ANNUAL REPORT

Preparation and Properties of New Inorganic Glasses and Gel-Derived Solids.
AD-A238095 REPORT DATE: APR 91 FINAL REPORT

UNCLASSIFIED

TITLE INDEX

Numerical and Analytical Studies of Stefan Problems.
 AD-A239183 REPORT DATE: 30 JUN 91 FINAL REPORT

Numerical Methods for Scattering from Electrically Large Objects.
 AD-A238282 REPORT DATE: 31 MAY 91 FINAL REPORT

N,N'-Bis(trimethylaluminum)ethylenediamine- and N,N'-Bis(trimethylaluminum)ethylenediamine-Derived Organometallic Precursors
 to Aluminum Nitride: Syntheses, Structures, and Pyrolyses.
 AD-A238604 REPORT DATE: 90 ANNUAL REPORT

Object Recognition in Range Images Using CAD Databases.
 AD-A239326 REPORT DATE: 10 JUL 91 FINAL REPORT

Observation of $Z > 1$ Particles Below 300 km Near the Geomagnetic Equator.
 AD-A240058 REPORT DATE: 91 FINAL REPORT

On Categorizing Sounds.
 AD-A240006 REPORT DATE: 07 AUG 91 FINAL REPORT

The QNR-802 Experiment and Investigation of Particle Precipitation Near the Equator.
 AD-A240208 REPORT DATE: 91 FINAL REPORT

Optical Computing Research.
 AD-A239061 REPORT DATE: 30 APR 91 FINAL REPORT

An Optically Activated Modulator and GaAs-GaAlAs Compound Semiconductor Channel Waveguide.
 AD-A238642 REPORT DATE: 30 APR 91 FINAL REPORT

Optimal Maintenance Strategies for Repairable Systems with General Degree of Repair.
 AD-A238641 REPORT DATE: 30 SEP 90 FINAL REPORT

Optimization Methods in Control of Electromagnetic Fields.
 AD-A240044 REPORT DATE: 31 MAY 91 FINAL REPORT

OPUS: Optimal Projection for Uncertain Systems. Volume 1.
 AD-A240372 REPORT DATE: 01 SEP 91 FINAL REPORT

OPUS: Optimal Projection for Uncertain Systems. Volume 2.
 AD-A240373 REPORT DATE: 01 SEP 91 FINAL REPORT

The Organization of the Suprachiasmatic Circadian Pacemaker of the Rat and its Regulation by Neurotransmitters and Modulators.
 AD-A237788 REPORT DATE: 24 APR 91 ANNUAL REPORT

Organometallic Precursor Routes to Si-C-Al-O-N Ceramics.
 AD-A237753 REPORT DATE: 15 MAY 91 FINAL REPORT

Parallel Logic Programming and Parallel System Software and Hardware.
 AD-A239228 REPORT DATE: 31 DEC 90 FINAL REPORT

TITLE INDEX 9

NUM - PAR

UNCLASSIFIED T85002

UNCLASSIFIED

TITLE INDEX

Probability and Statistics Applied to the Theory of Algorithms.
 AD-A239220 REPORT DATE: 30 OCT 90 FINAL REPORT

Problems in Nonlinear Continuum Dynamics.
 AD-A237844 REPORT DATE: 14 MAY 91 FINAL REPORT

Production of Reactive Oxygen Species by Polyhalogenated Cyclic Hydrocarbons (PCH).
 AD-A239263 REPORT DATE: 22 JUL 91 ANNUAL REPORT

Program and Abstracts of the Society for Research on Biological Rhythms (2nd) Held in Jacksonville, Florida on 9-13 May 1990.
 AD-A240007 REPORT DATE: 15 JUL 91 FINAL REPORT

Psychophysical Studies of Visual Cortical Function.
 AD-A238863 REPORT DATE: 28 JUN 91 FINAL REPORT

Pumping of Stimulated Raman Scattering by Stimulated Brillouin Scattering Within a Single Liquid Droplet: Input Laser Linewidth Effects.
 AD-A237894 REPORT DATE: JAN 90 ANNUAL REPORT

Quantitative Analysis of Thin Film Morphology.
 AD-B156201L REPORT DATE: 29 MAR 91 FINAL REPORT

Quantum 1/f Noise in High Technology Applications Including Ultrasmall Structures and Devices.
 AD-A240152 REPORT DATE: 15 JUL 91 ANNUAL REPORT

Reading: Interactions with Memory.
 AD-A239219 REPORT DATE: 23 JUL 91 ANNUAL REPORT

Reliability Assessment for One-Shot Devices Based on Repeated Samples.
 AD-A237850 REPORT DATE: 31 MAY 88 FINAL REPORT

Reminding-Based Learning.
 AD-A240370 REPORT DATE: 21 AUG 91 ANNUAL REPORT

Research in Mathematics and Computer Science: Calculation of the Probability of Undetected Error for Certain Error Detection Codes. Phase 2.
 AD-A238234 REPORT DATE: 31 MAY 91 FINAL REPORT

RLE Progress Report No 133.
 AD-A240154 REPORT DATE: JUN 91 FINAL REPORT

Scientific Imaging System.
 AD-A239059 REPORT DATE: 07 JUN 91 FINAL REPORT

Shape Distortion of a Single Water Droplet by Laser-Induced Electrostriction.
 AD-A237897 REPORT DATE: OCT 88 ANNUAL REPORT

Short Communication: Isolation of Buoyancy Effects in Jet Diffusion Flame Experiments.
 AD-A237892 REPORT DATE: 90 ANNUAL REPORT

TITLE INDEX

Soot Particle Inception and Growth Processes in Combustion.
AD-A238157 REPORT DATE: APR 91 ANNUAL REPORT

Spatial Light Modulators with Arbitrary Quantum Well Profiles.
AD-A238149 REPORT DATE: 14 JAN 91 ANNUAL REPORT

A Statistical Physics Analysis of Rock and Concrete Damage Response.
AD-A240310 REPORT DATE: 30 MAY 91 ANNUAL REPORT

Structures and Properties of Compositionally Modulated Ceramics.
AD-B156176L REPORT DATE: 29 NOV 90 FINAL REPORT

A Study of Coronal-Interplanetary Coupling Mechanisms.
AD-A238706 REPORT DATE: 30 APR 91 FINAL REPORT

A Study of the Behavior and Micromechanical Modelling of Granular Soil. Volume 1. A Constitutive Relation for Granular Materials Based on the Contact Law Between Two Spheres.
AD-A238091 REPORT DATE: 22 MAY 91 FINAL REPORT

A Study of the Behavior and Micromechanical Modelling of Granular Soil. Volume 2. An Experimental Investigation of the Behavior of Granular Media Under Load.
AD-A238092 REPORT DATE: 22 MAY 91 FINAL REPORT

A Study of the Behavior and Micromechanical Modelling of Granular Soil. Volume 3. A Numerical Investigation of the Behavior of Granular Media Using Nonlinear Discrete Element Simulation.
AD-A238158 REPORT DATE: 22 MAY 91 FINAL REPORT

A Study of the Effect of Hydrocarbon Structure on the Induction of Male Rat Nephropathy and Metabolite Structure.
AD-A237848 REPORT DATE: 17 JUN 91 ANNUAL REPORT

Study of Various Problems in Statistical Planning.
AD-A237780 REPORT DATE: 14 DEC 90 FINAL REPORT

Suppression of Dexamethasone-Stimulated DNA Synthesis in an Oncogene Construct Containing Rat Cell Line by a DNA Site-Oriented Ligand of Poly-ADP-Ribose Polymerase: 9-Amino-1,2-Benzopyrone.
AD-A238605 REPORT DATE: 91 ANNUAL REPORT

Suprathreshold Contrast Sensitivity Vision Test Chart.
AD-A239445 REPORT DATE: 14 JUL 91 FINAL REPORT

Synaptic Plasticity and Memory Formation.
AD-A240121 REPORT DATE: 14 JUN 91 ANNUAL REPORT

Synthesis of Novel, Substituted Polycyclic Cage Systems.
AD-A239325 REPORT DATE: 18 JUL 91 FINAL REPORT

Synthesis, Structure, and Pyrolysis of Organoaluminum Amides Derived from the Reactions of Trialkylaluminum Compounds with Ethylenediamine in a 3:2 Ratio.
AD-A238208 REPORT DATE: 91 FINAL REPORT

UNCLASSIFIED

TITLE INDEX

A Systematic Approach to Combustion Model Reduction and Lumping.
AD-A240195 REPORT DATE: 01 AUG 91 FINAL REPORT

A Systems Theoretic Investigation of Neuronal Network Properties of the Hippocampal Formation.
AD-A238615 REPORT DATE: 18 JUL 91 ANNUAL REPORT

Temporally and Spatially Resolved Spectroscopy of Laser-Induced Plasma from a Droplet.
AD-A237896 REPORT DATE: JUL 88 ANNUAL REPORT

Thermochemistry of Hydrocarbon Decomposition and Relationship to Properties of PECVD Diamond Films.
AD-A237793 REPORT DATE: 31 MAR 91 FINAL REPORT

Three-Dimensional Rapidly Scanning Laser Doppler Velocimeter with Low SNR Signal Processing.
AD-A238857 REPORT DATE: 30 NOV 90 FINAL REPORT

Three-Dimensional Vortex Dynamics and Interactions in Near-Wall Turbulent Boundary Layers.
AD-A237413 REPORT DATE: 30 MAR 91 FINAL REPORT

Time-Frequency Factors in Auditory Perception.
AD-A238788 REPORT DATE: 11 FEB 91 FINAL REPORT

Topographic Map Reading.
AD-A238026 REPORT DATE: 12 MAY 91 FINAL REPORT

Top-Down Influences on Bottom-Up Processing.
AD-A238235 REPORT DATE: 08 MAY 91 ANNUAL REPORT

Transformation and Precipitation of Toxic Metals by 'Pseudomonas maltophilia'.
AD-A238232 REPORT DATE: 31 MAY 91 ANNUAL REPORT

Ultra High Vacuum Sputtering System.
AD-A240157 REPORT DATE: 25 JUL 91 FINAL REPORT

Universal Transition from Order to Chaos and Applications in Plasma Physics.
AD-A239340 REPORT DATE: 31 AUG 90 FINAL REPORT

Validation and Application of Pharmacokinetic Models for Interspecies Extrapolations in Toxicity Risk Assessments of Volatile Organics.
AD-A240058 REPORT DATE: 23 JUL 91 FINAL REPORT

Vibrational, Mechanical, and Thermal Properties of III-V Semiconductors.
AD-A237785 REPORT DATE: 20 MAR 91 FINAL REPORT

Vibrations of Bladed Disk Assemblies.
AD-A237805 REPORT DATE: 29 MAR 91 FINAL REPORT

Visual Motion Perception.
AD-A240133 REPORT DATE: 15 AUG 91 FINAL REPORT

UNCLASSIFIED

TITLE INDEX

Vortex Dynamics.
AD-A238080 REPORT DATE: 27 JUN 91 FINAL REPORT

Wavelet Transforms and Parallel Image Processing.
AD-A239198 REPORT DATE: 29 JUN 91 ANNUAL REPORT

A Workshop on the Integration of Numerical and Symbolic Computing Methods Held in Saratoga Springs, New York on July 9-11, 1990.
AD-A238801 REPORT DATE: APR 91 FINAL REPORT

Workshop Proceedings: Toughening Mechanisms in Quasi-Brittle Materials Held on 18-20 July 1990 in Evanston, Illinois.
AD-A238289 REPORT DATE: 05 MAY 91 FINAL REPORT

TITLE INDEX 14

VOR - WOR

UNCLASSIFIED TR5002

ABSTRACTS

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-B156 876L CONTINUED

AD-B156 876L 20/4 16/2.1

MCDONNELL DOUGLAS MISSILE SYSTEMS CO ST LOUIS MO

(U) Chaotic Response of Aerosurfaces with Structural Nonlinearities.

DESCRIPTIVE NOTE: Final technical rept. 1 Mar 88-28 Feb 91.

APR 91 312P

PERSONAL AUTHORS: Gubser, John L.; Hauenstein, Anthony J.

REPORT NO. MDC-ATN-EBE4-020

CONTRACT NO. F49620-88-C-0047

PROJECT NO. 2302

TASK NO. 81

MONITOR: AFOSR, XF
TR-91-0601, AFOSR

UNCLASSIFIED REPORT

Distribution authorized to U.S. Gov't. agencies only; Proprietary Info.; 5 Aug 91. Other requests shall be referred to AFOSR, Attn: NA. Bolling AFB, Washington, DC 20332-6448.

ABSTRACT: (U) A general analytical and experimental research activity was performed to investigate the chaotic response behavior of nonlinear dynamic systems. Chaos is the paradoxical emergence of random-like motion in completely deterministic nonlinear systems. The results of this research are applicable to a wide range of systems and extend and enhance the basic scientific understanding of chaos and nonlinear dynamics; however, it was necessary to define, develop, and utilize specific analysis and experimental models as an aid in verifying the general dynamic response prediction techniques utilized in this research activity. These models were a rigid and a flexible aerosurface each having nonlinearities in their root support structures. These aerosurfaces were analyzed and tested in low speed wind tunnels and the analysis and test results correlated. This report summarizes the analysis techniques, models, testing, and results from this activity. Five types of

oscillatory response were observed in the analytical and experimental results for the aerosurface models; (1) damped decay, (2) chaotic sustained oscillations, (3) nonharmonic sustained oscillations, (4) harmonic limit cycle sustained oscillations, and (5) flutter.

DESCRIPTORS: (U) DAMPING, DECAY, DETERMINANTS(MATHEMATICS), DYNAMIC RESPONSE, DYNAMICS, EXPERIMENTAL DESIGN, FLUTTER, LOW VELOCITY, MODELS, NONLINEAR SYSTEMS, OSCILLATION, PREDICTIONS, RANGE(EXTREMES), RESPONSE, STRUCTURAL PROPERTIES, STRUCTURES, SUPPORTS, TEST AND EVALUATION, WIND TUNNELS.

IDENTIFIERS: (U) *Chaos, *Nonlinear systems, Dynamic response, Structural response, Wind tunnel tests, Random motion, *Aerodynamics, *Surfaces, Damping, Oscillation, PE81102F, WUAFOSR23028.

AD-B156 876L

AD-B156 876L

UNCLASSIFIED

PAGE

1

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-B156 558L 20/7

AD-B156 558L CONTINUED

UKAEA CULHAM LAB ABINGDON (UNITED KINGDOM) AEA
INDUSTRIAL TECHNOLOGY

evidence of significant emittance growth in the LEBT. Stripping of the ion beam plays an important role in the understanding of aperture scaling of current and must be carefully considered in the design of the injector. We have determined how to do this. Additives to the ion source, eg. Aluminium, can produce enhanced current performance, and the emittance is increased by aberrations at the plasma boundary.

(U) Particle Beams for Defence.

DESCRIPTIVE NOTE: Final rept. 1 Oct 88-31 Jan 91.

MAY 91 131P

PERSONAL AUTHORS: McAdams, R.

REPORT NO. AEA-InTec-0514

CONTRACT NO. F49620-88-C-0084

PROJECT NO. D051

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0591, AFOSR

DESCRIPTORS: (U) ADDITIVES, ALUMINUM, ANIONS, BOUNDARIES, CONTINUOUS WAVES, DEFENSE SYSTEMS, DENSITY, DEUTERIUM, EFFICIENCY, ELECTRONS, EMITTANCE, EXTRACTION, GROWTH(GENERAL), INJECTORS, ION BEAMS, ION SOURCES, IONS, OPERATION, PARAMETERS, PARTICLE BEAMS, PHYSICS, PLASMAS(PHYSICS), PURITY, SOURCES, SUPPRESSION, SUPPRESSORS, TEMPERATURE, VOLUME.

IDENTIFIERS: (U) *Particle accelerator components, *Ion sources, Neutral particle beams, PE81102F, WJAFOSRD051A1.

UNCLASSIFIED REPORT

Distribution authorized to U.S. Gov't. agencies only; Test and Evaluation; 26 Jul 91. Other requests shall be referred to AFOSR, Attn: NP, Bolling AFB, Washington, DC 20332-6448.

ABSTRACT: (U) The Particle Beams for Defence programme has been aimed at developing the continuous wave injector physics and technology, based on the volume negative ion source, necessary for the NPB mission. The broad conclusions of the programme are that: Pure volume sources are able to produce, at present, current densities of H- ions of up to 25-30 mA/sq cm with effective beam ion temperatures of approximately 1.5 - 2.0 eV resulting in a brightness of approximately 15 A/(cm²·rad)·sq. The problem of suppression of the extracted electrons is well understood and efficient suppressors can be designed. The sources operate continuous wave and are essentially noise free. The D- current performance is reduced by approximately a factor of two from the H- current performance and the emittance is reduced by a smaller factor of about 0.3. This is without reoptimisation of the source for deuterium operation. The c.w. beam can be transported to the match point of an RFQ and for the range of parameters investigated there is no

AD-B156 558L

AD-B156 558L

UNCLASSIFIED

PAGE

2

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-B156 503L 20/3

AD-B156 502L 6/5

ADVANCED MATERIALS CORP PITTSBURGH PA

MEHARRY MEDICAL COLL NASHVILLE TN

(U) Low-Cost, High Torque-to-Weight Ratio Permanent Magnet Motors, Actuators and Sensors.

(U) Assaying the Effects of Sublethal Industrial Toxicant Concentrations on Cultured Adrenal Cells.

DESCRIPTIVE NOTE: Annual rept. 1 Jun 89-30 May 90.

DESCRIPTIVE NOTE: Annual rept. 15 MAY 90-14 May 91.

JAN 91 15P

JUN 91 104P

PERSONAL AUTHORS: Sankar, S. G.; Simizu, S.; Pouarian, F.

PERSONAL AUTHORS: Mrotek, James T.

MONITOR: AFOSR TR-91-0203

CONTRACT NO. F49620-89-C-0058

UNCLASSIFIED REPORT

PROJECT NO. 2312

TASK NO. A5

Distribution authorized to DoD only: Critical Technology; 15 Jul 91. Other requests shall be referred to Strategic Defense Initiative Organization, Washington, DC 20301-7100.

MONITOR: AFOSR TR-91-0813

UNCLASSIFIED REPORT

ABSTRACT: (U) Several permanent magnets were fabricated from Pr-Fe-Co-B which exhibit energy products above 35 MGOe at room temperature. They were fabricated employing conventional powder metallurgical techniques. These magnets exhibit more than 48 MGOe at 4.2 K. Finite element analyses were performed to optimize the design of a brushless motor using these magnets. During this reporting period, we have completed the design studies and we have also built a first generation brushless motor. The back emf generated during the operation of the motor agrees with the values expected from the finite element analyses. A second generation motor is planned for construction during the second year of the contract. In the new design, a sensorless commutation technique will be used. This will allow us to cool the motor down to liquid nitrogen temperatures and examine the operation of the motor at these cryogenic temperatures.

DESCRIPTORS: (U) , ACTUATORS, BRUSHLESS ELECTRICAL EQUIPMENT, CRYOGENICS, DETECTORS, ELECTRIC MOTORS, ELECTRONIC COMMUTATORS, ENERGY, FINITE ELEMENT ANALYSIS, LIQUID NITROGEN, LOW TEMPERATURE, MAGNETS, MOTORS, OPERATION, PERMANENT MAGNETS, POWDER METALLURGY, ROOM TEMPERATURE, TEMPERATURE.

IDENTIFIERS: (U) *Parmanent magnets, *Motors.

AD-B156 503L

AD-B156 502L

UNCLASSIFIED

PAGE

3

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-B156 243L 20/6 7/4

AD-B156 201L 9/1

LASER PHOTONICS TECHNOLOGY INC AMHERST NY

PENNSYLVANIA STATE UNIV UNIVERSITY PARK MATERIALS RESEARCH LAB

(U) A Novel Second Harmonic Generator for Photonics Using Multifunctional Nonlinear Waveguides.

(U) Quantitative Analysis of Thin Film Morphology.

DESCRIPTIVE NOTE: Final rept. 1 Jul 90-15 May 91.

DESCRIPTIVE NOTE: Final technical rept. 1 Jul 87-30 Jun 90.

MAY 91 31P

MAR 91 14P

PERSONAL AUTHORS: Burzynski, Ryszard; Casstevens, Martin

PERSONAL AUTHORS: Messier, Russell

REPORT NO. AFO10-FROLPT(91)

CONTRACT NO. AFOSR-87-0343

CONTRACT NO. F48620-90-C-0052

PROJECT NO. 2306

PROJECT NO. 1802

TASK NO. B1

TASK NO. F1

MONITOR: AFOSR, XF TR-91-0588, AFOSR

MONITOR: AFOSR, XF TR-91-0562, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Distribution: Further dissemination only as directed by Air Force Office of Scientific Research, Bolling AFB, Washington, DC 20332, 2 Jul 91 or higher DoD authority.

Distribution: Further dissemination only as directed by Air Force Office of Scientific Research, Bolling AFB, DC 20332; 10 Jul 91 or higher DoD authority.

DESCRIPTORS: (U) . CONTROL, EFFICIENCY, ELECTRONICS, ELECTROOPTICS, FIBERS, GLASS, HARMONIC GENERATORS, INORGANIC MATERIALS, INTEGRATED SYSTEMS, MECHANICAL PROPERTIES, MEDICINE, MODULATION, MULTIMODE, OPTICAL EQUIPMENT, OPTICAL PROPERTIES, ORGANIC COMPOUNDS, OXIDES.

DESCRIPTORS: (U) . AMORPHOUS MATERIALS, CARBON, ELLIPSOMETERS, EVOLUTION(GENERAL), EXPERIMENTAL DATA, EXTERNAL, FILMS, GEOMETRY, GERMANIUM, GROWTH(GENERAL), INTERNAL, ION BOMBARDMENT, LENGTH, MATHEMATICS, MODELS, MORPHOLOGY, QUANTITATIVE ANALYSIS, REAL TIME, SCALE, SPECTROSCOPY, SURFACES, THIN FILMS.

IDENTIFIERS: (U) *Nonlinear waveguides, *Harmonic generators, *Photonics, Sol-Gel films, Integrated optics, WJAFOSR1802F1.

IDENTIFIERS: (U) *Thin films, *Morphology, *Quantitative analysis, Fractals, WJAFOSR2306B1, PE61102F.

AD-B156 243L

AD-B156 201L

UNCLASSIFIED

PAGE 4

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-8156 178L 11/2 20/12

AD-8156 087L 11/9 20/2

OAK RIDGE NATIONAL LAB TN

FOSTER-MILLER INC WALTHAM MA

(U) Structures and Properties of Compositionally Modulated Ceramics.

(U) Expert System Control of Orientation in Ordered Polymers for NLO Applications.

DESCRIPTIVE NOTE: Final rept. 1 Oct 87-30 Sep 90.

DESCRIPTIVE NOTE: Final technical rept. 1 Dec 88-30 Nov 90.

NOV 90 44P

APR 91 60P

PERSONAL AUTHORS: McKee, R. A.

PERSONAL AUTHORS: Druy, Mark A.; Augerl, Mark; Levin, Phillip

CONTRACT NO. AFOSR-ISSA-88-0012, AFOSR-ISSA-89-0015

PROJECT NO. 2306

REPORT NO. AFB-0018-FM-8961-454

TASK NO. A2

CONTRACT NO. F49620-89-C-0018

MONITOR: AFOSR, XF
TR-91-0579, AFOSR

PROJECT NO. 8961

TASK NO. AA

MONITOR: AFOSR, XF
TR-91-0611, AFOSR

UNCLASSIFIED REPORT

Distribution: Further dissemination only as directed by AFOSR, Program Manager, Electronics and Materials Sciences Directorate, Bolling AFB, Washington, DC 20332-8448.

Distribution: Further dissemination only as directed by AFOSR, Bolling AFB, Washington, DC 20332-8448, 12 Jul 91 or higher DoD authority.

DESCRIPTORS: (U) CERAMIC MATERIALS, ELECTRICAL PROPERTIES, EPITAXIAL GROWTH, FILMS, GRAIN SIZE, GROWTH(GENERAL), LAYERS, MECHANICAL PROPERTIES, MICROSTRUCTURE, MODULATION, MOLECULAR BEAMS, OPTICAL PROPERTIES, OXIDES, SILICON, STRUCTURES, TWO DIMENSIONAL.

DESCRIPTORS: (U) ALIGNMENT, CONTROL, CONTROL SYSTEMS, DETECTORS, EXPERT SYSTEMS, HISTORY, LIQUID CRYSTALS, MEASUREMENT, MOLECULES, NONLINEAR SYSTEMS, OPTICAL PROPERTIES, ORDER DISORDER TRANSFORMATIONS, ORIENTATION(DIRECTION), PHYSICAL PROPERTIES, POLYMERS, PROCESSING, SENSITIVITY, SHEAR PROPERTIES, VARIABLES, WIDE ANGLES, X RAY DIFFRACTION.

IDENTIFIERS: (U) Molecular beam epitaxy, *Epitaxial growth, *Thin films, *Ceramic materials, *Oxides, Single crystals, Deposition, PE81102F, WJAFOSR2308A2.

IDENTIFIERS: (U) *Polymers, *Liquid crystals, *Symmetry(Crystallography), Polyphenylenes, Benzyl radicals, Azoles, Polyphenylene benzobis oxazole, Polyphenylene benzobis thiazole, Thiazoles, Nonlinear optical properties, Crystal structure.

AD-8156 178L

AD-8156 087L

UNCLASSIFIED

PAGE

5

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 373 CONTINUED

AD-A240 373 12/4 22/2

HARRIS CORP MELBOURNE FL GOVERNMENT AEROSPACE SYSTEMS DIV

THEORY, MODELS, MULTIVARIATE ANALYSIS, NONLINEAR SYSTEMS, OPTIMIZATION, OUTPUT, PARAMETERS, POWER, RATES, REDUCTION, REPRINTS, SAMPLING, SPACE SYSTEMS, SPACECRAFT, TRACKING, UNCERTAINTY, YIELD.

(U) OPUS: Optimal Projection for Uncertain Systems. Volume 2.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A1, *OPUS(Optimal Projection for Uncertain Systems), *Flexible structures, *Multivariate analysis, *Control theory, Space stations, *Control systems, Optimization, Uncertainty, Lyapunov functions, Large space structures, Time domain, Frequency domain, Robust stability.

DESCRIPTIVE NOTE: Final rept. 15 Oct 88-3C Sep 91.

SEP 91 425P

PERSONAL AUTHORS: Bernstein, Dennis S.; Haddad, Wassim M.

CONTRACT NO. F49620-89-C-0011

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR, XF TR-91-0755, AFOSR

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-A240 372.

ABSTRACT: (U) OPUS (Optimal Projection for Uncertain Systems) is a unified approach to control-system design and analysis for high-performance, multivariable applications such as large flexible space structures. OPUS yields low-order, robust controllers that meet both time- and frequency-domain objectives. This final report discusses progress achieved during the previous three years in the areas of robust control, fixed-structure control, sampled-data control, tracking control, and nonlinear control. The appendices in this volume include reprints on the following topics: Controller design with regional pole constraints; Optimal output feedback for nonzero set point regulation; Inequalities for the trace of matrix exponentials; Reduced-order multirate estimation for stable and unstable plants; Nonquadratic cost and nonlinear feedback control; some open problems in matrix theory arising in linear systems and controls; small gain vs. positive real modeling of real parameter uncertainty; and compartmental modeling and power flow analysis for state space systems.

DESCRIPTORS: (U) CONTROL, COSTS, ESTIMATES, FEEDBACK, FLEXIBLE STRUCTURES, FLOW, GAIN, LINEAR SYSTEMS, MATRIX

AD-A240 373

AD-A240 373

UNCLASSIFIED

PAGE 6

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 372 AD-A240 372 CONTINUED

HARRIS CORP MELBOURNE FL GOVERNMENT AEROSPACE SYSTEMS
DIV

AD-A240 372 12/4 22/2

MULTIVARIATE ANALYSIS, NONLINEAR SYSTEMS, OPTIMIZATION,
PARAMETERS, PERFORMANCE TESTS, QUADRATIC PROGRAMMING,
REDUCTION, REGULATORS, REPRINTS, SAMPLING,
SIZES(DIMENSIONS), SPACECRAFT, SYNTHESIS, TRACKING, YIELD.

(U) OPUS: Optimal Projection for Uncertain Systems. Volume
1.

IDENTIFIERS: (U) PE61102F, WJAFOSR2304A1, *OPUS(Optimal
Projection for Uncertain Systems), *Flexible structures,
*Multivariate analysis, *Multivariate analysis, *Control
theory, Space stations, *Control systems, Optimization,
Uncertainty, Feedback, Large space structures, Time
domain, Frequency domain, Riccati equation, Robust
stability.

DESCRIPTIVE NOTE: Final rept. 15 Oct 88-30 Sep 91.

SEP 91 368P

PERSONAL AUTHORS: Bernstein, Dennis S.; Haddad, Wassim M.

CONTRACT NO. F49620-89-C-0011

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0754, AFOSR

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-A240 373.

ABSTRACT: (U) OPUS (Optimal Projection for Uncertain
Systems) is a unified approach to control-system design
and analysis for high-performance, multivariable
applications such as large flexible space structures.
OPUS yields low-order, robust controllers that meet both
time-and frequency-domain objectives. This final report
discusses progress achieved during the previous three
years in the areas of robust control, fixed-structure
control, sampled-data control, tracking control, and
nonlinear control. The appendices in this volume include
reprints on the following topics: Optimal projection
approach to robust fixed-structure control design;
combined L sub 2 H sub infinity model reduction; Robust
stability and performance analysis for linear dynamic
systems; Robust stability and performance via fixed-order
dynamic compensation; Finite-dimensional approximation
for optimal fixed-order compensation of distributed
parameter systems; Minimal complexity control law
synthesis; singular linear-quadratic regulator problem
and the Goh-Riccati equation.

DESCRIPTORS: (U) CONTROL THEORY, DISTRIBUTION,
DYNAMICS, FLEXIBLE STRUCTURES, LINEAR SYSTEMS, MODELS.

AD-A240 372

AD-A240 372

UNCLASSIFIED

PAGE

7

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 370 5/8

AD-A240 369 20/11

ILLINOIS UNIV AT URBANA DEPT OF PSYCHOLOGY

VIRGINIA UNIV CHARLOTTESVILLE

(U) Reminding-Based Learning.

(U) Large Deformation Induced Failures in Nonlinear Solids.

DESCRIPTIVE NOTE: Annual rept. 21 Jun 90-20 Jun 91,

DESCRIPTIVE NOTE: Final rept. 1 Sep 89-31 Jul 91,

AUG 91 16P

JUL 91 10P

PERSONAL AUTHORS: Ross, Brian H.

PERSONAL AUTHORS: Horgan, Cornelius O.

CONTRACT NO. AFOSR-89-0447

CONTRACT NO. AFOSR-89-0470

PROJECT NO. 2313

MONITOR: AFOSR, XF
TR-91-0758, AFOSR

TASK NO. A4

UNCLASSIFIED REPORT

MONITOR: AFOSR, XF
TR-91-0758, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) When learning new cognitive skills involving problem solving, novices are often reminded of earlier problems. The use of earlier problems is a common means of problem solving and affects the learning of the skill. This project has three aims in understanding this learning. First, the representation of the resulting generalizations is being examined. Generalizations formed from reminders are likely to be conservative, in that they may be more tied to the examples than many current theories allow. A main aim of the project is to distinguish and test different forms of this conservatism. Second, the development of problem solving expertise is examined by focusing on differences in how typical and atypical problems are solved. Third, the effects of such reminding-based learning in everyday problem solving is examined to extend the findings and test some theoretical ideas that are difficult to investigate in more formal domains.

DESCRIPTORS: (U) COGNITION, LEARNING, PROBLEM SOLVING, SKILLS, THEORY.

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A4.

AD-A240 370

AD-A240 369

UNCLASSIFIED

PAGE 8

T85002

ABSTRACT: (U) This work is concerned with the fundamental mechanics and mathematics of large deformation induced failures in nonlinear solids. The specific area investigated was that of void nucleation and growth due to large deformation in nonlinear solids. Research on cavitation phenomena, which serve as a precursor to fracture, is crucial to understanding failure mechanisms in rubber-like solids (e.g. polymers, solid rocket propellants) and of ductile fracture processes in metals. Mathematically, the work involved investigation of singular solutions of the second-order quasilinear system of partial differential equations describing equilibrium states of nonlinearly elastic bodies. For radially symmetric deformations, the basic problem reduces to a bifurcation problem for a single second-order nonlinear ordinary differential equation. Particular emphasis was placed on the effect of material inhomogeneity, compressibility and anisotropy on void nucleation and growth. Studies on the micromechanics of void formation, are receiving much attention from the solid mechanics, applied mathematics and materials science communities. The work has impact on failure mechanisms due to large deformations in anisotropic and composite materials. Compared to the vast amount of information available on small deformations of such materials, results on large deformations remain virtually unexplored. Considerations of large deformations in anisotropic or composite materials often lead to striking differences from predictions of corresponding linearized theories.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 389 CONTINUED

AD-A240 388 5/2

YALE UNIV NEW HAVEN CT DEPT OF PSYCHOLOGY

DESCRIPTORS: (U) ANISOTROPY, APPLIED MATHEMATICS, CAVITATION, COMMUNITIES, COMPOSITE MATERIALS, DEFORMATION, DIFFERENTIAL EQUATIONS, DUCTILITY, ELASTIC PROPERTIES, FAILURE, FRACTURE(MECHANICS), HETEROGENEITY, IMPACT, LINEARITY, MATERIALS, MATHEMATICS, MECHANICS, METALS, NONLINEAR SYSTEMS, NUCLEATION, PARTIAL DIFFERENTIAL EQUATIONS, PARTICLES, POLYMERS, PRECURSORS, RUBBER, SOLID ROCKET PROPELLANTS, SOLIDS, SOLUTIONS(GENERAL), SYMMETRY, THEORY, VOIDS.

(U) Long Term Synaptic Plasticity and Learning in Neuronal Networks.

DESCRIPTIVE NOTE: Annual rept. (Final) 1 Oct 88-30 Sep 91.

AUG 91 12P

PERSONAL AUTHORS: Brown, Thomas H.

IDENTIFIERS: (U) *Failure(Mechanics), *Solids, Nonlinear solids, Voids, Bifurcation(Mathematics), Compressive properties, Anisotropy, *Deformation.

CONTRACT NO. AFOSR-89-0047

PROJECT NO. 2312

IAC NO. PL-055849

TASK NO. A1

IAC DOCUMENT TYPE: PLASTC - MICROFICHE --

MONITOR: AFOSR, XF TR-91-0727, AFOSR

IAC SUBJECT TERMS: P--(U)NONLINEAR ANALYSIS, LARGE DEFORMATIONS, FAILURE, NUCLEATION, VOIDS, ANISOTROPY, BIFURCATION, SOLID PROPELLANTS, THERMOPLASTICS, STRESS CONCENTRATION, PROPELLANT BINDERS, ELASTIC PROPERTIES, FRACTURE TOUGHNESS, BINDERS, DUCTILITY, ZZ UNLIMITED.;

UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of this project was to understand a form of synaptic plasticity, called long-term potentiation (LTP), that appears to be a good candidate mechanism for rapid learning in mammals. LTP is a persistent form of synaptic enhancement that can be rapidly induced by brief periods of stimulation. As this project evolved, I focused on four aims: (1) methods for studying mechanisms underlying LTP expression in the hippocampus; (2) using these methods to elucidate the mechanisms; (3) developing a suitable system for evaluating the role of LTP in learning; (4) developing and applying methods of computational neuroscience to create a learning theory that is grounded in principles of cellular neurophysiology.

DESCRIPTORS: (U) CELLS, HIPPOCAMPUS, LEARNING, MAMMALS, NERVE CELLS, NETWORKS, NEUROPHYSIOLOGY, OPTIMIZATION, PLASTIC PROPERTIES, STIMULATION(GENERAL), SYNAPSE, THEORY.

IDENTIFIERS: (U) PE81102F, WUAFOSR2312A1.

AD-A240 389

AD-A240 386

UNCLASSIFIED

PAGE 9

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 365 CONTINUED

AD-A240 365 13/8 12/1

COLLEGE OF WILLIAM AND MARY WILLIAMSBURG VA DEPT OF
MATHEMATICS AND COMPUTER SCIENCE

DATA BASES, EFFICIENCY, LOGISTICS, NETWORKS, RELIABILITY,
STOCHASTIC PROCESSES, TELECOMMUNICATIONS.

(U) Algebraic Aspects of Network Reliability Problems.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5, *Network
reliability, *Algebra, Distributed systems,
Telecommunications.

DESCRIPTIVE NOTE: Final rept. 1 Dec 88-31 May 91.

MAY 91 10P

PERSONAL AUTHORS: Shier, Douglas R.

CONTRACT NO. AFOSR-89-0071

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR, XF
TR-91-0717, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) This research addresses both theoretical and computational aspects of evaluating the reliability of a complex system in terms of its structure and the reliability of its individual components. This type of problem frequently arises in the design and evaluation of telecommunication, logistics, and distribution systems, which are commonly modelled using networks. The present research employs an algebraic approach for studying the reliability of such network systems. This approach has not only unified a variety of theoretical results but has also produced a number of new algorithms for calculating various measures of system reliability. Based on this approach, both exact and approximate computational schemes have been developed, together with supporting data structures for implementing the necessary computations in an efficient manner. Approximation schemes, also based on an underlying algebraic structure, have also been developed for evaluating more general measures of system performance, such as average delay or throughput in stochastic systems. In addition this research has recently led to the study of efficient methods for generating cutsets in networks and has produced substantial improvements relative to existing methods for this fundamental task. (Author)

DESCRIPTORS: (U) , ALGEBRA, ALGORITHMS, COMPUTATIONS.

AD-A240 365

AD-A240 365

UNCLASSIFIED

PAGE 10

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 364 12/8

AD-A240 364 CONTINUED

NEW YORK UNIV NY DEPT OF PSYCHOLOGY

for this effect -- It says that the more difficult perceptual closure or completion of the fragmented figure is to achieve, the more priming occurs, as along as closure is finally achieved.

(U) Perception and Memory of Pictures.

DESCRIPTIVE NOTE: Annual rept. 1 Jul 88-30 Jun 80.

AUG 81 15P

DESCRIPTORS: (U) . ACTIVATION, CLOSURES, FRAGMENTATION, HYPOTHESES, MATHEMATICS, MEMORY DEVICES, MOTIVATION, PERCEPTION, PICTURES, PREDICTIONS, PRIMERS, RECOGNITION, STIMULI, TEST AND EVALUATION, TRANSIENTS, VEHICLES.

PERSONAL AUTHORS: Snodgrass, Joan G.

CONTRACT NO. AFOSR-88-0442

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A4, *Visual perception, Pattern recognition, Image processing, Connectionist model.

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR, XF
TR-91-0739, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) This research is concerned with perception and memory of pictures. The theoretical motivation behind the experiments vary from area to area: In some cases, we want to test predictions of a connectionist model for picture recognition; in others we want to compare pictures with words to determine whether the two surface forms are understood at the same rate; in still others, the pictures are used as a vehicle to study questions about implicit memory. Although there are five areas of research, here I will mention highlights from only two. In the area of perception, interference in identification of a degraded image occurs when even more degraded images of the same object precede it. We tested, and rejected, the explanation proposed by Bruner and Potter that erroneous hypotheses about the object's identity interfere with subsequent recognition in favor of the explanation generated by our connectionist model. This explanation holds that transient activation of perceptual features common to the target and its distractors reduces the signal-to-noise ratio and causes interference. We were able to eliminate interference by having subjects solve math problems between presentations of the more degraded images. In the area of implicit memory, we found that the best priming stimulus for subsequent identification was a moderately fragmented, as compared to a very fragmented or almost complete stimulus. We developed the perceptual closure hypothesis to account

AD-A240 364

AD-A240 364

UNCLASSIFIED

PAGE 11

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 363 6/5

AD-A240 359 3/2

ILLINOIS UNIV AT URBANA DEPT OF VETERINARY BIOSCIENCES

YALE UNIV NEW HAVEN CT CENTER FOR SOLAR AND SPACE RESEARCH

(U) A Comparative Study Regarding the Association of Alpha-2U Globulin with the Nephrotoxic Mechanism of Certain Petroleum-Based Air Force Fuels.

(U) Development of a System for Accurate Forecasting of Solar Activity.

DESCRIPTIVE NOTE: Annual rept. 1 Jul 90-30 Jun 91.

DESCRIPTIVE NOTE: Final rept. 15 Oct 87-14 Oct 90.

AUG 91 5P

JUL 91 14P

PERSONAL AUTHORS: Eurell, Thomas E.

PERSONAL AUTHORS: Sofia, Sabatino

CONTRACT NO. AFOSR-90-0303

CONTRACT NO. AFOSR-88-0054

PROJECT NO. 2312

PROJECT NO. 2311

TASK NO. A5

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0752, AFOSR

MONITOR: AFOSR, XF
TR-91-0728, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Adult male rats have a dose and time dependent renal proximal tubular degeneration induced by certain hydrocarbon compounds. This degeneration is associated with a low molecular weight urinary protein called alpha 2U globulin. We are using rat strain variation (Fisher 344 and NCI Black Reiter) and different hydrocarbon compounds (JP-4, JP-8, decalin and trimethylpentane) to investigate the hydrocarbon-induced nephrotoxic response. Preliminary histochemical and morphometric evaluation of NCI-Black Reiter rats exposed to JP-8 suggests that this strain undergoes an intermediate form of the hydrocarbon-induced nephrotoxicity when compared to the albino Fisher 344 strain.

DESCRIPTORS: (U) , ADULTS, AIR FORCE, BIODETERIORATION, FUELS, HYDROCARBONS, MALES, PETROLEUM PRODUCTS, RATS, STRAINS(BIOLOGY), TUBULAR STRUCTURES, VARIATIONS.

IDENTIFIERS: (U) PE81102F, WUAFOSR2312A5.

AD-A240 363

AD-A240 359

UNCLASSIFIED

PAGE 12

T85002

ABSTRACT: (U) This is a continuing effort which has empirical, theoretical and experimental components related to the physics of solar activity. The empirical forecasting scheme, developed under this grant, has been very successful for solar cycle 22. Important elements of a highly sophisticated theoretical scheme to model the solar activity cycle have been produced and tested. The Solar Disk Sextant experiment is progressing well. In addition to the Principal Investigator, this work involves five students and two research associates.

DESCRIPTORS: (U) , ACCURACY, FORECASTING, MODELS, PHYSICS, SOLAR ACTIVITY, SOLAR CYCLE, STUDENTS, THEORY.

IDENTIFIERS: (U) PE81102F, WUAFOSR2311A1, *Solar activity, Solar physics, *Forecasting, Solar cycles.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 358 CONTINUED

ILLINOIS UNIV AT URBANA COORDINATED SCIENCE LAB

MOTION, PARAMETERS, PERCEPTION, PLANAR STRUCTURES,
POLYNOMIALS, REGIONS, SEQUENCES, STRUCTURES, SURFACES,
TEXTURE, THREE DIMENSIONAL.

(U) Perceptual Grouping and Shape from Texture.

DESCRIPTIVE NOTE: Final rept. 1 Dec 89-30 Nov 90,

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A7.

NOV 90 3P

PERSONAL AUTHORS: Ahuja, Narendra

CONTRACT NO. AFOSR-90-0061

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR. XF
TR-91-0721, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes the progress made during the year 1990 under grant AFOSR-90-0061. During the grant period of December 1989 to November 1990, we have concentrated on the projects on motion through textured environment and perceptual structure and reliable computing. In the first project, we have made process on the estimation of three-dimensional structure from (1) two perspective, monocular views of a dynamic scene and (2) a sequence of perspective, monocular views of a dynamic scene. Towards (1), we have developed an algorithm that estimates the three-dimensional motion and structure of a moving piecewise textured surface from two perspective views. The algorithm has two major steps. Here, the local planar nature of the surface is used to obtain polynomial expressions for image plane displacements of features. Using regions as moving features, the image is segmented using Hough transform such that the regions in each segment have the same polynomial coefficients. The values of these coefficients and region properties (e.g., area) are then used to identify region correspondences. In the second step, for each planar surface, the region correspondences are used to compute the corresponding motion parameters and surface orientation in closed form.

DESCRIPTORS: (U) . ALGORITHMS, COEFFICIENTS,
DISPLACEMENT, DYNAMICS, ENVIRONMENTS, ESTIMATES, IMAGES,

AD-A240 358

AD-A240 358

UNCLASSIFIED

PAGE 13

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 329 AD-A240 329 CONTINUED

SOUTH CAROLINA UNIV COLUMBIA

DISTRIBUTION, DYNAMIC LOADS, FAULT TOLERANCE, LANGUAGE, LOAD DISTRIBUTION, MEMORY DEVICES, MONITORING, PARALLEL ORIENTATION, PARALLEL PROCESSING, PERFORMANCE TESTS, REAL TIME, SOUTH CAROLINA, SYMPOSIA, TIME SHARING.

(U) Distributed Memory Computing Conference (5th) Held in Charleston, South Carolina on April 3-12, 1990. Proceedings Volume 2. Architectures, Software Tools and Other General Issues.

IDENTIFIERS: (U) WUAFOSR2304A3, PE61102F, *Computer architecture, *Software engineering, *Symposia, *Computations, *Spacecraft, Distributed data processing.

DESCRIPTIVE NOTE: Final rept..

APR 90 878P

PERSONAL AUTHORS: Walker, David W.; Stout, Quentin F.

CONTRACT NO. AFOSR-90-0212

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0738-VOL-2, AFOSR

UNCLASSIFIED REPORT

Availability: IEEE Computer Society Press, 10662 Los Vagueros Circle, P.O. Box 3014, Los Alamitos, CA 90720-1264. \$190.00 per set, Volume 1 and 2. No copies furnished by DTIC/NTIS.

SUPPLEMENTARY NOTE: See also Volume 2, AD-A240 328.

ABSTRACT: (U) Contents: Overviews; Dual ported memory computers; Shared memory; Other hardware and architectures; Distributed computing; Communication systems; Routing; Fault tolerance; Matrix decomposition and allocation; Data allocation and mapping; Dynamic load balancing for spatial domains; Load distribution; Data parallel programming; Object oriented programming; Automatic exploitation of parallelism; Parallel languages; Software development tools; Performance monitoring and profiling; Performance evaluation and analysis; Communication performance; Embeddings; Database and file systems; Education; Minisymposium on fault tolerance in real-time distributed memory computing.

DESCRIPTORS: (U) ALLOCATIONS, COMMUNICATION AND RADIO SYSTEMS, COMPUTER PROGRAMMING, COMPUTER PROGRAMS, COMPUTERS, DATA BASES, DISTRIBUTED DATA PROCESSING.

AD-A240 329

AD-A240 329

UNCLASSIFIED

PAGE

14

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 328 12/1 22/2 22/5 AD-A240 328 CONTINUED
SOUTH CAROLINA UNIV COLUMBIA
(U) Distributed Memory Computing Conference (5th) Held in Charleston, South Carolina on April 8-12, 1990. Proceedings Volume 1. Applications.

PROCEDURES, PARTIAL DIFFERENTIAL EQUATIONS, PATHS, PHYSICS, PLANNING, PLASMAS(PHYSICS), RAY TRACING, SIMULATION, SOUTH CAROLINA, SPARSE MATRIX, STRUCTURAL ANALYSIS, SYMPOSIA, TARGETS, TRACKING.

IDENTIFIERS: (U) WUAFOSR2304A3, PE81102F, *Applied mathematics, *Computations, *Symposia, *Spacecraft, Prototypes, Distributed data processing.

DESCRIPTIVE NOTE: Final rept..

APR 90 057P

PERSONAL AUTHORS: Walker, David W.; Stout, Quentin F.

CONTRACT NO. AFOSR-90-0212

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0737-VOL-1, AFOSR

UNCLASSIFIED REPORT

Availability: IEEE Computer Society Press, 10882 Los Vaqueros Circle, P.O. Box 3014, Los Alamitos, CA 90720-1264. \$190.00 per set, Volume 1 and 2. No copies furnished by DTIC/NTIS.

SUPPLEMENTARY NOTE: See also Volume 2, AD-A240 329.

ABSTRACT: (U) Contents; Expert systems; Alternate applications; Multi target tracking; Simulation of systems and discrete events; Path planning and navigation; Data and image processing; Computer vision; Ray tracing; Sorting; Mathematical methods; Full and Banded matrix algorithms; Sparse matrix algorithms; Tridiagonal systems; Basic algorithms; Monte Carlo physics; Electromagnetic scattering problems; Plasma physics applications; Computational fluid dynamics; Other scientific applications; Structural analysis; Partial differential equation methods; Mini-symposium on concurrent simulation paradigms.

