AD-A231 910

FINAL REPORT

TO

OFFICE OF NAVAL RESEARCH

DOD Science and Engineering Apprenticeship Program for High School Minorities and Women
Summer 1990 Activities

Contract No. N00014-88-J-1159

Principal Investigator: Dr. Richard L. Pfeffer
Director, Geophysical Fluid Dynamics Institute
The Florida State University
Tallahassee, FL 32306
(904) 644-5594

Co-Manager: Dr. Robin J. Kung
Geophysical Fluid Dynamics Institute
Florida State University
Tallahassee, FL 32306
(904) 644-6597

January 1991

The Florida State University
Tallahassee, Florida
1. INTRODUCTION

The summer of 1990 represented the ninth successful DOD Science and Engineering Summer Apprenticeship Program for High School Minority Students sponsored by the Office of Naval Research at Florida State University. The program this year was again administered by the Geophysical Fluid Dynamics Institute (GFDI) under the direction of Drs. Richard L. Pfeffer and Robin Kung. Student activities were centered at GFDI and included work experience in GFDI.

Nine students were selected to work in the summer program. The guidance counselors of five local high schools were approached to obtain the names of outstanding college bound minorities and women. This summer our student group consisted of seven seniors, and two exceptional juniors. The departure from our past concentration on seniors was motivated by our desire to influence and expose students to possible scientific and engineering careers at an earlier age. Brief vitae of the selected students appear in the following section, and information pertaining to each apprentice is also attached at the end of the report.

Students spent a total of 30 hours per week with the program for 10 weeks. They participated in research via data handling and data processing with the aid of computer operated equipment, and in enrichment activities including lectures, laboratory demonstrations, scientific films, a formal course and a weekly discussion session on the history of science using the book *Coming of Age in the Milky Way* by Timothy Ferris. A summary of their activities and projects is included in section 3. A few of the students continued in the program during the Fall semester.
2. STUDENT VITAS

NAME: Darwin Ang
MINORITY: Asian male
HIGH SCHOOL: Florida High
COLLEGE: Florida State University
ANTICIPATED MAJOR: Pre-medicine
AWARDS/SCHOLARSHIPS: Florida Academic Scholarship (1990-1994)
ACTIVITIES/HOBBIES: Tennis, piano, martial arts and reading

NAME: Teresa Hays
MINORITY: Black female
HIGH SCHOOL: FAMU High
COLLEGE: Still in 12th grade
ANTICIPATED MAJOR: Unsure
AWARDS/SCHOLARSHIPS: Honor roll, 1990
ACTIVITIES/HOBBIES: Piano, Teens for Teens (anti-drug club), anti-drug conferences

NAME: Amber Jessup
MINORITY: White female
HIGH SCHOOL: Rickards High School
COLLEGE: Florida State University
ANTICIPATED MAJOR: Biology
AWARDS/SCHOLARSHIPS: National Merit Scholar, Florida Academic Scholar, Governor’s College Scholar, Salutatorian at Rickards High School
ACTIVITIES/HOBBIES: Soccer, caving, Brain Brawl
NAME: Vanessa Johnson  
Minority: Black female  
HIGH SCHOOL: Leon High School  
COLLEGE: University of Florida  
ANTICIPATED MAJOR: Unsure  
AWARDS/SCHOLARSHIPS: University of Florida scholarship (4 years), Presidential Scholarship, Who's Who of American High School Students, Foreign Language Award (State), Leon Foundation Award

NAME: Daria Navon  
MINORITY: White female  
HIGH SCHOOL: Lincoln High School  
COLLEGE: University of Florida  
ANTICIPATED MAJOR: Biology/genetics  
AWARDS/SCHOLARSHIPS: Who's Who Among American High School Students; Outstanding High School Students of America; 3rd Place in Florida on National French Exam; Outstanding French Student at Lincoln; Florida Academic Scholarship (4 years), Salutatorian at Lincoln High School, Florida Academic Fitness Award, National Merit Commended Scholar.  
ACTIVITIES/HOBBIES: Tennis team; National Honor Society; Mu Alpha Theta, French Club (Treasurer); French Honor Society (Vice-President); Society for Global Consciousness (Director); Volunteer Tutoring; Inter-Club Council; Playing piano.

