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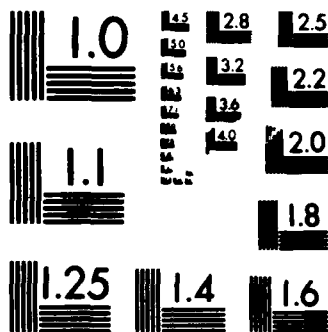
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FINAL REPORT  
1987 GORDON RESEARCH CONFERENCE

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ON  
HOLOGRAPHY AND OPTICAL INFORMATION PROCESSING

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Holography & Optical Information  
Processing

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*Steven K. Case*

February 1987



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FINAL REPORT  
1987 GORDON RESEARCH CONFERENCE  
ON  
HOLOGRAPHY AND OPTICAL INFORMATION PROCESSING

January 5-9, 1987  
Miraimar Hotel  
Santa Barbara, CA

1. Technical Statement

The field of Holography and Optical Information Processing is an important and active one with many significant advances during the past twenty years. This conference had 19 formal talks describing the most recent areas of interest. A complete list of speakers is included in Appendix A.

The conference contained a carefully selected mixture of talks including optical computing, components and architectures; optical processors; holography; and applications of coherent light.

In addition, 11 contributed poster papers were presented on Tuesday evening. The papers were posted early in the conference dining room and they remained for two days so it was relatively easy to have a short or lengthy session with a given author. Thursday evening was reserved for informal presentations which generated numerous discussions. Many of the discussions continued well into the night.

2. Funding

The purpose of this document is to report on the expenditures of funds received from the AFOSR and DARPA in response to an unsolicited proposal. In the proposal it was indicated that these funds would be spent to promote attendance of scholars who would otherwise be hampered from attending. The awardees are listed in the following table:

<u>Name</u>	<u>Institution</u>	<u>Amount</u>
Gerald Roosen	U. Paris	\$ 600
Jean-Marc Fournier	Bescanson, France	1,279
Shelly Glaser	Weizmann Institute	1,000
Jeff Jalkio	University of Minnesota	1,100
Oliver McBryan	Courant Institute	1,279
Henry Taylor	Texas	814
Desmond Smith	Heriott-Watt	1,200
Gerd Weigelt	University of Erlangen	415
G. R. Ayers	Imperial College	700
M. J. Northcott	Imperial College	700
Tony Ticknor	University of Arizona	385
Xiaoping Lu	Penn. State	750
Suganda Jutamulia	Penn. State	843
Don Schertler	University of Rochester	385
Keith Farr	University of Rochester	385
Brian Stossel	University of Rochester	385
Shen-ge-Wang	University of Rochester	385
Paul Griffith	Ohio State	850
Mark Garrett	USC	385
Ed Herbulock	USC	385
Richard Johnson	USC	385
Kasra Rastani	USC	<u>385</u>
		\$15,000

### 3. Conference Attendance

There were approximately 90 people attending this conference. A partial address list is included in Appendix B. The breakdown of attendees is approximately as follows:

56% from Universities

11% from Government

33% from Industry

Participants came from every geographic area of the United States and several foreign countries.

## GORDON RESEARCH CONFERENCE

### Optical Information Processing and Holography

January 5 - 9, 1987

Mirimar Hotel  
Santa Barbara, California

Steven K. Case, Chairman  
Stephen A. Benton, Vice-Chairman

#### Monday Morning - John Neff, Discussion Leader

8:45 a.m.	Steven Case	Welcome
9:00 a.m.	Keith Jenkins USC	"Parallel Computation and Optical Computing"
9:50 a.m.	Oliver McBryan Courant Institute NYU	"State of the Art for Digital Electronic Parallel Computers"
10:40 a.m.	--Break--	
11:10 a.m.	John Hopfield Cal Tech Bell Labs	"Neural Networks and Optical Computing"

#### Monday Evening - Keith Bromley, Discussion Leader

7:30 p.m.	Henry Taylor Texas A&M	"Fiber and Integrated Optics for Signal Processing"
8:20 p.m.	Armand Tanguay USC	"Optical Information Processing Components"



Tuesday Morning - Lee Giles, Discussion Leader

- |            |  |  |
|------------|--|--|
| 9:00 a.m.  | Alan Huang<br>Bell Labs                                  | "Optical-Digital Computers"  |
| 9:50 a.m.  | Tony Ticknor<br>H. H. Barrett<br>Optical Sciences Center | "Optical Acceleration of Digital Computation"  |
| 10:40 a.m. | --Break--  |  |
| 11:10 a.m. | Desmond Smith<br>Heriot-Watt University                  | "Restoring Optical Logic and a Simple Finite State Machine with the Consequences for Parallel Digital Computation" |

Tuesday Evening - Organized by Stephen Benton

- 7:30 p.m. -  
10:00 p.m.      Poster Session

Wednesday Morning - Emmett Leith, Discussion Leader

- |            |   |   |
|------------|---|---|
| 9:00 a.m.  | G. Michael Morris<br>U of Rochester             | "Monte Carlo Optical Processing"                              |
| 9:50 a.m.  | Don Sweeney<br>George Shils<br>Sandia-Livermore | "Holographic Correlator for Distortion-Invariant Recognition" |
| 10:40 a.m. | --Break--                                       |   |
| 11:10 a.m. | Nicholas George<br>U of Rochester               | "Hybrid Processors with Natural Illumination"                 |

Wednesday Evening - Tom Cathey, Discussion Leader

- |           |  |   |
|-----------|--|---|
| 7:30 p.m. | Yuri Owechko<br>Gilmore J. Dunning<br>Bernard H. Soffer<br>Emanuel Marom | "Holographic Association Memory with Non-Linearities in the Correlation Domain" |
| 8:20 p.m. | Gerd Weigelt<br>U Erlangen   | "Image Reconstruction from Astronomical Speckle Interferograms"                 |

Thursday Morning - Steve Benton, Discussion Leader

9:00 a.m.	James Leger MIT-Lincoln Lab	"Combining Laser Beams with Holography"
9:50 a.m.	Akira Tonomura Hitachi	"Electron Holography"
10:40 a.m.	--Break--	
11:10 a.m.	James Cowan Polaroid	"Fabrication of Optical Microstructures"

Thursday Evening - Neal Gallagher, Discussion Leader

7:30 p.m. Open Presentation

Friday Morning - Poohsan Tamura, Discussion Leader

9:00 a.m.	Jeffrey Jalkio U of Minnesota	"Coherent Optics for 3-D Metrology"
9:50 a.m.	Ole Lokberg Norwegian Institute of Technology	"What are the Limits of ESPI"
10:40 a.m.	--Break--	
11:10 a.m.	Robert A. Sprague Xerox Corporation	"Optical Addressing Schemes"

The conference ends after lunch on Friday.

GORDON RESEARCH CONFERENCES

JANUARY 5-9, 1987  
MIRAMAR HOTEL

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