DESCRIPTORS: (U) ALGORITHMS, COMPUTATIONS, COMPUTER VISION, DISTRIBUTION, ELECTROMAGNETIC PROPERTIES, ELECTROMAGNETIC SCATTERING, EXPERT SYSTEMS, FLUID DYNAMICS, IMAGE PROCESSING, MEMORY DEVICES, MODELS, MONTE CARLO METHOD, NAVIGATION, NUMERICAL METHODS AND

AD-A240 328

AD-A240 328

UNCLASSIFIED

PAGE

15

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 310 20/13 20/2 11/2 8/7 AD-A240 310 CONTINUED

ISRAEL ATOMIC ENERGY COMMISSION YAVNE SOREQ NUCLEAR RESEARCH CENTRE

external loading rate is high, a rising R-curve is obtained, which is primarily due to microcrack shielding.

(U) A Statistical Physics Analysis of Rock and Concrete Damage Response.

DESCRIPTORS: (U) APPROXIMATION(MATHEMATICS), CERAMIC MATERIALS, COALESCENCE, CONCRETE, CRACK PROPAGATION, CRACKS, DAMAGE, DENSITY, EQUILIBRIUM(GENERAL), EXTERNAL, FRACTURE(MECHANICS), HIERARCHIES, INTENSITY, INTERACTIONS, INTERNAL, MICROCRACKING, PARAMETERS, PERCOLATION, PHYSICS, RATES, RELAXATION, RESPONSE, SCALE, SHIELDING, SOLIDS, STATISTICAL ANALYSIS, STRESSES, SURFACE ENERGY, THERMODYNAMICS, THRESHOLD EFFECTS.

DESCRIPTIVE NOTE: Annual technical rept. 15 Apr 90-14 Apr 91,

MAY 91 170P

PERSONAL AUTHORS: Englman, R.; Jaeger, Z.

REPORT NO. CONTR-103/90 IDENTIFIERS: (U) PE81102F, WUAFOSR2302C2, *Concrete, *Rock, Reinforced concrete, *Cracking(Fracturing), Microcracking, *Crack propagation, Stress strain relations, Fracture(Mechanics), Porosity, Entropy, Lattice dynamics, Fragmentation, Defects(Materials), Thermophysical properties, Damage assessment.

CONTRACT NO. AFOSR-89-0374

PROJECT NO. 2302

TASK NO. C2

MONITOR: AFOSR, XF TR-91-0659, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) In our thermodynamic approach, crack densities have been treated as a hierarchy of order parameters operating at successively smaller scales (from macroscopic down to microcrack scales). The formalism renormalize surface energy densities due to interaction between microcracks, yields by thermodynamic self-consistency effective elastic constants (similar to those in effective medium approximations) and stress intensity factors (SIF) in cracked solids and provides thermodynamic definitions for observables (like R-curves and SIF). The fracture behavior under fixed grip or constant stress conditions has been studied numerically. Above a critical strain the material attains an equilibrium non-zero crack density that approaches the percolation threshold asymptotically with increasing strain. The effects of crack crack interactions of anisotropic crack-density and of pre-existing pores have also been studied. Crack propagation in ceramic materials, subject to microcrack formation and coalescence, has been examined with models that differ in the relative time scale involved in the internal relaxation processes and the external loading rate. It was found that when the

AD-A240 310

AD-A240 310

UNCLASSIFIED

PAGE 18

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 288 12/1

AD-A240 249 12/1

CONNECTICUT UNIV STORRS DEPT OF MATHEMATICS

MICHIGAN UNIV ANN ARBOR DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

(U) Convergence and Performance of Synchronous and Asynchronous Parallel and Conventional Iterative Methods.

(U) Fast Algorithms for Linear Least-Squares Estimation of Multi-Dimensional Random Fields.

DESCRIPTIVE NOTE: Final rept. 1 Nov 87-30 Jun 91.

DESCRIPTIVE NOTE: Final rept. 1 Nov 88-31 May 91.

AUG 91 29P

JUL 91 149P

PERSONAL AUTHORS: Neumann, Michael

PERSONAL AUTHORS: Yagle, Andrew E.

CONTRACT NO. AFOSR-88-0047

CONTRACT NO. AFOSR-89-0017

MONITOR: AFOSR, XF
TR-91-0750, AFOSR

PROJECT NO. 2304

TASK NO. A8

UNCLASSIFIED REPORT

MONITOR: AFOSR, XF
91-0741, AFOSR

ABSTRACT: (U) Parallel and Sequential Iterative Methods for Linear and Nonlinear Systems. Much of the work on this topic concentrated on the convergence and rate of convergence of parallel asynchronous methods for solving linear systems arising, on the one hand, from the numerical solution to partial differential equations and, on the other hand, from least squares solution to rectangular systems which arise in application such as image reconstruction from incomplete tomographical data. The mathematics behind the analysis of these two applications of the asynchronous parallel methods is quite different. Recently they have been able to extend their convergence results to asynchronous methods for solving nonlinear systems. One application now consists of tomographic reconstruction from incomplete data where the image is constrained to lie in a bounded convex set such as an n dimensional box.

DESCRIPTORS: (U) . BOXES, CONVERGENCE, CONVEX SETS, ITERATIONS, LEAST SQUARES METHOD, LINEAR SYSTEMS, MATHEMATICS, NONLINEAR SYSTEMS, NUMERICAL ANALYSIS, PARALLEL ORIENTATION, PARTIAL DIFFERENTIAL EQUATIONS, RECTANGULAR BODIES, SEQUENTIAL ANALYSIS, SIZES(DIMENSIONS) . SOLUTIONS(GENERAL).

IDENTIFIERS: (U) *Iterations, *Linear systems, *Nonlinear systems, *Problem solving.

AD-A240 288

UNCLASSIFIED

PAGE 17

T85002

UNCLASSIFIED REPORT

ABSTRACT: (U) This report develops fast algorithms for computing filters for linear least squares estimation of one, two, and three dimensional random fields. The algorithms generalize the split Levinson and Schur algorithms to two and three dimensions; however, they are applicable to a more general Toeplitz plus Hankel structure in the covariance function. A discrete version of the Bellman Sievert Krein resolvent identity is developed for smoothing problems in one and two dimensions. Applications to linear predictive coding, and restoration and smoothing, of isotropic random fields on a polar raster are demonstrated. In addition, two new algorithms are developed for spectral estimation on a two-dimensional polar raster. Both use the Radon transform to map the two dimensional problem into one dimensional problems. Interpolating functions for computing the Radon transform, positive definite covariance extensions, and correlation matching are all considered.

DESCRIPTORS: (U) . ALGORITHMS, CODING, CORRELATION, COVARIANCE, ESTIMATES, FUNCTIONS(MATHEMATICS), ISOTROPISM, LEAST SQUARES METHOD, LINEAR ALGEBRA, LINEAR SYSTEMS, MAPS, MATCHING, MULTIPURPOSE, ONE DIMENSIONAL, POLAR REGIONS, PREDICTIONS, RASTERS, SPECTRA, THREE DIMENSIONAL, TWO DIMENSIONAL.

AD-A240 249

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 249 CONTINUED

AD-A240 222 6/5

MONTANA STATE UNIV BOZEMAN DEPT OF CHEMISTRY

IDENTIFIERS: (U) WUAFOSR2304A6, PE61102F, *Mathematical filters, *Algorithms, *Estimates, *Least squares method.

(U) Development of Methods for Detection of Lipid Peroxidation Products in Human Tissues Generated by Environmental Toxins.

DESCRIPTIVE NOTE: Annual rept. 1 Jul 90-30 Jun 91.

JUL 91 4P

PERSONAL AUTHORS: Van Kuijk, Frederik J.

CONTRACT NO. AFOSR-90-0327

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR, XF
TR-91-0753, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) We have almost completed the organic synthesis of stable isotope internal standards of aldehydic products of lipid peroxidation. We have used human retina tissues as a model, since it contains high levels of poly-unsaturated fatty acids and proteins with many sulfhydryl groups (rhodopsin and ATP-ases). This model will allow us to test the improved GC-MS methods, and perform experiments for binding and release of aldehydes to proteins. Our studies of lipid peroxidation and photochemistry in the human retina are of interest to the Air force, since pilots can be exposed to high levels of ultraviolet (UV) radiation during flight missions.

DESCRIPTORS: (U) ACIDS, AIR FORCE, ALDEHYDES, DETECTION, ENVIRONMENTS, FLIGHT, HUMANS, INTERNAL, ISOTOPES, LIPIDS, MISSIONS, ORGANIC MATERIALS, OXIDATION, PHOTOCHEMICAL REACTIONS, PILOTS, PROTEINS, RETINA, STABILITY, STANDARDS, SYNTHESIS, TISSUES(BIOLOGY), TOXINS AND ANTITOXINS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A5.

AD-A240 249

AD-A240 222

UNCLASSIFIED

PAGE 18

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 221 CONTINUED

AD-A240 221 1/4 1/3.12

HONEYWELL SYSTEMS AND RESEARCH CENTER MINNEAPOLIS MN

MATHEMATICS, PARAMETERS, PITCH(INCLINATION), SPACE STATIONS, STABILITY, THEORY, VALUE, VARIATIONS, VEHICLES.

(U) New Methods in Robust Control.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A1, *Flight control systems, *Aerospace craft, *Systems craft, *Systems engineering, *Aerodynamic stability.

DESCRIPTIVE NOTE: Final draft technical rept. Mar 86-Aug 91.

AUG 91 86P

PERSONAL AUTHORS: Doyle, John; Morton, Blaise; Elgersma, Mike

REPORT NO. HSRC-C910984

CONTRACT NO. F49620-88-C-0077

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0740, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes advances in robust control in three areas: Optimal H infinity control singular values, and dynamic inversion. The H infinity results are a thorough treatment of the theory as it has been developed over the last three years. The structured singular value section describes an application of the technique to represent inertia parametric variations in the Space Station. The dynamic inversion section addresses global stability of aircraft pitch axis dynamics using a dynamic inversion control approach. This document is the first draft of the final report for the program New Methods in Robust Control. The emphasis of this program was to develop mathematical theory to help control system designers faced with challenging control problems associated with advanced aerospace vehicles. Relevant applications include flight control systems for new Air force fighter/bomber aircraft, the F-18 HARV research vehicle, the NASP vehicle, the next generation launch system (ALS or NLS), and the Space Station.

DESCRIPTORS: (U) AEROSPACE CRAFT, AIRCRAFT, AXES, CONTROL, CONTROL SYSTEMS, DYNAMICS, FLIGHT CONTROL SYSTEMS, GLOBAL, INERTIA, INVERSION, LAUNCHING.

AD-A240 221

AD-A240 221

UNCLASSIFIED

PAGE 19

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 209 CONTINUED

AD-A240 209 20/5

ARKANSAS UNIV AT PINE BLUFF SPACE AND ENVIRONMENT STUDIES
LAB

WIDTH.

IDENTIFIERS: (U) PE81102F, WUAFOSR2310A2, *Particle
precipitation, Telescope efficiency, Pitch angle,
*Minimum magnetic field, Magnetically quiet time, Full
width at half maximum, SAA Region, EUV Emission zone,
Ring current.

(U) Global Peak Flux Profile of Proton Precipitation in
the Equatorial Zone.

DESCRIPTIVE NOTE: Rept. for 1 Jul 89-30 Jun 91.

APR 91 9P

PERSONAL AUTHORS: Miah, M. A.

REPORT NO. SGCSL-UAPB-02-91

CONTRACT NO. F49620-89-C-0071

PROJECT NO. 2310

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0709, AFOSR

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Availability: Pub. in Indian Jnl. of
Radio and Space Physics, v20 p127-134, Apr 91. Available
to DTIC users only. No copies furnished by NTIS.

ABSTRACT: (U) Particle precipitation near the equator
within was investigated by the Phoenix-1 instrumentation
on board the S81-1 mission. The monitor telescope on
board the mission was sensitive to protons in the energy
range 0.6 - 9.1 MeV, to alpha particles in the energy
range 0.4 - 80 MeV/nucleon. The peak efficiency of the
telescope was for particles 88 degrees pitch angles at
the geomagnetically quiet time equatorial particle data
from the global data coverage and subsequent analysis
shows that the ML detector on board the mission detected
mostly protons. The proton peak flux profile follows the
line of minimum magnetic field. The full width at half
maximum (FWHM) of the equatorial zone is well within the
EUV emission zone.

DESCRIPTORS: (U) , ALPHA PARTICLES, DETECTORS,
EFFICIENCY, EMISSION, EQUATORIAL REGIONS, FLUX(RATE),
GLOBAL, MAGNETIC FIELDS, PARTICLES, PEAK VALUES,
PRECIPITATION, PROFILES, PROTONS, SENSITIVITY, TELESCOPES.

AD-A240 209

AD-A240 209

UNCLASSIFIED

PAGE 20

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 208 20/5

AD-A240 208 CONTINUED

ARKANSAS UNIV AT PINE BLUFF SPACE AND ENVIRONMENT STUDIES
LAB

PRECIPITATION, PULSE HEIGHT ANALYZERS, RATES, TELESCOPES.

(U) The ONR-602 Experiment and Investigation of Particle
Precipitation Near the Equator.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2310A2, *Radiation
belt, *Pulse-height analysis, Counting rates,
Discriminator thresholds, Quasitrapped, Cosmic rays,
Geomagnetic latitude, Charge exchange, Thermosphere,
Exosphere.

91 18P

PERSONAL AUTHORS: Mish, M. A.

REPORT NO. SGCSSL-UAPB-03-91

CONTRACT NU. F49620-89-C-0071

PROJECT NO. 2310

TASK NO. A2

MONITOR: AFOSR, XF
TR-81-0710, AFOSR

UNCLASSIFIED REPORT

Availability: Pub. in Jnl. Geomag. Geoelectr., v43 p445-
460 1981. Available to DTIC users only. No copies
furnished by NTIS.

ABSTRACT: (U) The ONR-602 experiment on board the S81-1
US Air Force mission was used, as one of its objectives,
to investigate the global precipitation of radiation belt
particles at low altitude. The experiment consisted of
two particle telescopes - the main telescope and the
monitor telescope. The main telescope performed Pulse-
Height Analysis (PHA) on a priority basis set by the
triggering of specific logical combinations of detectors
to determine the charge, mass and energy of events, and
returned detector coincidence and single counting rates.
Detector coincidence counting rates were formed by
various logical combinations of the detectors, and single
counting rates were simply individual detector's counting
rates. The three rates were corresponding to the three
discriminator thresholds - ML (0.36 MeV), NM (2.80 MeV),
and MH (10.50 MeV) for the pulse height analyzer of the
single Si detector.

DESCRIPTORS: (U) AIR FORCE OPERATIONS, COINCIDENCE
COUNTING, COUNTING METHODS, DETECTORS, ENERGY, EQUATORIAL
REGIONS, GLOBAL, LOW ALTITUDE, MISSIONS, PARTICLES.

AD-A240 208

AD-A240 208

UNCLASSIFIED

PAGE 21

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 195 12/2

AD-A240 193 9/3

PRINCETON UNIV NJ

SRI INTERNATIONAL MENLO PARK CA

(U) A Systematic Approach to Combustion Model Reduction and Lumping.

(U) Novel Nonlinear Laser Diagnostic Techniques.

DESCRIPTIVE NOTE: Final technical rept. Dec 88-Dec 90.

DESCRIPTIVE NOTE: Annual technical rept. 1 Jun 90-31 May 91.

AUG 91 481P

JUN 91 35P

PERSONAL AUTHORS: Rabitz, Herschel; Dryer, Fredrick

PERSONAL AUTHORS: Faris, Gregory W.; Jeffries, Jay B.; Huestis, D. L.

CONTRACT NO. AFOSR-89-0070

REPORT NO. SRI-MP-91-160

PROJECT NO. 2308

CONTRACT NO. F49620-90-C-0044

TASK NO. A2

PROJECT NO. 2308

MONITOR: AFOSR, XF
TR-91-0714, AFOSR

TASK NO. A3

UNCLASSIFIED REPORT

MONITOR: AFOSR, XF
TR-91-0708, AFOSR

ABSTRACT: (U) This report summarizes research activities completed over the past two years in the general area of combustion model reduction and lumping. The purpose of the research was for the further development of practical techniques capable of rendering complex combustion-transport models to their physical essence for realistic computational execution. The research followed three avenues of approach: (a) sensitivity analysis, (b) linear projective transformations; (c) Lie algebraic techniques. The diversity of approach was necessitated by the complexity of the problem and significant progress was made in each area. Specific conclusions were made concerning the likely next level of research developments needed to advance these tools to practical fruition.

DESCRIPTORS: (U) ALGEBRA, COMBUSTION, COMPUTATIONS, LIE GROUPS, MODELS, REDUCTION.

IDENTIFIERS: (U) PE81102F, WUAFOSR2308A2, *Combustion modeling, Chemical kinetics, Lumping, Reduction, Sensitivity analysis, *Algebra techniques.

AD-A240 195

UNCLASSIFIED

PAGE 22

T85002

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes research on novel laser-based diagnostic techniques in two areas: (1) extension of laser-based diagnostics to shorter wavelengths, allowing two-photon detection of atomic ions; and (2) investigation of the feasibility of obtaining quantitative concentration and velocity measurements using amplified spontaneous emission (ASE). For the first task, we have developed a high power VUV source based on two-photon-resonant difference frequency mixing of a ArF excimer laser and a frequency-doubled Nd:YAG-pumped dye laser in krypton gas. Up to 6 micro J at 147 nm have been generated, and the characteristics of the mixing process have been studied. On the second task, we have performed the first measurement of the ASE bandwidth, indicating that temperature and velocity measurements may be possible. Measurement of ASE in a variety of flames demonstrate that the ASE signal intensity can be influenced by gas collisions.

DESCRIPTORS: (U) AMPLIFICATION, COLLISIONS, DETECTION, DIAGNOSIS(GENERAL), DYE LASERS, EMISSION, EXCIMERS, FLAMES, GASES, HIGH POWER, INTENSITY, KRYPTON, LASER APPLICATIONS, LASER PUMPING, LASERS, MEASUREMENT, MIXING.

AD-A240 193

UNCLASSIFIED

AD-A240 193 CONTINUED UTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 193 CONTINUED

AD-A240 157 11/6.2

NONLINEAR SYSTEMS, PHOTONS, SIGNALS, SOURCES, VACUUM
ULTRAVIOLET RADIATION, VELOCITY, YAG LASERS.

MINNESOTA UNIV MINNEAPOLIS

(U) Ultra High Vacuum Sputtering System.

IDENTIFIERS: (U) PE81102F, WUAFOSR2308A3, LPN-SRI-1187,
*Laser based diagnostics, Multiphoton excitation, Atomic
ions, VUV generation, Four-wave mixing, Amplified
spontaneous emission, Velocity measurement, Temperature
measurement, Concentration measurements.

DESCRIPTIVE NOTE: Final rept. 1 Dec 89-15 Jun 91.

JUL 91 8P

PERSONAL AUTHORS: Dahlberg, E. D.

CONTRACT NO. AFOSR-89-0138

PROJECT NO. 3484

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0745, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) This grant provided for the purchase of an ultrahigh vacuum sputtering system for the preparation of high quality multilayered magnetic films and thin films. The system allows the preparation of continuous alloys with the use of three magnetron clusters and epitaxial multilayer films using ion beam sputtering. Initial tests of the quality of the films indicate that the films prepared in this system are comparable to those prepared by other workers using similar and different techniques in this area of research. The structural quality of the samples prepared with the system has been measured with low angle x-ray scattering whereas the magnetic properties have been characterized with electrical transport, magnetization, and magneto-optic measurements.

DESCRIPTORS: (U) ALLOYS, ELECTRICAL PROPERTIES, EPITAXIAL GROWTH, FILMS, ION BEAMS, LAYERS, LOW ANGLES, MAGNETIC PROPERTIES, MAGNETIZATION, MAGNETOOPTICS, MAGNETRONS, MEASUREMENT, PREPARATION, QUALITY, SPUTTERING, STRUCTURAL PROPERTIES, THIN FILMS, TRANSPORT, ULTRAHIGH VACUUM, X RAY SCATTERING.

IDENTIFIERS: (U) PE81102F, WUAFOSR3484A3, *Sputtering,
*Magnetic films, Ultrahigh vacuum, Magnetrons, Epitaxial growth.

AD-A240 193

AD-A240 157

UNCLASSIFIED

PAGE 23

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 158 9/1 20/12

AD-A240 155 20/12 20/10

YALE UNIV NEW HAVEN CT DEPT OF APPLIED PHYSICS

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES ELECTRONIC SCIENCES LAB

(U) Physics of Ultrasmall Superconducting Circuits.

DESCRIPTIVE NOTE: Final rept. 1 Aug 88-31 Jul 90.

(U) Joint Services Electronics Program Research in Electronics.

JUN 91 9P

DESCRIPTIVE NOTE: Final rept. 1 Apr 88-31 Mar 91.

PERSONAL AUTHORS: Prober, Daniel E.

MAY 91 11P

CONTRACT NO. AFOSR-88-0270

PERSONAL AUTHORS: Steier, W. H.

PROJECT NO. 2305

CONTRACT NO. F49820-88-C-0067

TASK NO. C3

PROJECT NO. 2305

MONITOR: AFOSR, XF
TR-91-0746, AFOSR

MONITOR: AFOSR, XF
TR-91-0748, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The collaboration between Yale and the Westinghouse Science and Technology Center produced high quality, sub-micron, superconducting Nb trilayer tunnel junctions. These junctions were made using a fabrication process developed at Westinghouse as a result of this collaboration. The junctions were fabricated on thin (2 mil) quartz substrates using the existing facilities at Westinghouse. The quality of these devices compares favorably with others reported, particularly in the sub-micron size range. These junctions were used as receiving elements in a broad-band 80-120 GHz mixer receiver. This receiver had no mechanical tuning elements. The noise of this receiver using these devices is among the lowest reported in the 80-120 GHz frequency band, particularly among those with no mechanical tuning elements.

DESCRIPTORS: (U) FABRICATION, MECHANICAL COMPONENTS, PHYSICS, QUARTZ, SIZES(DIMENSIONS), SUBSTRATES, TUNING DEVICES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2305C3,
*Superconducting circuits, *Tunnel junctions, Mixers, Receivers.

AD-A240 158

AD-A240 155

UNCLASSIFIED

PAGE 24

T85002

UNCLASSIFIED REPORT

ABSTRACT: (U) During this period thirteen research projects were supported under this program in the areas of Solid State Electronics, Quantum Electronics, and Information Electronics. This three year period has been a very productive one from the scientific results achieved and the transfer of the results to industry and government laboratories. The results are documented in the scientific publications that have resulted from this research. Perhaps the best mode of technology transfer is through students who graduate and carry the technology with them to other laboratories and industry. Fifteen students received degrees while supported by JSEP during this period.

DESCRIPTORS: (U) ELECTRONICS, INDUSTRIES, LABORATORIES, QUANTUM ELECTRONICS, SCIENTIFIC LITERATURE, SOLID STATE ELECTRONICS, STUDENTS, TECHNOLOGY TRANSFER.

IDENTIFIERS: (U) WUAFOSR2305A9, *Solid state electronics, *Quantum electronics, *Information electronics, Joint military activities.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 154 CONTINUED

AD-A240 154 6/5

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF ELECTRONICS TELEOPERATORS.

IDENTIFIERS: (U) PE81102F, WJAFOSR2313A9.

(U) RLE Progress Report No 133.

DESCRIPTIVE NOTE: Rept. for 1 Jan-31 Dec 90.

JUN 91 15P

PERSONAL AUTHORS: Duriach, Nathaniel I.

CONTRACT NO. AFOSR-90-0200

PROJECT NO. 2313

TASK NO. A8

MONITOR: AFOSR, XF
TR-90-0200, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The Sensory Communication Group is conducting research on the auditory and tactual senses, speech-reception aids (both auditory and tactual) for individuals who are hearing-impaired or deaf, and human-machine interfaces for teleoperator and virtual-environment systems (involving the visual as well as the auditory and tactual senses). Within the domain of hearing aids, research is being conducted on systems that bypass the outer and middle ear and directly stimulate the auditory nerve electrically (cochlear prostheses), as well as on systems that stimulate the system acoustically. The research on taction is focused not only on speech reception for the totally deaf, but also on the ability of the human hand to sense and manipulate the environment. Within the domain of human interfaces, topics of special interest concern the development of principles for mapping the human sensorimotor system into non-anthropomorphic slave mechanisms (or the equivalent in virtual space) and the ability of the human sensorimotor system to adapt to alterations of normal sensorimotor loops caused by the presence of the interface.

DESCRIPTORS: (U) , AUDITORY NERVE, COCHLEA, COMMUNICATION AND RADIO SYSTEMS, DEAFNESS, EARPHONES, EXTERNAL, HUMANS, INTERFACES, MAN MACHINE SYSTEMS, MIDDLE EAR, PROSTHETICS, RECEPTION, SENSES(PHYSIOLOGY), SPEECH,

AD-A240 154

AD-A240 154

UNCLASSIFIED

PAGE

25

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 153 5/8

AD-A240 153 CONTINUED

WISCONSIN UNIV-MADISON

CONSTRUCTION.

(U) Pictures and Anaphora.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A4.

DESCRIPTIVE NOTE: Annual technical rept. 1 Jul 90-30 Jun 91.

JUL 91 28P

PERSONAL AUTHORS: Glenberg, Arthur M.; Kruley, Peter

CONTRACT NO. AFOSR-89-0367

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR, XF
TR-91-0707, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Pictures help people to comprehend and remember texts. The goal of this project is to begin to understand how this occurs. Section I of this report contains a summary of work on several subgoals. Section II contains the report of two experiments testing the assumption that pictures provide an external memory which can assist working memory and thereby facilitate comprehension. We predicted that the availability of a diagram would interact with the difficulty of resolving anaphor references in texts. Resolution of an anaphor distance from its antecedent (which should stress working memory) should benefit greatly from a picture, whereas resolution of an anaphor near to its antecedent should benefit less from a picture. In experiments involving both cumulative and moving window presentations of texts, picture availability and distance separating antecedent from anaphor were manipulated. Although both picture presence and ease of anaphor resolution significantly improved subjects comprehension of the material, no evidence was found for an interaction of these factors. The results are interpreted as consistent with either dual code theory or aspects of working memory management that do not involve anaphor resolution.

DESCRIPTORS: (U) *READING, *COMPREHENSION, *PICTURES, MEMORY(PSYCHOLOGY), MENTAL ABILITY, COGNITION.

AD-A240 153

AD-A240 153

UNCLASSIFIED

PAGE 28

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. T85002

AD-A240 152 9/1

AD-A240 151 7/4 11/8

MISSOURI UNIV-ST LOUIS DEPT OF PHYSICS

GE AIRCRAFT ENGINES CINCINNATI OH

(U) Quantum 1/f Noise in High Technology Applications Including Ultrasml Structures and Devices.

(U) Alloy Modeling and Experimental Correlation for Ductility Enhancement in Near Stoichiometric Single Crystal Nickel Aluminate.

DESCRIPTIVE NOTE: Annual rept. no. 2 15 Jun 90-14 Jun 91,

DESCRIPTIVE NOTE: Final rept. 1 Mar 88-28 Feb 91,

JUL 91 33P

PERSONAL AUTHORS: Handel, Peter H.

JUL 91 88P

CONTRACT NO. AFOSR-89-0418

PERSONAL AUTHORS: Darolia, R.; Field, R. D.; Lahrman, D. F.; Freeman, A. J.

PROJECT NO. 2305

CONTRACT NO. F49820-88-C-0052

TASK NO. C1

PROJECT NO. 2038

MONITOR: AFOSR, XF TR-91-0742, AFOSR

TASK NO. A1

MONITOR: AFOSR, XF TR-91-0743, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes progress achieved this year both in the more general formulation of our new criterion for nonlinear systems which allows us to tell right away if a chaotic system will exhibit a 1/f spectrum, and in the application and further study of the quantum 1/f effect. The general criterion was applied to a one-dimensional crystal with anharmonic interactions, predicting for the first time a 1/f phonon number spectrum in the chaotic regime at very low frequencies and always when cubic terms are dominant in the potential energy. The quantum 1/f theory was applied to a quartz resonator directly for the first time, providing both an explanation for the observed 1/f frequency fluctuations and optimization means. Our new formula for collector 1/f noise in ultrasml BJT's was found to agree reasonably with the experiment.

DESCRIPTORS: (U) CRYSTALS, FORMULATIONS, INTERACTIONS, NONLINEAR SYSTEMS, ONE DIMENSIONAL, OPTIMIZATION, POTENTIAL ENERGY, QUARTZ RESONATORS.

IDENTIFIERS: (U) PE61102F, WJAFOSR2305C1, *Quantum 1/f Noise Theory, 1/f Noise, Electronic Noise, *Semiconductor devices, Quantum 1/f effect, Bipolar transistors, Noise in ultrasml devices, Chaos, Nonlin. Dynamics.

AD-A240 152

UNCLASSIFIED

AD-A240 151

PAGE 27

T85002

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of this research was to evaluate the applicability of theoretical approaches based on first principles to understand the ductility problem in intermetallic compounds. The predictive approach is based on all electron total energy band structure calculations. Predictions were evaluated on single crystals of nickel aluminum alloys. Calculations of anti-phase boundary (APB) energy in binary NiAl and the effects of ternary alloying additions on APB energy were performed. Experimental work on the effects of Cr and V additions, predicted by the calculations to reduce APB energy, was conducted. Studies aimed at exploiting the stress induced martensite transformation in NiAl to increase low temperature toughness were also conducted. Results from the calculations were found to be in good agreement with known stoichiometric effects on the transformation in binary alloys and suggested potentially beneficial ternary and quaternary alloying additions. The investigation of the role of Chromium in promoting slip in NiAl was continued. Experiments to more fully understand this effect were performed. Additional calculations were conducted to clarify the stress induced martensite effect. Calculations aimed at understanding the role of charge density distributions and bond

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 151 CONTINUED

AD-A240 133 6/4 5/8

directionality in NIAI were also initiated. Work to determine the role of microalloying in promoting ductility in NIAI was initiated, through calculations of their effect on local charge distribution and experimental work to determine their effect on slip and fracture behavior.

NEW YORK UNIV NY DEPT OF PSYCHOLOGY
(U) Visual Motion Perception.

DESCRIPTIVE NOTE: Final rept. 1 Feb 88-31 Jan 91.

AUG 91 279P

DESCRIPTORS: (U) . ADDITION, ALLOYS, ALUMINUM ALLOYS, BINARY ALLOYS, BONDING, CHARGE DENSITY, CHROMIUM, COMPUTATIONS, CORRELATION, DIRECTIONAL, DISTRIBUTION, DUCTILITY, ELECTRONS, ENERGY BANDS, INTERMETALLIC COMPOUNDS, LOW TEMPERATURE, MARTENSITE, MODELS, NICKEL ALLOYS, OPTIMIZATION, SINGLE CRYSTALS, STOICHIOMETRY, STRESSES, TERNARY COMPOUNDS, THEORY, TOUGHNESS, TRANSFORMATIONS.

PERSONAL AUTHORS: Sperling, George

CONTRACT NO. AFOSR-88-0140

PROJECT NO. 2313

TASK NO. A5

IDENTIFIERS: (U) PEG1102F, WUAFOSR2036A1, *Nickel alloys, *Aluminum, *Intermetallic compounds, *Ductility, Single crystals, Electron energy, APB(Antiphase Boundary), Energy bands, Phase transformations, Toughness, Crystal growth, Gas turbine rotors, Martensite.

MONITOR: AFOSR, XF
TR-91-0757, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The articles enclosed with this report describe work related to five aspects of visual information processing: (1) Continuing studies of two separate motion-computation systems in human vision and the derivation of the functional properties of each. (2) The investigation of three dimensional structure derived from two dimensional visual inputs. (3) A potent form of spatial contrast-gain-control was discovered and found to be not only frequency selective but also orientation specific. This form of local gain control may exemplify a universal form of neural normalization. (4) Studies of human pattern recognition of familiar shapes (such as letters) show that its statistical efficiency approaches an incredible 50% of the ideal detector's efficiency when the pattern is spatially bandpass filtered in a band whose wavelength is of the same order as the pattern itself. (5) Studies of real and simulated saccadic eye movements in which the same sequence of images that is produced on the retina during saccadic eye movements is artificially produced on a stationary retina.

DESCRIPTORS: (U) . CONTROL, DETECTORS, EFFICIENCY, FREQUENCY, FUNCTIONAL ANALYSIS, GAIN, HUMANS, IMAGES, INFORMATION PROCESSING, MOTION, NERVOUS SYSTEM, NORMALIZING(STATISTICS), PATTERN RECOGNITION, RETINA, SEQUENCES, STATIONARY, STATISTICAL ANALYSIS, THREE DIMENSIONAL, VISION, VISUAL PERCEPTION, VISUAL SIGNALS.

AD-A240 151

AD-A240 133

UNCLASSIFIED

PAGE 28

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 133 CONTINUED

AD-A240 131 20/4

KENTUCKY UNIV LEXINGTON DEPT OF MECHANICAL ENGINEERING

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A5, *Visual perception, *Motion, *Information processing, Vision, Space perception, Eye movements, Saccade, Cognition, Retina, Ideal detectors, Character recognition, Texture quilts, Sign language.

(U) An Additive Turbulent Decomposition of the Navier-Stokes Equations Implemented on Highly Parallel Computer Systems.

DESCRIPTIVE NOTE: Final rept..

AUG 91 49P

PERSONAL AUTHORS: McDonough, J. M.; Hylin, E. C.; Chan, Tony F.; Chan, Matthew T.; Yang, Y.

CONTRACT NO. AFOSR-90-0271

PROJECT NO. 2707

TASK NO. A1

MONITOR: AFOSR
TR-91-0733

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with California Univ.

ABSTRACT: (U) Progress is reported on a study of a new turbulence simulation technique based on unaveraged, additive decomposition of the Navier Stokes equations. The decomposition formalism provides a natural separation of the governing equations into large- and small-scale parts, with the small scale solved in local subdomains. The method thus exhibits a high degree of automatic parallelism, and in addition is well-suited for application of domain decomposition methods as part of the solution process. Results presented include validation of a 2-D version of the small-scale equations, initial studies associated with bifurcation of solutions to these equations, qualitative comparisons with data, and analysis of the additive turbulent decomposition in two dimensional, generalized coordinates.

DESCRIPTORS: (U) ADDITIVES, COMPUTERS, DECOMPOSITION, EQUATIONS, NAVIER STOKES EQUATIONS, PARALLEL PROCESSORS, SEPARATION, SIMULATION, SOLUTIONS(GENERAL), TURBULENCE, VALIDATION.

AD-A240 133

AD-A240 131

UNCLASSIFIED

PAGE 29

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 131 CONTINUED

AD-A240 121 5/8 6/15

IDENTIFIERS: (U) PE81102F, WUAFOSR2707A1, *Navier-Stokes equations, *Decomposition, *Turbulence, Parallel processors.

CALIFORNIA UNIV IRVINE CENTER FOR THE NEUROBIOLOGY OF LEARNING AND MEMORY

(U) Synaptic Plasticity and Memory Formation.

DESCRIPTIVE NOTE: Annual technical rept. 15 May 90-14 May 91.

JUN 91 6P

PERSONAL AUTHORS: Lynch, Gary

CONTRACT NO. AFOSR-89-0383

PROJECT NO. 2312

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0708, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The goal of the project is to define the mechanisms responsible for inducing, expressing, and stabilizing long-term synaptic potentiation (LTP), a form of physiological plasticity that is likely to be responsible for the encoding of memory in telencephalic networks. Studies in the past year defined the cellular changes likely to be responsible for expressions. The nootropic ('cognitive enhancing') drug aniracetam prolongs the open time of post-synaptic receptors mediating fast synaptic transmission. LTP changes the effect of the drug on synaptic responses in hippocampus; manipulations that enhance responses by increasing release do not interact with the drug. By far the most plausible explanation of this result is that LTP modifies receptors. This conclusion is supported by negative results from experiments testing the hypotheses that LTP is due to changes in release, receptor number, or spine resistance.

DESCRIPTORS: (U) CELLS, CODING, DRUGS, HIPPOCAMPUS, HYPOTHESES, LONG RANGE(TIME), MEMORY DEVICES, PHYSIOLOGY, PLASTIC PROPERTIES, RESISTANCE, RESPONSE, SENSE ORGANS, SPINAL COLUMN, STABILIZATION, SYNAPSE, TEST AND EVALUATION, TIME, TRANSMITTANCE.

AD-A240 131

AD-A240 121

UNCLASSIFIED

PAGE 30 T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 121 CONTINUED

AD-A240 120 6/4

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A2.

*Memory(Psychology), Cognition, *Synapse, Learning,

*Drugs, Long term potentiation, Response(Biology), Brain, Hippocampus.

YALE UNIV NEW HAVEN CT

(U) A Circuit Analysis and Computational Model of Operant Conditioning in Aplysia.

DESCRIPTIVE NOTE: Annual technical rept. 1 Jul 90-30 Jun 91.

JUL 91 4P

PERSONAL AUTHORS: Carew, Thomas J.

REPORT NO. 598A-31-41183

CONTRACT NO. AFOSR-89-0382

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0705, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Our primary objective is to carry out a cellular and computational analysis of operant conditioning of the head waving response in Aplysia. During the last twelve month period, progress has been made in four areas: (1) We have now identified the critical muscle groups and motor neurons responsible for generating the operant response (head waving); (2) We have now identified the interganglionic connections in the CNS that are necessary for coordinating headwaving movements in Aplysia; (3) We have found that the endogenous firing rate of headwaving motor neurons can be operantly conditioned in a preparation consisting only of the isolated CNS attached to the oral veil (reinforcement pathway); and (4) We have developed techniques for a network model of information processing in the CNS of Aplysia.

DESCRIPTORS: (U) APLYSIA, CELLS, CENTRAL NERVOUS SYSTEM, CIRCUIT ANALYSIS, COMPUTATIONS, INFORMATION PROCESSING, ISOLATION, MATHEMATICAL MODELS, MODELS, MOTOR NEURONS, MUSCLES, NETWORKS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A1, *Aplysia.

AD-A240 121

AD-A240 120

UNCLASSIFIED

PAGE 31 T85002

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 120 CONTINUED

AD-A240 119 6/4

*Neural nets, Motor neurons, Central nervous system,
Conditioned response, Head waving.

YALE UNIV NEW HAVEN CT SCHOOL OF MEDICINE

(U) Cytochemical Organization of the Retino-
Suprachiasmatic System.

DESCRIPTIVE NOTE: Annual rept. 15 May 90-14 May 91.

AUG 91 4P

PERSONAL AUTHORS: Pol, Van D.

CONTRACT NO. AFOSR-90-0072

PROJECT NO. 2312

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0704, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) This report is concerned with studies of the suprachiasmatic nucleus (SCN) and associated hypothalamic regions. This part of the brain is involved in regulation of circadian rhythms. Work included ultrastructural immunocytochemistry, intracellular electrophysiology, fluo-3 calcium imaging of SCN cells, and experimental neuroanatomy.

DESCRIPTORS: (U) ANATOMY, BRAIN, CELLS(BIOLOGY),
CIRCADIAN RHYTHMS, CONTROL, CYTOCHEMISTRY,
ELECTROPHYSIOLOGY, IMMUNOLOGY, NEUROLOGY.

IDENTIFIERS: (U) PEB1102F, WJAFOSR2312A3, *Hypothalamus,
*Optic nerve, *Cytochemistry, Neurotransmitters,
Circadian rhythms, Brain, Gamma aminobutyric acid,
Supraoptic nucleus, Synapse.

AD-A240 120

AD-A240 119

UNCLASSIFIED

PAGE 32 T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 118 CONTINUED

AD-A240 118 20/12

YALE UNIV NEW HAVEN CT DEPT OF APPLIED PHYSICS

*Thin films, Sputtering, Deposition, Strontium titanate, Ion bombardment.

(U) Preparation and Characterization of High Temperature Superconductor Film Surfaces.

DESCRIPTIVE NOTE: Annual rept. no. 1 1 Jun 90-31 May 91.

MAR 91 4P

PERSONAL AUTHORS: Prober, Daniel E.

CONTRACT NO. AFOSR-90-0306

PROJECT NO. 2305

TASK NO. C1

MONITOR: AFOSR, XF
TR-91-0744, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Research was conducted on deposition and characterization of high temperature superconductor films. A number of configurations for sputter deposition of films were tested, including three-source co-sputtering with the guns facing, and with the guns off-axis, from the growing film, and single composite-target sputtering. The best film properties were obtained with off-axis, single target sputtering onto a heated substrate. Films were deposited onto heated magnesium oxide substrates using simultaneous sputtering (co-sputtering) from three metal targets: yttrium, copper, and a barium copper alloy. After a significant number of depositions were carried out to optimize film composition and to maximize transition temperature and to maximize transition temperature, we began deposition onto substrates of strontium titanate. These substrates allowed higher transition temperatures and films with lower resistivities.

DESCRIPTORS: (U) BARIUM, CONFIGURATIONS, COPPER, COPPER ALLOYS, DEPOSITION, ELECTRICAL RESISTANCE, FILMS, GUNS, HEAT, HIGH TEMPERATURE, MAGNESIUM OXIDES, METALS, SPUTTERING, STRONTIUM, SUBSTRATES, SUPERCONDUCTORS, SYNCHRONISM, TARGETS, TITANATES, TRANSITION TEMPERATURE, YTTRIUM.

IDENTIFIERS: (U) PE61102F, WJAFOSR2305C1,

AD-A240 118

AD-A240 118

UNCLASSIFIED

PAGE 33

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 095 8/11

AD-A240 058 8/11

ARKANSAS UNIV FOR MEDICAL SCIENCES LITTLE ROCK

GEORGIA UNIV ATHENS DEPT OF PHARMACOLOGY AND TOXICOLOGY

(U) The Asian Toxicology Conference Tour.

(U) Validation and Application of Pharmacokinetic Models for Interspecies Extrapolations in Toxicity Risk Assessments of Volatile Organics.

DESCRIPTIVE NOTE: Final rept. 15 May 90-14 May 91.

JUL 91 5P

DESCRIPTIVE NOTE: Final rept. 1 Jul 87-30 Apr 91.

PERSONAL AUTHORS: Chang, Louis W.

JUL 91 284P

CONTRACT NO. AFOSR-90-0219

PERSONAL AUTHORS: Dallas, Cham E.

MONITOR: AFOSR, XF
TR-91-0724, AFOSR

CONTRACT NO. AFOSR-87-0248

PROJECT NO. 2312

UNCLASSIFIED REPORT

TASK NO. A5

ABSTRACT: (U) The Asian Toxicology Conference Tour successfully induced enthusiastic responses and active interactions between American and Asian toxicologists and health care agencies. Educational and technological transfers and opportunities were made available to those countries which need awareness and training in toxicological sciences. The American scientists gained first hand information on many of the unique toxicological problems in Asia, toxicities of oriental medicinal herbs, industrial and occupational toxicological problems and managements, etc.). Much human exposure data on various toxic chemicals were also available for clinical/experimental correlations. Thus, this project has provided mutual benefits to the American scientists, as well as to the Asian countries visited. As a result of this Asian Conference Tour, Japan, Korea, Taiwan, China, and India are now interested in the possibility of forming a Federation of Asian Toxicologists to continue such scientific exchange and interaction.

DESCRIPTORS: (U) ASIA, AWARENESS, BENEFITS, CHEMICALS, CHINA, CLINICAL MEDICINE, CORRELATION, EXCHANGE, EXPOSURE(PHYSIOLOGY), HANDS, HUMAN BODY, INDIA, INTERACTIONS, JAPAN, KOREA, MEDICAL SERVICES, SCIENTISTS, SYMPOSIA, TAIWAN, TOXICITY, TOXICOLOGISTS, TOXICOLOGY, TRAVEL.

IDENTIFIERS: (U) PE61102F, WJAFOSR2312A5, *Toxicology, Asia, Toxic hazards, Chemicals, Scientific organizations.

AD-A240 095

MONITOR: AFOSR, XF
TR-91-0735, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Direct measurements of perchloroethylene (PER), trichloroethylene (TCE), trichloroethane (TRI) and dichloroethylene (DCE) were made in the blood and exhaled breath of rats during and following inhalation exposures. The pharmacokinetics of these four halocarbons were also investigated following oral administration. An accurate assay for measuring volatile halogenated hydrocarbons in a variety of body tissues was developed and demonstrated for PER, TCE, TRI, and tetrachloroethane (TET). The tissue concentration-time profiles and bioavailability for PER and TET were determined in liver, kidney, brain, fat, lung, heart, and muscle tissues following oral and intraarterial administrations in rats. Interspecies comparisons of the pharmacokinetics of PER and TET were made following oral and intraarterial administrations in two species: Sprague-Dawley rats and Beagle dogs. Neurobehavioral determinations were conducted in rats following inhalation exposures, single oral bolus administration, and gastric infusion of PER.

DESCRIPTORS: (U) ACCURACY, ASSAYING, BLOOD, BRAIN, DOGS, EXTRAPOLATION, HALOGENATED HYDROCARBONS, HUMAN BODY, INFUSIONS, INGESTION(PHYSIOLOGY), LIVER, LUNG, MEASUREMENT, MODELS, ORAL INTAKE, ORGANIC MATERIALS, PHARMACOKINETICS, RATS, RISK, STOMACH, TEST AND

AD-A240 058

UNCLASSIFIED

PAGE 34

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 058 CONTINUED

AD-A240 057 21/2 21/5 21/8 20/4

EVALUATION, TISSUES(BIOLOGY), TOXICITY, TRICHLOROETHANES,
TRICHLOROETHYLENE, VALIDATION, VOLATILITY.

COLORADO UNIV AT BOULDER DEPT OF MECHANICAL ENGINEERING

(U) Contractors Meeting in Propulsion Held in Boulder
Colorado on June 10-14, 1991.

IDENTIFIERS: (U) PE61102F, WUAFOSR2312AS.

DESCRIPTIVE NOTE: Technical rept..

AUG 91 283P

PERSONAL AUTHORS: Birkan, M. A.; Tishkoff, J. M.

CONTRACT NO. AFOSR-89-0541

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0713, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Abstracts are given for research in
airbreathing combustion, rocket propulsion, and
diagnostics in reacting media supported by the Air Force
Office of Scientific Research. Major topics include: Gas
turbines, Shear layer, Lasers, Fluorescence, Spectroscopy,
Rocket, Engines, and Scramjets.

DESCRIPTORS: (U) AIR BREATHING, COMBUSTION,
FLUORESCENCE, GAS TURBINES, LASERS, LAYERS, PROPULSION
SYSTEMS, ROCKET PROPULSION, SHEAR PROPERTIES,
SPECTROSCOPY, SUPERSONIC COMBUSTION RAMJET ENGINES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2308A1, *Combustion,
Combustion stability, Flames, Supersonic combustion,
*Soot, Sprays, Plasmas(Physics), *Turbulent flow,
Ignition, Instability, Laser induced fluorescence,
*Propellants, Plasma devices, *Symposia.

AD-A240 058

AD-A240 057

UNCLASSIFIED

PAGE 35

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 058 20/5

AD-A240 058 CONTINUED

ARKANSAS UNIV AT PINE BLUFF SPACE AND ENVIRONMENT STUDIES
LAB

OBSERVATION, PARTICLE FLUX, PEAK VALUES, PRECIPITATION,
PROTONS, SPECTRA, STRUCTURES, WIDTH.

(U) Observation of Z>1 Particles Below 300 km Near the
Geomagnetic Equator.

IDENTIFIERS: (U) PE61102F, WJAFOSR2310A2, *Proton
precipitation, *Minimum magnetic field strength, Full
width at half maximum, Charge exchange, AP8MAX model,
Spectral index, Average geomagnetic condition, 10.7 cm
radio flux.

PERSONAL AUTHORS: Miah, M. A.

REPORT NO. SGCSSL-UAPB-04-91

CONTRACT NO. F49620-89-C-0071

PROJECT NO. 2310

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0711, AFOSR

UNCLASSIFIED REPORT

Availability: Pub. in Jnl. Geomag. Geoelectr., v43 p461-
475, 1991. Available to DTIC users only. No copies
furnished by NTIS.

ABSTRACT: (U) Precipitation of low energy protons at low
equatorial altitude has been investigated by the Phoenix-
1 instrumentation on board the S81-1 mission. Results of
the analysis of data received by the monitor telescope
and their geophysical interpretation are presented. Seven
months long observation during geomagnetic average
conditions in May through early December of 1982 shows
that the peak precipitation of protons occurs along the
line of minimum magnetic field strength. The full width
at half maximum (FWHM) is nearly 13 deg. The particle
flux shows a strong altitude dependence, and below 220 km
it shows double peak structures. Spectral index of the
precipitation flux has been obtained from the data of
previous observations. Further, peak precipitation flux
in 1982 is almost three times as large as peak
precipitation flux in 1969. Charge exchange mechanism
favors a stronger source than AP8MAX model.

DESCRIPTORS: (U) ALTITUDE, CHARGE TRANSFER, EQUATORIAL
REGIONS, FIELD INTENSITY, FLUX(RATE), GEOMAGNETISM,
INDEXES, LOW ALTITUDE, LOW ENERGY, MAGNETIC FIELDS.