NAME: Chikai Ohayama  
MINORITY: Asian male  
HIGH SCHOOL: Florida High  
COLLEGE: Vanderbilt University  
ANTICIPATED MAJOR: Medicine  
AWARDS/SCHOLARSHIPS: Vanderbilt Chancellor's Scholarship, Valedictorian of Florida High School, 1990  
ACTIVITIES/HOBBIES: Fencing, violin, computers, poetry
NAME: Vivine Owen  
MINORITY: Black female  
HIGH SCHOOL: FAMU High School  
COLLEGE: Still in 12th grade  
ANTICIPATED MAJOR: Unsure  
AWARDS/SCHOLARSHIPS: Honor roll, Who's Who Among American High School Students, National Merit Scholarship  
ACTIVITIES/HOBBIES: Reading, playing piano

NAME: Gina Starr  
MINORITY: Black female  
HIGH SCHOOL: Lincoln High School  
COLLEGE: Emory University  
ANTICIPATED MAJOR: Chemistry  
AWARDS/SCHOLARSHIPS: Alex Means Scholar, Emory National Achievement Scholar  
ACTIVITIES/HOBBIES: Piano, modern philosophy, reading scientific journals, Academic Team.

NAME: John Wang  
MINORITY: Asian male  
HIGH SCHOOL: Lincoln High School  
COLLEGE: Duke University  
ANTICIPATED MAJOR: Engineering  
AWARDS/SCHOLARSHIPS: HCA Foundation Scholarship, Duke University Grant, NROTC, AROTC and 3-ROTC, Valedictorian at Lincoln High School.  
ACTIVITIES/HOBBIES: Reading, Frisbee
3. WORK PROJECTS OF MINORITY STUDENTS

Eight of the nine students participated in digitizing velocity vector data from photographs of flow fields obtained in laboratory experiments. This activity was part of a larger project on studies of the interaction of bottom topography with overlying baroclinic waves investigated by Drs. R. L. Pfeffer and R. Kung. The students' work was supervised by Mr. Clayton Lewis and assisted by Messrs. Scott Boyles and Gerald Arnold. Two of these individuals are black undergraduates. One of the students participated in the analysis of atmospheric boundary layer data under the supervision of Professor S. Stage in the Meteorology Department. This student plotted data from the Frontal Air-Sea Interaction Experiment (FASINEX). The data show the effects of an oceanic sea surface temperature (SST) front on the overlying atmosphere. Atmospheric temperature, winds and humidity are each influenced by the SST front. The exact details of the influence were very different for the three days analyzed due to different directions between the winds associated with the large scale weather patterns and the SST front.

The major project in which eight of the students participated during the summer was the study of photographic velocity data from laboratory experiments on the interaction of topography with baroclinic waves, and flows with azimuthally varying lower thermal boundary conditions. The majority of their time was spent in digitizing photographs which were recorded in laboratory experiments designed to study the interaction of topography and different thermal boundary conditions with baroclinic waves. The experiments were conducted in a rotating, differentially heated annulus of fluid.
Vivine looks up at the monitor to ensure accuracy of digitized flow vectors.

The data from the experiments were obtained by means of a camera, mounted at the top of the rotating annulus, which recorded the movements of laser-illuminated particles suspended in the fluid. The camera produced a sequence of still photographs, in each of which the movement of every particle appeared as a string of dots. By digitizing the position of these dots and calculating the distance between dots and the orientation of each string of dots, one can determine the velocity field as a function of time. Fourier analyses and energetics calculations of such data provide valuable information about the behavior of baroclinic fluids in the presence of bottom topography.

The students had the opportunity to gain experience in the use of digitizing equipment, personal computers, and video monitors which display the work graphically as it is being digitized. They were also able to see and discuss the results of a first-level analysis of the
Teresa carefully digitizes the vectors on the photograph. Digitized data produced with the DEC VAX computer cluster. During the course of the summer, the students worked with photographs from several different experiments, which allowed them to see effects of variations in experimental parameters such as the difference in temperature between the inner and outer walls of the bath, the speed of rotation, and the presence or absence of topography.

Efforts were made to ensure the students' understanding of the relationships between the theoretical model and observable phenomena, such as the jet stream and ocean currents, which effect the transfer of energy between the earth's equator and poles.
4. INSTRUCTION AND ENRICHMENT ACTIVITIES

The instruction and training received by the students concerning their work assignments always went beyond that needed to do the job. An attempt was always made to make their work experience a learning process and an introduction to scientific research. An explanation of the research project, its implications, and the contribution of the student's work to the overall project was always given.