AD-A240 058

AD-A240 058

UNCLASSIFIED

PAGE 38

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 050 CONTINUED

AD-A240 050 20/4

ILLINOIS INST OF TECH CHICAGO FLUID DYNAMICS RESEARCH CENTER

RESONANCE, REYNOLDS NUMBER, SCALE, SCALING FACTOR, SEPARATION, SYNCHRONISM, THREE DIMENSIONAL, TRANSITIONS, TURBULENT BOUNDARY LAYER, TURBULENT FLOW, VARIABLES, WAVES.

(U) Management and Control of Unsteady and Turbulent Flows.

DESCRIPTIVE NOTE: Final technical rept. Oct 88-Mar 90,

IDENTIFIERS: (U) PE61102F, WJAFOSR2307A2, *Turbulent flow, *Boundary layer transition, Flow separation, Unsteady flow, Vortices, Airfoils, Three dimensional flow, Two dimensional flow.

JUL 91 15P

PERSONAL AUTHORS: Nagib, Hassan M.; Acharya, Mukund; Corke, Thomas C.; Reisenthel, Patrick H.; Wark, Candace C.

CONTRACT NO. F49620-88-C-0133

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0728, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Conclusions from a wide range of experiments in transitioning, turbulent, separated and unsteady flow fields include the following highlights: The simultaneous generation of controlled phase-coupled plane TS waves and oblique waves was used to investigate the development of three dimensional disturbances and mechanisms of transition in a Blasius boundary layer. From these experiments, the detuning of the fundamental/subharmonic resonance emerges as a primary candidate for the transition process under natural conditions. Three dimensional mappings of the Reynolds-stress-producing events in turbulent boundary layers over a range of Reynolds numbers and initial conditions have demonstrated that an integral-size of these dynamical motions scales better with outer variables as compared with inner variables. While the wall or inner layer is responsible for their initial, the hierarchy of their scales in the log layer expands with Reynolds number according to this outer scaling. Real-time reactive control of a model unsteady separating flow was successfully implemented using a simple scheme for the detention of the separation.

DESCRIPTORS: (U) BOUNDARY LAYER, CONTROL, DYNAMICS, EXTERNAL, FLOW FIELDS, HARMONICS, HIERARCHIES, INTERNAL, LAYERS, MOTION, RANGE(EXTREMES), REACTIVITIES, REAL TIME.

AD-A240 050

AD-A240 050

UNCLASSIFIED

PAGE 37

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 049 12/4 12/1

AD-A240 049 CONTINUED

CINCINNATI UNIV OH DEPT OF AEROSPACE ENGINEERING

(U) Approximate Evaluation of Reliability and Related Quantities via Perturbation Techniques.

DESCRIPTIVE NOTE: Final technical rept. 1 Sep 89-30 Sep 90.

DEC 90 107P

PERSONAL AUTHORS: Walker, Bruce K.; Srichander, Ramaswamy

CONTRACT NO. AFOSR-89-0488

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR, XF
TR-91-0716, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The evaluation of the reliability, stability, and performance of fault tolerant control systems (FTCS) is considered. New sufficient conditions for stochastic stability of FTCS with standard Markovian component failure behavior and Markovian failure detection decision behavior are derived. By specializing these results to the class of linear time-invariant (LTI) FTCS with linear state feedback control laws that are reconfigured by switching the feedback gain matrix according to the identified failure configuration, the stability results are strengthened to necessary and sufficient conditions for stochastic stability of a special type (exponential in mean square) that implies a very strong sense of stability (a.s. in probability). An approximate feedback control design technique for LTI FTCS is then proposed and demonstrated on a simple numerical case. In addition, previous results on semi-Markov analysis of FTCS reliability are used to derive a numerical method for establishing approximately optimal failure detection test thresholds for sequential failure detection tests. This method, though approximate, is shown to yield thresholds that provide a considerable increase in system reliability relative to those provided by a method based on a rigorously derived reliability approximation for one numerical example.

AD-A240 049

UNCLASSIFIED

AD-A240 049

PAGE 38

T85002

DESCRIPTORS: (U) CONFIGURATIONS, CONTROL SYSTEMS, DETECTION, FAILURE, FAULTS, INVARIANCE, LINEAR SYSTEMS, MARKOV PROCESSES, MEAN, NUMERICAL ANALYSIS, NUMERICAL METHODS AND PROCEDURES, PERTURBATIONS, RELIABILITY, SEQUENTIAL ANALYSIS, STABILITY, STATISTICAL TESTS, STOCHASTIC PROCESSES, TEST AND EVALUATION, TIME, TOLERANCE.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A5, *Control systems, *Systems analysis, *Fault tolerance, *Numerical methods and procedures.

IAC NO. GC-920344

IAC DOCUMENT TYPE: GACIAC - MICROFICHE --

IAC SUBJECT TERMS: G--(U)CONTROL SYSTEMS, CONTROL LAWS, STOCHASTIC PROCESSES, FEEDBACK CONTROL, STABILITY, RELIABILITY.;

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 048 20/4

AD-A240 046 12/2

TULANE UNIV NEW ORLEANS LA DEPT OF MATHEMATICS

MISSOURI UNIV-COLUMBIA DEPT OF MATHEMATICS

(U) A Grid-Free Method for High Reynolds Number Flow
Around an Immersed Elastic Structure.

(U) Applications of Multiparameter Bifurcations of Period
Functions.

DESCRIPTIVE NOTE: Final rept. 1 Apr 89-31 Jul 90.

DESCRIPTIVE NOTE: Final rept. 1 Nov 88-30 Jun 91.

JUL 90 29P

JUL 91 17P

PERSONAL AUTHORS: Fauci, Lisa J.

PERSONAL AUTHORS: Chicone, Carmen

CONTRACT NO. AFOSR-89-0295

CONTRACT NO. AFOSR-89-0078

PROJECT NO. 6177

PROJECT NO. 2304

TASK NO. 55

TASK NO. A8

MONITOR: AFOSR, XF
TR-91-0730, AFOSR

MONITOR: AFOSR, XF
TR-91-0722, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Finite difference schemes do not perform well in simulations of high Reynolds number flow because a restrictive number of grid points must be used to resolve boundary layers. In this report we present a grid-free numerical method which may be used to calculate flows around an immersed elastic structure. Numerical results are presented in two simple cases: flow past a circular cylinder and flow past a flat plate. Here the boundary motion is specified and is not time dependent. However, this algorithm can be used to simulate more complicated, time dependent problems in biological fluid mechanics.

ABSTRACT: (U) The objective of the research project was a mathematical analysis of multiparameter bifurcation problems which arise in the study of ordinary differential equations, especially, the bifurcation of critical points of period functions and the bifurcation of continuous families of periodic trajectories.

DESCRIPTORS: (U) ALGORITHMS, BIOLOGY, BOUNDARIES, BOUNDARY LAYER, ELASTIC PROPERTIES, FINITE DIFFERENCE THEORY, FLOW, FLUID MECHANICS, GRIDS(COORDINATES), HIGH RATE, MOTION, NUMERICAL ANALYSIS, PLATES, REYNOLDS NUMBER, TIME DEPENDENCE.

DESCRIPTORS: (U) DIFFERENTIAL EQUATIONS, MATHEMATICAL ANALYSIS, TRAJECTORIES.

IDENTIFIERS: (U) PE62202F, WJAFOSR617755, Boundary layer flow, Reynolds number, Immersion, Mathematical models, Cylinders, Plates, Underwater structures, Navier Stokes equations, Velocity, Grids.

IDENTIFIERS: (U) *Bifurcation(Mathematics), *Mathematical analysis, Parameters, Nonlinear systems.

AD-A240 048

AD-A240 046

UNCLASSIFIED

PAGE 39

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 045 24/3

AD-A240 044 20/14 17/9

JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF ENVIRONMENTAL HEALTH SCIENCES

DELAWARE UNIV NEWARK DEPT OF MATHEMATICS

(U) International Conference on Combined Effect of Environmental Factors (4th).

(U) Optimization Methods in Control of Electromagnetic Fields.

DESCRIPTIVE NOTE: Final rept. 30 Sep 90-29 Mar 91.

DESCRIPTIVE NOTE: Final rept. 1 Sep 89-31 May 91.

AUG 91 4P

MAY 91 11P

PERSONAL AUTHORS: Fechter, Lawrence D.

PERSONAL AUTHORS: Angell, Thomas S.; Kleinman, Ralph E.

CONTRACT NO. AFOSR-90-0344

CONTRACT NO. AFOSR-88-0289

PROJECT NO. 2312

PROJECT NO. 2304

TASK NO. A5

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0732, AFOSR

MONITOR: AFOSR, XF
TR-91-0719, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Issues discussed during the conference included interactions between gases and particulates, health effects of combined exposure in the psychosocial work environment, health effects from combined exposure to solvents and mechanisms of oto-and vestibulo-toxicity. The material presented at the scientific sessions included both laboratory based research and epidemiological study.

DESCRIPTORS: (U) ENVIRONMENTS, EPIDEMIOLOGY, EXPOSURE(GENERAL), GASES, HEALTH, INTERNATIONAL, LABORATORY TESTS, PARTICULATES, SOCIAL PSYCHOLOGY, SOLVENTS, SYMPOSIA.

IDENTIFIERS: (U) PE81102F, WUAFOSR2312A5, *Environmental impact, *Hazardous materials, Hazardous wastes, Toxic hazards.

ABSTRACT: (U) This program is developing constructive methods for certain constrained optimization problems arising in the design and control of electromagnetic fields and in the identification of scattering objects. The problems addressed fall into three categories: (1) the design of antennas with optimal radiation characteristics measured in terms of directivity; (2) the control of the electromagnetic scattering characteristics of an object, in particular the minimization of its radar cross section, by the choice of material properties, and (3) the determination of the shape of scattering objects with various electromagnetic properties from scattered field data. The main thrust of the program is toward the development of constructive methods based on the use of complete families of solutions of the time-harmonic Maxwell equations in the infinite domain exterior to the radiating or scattering body. During the course of the work an increasing amount of attention has been devoted to the use of iterative methods for the solution of various direct and inverse problems. The continued investigation and development of these methods and their application in parameter identification has become a significant part of the program.

DESCRIPTORS: (U) ANTENNAS, CONTROL, ELECTROMAGNETIC FIELDS, ELECTROMAGNETIC PROPERTIES, HARMONICS.

AD-A240 045

AD-A240 044

UNCLASSIFIED

PAGE 40 T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 044 CONTINUED

AD-A240 043 20/4

IDENTIFICATION, INVERSION, MAXWELLS EQUATIONS,
METHODOLOGY, OPTIMIZATION, PARAMETERS, RADAR CROSS
SECTIONS, RADIATION, SCATTERING, TIME.

YALE UNIV NEW HAVEN CT DEPT OF MECHANICAL ENGINEERING
(U) (DURIP) Two and Three Dimensional Imaging of Turbulent
and Unsteady Flows.

IDENTIFIERS: (U) PE81102F, WJAFOSR2304A1,
*Electromagnetic scattering. *Radar targets.

DESCRIPTIVE NOTE: Final rept. 1 Dec 88-30 Nov 90.

IAC NO. GC-920343

JUL 91 3P

IAC DOCUMENT TYPE: GACIAC - MICROFICHE --

PERSONAL AUTHORS: Sreenivasan, K. R.

IAC SUBJECT TERMS: G--(U)RADAR, ANTENNAS, ANTENNA
RADIATION PATTERNS, SCATTERING, OPTIMIZATION.;

CONTRACT NO. AFOSR-89-0163

PROJECT NO. 3842

MONITOR: AFOSR, XF
TR-91-0718, AFOSR

UNCLASSIFIED REPORT

DESCRIPTORS: (U) *FLOW VISUALIZATION, TURBULENT FLOW,
UNSTEADY FLOW, IMAGES, INSTRUMENTATION, TWO DIMENSIONAL,
THREE DIMENSIONAL, WAKE.

IDENTIFIERS: (U) PE81104D.

AD-A240 044

AD-A240 043

UNCLASSIFIED

PAGE 41

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 042 12/3

AD-A240 041 12/4 20/2

WISCONSIN UNIV-MADISON

RUTGERS - THE STATE UNIV PISCATAWAY NJ

(U) Life Testing and Reliability with Application in Engineering Systems.

(U) Geometry of Energy Minimizing.

DESCRIPTIVE NOTE: Final rept. 15 Jun 87-14 Oct 90.

DESCRIPTIVE NOTE: Final rept. 1 Sep 87-30 Sep 90.

OCT 90 8P

SEP 90 3P

PERSONAL AUTHORS: Johnson, Richard A.; Bhattacharyya, Gourl K.

PERSONAL AUTHORS: Taylor, Jean E.

CONTRACT NO. AFOSR-87-0256

CONTRACT NO. AFOSR-87-0277

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A5

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0720, AFOSR

MONITOR: AFOSR, XF
TR-91-0729, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Current research is concentrated in several important areas of life testing and reliability which are theoretically challenging as well as directly motivated from potential practical applications to engineering systems. Particular emphasis was placed on the development of procedures that are appropriate for costly experiments involving small sample sizes.

ABSTRACT: (U) The major accomplishments of this grant are: (1) Worked out a model and a computer program for the motion of polycrystalline interface in two dimensions. (2) Organized the AMS Special Session on computing Optimal Geometries, at the annual meeting in San Francisco (jointly with Fred Almgren and Al Marden), and edited the proceedings. (3) Worked out some of the theory for motion of curves in three dimensions by crystalline curvature, and implemented some of it in a computer program.

DESCRIPTORS: (U) ENGINEERING, LIFE TESTS, RELIABILITY.

DESCRIPTORS: (U) COMPUTER PROGRAMS, CRYSTALS, CURVATURE, ENERGY, GEOMETRY, INTERFACES, MOTION, OPTIMIZATION, POLYCRYSTALLINE.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5, *Statistical tests, *Life tests, Engineering, Air Force research, Parametric analysis, Variables.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A3, *Mathematical models, *Geometry, *Polycrystalline.

AD-A240 042

AD-A240 041

UNCLASSIFIED

PAGE 42 T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 009 CONTINUED

AD-A240 009 7/8 7/3

SOUTHEASTERN OKLAHOMA STATE UNIV DURANT DEPT OF PHYSICAL SCIENCES

the alpha-amino nitrogen atom, i.e., an aryl amine polymer which retains the structural qualities of 3-amino-L-tyrosine.

(U) NMR Characterization of Products Formed in Diazotizing Mixtures of Luminol and 3-Amino-L-Tyrosine.

DESCRIPTORS: (U) ABSORPTION, AMINES, ARYL RADICALS, BICARBONATES, CHEMILUMINESCENCE, DISPLACEMENT, ENERGY, FLASHES, GREEN(COLOR), HEAVY WATER, HEMOGLOBIN, HETEROGENEITY, HOMOGENEITY, HYDRAZIDES, INTENSITY, IONS, MICROWAVES, MIXTURES, POLYMERIZATION, POLYMERS, PROTEINS, PULSES, SOLUTIONS(MIXTURES), SUBSTRATES, TRANSIENTS, WATER, WATER SOLUBLE MATERIALS.

PERSONAL AUTHORS: Wright, John R.

CONTRACT NO. AFOSR-89-0530

IDENTIFIERS: (U) *Polymers, *Melanin, *Amines, *Aryl radicals, *Nuclear magnetic resonance, Molecular structure, Luminol, Diazotization, Phthalazinedione/5-Amino-2-3-dihydro-1-4, Tyrosine-3-Amino-L, Diazoluminomealanin.

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR, XF
TR-91-0758, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) A diazotized mixture of luminol and 3-amino-L-tyrosine prepared as an acetone-precipitated solid polymerizes slowly (over a period of weeks) yielding a brown, water soluble polymer which migrates electrophoretically as an anion at pH 8. Solutions of this substance in heavy water or a mixed D2O/deuterated Dimethylsulfoxide solvent present very broadened ¹Hydrogen-nmr resonances, and all attempts to chemically fragment this material into its subunit structures have been unsuccessful. The polymer, which has been named diazoluminomealanin (DALM) because of a possible relationship to the natural melanins, is of interest because its aqueous solution with alkaline Hydrogen peroxide and bicarbonate ion flashes a transient chemiluminescence on being irradiated with an intense pulse of microwave energy. Also, aqueous solutions of DALM serve as substrates for the green heme proteins. The reactions leading to DALM appear to involve chiefly 3-diazonium-L-tyrosine and the 5-diazonium derivative of luminol combined in an intimate solid matrix. This solid presents a strong esr absorption, and the polymerization may involve both homolytic and heterolytic processes. Characterization of a polymer obtained from diazotized aqueous solutions of 3-amino-L-tyrosine alone indicate a linkage based on displacement of the 3-diazonium group by

AD-A240 009

AD-A240 009

UNCLASSIFIED

PAGE 43

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 007 CONTINUED

AD-A240 007 6/4

NORTHWESTERN UNIV EVANSTON IL

rhythms, Circadian rhythms, Photoperiodism, Abstracts, Entrainment, Symposia, Photoreceptors, Sleep, Neurotransmitters, Diurnal variations, Scientific organizations.

(U) Program and Abstracts of the Society for Research on Biological Rhythms (2nd) Held in Jacksonville, Florida on 9-13 May 1990.

DESCRIPTIVE NOTE: Final rept. 1 May 90-30 Apr 91.

JUL 91 121P

PERSONAL AUTHORS: Turek, Fred W.

CONTRACT NO. AFOSR-90-0270

PROJECT NO. 2312

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0725, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) From May 9-13, 1990 the Society for Research on Biological Rhythms held its second meeting at Amelia Island Plantation, Florida. The Society was formed to promote the advancement of basic and applied research in all aspects of biological rhythms, to disseminate important research results concerning biological rhythms to the general public, to develop and enhance the education and training of students and researchers in the field and to foster interdisciplinary communication. This second meeting was successful in meeting the goals of the Society, particularly in the area of interdisciplinary communication. This second meeting promoted the interaction of workers in the various areas in a variety of different ways. First, there was a mixture of Symposia as well as slide and poster sessions on clinical and basic research topics. The Symposia were organized to insure that the entire frequency range of biological rhythms would be presented.

DESCRIPTORS: (U) ABSTRACTS, BIOLOGICAL RHYTHMS, CLINICAL MEDICINE, FLORIDA, FREQUENCY, INTERACTIONS, MIXTURES, PERSONNEL, SOCIETIES, STUDENTS, SYMPOSIA, TRAINING.

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A3, *Biological

AD-A240 007

AD-A240 007

UNCLASSIFIED

PAGE

44

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 006 5/8 20/1

AD-A240 006 CONTINUED

DUKE UNIV DURHAM NC DEPT OF PSYCHOLOGY

IDENTIFIERS: (U) *Psychoacoustics, *Sound signals,
Acoustic properties, Judgement (Psychology),
Range (Distance), Spatial distribution, Performance (Human),
Sequences, Classification, PE81102F, WUAFDSR2313A6.

(U) On Categorizing Sounds.

DESCRIPTIVE NOTE: Final rept. 1 Sep 87-30 Jun 91.

AUG 91 46P

PERSONAL AUTHORS: Lockheed, Gregory R.

CONTRACT NO. AFOSR-87-0353

PROJECT NO. 2313

TASK NO. A6

MONITOR: AFOSR, XF
TR-81-0731, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Context is important when people judge sounds, or attributes of sounds, or other stimuli. It is shown how judgments depend on what sounds recently occurred (sequence effects), on how those sounds differ from one another (range effects), on the distribution of these differences (set effects), on what subjects are told about the situation (task effects), and on what subjects are told about their performance (feedback effects). Each of these factors determines the overall mean and variability of response times and response choices, which are the standard measures, when people judge attribute amounts. Trial-by-trial analysis of the data show these factors also determine performance on individual trials. Moreover, these momentary data cannot be predicted from the overall data. The opposite is not true; the averaged data can be predicted from the momentary details. These results are consistent with a model having two simple assumptions: Successive sounds (not just their attributes) assimilate toward one another in memory, and judgments are based on comparisons of these remembered events. It is suggested that relations between attributes, rather than the magnitudes of the attributes themselves, are the basis for judgment.

DESCRIPTORS: (U) FEEDBACK, JUDGEMENT (PSYCHOLOGY),
RESPONSE, SEQUENCES, SOUND, STIMULI.

AD-A240 006

AD-A240 006

UNCLASSIFIED

PAGE

45

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 005 7/4 21/2

AD-A240 005 CONTINUED

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

(U) The Determination of Rate-Limiting Steps during Soot Formation.

DESCRIPTIVE NOTE: Final rept. 1 Feb 88-31 Jan 91.

AUG 91 97P

PERSONAL AUTHORS: Colket, M. B., III; Hall, R. J.; Sangiovanni, J. J.; Seery, D. J.

REPORT NO. UTRC91-21

CONTRACT NO. F49620-88-C-0051

PROJECT NO. 2398

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0736, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) A detailed model for soot formation has been developed for describing soot production in laminar, premixed flames. The analysis is based on detailed chemical kinetic modeling, a simplified inception model, kinetic calculations of surface growth, and coalescing particle collisions. Several different models for surface growth are compared. Sensitivities to flame parameters and many of the assumptions were determined. The importance of inception to the amount of soot formed has been verified for several premixed flames. Comparisons have been made to several flames with varying stoichiometry, temperature, fuel type, and pressure. A mechanism for the pyrolysis of cyclopentadiene has been developed. In addition, mechanisms for the addition of acetylene to cyclopentadiene to form toluene are discussed.

DESCRIPTORS: (U) , ACETYLENE, CHEMICAL REACTIONS, COMPUTATIONS, CYCLOPENTENES, FLAMES, FUELS, GROWTH(GENERAL), KINETICS, LAMINAR FLOW, MIXING, MODELS, PARTICLE COLLISIONS, PENTADIENES, PRODUCTION, PYROLYSIS, REACTION KINETICS, SOOT, STOICHIOMETRY, SURFACES, TOLUENES.

AD-A240 005

AD-A240 005

UNCLASSIFIED

PAGE 48

T85002

IDENTIFIERS: (U) PEG1102F, WJAFOSR2308A2, *Soot, *Flames, *Aromatic hydrocarbons, Acetylene, Surface reactions, Reaction kinetics, Cyclopentadienes, Pyrolysis, Benzene, Mathematical models.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A240 004 CONTINUED

AD-A240 004 21/3

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF
MECHANICAL ENGINEERING

configurations, with somewhat lower efficiencies for the
propagating plasmas.

(U) Coupling between Radiation and Gas Dynamics.

DESCRIPTORS: (U) ABSORPTION, CAVITIES, CONFIGURATIONS,
COUPLING(INTERACTION), EFFICIENCY, ELECTROMAGNETIC
RADIATION, EXPERIMENTAL DATA, FLOATING BODIES, FLOW RATE,
GAS DYNAMICS, GEOMETRIC FORMS, HELIUM, HIGH POWER, INPUT,
LIMITATIONS, MASS FLOW, MATHEMATICAL PREDICTION,
MICROWAVES, NITROGEN, PARAMETERS, PEAK VALUES,
PLASMAS(PHYSICS), POWER, POWER LEVELS, POWER SUPPLIES,
PROPULSION SYSTEMS, RESONANCE, RESPONSE, SIZES(DIMENSIONS)
. TEMPERATURE, THERMAL PROPERTIES, WAVEGUIDES.

DESCRIPTIVE NOTE: Final rept. 1 Feb 90-1 Feb 91,

MAY 91 75P

PERSONAL AUTHORS: Merkle, Charles L.; Micci, Michael M.

CONTRACT NO. AFOSR-89-0312

PROJECT NO. 2308

IDENTIFIERS: (U) *Electric propulsion, *Plasmas(Physics),
*Plasma devices, *Microwaves, Thrusters,
Coupling(Interaction), Energy transfer, Efficiency,
Microwave equipment, Resonant cavities, Microwave heating,
Beamed energy, Microwave heated plasmas, Electrothermal
propulsion, PE81102F, WUAFOSR2308A1.

TASK NO. A1

MONITOR: AFOSR, XF

TR-91-0715, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Detailed experimental and analytic studies
of microwave thermal propulsor are presented. Results
are obtained for four geometric configurations: bluff-
body stabilized resonant cavity plasmas; swirl-stabilized
resonant cavity plasmas; free-floating plasmas in
resonant cavities; and propagating, bluff-body stabilized
plasmas in waveguides. Swirl stabilization proved to be
less effective than bluff-body stabilization and was not
modeled analytically. The experimental studies included
both helium and nitrogen plasmas, while the analytic
results are for helium only. In the free-floating plasmas,
non-axisymmetric effects in the experimental setup led to
arcing to the wall, limiting maximum power levels to
about 500 W, although analysis suggests substantially
higher upper power levels for this configuration. The
bluff-body stabilized, resonant cavity plasmas, however,
allowed power absorptions up to the maximum source power
of 2.5 kW and 5 atm pressure for helium, although
experiments in nitrogen were limited to lower powers. The
analytic predictions agree well with the experiments in
terms of plasma size, location, and response to
parameters such as input power, mass flow rate,
electromagnetic wave form, and pressure. The predicted
coupling efficiencies and peak temperatures also agree
well with measurements. Coupling efficiencies of near
100% can be obtained for the resonant cavity

AD-A240 004

AD-A240 004

UNCLASSIFIED

PAGE

47

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 994 5/8

AD-A239 994 CONTINUED

YALE UNIV NEW HAVEN CT DEPT OF PSYCHIATRY

CHEMICALS, CIRCUITS, DRUGS, ELECTRIC CURRENT, FEAR, GENES, HUMANS, INFUSIONS, LEARNING, LESIONS, MEASUREMENT, MECHANICAL PROPERTIES, MODELS, PHARMACOLOGICAL ANTAGONISTS, RATS, SENSE ORGANS, STIMULATION(GENERAL), STIMULI.

(U) Fear-Potentiated Startle as a Model System for Analyzing Learning and Memory.

DESCRIPTIVE NOTE: Final rept. 1 Jul 87-31 Jan 91.

JAN 91 4P

IDENTIFIERS: (U) WJAFOSR2312A2, PEB1102F, *Fear, Conditioning(Learning), Memory(Psychology), *Conditioned response, *Amygdala, Ganglia, Shock(Pathology), Rats, Acoustic startle.

PERSONAL AUTHORS: Davis, Michael

CONTRACT NO. AFOSR-87-0336

PROJECT NO. 2312

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0749, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Research during this funding period has focussed on the role of a particular brain area, the amygdala, in fear conditioning, using increased acoustic startle amplitude in the presence of a stimulus previously paired with shock as a measure of fear in rats. We have found that (a) electrical stimulation of the amygdala increases startle; (b) mechanical or chemical lesions of the amygdala prevent either footshock or stimuli paired with footshock from elevating startle; (c) there is a direct anatomical connection between the central nucleus of the amygdala and a specific point along the acoustic startle pathway; (d) lesions at several levels of this connection between the amygdala and the startle circuit block conditioned and unconditioned fear; (e) local infusion of specific receptor antagonists into the amygdala prevent the development of fear conditioning and (f) presentation of a conditioned fear stimulus activates early expression genes (c-fos) in the amygdala. The data strongly implicate the amygdala as a critical brain structure for both the acquisition and expression of conditioned and unconditioned fear. Drugs that reduce anxiety in humans may act by interacting with specific receptors in the amygdala.

DESCRIPTORS: (U) . ACQUISITION, ANXIETY, BRAIN.

AD-A239 994

AD-A239 994

UNCLASSIFIED

PAGE

48

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 822 12/3

AD-A239 445 8/4

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

VISION SCIENCES RESEARCH CORP SAN RAMON CA

(U) Identification of Nonlinear Times Series from First Order Cumulative Characteristics.

(U) Suprathreshold Contrast Sensitivity Vision Test Chart.

DESCRIPTIVE NOTE: Technical rept.,

DESCRIPTIVE NOTE: Final rept. 15 May 88-14 May 91.

AUG 91 25P

JUL 91 77P

PERSONAL AUTHORS: McKeague, Ian W.; Zhang, Mei-Jie

PERSONAL AUTHORS: Ginsburg, Arthur P.

REPORT NO. FSU-STATISTICS-TR-M-853

CONTRACT NO. F49620-88-C-0083

CONTRACT NO. DAAL03-88-G-0204, \$DAA03-90-G-0103

MONITOR: AFOSR, XF
TR-91-0896, AFOSR

MONITOR: ARO, ARO, AFOSR, XA
27868.10-MA, D-121, TR-91-281, ARO

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) We consider the problem of identifying the class of time series model to which a series belongs based on observation of part of the series. Techniques of nonparametric estimation have been applied to this problem by various authors using kernel estimates of the one-step lagged conditional mean and variance functions. We study cumulative versions of Tukey regressogram estimators of such functions. These are more stable than estimates of the mean and variance functions themselves and can be used to construct confidence bands. Goodness of fit tests for specific parametric models are also developed.

DESCRIPTORS: (U) ESTIMATES, FUNCTIONS, GOODNESS OF FIT TESTS, MATHEMATICAL MODELS, MEAN, MODELS, NONLINEAR SYSTEMS, NONPARAMETRIC STATISTICS, OBSERVATION, PARAMETRIC ANALYSIS, TIME SERIES ANALYSIS, VARIATIONS.

IDENTIFIERS: (U) *Time series analysis, *Mathematical models, *Nonlinear analysis.

AD-A239 822

UNCLASSIFIED

AD-A239 445

PAGE 49

T85002

ABSTRACT: (U) This research project further developed and tested the first-ever practical suprathreshold contrast test chart (SCTS). The SCTS, which measures a family of suprathreshold contrast-matching curves, was found to be a valid and reliable test chart and extends our knowledge about spatial mechanisms in normal and abnormal vision by allowing extensive data collection due to its portability, and ease and speed of administration. Comparison of normative data collected in 336 eyes with data collected on patients having amblyopia, glaucoma and macular degeneration showed that the SCTS may be effectively used as an initial screening tool and for monitoring patients in clinical situations. Individual differences in contrast-matching curves, similar to those seen in contrast sensitivity, were seen in visually normal and clinical patients. The SCTS significantly predicts letter detection and discrimination above the predictive ability of contrast sensitivity by approximately 12%.

DESCRIPTORS: (U) ABNORMALITIES, CHARTS, CLINICAL MEDICINE, CONTRAST, DATA ACQUISITION, GLAUCOMA, MONITORING, PATIENTS, RELIABILITY, SENSITIVITY, SPATIAL DISTRIBUTION, TEST AND EVALUATION, VELOCITY, VISION.

IDENTIFIERS: (U) Vision performance, Contrast sensitivity, Target acquisition, Vision testing, Population data, Test-retest reliability, PE65502F.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 340 20/9

STEVENS INST OF TECH HOBOKEN NJ DEPT OF PHYSICS AND
ENGINEERING PHYSICS

(U) Universal Transition from Order to Chaos and
Applications in Plasma Physics.

DESCRIPTIVE NOTE: Final rept. 1 Jan 87-31 Aug 90.

AUG 90 5P

PERSONAL AUTHORS: Schmidt, George

CONTRACT NO. AFOSR-87-0122

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR, XF
TR-91-0693, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) We have proven using renormalization theory that coupled nonlinear systems exhibit universal behavior as the strength parameter and coupling parameters are varied. This qualitative as well as quantitative universality has a wide range of applicability in particular the limits of parameter ranges where free electron lasers can produce coherent waves (no chaos in electron motion) has also been studied and the results published.

DESCRIPTORS: (U) , COHERENCE, COUPLING(INTERACTION), ELECTRONS, FREE ELECTRON LASERS, MOTION, NONLINEAR SYSTEMS, PARAMETERS, PLASMAS(PHYSICS), RANGE(EXTREMES), STRENGTH(GENERAL), WAVES.

IDENTIFIERS: (U) Plasmas(Physics), Laser pumping,
PE61102F, WJAFOSR2304A4.

AD-A239 340

UNCLASSIFIED

AD-A239 328 12/5

MICHIGAN UNIV ANN ARBOR ARTIFICIAL INTELLIGENCE LAB

(U) Object Recognition in Range Images Using CAD Databases.
DESCRIPTIVE NOTE: Final rept. 1 Feb 89-31 Jul 90.

JUL 91 14P

PERSONAL AUTHORS: Jain, Ramesh

CONTRACT NO. AFOSR-89-0277

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR, XF
TR-91-0880, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) An aspect graph plays an important role in three dimensional object recognition. Its represents the three-dimensional shape of an object by its two dimensional qualitative views as seen from various viewpoints. To create the aspect graph of an object, the viewpoint space is partitioned into regions, each of which corresponds to qualitatively similar projections of the object. Algorithms for creating aspect graphs of polyhedral objects have been developed. We developed an algorithm to compute the aspect graph of a curved object. Our approach partitions the viewpoint space by computing boundary viewpoints from the shape descriptions of the object given in a computer aided design database. These computations are formulated from the understanding of visual events and the locations of corresponding viewpoints. We also studied new visual events for piecewise smooth objects.

DESCRIPTORS: (U) , ALGORITHMS, COMPUTATIONS, COMPUTER AIDED DESIGN, CURVATURE, DATA BASES, GRAPHS, IMAGES, RECOGNITION, SHAPE, THREE DIMENSIONAL, VISION.

IDENTIFIERS: (U) .PE61102F, WJAFOSR2304A7, *Pattern recognition, *Graphs, *Computer vision, Shape.

AD-A239 328

PAGE 50 T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 325 CONTINUED

AD-A239 325 7/3

UNIVERSITY OF NORTH TEXAS DENTON DEPT OF CHEMISTRY

compounds, Cubanes, Addition reactions, Electrophilic reactions, Nitro radicals.

(U) Synthesis of Novel, Substituted Polycyclic Cage Systems.

DESCRIPTIVE NOTE: Final rept. 1 Apr 88-31 Mar 91.

JUL 91 45P

PERSONAL AUTHORS: Marchand, Alan P.

CONTRACT NO. AFOSR-88-0132

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0691, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Studies of the synthesis and chemistry of poly carbocyclic cage hydrocarbons and polynitropolycyclic compounds are described. These compounds constitute a new class of energetic materials; the former are of interest as high energy/high density fuels, and the latter have potential application as relatively insensitive high energy explosives. As part of this program, alkene dimers were prepared via low valent titanium-promoted reductive coupling of D3-trishomocubane and of homocubane. The mechanism of addition of electrophiles to the carbon-carbon double bond of each of the resulting alkene dimers (i.e., meso- and d,l-trishomocubylidene-trishomocubane and homocubylidenehomocubane, respectively) was investigated. In addition, the structures of several new cage intermediates were elucidated via single crystal X-ray crystallographic methods. Finally, ring homologations of substituted pentacycloundecanediones were studied.

DESCRIPTORS: (U) ALKENES, BONDING, CHEMISTRY, DIMERS, ENERGETIC PROPERTIES, HIGH ENERGY, HIGH EXPLOSIVES, MATERIALS, SYNTHESIS.

IDENTIFIERS: (U) PE61102F, WJAFOSR2303A3, *Hydrocarbons, *Cyclic compounds, *Synthesis(CHEMISTRY), Polycarbocyclic compounds, Polynitropolycyclic compounds, *Polymers, Cage

AD-A239 325

AD-A239 325

UNCLASSIFIED

PAGE 51

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 323 CONTINUED

INSTITUTE FOR THE STUDY OF HUMAN CAPABILITIES
BLOOMINGTON IN

(U) Institute for the Study of Human Capabilities: Summary
Descriptions of Research for the Period June 1, 1990
through May 31, 1991.

DESCRIPTIVE NOTE: Annual technical rept..

JUL 91 72P

PERSONAL AUTHORS: Watson, Charles S.

CONTRACT NO. AFOSR-90-0215

PROJECT NO. 3398

TASK NO. A4

MONITOR: AFOSR, XF
TR-91-0997, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) A Second conference was held during this funding period, on March 20-22, 1991, again on the subject of 'Human Error.' During this funding period, one Institute-supported psychophysical testing station was used in cross-modality sensory and cognitive research by a visiting scientist, Ted Bell from UCLA. Also during this funding period, the University began rehabilitation of three buildings for use in Institute-related research. Two of these buildings are an anechoic and an echoic chamber, each with associated control rooms, that were originally constructed as part of J.P. Egan's laboratory. The third building is a residence that has been modified to serve as a multi-station testing facility for Human Factors research. One of the major goals of the Institute has been to appoint a visiting investigator in Human Factors to augment our basic-science oriented research staff. During winter semester 1991 (January-June) two visiting investigators, Arthur D. (Dan) Fisk of Georgia Tech and Donald L. Fisher of University of Massachusetts joined our research group. Their contributions are discussed in more detail in a later section. A search is underway for suitable candidate(s) to be appointed to the position(s) for 1992.

DESCRIPTORS: (U) BUILDINGS, CONTROL CENTERS, ERRORS,
GEORGIA, HUMAN FACTORS ENGINEERING, HUMANS, MASSACHUSETTS,
PERFORMANCE(HUMAN), REHABILITATION, SCIENTISTS, SYMPOSIA,
UNIVERSITIES, WINTER.

IDENTIFIERS: (U) *Performance(Human), *Cognition, *Human
factors engineering, PE61103F, WUAFOSR3398A4.

AD-A239 323

AD-A239 323

UNCLASSIFIED

PAGE 52

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. T85002

AD-A239 297 17/9 12/1

AD-A239 292 20/4 12/1 1/3

MARTIN MARIETTA ELECTRONICS AND MISSILES GROUP ORLANDO
FL MISSILE SYSTEMS

DELAWARE UNIV NEWARK DEPT OF MATHEMATICAL SCIENCES

(U) Applications of Wavelets to Radar Data Processing.

(U) Mathematical Problems in Transonic Flow.

DESCRIPTIVE NOTE: Final rept. 27 Aug 90-26 Apr 91.

DESCRIPTIVE NOTE: Final rept. 1 Dec 90-31 May 91.

JUL 91 113P

JUL 91 3P

PERSONAL AUTHORS: Stirman, Charles

PERSONAL AUTHORS: Cook-Ioannidis, L. P.

REPORT NO. OA-11608

CONTRACT NO. AFOSR-91-0113

CONTRACT NO. F49620-90-C-0050, DARPA Order-7450

PROJECT NO. 2304

MONITOR: AFOSR, XF
TR-91-0888, AFOSR

MONITOR: AFOSR
TR-91-0888

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) In this study, the recent mathematical theory of wavelets was introduced to the engineering problems of designing radar systems, radar processors, and radar algorithms. The goal was to make radars more efficient or more effective by the use of wavelets. To understand why particular possible applications of wavelets to radars were examined, it is necessary to understand some background information on both radars and wavelets theory. (Author)

ABSTRACT: (U) This research was a continuation of the PI's studies of transonic flow about two and three dimensional lifting wings. The work was carried out in close collaboration with Prof. J.D. Cole, Rensselaer Polytechnic Institute. The investigations were carried out within the framework of small disturbance theory. Flows about not-so-slender wings were investigated, chokes wind tunnel flows were analyzed, and the question of the perturbation of shock free flows was considered. In addition a minisymposium for ICIAM'91 was organized around these topics, and the contributions are to be organized as a SIAM monograph.

DESCRIPTORS: (U) ALGORITHMS, DATA PROCESSING, ENGINEERING, PROCESSING EQUIPMENT, RADAR, RADAR EQUIPMENT, RADAR SIGNALS, SIGNAL PROCESSING.

IDENTIFIERS: (U) PE61101E, WUAFOSR745000, *Wavelet theory, *Radar processing, Data processing, Fourier transforms.

DESCRIPTORS: (U) FLOW, MATHEMATICS, SHOCK, THEORY, TRANSONIC FLOW, WINGS.

IDENTIFIERS: (U) *Transonic flow, *Wings, *Applied mathematics, Lifting bodies, PE61102F, WUAFOSR2304A4.

IAC NO. GC-920071

IAC DOCUMENT TYPE: GACIAC - MICROFICHE --

IAC SUBJECT TERMS: G--(U)RADAR, WAVES, SIGNAL PROCESSING, DATA PROCESSING, ALGORITHMS, MODELS, MATHEMATICAL MODELS, APPROXIMATION.:

AD-A239 297

AD-A239 292

UNCLASSIFIED

PAGE 53

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 284

12/5

AD-A239 267

7/3

7/2

7/1

ILLINOIS UNIV AT CHICAGO CIRCLE DEPT OF MATHEMATICS
STATISTICS AND COMPUTER SCIENCE

IDAHO UNIV MOSCOW DEPT OF CHEMISTRY

(U) Error Correcting Codes and Related Designs.

(U) Highly Fluorinated Nitrogen-Containing Compounds. New Stable Fluids.

DESCRIPTIVE NOTE: Final rept. 1 Aug 88-30 Sep 90.

DESCRIPTIVE NOTE: Final rept. 1 Dec 86-30 Nov 90.

SEP 90

4P

JUL 91

26P

PERSONAL AUTHORS: Pless, Vera

PERSONAL AUTHORS: Shreeve, Jean ne M.

CONTRACT NO. AFOSR-88-0237

CONTRACT NO. AFOSR-87-0087

PROJECT NO. 2304

MONITOR: AFOSR, XF
TR-91-0701, AFOSR

TASK NO. 81

UNCLASSIFIED REPORT

MONITOR: AFOSR, XF
TR-91-0883, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Professor Pless has made fundamental contributions to the theory of Reed-Muller codes. In particular, she has enumerated the binary self-dual Reed-Muller codes.

DESCRIPTORS: (U) , ERROR CORRECTION CODES.

IDENTIFIERS: (U) *Error correction codes,
*Bibliographies.

ABSTRACT: (U) The main objective of this work was to synthesize highly fluorinated nitrogen-containing compounds that could be useful either as high energy materials or as fluids with good thermal and hydrolytic stabilities. Additionally, a wide range of fluoroalkylsulfonic and fluoroalkylphosphonic esters, ethers, and acids were prepared. Two new, mild nondestructive fluorinating reagents, carbonyl fluoride and trifluoroamine oxide were studied. Results of particular significance include the following: The syntheses of a large family of poly- and perfluoroalkylsulfonic, disulfonic, and sulfonic/ phosphonic acids and their precursors as well as acyclic and cyclic unsaturated phosphonic acids were successfully carried out. Carbonyl fluoride is a highly versatile reagent for introducing fluorine to the central atom by the displacement of hydrogen by fluorine from P-H, N-H or C-H bonds. Inorganic oxides selected from group 5 to group 17 can be fluorinated but not invariably to the highest oxidation state. Trifluoroamine oxide converts metals to their fluorides in high purity.

DESCRIPTORS: (U) , ACIDS, ATOMS, CHEMICAL AGENTS, DISPLACEMENT, ESTERS, ETHERS, FLUIDS, FLUORIDES, FLUORINATION, HIGH ENERGY, HIGH RATE, HYDROGEN, HYDROLYSIS, INORGANIC MATERIALS, MATERIALS, METALS, NITROGEN COMPOUNDS, OXIDATION, OXIDES, PHOSPHONIC ACIDS, PURITY, RANGE(EXTREMES), STABILITY, SULFONIC ACIDS, THERMAL STABILITY.

AD-A239 284

AD-A239 267

UNCLASSIFIED

PAGE 54

T85002

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 267 CONTINUED

AD-A239 286 20/4

IDENTIFIERS: (U) *Nitrogen compounds, *Fluorine compounds, *Organic compounds, Alkyl radicals, Phosphonic acids, Sulfonic acids, Fluoroamines, PE81102F.

STANFORD UNIV CA THERMOSCIENCES DIV

(U) Investigation of the Turbulence Producing Structures in the Boundary Layer.

DESCRIPTIVE NOTE: Final rept. 1 Apr 89-31 Jan 91.

JUL 91 58P

PERSONAL AUTHORS: Kline, Stephen J.

CONTRACT NO. AFDSR-87-0304

PROJECT NO. 2703

TASK NO. A2

MONITOR: AFOSR. XF
TR-91-0892. AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Phase A: Community-wide survey of existing knowledge on turbulence producing structures in the boundary layer. Creation of a uniform nomenclature for the field. Phase B: Study of questions focused by Phase A using a work station to interrogate the Direct Navier-Stokes Simulation Data Base for the Flat Plate, at $R_{\theta} = 670$. Results include: (1) creation of the first clear picture of the spatio-temporal relations among the eight kinds of structure previously documented and their connections to regions of high and low pressure at the wall and in the flow; (2) demonstration of the centrality of two types of vortices to the turbulence producing structures in the boundary layer: tilted streamwise vortices in the wall layers and transverse vortices in the outer layer, and the range of overlap of the dense range of the distribution of the two vortex types is the log region; (3) establishment of two computer methods for identification of vortices (as distinct from lines of distributions of vortices for preliminary sample. This work establishes a basis for considering connections between knowledge of the physics and computer models of turbulence in the next phases of research.

DESCRIPTORS: (U) BOUNDARY LAYER, COMPUTER APPLICATIONS, COMPUTERIZED SIMULATION, DISTRIBUTION, EXTERNAL, HIGH

AD-A239 267

AD-A239 286

UNCLASSIFIED

PAGE 55

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 266 CONTINUED

AD-A239 265 17/5.1 20/12

DENSITY, IDENTIFICATION, LAYERS, LOW PRESSURE, OVERLAP, PLATES, SIZES(DIMENSIONS), TILT, TRANSVERSE, TURBULENCE, VORTICES, WALLS, WORK STATIONS.

STANFORD UNIV CA DEPT OF APPLIED PHYSICS

(U) Detectors of Infrared Radiation Based on High T(c) Superconducting YBCO Films.

IDENTIFIERS: (U) *Turbulent boundary layer, *Turbulence, Computerized simulation, PE61102F, WUAFOSR2703A2.

DESCRIPTIVE NOTE: Final rept. 1 Dec 87-30 Apr 90.

JUN 91 6P

PERSONAL AUTHORS: Geballe, Theodore H.

CONTRACT NO. F49820-88-K-0002

MONITOR: AFOSR, XF
TR-91-0695, AFOSR

UNCLASSIFIED REPORT

DESCRIPTORS: (U) DETECTORS, INFRARED RADIATION.

IDENTIFIERS: (U) TPR(Transient Photoresponse), Infrared detectors, Light pulses.

AD-A239 266

AD-A239 265

UNCLASSIFIED

PAGE 56

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 264 12/1

AD-A239 263 6/1 6/11

OHIO STATE UNIV COLUMBUS DEPT OF MATHEMATICS

CREIGHTON UNIV HEALTH SCIENCES CENTER OMAHA NE

(U) Coherence and Chaos in Integrable PDEs (Partial Differential Equations).

(U) Production of Reactive Oxygen Species by Polyhalogenated Cyclic Hydrocarbons (PCH).

DESCRIPTIVE NOTE: Final rept. 1 Aug 88-30 Sep 80.

DESCRIPTIVE NOTE: Annual rept. 15 Jun 90-14 Jul 91.

MAR 81 52P

JUL 91 25P

PERSONAL AUTHORS: Overman, Edward

PERSONAL AUTHORS: Stohs, Sidney J.

CONTRACT NO. AFOSR-88-0195

CONTRACT NO. AFOSR-90-0278

PROJECT NO. 2304

PROJECT NO. 2312

TASK NO. K7

TASK NO. A5

MONITOR: AFOSR, XF
TR-91-0894, AFOSR

MONITOR: AFOSR, XF
TR-91-0878, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The results of the efforts for grant AFOSR-88-0195 are: (1) numerically identified low dimensional chaotic attractors with spatially coherent structures; (2) measured the properties of the chaos; (3) identified the sources and types of chaos; (4) determined natural coordinates for the attractor which are associated with the simple spatial patterns in chaos; AND (5) used these coordinates to calculate reduced systems of equations which have the same routes to chaos and qualitatively-and quantitatively-similar strange attractors.

DESCRIPTORS: (U) , COHERENCE, COORDINATES, EQUATIONS, PATTERNS, REDUCTION, SPATIAL DISTRIBUTION, STRUCTURES.

IDENTIFIERS: (U) *Partial differential equations.
PE81102F, WUAFOSR2304K7.

ABSTRACT: (U) We have developed a HPLC method for the simultaneous determination of four lipid peroxidation products, namely, formaldehyde, malondialdehyde, acetaldehyde and acetone. This procedure has wide-spread applicability to exposure to environmental pollutants as well as the study of various disease states. Initial studies have clearly demonstrated that the in vitro exposure of peritoneal macrophages, mitochondria and microsomes to selected PCH results in the production of reactive oxygen species as well as a decrease in membrane fluidity. Furthermore, the administration of a variety of polyhalogenated cyclic hydrocarbons to rats results in an induction of DNA damage as assessed by the formation of DNA single strand breaks. The results support our basic hypothesis concerning the ability of polyhalogenated cyclic hydrocarbons to induce production of reactive oxygen species which may lead to membrane damage and the subsequent manifestation of toxic symptoms following exposures.

DESCRIPTORS: (U) , ACETALDEHYDE, ACETONES, CYCLES, DAMAGE, DEOXYRIBONUCLEIC ACIDS, DETERMINATION, ENVIRONMENTS, EXPOSURE(GENERAL), FLUIDS, FORMALDEHYDE, HYDROCARBONS, HYPOTHESES, IN VITRO ANALYSIS, INDUCTION SYSTEMS, LIPIDS, MACROPHAGES, MEMBRANES, MICROSOMES, MITOCHONDRIA, OXIDATION, OXYGEN, PERITONEUM, POLLUTANTS.

AD-A239 264

AD-A239 263

UNCLASSIFIED

PAGE 57

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 263 CONTINUED

AD-A239 228 12/5

PRODUCTION, RATS, REACTIVITIES, SYNCHRONISM.

MARYLAND UNIV COLLEGE PARK DEPT OF COMPUTER SCIENCE

IDENTIFIERS: (U) *Halogenated hydrocarbons, Urinalysis, PCH(Polyhalogenated Cyclic Hydrocarbons), *Oxygen, Reactive gases, *Lipid metabolism, Membranes(Biology), Rats, *Toxicity, Excretion, Peroxidation, Liquid chromatography, PE81102F, WJAFOSR2312AS.

(U) Parallellologic Programming and Parallel System Software and Hardware.

DESCRIPTIVE NOTE: Final rept. 1 Nov 89-31 Dec 90.

DEC 90 17P

PERSONAL AUTHORS: Minker.

CONTRACT NO. AFOSR-90-0027

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR, XF
TR-91-0889, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) This constitutes the final report of work performed under AFOSR grant number 90-0027 to investigate parallel problem solving and deductive databases. Under the grant experiments were performed on the PRISM parallel inference system on the BBN Butterfly. The experiments evaluated alternative message passing strategies for distributing tasks to processors at run-time. Several enhancements were made to PRISM during the grant period. These are: a new inference engine was implemented which provides more efficient support for the full control language of PRISM; and a stack based inference engine was implemented which provides efficient support for the use of limited set of control strategies. Simulation studies were performed which evaluate alternative methods for scheduling tasks on parallel architectures. Two methods were examined which allow the OR-parallel execution of logic programs with no communication overhead. A study was performed evaluating two alternative methods for incorporating integrity constraints into query processing in PRISM. In the first method, separate constraint processors are introduced which check constraints at run-time. In the second method, constraints are incorporated through compile-time transformations. The study indicates that constraints are useful inquiry processing and that the compile-time methodology results in more efficient performance than

AD-A239 228

AD-A239 263

UNCLASSIFIED

PAGE 58

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 228 CONTINUED

AD-A239 222 12/1

checking constraints at run-time. In addition to the above, work continued in the area of informative answers to queries in deductive databases.

DESCRIPTORS: (U) , ARCHITECTURE, COMPUTER LOGIC, COMPUTER PROGRAMS, CONTROL, DATA BASES, EFFICIENCY, INTERROGATION, LANGUAGE, PARALLEL ORIENTATION, PROBLEM SOLVING, REPORTS, SIMULATION, STRATEGY.

IDENTIFIERS: (U) *Computer programming, *Parallel processing, WUAFOSR2304A7, PE61102F.

STANFORD UNIV CA DEPT OF MATHEMATICS

(U) Mathematical Problems of Nonlinear Wave Propagation and of Waves in Heterogeneous Media.

DESCRIPTIVE NOTE: Final rept. 1 Nov 87-31 Oct 90.

OCT 90 2P

PERSONAL AUTHORS: Keller, Joseph

CONTRACT NO. AFOSR-88-0053

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR, XF
TR-91-0687, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) In Exact non-reflecting boundary conditions by Keller and Givoli, an exact boundary condition is devised for the numerical solution of the reduced wave equation in an infinite domain, using the finite element region without error. This work has been extended to other equations, including those for elastic waves, and small test problems have shown that method is very effective.

DESCRIPTORS: (U) , BOUNDARIES, ELASTIC WAVES, EQUATIONS, FINITE ELEMENT ANALYSIS, HETEROGENEITY, MATHEMATICS, MEDIA, NONLINEAR PROPAGATION ANALYSIS, NONREFLECTING COATINGS, NUMERICAL ANALYSIS, REDUCTION, REGIONS, SOLUTIONS(GENERAL), TEST AND EVALUATION, WAVE EQUATIONS, WAVE PROPAGATION.

IDENTIFIERS: (U) *Wave equations, *Problem solving, Wave propagation, PE61102F, WUAFOSR2304A4.

AD-A239 228

AD-A239 222

UNCLASSIFIED

PAGE 59

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 221 7/2 11/8.1

AD-A239 221 CONTINUED

GEORGIA INST OF TECH ATLANTA SCHOOL OF MATERIALS
ENGINEERING

N13A1 and limited number of permissible slip systems for
N1A1.

(U) Deformation, Constitutive Behavior and Damage of
Advanced Structural Materials under Multiaxial Loading.

DESCRIPTORS: (U) , ALLOYS, ALUMINIDES, ALUMINUM,
BRITTLENESS, CONSTRUCTION MATERIALS, CORROSION RESISTANCE,
CREEP STRENGTH, CRYSTAL LATTICES, DEFORMATION, DIFFUSION,
DISLOCATIONS, GRAIN BOUNDARIES, HIGH TEMPERATURE, JET
AIRCRAFT, JET ENGINES, LONG RANGE(DISTANCE), LONG
RANGE(TIME), LOW STRENGTH, MOBILITY, MOTION, NICKEL,
ORDER DISORDER TRANSFORMATIONS, OXIDATION RESISTANCE,
RATES, STRAIN RATE, STRESSES, STRUCTURES, SUPERALLOYS,
YIELD.

DESCRIPTIVE NOTE: Annual rept. 1 Jun 90-31 May 91.

JUN 91 27P

PERSONAL AUTHORS: Antolovich, Stephen D.; Webb, Graham

CONTRACT NO. AFOSR-90-0182

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0899, AFOSR

IDENTIFIERS: (U) *Intermetallic compounds, *Deformation,
Axial loads, Dislocations, *Nickel aluminides, *Nickel
alloys, Jet engines, Advanced materials, Yield strength,
Aluminum intermetallics, Multiaxial loading, Nickel
intermetallics, Mathematical models, PE61102F,
WUAFOSR2308A1.

UNCLASSIFIED REPORT

ABSTRACT: (U) This report investigates the mechanisms of
cyclic and monotonic deformation in nickel aluminides
(N13A1) and nickel/aluminum as a function of loading mode
(uniaxial vs. multiaxial) temperature, strain rate and
environment. The program has analytical, numerical, and
experimental aspects. The premise of the program is that
it is important to understand these phenomena if ordered
alloys are to be used in advanced jet engine components.
Ordered intermetallic alloys possessing long range atomic
order and forming superlattice structures are being
studied for high temperature applications which are
currently dominated by superalloys. These alloys
generally exhibit excellent corrosion resistance and
oxidation resistance at elevated temperatures. The long
range order causes slower diffusion rates and thus
improves creep resistance. In these structures,
dislocation motion depends on various factors which
either enhance or inhibit dislocation mobility depending
upon temperature. The strength of these materials does
not decrease drastically with temperature as seen in
other disordered alloys, and in some cases the yield
stress actually increases with temperature. In spite of
the desirable properties possessed by these materials,
inherent brittleness has limited their applications. This
brittleness is due to weak grain boundaries for N1A1 and

AD-A239 221

AD-A239 221

UNCLASSIFIED

PAGE 60

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 220 12/3

AD-A239 219 5/7

PRINCETON UNIV NJ

NORTHWESTERN UNIV EVANSTON IL

(U) Probability and Statistics Applied to the Theory of Algorithms.

(U) Reading: Interactions with Memory.

DESCRIPTIVE NOTE: Final rept. 1 Apr 89-30 Oct 90.

DESCRIPTIVE NOTE: Annual rept. 1 Mar 90-28 Feb 91.

OCT 90 5P

JUL 91 56P

PERSONAL AUTHORS: Steele, J. M.

PERSONAL AUTHORS: McKoon, Gail

CONTRACT NO. AFOSR-89-0301

CONTRACT NO. AFOSR-90-0246

PROJECT NO. 2304

PROJECT NO. 2313

TASK NO. A5

TASK NO. A4

MONITOR: AFOSR, XF

MONITOR: AFOSR, XF

TR-91-0681, AFOSR

TR-91-0700, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) This report outlines in three sections the progress that has been made in the last two years. Work on the minimal spanning tree problem is first discussed, since this area has seen the most striking progress. The second section discuss work on the convex hulls of random walks. This work is the most recent, and it illustrates the broader applicability of ideas that were developed in the earlier stages of this grant. The third section discusses the thesis work of doctoral candidates Maki Monna and Jun Gao who have been supported in part through this contract.

DESCRIPTORS: (U) ALGORITHMS, CONVEX BODIES, HULLS(STRUCTURES), TREES.

IDENTIFIERS: (U) *Probability, *Statistics, *Algorithms, Applied mathematics, PE61102F, WUAFOSR2304A5.

ABSTRACT: (U) The research proposed that the representation of linguistic and contextual information be kept in working memory during reading or listening can be described as a discourse model, representing the concepts referenced in the discourse and the relations among them. The concepts in the model are hypothesized to vary in their accessibility, where accessibility is determined by the syntactic and pragmatic contexts in which the concept are introduced. Subsequent reference to a concept is a function of the interaction of the expression used to reference the concept and the concept itself. The experiments in this report demonstrate support for the discourse model view by showing that difficulty of comprehension for pronouns and the degree to which they are fully understood depends on syntactic and pragmatic variables that affect the accessibility of the pronouns' intended referents.

DESCRIPTORS: (U) ACCESS, COMPREHENSION, INTERACTIONS, MEMORY DEVICES.

IDENTIFIERS: (U) *Linguistics, *Memory(Psychology), Retention(Psychology), PE61102F, WUAFOSR2313A4.

AD-A239 220

AD-A239 219

UNCLASSIFIED

PAGE 61

T85002

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 196 12/9 9/1

AD-A239 196 CONTINUED

PITTSBURGH UNIV PA DEPT OF ELECTRICAL ENGINEERING

DESCRIPTORS: (U) , ALGORITHMS, BANDWIDTH, COMMUNICATION AND RADIO SYSTEMS, DETECTION, EDGES, FILTERS, FUNCTIONS, GRAPHS, IMAGE PROCESSING, LIMITATIONS, MESH, PARALLEL ORIENTATION, PARALLEL PROCESSING, RESOLUTION, SCALE, SYMMETRY, TWO DIMENSIONAL.

(U) Wavelet Transforms and Parallel Image Processing.

DESCRIPTIVE NOTE: Annual rept. 1 Jun 90-30 May 91.

JUN 91 33P

IDENTIFIERS: (U) *Waves, *Edges, *Image processing, *Parallel processing, Computer architecture.

PERSONAL AUTHORS: LI, Ching-Chung; Hall, Richard W.; Goekmen, M.

IAC NO. GC-911003

REPORT NO. TR-SP-01-05

IAC DOCUMENT TYPE: GACIAC - MICROFICHE --

CONTRACT NO. AFOSR-90-0310

IAC SUBJECT TERMS: G--(U)IMAGE PROCESSING, EDGE DETECTION, EDGES, RESOLUTION, STERATION, TRANSFORMATIONS, PARALLEL PROCESSING, ALGORITHMS.;

PROJECT NO. 9808

TASK NO. 00

MONITOR: AFOSR, XF
TR-91-0879, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) A wavelet function generated by a specially constructed symmetric scale function has been explored for use in edge detection. Experiments showed that relatively refined edge information was obtained in the coarse resolution levels. An edge detection algorithm based on regularization with space-varying parameters has been developed, where the values of the parameters are adaptively determined iteratively. A multiscale edge detection algorithm using a first order regularization filter has been developed. It is demonstrated experimentally that the high localization performance of the filter is combined with high detection performance by using a multiscale integration scheme. Time performances have been evaluated for different embeddings of the wavelet coefficients into two dimensional meshes over typical wavelet based algorithms. Parallel image processing algorithms are under study to identify fundamental parallel limits and to enable fully their parallel application in multiresolution application. Novel graph compounds which can be utilized to enhance communication bandwidth in mesh architectures have been evaluated and appear to offer some promise in image processing.

AD-A239 196

AD-A239 196

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 175 12/8

AD-A239 174 20/4

CALIFORNIA UNIV LOS ANGELES DEPT OF MECHANICAL AEROSPACE
AND NUCLEAR ENGINEER ING

OHIO STATE UNIV COLUMBUS DEPT OF MATHEMATICS

(U) Digital Control and Identification of Distributed
Systems.

(U) Modeling of Free Viscoelastic Jets and Instability
Mechanisms.

DESCRIPTIVE NOTE: Final rept. 15 Aug 87-14 Aug 80,

DESCRIPTIVE NOTE: Final rept. 1 Apr 88-31 Dec 90,

AUG 90 111P

DEC 90 7P

PERSONAL AUTHORS: Gibson, J. S.

PERSONAL AUTHORS: Forest, Greg; Bechtel, Stephen

CONTRACT NO. AFOSR-87-0373

CONTRACT NO. AFOSR-88-0184

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A1

TASK NO. A4

MONITOR: AFOSR, XF

MONITOR: AFOSR, XF
TR-91-0684, AFOSR

TR-91-0690, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Research has been conducted in the
following general areas: Optimal Control of Distributed
Parameter System, Adaptive Identification and Control,
and Robust Control. Work includes research in
approximation theory and numerical methods for the design
of finite dimensional compensators for optimal control of
systems represented by partial differential equations,
and adaptive control and tracking problems for flexible
structures and manipulators with flexible links and
joints. (Author)

DESCRIPTORS: (U) *JET FLOW, *NONNEWTONIAN FLUIDS,
DIGITAL SIMULATION, BOUNDARY VALUE PROBLEMS, ASYMPTOTIC
SERIES, RHEOLOGY.

IDENTIFIERS: (U) PE81102F, WJAFOSR2304A4, Maxwell models.

DESCRIPTORS: (U) ADAPTIVE CONTROL SYSTEMS, ADAPTIVE
SYSTEMS, APPROXIMATION(MATHEMATICS), COMPENSATORS,
CONTROL, DIGITAL SYSTEMS, DISTRIBUTION, FLEXIBLE
STRUCTURES, IDENTIFICATION, IDENTIFICATION SYSTEMS,
NUMERICAL METHODS AND PROCEDURES, OPTIMIZATION,
PARAMETERS, PARTIAL DIFFERENTIAL EQUATIONS,
SIZES(DIMENSIONS), THEORY, TRACKING.

IDENTIFIERS: (U) *Distributed parameter systems,
*Digital control systems, Robust control systems,
Adaptive control systems, WJAFOSR2304A1, PE81102F.

AD-A239 175

AD-A239 174

UNCLASSIFIED

PAGE 63

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 183 CONTINUED

AD-A239 183 12/1

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIV
GREENSBORO

ELEMENT ANALYSIS, FORMULATIONS, FORTRAN, INSTRUCTORS,
ITERATIONS, NUMERICAL ANALYSIS, STUDENTS.

(U) Numerical and Analytical Studies of Stefan Problems.

IDENTIFIERS: (U) *Finite element analysis, *Problem
solving, Diffusion, Enthalpy, Multiprocessors, Finite
difference theory, PEB1102F, WUAFOSR2304A3.

DESCRIPTIVE NOTE: Final rept. 1 Nov 88-30 Jun 91.

JUN 91 110P

PERSONAL AUTHORS: Rose, Milton E.; Borah, Bolindra N.;
White, Robert E.; Kyrillidis, Archimedes J.

CONTRACT NO. F48620-89-C-0010

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0885, AFOSR

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with North
Carolina State Univ. at Raleigh.

ABSTRACT: (U) Compact finite element scheme is used to
solve Stefan Problem, with one dimensional and two
dimensional numerically, using an Enthalpy formation. The
numerical results indicate that the position of the
melting front can be determined with first order accuracy
by this method, the number of iterations at each time
step being determined largely by the number of cells
traversed by the front during a time step. The codes both
1-D and 2-D Stefan problems are written in Cray Fortran
and vectorization on the Cray Y-MP was used. The enthalpy
formulation of the 1-D and 2-D Stefan problems are
approximated by compact schemes. The numerical results
are compared to known exponential solutions, and the
solutions and errors are plotted using mathematics. Four
papers have been published or completed for publication.
Three faculty members, Bolindra N. Borah (P.I.), Robert E.
White (Co-P.I.), and Milton E. Rose (Co-P.I.) did work in
this project. Besides three professors, there were three
graduated students who also helped to complete the
project.

DESCRIPTORS: (U) ACCURACY, CELLS, ENTHALPY, FINITE

AD-A239 183

AD-A239 183

UNCLASSIFIED

PAGE 64

T85002

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 162

11/4

AD-A239 162 CONTINUED

NORTHWESTERN UNIV EVANSTON IL CENTER FOR QUALITY
ENGINEERING AND FAILURE PREV ENTION

(U) Heterogeneous Characterization of Composite Materials
with Progressive Damage.

IDENTIFIERS: (U) *Composite materials. Heterogeneity,
Ceramic materials, *Ceramic matrix composites,
Failure(Mechanics), *Microstructure, Mechanical
properties, Fiber reinforced composites, Tensile loading,
Tensile properties, Debonding, PE81102F, WUAFOSR230282.

DESCRIPTIVE NOTE: Final rept. 1 Feb 88-31 Jan 91,

IAC NO. PL-055464 PL-055464

JUN 91 40P

IAC DOCUMENT TYPE: PLASTC - MICROFICHE --

PERSONAL AUTHORS: Daniel, I. M.; Achenbach, J. D.; Keer,
L. M.

IAC SUBJECT TERMS: P--(U)CONSTITUTIVE RELATIONS, STRESS
STRAIN, CHARACTERIZATION, FRACTURE, MICROMECHANICS, CRACK
PROPAGATION, SILICON CARBIDE FIBERS, ALUMINUM SILICATE,
COMPOSITES, THERMAL EXPANSION, INPLANE SHEAR, TENSILE
STRENGTH, MATRIX CRACKING, DEBONDING, INTERFACE
DEGRADATION, TRANSVERSE SHEAR, DAMAGE, ELASTIC MODULUS,
SHEAR, ZZ UNLIMITED.;

REPORT NO. C447-3

CONTRACT NO. AFOSR-88-0124

PROJECT NO. 2302

TASK NO. 82

MONITOR: AFOSR, XF
TR-91-0682, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of this investigation is to
develop constitutive and failure models for composite
materials based on observed damage mechanisms and damage
development. Unidirectional continuous-fiber ceramic
matrix composites were investigated under longitudinal
and transverse loading. Failure mechanisms and their
development were studied in real time under the
microscope. Micromechanical analyses were conducted and
stress distributions were obtained in the constituents
and around matrix and interfacial cracks. The influence
of the interphase region on stress strain relations and
failure properties was studied. A modified shear lag
analysis yielded stress strain relations to failure and
relations between applied stress, matrix cracking and
fiber-matrix debonding.

DESCRIPTORS: (U) , COMPOSITE MATERIALS,
CRACKING(FRACTURING), CRACKS, DAMAGE, DELAY, DISTRIBUTION,
FAILURE, INTERFACES, MATRIX MATERIALS, MODELS, PHASE
STUDIES, REAL TIME, REGIONS, SHEAR PROPERTIES, STRESS
STRAIN RELATIONS, STRESSES, TRANSVERSE.

AD-A239 162

AD-A239 162

UNCLASSIFIED

PAGE 65

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 157 21/2 21/5

AD-A239 157 CONTINUED

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF
MECHANICAL ENGINEERING

DESCRIPTORS: (U) , ADIABATIC CONDITIONS, ARGON, DELAY,
DIFFUSION, DILUTION, FLAMES, FLOW, FUELS, GAS TURBINES,
GROWTH(GENERAL), MEASUREMENT, NITROGEN, OPERATION,
PARTICLES, REGIONS, SOOT, STREAMS, TEMPERATURE, TIME.

(U) Soot Particle Inception and Growth Processes in
Combustion.

IDENTIFIERS: (U) *Soot, *Combustion, *Gas turbines,
Diffusion flames, PE81102F, WUAFOSR2308A2.

DESCRIPTIVE NOTE: Annual rept. 15 Jan 90-15 Jan 91.

APR 91 42P

PERSONAL AUTHORS: Santoro, Robert J.

CONTRACT NO. AFOSR-87-0145

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0677, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The present research program is intended to provide a fundamental understanding of the processes controlling soot particle formation under conditions applicable to future gas turbine engine operation. During the current year of the effort, work has emphasized the effects of concentration and temperature on the formation of soot particles. Through a carefully structured study, the effects of adding a diluent to the fuel stream of a diffusion flame have been studied. Measurements and modelling efforts have shown that differences in the initial concentration of fuel are rapidly mitigated by diffusional processes. Consequently, local concentration variations are reduced between the initial undiluted and diluted flow cases. Furthermore, local temperature measurements indicate that even under equal adiabatic flame conditions, the local temperature in the soot forming region can differ by 40K between flames involving nitrogen or argon as the diluent. These differences in temperature are argued, based on previous work by other researchers, to be a possible source for the observed effects on soot formation. Additionally, consideration has been given to residence time effects, largely a result of delays in the onset of soot formation which reduces the effective time for soot growth.

AD-A239 157

AD-A239 157

UNCLASSIFIED

PAGE 68

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 137 CONTINUED

AD-A238 137 8/10

PURDUE UNIV LAFAYETTE IN SCHOOL OF CIVIL ENGINEERING

Pressure measurement, *Clay, Anisotropy, Shear properties,
Triaxial stresses, Pressure gages, *Soil mechanics.

(U) Anisotropic Behavior of Soils and Pressuremeter Tests.

DESCRIPTIVE NOTE: Annual rept. 1 Jul 89-30 Jun 90,

JUL 90 18P

PERSONAL AUTHORS: Chameau, J. L.

CONTRACT NO. F49620-89-C-0090

PROJECT NO. 2302

TASK NO. C1

MONITOR: AFOSR, XF
TR-91-0870, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Several important questions related to cavity expansion and pressuremeter testing in clays are being investigated. Tests are performed in a cuboidal shear device to simulate pressuremeter stress paths and to evaluate the strain rate effects. Similarly, experiments will be conducted to evaluate effects of stress relief, relaxation and disturbance. Model pressuremeter tests will be performed in a calibration chamber to confirm the strain rate effects obtained in the cubic triaxial simulation and verify the applicability of the interpretation technique based on anisotropic model to determine the initial in-situ stress. The calibration chamber test equipment is currently being redesigned and modified to perform the model pressuremeter tests. The experimental data will be used to calibrate the anisotropic soil model developed for this study. With this model, one can predict the behavior of clay type material under any desired stress path from the results obtained under a particular stress path, such as the pressuremeter stress path.

DESCRIPTORS: (U) ANISOTROPY, CALIBRATION, CAVITIES, CHAMBERS, CLAY, EXPANSION, EXPERIMENTAL DATA, MATERIALS, MODELS, PATHS, SOIL MODELS, SOILS, STRAIN RATE, STRESSES, TEST EQUIPMENT.

IDENTIFIERS: (U) PEB1102F, WJAFOSR2302C1, *Soil tests,

AD-A238 137

AD-A238 137

UNCLASSIFIED

PAGE 67

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 061 23/2 20/8

AD-A239 060 20/4

STANFORD UNIV CA DEPT OF ELECTRICAL ENGINEERING

CORNELL UNIV ITHACA NY

(U) Optical Computing Research.

(U) Vortex Dynamics.

DESCRIPTIVE NOTE: Final rept. 1 Oct 87-28 Feb 91.

DESCRIPTIVE NOTE: Final rept. 1 Jun 89-31 May 91.

APR 91 7P

JUN 91 8P

PROJECT NO. 2305

PERSONAL AUTHORS: Leibovich, Sidney

TASK NO. 81

CONTRACT NO. AFOSR-89-0348

MONITOR: AFOSR, XF
TR-91-0856, AFOSR

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0633, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Work completed under Grant AFOSR-88-0024 during the time period 1 October 1987 through 28 February 1988. Publications funded in whole or in part by the grant are also listed.

DESCRIPTORS: (U) CIRCUIT INTERCONNECTIONS, OPTICAL CIRCUITS, OPTICAL PROCESSING, OPTICS.

IDENTIFIERS: (U) WUAFOSR230581, PE61102F, *Neural networks, *Optical interconnections, Hopfield networks, Associative memories.

UNCLASSIFIED REPORT

ABSTRACT: (U) A theoretical description of vortex breakdown incorporating the essential physical processes governing the occurrence, location, and strength of the phenomenon and suitable for design and control purposes, is under development. The strongly decelerated motions, which can have flow reversals and therefore provide a model for vortex breakdown events, found earlier in the course of this project for vortices of aerodynamic type, have been shown to be unstable to three-dimensional perturbations when the deceleration exceeds a threshold value. The nature of the instability agrees with experimental observations and supports a comprehensive theoretical framework for vortex breakdown previously outlined. New numerical algorithms useful for very large stability problems have been developed under grant sponsorship, and have been published or will be shortly submitted for publication. Several other stability and bifurcation problems for rotating pipe flows have been solved. Rotating pipe flows are the simplest known exact viscous flows bearing a qualitative resemblance to vortices with axial streaming, and serve as a convenient theoretical testbed on which to develop an understanding of vortex instability and subsequent nonlinear evolution.

DESCRIPTORS: (U) AERODYNAMICS, ALGORITHMS, DECELERATION, DYNAMICS, EVOLUTION(GENERAL), FLOW, NONLINEAR SYSTEMS, PERTURBATIONS, PIPES, REVERSIBLE.

AD-A239 061

AD-A239 060

UNCLASSIFIED

PAGE 68

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 060 CONTINUED

AD-A239 059 20/5 9/3

ROTATION, STABILITY, TEST BEDS, THREE DIMENSIONAL,
THRESHOLD EFFECTS, VISCOUS FLOW, VORTICES.

ILLINOIS INST OF TECH CHICAGO DEPT OF MECHANICAL
ENGINEERING

IDENTIFIERS: (U) *Vortices, Vortex breakdown, Pipe flow,
PE81102F, WUAFOSR2307A1.

(U) Scientific Imaging System.

DESCRIPTIVE NOTE: Final rept. 1 Dec 88-31 Oct 90,

JUN 91 7P

PERSONAL AUTHORS: Mazumder, Jyotirmoy

CONTRACT NO. AFOSR-89-0152

PROJECT NO. 2917

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0855, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Acquisition of all the necessary components for the scientific imaging system based on absorption and fluorescence spectroscopy for the measurement of concentration and nucleation rate during non-equilibrium synthesis by laser is almost complete. The list of equipment for the assembly of this unique diagnostic system is enclosed. Major components include a 20 W Argon-Ion laser and a Ring-Dye laser with various associated electronics. Equipment which has already been delivered and is currently working are marked. The remaining few are in the process of acquisition, awaiting the evaluation of the core laser scanning and detection system. This phased purchase will allow us to specify the remaining electronics to match the performance of core-laser scanning system. The diagnostic technique using this system will involve performing absorption and fluorescence spectroscopy on the plasma produced by a laser beam impinging upon the metallic surface. The diagnostic spectroscopy will use a tunable dye laser (Coherent 899-28) to probe a particular transition originating in the ground state of niobium and aluminum. The absorption cross-section at the wavelength of interest (5252 A (Nb) and 3961 A (Al)) may be calculated using the tabulated values for the oscillator strengths of the various transitions between hyperfine levels which contribute to absorption at this wavelength.

AD-A239 060

AD-A239 059

UNCLASSIFIED

PAGE 69

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 059 CONTINUED

AD-A239 040 12/1

STANFORD UNIV CA DEPT OF ELECTRICAL ENGINEERING

DESCRIPTORS: (U) ABSORPTION, ACQUISITION, ALUMINUM, CORES, CROSS SECTIONS, DETECTORS, DIAGNOSIS(GENERAL), DYE LASERS, ELECTRONICS, FLUORESCENCE, GROUND STATE, IMAGES, LASER BEAMS, LASERS, METALS, NIOBIUM, NONEQUILIBRIUM FLOW, NUCLEATION, OPTICAL SCANNING, OSCILLATORS, PHASE, PROCUREMENT, RATES, SPECTROSCOPY, STRENGTH(GENERAL), SURFACES, SYNTHESIS, TABLES(DATA), TUNABLE LASERS, VALUE.

(U) Fast Algorithms for Fixed-Order Recursive Least-Squares Parameter Estimation.

DESCRIPTIVE NOTE: Rept. for 1989-1990.

SEP 89 2P

IDENTIFIERS: (U) Laser equipment, Spectroscopy, Fluorescence, Absorption spectroscopy, Laser produced plasmas, PE61102F, WUAFOSR2917A3.

PERSONAL AUTHORS: Stock, Dirk T. M.

CONTRACT NO. AFOSR-88-03271

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR, XF
TR-90-0988, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Recursive Least-Squares (RLS) algorithms are a family of widely-used techniques for adaptive parameter estimation and filtering. In many applications, a special structure in the estimation problem can be exhibited. This structure can be exploited to arrive at fast RLS algorithms. In this dissertation, we focus mainly on fast algorithms based on certain shift-invariance properties, and the particular filter structure considered will be a so-called tapped delay-line or transversal filter structure. Single-channel applications include high resolution spectrum estimation (AR modeling), noise cancellation, speech and biomedical signal processing. The multichannel algorithms (where each channel feeds a tapped delay-line) accommodate such applications as identification of systems described by difference equations with multiple polynomials (e.g. ARX and ARMAX models), adaptive minimum-variance control, fractionally-spaced and decision-feedback equalizers, multirate signal processing, image enhancement, and adaptive broadband beamforming.

DESCRIPTORS: (U) ADAPTIVE SYSTEMS, ALGORITHMS, BEAM FORMING, BIOMEDICINE, BROADBAND, CANCELLATION, CHANNELS, DELAY LINES, DIFFERENCE EQUATIONS, ELECTROMAGNETIC WAVE FILTERS, ESTIMATES, FEEDING, FILTERS, HIGH RESOLUTION, IDENTIFICATION SYSTEMS, IMAGE PROCESSING, LEAST SQUARES

AD-A239 059

AD-A239 040

UNCLASSIFIED

PAGE 70

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A239 040 CONTINUED

AD-A239 020 5/2

METHOD, MULTICHANNEL, NOISE, OPTIMIZATION, PARAMETERS,
POLYNOMIALS, RATES, RECURSIVE FUNCTIONS, SIGNAL
PROCESSING, SPECTRA, SPEECH, TAPS, TRANSVERSE WAVES.

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH BOLLING AFB DC
(U) Air Force Office of Scientific Research Technical
Report Summaries January - March 1991.

IDENTIFIERS: (U) *Least squares method, *Algorithms,
*Recursive functions, Mathematical filters, Transverse,
WJAFOSR2304A6, PE61102F.

DESCRIPTIVE NOTE: Quarterly summary rept. Jan-Mar 91.

APR 91 388P

PERSONAL AUTHORS: Tyrrell, Debra L.

MONITOR: AFOSR, XF
TR-91-0673, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The AFOSR Technical Report Summaries are published quarterly of each calendar year. They consist of a brief summary of each AFOSR technical report received in the Technical Information Division and submitted to the Defense Technical Information Center for that quarter. The following indexes are included: Contract, Subject, Personal author and title.

DESCRIPTORS: (U) *AIR FORCE RESEARCH.

IDENTIFIERS: (U) Announcement bulletins, Reports, Abstracts, Indexes.

AD-A239 040

AD-A239 020

UNCLASSIFIED

PAGE 71

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. T85002

AD-A239 019 13/2

AD-A238 977 12/1

NORTHWESTERN UNIV EVANSTON IL DEPT OF CIVIL ENGINEERING

STANFORD UNIV CA DEPT OF ELECTRICAL ENGINEERING

(U) Dynamic Response of Embedded Structures.

(U) Fast Array Algorithms for Structured Matrices.

DESCRIPTIVE NOTE: Final rept. 15 Jan 89-15 Jan 91.

DESCRIPTIVE NOTE: Rept. for 1989-1990.

JUL 91 281P

JUN 89 2P

PERSONAL AUTHORS: Keer, Leon M.; Shah, Surendra P.;
Dancygier, Avraham N.

PERSONAL AUTHORS: Chun, Joohwan

CONTRACT NO. AFOSR-89-0255

PROJECT NO. 2304

PROJECT NO. 2302

TASK NO. A6

TASK NO. C1

MONITOR: AFOSR, XF

TR-90-0987, AFOSR

MONITOR: AFOSR
TR-91-0674

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Structures that have to resist impact loading are often designed to be embedded under soil backfill. The backfill attenuates the external surface load and decreases the free field stresses at the level of the structure. Physical mechanisms which are associated with the soil-structure interaction further affect the loading and response of the structure, and are important to understand for better, more efficient design of these structures. The response to an external surface impact of a structure with a reinforced concrete roof, embedded in a shallow depth of burial, was studied here. The research employed an experimental investigation of a small scale radial model and numerical analysis based on the finite element method to evaluate the mechanisms associated with the experimental results.

DESCRIPTORS: (U) BURIED OBJECTS, DYNAMIC RESPONSE, EFFICIENCY, EMBEDDING, EXTERNAL, FINITE ELEMENT ANALYSIS, FREE FIELD, IMPACT, INTERACTIONS, LOADS(FORCES), MODELS, NUMERICAL ANALYSIS, PHYSICAL PROPERTIES, REINFORCED CONCRETE, RESPONSE, ROOFS, SHALLOW DEPTH, SOILS, STRESSES, STRUCTURES, SURFACES.

IDENTIFIERS: (U) WJAFOSR2302C1, PE61102F, *Dynamic loading, Embedded structures, Soil structure interaction.

AD-A239 019

UNCLASSIFIED

PAGE 72

T85002

ABSTRACT: (U) Many engineering or mathematical problems require to factorize structured matrices (Toeplitz, Hankel, Vandermonde products of such matrices and their inverses, Schur complements, etc) either in explicit or in disguised form. Consequently there exist various analytic tools regarding structured matrices as well as several fast factorization algorithms. In this thesis, we show that many of these results and several significant generalizations can be obtained in a very constructive way. The generic form is to use elementary circular and hyperbolic transformations to triangularize a certain array of numbers derived from the displacement representation of the given structured matrix; the desired results can then be read off from the resulting array. These fast array algorithms require $O(mn)$ operations for LU and QR factorizations of $m \times n$ structured matrices, and $O(mn)$ or even $O(n \log^2 n)$ operations for solving matrix equations. Also the array form suggests various alternative algorithms, depending upon the order in which the transformations are applied; these variations can have different numerical properties and lead to different implementations.

DESCRIPTORS: (U) ALGORITHMS, ARRAYS, CIRCULAR, DISPLACEMENT, HYPERBOLAS, MATHEMATICS, NUMBERS, NUMERICAL METHODS AND PROCEDURES, TRANSFORMATIONS.

IDENTIFIERS: (U) *Matrices(Mathematics), *Algorithms, WJAFOSR2304A6, PE61102F.

AD-A238 977

UNCLASSIFIED

AD-A238 975 12/1 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002
AD-A238 975 CONTINUED
WJAFOSR2304A6, PE61102F.

STANFORD UNIV CA DEPT OF ELECTRICAL ENGINEERING

(U) Fast Algorithms for Structured Matrices with Arbitrary Rank Profile.

DESCRIPTIVE NOTE: Rept. for 1989-1990.

MAY 90 2P

PERSONAL AUTHORS: Pal, Debajoyti

CONTRACT NO. AFOSR-88-0327

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR, XF
TR-90-0985, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Triangular factorization, solution to linear equations, inversion, computation of rank profile and inertia (in the Hermitian case) etc. of general $n \times n$ matrices require $O(n^3)$ operations. For certain structured matrices including Toeplitz and Hankel matrices the computational complexity is known to be $O(n^2)$ or better. These structured matrices often arise in a wide variety of areas including Signal processing. Systems theory and Communications. Fast (i.e. $O(n^2)$) algorithms for these structured matrices have been actively studied for over twenty five years. However almost all the authors have assumed that the underlying matrices are strongly regular i.e. every principal submatrix is nonsingular. Although some fast algorithms have recently been developed for certain problems involving some of these structured matrices which may have one or more zero minors, several other problems is lacking. In this dissertation, we obtain several new results through a unified approach to the problems mentioned earlier.

DESCRIPTORS: (U) ALGORITHMS, COMPUTATIONS, INERTIA, LINEAR ALGEBRAIC EQUATIONS, PROFILES, RANK ORDER STATISTICS, SIGNAL PROCESSING, SOLUTIONS(GENERAL), THEORY.

IDENTIFIERS: (U) *Matrices(Mathematics), *Algorithms.

AD-A238 975

AD-A238 975

UNCLASSIFIED

PAGE 73

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 935 11/11

AD-A238 908 11/4

WASHINGTON UNIV SEATTLE DEPT OF MATERIALS SCIENCE AND ENGINEERING

WEST VIRGINIA UNIV MORGANTOWN DEPT OF PHYSICS

(U) Microdesigning of Lightweight/High Strength Ceramic Materials.

(U) High Temperature Properties of Ceramic/Carbon Systems in a Oxidizing Environment.

DESCRIPTIVE NOTE: Final rept. for period ending 1 Jan 89.

DESCRIPTIVE NOTE: Final rept. 1 Jun 87-30 Sep 90.

JUL 89 149P

MAY 91 13P

PERSONAL AUTHORS: Aksay, I. A.; Stangle, G. C.; Dabbs, D. M.; Sarikaya, M.

PERSONAL AUTHORS: Cooper, Bernard R.; Montano, Pedro A.

CONTRACT NO. AFOSR87-0114

CONTRACT NO. AFOSR-87-0251

PROJECT NO. 2303

PROJECT NO. 2306

TASK NO. A3

TASK NO. B1

MONITOR: AFOSR, XF
TR-91-0610, AFOSR

MONITOR: AFOSR, XF
TR-91-0657, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) This interim report describes the results of research conducted under Grant No. AFOSR-87-0114, which deals primarily with the processing and characterization of complex ceramic matrix composite systems. Particular emphasis was placed on developing processing schemes for whisker-reinforced ceramic matrix composites. Additional studies are being conducted on boron carbide-aluminum ceramic/metal composites. Further, theoretical studies have been made to provide the foundation for developing a more fundamental understanding of colloidal systems.

DESCRIPTORS: (U) COLLOIDS, PROCESSING, THEORY.

IDENTIFIERS: (U) PE81102F, WUAFOSR2303A3, *Ceramics, Composite materials, Colloidal processing.

ABSTRACT: (U) The objective of the research has been to identify how deleterious effects on bonding develop that can cause deterioration of mechanical properties of carbon-based ceramics in a high temperature environment and then to learn how to design modified ceramic systems that can better withstand such conditions. To do this, we have developed a coordinated computer modeling/experimental study concentrating on fracture and ductility behavior as affected by impurities and defects, high temperatures and bonding effects at material interfaces. We made and studied a variety of metal/carbon and silicon/carbon systems both in naturally occurring crystals and in superlattices. The results obtained in the coordinated study provide valuable information on the interface stability of superlattice systems and on their mechanical and structural properties as compared to systems in naturally occurring crystalline forms.

DESCRIPTORS: (U) BEHAVIOR, BONDING, CARBON, CERAMIC MATERIALS, COMPUTERIZED SIMULATION, CRYSTAL LATTICES, CRYSTALS, DETERIORATION, DUCTILITY, ENVIRONMENTS, HIGH TEMPERATURE, IMPURITIES, INTERFACES, MATERIALS, MECHANICAL PROPERTIES, METALS, OXIDATION, SILICON, STABILITY, STRUCTURAL PROPERTIES, SUPERLATTICES.

IDENTIFIERS: (U) PE81102F, WUAFOSR2306B1.

AD-A238 935

AD-A238 908

UNCLASSIFIED

PAGE 74

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. T85002

AD-A238 861 6/5

AD-A238 859 21/3

MASSACHUSETTS UNIV AMHERST

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS

(U) Biological and Theoretical Studies of Adaptive Networks: The Conditioned Response.

DESCRIPTIVE NOTE: Annual rept. 1 Jun 90-31 May 91.

DESCRIPTIVE NOTE: Final rept. 1 May 90-31 Jan 91.

JUN 91 51P

MAY 91 23P

PERSONAL AUTHORS: Moore, John W.

PERSONAL AUTHORS: Martinez-Sanchez, Manuel

CONTRACT NO. AFOSR-89-0391

CONTRACT NO. AFOSR-86-0019

PROJECT NO. 2312

PROJECT NO. 2038

TASK NO. A1

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0844, AFOSR

MONITOR: AFOSR, XF
TR-91-0634, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The following experimental projects were initiated: (a) Reexamination of the activity of neurons of cerebellar cortex during two-tone differential conditioning (Dr. Ivona Zurawska). (b) A recording study of the medial geniculate neurons during two-tone differential trace conditioning (Dr. Kevin O'Connor). (c) A recording study of pontine nucleus neurons during two-tone differential conditioning (Michael Hirl). (d) Anatomical experiments using WGA-HRP designed to clarify red nucleus innervation of the cerebellum (Marcy Rosenfield). (e) A behavioral experiment designed to assess attenuated latent inhibition by flagging a phenomenon of potential importance for connectionist learning theories (Peter Underdown). In addition to the experimental work, my current team and I have initiated a major upgrading of experimental facilities.

DESCRIPTORS: (U) ADAPTIVE SYSTEMS, ANATOMY, BEHAVIOR, BIOLOGY, CEREBELLUM, CONDITIONED RESPONSE, DORMANCY, INHIBITION, NERVE CELLS, NETWORKS, RECORDING SYSTEMS, RESEARCH FACILITIES, TEAMS(PERSONNEL), THEORY.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2312A1.

AD-A238 861

AD-A238 859

UNCLASSIFIED

PAGE 75

T85002

ABSTRACT: (U) This Report summarizes work on ionization non-equilibrium, and new results pertaining to inlet ionization in MPD thrusters are presented. Brief summaries are also given of our work on transport effects. Hall effects magnetic layers and electrothermal arcjets. The object of our research has been the basic physics of plasma thrusters, particularly MPD thrusters. More specifically, the present Grant, addressed the complex of issues which encompass excitation - ionization kinetics of MPD plasmas, and their effects on thruster flows.

DESCRIPTORS: (U) FLOW, HALL EFFECT, INLETS, IONIZATION, KINETICS, LAYERS, MAGNETIC MATERIALS, NONEQUILIBRIUM FLOW, PHYSICS, PLASMA ENGINES, THRUSTERS, TRANSPORT.

IDENTIFIERS: (U) *Plasma thrusters, *Plasma engines, PEB1102F, WUAFOSR2038A1.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 858 CONTINUED

STUTT GART UNIV (GERMANY F R) INST FUER RAUMFAHRTSYSTEME

samples are reported on and explained by a refined cathode spot theory.

(U) Basic Processes of Plasma Propulsion.

DESCRIPTORS: (U) CATHODES, CHANNELS, COMPUTATIONS,

CONFIGURATIONS, ELECTRIC DISCHARGES, ELECTRODES, ELECTRONS, EROSION, MAGNETIC FIELDS, MEASUREMENT, MODELS, PERTURBATIONS, PLASMA DEVICES, PLASMA ENGINES, PLASMAS (PHYSICS), PROPULSION SYSTEMS, PULSES, RATES, RECTANGULAR BODIES, RELIABILITY, SAMPLING, SELF CONTAINED, STABILITY, TEMPERATURE, TEST EQUIPMENT, THEORY, THRUSTERS, TRANSVERSE.

DESCRIPTIVE NOTE: Final rept. 1 Aug 86-31 Jul 90.

APR 91 88P

PERSONAL AUTHORS: Schrade, Herbert O.; Sleziona, P. C.; Kurtz, Helmut L.

CONTRACT NO. AFOSR-86-0337

IDENTIFIERS: (U) Plasma thrusters, *Plasma engines, Joule heating, PE81102F, WUAFOSR2308A1.

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR, XF TR-91-0635, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) In order to improve performance, lifetime and reliability of plasma thrusters one has to understand and assess the fundamental processes and problem areas like nonequilibrium magneto plasma dynamics flows in electric discharges, their stability and electrode erosion effects. In order to assess the flow, pressure and density or temperature fields in plasma thruster devices several theoretical model calculations have been developed and applied to different thruster configurations. The results of these calculations are compared with corresponding experimental arc devices and both agree well with each other. Concerning the plasma stability work, a new explanation of the so called Onset phenomenon is presented. It is based on a run-away Joule heating effect caused by the self magnetic field of a current carrying plasma channel which drastically decreases the radial heat conduction losses due to the electrons. The dependency of the electron heatflux vector and heat conduction coefficient in a transverse magnetic field has been derived by means of a perturbation approach of the Maxwell distribution. Cathode erosion measurements have been conducted by means of a fully automatically working test rig. The cathode sample is repeatedly charged by a fairly rectangular current pulse of 1400 A which lasts about 2 ms. Erosion rate measurements on thoriated (2% Thorium Oxide) cathode

AD-A238 858

AD-A238 858

UNCLASSIFIED

PAGE 78

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 857 CONTINUED

METHODS, MOTION, OPTICAL EQUIPMENT, OPTICAL SCANNING, OPTICS, PATTERNS, PHOTOMULTIPLIER TUBES, POSITION(LOCATION), PROBES, PROFILES, SIGNAL PROCESSING, THREE DIMENSIONAL FLOW, VELOCITY, VERTICAL ORIENTATION, VOLUME, WATER.

AD-A238 857 14/2 17/8 20/4 4/2

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT OF AEROSPACE AND OCE AN ENGINEERING

(U) Three-Dimensional Rapidly Scanning Laser Doppler Velocimeter with Low SNR Signal Processing.

DESCRIPTIVE NOTE: Final rept. 1 Feb 88-30 Nov 90.

NOV 90 74P

PERSONAL AUTHORS: Shirpaugh, Kevin A.; Simpson, Roger L.

REPORT NO. VPI-AOE-179

CONTRACT NO. F49620-88-C-0043

PROJECT NO. 2307

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0848, AFOSR

IDENTIFIERS: (U) *Laser velocimeter, *Doppler anemometer, Array processors, Photomultiplier tubes, PE61102F, WUAFOSR2307A3.

UNCLASSIFIED REPORT

ABSTRACT: (U) A rapidly scanning directionally sensitive three-velocity-component laser Doppler velocimeter (RSLDV) has been designed. It permits rapid scans through three-dimensional flows to obtain space-time velocity information and almost instantaneous velocity profiles vital to understanding such flows. A flexible optical system allows for easy variation of the fringe spacing as well as the location and size of the measurement volume. Several optical techniques to maintain coincidence between the horizontal, U and V, and vertical, V, probe volumes were investigated. A lens, used like a prism, and two plane mirrors for the out of plane scanning laser beam maintains good coincidence between the probe volumes, while maintaining some flexibility. Moving fringe patterns in the horizontal and vertical planes are produced by a dual water Bragg cell. The Doppler frequency is independent of the position of the receiving optics, and only one photomultiplier tube (PMT) is needed to receive the signals for all three velocity components.

DESCRIPTORS: (U) BRAGG ANGLE, CELLS, DOPPLER EFFECT, DOPPLER SYSTEMS, FREQUENCY, HORIZONTAL ORIENTATION, LASER BEAMS, LASER VELOCIMETERS, LASERS, MEASUREMENT.

AD-A238 857

AD-A238 857

UNCLASSIFIED

PAGE 77

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 855 20/4

AD-A238 827 8/5

STANFORD UNIV CA

INTERNATIONAL SOCIETY FOR CHRONOBIOLOGY BELTSVILLE MD

(U) Flow Control.

(U) Annual Review of Chronopharmacology. Volume 7. Biological Rhythms and Medications. Proceedings of the Conference of Chronopharmacology Held in Nice, France on 12-15 March 1990.

DESCRIPTIVE NOTE: Final rept..

APR 91 9P

90 385P

PERSONAL AUTHORS: Reynolds, W. C.

PERSONAL AUTHORS: Reinberg, A.; Smolensky, M.; Labrecque, G.

CONTRACT NO. F49620-88-K-0020

MONITOR: AFOSR TR-91-0845

CONTRACT NO. AFOSR-90-0264

PROJECT NO. 2312

UNCLASSIFIED REPORT

TASK NO. A3

ABSTRACT: (U) This report outlines a coordinated set of research programs on flow control. The work was carried out by a team of experts in fluid mechanics and automatic control. Jets, turbulent boundary layers near separation, and delta wing flows formed the basis for these studies aimed primarily at developing fundamentals needed for active control of flows of technical interest.

MONITOR: AFOSR, XF TR-91-0550, AFOSR

UNCLASSIFIED REPORT

Availability: Pergamon Press, Inc., Maxwell House, Elmsford, NY 10523. PC \$191.00. No copies furnished by DTIC.

DESCRIPTORS: (U) AUTOMATIC, CONTROL, DELTA WINGS, FLOW, FLUID MECHANICS, RESEARCH MANAGEMENT.

IDENTIFIERS: (U) *Boundary layer control, Flow control, Turbulent flow.

ABSTRACT: (U) This grant funded in part the Fourth International Conference on Biological Rhythms and Medications held in Nice, France 12-15 March 1990. Sponsored by the International Society for Chronobiology. The published Proceedings compiled in this final report deal with seven major themes: (1) neurobiology, (2) endocrinology and gastroenterology, (3) cardiovascular agents, (4) metabolic aspects, (5) immunology and cancer, (6) general chronopharmacology and (7) chronotherapeutics.

DESCRIPTORS: (U) BIOLOGICAL RHYTHMS, CANCER, CHRONOBIOLOGY, ENDOCRINOLOGY, IMMUNOLOGY, INTERNATIONAL, NEUROBIOLOGY, SOCIETIES, SYMPOSIA.

IDENTIFIERS: (U) PE61102f, WUAFOSR2312A3.

AD-A238 855

AD-A238 827

UNCLASSIFIED

PAGE 78

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 811 20/11

AD-A238 792 7/4

ILLINOIS UNIV AT CHICAGO CIRCLE DEPT OF CIVIL ENGINEERING
MECHANICS AND METALL URGY

COLUMBIA UNIV NEW YORK LOWELL MEMORIAL LIBRARY

(U) Eshelby Forces Associated with an Advancing Crack
Surrounded by Vanishingly Small Inhomogeneity.

(U) Photochemistry of Large-Ring 2-Phenylcycloalkanes in
Various Environments. Intramolecular Para Coupling
Products of Acyl Benzyl Biradicals.

DESCRIPTIVE NOTE: Final rept. 1 Sep 89-Aug 90.

91 5P

MAY 91 47P

PERSONAL AUTHORS: Wu, Chien H.
Nicholas J.

PERSONAL AUTHORS: Han, Mianhe; Lei, Xuegong; Turro,
Nicholas J.

CONTRACT NO. AFOSR-89-0503

CONTRACT NO. AFOSR-90-0049

MONITOR: AFOSR, XF
TR-91-0871, AFOSR

PROJECT NO. 2303

TASK NO. 82

UNCLASSIFIED REPORT

MONITOR: AFOSR, XF
TR-91-0847, AFOSR

ABSTRACT: (U) The propagation of a crack surrounded by
damage is simplistically replaced by that of a crack
lodged in a vanishingly thin or small elastic
inhomogeneity. This latter problem is asymptotically
analyzed and numerically solved via the use of Fast
Fourier Transform Algorithm. A re-examination of
Mindlin's grade-3 elasticity is thoroughly carried out to
reveal the interaction between mechanical loading and
surface tension.

DESCRIPTORS: (U) ALGORITHMS, ELASTIC PROPERTIES, FAST
FOURIER TRANSFORMS, HETEROGENEITY, MECHANICAL PROPERTIES,
SURFACE TENSION, THINNESS.

UNCLASSIFIED REPORT

Availability: Pub. in Jnl. of Organic Chemistry, v56 n8
p2927-2930 1991. Available only to DTIC users. No copies
furnished by NTIS.

ABSTRACT: (U) The photochemistry of five- and six-
membered cycloalkanes has played an important role in
mechanical organic chemistry and in our knowledge of
biradicals. The photolysis of 2-phenylcyclopentanone and
cyclohexanone yields alkenals in good yields. However,
for the photochemistry of large-ring unsubstituted
cycloalkanes, the dominant primary process in hydrogen
abstraction, which affords cyclobutanol derivatives,
although 2-methyl-substituted cyclododecanones undergo
both cleavage and hydrogen abstraction. We report the
photochemistry of large-ring-2-phenylcycloalkanes (11-
to 15-membered) that produce cyclophanes as major
products under different conditions.

DESCRIPTORS: (U) CLEAVAGE, CYCLOHEXANONES, HYDROGEN,
ORGANIC CHEMISTRY, PHOTOCHEMICAL REACTIONS, YIELD.

IDENTIFIERS: (U) *Photochemistry, Cyclophanes,
Biradicals, WJAFOSR230382, PE61102F.

AD-A238 811

AD-A238 792

UNCLASSIFIED

PAGE 79

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 791 CONTINUED

CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF CHEMISTRY

(U) OURIP Synthesis and Study of Preceramic Polymers/
Ceramic Precursors, Metal Silicides, and Polymers with
Unique Optical and Electronic Properties.

DESCRIPTIVE NOTE: Final technical rept. 1 Dec 89-30 Nov
90.

MAY 91 14P

PERSONAL AUTHORS: Tilley, T. D.

CONTRACT NO. AFOSR-89-0174

PROJECT NO. 3484

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0837, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The thermal analysis system and tube furnace have been used to conduct initial studies on the conversion of alkoxysiloxo derivatives to metal silicate solid state materials. These results, pertaining titanium, zirconium, and hafnium, are described. Interest in low-temperature chemical routes to ceramic materials is based largely on the potential for generating metastable structures with unusual properties, or on development of improved processing methods. The sol-gel method in particular has attracted attention as a low temperature route to oxides. This method can be extended to the synthesis of mixed metal oxides, however the formation of homogeneous materials can be complicated by differences in hydrolysis rates for the starting metal compounds. Sol-gel processes have been utilized to produce titanium oxides or zirconium oxides containing silicates in the form of thin films, fibers, or monoliths. Materials of this type find applications that take advantage of their optical properties, chemical inertness, high melting points, insulating properties, and fracture toughness.

DESCRIPTORS: (U) CERAMIC MATERIALS, CHEMICALS,
CONVERSION, ELECTROMAGNETIC PROPERTIES,
FRACTURE(MECHANICS), FURNACES, HAFNIUM, HIGH TEMPERATURE,

AD-A238 791

AD-A238 791

UNCLASSIFIED

PAGE 80

T85002

HOMOGENEITY, HYDROLYSIS, INSULATION, LOW TEMPERATURE,
MATERIALS, MELTING POINT, METAL COMPOUNDS, METALS,
METASTABLE STATE, METHODOLOGY, MIXING, OPTICAL PROPERTIES,
OXIDES, POLYMERS, PRECURSORS, PROCESSING, RATES, ROUTING,
SILICATES, SILICIDES, STARTING, STRUCTURES, SYNTHESIS,
THERMAL ANALYSIS, THIN FILMS, TITANIUM, TITANIUM OXIDES,
TOUGHNESS, TUBES, ZIRCONIUM, ZIRCONIUM OXIDES.

IDENTIFIERS: (U) *Ceramic materials, *Polymers,
Silicides, Metals, Optical properties,
Synthesis(Chemistry), Electronic properties, Sol gel
processes, WUAFOSR3484A2, PE61102F.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 790 8/5

AD-A238 790 CONTINUED

GEORGE WASHINGTON UNIV MEDICAL CENTER WASHINGTON DC DEPT
OF MEDICINE

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A5, *Free radical,
IRP Volume I and II chemicals, *Cytotoxicity membrane
lipid peroxidation, Spin trapping, ESR, Cell culture,
Endothelial cell, *Smooth muscle cell.

(U) Free Radical Mechanisms of Xenobiotic Mammalian
Cytotoxicities.

DESCRIPTIVE NOTE: Final rept..

JUN 91 38P

PERSONAL AUTHORS: Dickens, Benjamin F.

CONTRACT NO. AFOSR-88-0018

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR, XF
TR-91-0632, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Our initial goal was to identify if free radical mechanisms are involved in the cytotoxicity of a number of IRP volume I and II chemicals. We found that a number of these agents act to enhance membrane lipid peroxidation in response to a standard dose of exogenous free radicals. Using chlorinated hydrocarbons (carbon tetrachloride, trichloroethylene, dichloroethylene, trichloroethane, dichloroethane) as a model for other IRP chemicals, we established conditions to measure lipid peroxidation in cultured smooth muscle and endothelial cells. These agents induced lipid peroxidation in the presence of physiological levels of iron in these vascular cells by a mechanism that doesn't require cytochrome P-450. Antiradical treatment with deferoxamine and probucol (but not SOD, catalase, or mannitol) appear to reduce the toxicity of these agents.

DESCRIPTORS: (U) CARBON TETRACHLORIDE, CARDIOVASCULAR SYSTEM, CATALASE, CELLS, CELLS(BIOLOGY), CHEMICALS, CHLORINATED HYDROCARBONS, CHLOROETHANES, DOSAGE, ENDOTHELIAL, FREE RADICALS, IRON, LIPIDS, MANNITOL, MEASUREMENT, MEMBRANES(BIOLOGY), MUSCLES, OXIDATION, PHYSIOLOGY, TOXICITY, TRICHLOROETHANES, TRICHLOROETHYLENE, VOLUME.

AD-A238 790

AD-A238 790

UNCLASSIFIED

PAGE 81

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 789 20/8

AD-A238 789 CONTINUED

PENNSYLVANIA STATE UNIV UNIVERSITY PARK LAB FOR
ELEMENTARY PARTICLE SCIENCE

NEUTRONS, INDICATORS, NEUTRAL, NEUTRONS, NUCLEAR
PARTICLES, NUCLEI, RESIDUALS, REST, SPECTRA, URANIUM,
YIELD.

(U) A Measurement of Charged and Neutral Elementary
Particles Emitted from Antiproton Annihilation at Rest
in Heavy Nuclei.

IDENTIFIERS: (U) *Annihilation reactions, *Antiprotons,
*Neutron spectrum, WJAFOSR230182, PE61102F.

DESCRIPTIVE NOTE: Final rept. 1 May 87-30 Apr 91.

JUN 89 150P

PERSONAL AUTHORS: Smith, Gerald A.

CONTRACT NO. AFOSR-87-0248

PROJECT NO. 2301

TASK NO. B2

MONITOR: AFOSR, XF
TR-91-0841, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The first complete spectrum of neutrons from antiproton induced fission of Uranium has been obtained. Features of the spectrum are explained by three processes: emission of prompt ejectiles driven from the nucleus by pions in the intranuclear cascade, evaporation of neutrons from the excited nucleus before fission, and de-excitation of fission fragments. The temperature of the fission neutrons is about 67% higher than normal fission, indicating large residual energy deposited in the fission fragments. Hence, the fission process serves as a window into the excitation process itself. Results have also been obtained on gamma-rays associated with de-excitation of fission fragments after neutron emission. With respect to normal fission, the relative yield of gamma-rays to neutrons is suppressed, but the temperature of the gamma-rays is higher. Energy transfer by pi-zeros in the intranuclear cascade initiated by antiproton annihilation at rest in carbon and uranium has been measured. The prospects for initiating multifragmentation and disintegration of heavy nuclei appear good.

DESCRIPTORS: (U) ANNIHILATION REACTIONS, ANTIPROTONS,
CARBON, DISINTEGRATION, ELEMENTARY PARTICLES, EMISSION,
ENERGY, EVAPORATION, EXCITATION, FISSION, FISSION

AD-A238 789

AD-A238 789

UNCLASSIFIED

PAGE 82

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 788 6/1 AD-A238 787 11/4 11/8.1 11/8.2

MICHIGAN UNIV ANN ARBOR DEPT OF ELECTRICAL ENGINEERING
AND COMPUTER SCIENCE

AUBURN UNIV AL

(U) Investigation of the Properties of Titanium-Carbon
Hybrid Alloys.

DESCRIPTIVE NOTE: Final rept. 15 Apr 87-14 Apr 90.

DESCRIPTIVE NOTE: Final rept. Dec 87-Apr 91.

FEB 91 1P

JUN 91 78P

PERSONAL AUTHORS: Wakefield, Gregory

PERSONAL AUTHORS: Chln, Bryan A.; Zee, Ralph H.

CONTRACT NO. AFOSR-87-0198

CONTRACT NO. AFOSR-88-0038

PROJECT NO. 2313

PROJECT NO. 2308

TASK NO. A6

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0838, AFOSR

MONITOR: AFOSR, XF
TR-91-0854, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The final report of this year research program summarizes our experimental and theoretical results concerning what we have termed cross-spectral temporal resolution. The experiments measured the temporal resolution. The experiments measured the stimulus parameters. From these experimental results, three theoretical results have been obtained. The first of these concerns the form of the ideal receiver for cross-spectral temporal resolution of amplitude modulated carries. This model incorporates an auditory-nerve model and is based entirely on point-process statistics. The second of these concerns the form of the ideal receiver for cross-spectral temporal resolution of frequency modulated carriers. This model fails to account for the experimental results, which are, in general, much worse than would be predicted from the model and from simple extension of the amplitude-modulation results. On the basis of this failure, a third general theoretical results has addressed the problem of uncertainty in auditory processing.

DESCRIPTORS: (U) , AUDITORY PERCEPTION, AUDITORY SIGNALS, FREQUENCY, PARAMETERS, RECEIVERS, SIGNAL PROCESSING, STIMULI, TIME, UNCERTAINTY.

IDENTIFIERS: (U) PE81102F, WJAFOSR2313A8.

AD-A238 788

UNCLASSIFIED

PAGE 83

T85002

ABSTRACT: (U) The effects of 6% aluminum additions on the compressive properties and microhardness of titanium-titanium carbide composites were investigated. Composites containing 40-50% TiC by volume were produced using standard casting procedures from the melt. Enhanced strength of Ti-TiC composites at room temperature and elevated temperatures upon Al additions was found. Strengthening mechanism was also studied. The tensile properties of Ti-TiC composites was most sensitive to the size and distribution of TiC particles. Tensile properties with different TiC size which was controlled by cooling rate during melting were studied. Results show that 50% improvement of ultimate tensile strength could be achieved by microstructure refinement. Titanium-base alloys are a potential candidate for space applications because of their light weight, high specific modulus, high specific strength, and good corrosion resistance. The TiC system reinforced metal-matrix composites were produced by traditional ingot metallurgy. The use of this metallurgical method has been developed in an attempt to improve mechanical properties through the presence of a ductile metal matrix. Good strength and ductility have been achieved in compression.

DESCRIPTORS: (U) , ALLOYS, BASE METAL, CASTING, CASTINGS, COMPOSITE MATERIALS, COMPRESSIVE PROPERTIES, CONTROL.

AD-A238 787

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 787 CONTINUED

AD-A238 788 5/8 12/5

COOLING, CORROSION RESISTANCE, DUCTILITY, HIGH STRENGTH, HIGH TEMPERATURE, LIGHTWEIGHT, MATRIX MATERIALS, MECHANICAL PROPERTIES, METALLURGY, METALS, MICROHARDNESS, MICROSTRUCTURE, PARTICLES, RATES, REFINING, REINFORCING MATERIALS, ROOM TEMPERATURE, SPACE TECHNOLOGY, TENSILE PROPERTIES, TENSILE STRENGTH, TITANIUM ALLOYS.

NEW YORK UNIV MEDICAL CENTER NY DEPT OF PSYCHIATRY
(U) Computing With Neural Maps: Application to Perceptual and Cognitive Functions.

DESCRIPTIVE NOTE: Annual rept. 1 Sep 89-30 Aug 90.

IDENTIFIERS: (U) *Metal matrix composites, *Ceramic materials, High temperature, Microhardness, *Titanium carbides, Strength(Mechanics), *Titanium, Space based, Casting, WJAFDSR2308A2, PE81102F.

JUL 91 7P

PERSONAL AUTHORS: Schwartz, Eric L.

CONTRACT NO. AFOSR-88-0275

IAC NO. MMC-703368

PROJECT NO. 2313

IAC DOCUMENT TYPE: MMCIAC - HARD COPY --

TASK NO. A8

MONITOR: AFOSR, XF
TR-91-0631, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) During the past year these investigators: (1) Illustrated application of computer science to neuroscience at three levels: measuring, modeling, and understanding the computational function of the columnar pattern of ocular dominance in primate visual cortex; (2) Demonstrated an algorithm for modeling polymap architectures of the cerebral neocortex, where the term 'polymap' emphasizes the joint occurrence of topographic mapping of multiple sub-modalities, interlaced in the form of macroscopic patches ('columns') into a single cortical lamina; (3) Considered a space-variant sensor design based on the conformal mapping of the half disk, $w = \log(z+a)$, a 0, which characterizes the anatomical structure of the primate and human visual systems; (4) Showed that the best algorithm for fusing multiple space-variant fixations of the same scene show, under certain assumptions of pixel distribution, is indeed optimal in a least-squared-error sense; (5) Analyzed the characteristics of a synthetic sensor comparable, with respect to field width and resolution, to the primate visual system; (6) Showed a quantitative measurement of the macaque ocular dominance column pattern, based on measurement of local power spectral densities of a computer reconstruction and numerical flattening of VI.

DESCRIPTORS: (U) ALGORITHMS, ANATOMY, COGNITION.

AD-A238 787

AD-A238 788

UNCLASSIFIED

PAGE 84

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 786 CONTINUED

AD-A238 782 23/1

COMPUTATIONS, COMPUTERS, CONFORMAL MAPPING, DETECTORS, EYE, FUNCTIONS, HUMANS, MAPPING, MAPS, MEASUREMENT, NERVOUS SYSTEM, PATTERNS, POWER SPECTRA, PRIMATES, SPECTRAL ENERGY DISTRIBUTION, TOPOGRAPHIC MAPS, VISION, VISUAL CORTEX, WIDTH.

MASSACHUSETTS INST OF TECH LEXINGTON LINCOLN LAB

(U) Parametric Study of Diffusion-Enhancement Networks for Spatiotemporal Grouping in Real-Time Artificial Vision.

IDENTIFIERS: (U) *Cognition, Computer applications, Computerized simulation, *Neurophysiology, *Computer vision, WUAFOSR2313AB, PE81102F.

DESCRIPTIVE NOTE: Annual summary rept. no. 1, Oct 89-Mar 91,

JUN 91 42P

PERSONAL AUTHORS: Waxman, A. M.; Cunningham, R. K.

CONTRACT NO. AFOSR-PD-90-0001

PROJECT NO. 2313

TASK NO. AB

MONITOR: AFOSR, XF
TR-91-0643, AFOSR

UNCLASSIFIED REPORT

Availability: Document partially illegible

ABSTRACT: (U) This is the first Annual Technical Summary of the MIT Lincoln Laboratory effort into the parametric study of diffusion-enhancement networks for spatiotemporal grouping in real-time artificial vision. Spatiotemporal grouping phenomena are examined in the context of static and time-varying imagery. Dynamics that exhibit static feature grouping on multiple scales as a function of time and long-range apparent motion between time-varying inputs are developed for a biologically plausible diffusion-enhancement bilayer. The architecture consists of a diffusion and a contrast-enhancement layer coupled by feedforward and feedback connections. Input is provided by a separate feature extracting layer. The model is cast as an analog circuit that is realizable in VLSI, the parameters of which are selected to satisfy a psychophysical database on apparent motion.

DESCRIPTORS: (U) ANALOG SYSTEMS, CIRCUITS, DATA BASES, DYNAMICS, EXTRACTION, LAYERS, LONG RANGE(DISTANCE), MOTION, PARAMETRIC ANALYSIS, PSYCHOPHYSICS, REAL TIME, SCALE, STATICS, VISION.

IDENTIFIERS: (U) WUAFOSR2313AB, PE81102F, *Neural

AD-A238 786

AD-A238 782

UNCLASSIFIED

PAGE 85

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 782 CONTINUED

AD-A238 781 5/2

networks, Astrocyte glial networks, Diffusion enhancement, Long-range apparent motion, Spatiotemporal grouping dynamics, Interference suppression.

GORDON RESEARCH CONFERENCES INC KINGSTON RI

(U) The Gordon Conference on Inorganic Chemistry Held in Wolfboro, New Hampshire on 30 July-3 August 1990.

DESCRIPTIVE NOTE: Final rept. 1 May 89-30 Apr 91.

JUN 91 65P

PERSONAL AUTHORS: Cruickshank, Alexander M.

CONTRACT NO. AFOSR-89-0299

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR, XF
TR-91-0636, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Six Gordon Conferences were supported by AFOSR during 1990. The Conference on Inorganic Chemistry was held in Wolfboro, NH July 30 to August 3. Total attendance was 98. 22 papers and 40 posters were presented. The Conference on Glass was held in Tifton, NH, June 25-29. Total attendance was 80 including 5 from Europe and Japan. 18 talks and 24 posters were presented. The Conference on Biocatalysis was held in Plymouth, NH, June 24-29. Total attendance was 113. 26 papers and 30 posters were presented. The Conference on Dielectric Phenomena was held in Plymouth, NH, July 22-27. Total attendance was 76. 20 papers and 15 posters were presented. The Conference on Physical Electrochemistry was held in New London, NH, July 29 to August 3. The Conference on Organometallic Chemistry was held in Newport, RI, June 24-29. Total attendance was 134. 28 papers and 57 posters were presented.

DESCRIPTORS: (U) CHEMISTRY, DIELECTRICS, ELECTROCHEMISTRY, EUROPE, GLASS, INORGANIC CHEMISTRY, JAPAN, NEW HAMPSHIRE, ORGANOMETALLIC COMPOUNDS, PHYSICAL CHEMISTRY, SYMPOSIA.

IDENTIFIERS: (U) WJAFOSR2303B1, PE61102F.

AD-A238 782

AD-A238 781

UNCLASSIFIED

PAGE 86

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 755 12/9 12/4

AD-A238 732 7/2

NETROLOGIC INC DAYTON OH

TEXAS CHRISTIAN UNIV FORT WORTH DEPT OF PHYSICS

(U) Microcomputer-Based Vehicle Routing and Scheduling.

(U) Adsorption of Pyridine on Silica Gels.

DESCRIPTIVE NOTE: Final rept.

91 8P

JUN 91 58P

PERSONAL AUTHORS: Nikiel, L.; Zerda, T. W.

CONTRACT NO. F49620-90-C-0049

CONTRACT NO. AFOSR-90-0165

PROJECT NO. 3005

PROJECT NO. 3398

TASK NO. A1

TASK NO. A7

MONITOR: AFOSR
TR-91-0685

MONITOR: AFOSR, XF
TR-91-0648, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Netrologic has designed and implemented a system that uses alternative ways of employing methods of artificial intelligence in conjunction with heuristic mathematical models for solving vehicle routing problems and applied them to the Air Force LOGAIR cargo handling systems. The artificial intelligence problem solving techniques involve genetic algorithms and set partitioning algorithms as applied to the LOGAIR vehicle routing problem.

DESCRIPTORS: (U) AIR FORCE, ALGORITHMS, ARTIFICIAL INTELLIGENCE, CARGO HANDLING, GENETICS, HEURISTIC METHODS, MATHEMATICAL MODELS, PROBLEM SOLVING, ROUTING, VEHICLES.

IDENTIFIERS: (U) *Artificial intelligence, *Routing, *Scheduling, Microcomputers.

Availability: Pub. in Jnl. of Physical Chemistry. v95 n10 p4063-4069 1991. Available only to DTIC users. No copies furnished by NTIS.

ABSTRACT: (U) Raman spectra of pyridine adsorbed at silica surface are reported as a function of surface coverage, ranging from a fraction of a monolayer to completely filled pores. It is observed that pyridine is preferentially adsorbed by silica, and it is suggested that the process results in a bilayer structure of the interface. The increased concentration of pyridine in silica pores in comparison with the concentration of pyridine in binary mixtures in the reservoir outside of the sample is reported for mixtures with CC14, CH3NO2, and to a lesser extent, (CH3)2CO and CHCl3.

DESCRIPTORS: (U) ADSORPTION, GELS, LAYERS, MIXTURES, RAMAN SPECTRA, SILICON DIOXIDE, SURFACES.

IDENTIFIERS: (U) Silica, *Sol Gel glass, Silica surface, PE61103F, WUAFOSR3398A7.

AD-A238 755

AD-A238 732

UNCLASSIFIED

PAGE 87

T85002

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 725 11/4 11/2 11/8.1 20/2
20/12 20/3 20/5 20/6

AD-A238 725 CONTINUED

MATERIALS RESEARCH SOCIETY PITTSBURGH PA

Photoconductivity of highly disordered carbon fibers; (16) Defect analysis and defects in semiconductors; (17) Spectroscopy study of hydrogen induced defects; (18) The precipitation of nickel and copper at grain boundaries in silicon; (19) Interfaces and surfaces; (20) Defects in oxide superconductors; and (21) Defect network in superconducting ceramic oxides and ceramic materials studied by neutron and proton irradiation.

(U) Defects in Materials. Materials Research Society Symposium Proceedings, Volume 209.

DESCRIPTIVE NOTE: Final rept. 15 Nov 90-14 Nov 91.

91 947P

PERSONAL AUTHORS: Bristowe, Paul D.; Epperson, J. E.; Griffith, Joseph E.; Lillental-Weber, Zuzanna

CONTRACT NO. AFOSR-91-0088

PROJECT NO. 2305

TASK NO. C1

MONITOR: AFOSR, XF
TR-91-0652, AFOSR

DESCRIPTORS: (U) BOUNDARIES, CARBON FIBERS, CERAMIC MATERIALS, COMPUTERIZED SIMULATION, COPPER, CRYSTALS, DEFECT ANALYSIS, DEFECTS(MATERIALS), DIFFRACTION, DIFFUSION, DOPING, DYNAMICS, ELECTRON MICROSCOPY, ELECTRONICS, GOLD, GRAIN BOUNDARIES, HYDROGEN, IRON, IRRADIATION, MATERIALS, MICROSTRUCTURE, MOLECULAR PROPERTIES, NETWORKS, NICKEL, ORDER DISORDER TRANSFORMATIONS, OXIDES, PHASE, PHASE TRANSFORMATIONS, PHOTOCONDUCTIVITY, POINT DEFECTS, POLYCRYSTALLINE, POLYETHYLENE, PRECIPITATION, PROTONS, SEMICONDUCTORS, SEPARATION, SILICON, SIMULATION, SPECTROSCOPY, SUPERCOMPUTERS, SUPERCONDUCTORS, SURFACES, TRANSMITTANCE, TWIST(MOTION), X RAY DIFFRACTION, X RAY SCATTERING.

UNCLASSIFIED REPORT

IDENTIFIERS: (U) *Defects(Materials), Crystal defects, *Composite materials, *Materials, Crystal lattices, Symposia, Thin films, Pe81102F, WJAFOSR2305C1.

Availability: Materials Research Society, 9800 McKnight Rd., Pittsburgh, PA 15237-6005, PC\$57.00. No copies furnished by DTIC.

SUPPLEMENTARY NOTE: Proceedings of a symposium held in Boston, Massachusetts, 26-29 Nov 90.

ABSTRACT: (U) Partial contents include the following: (1) Characterization and computerized simulation of defects in materials; (2) Structure of grain boundaries in nanophase materials; (3) Polycrystalline materials; (4) Diffraction effects from twist boundaries in gold; (5) Effect of hydrogen on the electronic structure of a grain boundary in iron; (6) Interatomic interactions; (7) X ray scattering from highly distorted lattices undergoing phase separation and phase transformation; (8) microstructure analysis using X ray diffraction and transmission electron microscopy; (9) Peculiar doping behavior of silicon; (10) Molecular dynamics studies of defects in silicon; (11) Molecular dynamics simulation of steps at crystal surfaces; (12) Defect generation and motion in polyethylene like crystals, analyzed by simulation with supercomputers; (13) Point defects and line defects; (14) Diffusion mechanisms; (15)

AD-A238 725

AD-A238 725

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 719 6/5 AD-A238 718 10/2 9/1 20/12

PENNSYLVANIA UNIV PHILADELPHIA DEPT OF CHEMISTRY

TRI-CITIES UNIVERSITY CENTER RICHLAND WA

(U) Photochromic Polyphosphazenes with Spiropyran Units.

(U) Investigation of High Efficiency Monolithic Multibandgap Solar Cells.

91 7P

PERSONAL AUTHORS: Allcock, Harry R.; Kim, Chulhee

DESCRIPTIVE NOTE: Final rept. 15 Nov 88-14 Nov 90.

CONTRACT NO. AFOSR-89-0234

JUN 91 49P

PROJECT NO. 2303

PERSONAL AUTHORS: Olsen, Lawrence

TASK NO. B2

CONTRACT NO. AFOSR-89-0182

MONITOR: AFOSR, XF
TR-91-0649, AFOSR

PROJECT NO. 2301

TASK NO. A7

UNCLASSIFIED REPORT

MONITOR: AFOSR, XF
TR-91-0653, AFOSR

ABSTRACT: (U) Photochromic spiroopyrans were linked to polyphosphazenes through diethyleneoxy or triethyleneoxy spacer units. The reversion of photogenerated merocyanine groups to spiroopyran units in these polymers in various solvents or in the solid state was investigated. The reversion rate in the polymeric solid state was much slower than in solution. In solution the rate decreased as the solvent polarity decreased. A phosphazene polymer with spiroopyran units as the only side groups present showed a slower merocyanine to spiroopyran reversion rate than did a mixed-substituent polyphosphazene with a lower loading of the chromophores. Presumably this is a consequence of steric effects. A polymer with spiroopyran units linked via diethyleneoxy spacer groups underwent the merocyanine to spiroopyran reversion at a slower rate than did a polymer with the spiroopyran units connected through a triethyleneoxy spacer unit. Unlike the behavior of the free small-molecule spiroopyran, the merocyanine relaxation in the polymeric species showed deviations from a first-order relationship in solution and in the solid state.

DESCRIPTORS: (U) , CHROMOPHORES, CYANINE, LINKAGES, MERCURY COMPOUNDS, PHOSPHAZENE, PHOTOCROMIC MATERIALS, POLARITY, POLYMERS, RELAXATION, SIDES, SOLVENTS, SPACERS.

IDENTIFIERS: (U) Polymers, *Phosphazenes, *Photochromic, Synthesis, WUAFOSR230382, PE61102F.

UNCLASSIFIED REPORT

ABSTRACT: (U) This program concerned investigations of multibandgap solar cell structures with potential efficiencies greater than 40%. The basic concept utilized a monolithic stack of three or more cells based on Aluminum Gallium Arsenide and Indium Gallium Arsenide ternary compounds. In particular, the planned work for the two-year program was to involve research related to a three-cell stack comprised of a top Al_{0.37}Ga_{0.63}As cell, a middle Gallium arsenide cell and a bottom In_{0.3}Ga_{0.7}As cell. Efforts first concentrated on GaAs cell growth and fabrication, and then on AlGaAs film growth. Although significant progress was made in the development of AlGaAs film growth, efforts to grow InGaAs films and solar cells were not initiated. GaAs solar cells were fabricated from epi-wafers grown at WSU Tri-Cities. The cells had a p/n structure with Gold metallization and silicon monoxide anti-reflection coatings. Cells exhibited AM1.5 efficiencies greater than 21%. Studies of AlGaAs included development of procedures for growth of films of known aluminum concentration and measurement of minority carrier properties. The minority carrier diffusion length was found to be 0.6 micrometers for AlGaAs with a composition corresponding to 10% aluminum. Films with larger amounts of Al exhibited much lower values of diffusion length. Studies were conducted which determined that oxygen impurity levels in the AlGaAs were

AD-A238 719

AD-A238 718

UNCLASSIFIED

PAGE 89

TR5002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 718 CONTINUED

AD-A238 711 6/1

degrading minority carrier properties.

DESCRIPTORS: (U) ALUMINUM, ALUMINUM GALLIUM ARSENIDES, ANTIREFLECTION COATINGS, CELLS, CELLS(BIOLOGY), CHARGE CARRIERS, CONCENTRATION(COMPOSITION), DIFFUSION, EFFICIENCY, FILMS, GALLIUM ARSENIDES, GOLD, GROWTH(GENERAL), HIGH RATE, IMPURITIES, LENGTH, LEVEL(QUANTITY), METALLIZING, MONOLITHIC STRUCTURES(ELECTRONICS), MONOXIDES, OXYGEN, SILICON COATINGS, SOLAR CELLS, STACKING, STRUCTURES, VALUE.

IDENTIFIERS: (U) *Solar cells, P Type semiconductors, N Type semiconductors, Wafers, WUAFOSR2301A7, PE81102F.

SAN FRANCISCO STATE UNIV TIBURON CA TIBURON CENTER FOR ENVIRONMENTAL STUDIES

(U) Cellular Regulation of ADP-Ribosylation of Proteins. 4. Conversion of Poly(ADP-Ribose) Polymerase Activity to NAD-Glycohydrolase during Retinoic Acid-Induced Differentiation of HL60 Cells.

91 9P

PERSONAL AUTHORS: Kirsten, Eva; Bauer, Pal I.; Kun, Ernest

CONTRACT NO. AFOSR-89-0231

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR, XF TR-91-0650, AFOSR

UNCLASSIFIED REPORT

Availability: Pub. in Experimental Cell Research, v194 p1-8, 1991. Available to DTIC users only. No copies furnished by NTIS.

ABSTRACT: (U) Two enzymatic activities of the nuclear enzyme poly(ADP-ribose) polymerase or transferase (ADPRT, EC2.4.2.30), a DNA-associating abundant nuclear protein with multiple molecular activities, have been determined in HL60 cells prior to and after their exposure to 1 micromole retinoic acid, which results in the induction of differentiation to mature granulocytes in 4-5 days. The cellular concentration of immunoreactive ADPRT protein molecules in differentiation granulocytes remained unchanged compared to that in HL60 cells prior to retinoic acid addition as did the apparent activity of poly(ADP-ribose) glycohydrolase of nuclei.

DESCRIPTORS: (U) CELLS, CONTROL, ENZYMES, GRANULOCYTES, MOLECULES, NUCLEI, PROTEINS, TRANSFERASES.

IDENTIFIERS: (U) PE81102F, WUAFOSR2312A5.

AD-A238 718

AD-A238 711

UNCLASSIFIED

PAGE 90

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 706 CONTINUED

AD-A238 706 20/14 3/2

ALABAMA UNIV IN HUNTSVILLE DEPT OF MECHANICAL ENGINEERING
(U) A Study of Coronal-Interplanetary Coupling Mechanisms.

STORMS, MAGNETOSPHERE, MOTION, PATHS, PHOTOSPHERE,
PHYSICAL PROPERTIES, PLASMAS(PHYSICS), PREDICTIONS,
PROPAGATION, RELEASE, SHEAR PROPERTIES, SHOCK WAVES,
SOLAR FLARES, SUN, TRACKING.

DESCRIPTIVE NOTE: Final rept. 1 Nov 87-31 Mar 91.

IDENTIFIERS: (U) Radio interference, Solar flares,
PE81102F, WJAFOSR2311A1.

APR 91 288P

PERSONAL AUTHORS: WJ, S. T.

REPORT NO. CSPAR531791WU

CONTRACT NO. AFOSR-88-0013

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR, XF
TR-19-0842, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) It is understood that the operations of military, as well as civilian, satellite and systems for communications, tracking and surveillance can be interrupted, degraded or even endangered as a result of powerful explosions on the surface of the sun called solar flares. These spectacular eruptions release shock waves, hot plasma clouds, highly accelerated atomic nuclei and burst of x-rays, ultra-violet and visible-band electromagnetic radiation into interplanetary space. When the path of propagation of these high-energy emissions intersects the Earth's magnetosphere, our terrestrial environment is impacted in various ways that may produce deleterious effects on military systems, both on the ground and in space. This investigation conducted a theoretical study of the dynamics of coronal-interplanetary coupling. It was demonstrated that photospheric shear motion could be a viable physical mechanism to understand the occurrence of solar flares. This study has laid the groundwork for solar flare prediction and their consequences on the geomagnetic storm.

DESCRIPTORS: (U) CLOUDS, DYNAMICS, EARTH(PLANET), EMISSION, ENVIRONMENTS, EXPLOSIONS, GEOMAGNETISM, HIGH ENERGY, HIGH TEMPERATURE, INTERPLANETARY SPACE, MAGNETIC

AD-A238 706

AD-A238 706

UNCLASSIFIED

PAGE 91

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 701 20/10

AD-A238 701 CONTINUED

CALIFORNIA UNIV SANTA BARBARA DEPT OF ELECTRICAL AND
COMPUTER ENGINEERING

MODULATORS, OPTICAL PROPERTIES, QUANTUM THEORY, RATIOS,
STRUCTURES, SYMMETRY, TRANSFER FUNCTIONS.

(U) Efficient Optical Logic, Interconnections and
Processing Using Quantum Confined Structures.

IDENTIFIERS: (U) WUAFOSR230584, *Light modulators,
Quantum wells, AFPM(Asymmetric Fabry Perot Modulators).

DESCRIPTIVE NOTE: Annual rept. 30 Sep 89-31 Mar 91.

MAY 91 55P

PERSONAL AUTHORS: Coldren, L. A.; Gossard, A. C.; Simes,
R. J.; Yan, R. H.; Law, K. K.

REPORT NO. ECE-TR-91-11

CONTRACT NO. AFOSR-89-0549

PROJECT NO. 2305

TASK NO. 84

MONITOR: AFOSR, XF
TR-91-0682, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The work has been strongly focused on the development of high-efficiency surface-normal Fabry-Perot cavity modulators in particular the asymmetric Fabry-Perot modulator (AFPM). In contrast to the high-finesse, refractive index-tuned, symmetric cavity type of modulator (SFPM), on which we first reported under contract 85-0323, the AFPM utilizes the electroabsorptive properties of the intra-cavity medium- normally a GaAs-AlGa multiple quantum well structure- to balance the initially unbalanced (asymmetric) mirrors of a low-finesse cavity, thus making it possible to achieve high contrast ratio, very efficient transfer function with low operating voltage, low insertion loss and, importantly, significantly wider optical bandwidth for the SFPM. During this period we made one of the initial demonstrations of the AFPM, where we achieved a contrast ratio of 22:1 in reflection, at a d.c. operating voltage of 11V, and with only 3.7dB insertion loss.

DESCRIPTORS: (U) ASYMMETRY, BANDWIDTH, CAVITIES,
CONFINEMENT(GENERAL), CONTRAST, EFFICIENCY, FABRY PEROT
INTERFEROMETERS, INSERTION LOSS, LOGIC, LOW LOSS, MIRRORS,

AD-A238 701

AD-A238 701

UNCLASSIFIED

PAGE 92

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 686 7/2 11/6.1 11/6.2 21/5
UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

AD-A238 686 CONTINUED
active slip systems and strain compatibility in polycrystals.

(U) Fatigue and Fracture of Intermetallic Alloys.

DESCRIPTORS: (U) AIRCRAFT ENGINES, ALUMINUM, ALUMINUM ALLOYS, ALUMINUM OXIDES, COMBUSTION, COPPER, CRYSTAL STRUCTURE, FILMS, FRACTURE(MECHANICS), GAS TURBINES, HIGH TEMPERATURE, IDENTIFICATION SYSTEMS, INTERMETALLIC COMPOUNDS, IRON, MATERIALS, MECHANICAL PROPERTIES, NICKEL, NICKEL ALLOYS, OXIDATION, OXIDATION RESISTANCE, PHASE TRANSFORMATIONS, PROCESSING, RATIOS, SUPERALLOYS, SYMMETRY, TERNARY COMPOUNDS, THERMOMECHANICS, THRUST, TITANIUM, TITANIUM ALLOYS, TRANSITION METALS, WEIGHT.

DESCRIPTIVE NOTE: Annual rept. 1 Apr 90-31 Mar 91.

MAY 91 47P

PERSONAL AUTHORS: Cooper, C. V.; Inoue, H. R.; Giamel, A. F.; Favrow, L. H.

REPORT NO. R81-817992-2

CONTRACT NO. F49620-89-C-0047

PROJECT NO. 2306

TASK NO. A1

MONITOR: AFOSR, XF
TR91-0668, AFOSR

IDENTIFIERS: (U) *Intermetallic compounds.
*Fatigue(Mechanics), *Fracture(Mechanics), Microstructure, Gas turbines, Jet engines, High temperatures, Casting, Hot isostatic pressing, Yield point, Ductility, Brittleness, WUAFOSR2308A1, PE61102F.

UNCLASSIFIED REPORT

ABSTRACT: (U) Future aircraft gas turbine engines will, most likely, utilize hot-section materials based on systems other than nickel-base superalloys. The identification of new systems has been motivated by the quest for higher combustion temperatures to satisfy the need for greater thrust-to-weight ratios and higher operating efficiencies. Among the potential systems is the broad class of materials known as intermetallics. Research and development has gone into the study of based on the titanium/aluminum system, often with the focus on alloy development through ternary compounds and quaternary additions as well as thermomechanical processing. Three ordered compounds based on this binary system have been investigated to varying degrees: titanium alloys/aluminum and aluminum alloys/Because of the tendency to form oxidation protective alumina films and its low density Al3Ti has held particular attraction. Despite its oxidation resistance, Al3Ti has remained understudied. Through the addition of certain ternary transition metals, including iron, copper, or nickel, a phase transition can be induced. Being a crystal structure with higher symmetry over the D022, the L1 sub 2 possesses in mechanical behavior over the ordered tetragonal structure due to the increase in the number of

AD-A238 686

AD-A238 686

UNCLASSIFIED

PAGE 93

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 684 6/5

AD-A238 684 CONTINUED

EYE RESEARCH INST OF RETINA FOUNDATION BOSTON MA

pattern vision, eye movements, visual illusions, color constancy, color vision.

(U) Eye Movements and Spatial Pattern Vision.

DESCRIPTIVE NOTE: Annual rept. 1 May 90-30 Apr 01.

JUL 91 16P

PERSONAL AUTHORS: Arend, Lawrence E.

CONTRACT NO. AFOSR-89-0377

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR, XF
TR-91-0851, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Models of human lightness and color perception must take account of color constancy, a tendency for apparent surface color to be relatively independent of the color and intensity of the illuminating light source. Our observers matched the lightnesses (apparent reflectances) and brightnesses (apparent luminances) of regions in simple and complex achromatic spatial patterns. The data showed that the observers' knowledge of the surface reflectances was unaffected by brightness changes due to varying illuminance. A third perceptual dimension, local brightness contrast, was different from both lightness and brightness. In further experiments we found that moving a patch from a black background to a white background could produce an error of apparent surface color of about 1.5 Munsell Value steps. Similar experiments at mesopic mean luminances revealed that the brightness contrast produced by a fixed luminance contrast declines with mean luminance.

DESCRIPTORS: (U) BACKGROUND, BLACK(COLOR), BRIGHTNESS, COLOR VISION, COLORS, CONTRAST, EYE MOVEMENTS, HUMANS, ILLUMINATION, LIGHT SOURCES, LUMINANCE, MEAN, MODELS, PATTERNS, PERCEPTION, REFLECTANCE, SPATIAL DISTRIBUTION, SURFACES, VISION.

IDENTIFIERS: (U) WJAFOSR2313A5, PE81102F, Spatial

AD-A238 684

AD-A238 684

UNCLASSIFIED

PAGE 94

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 663 6/5

AD-A238 643 11/4

SMITH-KETTLEWELL EYE RESEARCH INST SAN FRANCISCO CA

MASSACHUSETTS UNIV AMHERST DEPT OF POLYMER SCIENCE AND ENGINEERING

(U) Psychophysical Studies of Visual Cortical Function.

(U) Phase Transformations, Ultrastructure and Properties of Rigid-Rod Polymers.

DESCRIPTIVE NOTE: Final technical rept. 1 Sep 88-31 Dec 90.

DESCRIPTIVE NOTE: Final rept. 1 Jun 89-30 Nov 90.

JUN 91 4P

MAY 91 9P

PERSONAL AUTHORS: Nakayama, Ken

PERSONAL AUTHORS: Thomas, Edwin L.

CONTRACT NO. AFOSR-88-0328

CONTRACT NO. F49620-89-C-0073

PROJECT NO. 2313

PROJECT NO. 2303

TASK NO. A5

TASK NO. A3

MONITOR: AFOSR, XF

MONITOR: AFOSR, XF

TR-91-0639, AFOSR

TR-91-0666, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Our work explored a variety of research areas, all directed towards obtaining an understanding of visual cortical function using psychophysical techniques. In particular, we examined visual search, visual attention, the encoding of occluding surfaces, and color filling-in. With respect to visual search, we found a new unexpected relation between distractor number and reaction time, showing that for particular tasks, performance improved when distractor number increased. With respect to visual attention we obtained new information to support the specific hypothesis which proposed that express saccades were due to a rapid disengagement of attention from the fixation. With respect to occluded surfaces, we provided a new theoretical framework to understand the large number of new results collected, suggesting the generic view principle. Finally, with respect to color filling-in, we found evidence that such a hypothetical process can be interrupted after the presentation of a stimulus and we evaluated its spatio-temporal time course.

DESCRIPTORS: (U) ; HYPOTHESES, PSYCHOPHYSICS, REACTION TIME, SEARCHING, VISUAL PERCEPTION.

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A5.

AD-A238 663

UNCLASSIFIED

ABSTRACT: (U) The structure and properties of PBZT and P80 fibers and films depend critically in the detailed processing. Investigation of the coagulation process is of significant interest this is where the initial solid state polymer structure forms and the starting point from which all other post treatment microstructures evolve. Research under F49620-89-C-0073 has concerned an analysis of crystal solvates in a PBZT/PPA/water system, a general geometrical classification scheme for grain boundaries in PBZT, the analysis of compressive strength of PBZT/PEEK film laminates after sol-gel microcomposite processing, a morphological study of kink bands in PBZT and PBZ0 fibers to determine the cause of the relative weakness of the fibers in compression, and a microstructural examination of PBZ0 fibers as a function of heat treatment processing.

DESCRIPTORS: (U) ; BANDS(STRIPS), CLASSIFICATION, COAGULATION, COMPRESSIVE PROPERTIES, CRYSTALS, FILMS, GEOMETRY, GRAIN BOUNDARIES, HEAT TREATMENT, LAMINATES, MICROSTRUCTURE, MORPHOLOGY, PHASE TRANSFORMATIONS, PROCESSING, SOLVATES, STRENGTH(MECHANICS), WATER SUPPLIES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3

IAC NO. PL-055374

AD-A238 643

PAGE 95

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 643 CONTINUED

AD-A238 642 9/1

PHYSICAL OPTICS CORP TORRANCE CA

IAC DOCUMENT TYPE: PLASTIC - MICROFICHE --

IAC SUBJECT TERMS: P--(U)SOLVENT EFFECTS, HEAT TREATMENT EFFECTS, PHASE TRANSFORMATION, MORPHOLOGY, POLYBENZOTHIAZOLES, COMPRESSION STRENGTH, FIBERS, CRYSTALLINITY, SEM, X RAY SCATTERING, POLYPHENYLENES, KINKING, POLYBENZOXAZOLES, MICROSTRUCTURE, AZOLES, PEEK, COMPOSITES, STRENGTH RETENTION, LAMINATES, TENSILE STRENGTH, ZZ UNLIMITED.:

(U) An Optically Activated Modulator and GaAs-GaAlAs Compound Semiconductor Channel Waveguide.

DESCRIPTIVE NOTE: Final rep. 1 Sep90-30 Apr 91.

APR 91 53P

PERSONAL AUTHORS: Chen, Ray

CONTRACT NO. F49620-90-C-0088

PROJECT NO. 1602

TASK NO. F1

MONITOR: AFOSR, XF
TR-91-0864, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) We proposed and then developed for the first time an optically activated modulator (OAM) and modulator array on GaAs-GaAlAs compound semiconductor channel waveguides. A channel waveguide device with an optical activation window of 5 μm in diameter was fabricated. Optical activation was produced by using HeNe 631.8 nm wavelength as the free-carrier generator and a 1.3 μm laser as the signal carrier. Thirty-three percent modulation depth was observed and 10-2 index modulation was experimentally confirmed on an OAM working in the phase modulation regime. OAMs working in both phase- and cutoff-modulation regimes were theoretically determined by considering the fluctuation of the waveguide confinement factor. 8.2dB modulation depth was observed on an OAM working at the cutoff regime. Furthermore, the activation source is in the mW power region which significantly reduces the size and cost of all optical switching devices.

DESCRIPTORS: (U) , ACTIVATION, ARRAYS, CHANNELS, CONFINEMENT(GENERAL), COSTS, DEPTH, LASERS, MODULATION, MODULATORS, OPTICAL EQUIPMENT, OPTICAL PROPERTIES, OPTICAL SWITCHING, PHASE MODULATION, POWER, REGIONS, SIGNALS, SOURCES, WAVEGUIDES, WINDOWS.

IDENTIFIERS: (U) WJAFOSR1602F1.

AD-A238 643

AD-A238 642

UNCLASSIFIED

PAGE 98

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 841 15/5

AD-A238 615 20/5

DREXEL UNIV PHILADELPHIA PA

PITTSBURGH UNIV PA

(U) Optimal Maintenance Strategies for Repairable Systems with General Degree of Repair.

(U) A Systems Theoretic Investigation of Neuronal Network Properties of the Hippocampal Formation.

DESCRIPTIVE NOTE: Final rept. 1 Apr-30 Sep 90.

DESCRIPTIVE NOTE: Annual rept. 1 Dec 89-30 Nov 90.

SEP 90 11P

JUL 91 21P

PERSONAL AUTHORS: Zuckerman, Dror

PERSONAL AUTHORS: Berger, Theodore W.

CONTRACT NO. AFOSR-91-0669

CONTRACT NO. AFOSR-89-0197

PROJECT NO. 2304

PROJECT NO. 2312

TASK NO. A5

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0689, AFOSR

MONITOR: AFOSR, XF
TR-91-0672, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Our project focuses on a single unit system which is subject to random failure. The age of the system in service is maintained as a control variable. Upon failure, an age-dependent maintenance action specifying the degree of repair is taken by a controller. By employing analytical tools and numerical procedures, we investigate and characterize the structures of the optimal repair policy under a discounted cost optimality criterion. Special analytical and numerical effort is directed throughout the study for the development of efficient computational procedures for the optimal strategy.

DESCRIPTORS: (U) . COMPUTATIONS, COSTS, EFFICIENCY, FAILURE, MAINTENANCE, MATHEMATICAL ANALYSIS, NUMERICAL METHODS AND PROCEDURES, OPTIMIZATION, POLICIES, REPAIR, STRATEGY.

IDENTIFIERS: (U) *Repair, *Maintenance, Strategic analysis, WUAFOSR2304A5, PEB1102F.

ABSTRACT: (U) The major emphasis during this past year of AFOSR support has been on refining the transputer network as a simulation tool. The structure of the functioning parallel computer system has been expanded to include all of the available transputer elements and the inter-processor communication pathways have been simplified and made more efficient. In addition, the user's interface has been refined to make the simulations a working tool for the experimentalist. Additional efforts were placed on minimizing computational errors inherent in the simulations and in investigating the accuracy of the simulations against alternative complex patterns of stimuli such as doublets and triplets.

DESCRIPTORS: (U) . ACCURACY, CHIPS(ELECTRONICS), COMPUTATIONS, ERRORS, HIPPOCAMPUS, INTERFACES, MICROPROCESSORS, NERVE CELLS, NETWORKS, PARALLEL PROCESSORS, PATTERNS, SIMULATION, SIMULATORS, STIMULI, SUPERCOMPUTERS, THEORY, TOOLS.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2312A1.

AD-A238 841

AD-A238 615

UNCLASSIFIED

PAGE 97

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 614 20/4

AD-A238 608 6/5

FLORIDA INST OF TECH MELBOURNE

SMITH-KETTLEWELL EYE RESEARCH INST SAN FRANCISCO CA

(U) Asymptotic Analysis of the Fully Developed Region of an Incompressible, Free, Turbulent, Round Jet.

(U) Coherence Determines Speed Discrimination.

91 20P

90 12P

PERSONAL AUTHORS: Bush, W. B.; Krishnamurthy, L.

PERSONAL AUTHORS: Welch, Leslie; Browne, Samuel F.

CONTRACT NO. F49820-88-C-0040

CONTRACT NO. AFOSR-89-0035

PROJECT NO. 2304

PROJECT NO. 2313

TASK NO. A3

TASK NO. A9

MONITOR: AFOSR, XF
TR-91-0687, AFOSR

MONITOR: AFOSR, XF
TR-91-0609, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Availability: Pub. in Jnl. of Fluid Mechanisms, v223 p83-111, 1991. Available to DTIC users only. No copies furnished by NTIS.

Availability: Pub. in Perception, v19 p425-435 1990. Available only to DTIC users. No copies furnished by NTIS.

Reprint: Asymptotic Analysis of the Fully Developed Region of an Incompressible, Free, Turbulent, Round Jet.

ABSTRACT: (U) The visual system must determine which elements in a scene to regard as parts of a single object and which to regard as different objects. We can create stimuli that are ambiguous, ie consistent with more than one interpretation, and ask in what situations the stimulus elements are interpreted as part of a single object and when they are interpreted as multiple objects. The ambiguous stimuli in this study were moving plaid patterns--the sum of two drifting gratings with different orientations. Observers may see a rigid coherent plaid object moving in one direction, or may see two gratings moving in different directions sliding over one another. When the gratings have similar contrasts they appear to cohere and only the plaid speed is perceptually available; when the gratings have different contrasts they appear to slide and only the speeds of the gratings are perceived. Coherence thus determines that speed information is passed to higher stages of motion processing.

DESCRIPTORS: (U) *JET FLOW, TURBULENT FLOW, INCOMPRESSIBLE FLOW, AXISYMMETRIC FLOW, NOZZLES, FAR FIELD, BOUNDARY VALUE PROBLEMS, REPRINTS.

IDENTIFIERS: (U) Round jets, Isothermal flow, PE61102F, WUAFOSR2304A3.

DESCRIPTORS: (U) DISCRIMINATION, DRIFT, GRATINGS(SPECTRA), MOTION, ORIENTATION(DIRECTION), PROCESSING, SLIDING, STIMULI, VELOCITY, VISION.

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A9.

AD-A238 614

AD-A238 608

UNCLASSIFIED

PAGE 98

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 807 5/9

AD-A238 608 7/3

SMITH-KETTLEWELL EYE RESEARCH INST SAN FRANCISCO CA

SAN FRANCISCO STATE UNIV TIBURON CA TIBURON CENTER FOR ENVIRONMENTAL STUDIES

(U) Neural Coding of Local and Global Motion.

(U) Apparent Role of Adenosine Diphosphoribosyl Transferase in the Development of Mytilus edulis and the Inhibition of Differentiation by Ligands of the Enzyme Protein.

91 3P

91 6P

PERSONAL AUTHORS: McKee, Suzanne P.

CONTRACT NO. AFOSR-89-0035

PROJECT NO. 2313

PERSONAL AUTHORS: Bauer, Pal I.; Kline, Kurt; Kun, Ernest

TASK NO. A9

CONTRACT NO. AFOSR-89-0231

MONITOR: AFOSR, XF
TR-91-0608, AFOSR

PROJECT NO. 2312

TASK NO. A5

UNCLASSIFIED REPORT

MONITOR: AFOSR, XF
TR-91-0607, AFOSR

Availability: Pub. in Cognitive Neuroscience, V1 n2 p97-98 1991. Available only to DTIC users. No copies furnished by NTIS.

Reprint: Neural Coding of Local and Global Motion.

DESCRIPTORS: (U) *PSYCHOLOGY, *NEURAL NETS, *NEUROCHEMICAL TRANSMISSION, NEUROCHEMICAL CODING, REPRINTS.

IDENTIFIERS: (U) Global motion, PE61102F, WJAFOSR2313A9.

UNCLASSIFIED REPORT

Availability: Pub. in P.S.E.B.M., V198 P386-400 1991. Available only to DTIC users. No copies furnished by NTIS.

ABSTRACT: (U) The poly(ADP-ribose) polymerase or transferase (ADPRT) activity of developing embryos of Mytilus edulis increases with the progression of larval growth. ADPRT protein was partially purified from 2-hr-old embryos and identified by gel electrophoresis and immunotransblot, demonstrating crossed-reactivity with anti-ADPRT IgD produced against the calf thymus enzyme. Two inhibitors of ADPRT, benzamide, competing with NAD at the nicotinamide binding site, and 6-amino-1,2-benzopyrone, which competes with DNA at the DNA binding site(s), both selectively arrest differentiation at the prodissococh stage. The DNA site-oriented inhibitor, 6-amino-1,2-benzopyrone, has a much larger differentiation arresting effect than benzamide. The arrest of differentiation by 6-amino-1,2-benzopyrone is reversible. A probable ecotoxicity of ADPRT ligands on mussel differentiation is proposed.

DESCRIPTORS: (U) , ADENOSINE, AMIDES, ARRESTING GEAR, BENZENE, DEOXYRIBONUCLEIC ACIDS, ELECTROPHORESIS, EMBRYOS, ENZYMES, GELS, INHIBITION, INHIBITORS, LIGANDS, MUSSELS, PROTEINS, SITES, TRANSFERASES.

AD-A238 607

AD-A238 608

UNCLASSIFIED

PAGE 99

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 606 CONTINUED

AD-A238 605 6/5

IDENTIFIERS: (U) PE81102F, WUAFDSR2312A5.

SAN FRANCISCO STATE UNIV TIBURON CA TIBURON CENTER FOR ENVIRONMENTAL STUDIES

(U) Suppression of Dexamethasone-Stimulated DNA Synthesis in an Oncogene Construct Containing Rat Cell Line by a DNA Site-Oriented Ligand of Poly-ADP-Ribose Polymerase: 6-Amino-1,2-Benzopyrone.

91 5P

PERSONAL AUTHORS: Kirsten, Eva; Bauer, Pal I.; Kun, Ernest

CONTRACT NO. AFDSR-89-0231

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR, XF
TR-91-0608, AFOSR

UNCLASSIFIED REPORT

Availability: Pub. in Experimental Cell Research, v193 p1-4 1991. Available only to DTIC users. No copies furnished by NTIS.

ABSTRACT: (U) The cellular inhibitory effects of 6-amino-1,2-benzo-pyrene (6-ABP), a DNA site-specific ligand of adenosine diphosphoribosyl transferase (ADPRT), were determined in a dexamethasone-sensitive EJ-ras gene construct containing cell line (14C cells). Dexamethasone in vitro transforms these cells to a tumorigenic phenotype and also stimulates cell replication. At a nontoxic concentration (0.2 nM) 6-ABP treatment of intact cells for 4 days inhibits the dexamethasone stimulated increment of cellular DNA content, depresses replicative DNA synthesis as assayed by thymidine incorporation to the level of cells that were not exposed to dexamethasone, and in permeabilized cells reduces the dexamethasone-stimulated increase of deoxyribonucleotide incorporation into DNA to the level of untreated cells.

DESCRIPTORS: (U) ADENOSINE, BIOSYNTHESIS, CELLS, CELLS(BIOLOGY), DEOXYRIBONUCLEIC ACIDS, INHIBITION, RATS, TRANSFERASES.

AD-A238 606

AD-A238 605

UNCLASSIFIED

PAGE 100

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 605 CONTINUED

AD-A238 604 7/4

IDENTIFIERS: (U) PE81102F, WUAFOSR2312A5.

RENSELAER POLYTECHNIC INST TROY NY DEPT OF CHEMISTRY

(U) N,N'-Bis(triethylaluminio)ethylenediamine- and N,N'-Bis(trimethylaluminio)ethylenediamine-Derived Organometallic Precursors to Aluminum Nitride: Syntheses, Structures, and Pyrolyses.

90 9P

PERSONAL AUTHORS: JIANG, ZHIPING; INTERRANTE, L. V.

CONTRACT NO. AFOSR-89-0439

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0825, AFOSR

UNCLASSIFIED REPORT

Availability: Pub. in Chemistry of Materials, v2 n4 p439-448 1990. Available only to DTIC users. No copies furnished by NTIS.

ABSTRACT: (U) The reactions of triethylaluminum or trimethylaluminum with ethylenediamine (en) in a 2:1 molar ratio have been studied. Pyrolysis of the initially formed adducts under nitrogen yields polymeric amides and imides. Evidence was also obtained for the formation of novel en-chelated organoaluminum intermediates during the conversion of the adducts to the amides. The structures and properties of the adducts, as well as their pyrolysis products, have been studied with ¹H and ¹³C NMR, FT-IR, GC, DSC, TGA, elemental analysis, and XRD methods. AIN powder has been obtained by the pyrolysis of the imides at 1000 C in NH₃. Preliminary studies were also carried out on the fabrication of AIN thin films on Si substrates by solution coating, using a solution of the bis(diethylaluminio)ethylenediamine in benzene, followed by pyrolysis under NH₃.

DESCRIPTORS: (U) ALUMINUM COMPOUNDS, AMIDES, BENZENE, COATINGS, ETHYLENEDIAMINE, IMIDES, NITRIDES, NITROGEN, POLYMERS, PYROLYSIS, SOLUTIONS(GENERAL), SUBSTRATES, TRIETHYLALUMINUM, YIELD.

AD-A238 605

AD-A238 604

UNCLASSIFIED

PAGE 101

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 604 CONTINUED

AD-A238 602 11/6

IDENTIFIERS: (U) PEG1102F, WJAFOSR2303A3, *Aluminum nitride, *Organometallic precursor, Ethylenediamine A1N coating.

EPIR LTD OAKBROOK IL

(U) Evaluation of the Feasibility and the Cost of HgCdTe Epitaxial Layers Grown by Molecular Beam Epitaxy on CdTe, CdZnTe and GaAs Substrates.

DESCRIPTIVE NOTE: Final rept. 15 Jul 90-14 Jan 91.

JAN 91 19P

PERSONAL AUTHORS: Faurie, Jean-Pierre

CONTRACT NO. F49620-90-C-0062

MONITOR: AFOSR, XF
TR-91-0578, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) In this contract which has been awarded to EPIR Ltd. two tasks were assigned. The first one was related to the evaluation of the cost Mercury Cadmium Tellurium epitaxial layers grown by Molecular Beam Epitaxy (MBE) on various substrates. The substrates which were supposed to be considered are Cadmium Telluride, CdZnTe and Gallium Arsenic. In addition, EPIR has also analyzed the cost on silicon substrates since Si is currently considered to be the most important substrates for IR photodiode technology. The second task was related to the feasibility of growing a few HgCdTe epilayers by MBE with at least one exhibiting standard specifications.

DESCRIPTORS: (U) CADMIUM TELLURIDES, COSTS, EPITAXIAL GROWTH, FEASIBILITY STUDIES, GALLIUM, GALLIUM ARSENIDES, GROWTH(GENERAL), LAYERS, MERCURY COMPOUNDS, MILITARY FACILITIES, MOLECULAR BEAMS, ORDNANCE, PHOTODIODES, SILICON, SPECIFICATIONS, SUBSTRATES.

AD-A238 604

AD-A238 602

UNCLASSIFIED

PAGE 102

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 601 12/4

AD-A238 574 25/5

STATE UNIV OF NEW YORK AT ALBANY DEPT OF COMPUTER SCIENCE

RUTGERS - THE STATE UNIV NEW BRUNSWICK NJ

(U) A Workshop on the Integration of Numerical and Symbolic Computing Methods Held in Saratoga Springs, New York on July 9-11, 1990.

(U) Feasibility Study of Developing a Meaningful and Implementable Methodology for Assessing JTC3A Effectiveness.

DESCRIPTIVE NOTE: Final rept. May 90-Apr 91.

DESCRIPTIVE NOTE: Final rept. 1 Jun 90-1 Jan 91.

APR 91 10P

DEC 90 31P

PERSONAL AUTHORS: Kapur, Deepak

PERSONAL AUTHORS: Avi-Itzhak, Benjamin; Hansen, Pierre

PROJECT NO. 2304

CONTRACT NO. AFOSR-90-0291

TASK NO. A2

PROJECT NO. 2581

MONITOR: AFOSR, XF
TR-91-0556, AFOSR

TASK NO. 00

MONITOR: AFOSR, XF
TR-91-0858, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) A workshop on the integration of symbolic and numerical computing methods was held on July 9 to 11, 1990 in Saratoga Springs, New York. The workshop was supported by a grant from the Air Force Office of Scientific Research and the National Science Foundation along with partial funding from G.E. Corporate Research and Development, and the State University of New York at Albany. The workshop was hosted by the Institute of Programming and Logics, the State University of New York at Albany. Twenty five research papers on symbolic methods, numerical methods, interface between symbolic and numerical methods, applications of symbolic methods in machine vision, robotics, computer aided design, computational geometry, and related topics were presented. Over forty researchers and students participated in the workshop.

DESCRIPTORS: (U) COMPUTATIONS, COMPUTER AIDED DESIGN, CORPORATIONS, GEOMETRY, INTEGRATION, LOGIC, NEW YORK, NUMERICAL ANALYSIS, NUMERICAL METHODS AND PROCEDURES, ROBOTICS, STUDENTS, SYMBOLS, WORKSHOPS.

IDENTIFIERS: (U) *Computations, *Mathematical models, Workshop, PE81102F, WUAFOSR2304A2.

DESCRIPTORS: (U) *COMMAND AND CONTROL SYSTEMS, FEASIBILITY STUDIES, COMMAND GUIDANCE, LOGISTICS, FEDERAL BUDGETS, MILITARY REQUIREMENTS.

IDENTIFIERS: (U) WUAFOSR258100, PE28045K.

AD-A238 601

AD-A238 574

UNCLASSIFIED

PAGE 103

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 573 6/5

AD-A238 573 CONTINUED

GEORGIA UNIV ATHENS DEPT OF PHARMACOLOGY AND TOXICOLOGY

LEVEL(QUANTITY), LOW LEVEL, MEDIA, OILS, ORGANIC MATERIALS, PEAK VALUES, TOXICITY, TRICHLOROETHYLENE, VEHICLES, VOLATILITY, WATER SUPPLIES.

(U) Bioavailability of Volatile Organics and Other Hydrocarbons from Environmental Media: Ingestion in Drinking Water.

IDENTIFIERS: (U) WUAFOSR2312A4, PE81102F, Absorption, *Metabolism, Bioavailability, Pharmacokinetics, Hepatic elimination, Pulmonary elimination, Volatile organic chemicals (VOCs), Dosage vehicles, *Drinking water.

DESCRIPTIVE NOTE: Annual rept. no. 2, 15 Sep 89-14 Nov 90,

NOV 90 14P

PERSONAL AUTHORS: Bruckner, J. V.; Manning, R. O.; Gallo, J. M.; Dallas, C. E.

CONTRACT NO. AFOSR-88-0277

PROJECT NO. 2312

TASK NO. A4

MONITOR: AFOSR, XF
TR-91-0660, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The primary objectives of this project are to: (1) assess the roles of hepatic and pulmonary presystemic elimination in reducing the bioavailability of low levels of volatile organic chemicals (VOCs) found in drinking water supplies; (2) investigate gastrointestinal (GI) absorption pathways for VOCs; (3) characterize the influence of oil dosage vehicles on the absorption, pharmacokinetics (PK) and toxicity of VOCs, with emphasis on potential mechanisms by which corn oil acts. Substantial progress has been made during the first 2 years of the grant towards achieving each of these objectives. Studies in unanesthetized, freely-moving rats, contrasting the PK of equal doses of VOCs given orally as a single bolus and by constant intragastric (ig) infusion for up to 6 hours, revealed significantly lower peak blood levels and bioavailability in the ig groups. Blood concentrations of well metabolized VOCs, such as trichloroethylene (TCE) and 1,1-dichloroethylene, were so low that they were hardly detectable at low dosage levels in the ig animals.

DESCRIPTORS: (U) , ABSORPTION, ANIMALS, BLOOD, BLOOD VOLUME, CHEMICALS, CONCENTRATION(CHEMISTRY), CORN, DOSAGE, DRINKING WATER, ENVIRONMENTS, HYDROCARBONS,

AD-A238 573

AD-A238 573

UNCLASSIFIED

PAGE 104

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 322 CONTINUED

AD-A238 322 12/3

COMPUTATIONAL MECHANICS CO INC AUSTIN TX

(U) Non-Algorithmic Issues in Automated Computational Mechanics.

environment, based on full coupling of h-p adaptive finite element program with expert systems technology. Several examples of automated decision making in finite element analysis prove the feasibility and great practical potential of automated environments for design of aerospace structures. Based on the studies performed in the project, directions of further research and development in this area were identified.

DESCRIPTIVE NOTE: Final rept. 1 Mar 89-18 Feb 91.

APR 91 180P

PERSONAL AUTHORS: Tworzydlo, W. W.; Oden, J. T.; Bass, J. M.; Combs, J.; Sheik, S.

REPORT NO. TR-91-09

CONTRACT NO. F49620-89-C-0015

PROJECT NO. 2302

TASK NO. B1

MONITOR: AFOSR
TR-91-0603

DESCRIPTORS: (U) ADAPTIVE SYSTEMS, AEROSPACE CRAFT, ALGORITHMS, AUTOMATIC, AUTOMATION, COMPUTATIONS, COMPUTERS, COUPLING(INTERACTION), DECISION MAKING, ENGINEERING, ENVIRONMENTS, EXPERT SYSTEMS, FEASIBILITY STUDIES, FINITE ELEMENT ANALYSIS, HEURISTIC METHODS, KNOWLEDGE BASED SYSTEMS, MECHANICS, MODELS, MONITORING, QUALITY ASSURANCE, SELECTION, STRATEGY.

IDENTIFIERS: (U) WUAF05R2302B1, PE81102F, *Statistical mechanics, *Computations.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates: All DTIC reproductions will be in black and white.

ABSTRACT: (U) The general goal of the project was to study the feasibility of the development of an automatic environment for engineering design of aerospace structures, in particular for their analysis by the finite element method. Of particular interest were non-algorithmic issues related to automated decision making based on heuristics and expertise. In the first phase of work, the types of knowledge and decisions involved in the design process were studied, and computer technologies best suited for their automation were evaluated. These technologies include algorithmic procedures, knowledge based expert systems, neural networks, knowledge acquisition systems, etc. The main thrust of research in the project was focused on the development and extension of concepts related to automated computational mechanics, such as adaptive computational techniques, automated model and strategy selection, automated performance monitoring and quality assurance for the finite element analysis. These methods were implemented in an automated computational

AD-A238 322

AD-A238 322

UNCLASSIFIED

PAGE 105

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 289 CONTINUED

CENTER FOR ADVANCED CEMENT-BASED MATERIALS EVANSTON IL

MATERIALS, DAMAGE, FRACTURE(MECHANICS), ILLINOIS,
INFORMATION EXCHANGE, MATERIALS, MICROSCOPY,
MICROSTRUCTURE, NONDESTRUCTIVE TESTING, NONLINEAR
ANALYSIS, OBSERVATION, THEORY, TOUGHNESS.

(U) Workshop Proceedings: Toughening Mechanisms in Quasi-
Brittle Materials Held on 18-20 July 1990 in Evanston,
Illinois.

IDENTIFIERS: (U) PE81102F, WUAFOSR2302C2.

DESCRIPTIVE NOTE: Final rept. 15 Jul-1 Nov 90.

IAC NO. NT-45048

MAY 91 569P

PERSONAL AUTHORS: Shah, Surendra P.

IAC DOCUMENT TYPE: NTIAC - MICROFICHE --

CONTRACT NO. AFOSR-90-0290

IAC SUBJECT TERMS: N--(U) CEMENTS, CERAMIC MATERIALS,
ROCKS, FRACTURE MECHANICS, BRITTLENESS, ELASTIC WAVES,
WAVE VELOCITY, ACOUSTIC EMISSIONS, HOLOGRAPHY,
INTERFEROMETRIC HOLOGRAPHY, TEST METHODS, TOUGHNESS.;

PROJECT NO. 2302

TASK NO. C2

MONITOR: AFOSR, XF
TR-91-0546, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Recently, considerable interest has been developing in understanding and modeling the fracture processes in these quasi-brittle materials as well as in designing materials with improved toughness. The research activities in these groups of materials: ceramics, cement and rock can be substantially enhanced with the exchange of information between these three groups of investigators. Since the field is relatively new, it is likely that the researchers working with one set of materials are not aware of similar developments with other set of materials. Although each material has its own set of specific characteristics, many common aspects can be shared among these quasi-brittle materials. These include: (1) application of nonlinear fracture mechanics, (2) experimental and theoretical considerations of strain localization, (3) microscopic observation of fracture process zone, (4) nondestructive evaluation of damage, (5) models to relate microstructure with macroscopic response, and (6) development of experimental and theoretical tools. The purpose of this workshop was to bring together researchers addressing the problem of fracture in cement, ceramics, and rock so that they can share their knowledge and develop a more general syntheses of the problem.

DESCRIPTORS: (U) , BRITTLENESS, CEMENTS, CERAMIC

AD-A238 289

AD-A238 289

UNCLASSIFIED

PAGE 106

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002
AD-A238 261 8/7

ROCKWELL INTERNATIONAL THOUSAND OAKS CA SCIENCE CENTER
NATIONAL RESEARCH COUNCIL WASHINGTON DC COMMISSION ON
ENGINEERING AND TECHNICAL SYSTEMS

(U) Numerical Methods for Scattering from Electrically
Large Objects.
(U) The Geotechnical Board, National Research Council
Activities Report.

DESCRIPTIVE NOTE: Final rept. 1 Apr 89-31 Mar 91.
MAY 91 92P

PERSONAL AUTHORS: Engquist, Bjorn; Murphy, W. D.; Rokhlin,
Vladimir; Vassiliou, Marius S.

REPORT NO. SC71004.FR

CONTRACT NO. F48620-89-C-0048

PROJECT NO. 2304

TASK NO. A9

MONITOR: AFOSR, XF
TR-91-0612, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) A new and computationally very efficient
integral equation numerical method for computing
electromagnetic scattering and Radar Cross Section (RCS)
was developed. A theory of higher order impedance
boundary conditions was derived to handle single and
multiple dielectric coatings around conductors. The
method was tested in two dimensions using a 14,000-line
FORTRAN program and was found to be very promising for
electrically large objects. Initial ideas for extensions
to three dimensions were explored. Treatments of trailing
edge and corner singularities were developed.

DESCRIPTORS: (U) ADAPTERS, ELECTRICAL PROPERTIES,
ELECTROMAGNETIC SCATTERING, NUMERICAL METHODS AND
PROCEDURES, RADAR CROSS SECTIONS, SCATTERING, TRAILING
EDGES.

IDENTIFIERS: (U) *Integral equations, *Computations,
*Radar cross sections, *Electromagnetic scattering,
WJAFORR2304A9, PE61102F.

AD-A238 262

UNCLASSIFIED

AD-A238 261

PAGE 107

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 280 CONTINUED

AD-A238 280 7/4

OREGON STATE UNIV CORVALLIS DEPT OF ELECTRICAL AND
COMPUTER ENGINEERING

IDENTIFIERS: (U) WUAFOSR2306B1, PE61102F.

(U) Atomic Approaches to Defect Thermochemistry.

DESCRIPTIVE NOTE: Annual technical rept. 1 Apr 90-31 Mar
91.

APR 91 15P

PERSONAL AUTHORS: Van Vechten, James A.; Wager, John F.

CONTRACT NO. AFOSR-89-0309

PROJECT NO. 2306

TASK NO. B1

MONITOR: AFOSR, XF
TR-91-0574, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The goal of the research program described herein was to apply atomistic thermodynamic theory, Monte Carlo simulation, and experimental analysis to elucidate the identity of point defects in semiconductors as well as to understand their static and dynamic properties. Significant progress has been made in the following nine areas: (1) Direct simulation of atomic diffusion including the effects of realistic boundary conditions, carrier injection and mis-fit strain, (2) Independent measurement of vacancy concentration and diffusivity, (3) Effects of temperature and strain on band offsets and atomic diffusion, (4) Elimination of DX centers from AlGaAs by optically stimulated dislocation climb, (5) Proper analysis of the capacitance-transient due to multiple carrier emission from a highly compensating deep level, (6) C-V analysis and SPICE modeling of ACTFEL devices, (7) DX in AlGaAs, (8) Statistical thermodynamics of ballistic hopping, and (9) Energetics of self-diffusion in GaAs.

DESCRIPTORS: (U) ATOMIC PROPERTIES, BOUNDARIES, COMPENSATION, DIFFUSION, DIFFUSION COEFFICIENT, DYNAMICS, EMISSION, ENERGETIC PROPERTIES, INJECTION, MEASUREMENT, MONTE CARLO METHOD, SEMICONDUCTORS, SIMULATION, STATISTICS, THEORY, THERMOCHEMISTRY, THERMODYNAMICS.

AD-A238 260

AD-A238 260

UNCLASSIFIED

PAGE 108

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 256 12/3

AD-A238 235 6/4 5/8

DUKE UNIV DURHAM NC DEPT OF COMPUTER SCIENCE

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF BRAIN AND COGNITIVE SCIENCES

(U) A Hierarchical, Combinatorial-Markov Method of Solving Complex Reliability Models.

86 11P

(U) Top-Down Influences on Bottom-Up Processing.

DESCRIPTIVE NOTE: Annual rept. Sep 89-May 91.

PERSONAL AUTHORS: Sahner, Robin A.; Trivedi, Kisbor S.

MAY 91 6P

CONTRACT NO. AFOSR-84-0132

PERSONAL AUTHORS: Richards, Whitman

PROJECT NO. 2304

CONTRACT NO. AFOSR-89-0504

TASK NO. A5

PROJECT NO. 2313

MONITOR: AFOSR TR-90-0984

TASK NO. A9

MONITOR: AFOSR, XF TR-91-0597, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Availability: Pub. in Proc ACM/IEEE Fall Joint Computer Conference, Dallas, TX 1986 p 817-825. Available only to DTIC users. No copies furnished by NTIS. Document partially illegible.

Reprint: A Hierarchical, Combinatorial-Markov Method of Solving Complex Reliability Models.

DESCRIPTORS: (U) *COMBINATORIAL ANALYSIS, *MATHEMATICAL MODELS, *MARKOV PROCESSES, REPRINTS.

DESCRIPTORS: (U) , REASONING.

IDENTIFIERS: (U) SHARPE(Symbolic Hierarchical Automated Reliability and Performance Evaluation), WUAFOSR2304A5, PE61102F..

IDENTIFIERS: (U) *Vision, *Cognition, Neurophysiology, Visual psychophysics, Dynamical systems, Artificial intelligence, PE61102F, WUAFOSR2313A9.

AD-A238 256

AD-A238 235

UNCLASSIFIED

PAGE 109

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 234

12/5

QUALCOMM INC SAN DIEGO CA

AD-A238 234

CONTINUED

PROBABILITY, TEST AND EVALUATION.

(U) Research in Mathematics and Computer Science:
Calculation of the Probability of Undetected Error for
Certain Error Detection Codes. Phase 2.

IDENTIFIERS: (U) *Error detection codes, *Computer
program reliability, PE61102F, WUAFOSR2304A3.

DESCRIPTIVE NOTE: Final technical rept. 1 Apr 90-31 May
91.

MAY 91

32P

PERSONAL AUTHORS: Viterbi, Andrew J.; Wolf, Jack K.;
Fredrickson, Lyle J.; Levin, Jeff A.; Blakeney, Robert D.

CONTRACT NO. F49620-90-C-0017

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0596, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Cyclic Redundancy Check (CRC) codes have become the standard means for detecting error in messages that have been transmitted over a noisy communications channel. Unfortunately, even the very best CRC codes cannot detect all transmission errors. In this report, we first describes a hardware device capable of evaluating the random error performance of an important class of CRC codes that are generated by polynomials of the form $g(x) = (x+1)p(x)$, where $p(x)$ is a primitive polynomial of degree $(R-1)$. We then introduce a new burst error model and establish an equivalence between the burst and random error performance of cyclic codes. From this, we can extend the random error test results obtained from the hardware device to include burst errors. Also included in this report is an intuitive look at the factors which lead to good code performance, and an overview of a supplemental hardware device to measure the performance of cyclic codes that are generated by arbitrary polynomials.

DESCRIPTORS: (U) BURST TRANSMISSION, CODING,
COMPUTATIONS, COMPUTERS, ERROR DETECTION CODES, ERRORS,
MATHEMATICS, MEASUREMENT, MODELS, POLYNOMIALS.

AD-A238 234

AD-A238 234

UNCLASSIFIED

PAGE 110

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 233 17/4 12/9 12/4

AD-A238 232 8/5

CALIFORNIA INST OF TECH PASADENA DEPT OF ELECTRICAL
ENGINEERING

MEHARRY MEDICAL COLL NASHVILLE TN

(U) Coding for Spread-Spectrum Channels in the Presence of
Jamming.

(U) Transformation and Precipitation of Toxic Metals by
'Pseudomonas maltophilia'

DESCRIPTIVE NOTE: Final technical rept. 1 Jul 88-30 Sep
90.

DESCRIPTIVE NOTE: Annual technical rept. 1 May 90-30 Apr
91.

SEP 90 5P

MAY 91 6P

PERSONAL AUTHORS: McEIliece, Robert J.

PERSONAL AUTHORS: Blake, Robert, III

CONTRACT NO. AFOSR-88-0247

CONTRACT NO. F49620-89-C-0052

PROJECT NO. 2304

PROJECT NO. 2312

TASK NO. B1

TASK NO. A5

MONITOR: AFOSR, XF

MONITOR: AFOSR, XF

TR-91-0618, AFOSR

TR-91-0605, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Multi-user communication systems have been
studied. There are systems in which many simultaneous two-
way conversations have common frequencies. The maximum
number of such conversations can be computed by a fairly
simple linear program. (Author)

ABSTRACT: (U) The aims of this research are to study
each of the various molecular mechanisms whereby toxic
metal cations and oxyanions are chemically transformed by
Pseudomonas maltophilia strain OR-02. The research effort
for the current year has focused on the microbial-
dependent transformations of mercury, selenium, tellurium,
chromium and lead. The NADPH-dependent reduction of Hg(II)
was catalyzed by an inducible mercuric reductase. The
reduction of selenite and tellurite to their insoluble
elemental forms was mediated by an intracellular
glutathione reductase that utilized the spontaneously-
formed bis(glutathio)Se(II) or bis(glutathio)Te(II),
respectively, as pseudosubstrates.

DESCRIPTORS: (U) CHANNELS, CODING, COMMUNICATION AND
RADIO SYSTEMS, FREQUENCY, JAMMING, LINEAR PROGRAMMING,
SPREAD SPECTRUM, USER NEEDS.

IDENTIFIERS: (U) *Spread spectrum techniques. *Jamming.
*Game theory, Noise, Fading, PE81102F, WUAFOSR230481.

DESCRIPTORS: (U) CATIONS, CELLS(BIOLOGY), CHROMIUM,
ENZYMES, GLUTATHIONE, MERCURY, METALS, MOLECULAR
PROPERTIES, PRECIPITATION, SELENIUM, TELLURIUM, TOXICITY.

IDENTIFIERS: (U) PE81102F, WUAFOSR2312A5.

AD-A238 233

AD-A238 232

UNCLASSIFIED

PAGE 111

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 231 20/10 20/5

AD-A238 231 CONTINUED

MARYLAND UNIV COLLEGE PARK INST FOR PHYSICAL SCIENCE AND TECHNOLOGY

COMPUTATIONS, CROSS SECTIONS, DEFECT ANALYSIS, ELECTROMAGNETIC SUSCEPTIBILITY, FREQUENCY, HIGH RATE, HYDROGEN, INTENSITY, INTERACTIONS, LASERS, MODELS, NONLINEAR OPTICS, NONLINEAR SYSTEMS, NUMERICAL ANALYSIS, PERTURBATION THEORY, PHOTOIONIZATION, PHOTONS, POLES(SUPPORTS), QUANTUM EFFICIENCY, QUANTUM THEORY, RANGE(EXTREMES), REFRACTIVE INDEX, RESONANCE, SCHRODINGER EQUATION, SOLUTIONS(GENERAL), TIME DEPENDENCE.

(U) Laser-Atom Interaction at High Intensities.

DESCRIPTIVE NOTE: Final rept. 1 Jan 88-31 Dec 90.

MAY 91 7P

PERSONAL AUTHORS: McIlrath, T. J.; Clark, C. W.

IDENTIFIERS: (U) *Laser target interactions, *Perturbation theory, Multiphoton processer, PEG1102F, WJAFOSR2301A4.

CONTRACT NO. AFOSR-88-0098

PROJECT NO. 2301

TASK NO. A4

MONITOR: AFOSR, XF
TR-91-0593, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) A general program has been developed to calculate multiphoton processes in atomic hydrogen to arbitrarily high order in perturbation theory. This program can be used to calculate quantities in intense field multiphoton processes, such as the generalized cross section of multiphoton absorption, the a.c. Stark effect (shift and the broadening of the level due to the field interaction), and the parameters in nonlinear optics such as the nonlinear index of refraction and the nonlinear susceptibility. Effective parametrization of high-order susceptibilities has been achieved over a wide range of frequencies, utilizing concepts from quantum defect theory to express the results of lengthy calculations in a compact form that also permits extrapolation across thresholds and resonance poles. Significant progress has been made in direct numerical solution of the time-dependent Schroedinger equation. In addition, contributions have been made in: understanding the role of spatial dimensionality in the solution of model systems (e.g., the one-dimensional delta-function potential); the development of a general R-matrix code for perturbative computations of multiphoton processes in many-electron atoms; and multiphoton ionization with two commensurate laser frequencies.

DESCRIPTORS: (U) , ABSORPTION, ATOMIC STRUCTURE.

AD-A238 231

AD-A238 231

UNCLASSIFIED

PAGE 112

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 230 6/5

AD-A238 229 12/1

TRINITY UNIV SAN ANTONIO TX DEPT OF BIOLOGY

ARIZONA UNIV TUCSON DEPT OF SYSTEMS AND INDUSTRIAL
ENGINEERING

(U) Image Analysis of Viral-Expressing Mouse Macrophage
Cells.

(U) Heuristic Methods in Applied Probability.

DESCRIPTIVE NOTE: Final rept. 1 Jul 90-31 Mar 91.

DESCRIPTIVE NOTE: Final rept. 1 Dec 89-30 May 90.

MAY 91 13P

MAY 91 8P

PERSONAL AUTHORS: Blystone, Robert V.

PERSONAL AUTHORS: Higle, Julia L.

CONTRACT NO. AFOSR-90-0287

CONTRACT NO. AFOSR-88-0078

PROJECT NO. 2312

PROJECT NO. 2304

TASK NO. A5

TASK NO. A5

MONITOR: AFOSR, XF
TR-91-0592, AFOSR

MONITOR: AFOSR, XF
TR-91-0815, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) RAW 264.7 mouse macrophage cells have interesting growth properties. To best utilize these cells in research protocols, rapid and inexpensive monitoring of in situ growth characteristics are necessary. An inexpensive computer imaging and visualization system was assembled to complement the analysis provided by a combination of optically scanned cell cultures, framed-grabbed light microscopy, and optically scanned scanning and transmission micrographs of in situ cell cultures. Data for image analysis was provided by a combination of optically scanned cell cultures, framed-grabbed light microscopy, and optically scanned scanning and transmission micrographs of in situ cell cultures. The imaging system proved to be quite rapid. Several elements concerning RAW cell growth were uncovered including a relationship between cell culture seed concentration and the appearance of foci. However, the mechanism of viral expression is still unclear. The imaging system was successfully adapted for looking at bacterial cultures as well. A low-cost imaging system is now in place for examining in situ cell culture systems of several types.

DESCRIPTORS: (U) CELLS(BIOLOGY), COMPUTERS,
CULTURES(BIOLOGY), GROWTH(GENERAL), IMAGE PROCESSING,
IMAGES, LOW COSTS, MICROSCOPY, VIRUSES.

IDENTIFIERS: (U) Image analysis, *Microscopy, Cell
culture, Virus, PE61102F, WUAFOSR2312A5.

AD-A238 230

ABSTRACT: (U) The purpose of this research program is the development of heuristic and algorithmic approaches to various problems of engineering and applied mathematical interest. This research program was initiated under the guidance of Professor Marcel F. Neuts. Unfortunately, a substantial revision of the project budget required his resignation from the project. Thus, in this report, we will summarize the work of Dr's Julia L. Higle, who investigates problems of stochastic optimization and develops non-accident based measures of vehicular traffic hazards, and Jeffrey B. Goldberg, who investigates problems of design for reliability and manufacturability, decision making in Just-In-Time manufacturing systems, and approximation models for spatially distributed queueing systems. These investigators and the students supported during the final year of this grant work in quite diverse areas, but share a strong interest in algorithmic methodology.

DESCRIPTORS: (U) ALGORITHMS, BUDGETS, DECISION MAKING,
DISTRIBUTION, ENGINEERING, HAZARDS, HEURISTIC METHODS,
METHODS, MODELS, OPTIMIZATION, PROBABILITY, QUEUEING
THEORY, RELIABILITY, STOCHASTIC PROCESSES, STUDENTS,
TRAFFIC, VEHICLES.

IDENTIFIERS: (U) *Heuristic methods, *Algorithms.

AD-A238 229

UNCLASSIFIED

PAGE 113

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 228 CONTINUED

AD-A238 209 7/3 7/1 11/2

*Applied mathematics, PE81102F, WUAFOSR2304A5.

RENSELAEER POLYTECHNIC INST TROY NY DEPT OF CHEMISTRY

(U) Effects of Ring Substituents, Preferential Solvation,
and Added Amine on the Trimer-Dimer Equilibrium in
Cyclic Dialkylaluminum Amide Compounds.

90 6P

PERSONAL AUTHORS: Sauls, Frederick C.; Czekaj, Corinna L.;
Interrante, Leonard V.

CONTRACT NO. AFOSR-89-0439

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0829, AFOSR

UNCLASSIFIED REPORT

Availability: Pub. in Inorganic Chemistry, v29 n23 p4688-
4692 1990. Available only to DTIC users. No copies
furnished by NTIS.

Reprint: Effects of Ring Substituents, Preferential
Solvation, and Added Amine on the Trimer-Dimer
Equilibrium in Cyclic Dialkylaluminum Amide Compounds.

DESCRIPTORS: (U) *AMIDES, *ORGANOMETALLIC COMPOUNDS,
*ALUMINUM COMPOUNDS, *CHEMICAL EQUILIBRIUM, CERAMIC
MATERIALS, NITRIDES, CYCLIC COMPOUNDS, SOLVATION, AMINES,
DIMERS, NUCLEAR MAGNETIC RESONANCE, PYROLYSIS, REPRINTS.

IDENTIFIERS: (U) Aluminum nitride, Dialkylaluminum
amide, Trimers, PE81102F, WUAFOSR2303A3.

AD-A238 229

AD-A238 209

UNCLASSIFIED

PAGE 114

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 208

7/3

7/1

11/2

RENSELAEER POLYTECHNIC INST TROY NY DEPT OF CHEMISTRY

AD-A238 207

7/5

7/4

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Synthesis, Structure, and Pyrolysis of Organoaluminum Amides Derived from the Reactions of Trialkylaluminum Compounds with Ethylenediamine in a 3:2 Ratio.

81

7P

PERSONAL AUTHORS: JIANG, ZHIPING; INTERRANTE, LEONARD V.; KWON, DAEKEUN; THAM, FOOK S.; KULLING, RUDOLPH

CONTRACT NO. AFOSR-89-0439

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0824, AFOSR

UNCLASSIFIED REPORT

Availability: Pub. in Inorganic Chemistry, v30 n5 p995-1000 1991. Available only to DTIC users. No copies furnished by NTIS.

Reprint: Synthesis, Structure, and Pyrolysis of Organoaluminum Amides Derived from the Reactions of Trialkylaluminum Compounds with Ethylenediamine in a 3:2 Ratio.

DESCRIPTORS: (U) *AMIDES, *ORGANOMETALLIC COMPOUNDS, *ALUMINUM COMPOUNDS, *SYNTHESIS(CHEMISTRY), MOLECULAR STRUCTURE, PYROLYSIS, CERAMIC MATERIALS, NITRIDES, ETHYLENEDIAMINE, REPRINTS.

IDENTIFIERS: (U) ALUMINUM NITRIDE, PEB1102F, WUAFOSR2303A3.

(U) Investigation of the Kinetic Window for Generation of 13C t(O)-S CIDNP Derived from Long-Chain Biradicals by Tuning the Rates of Bimolecular Scavenging and Intersystem Crossing.

81

5P

PERSONAL AUTHORS: HWANG, KUO C.; TURRO, NICHOLAS J.; DOUBLEDAY, CHARLES, JR

CONTRACT NO. AFOSR-90-0049

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR, XF
TR-91-0830, AFOSR

UNCLASSIFIED REPORT

Availability: Pub. in Jnl. of the American Chemical Society, v113 p2850-2853 1991. Available only to DTIC users. No copies furnished by NTIS.

Reprint: Investigation of the Kinetic Window for Generation of 13C T(O)-S CIDNP Derived from Long-Chain Biradicals by Tuning the Rates of Bimolecular Scavenging and Intersystem Crossing.

DESCRIPTORS: (U) *CYCLOALKANES, *CHEMICAL RADICALS, *NUCLEAR SPINS, *POLARIZATION, *PHOTOLYSIS, REACTION KINETICS, MOLECULAR ORBITALS, COUPLING(INTERACTION), REPRINTS, PHENYL RADICALS.

IDENTIFIERS: (U) Phenylcycloalkanes, CIDNP(Chemically Induced Dynamic Nuclear Polarization), *Nuclear Polarization, Scavengers(Chemistry), Carbon 13, Crossing, Spin orbit coupling, PEB1102F, WUAFOSR2303B2.

AD-A238 208

AD-A238 207

UNCLASSIFIED

PAGE 115

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 208 7/5 7/4

AD-A238 205 7/4 7/5 7/3

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Photoelectron Transfer between Molecules Adsorbed in Restricted Spaces.

(U) Diastereoselective Induction in Radical Coupling Reactions: Photolysis of 2,4-diphenylpentan-3-ones Adsorbed on Faujasite Zeolites.

91 11P

91 14P

PERSONAL AUTHORS: Turro, Nicholas J.; Barton, Jacqueline K.; Tomalia, Donald

PERSONAL AUTHORS: Ghatlia, Naresh D.; Turro, Nicholas J.

CONTRACT NO. AFOSR-90-0049

CONTRACT NO. AFOSR-90-0049

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. 82

TASK NO. 82

MONITOR: AFOSR, XF TR-91-0827, AFOSR

MONITOR: AFOSR, XF TR-91-0828, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Availability: Pub. in Photochemical Conversion and Storage of Solar Energy, p121-139 1991. Available only to DTIC users. No copies furnished by NTIS.

Availability: Pub. in Jnl. of Photochemistry and Photobiology A: Chemistry, v57 p7-19 1991. Available only to DTIC users. No copies furnished by NTIS.

Reprint: Photoelectron Transfer between Molecules Adsorbed in Restricted Spaces.

Reprint: Diastereoselective Induction in Radical Coupling Reactions: Photolysis of 2,4-diphenylpentan-3-ones Adsorbed on Faujasite Zeolites.

DESCRIPTORS: (U) *METAL COMPLEXES, *PHOTOELECTRONS, *ELECTRON TRANSFER, ADSORPTION, ANIONS, SURFACES, DEOXYRIBONUCLEIC ACIDS, POLYELECTROLYTES, RUTHENIUM, PYRIDINES, COBALT, METHYL RADICALS, REPRINTS.

DESCRIPTORS: (U) *PENTANONES, *ISOMERS, *PHOTOLYSIS, ADSORPTION, ION EXCHANGE RESINS, STEREOCHEMISTRY, LITHIUM, SODIUM, BUTANES, PHENYL RADICALS, REPRINTS.

IDENTIFIERS: (U) Methyl viologens, PE61102F, WUAFOSR2303B2.

IDENTIFIERS: (U) Zeolites, Diastereoselectivity, Faujasites, Diphenylpentanones, PE61102F, WUAFOSR2303B2.

AD-A238 208

AD-A238 205

UNCLASSIFIED

PAGE 116

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 158 8/10

AD-A238 158 CONTINUED

RENSELAEER POLYTECHNIC INST TROY NY DEPT OF CIVIL
ENGINEERING

(U) A Study of the Behavior and Micromechanical Modelling
of Granular Soil. Volume 3. A Numerical Investigation
of the Behavior of Granular Media Using Nonlinear
Discrete Element Simulation.

DESCRIPTIVE NOTE: Final rept. 6 Jan 89-15 May 91.

MAY 91 48P

PERSONAL AUTHORS: Petrakis, Emmanuel; Dobry, Ricardo; Ng,
Tang-Tag; Liu, Li

CONTRACT NO. AFOSR-89-0350

PROJECT NO. 2302

TASK NO. C1

MONITOR: AFOSR
TR-91-0621

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-A238 091.

ABSTRACT: (U) Nonlinear discrete element simulations were used to provide an insight on the nonlinear modelling of granular soil. These simulations were based on an incremental solution to the nonlinear problem of two spheres in contact, incorporated into discrete element TRUBAL which was further optimized for vector and parallel processing on the IBM 3090 supercomputer. It was found that this approach not only interprets successfully nonlinear behavior of soil, but also provides a wealth of information on the fabric changes during the loading. The yield surface of a granular medium, needed for defining the constitutive relation of such a medium, distorts by forming an apex in the direction of loading while becoming flatter in the opposite direction. This contrary to the practice followed in modelling granular media where the yield surface of soils are typically assumed to retain the same shape. Origin of this distortion phenomenon lies in the texturing (or fabric anisotropy) which occurs in the direction of prestraining, as well as in the redistribution of interparticle contact forces in

AD-A238 158

UNCLASSIFIED

AD-A238 158

PAGE 117

T85002

the absence of significant particle movement during the small strain probes needed to define the yield surface. These phenomena cause certain slip systems to be activated which produce the characteristic apex which appear in the yield surface in the loading direction. Therefore, distribution and magnitude of the contact forces are critical for a good understanding of the macroscopic response of the medium. Accurate modelling of the contact force distribution can be achieved only if the behavior at the contact is fully understood and rigorously modelled.

DESCRIPTORS: (U) ANISOTROPY, BEHAVIOR, DISTORTION, DISTRIBUTION, FABRICS, NONLINEAR SYSTEMS, NUMERICAL ANALYSIS, PARALLEL PROCESSING, PARTICLES, SIMULATION, SOILS, SOLUTIONS(GENERAL), SPHERES, SURFACES, VECTOR ANALYSIS, YIELD.

IDENTIFIERS: (U) *Soil mechanics, *Soil models, Granules, Stress strain relations, Computerized simulation, Elastoplasticity, Granular soils, Loads(Forces), Constitutive models, Aggregated soils, Polycrystalline, Nonlinear analysis, Soil fabrics, Unloading, Anisotropy, Discrete element method, WUAFOSR2302C1, PE81102F.

AD-A238 158

UNCLASSIFIED

PAGE 117

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 151 11/8.1 11/8.2 21/5

AD-A238 151 CONTINUED

CALIFORNIA UNIV BERKELEY DEPT OF MATERIALS SCIENCE AND MINERAL ENGINEERING

(U) Micromechanisms of Monotonic and Cyclic Subcritical Crack Growth in Advanced High Melting Point Low-Ductility Intermetallics.

DESCRIPTIVE NOTE: Annual rept. no. 1, 15 Apr 90-14 Apr 91,

MAY 91 49P

PERSONAL AUTHORS: Rao, K. T.; Muruges, L.; Dejonghe, L. C.

REPORT NO. UC8/R/91/A1072

CONTRACT NO. AFOSR-90-0167

PROJECT NO. 2306

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0578, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The next generation of high-performance jet engines will require markedly stiffer materials, operating at higher stress levels and capable of withstanding temperatures of up to 1850 deg C. Prime candidates for such applications include ordered intermetallics, ceramics and composites based on metal, intermetallic and ceramic or carbon matrices, all of which are currently of limited use due to their low ductility and fracture properties. Moreover, there is a lack of fundamental understanding on the micromechanisms influencing crack growth in these materials, particularly intermetallics. Accordingly, the present study is aimed at exploring the potential of intermetallic alloys and their composites as advanced structural materials by identifying the critical factors influencing the crack-propagation resistance under monotonic and cyclic loads. Attention is focused on the Nb3Al and TiAl intermetallic systems. In both cases, the principal mechanism of toughening is to impede crack advance from crack bridging by ductile second phase particles. Reactive sintering and vacuum hot pressing techniques are successful in

processing Nb3Al intermetallics and duplex Nb/Nb3Al microstructure with a stringy niobium phase can be achieved through thermal treatments. Characterization of mechanical properties will commence in the second year.

DESCRIPTORS: (U) BRIDGES, CERAMIC MATERIALS, COMPOSITE MATERIALS, CONSTRUCTION MATERIALS, CRACK PROPAGATION, CRACKS, DUCTILITY, FRACTURE(MECHANICS), HEAT TREATMENT, HOT PRESSING, INTERMETALLIC COMPOUNDS, JET ENGINES, MECHANICAL PROPERTIES, METALS, NIOBIUM, PARTICLES, PERFORMANCE(ENGINEERING), RATES, REACTIVITIES, RESISTANCE, SINTERING, STRESSES, VACUUM.

IDENTIFIERS: (U) *Intermetallic compounds, *Crack propagation, Microstructure, Jet engines, Fracture(Mechanics), Fatigue(Mechanics), Toughness, Monotonic loading, Aluminum, Titanium, WJAFOSR2306A1, PE61102A.

IAC NO. MMC-703367

IAC DOCUMENT TYPE: MMCIAC - HARD COPY --

AD-A238 151

AD-A238 151

UNCLASSIFIED

PAGE 118

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 149 AD-A238 149 CONTINUED

contrast ratios at low electric fields.

AD-A238 149 20/12 20/10 ARIZONA STATE UNIV TEMPE DEPT OF ELECTRICAL AND COMPUTER ENGINEERING

(U) Spatial Light Modulators with Arbitrary Quantum Well Profiles.

DESCRIPTIVE NOTE: Annual technical rept. 14 Jan 90-14 Jan 91.

JAN 91 21P

PERSONAL AUTHORS: Maracas, George N.; Bajaj, Krishan K.

CONTRACT NO. AFOSR-90-0118

PROJECT NO. 3484

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0570, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The program has successfully grown GaAs/A/GaAs triangular and parabolic compositionally graded wells by solid source (SS) Molecular Beam Epitaxy (MBE) and gas source (GS) molecular beam epitaxy (GSMBE). In addition, strained In GaAs/GaAs wells have also been grown. An optimization of growth conditions for obtaining narrow exciton linewidths in square and nonrectangular wells was completed. We have refined the superlattice compositional grading technique to obtain 3 meV photoluminescence linewidths in a triangular quantum well. A study of the optical properties has begun in which the structures are characterized by room temperature and 2K photoluminescence and photocurrent spectroscopies. Responsivity curves for structures having various well shapes have shown the excited states and a comparison with theory is in progress. A preliminary comparison of contrast ratios in rectangular and triangular SEED devices has been completed. Calculations of exciton transition energies, oscillator strength and modulator absorption ratios have successfully been performed for quantum wells having different profiles. The behavior of these structures as a function of electric field has also been performed. It was shown theoretically that asymmetric triangular quantum wells exhibit large

DESCRIPTORS: (U) ABSORPTION, COMPARISON, CONTRAST, CRYSTAL LATTICES, ELECTRIC CURRENT, ELECTRIC FIELDS, ENERGY, ENVIRONMENTS, EPITAXIAL GROWTH, EXCITONS, GALLIUM ARSENIDES, GASES, GROWTH(GENERAL), LIGHT MODULATORS, MODULATORS, MOLECULAR BEAMS, OPTICAL PROPERTIES, OPTIMIZATION, OSCILLATORS, PHOTOELECTRICITY, PROFILES, QUANTUM ELECTRONICS, QUANTUM THEORY, RATIOS, ROOM TEMPERATURE, SHAPE, SOLIDS, SOURCES, SPATIAL DISTRIBUTION, SPECTROSCOPY, STRENGTH(GENERAL), TRANSITIONS.

IDENTIFIERS: (U) *Light modulators, *Quantum wells, Epitaxial growth..

AD-A238 149

AD-A238 149

UNCLASSIFIED

PAGE 119

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002
AD-A238 095 11/2 9/1 AD-A238 095 CONTINUED

CALIFORNIA UNIV LOS ANGELES DEPT OF MATERIALS SCIENCE
AND ENGINEERING

(U) Preparation and Properties of New Inorganic Glasses
and Gel-Derived Solids.

DESCRIPTIVE NOTE: Final technical rept. 1 Nov 87-30 Oct
80.

APR 91 38P

PERSONAL AUTHORS: Mackenzie, John D.

CONTRACT NO. AFOSR-88-0086

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0614, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Research has been carried out on two families of solids. The first one involves solids made by the sol-gel process and includes composites. The second one involves non-oxide glasses based on fluorides, chalcogenides, and chalcogenates. The structures of oxide gels were studied by x-ray photoelectron spectroscopy, liquid and solid state NMR. A new theory was developed on gel transformations. A number of new composites made by the sol-gel route were examined, including the use of silicon carbide and diamond powder as fillers and some triphasic solids. Many ferroelectric thin films were prepared and their properties measured. An inorganic-organic gel material named ORMOSIL was developed which developed which exhibited rubbery elasticity. The viscosity and viscoelasticity of fluorozirconate glasses and glass fibers have been studied. New chalcogenide glasses were prepared and their optical properties evaluated. Structural information was derived from Raman spectroscopy. The interaction of ultraviolet radiation on chalcogenide fibers was investigated.

DESCRIPTORS: (U) , CHALCOGENS, COMPOSITE MATERIALS,
DIAMONDS, ELASTIC PROPERTIES, FLUORIDES, FLUORINE
COMPOUNDS, GELS, GLASS, GLASS FIBERS, INORGANIC MATERIALS.

AD-A238 085

AD-A238 095

UNCLASSIFIED

PAGE 120

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 092 8/10

AD-A238 092 CONTINUED

RENSELAER POLYTECHNIC INST TROY NY DEPT OF CIVIL
ENGINEERING

DESCRIPTORS: (U) BEADS, BEHAVIOR, CONICAL BODIES,
CONSTANTS, CYLINDRICAL BODIES, ELASTIC PROPERTIES,
FAILURE, GLASS, GRANULES, MEAN, NUMERICAL ANALYSIS,
PLASTIC PROPERTIES, RESPONSE, SOILS, SPHERES, STRESS
STRAIN RELATIONS, STRESS TESTING, YIELD.

(U) A Study of the Behavior and Micromechanical Modelling
of Granular Soil. Volume 2. An Experimental
Investigation of the Behavior of Granular Media Under
Load.

IDENTIFIERS: (U) *Soil mechanics, Granules,
Polycrystalline, *Soil models, Stress strain relations,
Yield, Sand, Spheres, Elastoplasticity, Granular soils,
Micromechanics, Constitutive models, Aggregated soils,
Mathematical prediction, Model tests, Plastic properties,
Sliding, Compacting, Packing density, WUAFOSR2302C1,
PEB1102F.

DESCRIPTIVE NOTE: Final rept. 8 Jan 89-15 May 91.

MAY 91 135P

PERSONAL AUTHORS: Petrakis, Emaruel; Dobry, Ricardo; Van
Laak, Paul; Kotsanopoulos, Panos

CONTRACT NO. AFOSR-89-0350

PROJECT NO. 2302

TASK NO. C1

MONITOR: AFOSR
TR-91-0820

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 3, AD-A238 158.

ABSTRACT: (U) A comprehensive research effort was
conducted on constitutive and micromechanical modelling
of granular soil. This includes: (1) the development of a
new constitutive relation for granular media based on the
contact law between two spheres; (2) an experimental
investigation on the stress-strain response of a glass
bead material with 48 monotonic and cyclic experiments on
hollow cylinder specimens, most of them constant mean
stress tests to measure deviatoric response and behavior
of initial and subsequent yield loci; and (3) numerical
simulations of the behavior of granular media using the
discrete element method. The proposed constitutive law
captures a number of key aspects of the observed stress-
strain behavior of granular soils, and it predicts well
the experiments on glass beads. Novel aspects of the
proposed model include yield cones parallel to the
failure envelope, and a basic relation between the field
of elastoplastic moduli and the elastic constants of the
material.

AD-A238 092

AD-A238 092

UNCLASSIFIED

PAGE 121

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 091 8/10

AD-A238 091 CONTINUED

RENSELAER POLYTECHNIC INST TROY NY DEPT OF CIVIL
ENGINEERING

CONSTANTS, CYLINDRICAL BODIES, ELASTIC PROPERTIES,
FAILURE, GLASS, GRANULES, MEAN, PLASTIC PROPERTIES,
RESPONSE, SOILS, SPHERES, STRESS STRAIN RELATIONS, STRESS
TESTING, YIELD.

(U) A Study of the Behavior and Micromechanical Modelling
of Granular Soil. Volume 1. A Constitutive Relation
for Granular Materials Based on the Contact Law
Between Two Spheres.

IDENTIFIERS: (U) WUAFOSR2302C1, PE61102F, *Soil
mechanics, Granules, *Soil models, Stress strain
relations, Yield, Computer simulation, Elastoplasticity,
Granular soils, Micromechanics, Constitutive models,
Compressive properties, Mathematical prediction, Model
tests, Plastic properties, Isotropism, Anisotropy,
Contact law.

DESCRIPTIVE NOTE: Final rept. 8 Jan 89-15 May 91.

MAY 91 82P

PERSONAL AUTHORS: Dobry, Ricardo; Petrakis, Emmanuel

CONTRACT NO. AFOSR-89-0350

PROJECT NO. 2302

TASK NO. C1

MONITOR: AFOSR
TR-91-0619

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-A238 092.

ABSTRACT: (U) A comprehensive research effort was
conducted on constitutive and micromechanical modelling
of granular soil. This includes: (1) the development of a
new constitutive relation for granular media based on the
contact law between two spheres; (2) an experimental
investigation on the stress-strain response of a glass
bead material with 48 monotonic and cyclic experiments on
hollow cylinder specimens, most of them constant mean
stress tests to measure deviatoric response and behavior
of initial and subsequent yield loci; and (3) numerical
simulations of the behavior of granular media using the
discrete element method. The proposed constitutive law
captures a number of key aspects of the observed stress-
strain behavior of granular soils, and it predicts well
the experimental behavior on glass beads. Novel aspects of the
proposed model include yield cones parallel to the
failure envelope, and a basic relation between the field
of elastoplastic moduli and the elastic constants of the
material.

DESCRIPTORS: (U) BEADS, BEHAVIOR, CONICAL BODIES,

AD-A238 091

AD-A238 091

UNCLASSIFIED

PAGE 122

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 029 CONTINUED

AD-A238 029 13/13 20/11

NORTHWESTERN UNIV EVANSTON IL DEPT OF CIVIL ENGINEERING

(U) Fission-Fusion Adaptivity in Finite Elements for
Nonlinear Dynamics of Shells.

DESCRIPTIVE NOTE: Final technical rept. 1 Oct 87-30 Aug
90.

AUG 90 48P

PERSONAL AUTHORS: Belytschko, Ted

CONTRACT NO. F48620-88-C-0011

PROJECT NO. 2302

TASK NO. B1

MONITOR: AFOSR, XF
TR-91-0602, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of this work was to develop adaptive finite element analysis methods for nonlinear structural dynamics. Adaptive methods are particularly promising for nonlinear problems involving failure, because in failure and near-failure states of structures, three predominant phenomena are; buckling, shear banding, and fracture. These phenomena are associated with localization of the deformation, by which is meant the development of large strains in small regions of the structure, which is accompanied by large gradients in the strain. While strains are distributed in elastic buckling, once plasticity develops a large part of the deformation of beams or shells usually occurs over narrow zone called hingelines. Shear banding is a result of strain softening material behavior and is also associated with narrow bands of highly strained material. In fracture, high strain gradients occur at the crack tip, and in addition the displacement field is discontinuous behind the crack tip. In this work, adaptive methods are developed for the nonlinear dynamics of shells with both geometric and material nonlinearities. The localization phenomenon which is of primary interest in this class of problems is hingeline formation, but aspects of this work should be applicable to other localization phenomena in structural dynamics.

DESCRIPTORS: (U) , ADAPTATION, BUCKLING, CRACKS, DEFORMATION, DISPLACEMENT, DYNAMICS, ELASTIC PROPERTIES, FINITE ELEMENT ANALYSIS, GEOMETRY, GRADIENTS, MATERIALS, NARROWBAND, NONLINEAR SYSTEMS, PLASTIC PROPERTIES, REGIONS, SHELLS(STRUCTURAL FORMS), STRUCTURAL PROPERTIES.

IDENTIFIERS: (U) *Shells(structural forms), Hingelines, *Structural mechanics, Stress strain relations, Mesh, Plastic deformation, *Failure(mechanics), Fission, Fusion, PEB1102F, WUAFOSR2302B1, Shear strength, Localization.

AD-A238 029

AD-A238 029

UNCLASSIFIED

PAGE 123

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 028 20/5
YALE UNIV NEW HAVEN CT

AD-A238 028 CONTINUED

in a turbulent nonpremixed flame, and (6) Investigation of differential diffusion effects.

(U) Nonlinear Spectroscopy of Multicomponent Droplets and Two- and Three-Dimensional Measurements in Flames.

DESCRIPTORS: (U) MEASUREMENT, NONLINEAR SYSTEMS, SPECTROSCOPY, THREE DIMENSIONAL.

DESCRIPTIVE NOTE: Final rept. 1 Jan 88-31 Jan 91.

IDENTIFIERS: (U) Nonlinear spectroscopy, SRS(Stimulated Raman Scattering), *Flames, *Emission spectroscopy, Laser diagnostics, Turbulent flames, Four wave mixing, PE61102F, WJAFDSR2308A3.

MAY 91 24P

PERSONAL AUTHORS: Chang, Richard K.; Long, Marshall B.

CONTRACT NO. AFOSR-88-0100

PROJECT NO. 2308

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0599, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Significant progress has been made in the following two research areas: (1) Nonlinear spectroscopy of micrometer-size droplets; and (2) Development and application of two- and three- dimensional scalar measurement techniques in flames. In the nonlinear spectroscopy area, the following achievements are reported: (1) Laser-induced shape deformation of transparent droplets by electrostriction, which pushes against the surface tension force and causes the droplet to bulge; (2) Laser-induced shape deformation by heating of absorbing droplets, which were imaged with fluorescence photography; (3) Laser-induced breakdown which quenches the stimulated Raman scattering (SRS); (4) Excitation of SRS with single-mode and multimode Q-switched lasers; and (5) Four-wave mixing processes in droplets, such as third-order sum frequency generation. Achievements in multidimensional scalar imaging include the following: (1) Measurement of the time evolution in premixed H₂-air flames using imaging techniques; (2) Development of new techniques for following the time evolution of flow structures in three dimensions; (3) Introduction of a technique for visualizing supersonic flows using Rayleigh scattering from condensed supersonic droplets; (4) Measurement of the complete scalar gradient in a nonreacting flow, which allows calculation of the scalar dissipation; (5) Simultaneous CH and CH₄ mapping

AD-A238 028

AD-A238 028

UNCLASSIFIED

PAGE 124

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 027 6/5

AD-A238 028 8/2 5/8 17/7

BAYLOR COLL OF MEDICINE HOUSTON TX

MINNESOTA UNIV MINNEAPOLIS INST OF CHILD DEVELOPMENT

(U) Heterosynaptic Modulation of Long-Term Potentiation at Mossy Fiber Synapses in Hippocampus.

(U) Topographic Map Reading.

DESCRIPTIVE NOTE: Final technical rept. 1 Apr 88-31 Mar 91.

DESCRIPTIVE NOTE: Final rept. 1 May 88-31 Dec 90.

MAY 91 18P

MAY 91 60P

PERSONAL AUTHORS: Johnston, Daniel

PERSONAL AUTHORS: Pick, Herbert L., Jr.; Thompson, William B.

CONTRACT NO. AFOSR-88-0142

CONTRACT NO. AFOSR-88-0187

PROJECT NO 2312

PROJECT NO. 2313

TASK NO. A2

TASK NO. A4

MONITOR: AFOSR, XF
TR-91-0598, AFOSR

MONITOR: AFOSR, XF
TR-91-0590, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The overall goal of this research project was to investigate the cellular and membrane mechanism associated with heterosynaptic modulation of long-term synaptic potentiation (LTP) at mossy fiber synapses in the hippocampus. Previous work in this laboratory had shown that norepinephrine (NE), through Beta-adrenoceptors, enhances the magnitude, duration, and probability of induction of mossy fiber LTP. We also had preliminary evidence that acetylcholine (ACh), through muscarinic receptors, depresses the magnitude and probability of induction of mossy fiber LTP. We hypothesized that the heterosynaptic modulation of mossy fiber LTP was through modulation of voltage-gated calcium channels. That is, the modulation of LTP by NE results from an enhancement of voltage-gated calcium channels, while suppression of LTP by ACh was through a decrease in activity of voltage-gated calcium channels.

DESCRIPTORS: (U) ACETYLCHOLINE, CELLS, HIPPOCAMPUS, LONG RANGE(TIME), MEMBRANES, MODULATION, NOREPINEPHRINE.

IDENTIFIERS: (U) *Norepinephrine, Acetylcholine, Synaptic plasticity, Voltage clamp, Patch clamp, Calcium channels, Hippocampus, Mossy fiber, PEG1102F, WUAFOSR2312A2.

AD-A238 027

AD-A238 028

UNCLASSIFIED

PAGE 125

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 026 CONTINUED

AD-A238 023 9/1

hypothesized solutions as well as a control structure for guiding problem solving activity.

LOYOLA UNIV OF CHICAGO IL PARMLY HEARING INST

DESCRIPTORS: (U) ARCHITECTURE, COMPUTATIONS, CONFIGURATIONS, CONTROL SYSTEMS, HYPOTHESES, INFORMATION PROCESSING, LABORATORIES, LABORATORY PROCEDURES, LABORATORY TESTS, MAP READING, MAPS, MATCHING, ORIENTATION(DIRECTION), PHOTOGRAPHIC IMAGES, PHOTOGRAPHY, PHYSICAL PROPERTIES, PROBLEM SOLVING, RANGE(DISTANCE), RECONNAISSANCE, SIMULATION, STATIONS, TOPOGRAPHIC MAPS.

(U) Auditory Processing of Complex Sounds across Frequency Channels.

DESCRIPTIVE NOTE: Annual technical rept. 1 May 90-1 May 91.

MAY 91 8P

PERSONAL AUTHORS: Shofner, William P.; Dye, Raymond H.; Yost, William A.; Sheft, Stanley

CONTRACT NO. AFOSR-89-0335

PROJECT NO. 2313

TASK NO. AB

MONITOR: AFOSR, XF
TR-91-0804, AFOSR

IDENTIFIERS: (U) *Map reading, Position finding, *Topographic maps, Information processing, Judgement(Psychology), Range(Distance), Slope, Navigation, Performance(Human), Mathematical models, PE81102F, WJAFOSR2313A4.

UNCLASSIFIED REPORT

ABSTRACT: (U) Our work has centered on the discovery of the MDI or Modulation Detection Interference phenomenon, in which the modulation properties of tonal components in multi-tone complexes can not be processed when all the tones are modulated at the same low modulation rate as well as when the tones are not modulated or when the modulation rates differ for different components. We have argued that MDI results from the fact that the coherent modulation of all of the components fuse them into a single auditory image, and since coherent modulation was the basis of the perceptual fusion, temporal modulation for any one tone is not easily processed. We recently tested a corollary to this assumption. That is, when tonal complexes are fused into an auditory image based on coherent temporal modulation and MDI occurs, can subjects still process other attributes of the tones (e.g. changes in frequency and intensity) since these other attributes were not the basis for the tones being fused into a single image.

DESCRIPTORS: (U) AUDIO TONES, AUDITORY SIGNALS, CHANNELS, COHERENCE, DETECTION, FREQUENCY, FUSES(ELECTRICAL), HEARING, IMAGES, INTERFERENCE, LOW RATE, MODULATION, RATES, SIGNAL PROCESSING, SOUND.

AD-A238 026

AD-A238 023

UNCLASSIFIED

PAGE 126

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 023 CONTINUED

AD-A238 010 12/2

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT
OF COMPUTER SCIENCE

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A6.

(U) Continuous Homotopies for the Linear Complementarity
Problems.

APR 89 20P

PERSONAL AUTHORS: Watson, Layne T.; Bixler, J. P.; Poore,
Aubrey B.

CONTRACT NO. AFOSR-85-0250

PROJECT NO. 2304

MONITOR: AFOSR
TR-91-0560

UNCLASSIFIED REPORT

Availability: Pub. in SIAM Jnl. Matrix Anal. Appl., v10
n2 p259-277. Available only to DTIC users. No copies
furnished by NTIS.

ABSTRACT: (U) There are various formulations of the
linear complementarity problem as a Kadutani fixed point
problem, a constrained optimization, or a nonlinear
system of equations. These formulations have remained a
curiosity since not many people seriously thought that a
linear combinatorial problem should be converted to a
nonlinear problem. Recent advances in homotopy theory and
new mathematical software capabilities such as HOMPACK
indicate that continuous nonlinear formulations of linear
and combinatorial problems may not be farfetched. Several
different types of continuous homotopies for the linear
complementarity problem are presented and analyzed here,
with some numerical results. The homotopies with the best
theoretical properties (global convergence and no
singularities along the zero curve) turn out to also be
the best in practice.

DESCRIPTORS: (U) ALGEBRAIC TOPOLOGY, CONVERGENCE,
EQUATIONS, FORMULATIONS, GLOBAL, MATHEMATICAL PROGRAMMING,
NONLINEAR ALGEBRAIC EQUATIONS, NONLINEAR SYSTEMS,
NUMERICAL ANALYSIS, OPTIMIZATION, THEORY.

IDENTIFIERS: (U) *Algebraic topology, *Linearity,
*Combinational analysis, WUAFOSR2304, PE61102F.

AD-A238 023

AD-A238 010

UNCLASSIFIED

PAGE 127

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 009 13/9 12/1

AD-A238 008 12/2

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT
OF COMPUTER SCIENCE

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT
OF COMPUTER SCIENCE

(U) Large Deformations of a Whirling Elastic Cable.

(U) Globally Convergent Homotopy Algorithms for Nonlinear
Systems of Equations.

DESCRIPTIVE NOTE: Rept. for 1 Jul 89-1 Jun 91,

DESCRIPTIVE NOTE: Rept. for 1 Jul 89-1 Jun 91,

91 12P

80 51P

PERSONAL AUTHORS: Wang, C.-Y.; Watson, L. T.

PERSONAL AUTHORS: Watson, Layne T.

CONTRACT NO. AFOSR-89-0497

CONTRACT NO. AFOSR-89-0497

PROJECT NO. 2304

PROJECT NO. 2304

MONITOR: AFOSR
TR-91-0559

MONITOR: AFOSR, XF
TR-91-0558, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Availability: Pub. in Acta Mechanica, v87 p45-57 1991.
Available only to DTIC users. No copies furnished by NTIS.

Availability: Pub. in Nonlinear Dynamics, v1 p143-191
1990. Available only to DTIC users. No copies furnished
by NTIS.

Reprint: Large Deformations of a Whirling Elastic Cable.

DESCRIPTORS: (U) *CABLES, *DEFORMATION, *ELASTIC
PROPERTIES, *NUMERICAL ANALYSIS, NUMERICAL INTEGRATION,
REPRINTS.

ABSTRACT: (U) Probability-one homotopy methods are a
class of algorithms for solving nonlinear systems of
equations that are accurate, robust, and converge from an
arbitrary starting point almost surely. These new
globally convergent homotopy techniques have been
successfully applied to solve Brouwer fixed point
problems, polynomial systems of equations, constrained
and unconstrained optimization problems, discretizations
of non-linear two-point boundary value problems based on
shooting, finite difference, collocation, and Galerkin
approximations to nonlinear partial differential
equations. This paper introduces, in a tutorial fashion,
the theory of globally convergent homotopy algorithms,
describes some computer algorithms and mathematical
software, and presents several nontrivial engineering
applications.

IDENTIFIERS: (U) *Whirling elastic cables, WUAFOSR2304,
PE61102F.

DESCRIPTORS: (U) ALGEBRAIC TOPOLOGY, ALGORITHMS,
COMPUTER PROGRAMS, CONVERGENCE, ENGINEERING, EQUATIONS,
MATHEMATICAL PROGRAMMING, NONLINEAR DIFFERENTIAL
EQUATIONS, NONLINEAR SYSTEMS, OPTIMIZATION, PARTIAL
DIFFERENTIAL EQUATIONS, POLYNOMIALS.

AD-A238 008

AD-A238 008

UNCLASSIFIED

PAGE 128

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A238 008 CONTINUED

AD-A237 898 20/4

IDENTIFIERS: (U) *Algebraic topology, *Algorithms,
Partial differential equations, Nonlinear differential
equations, WUAFOSR2304, PE61102F.

YALE UNIV NEW HAVEN CT DEPT OF APPLIED PHYSICS

(U) Fluorescence Imaging of CO2 Laser-Heated Droplets.

JUN 90 4P

PERSONAL AUTHORS: Kwok, Alfred S.; Wood, Carol F.; Chang,
Richard K.

CONTRACT NO. AFOSR-88-0100

PROJECT NO. 2308

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0540, AFOSR

UNCLASSIFIED REPORT

Availability: Pub. in Optics Letters, v15 n12 p664-666,
15 Jun 90. Available only to DTIC users. No copies
furnished by NTIS.

Reprint: Fluorescence Imaging of CO2 Laser-Heated
Droplets.

DESCRIPTORS: (U) *FLUORESCENCE, *IMAGES, *DROPS, CARBON
DIOXIDE, REPRINTS, PROPULSION SYSTEMS, IRRADIATION,
DISTORTION, LIQUID PHASES.

IDENTIFIERS: (U) WUAFOSR2308A3, PE61102F.

AD-A238 008

AD-A237 898

UNCLASSIFIED

PAGE 129

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 897 9/3

YALE UNIV NEW HAVEN CT DEPT OF APPLIED PHYSICS

(U) Shape Distortion of a Single Water Droplet by Laser-Induced Electrostriction.

OCT 88 4P

PERSONAL AUTHORS: Zhang, Jian-Zhi; Chang, Richard K.

CONTRACT NO. AFOSR-88-0100

PROJECT NO. 2308

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0539, AFOSR

UNCLASSIFIED REPORT

Availability: Pub. in Optics Letters, v13 n10 p918-918 Oct 88. Available only to DTIC users. No copies furnished by NTIS.

Reprint: Shape Distortion of a Single Water Droplet by Laser-Induced Electrostriction.

DESCRIPTORS: (U) *ELECTROSTRICTION, REPRINTS, LASER APPLICATIONS, LASERS, SURFACE TENSION, DROPS, SURFACE TENSION, OSCILLATION, SHAPE, SHAPE.

IDENTIFIERS: (U) WJAFOSR2308A3, PE61102F.

AD-A237 897

UNCLASSIFIED

AD-A237 896 20/9 9/3

YALE UNIV NEW HAVEN CT DEPT OF APPLIED PHYSICS

(U) Temporally and Spatially Resolved Spectroscopy of Laser-Induced Plasma from a Droplet.

JUL 88 4P

PERSONAL AUTHORS: Zheng, Jia-Biao; Hsieh, Wen-feng; Chen, Shu-Chi; Chang, Richard K.

CONTRACT NO. AFOSR-88-0100

PROJECT NO. 2308

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0538, AFOSR

UNCLASSIFIED REPORT

Availability: Pub. in Optics Letters, v13 n7 p559-561 Jul 88. Available only to DTIC users. No copies furnished by NTIS.

Reprint: Temporally and Spatially Resolved Spectroscopy of Laser-Induced Plasma from a Droplet.

DESCRIPTORS: (U) *LASER PUMPING, *PLASMAS(PHYSICS), DROPS, WATER, DETONATION WAVES, REPRINTS.

IDENTIFIERS: (U) Laser induced plasmas, Laser induced breakdown, WJAFOSR230A3, PE61102F.

AD-A237 896

PAGE 130 T85002

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 895 20/8

AD-A237 894 20/8

YALE UNIV NEW HAVEN CT DEPT OF APPLIED PHYSICS

YALE UNIV NEW HAVEN CT DEPT OF APPLIED PHYSICS

(U) Growth, Decay, and Quenching of Stimulated Raman Scattering in Transparent Liquid Droplets.

(U) Pumping of Stimulated Raman Scattering by Stimulated Brillouin Scattering Within a Single Liquid Droplet: Input Laser Linewidth Effects.

89 8P

JAN 90 9P

PERSONAL AUTHORS: Zheng, Jia-Biao; Hsieh, Wen-Feng; Chen, Shu-Chi; Chang, Richard K.

PERSONAL AUTHORS: Zhang, Jian-Zhi; Chen, Gang; Chang, Richard K.

CONTRACT NO. AFOSR-88-0100

CONTRACT NO. AFOSR-88-0100

PROJECT NO. 2308

PROJECT NO. 2308

TASK NO. A3

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0536, AFOSR

MONITOR: AFOSR, XF
TR-91-0537, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Availability: Pub. in Laser Materials and Laser Spectroscopy, p259-264 1989. Available only to DTIC users. No copies furnished by NTIS.

Availability: Pub. in Jnl. of the Optical Society of America B, v7 n1 p108-115 Jan 90. Available only to DTIC users. No copies furnished by NTIS.

Reprint: Growth, Decay, and Quenching of Stimulated Raman Scattering in Transparent Liquid Droplets.

Reprint: Pumping of Stimulated Raman Scattering by Stimulated Brillouin Scattering Within a Single Liquid Droplet: Input Laser Linewidth Effects.

DESCRIPTORS: (U) *LIGHT SCATTERING, *DROPS, RAMAN SPECTRA, NONLINEAR OPTICS, STREAK CAMERAS, QUENCHING(INHIBITION).

DESCRIPTORS: (U) *LIGHT SCATTERING, *DROPS, RAMAN SPECTRA, BRILLOUIN ZONES, LASER BEAMS, Q SWITCHING, REPRINTS.

IDENTIFIERS: (U) SRS(Stimulated Raman Spectra), Laser induced breakdown, WUAFOSR2308A3, PE81102F.

IDENTIFIERS: (U) SBS(Stimulated Brillouin Scattering), SRS(Stimulated Raman Scattering), Ndiyag lasers, WUAFOSR2308A3, PE81102F.

AD-A237 895

AD-A237 894

UNCLASSIFIED

PAGE 131

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 893 12/1

AD-A237 892 21/2

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT OF COMPUTER SCIENCE

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF MECHANICAL ENGINEERING

(U) Least-Change Secant Update Methods for Underdetermined Systems.

(U) Short Communication: Isolation of Buoyancy Effects in Jet Diffusion Flame Experiments.

OCT 90 37P

90 12P

PERSONAL AUTHORS: Walker, Homer F.; Watson, Layne T.

PERSONAL AUTHORS: Davis, R. W.; Moore, E. F.; Santoro, R. J.; Ness, J. R.

CONTRACT NO. AFOSR-85-0250

CONTRACT NO. AFOSR-87-0145

PROJECT NO. 2304

PROJECT NO. 2308

MONITOR: AFOSR, XF
TR-91-0561, AFOSR

TASK NO. A2

UNCLASSIFIED REPORT

MONITOR: AFOSR, XF
TR-91-0541, AFOSR

Availability: Pub. in SIAM Jnl. of Numerical Mathematics, v27 n5 p1227-1262 Oct 90. Available only to DTIC users. No copies furnished by NTIS.

UNCLASSIFIED REPORT

Availability: Pub. in Combustion Science and Technology, v73 p825-835 1990. Available only to DTIC users. No copies furnished by NTIS.

ABSTRACT: (U) Least-change secant updates for nonsquare matrices have been addressed recently in (8). Here the use of these updates in iterative procedures for the numerical solution of underdetermined systems is considered. The model method is the normal flow algorithm used in homotopy or continuation methods for determining points on an implicitly defined curve. A Kantorovich-type local convergence analysis is given which supports the use of least-change secant updates in this algorithm. This analysis also provides a Kantorovich type local convergence analysis for least-change secant update methods in the usual case of an equal number of equations and unknowns. This in turn gives a local convergence analysis for augmented Jacobian algorithms which use least-change secant updates. In conclusion, the results of some numerical experiments are given.

DESCRIPTORS: (U) *ALGORITHMS, *DETERMINANTS(MATHEMATICS), MATRICES(MATHEMATICS), CURVES(GEOMETRY), TRACKING, PARAMETRIC ANALYSIS, REPRINTS.

IDENTIFIERS: (U) PE61102F.

DESCRIPTORS: (U) *JET FLAMES, *BUOYANCY, DIFFUSION, REPRINTS, BURNERS.

AD-A237 893

AD-A237 892

UNCLASSIFIED

PAGE 132

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 892 CONTINUED

AD-A237 864 22/2 12/1 20/6

IDENTIFIERS: (U) PE61102F, WUAFOSR2308A2.

HARRIS CORP MELBOURNE FL GOVERNMENT AEROSPACE SYSTEMS
DIV

(U) Experimental Verification of an Innovative Performance-
Validation Methodology for Large Space Systems.

DESCRIPTIVE NOTE: Final rept. 15 Aug 87-14 Feb 91.

FEB 91 171P

PERSONAL AUTHORS: Hyland, David C.

CONTRACT NO. F49620-87-C-0108

PROJECT NO. 1200

TASK NO. K1

MONITOR: AFOSR, XF
TR-91-0232, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) A technology gap exists in verifying performance of large space systems. To fill that gap the proposed program seeks to develop and validate an efficient pre-flight performance verification methodology. The approach involves selective component testing along with analysis of subsystem interactions. The methodology exploits MEOP (Maximum Entropy/Optimal Projection) Control System Design and Majorant Robustness Analysis. The approach is formulated for several representative large space systems and experimentally verified on a 3-meter diameter multi-hex panel ground-based active control tested.

DESCRIPTORS: (U) EFFICIENCY, ENTROPY, FLIGHT,
OPTIMIZATION, SPACE SYSTEMS, VERIFICATION.

IDENTIFIERS: (U) *Large space systems, MEOP(Maximum Entropy Optical Projection), Preflight performance-validation methodology, MPE(Multi Hex Prototype Experiment), Mirrors, Vibration, WUAFOSR1200K1, PE63221C.

AD-A237 892

AD-A237 864

UNCLASSIFIED

PAGE 133

T85002

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 857 13/9

AD-A237 857 CONTINUED

ILLINOIS UNIV AT CHICAGO CIRCLE DEPT OF MECHANICAL
ENGINEERING

IDENTIFIERS: (U) PUTD(Pseudo Uptriangular Decomposition),
Articulated mechanical systems, Robotics, *Mechanical
engineering, Stability, Regularization, Constrained
multibody systems, Nonlinear dynamics, WUAFOSR1302B1,
PE61102F.

(U) Performance and Stability in High Speed Articulated
Structures Undergoing Quick Maneuvers - Theory and
Applications.

DESCRIPTIVE NOTE: Final rept. 1 Sep-31 Dec 91.

JAN 91 46P

PERSONAL AUTHORS: Amirouche, Farid M.

CONTRACT NO. F49620-89-C-0114

PROJECT NO. 1302

TASK NO. B1

MONITOR: AFOSR, XF
TR-91-0535, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The proposed research is divided into two phases. The first introduces the PUTD (Pseudo-Uptriangular-Decomposition) to reduce the governing equations of motion of articulated mechanical systems. This investigation proposes a new method, which allows the constrained systems to operate in the presence of singularities. This is achieved by regularization technique which makes use of a new representation of the kinematical and geometrical constraint equations at singular positions. This method of stability analysis is compared with the asymptotic stability presented by Baumgarte. The PUTD is extended to accommodate the dynamics of such systems. An illustration of the utility and effectiveness of the method proposed is shown through a two arm planar robot undergoing large motions and driven through singularities. The driving torques are then compared to check for discontinuities and jerks. The second phase of the research project set the stage for the testing of the proposed method when the articulated structures are composed of flexible bodies.

DESCRIPTORS: (U) ASYMPTOTIC SERIES, DYNAMICS,
EQUATIONS, FLEXIBLE STRUCTURES, MECHANICAL COMPONENTS,
MOTION, STABILITY, STRUCTURES, TORQUE.

AD-A237 857

AD-A237 857

UNCLASSIFIED

PAGE 134

T85002

UNCLASSIFIED

AD-A237 856 12/4 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002
AD-A237 856 CONTINUED
PRINCETON UNIV NJ DEPT OF ELECTRICAL ENGINEERING AND IDENTIFIERS: (U) WUAFOSR2304A2, PEB1102F.
COMPUTER SCIENCE

(U) Analog Computation in Neutral Systems: Architectures and Complexity.

DESCRIPTIVE NOTE: Final technical rept. 1 Aug 88-31 Jul 90.

MAY 91 12P

PERSONAL AUTHORS: Dickinson, Bradley W.

CONTRACT NO. AFOSR-88-0227

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0554, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) First, we studied the representation problem for the class of single- hidden-layer feedforward networks, which is fundamental for understanding limitations of learning algorithms, and which also contributed to understanding the behavior of learning algorithms in applications involving low-complexity networks. The second kind of problem studied concerns dynamics behavior in neural networks containing feedback (trellis-structured networks in one particular applications). Our work focused on studying stability issues and exploring the implications of computational complexity theory. Third, the PAC learning paradigm (probably Almost Correct) was analyzed with the goal of characterizing the effects of statistically dependent sequences of training examples on learning performance. The goal of all these efforts was to discover and explore insights about fundamental limitations on the computational capabilities of analog neural systems and, where possible, of more general classes of physical systems as well.

DESCRIPTORS: (U) *NEURAL NETS, *ARCHITECTURE, *ANALOG COMPUTERS, NETWORKS, ALGORITHMS.

AD-A237 856

AD-A237 856

UNCLASSIFIED

PAGE 135

T85002

AD-A237 851 21/2 21/9.2

AD-A237 851 CONTINUED

GEORGIA INST OF TECH ATLANTA SCHOOL OF AEROSPACE
ENGINEERING

distribution in the flame region, the model was used to predict oscillatory vertical velocity distributions in the flame region. These were then compared to velocity distributions measured with an LDV system, showing good qualitative agreement.

(U) Investigation of the Flame-Acoustic Wave Interaction during Axial Solid Rocket Instabilities.

DESCRIPTIVE NOTE: Final rept. 1 Mar 89-28 Feb 91.

DESCRIPTORS: (U) ACOUSTIC FIELDS, ACOUSTIC PROPERTIES, ACOUSTIC WAVES, ADMITTANCE, BURNERS, DAMPING, DIFFUSION, DISTRIBUTION, DOPPLER SYSTEMS, DRIVES, FLAMES, LASER VELOCIMETERS, MEASUREMENT, MODELS, OSCILLATION, RADIATION, REGIONS, RESPONSE, SHAPE, SIDES, SOLID PROPELLANT ROCKET ENGINES, SOLID PROPELLANTS, STATE OF THE ART, STEADY STATE, TEMPERATURE, THEORY, VELOCITY, VERTICAL ORIENTATION, WALLS.

APR 91 47P

PERSONAL AUTHORS: Zinn, Ben T.; Daniel, Brady R.

CONTRACT NO. AFOSR-89-0280

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0600, AFOSR

IDENTIFIERS: (U) *Combustion stability, *Solid rocket propellants, *Flames, Oscillation, Mathematical prediction, Laser doppler velocimetry, Laser velocimeters, Length, Flow turning loss, Flame driving, PE61102F, WJAFOSK2308A1.

UNCLASSIFIED REPORT

ABSTRACT: (U) Primary research objectives are to: (1) investigate mechanisms responsible for driving of axial instabilities by solid propellant flames; (2) determine whether state-of-the-art theoretical models can predict characteristics of the flame driving mechanisms; and (3) investigate the effect of flow turning upon axial instabilities in solid propellant rocket motors. To attain these objectives, the response of diffusion flames, stabilized on the side wall of a duct, to imposed acoustic waves was investigated by using flame radiation measurements and laser Doppler velocimetry (LDV). Flame radiation measurements revealed that the presence of an acoustic field produced space dependent oscillatory heat release rates which depend upon characteristics of the flame and the excited acoustic field. Measurements of flame radiation and velocity field both showed that at a given instant some sections of the flame drive the acoustic field while others damp it. The net effect of the flame upon the acoustic field depends on the relative magnitude of these driving and damping regions. Validity of a previously developed flame response model was investigated by comparing measured and predicted oscillatory velocity components in the flame region. Using measured values of the acoustic admittance of the burner, flame shape, and steady state temperature

AD-A237 851

AD-A237 851

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 850 12/3

AD-A237 849 6/5

MISSOURI UNIV-ROLLA DEPT OF MATHEMATICS AND STATISTICS

NORTHWESTERN UNIV EVANSTON IL COLL OF ARTS AND SCIENCES

(U) Reliability Assessment for One-Shot Devices Based on Repeated Samples.

(U) Phosphoprotein Regulation of Synaptic Reactivity.

DESCRIPTIVE NOTE: Final rept. 1 Jun 84-31 May 88.

DESCRIPTIVE NOTE: Annual technical rept. 3 Jan 90-28 Feb 91.

MAY 88 8P

MAY 91 8P

PERSONAL AUTHORS: Bain, Lee J.; Engelhardt, Max

PERSONAL AUTHORS: Routtenberg, Aryeh

CONTRACT NO. AFOSR-84-0164

CONTRACT NO. AFOSR-90-0240

PROJECT NO. 2304

PROJECT NO. 2312

TASK NO. A5

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0618, AFOSR

MONITOR: AFOSR, XF
TR-91-0623, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The research findings during this grant period fall into two categories. The first category includes methods for repairable systems where repeated failures are modeled by either a nonhomogeneous Poisson process or else a compound nonhomogeneous Poisson process. The second category includes methods for nonrepairable systems. Papers in this second category are often useful in the analysis of repairable systems when applied to first-failure data. Such an analysis is often useful in the preliminary analysis of repairable systems when only early failure data is available.

DESCRIPTORS: (U) , FAILURE, POISSON EQUATION, RELIABILITY, REPAIR, TEST AND EVALUATION.

IDENTIFIERS: (U) *Statistical samples, *Failure, *Repair, Bibliographies, Reports, Abstracts, PE61102F, WJAFOSR2304A5.

ABSTRACT: (U) The regulation of synaptic reactivity by protein kinase C and its substrates has been studied using the long-term potentiation paradigm (LTP). We have studied the effects of protein kinase C activators and inhibitors on behavior: imprinting in the chick and radial arm maze performance. The main conclusion to be drawn is that PKC is necessary but not sufficient to the enhanced durability of memory. In combination with a neural signal, however, PKC demonstrates a profound synergism. Synergism is also observed in the analysis of metal ion regulation of PKC activity. Calcium and zinc interact in their effect on the enzyme in a bidirectional manner. Significant accomplishments made during the period were: determining the effect of inhibitors on behavior and the species generality of PKC-F1 module in memory formation.

DESCRIPTORS: (U) , BEHAVIOR, CALCIUM, CONTROL, ENZYMES, INHIBITORS, IONS, MEMORY DEVICES, METALS, NERVOUS SYSTEM, REACTIVITIES, SIGNALS, SUBSTRATES, SYNAPSIS, SYNERGISM, ZINC.

IDENTIFIERS: (U) PE61102F, WJAFOSR2312A2, *Synaptic reactivity, Protein kinase C, Activators, Inhibitors, Synergism.

AD-A237 850

AD-A237 849

UNCLASSIFIED

PAGE 137

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 848 6/5

AD-A237 847 12/3

WRIGHT STATE UNIV DAYTON OH DEPT OF CHEMISTRY

NORTHERN ILLINOIS UNIV DE KALB DEPT OF MATHEMATICAL SCIENCES

(U) A Study of the Effect of Hydrocarbon Structure on the Induction of Male Rat Nephropathy and Metabolite Structure.

(U) Analysis of Nongaussian, Nonlinear Time Series with Long -Memory.

DESCRIPTIVE NOTE: Annual rept. 1 Jun 90-31 May 91.

DESCRIPTIVE NOTE: Final rept. 30 Sep 88-31 Mar 91.

JUN 91 10P

MAR 91 6P

PERSONAL AUTHORS: Serve, M. P.; Bombick, D. D.; Clemens, J. M.; McDonald, Gayle A.; Mattie, David R.

PERSONAL AUTHORS: Pourahmadi, Moshen

PROJECT NO. 2312

CONTRACT NO. AFOSR-88-0284

TASK NO. A5

PROJECT NO. 2304

MONITOR: AFOSR, XF
TR-91-0822, AFOSR

TASK NO. A5

MONITOR: AFOSR, XF
TR-91-0617, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The identification of the urinary metabolites have been identified using gas chromatography (GC) and gas chromatography/mass spectrometry (GC/MS). Histopathologic examination of the kidneys revealed minimal hyaline droplet formation (alpha 2u-g'obulin nephropathy) in the proximal tubule area from 2-methylheptane (2-MH). While 2,5-dimethylhexane (2,5-DMH) revealed moderate hyaline droplet formation in the renal proximal tubule. Work is currently progressing on the metabolism of 3-methylheptane. There are 18 separate metabolites which have been found, but only 3 have been identified. This molecule's metabolism is very complex. Pathological results indicate that it is more nephrotoxic than 2-methylheptane or n-octane, two structural isomers.

DESCRIPTORS: (U) GAS CHROMATOGRAPHY, HISTOLOGY, HYDROCARBONS, ISOMERS, KIDNEY DISEASES, KIDNEYS, MALES, MASS SPECTROMETRY, METABOLISM, METABOLITES, MOLECULES, PATHOLOGY, RATS, STRUCTURAL PROPERTIES, TUBULAR STRUCTURES, URINE.

IDENTIFIERS: (U) PE81102F, WUAFOSRA312AS.

AD-A237 848

AD-A237 847

UNCLASSIFIED

PAGE 138

T85002

ABSTRACT: (U) The project has been concerned with statistical analysis of certain time series and stochastic signals that are unusual, in that they have long memory and are nongaussian. Standard statistical procedures, such as the Box Jenkins procedure which presumes Gaussianity and short range dependence, when applied to these series will certainly produce inferior and suboptimal results. The PI pursued two approaches to address the twin problems of long memory and nongaussianity. The first approach is rather general and it uses the setup of the Kolmogorov Wiener prediction theory of stationary processes. The second approach is more specific and it uses a random coefficient stochastic difference equation, which has a stationary solution with long memory and nongaussian marginal simulating time series data with aforementioned properties. Such simulated data are used in verifying empirically the more general results obtained via the first approach.

DESCRIPTORS: (U) BOXES, SHORT RANGE(DISTANCE), SIGNALS, SIMULATION, SOLUTIONS(GENERAL), STATIONARY, STATISTICAL PROCESSES, STOCHASTIC PROCESSES, TIME SERIES ANALYSIS.

IDENTIFIERS: (U) *Statistical analysis, *Time series analysis, PE81102F, WUAFOSR2304AS.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 846 5/8 6/4

AD-A237 846 CONTINUED

NEW YORK UNIV NY NEUROMAGNETISM LAB

DESCRIPTORS: (U) *COGNITION, *BRAIN, MAGNETOENCEPHALOGRAMS, SENSORY DEPRIVATION, MEMORY (PSYCHOLOGY), MAGNETIC FIELDS, ELECTROENCEPHALOGRAPHY, RESPONSE, STIMULI, VISUAL CORTEX.

DESCRIPTIVE NOTE: Annual technical rept. 15 Feb 90-14 Feb 91.

IDENTIFIERS: (U) PE81102F, WJAFOSR2313A4.

MAY 91 62P

PERSONAL AUTHORS: Kaufman, Lloyd; Williamson, Samuel J.

CONTRACT NO. AFOSR-90-0221

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR, XF
TR-91-0571, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Using an array of 14 superconducting magnetic field sensors we succeeded in establishing the locations of neuronal activity that produce the dominant alpha rhythm recorded in the electroencephalogram and magnetoencephalogram. Of particular interest is our observation that spontaneous alpha activity is suppressed over the visual area when a person is engaged in mental imagery, and over other functional areas when appropriate cognitive tasks are performed. Computer simulations of the changes in patterns of alpha field power reveal how the power map is related to the underlying cortical topography when suppression occurs. In studies of sensory evoked cortical activity, an analysis of published current source density measurements on animals provides information from which we obtain the first realistic measure for the spatial extent of cortical activity in human cortex when responding to sensory stimuli. Measurements with a 5-sensor system for chrominance and luminance stimuli shows that the sites of response in visual cortex coincide. The separation of color information processing apparently takes place at a later stage, if at all. Responses in human auditory cortex to appropriate sound stimuli reveal activity not previously identified, which has characteristics that suggest it is related to sensory memory functions.

AD-A237 846

AD-A237 846

UNCLASSIFIED

PAGE 139

T85002

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 844 20/4 12/2

AD-A237 805 20/11

WISCONSIN UNIV-MADISON CENTER FOR MATHEMATICAL SCIENCES

PURDUE UNIV LAFAYETTE IN SCHOOL OF MECHANICAL ENGINEERING

(U) Problems in Nonlinear Continuum Dynamics.

(U) Vibrations of Bladed Disk Assemblies.

DESCRIPTIVE NOTE: Final rept. 15 Sep 87-14 Apr 91,

DESCRIPTIVE NOTE: Final rept. 1 Nov 88-31 Dec 90.

MAY 91 7P

MAR 91 172P

PERSONAL AUTHORS: Slemrod, Marshall

PERSONAL AUTHORS: Nwokah, O. D.; Bajaj, A. K.

CONTRACT NO. AFOSR-87-0315

CONTRACT NO. AFOSR-89-0002

PROJECT NO. 2304

PROJECT NO. 2302

TASK NO. A9

TASK NO. B1

MONITOR: AFOSR, XF
TR-91-0594, AFOSRMONITOR: AFOSR, XF
TR-91-0551, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Slemrod's research in 1980-1991 centered on two issues: (1) the kinetics of coagulation processes, (2) behavior of discrete velocity models in the kinetic theory of gases. In the first area Slemrod has (a) given a new method for solving the special class of coagulation equations which exhibit gelatin and (b) derived and proved existences of similarity solutions for coagulation equations with diffusion. In the second area Slemrod has used his 'relaxed invariance principle' method to prove weak decay to equilibrium for the Broadwell model of gas dynamics in the case of specularly reflective boundary conditions.

DESCRIPTORS: (U) BOUNDARIES, COAGULATION, DECAY, DYNAMICS, EQUATIONS, EQUILIBRIUM(GENERAL), GAS DYNAMICS, GASES, GELATINS, INVARIANCE, KINETIC THEORY, KINETICS, LOW STRENGTH, MODELS, NONLINEAR SYSTEMS, VELOCITY.

IDENTIFIERS: (U) Kinetics of coagulation processes. Discrete velocity models of gases, Nonlinear continuum dynamics, PE61102F, WUAFOSR2304A9, *Mathematics, Theory, Gelation, *Gas dynamics.

AD-A237 844

AD-A237 805

UNCLASSIFIED

PAGE 140

T85002

ABSTRACT: (U) The problems associated with uneven forced response vibration amplitudes in bladed disk assemblies is considered in the report. It is established that uneven vibration amplitudes arise principally by the destruction of cyclic-symmetry by some small perturbations usually within the component manufacturing tolerances. Such perturbations first split some of the eigenvalue degeneracies inherent in all cyclic systems. This split in turn gives rise to the modal bifurcation phenomenon. Particular forms of the modal phenomenon give rise to the uneven vibration amplitudes and under some restricted conditions to the mode localization phenomenon. In this report, group theory, singularity theory and singular perturbation theory are combined to give a complete analysis of uneven amplitudes and mode localization; as a prelude to blade vibration control.

DESCRIPTORS: (U) AMPLITUDE, BLADES, CONTROL, CYCLES, DISKS, EIGENVALUES, GROUPS(MATHEMATICS), LIMITATIONS, MANUFACTURING, PERTURBATION THEORY, PERTURBATIONS, RESPONSE, THEORY, TOLERANCES(MECHANICS), VIBRATION.

IDENTIFIERS: (U) *Blades, Vibration, Modal bifurcation, Singularity theory, PE61102F, WUAFOSR2302B1.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 798 CONTINUED

AD-A237 798 7/2 20/12

MINNESOTA UNIV MINNEAPOLIS DEPT OF ELECTRICAL ENGINEERING

RELAXATION, SEMICONDUCTORS, STRUCTURES, SUBSTRATES, TRANSMITTANCE.

IDENTIFIERS: (U) *Intermetallic compounds, *Epitaxial growth, *Thin films, Nickel intermetallics, Electron diffraction, Semiconductors, WUAFOSR2306B1, PE61102F.

(U) The Growth of Ultrathin Epitaxial Intermetallic Films.

DESCRIPTIVE NOTE: Technical rept. 1 Aug 89-31 Jul 90.

FEB 91 9P

PERSONAL AUTHORS: Cohen, P. I.

CONTRACT NO. AFOSR-89-0494

PROJECT NO. 2306

TASK NO. B1

MONITOR: AFOSR, XF
TR-91-0575, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The growth of iron aluminate and NiAl intermetallic compounds on III-V substrates has been studied using reflection high-energy electron diffraction (RHEED), transmission electron diffraction (TEM), and selected area electron channeling patterns (SAECP). Procedures for the growth of both of these intermetallics with layer-by-layer control were developed. The quality of the films on indium phosphides (100) substrates exceeds those grown on gallium arsenides (100) substrates due to the lower lattice mismatch. The films are stable to at least 820K. TEM measurements indicate that the burgers vector of misfit dislocations is a complete a(100) . SACP, TEM, and TEM indicate that the film relaxation approximates the Matthews Blakeslee prediction. Even this was surprising in light of the layer by layer growth after relaxation since the type of dislocation that forms cannot glide to the interface to relieve the strain. Preliminary semiconductor - intermetallic - semiconductor structures have been grown. The quality of the interfaces is being assessed.

DESCRIPTORS: (U) , DISLOCATIONS, ELECTRON DIFFRACTION, ELECTRON ENERGY, FILMS, GALLIUM ARSENIDES, GROUP III COMPOUNDS, GROUP V COMPOUNDS, GROWTH(GENERAL), HIGH ENERGY, INDIUM PHOSPHIDES, INTERFACES, INTERMETALLIC COMPOUNDS, IRON ALUMINIDE, LAYERS, QUALITY, REFLECTION.

AD-A237 798

AD-A237 798

UNCLASSIFIED

PAGE 141

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 796 6/4 8/5

AD-A237 796 CONTINUED

YALE UNIV NEW HAVEN CT DEPT OF PSYCHOLOGY

IDENTIFIERS: (U) *Auditory perception, Pattern recognition, *Auditory signals, *Information processing, Attention, Listening, Speech, *Psychoacoustics, Fatigue(Physiology), Music, Degradation, Interruption, Speech perception, PE61102F, WJAFOSR2313A6.

(U) Levels of Processing of Speech and Non-Speech.

DESCRIPTIVE NOTE: Final rept. Sep 86-Mar 90.

MAY 91 20P

PERSONAL AUTHORS: Samuel, Arthur G.

CONTRACT NO. AFOSR-86-0357

PROJECT NO. 2313

TASK NO. AB

MONITOR: AFOSR, XF
TR-91-0553, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) These studies examined both signal-dependent factors, and listener-dependent factors. The examinations of signal factors include experiments on perceptual degradation due to signal interruption at critical rates (approximately 4cps), and studies mapping the early levels of representation of speech. The data support the existence of two qualitatively different early processing stages; the first is relatively peripheral and subject to neural fatigue, while the second is central and subject to criterion shifts. The studies of listener based factors include studies of perceptual restoration of deleted sounds (phonemes or musical notes), and studies of the perceptual effect of attentional allocation. The restoration experiments indicate similar architectures in the perceptual processing of speech and music. The attentional investigations demonstrate rather fine-tuned attentional control under high-predictability conditions. Significant progress has been made in achieving the research objective of clarifying the properties of complex auditory pattern recognition.

DESCRIPTORS: (U) ; AUDITORY SIGNALS, DEGRADATION, FATIGUE, MAPPING, MUSIC, NERVOUS SYSTEM, PATTERN RECOGNITION, PERCEPTION, PHONEMES, PROCESSING, RATES, SPEECH.

AD-A237 796

AD-A237 796

UNCLASSIFIED

PAGE 142

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 795 20/2

AD-A237 795 CONTINUED

JOINT INST FOR LAB ASTROPHYSICS BOULDER CO

*Lasers, PE81102F, WJAFOSA2308B1.

(U) Laser Probing of the Kinetics and Dynamics of III - V
Semiconductor Growth.

DESCRIPTIVE NOTE: Annual rept. 1 Feb 90-31 Jan 91.

JAN 91 7P

PERSONAL AUTHORS: Leone, Stephen R.

CONTRACT NO. AFOSR-90-0188

PROJECT NO. 2308

TASK NO. B1

MONITOR: AFOSR, XF
TR-91-0572, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Work is carried out on the dynamics of Ga, In, and As scattering, sticking, and desorption from silicon single crystals using laser induced fluorescence probing of the Ga and In atoms and As dimer gas phase species. Desorption kinetics are used to probe the InAs and GaAs heterostructures on silicon and the islanding behavior that occurs for the mixed systems. It is observed that islands form readily when In or Ga are grown on a prelayer of As on Si(100). State-resolved detection of As₂ species is demonstrated by laser-induced fluorescence probing for the first time. Laser multiphoton ionization detection of the III-V semiconductor species is also demonstrated. A technique is being developed to measure surface migration rates of epitaxial species by using a two laser, desorption and detection scheme.

DESCRIPTORS: (U) , ATOMS, DESORPTION, DETECTION, DIMERS, DYNAMICS, EPITAXIAL GROWTH, GALLIUM ARSENIDES, GROUP III COMPOUNDS, GROUP V COMPOUNDS, GROWTH(GENERAL), LASER INDUCED FLUORESCENCE, LASERS, MEASUREMENT, MIGRATION, MIXING, PHOTOIONIZATION, RATES, REACTION KINETICS, SCATTERING, SEMICONDUCTORS, SILICON, SINGLE CRYSTALS, STRUCTURES, SURFACES, VAPOR PHASES.

IDENTIFIERS: (U) *Semiconductors, GaAs, InAs, Surfaces,

AD-A237 795

AD-A237 795

UNCLASSIFIED

PAGE 143

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 794 20/6

AD-A237 794 CONTINUED

HARVARD UNIV CAMBRIDGE MA DIV OF APPLIED SCIENCES

IDENTIFIERS: (U) PE81102F, WUAFOSR2313A5.

(U) The Effects of Luminance Boundaries on Color Perception.

DESCRIPTIVE NOTE: Annual rept. 15 Mar 90-14 Mar 91.

APR 91 19P

PERSONAL AUTHORS: Kronauer, Richard E.; Eskew, R. T., Jr.; Stromeyer, C. F., III

CONTRACT NO. AFOSR-89-0304

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR, XF
TR-81-0544, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) When a suprathreshold luminance flash, presented as an increment on a large background field, accompanies a coincident equiluminant flash, the chromatic threshold is reduced. Early studies suggested that the chromatic facilitation grows large at small test size. We have measured detection thresholds for test spots with diameters from 5 min - 1 degree. Even for the smallest size the chromatic red-green sensitivity (specified in cone-contrast coordinates) is greater than luminance sensitivity, which has important implication for what the eye sees best. Facilitation by the luminance flash remains constant at 2x for all sizes contrary to other earlier studies. Further work with 1 degree flashes indicates that the facilitation results from a demarcation of the chromatic region by luminance features, and is not due to simple reduction of detection uncertainty. We also studied how the L and M cone signals combine in detecting motion.

DESCRIPTORS: (U) , BACKGROUND, BOUNDARIES, CHROMATICITY, COLOR VISION, CONICAL BODIES, DETECTION, EYE, FLASHES, LUMINANCE, REDUCTION, REGIONS, SENSITIVITY, SIGNALS, SIZES(DIMENSIONS), TEST AND EVALUATION, THRESHOLD EFFECTS, UNCERTAINTY.

AD-A237 794

AD-A237 794

UNCLASSIFIED

PAGE 144

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 793

7/4

AD-A237 793 CONTINUED

CRYSTALLUME MENLO PARK CA

LANGMUIR PROBES, MODELS, PARAMETERS, PLASMA DIAGNOSTICS, PLASMAS(PHYSICS), PRESSURE, RATES, SUBSTRATES, THERMOCHEMISTRY.

(U) Thermochemistry of Hydrocarbon Decomposition and Relationship to Properties of PECVD Diamond Films.

IDENTIFIERS: (U) Diamond, Deposition, Plasma diagnostics, Computer modeling, Film characterization, Langmuir probe, PE85502F, WUAFOS.

DESCRIPTIVE NOTE: Final rept. 1 Nov 88-31 Jan 91.

MAR 91 47P

IAC NO. MT-010599

PERSONAL AUTHORS: Plano, Linda S.

IAC DOCUMENT TYPE: MTIAC - MICROFICHE --

CONTRACT NO. F49620-89-C-0009

IAC SUBJECT TERMS: T--(U)*DIAMONDS, *DEPOSITION, *MODELING, SIMULATION, COMPUTERS, BONDING, /CODE D.:

PROJECT NO. 3005

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0569, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Considerable empirical research has been performed in the field of diamond film growth over the past fifteen years. However, this approach has proven insufficient in optimizing the deposition process. Also, no deposition mechanism has become universally accepted. A combination of in situ plasma diagnostic instruments, diamond film characterization, and computer modeling has been used to produce a self-consistent model of diamond-producing DC plasmas and to optimize the deposition process in terms of bonding type (i.e., graphite vs. diamond) and growth rate. The effects of important deposition parameters including methane concentration in hydrogen, current, electrode spacing, and pressure on both film and plasma characteristics have been analyzed. The presence of a negative electric field at the anode (or substrate electrode) has been determined to be necessary for the growth of high quality diamond films. The magnitude of this field is strongly dependent on pressure. Control of this field will be possible by monitoring with a Langmuir probe and controlling pressure, leading to in situ process control.

DESCRIPTORS: (U) BONDING, COMPUTERIZED SIMULATION, CONSISTENCY, DECOMPOSITION, DEPOSITION, DIAGNOSTIC EQUIPMENT, DIAMONDS, ELECTRIC FIELDS, ELECTRODES, FILMS, GRAPHITE, GROWTH(GENERAL), HYDROCARBONS, HYDROGEN,

AD-A237 793

AD-A237 793

UNCLASSIFIED

PAGE 145

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 792 9/5 20/12

AD-A237 790 12/3

KANSAS STATE UNIV MANHATTAN DEPT OF PHYSICS

CALIFORNIA UNIV RIVERSIDE

(U) Persistent Photoconductivity in II-VI Mixed Semiconductors Related Critical Phenomena and Applications.

(U) Study of Various Problems in Statistical Planning.

DESCRIPTIVE NOTE: Final rept. 15 Dec 87-14 Dec 90.

DESCRIPTIVE NOTE: Final rept. 1 Aug 90-31 Mar 91.

DEC 90 8P

MAR 91 29P

PERSONAL AUTHORS: Ghosh, Subir

PERSONAL AUTHORS: Jing, Hongxing

CONTRACT NO. AFOSR-88-0092

CONTRACT NO. AFOSR-90-0318

PROJECT NO. 2304

PROJECT NO. 2308

TASK NO. A5

TASK NO. B1

MONITOR: AFOSR, XF
TR-91-0547, AFOSR

MONITOR: AFOSR, XF
TR-91-0582, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) During the period of Aug 1, 1990 to Jan 31, 1991, the following research activities have been carried out in studying persistent photoconductivity (PPC) in II-VI mixed semiconductors and related device applications: (1) New Type of Materials, (2) PPC in II-VI Semiconductor Thin Films, (3) Comparison Between II-VI and III-V Semiconductors and (4) PCC Transient Behavior. (Author)

ABSTRACT: (U) The research done under the Grant AFOSR-88-0092 during the period December 1989 - December 1990 are (1) efficiency of connected binary block design when a single observation is unavailable (2) determination of optimal experimental conditions using dispersion main effects and interactions of factors in replicated factorial experiments (3) main effect plans with an additional search property for certain factorial experiments.

DESCRIPTORS: (U) . GROUP III COMPOUNDS, GROUP II-VI COMPOUNDS, GROUP V COMPOUNDS, MIXING, PHOTOCONDUCTIVITY, SEMICONDUCTING FILMS, SEMICONDUCTORS, THIN FILMS, TRANSIENTS.

DESCRIPTORS: (U) . COMBINATORIAL ANALYSIS, DISPERSING, INTERACTIONS, OBSERVATION, OPTIMIZATION, PLANNING, SEARCHING, STATISTICS.

IDENTIFIERS: (U) *Persistent photoconductivity, *Group II IV semiconductors, Thin film semiconductors, Zinc cadmium tellurides, WUAFOSR2308B1, PE81102F.

IDENTIFIERS: (U) *Factorial design, *Research management, Bibliographies, PE61102F, WUAFOSR2304A5.

AD-A237 792

AD-A237 790

UNCLASSIFIED

PAGE 148

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 789 12/5

AD-A237 788 6/5

INDIANA UNIV AT BLOOMINGTON DEPT OF COMPUTER SCIENCE

ILLINOIS UNIV AT URBANA

(U) Data Compilation: Its Design and Analysis.

(U) The Organization of the Suprachiasmatic Circadian Pacemaker of the Rat and its Regulation by Neurotransmitters and Modulators.

DESCRIPTIVE NOTE: Final rept. 15 Dec 88-14 Jun 90.

JUN 90 24P

DESCRIPTIVE NOTE: Annual technical rept. 1 Apr 90-31 Mar 91.

PERSONAL AUTHORS: Franco, John; Friedman, Daniel P.

APR 91 18P

CONTRACT NO. AFOSR-89-0188

PERSONAL AUTHORS: Gillette, Martha U.; Medanic, Marija; Michel, Ann-Marie; Rea, Michael; Tchong, Thomas

PROJECT NO. 2304

TASK NO. A2

CONTRACT NO. AFOSR-90-0205

MONITOR: AFOSR, XF
TR-91-0548, AFOSR

PROJECT NO. 3484

TASK NO. A4

UNCLASSIFIED REPORT

ABSTRACT: (U) The aim of this research is to study the idea compilation and its impact on the development of concise, efficient, verifiable code. This entails developing, formalizing, analyzing, and extending a data compilation methodology based on work proposed. One goal of our study is to delineate the scope of applicability of data compilation techniques. Our purpose is similar to that of researchers studying functional transformations and partial computation. Regarding data compilation, the greatest success of this work has been the appreciation of the ideas; a variety of problems using extend-syntax in Scheme. The solutions we have obtained are concise, are of optimal complexity, and yet are relatively free of data structure considerations including boundedness and sparsity. The potential for solving a wider variety of problems in this style by adding features to Scheme has been shown to be great. We have proposed some new features and modifications to existing features which will be needed to manage data compilation more efficiently.

DESCRIPTORS: (U) COMPUTATIONS, DATA ACQUISITION, DATA BASES, IMPACT, METHODOLOGY, OPTIMIZATION, TRANSFORMATIONS.

IDENTIFIERS: (U) *Data acquisition, *Coding, *Computer programming, PE81 102F, WUAFOSR2304A2.

AD-A237 789

AD-A237 788

UNCLASSIFIED REPORT

ABSTRACT: (U) This research addresses the cellular organization and regulation of a biological clock that controls daily (circadian) rhythms of behavior (e.g., performance), physiology and metabolism in mammals. This clock, located in the brain's suprachiasmatic nucleus (SCN), can be removed in a slice of hypothalamus, maintained in a life support system for up to 3 days and studied directly. Using this approach, progress in year 1 of this award has been made in (1) localizing time-keeping properties within the SCN of rat. (2) establishing the regulatory role of serotonin, a neuromodulatory input from the brain's arousal center in the raphe nucleus, and (3) examining the release of excitatory amino acids from the optic tract in the region of the SCN. This project involves both individual and interactive research projects at the University of Illinois and the USAF School of Aerospace Medicine.

DESCRIPTORS: (U) AMINO ACIDS, BIOLOGY, BRAIN, CELLS, CIRCADIAN RHYTHMS, CLOCKS, CONTROL, HYPOTHALAMUS, ILLINOIS, INTERACTIONS, LIFE SUPPORT SYSTEMS, MAMMALS, METABOLISM, MODULATORS, NEUROTRANSMITTERS, ORGANIZATIONS, PHYSIOLOGY, RATS.

UNCLASSIFIED

PAGE 147

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 788 CONTINUED

AD-A237 787 6/5

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

IDENTIFIERS: (U) *Brain slice, Circadian rhythm,
Electrosphysiology, Excitatory amino acids, *Pacemaker,
*Serotonin, PE81103D, AFOSR34844.

(U) Investigation of the Hepatotoxic and Immunotoxic
Effects of the Peroxisome Proliferator
Perfluorodecanoic Acid.

DESCRIPTIVE NOTE: Annual technical rept. 30 Sep 90-30 Apr
91.

APR 91 39P

PERSONAL AUTHORS: Frazier, Donald E.; Tarr, Melinda J.

REPORT NO. OSURF-723582

CONTRACT NO. AFOSR-90-0371

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR, XF
TR-91-0542, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Our research efforts of the past six months have involved evaluation of the immunotoxic and toxic effects of perfluorodecanoic acid (PFDA). Eight day exposure to PFDA caused thymic atrophy with marked thymocyte depletion as well as decreased spleen cellularity at 50 mg/kg. Con A-induced T cell mitogenic responses were decreased at 20 mg/kg PFDA, but no effect on B cell proliferation was observed. Antigen-induced proliferation was decreased in both 20 and 50 mg/kg PFDA-exposed animals, although delayed-type hypersensitivity reactions did not vary significantly from control animals. Interestingly, IL-2 activity of cell culture supernates was increased with PFDA exposure, although NK cell activity was similar to control and lymphocyte subsets (Th and Ts/c cells) were not affected.

DESCRIPTORS: (U) . ATROPHY, CELLS, CONTROL, DAY,
EXPOSURE(GENERAL), IMMUNOLOGY, LABORATORY ANIMALS,
LYMPHOCYTES, SPLEEN, THYMUS, TOXICITY.

IDENTIFIERS: (U) *Perfluorodecanoic acid, *Immunotoxic,
Thymic atrophy, Lympho-proliferation, Delayed-type

AD-A237 788

AD-A237 787

UNCLASSIFIED

PAGE 148

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 787 CONTINUED

AD-A237 786 9/1

hypersensitivity, NK Cell activity, Lymphocyte subsets, Interleukin 2, LPN-OSURF-788380/723582, PE61102F, WUAFOSR2312A5.

ARIZONA STATE UNIV TEMPE DEPT OF PHYSICS

(U) In-Situ Diffraction and Imaging Studies of Heteroepitaxial Growth of Semi-Conductors.

DESCRIPTIVE NOTE: Final technical rept. 1 Aug 87-31 Jul 90.

OCT 90 8P

PERSONAL AUTHORS: Bennett, Peter A.; Venables, John A.

CONTRACT NO. AFOSR-87-0378

PROJECT NO. 2308

TASK NO. B1

MONITOR: AFOSR, XF
TR-91-0581, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Our work emphasizes in-situ characterization of the initial stages of heteroepitaxial growth of semiconductors and ultrathin film silicides using advanced instrumentation and techniques, including high resolution reflection high energy electron diffraction (RHEED), a UHV scanning electron microscope with micro-probe RHEED and a UHV scanning transmission electron microscope with micro-probe RHEED and a UHV scanning transmission electron microscope (UHV-STEM). Systems of interest include vicinal Si(100), germanium on silicon, and ultrathin film silicides. Specific instrument and technique developments include: Demonstration that Auger lineshapes can be used to separate coexisting silicide phases in a partially reacted ultrathin film; Demonstration that quasi-kinematic RHEED intensity calculations can be used to identify epitaxial structures; Imaging of single atomic height steps with STEM; Visualization of submonolayers of germanium and various metals using biased secondary electron imaging; Auger imaging at the highest spatial resolution obtained anywhere.

DESCRIPTORS: (U) AUGERS, COMPUTATIONS, DIFFRACTION, ELECTRON MICROSCOPES, ELECTRON MICROSCOPY, ELECTRONIC SCANNERS, ELECTRONS, EPITAXIAL GROWTH, GERMANIUM,

AD-A237 787

AD-A237 786

UNCLASSIFIED

PAGE 149 T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 786 CONTINUED

AD-A237 785 9/1

GROWTH(GENERAL), HIGH RESOLUTION, IMAGES, INSTRUMENTATION, INTENSITY, METALS, PHASE, SEMICONDUCTORS, SILICIDES, SILICON, SPATIAL DISTRIBUTION, STRUCTURES, THIN FILMS, TRANSMITTANCE.

NOTRE DAME UNIV IN DEPT OF PHYSICS

(U) Vibrational, Mechanical, and Thermal Properties of III-V Semiconductors.

IDENTIFIERS: (U) PE61102F, WUAFOSR230681.

DESCRIPTIVE NOTE: Final rept. 1 Nov 88-31 Oct 90.

MAR 91 8P

PERSONAL AUTHORS: Dow, John

CONTRACT NO. AFOSR-89-0063

PROJECT NO. 2306

TASK NO. B1

MONITOR: AFOSR, XF
TR-91-0583, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Theories of the mechanical, vibrational, and electronic properties of III-V semiconductors have been developed and applied to (1) understanding the physics underlying the II-VI doping problem and suggesting band-gap engineering schemes for circumventing the problem; (2) making predictions of how the character of deep and shallow impurities can be different in superlattices from in bulk materials (3) understanding how surfaces of zincblende and wurtzite semiconductors relax, and how this relaxation depends on the ionicity of the semiconductor; (4) obtaining better insight into the properties of semiconducting alloys, both electronically and vibrationally, with attention paid to how ordering phenomena in these alloys affects their properties.

DESCRIPTORS: (U) ALLOYS, BULK MATERIALS, DOPING, ELECTROMAGNETIC PROPERTIES, ENERGY BANDS, ENERGY GAPS, ENGINEERING, GROUP III COMPOUNDS, GROUP II-VI COMPOUNDS, GROUP V COMPOUNDS, PHYSICS, SEMICONDUCTORS, THERMAL PROPERTIES, ZINC SULFIDES.

IDENTIFIERS: (U) PE61102F, WUAFOSR230681.

AD-A237 786

AD-A237 785

UNCLASSIFIED

PAGE 150

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 783 20/2

AD-A237 787 5/8 8/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MATERIALS
SCIENCE AND ENGINEERING

INDIANA UNIV AT BLOOMINGTON

(U) Post-Nucleation Heteroepitaxy in Poorly Lattice Matched Systems.
(U) Institute for the Study of Human Capabilities: Summary Descriptions of Research for the Period December 1989 through September 1990.

DESCRIPTIVE NOTE: Annual technical rept. 15 Oct 89-15 Oct 90.

DESCRIPTIVE NOTE: Final rept. 1 Nov 88-30 Sep 90.

NOV 90 17P

MAY 91 81P

PERSONAL AUTHORS: Thompson, Carl V.

PERSONAL AUTHORS: Watson, Charles S.

CONTRACT NO. AFOSR-85-0154

CONTRACT NO. AFOSR-87-0089

PROJECT NO. 2308

PROJECT NO. 3484

TASK NO. B1

TASK NO. A4

MONITOR: AFOSR, XF
TR-91-0573, AFOSR

MONITOR: AFOSR, XF
TR-91-0564, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) We have demonstrated a new mechanism for obtaining heteroepitaxial films, Epitaxial Grain Growth (EGG), which can lead to higher quality ultrathin epitaxial films than can be obtained by other techniques in systems with highly mismatched lattices. We have experimentally characterized this process in model materials systems and have shown that the observed orientation selectivity as well as the observed kinetic dependence of film thickness are consistent with the proposed surface- and interface-energy-driven mechanism. We have developed a computer simulation for EGG which is allowing us to determine which materials properties and processing conditions will lead to higher orientation selectivity and further reduced defect densities.

DESCRIPTORS: (U) COMPUTERIZED SIMULATION, DENSITY, EPITAXIAL GROWTH, FILMS, GRAIN GROWTH, KINETICS, MODELS, ORIENTATION(DIRECTION), PROCESSING, REDUCTION, THICKNESS.

IDENTIFIERS: (U) PE61102F, WUAFOSR230681.

AD-A237 783

AD-A237 787

UNCLASSIFIED

PAGE 151

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 767 CONTINUED

AD-A237 753 7/4

RENSELAER POLYTECHNIC INST TROY NY DEPT OF CHEMISTRY

DESCRIPTORS: (U) *PERFORMANCE(HUMAN), *PSYCHOPHYSIOLOGY,
COGNITION, SENSORY DEPRIVATION, CUEING, AUDITORY ACUITY,
VISUAL ACUITY.

(U) Organometallic Precursor Routes to Si-C-Al-O-N
Ceramics.

IDENTIFIERS: (U) PE61103D, WJAFOSR3484A4.

DESCRIPTIVE NOTE: Final rept. 1 Jul 89-31 Mar 91.

MAY 91 78P

PERSONAL AUTHORS: Interrante, Leonard V.

CONTRACT NO. AFOSR-89-0439

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR, XF
TR-91-0586, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes the results of a research program directed at the development of improved methods for the preparation of Si-C-Al-O-N ceramics using organometallic precursors. Two main approaches were employed in these studies. (1) co-pyrolysis of homogeneous mixtures of organosilicon and organoaluminum precursors and (2) pyrolysis of specially designed single-component precursors containing both Si and Al. Depending on the choice of precursors and the pyrolysis atmosphere employed, nanocrystalline Beta-SiC/2H-AlN and Si3N4/AlN composites, 2H-SiC/AlN solid solutions, and various crystalline SiAlON phases were obtained as final ceramic products after annealing at 1400-1800 C the initially amorphous pre-ceramic phases obtained on pyrolysis to 1000 C.

DESCRIPTORS: (U) ATMOSPHERES, CERAMIC MATERIALS,
CRYSTALS, HOMOGENEITY, MIXTURES, ORGANIC COMPOUNDS,
ORGANOMETALLIC COMPOUNDS, PHASE, PRECURSORS, PYROLYSIS,
ROUTING, SILICON COMPOUNDS, SOLID SOLUTIONS.

IDENTIFIERS: (U) PE61102F, WJAFOSR2303A3.

IAC NO. CE--002591

IAC SUBJECT TERMS: B--(O)B--(U)ICERAMIC MATRIX COMPOSITES.

AD-A237 753

AD-A237 767

UNCLASSIFIED

PAGE 152

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 753 CONTINUED

AD-A237 722 12/1 20/11

CERAMIC MATERIALS, SIC(P)/ALN COMPOSITE, TIN(P)/BN COMPOSITE, SI3N4(P)/BN COMPOSITE, ALN(P)/BN COMPOSITE, SILICON CARBIDE, SILICON CARBON ALUMINUM OXYNITRIDE (SICALON), ALUMINUM NITRIDE, SILICON NITRIDE, TITANIUM NITRIDE, BORON NITRIDE, PRECURSORS, MICROSTRUCTURE, PROCESSING, SYNTHESIS, PYROLYSIS, SOLID SOLUTIONS, TGA, NMR, INFRARED SPECTROSCOPY, XRD;

CALIFORNIA INST OF TECH PASADENA FIRESTONE FLIGHT SCIENCES LAB

(U) Differential Equations and Continuum Mechanics.

DESCRIPTIVE NOTE: Final rept. 1 Aug 88-31 Jul 90.

MAY 91 7P

PERSONAL AUTHORS: Cohen, Donald S.

CONTRACT NO. AFOSR-88-0269

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR, XF
TR-91-0557, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) Work has continued in two simultaneous veins. (1) Models have been developed to attempt to realistically account for recent observations involving new classes of polymerpenetrant systems. The attempt has been to account for their properties as they are currently being used in certain emerging technologies such as novel pharmaceutical delivery systems and separating membranes. (2) Since most of the new observations involve various aspects of non-Fickian diffusion coupled with viscoelastic mechanical properties, the mathematical models usually involve degenerate parabolic systems which give rise to new and fascinating types of mathematical behavior. They have provided the impetus to develop interesting analytical and numerical techniques.

DESCRIPTORS: (U) BEHAVIOR, CONTINUUM MECHANICS, DELIVERY, DIFFERENTIAL EQUATIONS, DRUGS, MATHEMATICAL MODELS, MATHEMATICS, MECHANICAL PROPERTIES, NUMERICAL METHODS AND PROCEDURES, PARABOLAS, SYNCHRONISM, VEINS, VISCOELASTICITY.

IDENTIFIERS: (U) *Differential equations, *Continuum mechanics, PE61102F, WUAFOSR2304A4.

AD-A237 753

AD-A237 722

UNCLASSIFIED

PAGE 153

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 718 CONTINUED

LASER PHOTONICS TECHNOLOGY INC AMHERST NY

(U) Chemical Processing of Novel Multifunctional Materials for Sensor Protection against Laser Threats.
IDENTIFIERS: (U) *Anthracenes, *Protective equipment, *Defense systems, *Photochemical reactions, *Laser weapons, PE83221C, WUAFOSR1802F1.

DESCRIPTIVE NOTE: Final rept. 15 Sep 90-15 May 91.

MAY 91 28P

PERSONAL AUTHORS: Burzynski, Ryszard; Casstevens, Martin K.

REPORT NO. AFO11-FR-LPT91

CONTRACT NO. F49620-90-C-0082

PROJECT NO. 1802

TASK NO. F1

MONITOR: AFOSR, XF
TR-91-0587, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) There is an immediate need for the development of materials that could function to protect human vision and light sensitive equipment from laser based weapons. The goal of the just concluded research was to synthesize a compound that would incorporate a nonlinear two photon absorbing functional group adjacent to a photoreactive moiety. This innovative approach would lead to broad band high optical transparency at lower power levels and efficient and fast attenuation at higher power levels. The use of organic compounds in this application ensures that the molecular structure could be further optimized by careful adjustment of the molecular structure. The synthesized compound, anthracene leuconitrile, was found to be photochemically unstable and took an inappropriately long time for the reconversion from the absorbing to the transmitting form.

DESCRIPTORS: (U) ANTHRACENES, ATTENUATION, CHEMICALS, DETECTORS, EFFICIENCY, HIGH POWER, HUMANS, LASER WEAPONS, LASERS, LIGHT, LONG RANGE(TIME), LOW LEVEL, LOW POWER, MATERIALS, MOLECULAR STRUCTURE, ORGANIC COMPOUNDS, POWER LEVELS, PROCESSING, PROTECTION, SENSITIVITY, SYNTHESIS, THREATS, VISION.

AD-A237 718

AD-A237 718

UNCLASSIFIED

PAGE 154

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. T85002

AD-A237 710 20/2

AD-A237 708 11/2

NORTH CAROLINA STATE UNIV AT RALEIGH DEPT OF ELECTRICAL AND COMPUTER ENGINEERING

TERRA TEK INC SALT LAKE CITY UT

(U) Defect Reductions in Epitaxial Growth Using Superlattice Buffer Layers.

(U) Compressive Stress-Induced Microcracks and Effective Elastic Properties of Limestone and Concrete. Phase 1.

DESCRIPTIVE NOTE: Final rept. 1 Apr 88-30 Sep 90.

DESCRIPTIVE NOTE: Final rept. 20 Aug 90-19 Feb 91.

DEC 90 170P

APR 91 52P

PERSONAL AUTHORS: Bedair, Salah; El-Masry, N.

PERSONAL AUTHORS: Zheng, Ziqiong; McLennan, John D.; Martin, J. W.

CONTRACT NO. AFOSR-88-0180

REPORT NO. TR-91-107

PROJECT NO. 2306

CONTRACT NO. F49620-90-C-0060

TASK NO. 01

PROJECT NO. 3005

MONITOR: AFOSR, XF
TR-91-0584, AFOSR

TASK NO. A1

MONITOR: AFOSR, XF
TR-91-0555, AFOSR

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The final report is based on the thesis of two Ph.D. students working in the area of defect reduction using strained layer superlattices. A variety of attempts to reduce the defects density in GaAs epitaxial films grown on Si substrates using annealing, InGaAs-GaAsP strained-layer superlattices, strained-layer superlattices combined with annealing, and the selective etching are presented. Both conventional furnace annealing/slow cooling and rapid thermal annealing were effective to eliminate microtwins and stacking faults. However, the conventional furnace annealing/slow cooling showed more promising results in terms of dislocations reduction. This conventional furnace annealing reduces dislocation density to about high 10⁷ cm⁻².

DESCRIPTORS: (U) ANNEALING, BUFFERS, CRYSTAL LATTICES, DEFECTS(MATERIALS), DENSITY, DISLOCATIONS, EPITAXIAL GROWTH, ETCHING, FAULTS, FILMS, FURNACES, GALLIUM ARSENIDES, LAYERS, REDUCTION, REDUCTION OF AREA, STACKING, STUDENTS, SUBSTRATES, SUPERLATTICES, THERMAL RADIATION.

IDENTIFIERS: (U) WJAT-OSR2306B1.

DESCRIPTORS: (U) ACOUSTIC VELOCITY, ANGLES, COMPRESSION, CONCRETE, CURVES(GEOMETRY), DENSITY.

AD-A237 710

AD-A237 708

UNCLASSIFIED

PAGE 155

T85002

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 708 CONTINUED

AD-A237 535 7/2 11/6

DYNAMICS, ELASTIC PROPERTIES, ENERGY CONSERVATION, INDIANA, LENGTH, LIMESTONE, MICROCRACKING, POISSON EQUATION, RATIOS, SOLUTIONS(GENERAL), STATIC TESTS, STATICS, STRESS STRAIN RELATIONS, STRESSES, TEST AND EVALUATION, ULTRASONIC PROPERTIES, WETTING.

PITTSBURGH UNIV PA DEPT OF MATERIALS SCIENCE AND ENGINEERING

(U) Environmental Effects in Niobium Base Alloys and Other Selected Intermetallic Compounds.

IDENTIFIERS: (U) *Concrete, *Limestone, *Compressive loading, * Microcracking, Crack propagation, Elastic properties, Modules of elasticity, Elastic waves, Stress strain relations, Construction materials, Ultrasonic tests, Failure(Mechanics), PE61102F, WUAFOSR3005A1.

DESCRIPTIVE NOTE: Final rept. 1 Jan 87-31 Oct 90.

APR 91 186P

PERSONAL AUTHORS: Meter, G. H.; Thompson, A. W.

IAC NO. NT-44853

CONTRACT NO. F49620-88-C-0013, DARPA Order-6155

IAC DOCUMENT TYPE: NTIAC - MICROFICHE --

MONITOR: AFOSR, XF
TR-91-0568, AFOSR

IAC SUBJECT TERMS: N--(U) MICROCRACKS, ACOUSTIC VELOCITY, LIMESTONE, CONCRETE, ELASTIC PROPERTIES, STRESS STRAIN RELATIONS, COMPRESSION, MICROSTRUCTURE, TENSILE STRESS, ULTRASONICS, WAVES, WAVE VELOCITY, ELASTIC WAVES, P WAVES, SHEAR WAVES;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Carnegie Mellon University, Department of Metallurgical Engineering and Materials Science, Pittsburgh, PA.

ABSTRACT: (U) Niobium aluminides and silicides as well as other intermetallic compounds have potential for use in advanced gas turbines where increased operating temperatures are necessary to obtain the targeted performance goals. These materials will be subjected to a variety of environments over a range of temperatures. Two of the principal reactants in these environments are oxygen and hydrogen. This program has been concerned with the effects of oxygen and hydrogen on niobium alloys and other selected intermetallic compounds. The investigations involving oxygen examined the mechanisms by which intermetallic compounds are degraded in oxidizing environments. Emphasis was placed upon the conditions which must be achieved in order to obtain sufficient oxidation resistance for use at temperatures above about 1100 deg C. Oxidation was investigated at temperatures between 500 and 1400 C in oxygen and in air. Investigations involving hydrogen have emphasized brittle fracture, crack growth and the behavior of hydrides in Ti-24Al-11Nb (at. %). Some work of this type was also performed on TiAl. The mechanical properties of these alloys were determined after exposure to hydrogen. Mechanical tests included simple tensile and compression tests, and notched bend and precracked compact tension specimens. Properties such as yield strength and ultimate

AD-A237 708

AD-A237 535

UNCLASSIFIED

PAGE 156

T85002

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 535 CONTINUED

AD-A237 457 9/1

strength, tensile strength, ductility, and fracture toughness have been determined as a function of both hydrogen (hydride) content and temperature.

ARIZONA UNIV TUCSON OPTICAL SCIENCES CENTER
(U) Center for Thin Film Studies.

DESCRIPTORS: (U) , ALLOYS, ALUMINIDES, BRITTLENESS, CRACK PROPAGATION, DUCTILITY, ENVIRONMENTAL IMPACT, ENVIRONMENTS, EXPOSURE(GENERAL), FRACTURE(MECHANICS), GAS TURBINES, HYDRIDES, HYDROGEN, INTERMETALLIC COMPOUNDS, MECHANICAL PROPERTIES, NIOBIUM, NIOBIUM ALLOYS, OXIDATION, OXIDATION RESISTANCE, OXYGEN, SILICIDES, TEMPERATURE, TENSILE STRENGTH, TENSION, TEST AND EVALUATION, TOUGHNESS, YIELD STRENGTH.

DESCRIPTIVE NOTE: Final rept. 1 Oct 86-1 Jun 90.

JAN 91 140P

PERSONAL AUTHORS: Shannon, Robert R.

PROJECT NO. 3484

TASK NO. A3

IDENTIFIERS: (U) *Intermetallic compounds, *Niobium alloys, Gas turbines, *Hydrogen, *Oxidation, Temperature, Microstructure, Grain size, Compressive strength, Brittleness, PE82712E, Titanium alloys.

MONITOR: AFOSR, XF
TR-91-0565, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) This report is for the entire term of operation of the URI Thin Film Center, including the six-month no-cost extension of the subject contract, and contains a summary of the research performed under this umbrella grant. Sections of this report address work on growth and characterization of thin films by various methods; modeling of thin film growth; and preparation and characterization of substrates for film growth. The Center for Thin Film Studies covered a wide range of research topics, from fundamental studies of growth to applications of processing methods. Also developed were new and improved analysis tools, such as Brillouin spectroscopy, Rutherford backscattering spectrometry, microreflectometry, and surface probes such as scanning tunneling microscopy. Practical properties of interest such as scattering and absorptive losses, surface roughness, and optical properties for a variety of materials have also been reported. The attached summary highlights the important advances of the three-and-a-half-year effort; for further details, the reader is referred to the bibliography and the articles listed therein.

DESCRIPTORS: (U) , ABSORBERS(MATERIALS), BACKSCATTERING, BIBLIOGRAPHIES, BRILLOUIN ZONES, COSTS, FILMS, GROWTH(GENERAL), LOSSES, METHODOLOGY, MICROSCOPY, PROBES, PROCESSING, RANGE(EXTREMES), SCANNING, SCATTERING, SPECTROMETRY, SPECTROSCOPY, SUBSTRATES, SURFACE ROUGHNESS, SURFACES, THIN FILMS, TUNNELING.

AD-A237 535

AD-A237 457

UNCLASSIFIED

PAGE 157

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 457 CONTINUED

AD-A237 456 20/2 20/13 11/6

IDENTIFIERS: (U) PE61103D, WUAFOSR3484A3.

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Development of Model Based Magnetic LP-LEC Growth Large Diameter GaAs.

DESCRIPTIVE NOTE: Final rept. 14 Aug 87-28 Nov 90.

NOV 90 105P

PERSONAL AUTHORS: Witt, August F.

CONTRACT NO. F49620-87-C-0106

MONITOR: AFOSR, XF
TR-91-0580, AFOSR

UNCLASSIFIED REPORT

ABSTRACT: (U) The stated objectives of this research effort were directed at: (1) The establishment of magnetic LP-LEC growth capability with diameters approaching 4 inches; (2) The design of heat and mass transfer control systems required for optimization of growth with magnetic melt stabilization, and (3) Development of a model-based growth control scheme which includes complementary knowledge-based system inputs for seeding, shouldering, and growth termination. A non-invasive wafer inspection system has been developed. It is based on NIR transmission microscopy with bright and dark field illumination. It provides for rapid quantitative characterization of doped and non-doped Si GaAs on both a macro- and selected microscale. Model-based control of thermal stresses in LEC growth of GaAs has been implemented. In this approach mathematical models of the growth process and a heat exchange system are used to control the temperature field in the crystal during growth and cooldown. Crystals grown in this configuration exhibit dislocation densities in the range of 1000/sq. cm. Also developed was a micro-mechanical constitutive law for high temperature creep and dislocation multiplication in GaAs.

DESCRIPTORS: (U) BRIGHTNESS, CONTROL SYSTEMS, CREEP, CRYSTALS, DARKNESS, DENSITY, DISLOCATIONS, EXCHANGE, GALLIUM ARSENIDES, GROWTH(GENERAL), HEAT TRANSFER, HIGH TEMPERATURE, ILLUMINATION, INSPECTION, MAGNETIC FIELDS, MASS TRANSFER, MATHEMATICAL MODELS, MELTS, MICROSCOPY, MULTIPLICATION, OPTIMIZATION, STABILIZATION, TEMPERATURE.

AD-A237 457

AD-A237 456

UNCLASSIFIED

PAGE 158

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 458 CONTINUED

AD-A237 413 20/4

LEHIGH UNIV BETHLEHEM PA PACKARD LAB

IDENTIFIERS: (U) *Gallium arsenides, Doping, LEC(Liquid Encapsulated Crystals), Semiconductors, Mathematical models, *Crystal growth, *Heat transfer, Mass transfer, Defects(Materials).

(U) Three-Dimensional Vortex Dynamics and Interactions in Near-Wall Turbulent Boundary Layers.

DESCRIPTIVE NOTE: Final rept. 1 Nov 88-1 Mar 91.

IAC NO. NT-45043

MAR 91 97P

IAC DOCUMENT TYPE: NTIAC - MICROFICHE --

PERSONAL AUTHORS: Smith, C. R.; Walker, J. D.

IAC SUBJECT TERMS: N--(U) THERMAL IMAGING, CRYSTAL GROWTH, SEMICONDUCTORS, REAL TIME, PROCESS CONTROL, GALIUM ARSENIDE, NONCONTACTING, MICROSCOPY, TRANSMISSION, WAFERS, NUCLEAR ACTIVATION, INFRARED RADIATION, OPTICAL INSPECTION, SILICON, GERMANIUM;

CONTRACT NO. AFOSR-89-0065

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR, XF
TR-91-0504, AFDSR

UNCLASSIFIED REPORT

ABSTRACT: (U) A model of the three-dimensional dynamic physical processes that occur in the near-wall region of a turbulent flow at high Reynolds numbers is developed. The hairpin vortex is postulated to be the basic flow structure of the turbulent boundary layer. It is shown that the central features of the near-wall flow can be explained in terms of how asymmetric hairpin vortices interact with the background shear flow, with each other, and with the surface layer near the wall. The physical process that leads to the regeneration of new hairpin vortices near the surface is described, as well as the processes of evolution of such vortices to larger-scale motions farther from the surface. The model is supported by important developments in the theory of unsteady surface-layer separation and a number of 'kernel' experiments which demonstrate basic fluid mechanics phenomena relevant to the turbulent boundary layer. Explanations for the kinematical behavior observed in direct numerical simulations of low Reynolds number boundary-layer and channel flows are given.

DESCRIPTORS: (U) BACKGROUND, BOUNDARY LAYER, CHANNEL FLOW, DYNAMICS, FLOW, FLUID MECHANICS, HIGH RATE, LAYERS, LOW RATE, NUMERICAL ANALYSIS, PHYSICAL PROPERTIES, REGENERATION(ENGINEERING), REYNOLDS NUMBER, SHEAR PROPERTIES, SURFACES, THREE DIMENSIONAL, THREE

AD-A237 458

AD-A237 413

UNCLASSIFIED

PAGE 159

T85002

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. T85002

AD-A237 413 CONTINUED

DIMENSIONAL FLOW, TURBULENT BOUNDARY LAYER, TURBULENT
FLOW, VORTICES.

IDENTIFIERS: (U) *Vortices, *Turbulent boundary layer,
Hairpin vortices, PEG1102F, WJAFOSR2307A2.

AD-A237 413

UNCLASSIFIED

PAGE 160

T85002