Aside from the students' regular work, a variety of activities were scheduled. Activities included a series of lectures on research topics pertaining to their work and the work of the
Dr. Kung explains the procedure of the laboratory annulus experiments.

research staff. Lectures were given by Drs. Buzyna, Nicholson, Pfeffer, Ruby Krishnamurti, Howard, Kung, Blumsack, Fuelberg, Gruender, Stage and Long, and by graduate student David Coulliette. In addition to these, the students were given lectures and discussions with Dr. Pfeffer on *Coming of Age in the Milky Way*, an exciting book on the history of science by Timothy Ferris. A series of educational scientific movies were also shown, such as waves and beaches, meteorology today, stratified flow, turbulence, surface tension, breaking waves and others. A list of these activities is given in Table 1. The students were also given opportunities to experience work in areas outside their main assignments, so that all students could experience each other's work and thus broaden their overall experience.
<table>
<thead>
<tr>
<th>MONDAY (Movies)</th>
<th>TUESDAY (Talks)</th>
<th>WEDNESDAY (Discussions)</th>
<th>FRIDAY (Lab Demo.)</th>
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<tbody>
<tr>
<td>Fluid Dynamics of Drag Part 1 &amp; 2 (B &amp; W)</td>
<td>Ruby Krishnamurti Bénard Convection (Lab. Demo.)</td>
<td>Pfeffer Raising the Roof</td>
<td>Richard Pfeffer A discussion of Coriolis force</td>
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<tr>
<td>25 1:00</td>
<td>26 1:00</td>
<td>27 1:00</td>
<td>29 1:00</td>
</tr>
<tr>
<td>Fluid Dynamics of Drag Part 3 &amp; 4 (B &amp; W)</td>
<td>Louis Howard Continued Fractions</td>
<td>Pfeffer The Discovery of the Earth</td>
<td>David Coulliette A Model of the Mantle Convection</td>
</tr>
<tr>
<td>2 JULY 1:00</td>
<td>3 1:00</td>
<td>4 1:00</td>
<td>6 1:00</td>
</tr>
<tr>
<td>Meteorology Today (video)</td>
<td>Henry Fuelberg Thunderstorm Forecasting</td>
<td>Pfeffer The Sun Worshippers</td>
<td>Krishnamurti Double-diffusive Instability</td>
</tr>
<tr>
<td>9 1:00</td>
<td>10 1:00</td>
<td>11 1:00</td>
<td>13 1:00</td>
</tr>
<tr>
<td>Surface Tension (color)</td>
<td>David Gruender The Trial of Galileo</td>
<td>Pfeffer The World in Retrograde</td>
<td>Kung Coriolis Force</td>
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<tr>
<td>16 1:00</td>
<td>17 1:00</td>
<td>18 1:00</td>
<td>20 1:00</td>
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<tr>
<td>Stratified Flow (color)</td>
<td>George Buzyna Lab. Exp. of Land Sea Influences</td>
<td>Pfeffer Newton's Reach</td>
<td>Krishnamurti Thermal Oscillators.</td>
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<tr>
<td>23 1:00</td>
<td>24 1:00</td>
<td>25 1:00</td>
<td>27 1:00</td>
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<tr>
<td>Flow Instability (B &amp; W)</td>
<td>Steve Blumsack Intro. to Chaos</td>
<td>Pfeffer A Plumb Line to the Sun</td>
<td>Kung Taylor Column</td>
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<tr>
<td>30 1:00</td>
<td>31 1:00</td>
<td>1 AUGUST 1:00</td>
<td>3 1:00</td>
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<tr>
<td>Turbulence (color)</td>
<td>Sharon Nicholson African Climate Variability</td>
<td>Pfeffer Deep Space</td>
<td>Krishnamurti Rijke Tube</td>
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<td>6 1:00</td>
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<td>8 1:00</td>
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<td>13 1:00</td>
<td>14 1:00</td>
<td>15 1:00</td>
<td>17 1:00</td>
</tr>
<tr>
<td>Aero. Generation of Sound (B &amp; W)</td>
<td>Christopher Long Nuclear Physics at FSU</td>
<td>Pfeffer Einstein's Sky</td>
<td>Krishnamurti</td>
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</tbody>
</table>

**Time:** 12:15 to 1:00 before 6/22/90; 1:00 to 1:45 after 6/25/90
Dr. Steven Blumsack gives a lecture on Introduction to Chaos

Dr. Howard gives a lecture on continued fractions.
This summer the students also benefitted from another enrichment program which included a basic meteorology course given by Professor Jon Ahlquist, in which seven of the students participated. They were given the same homework assignments and exams as the regular college students.

5. CONCLUSION

The summer program was very successful this year. The students were bright, attentive, well-motivated, and willing to work. Aside from the monetary reward, the students related that they benefited a great deal from their summer experience, especially the younger students. They were grateful for the opportunity to work in a scientific environment and acquire new skills and experience. Their contribution to the various projects was also significant. The digitizing work was done carefully and accurately and hence contributed substantially to a much needed data base for further analysis and study. Their work on other projects enabled us to investigate certain aspects we might not have otherwise found time to do or would have to do at some later time.

In general, the students felt financially rewarded and scientifically enriched by their experience in the summer program. We feel that the students acquired a certain maturity and confidence which should be a great asset to them during their final years in high school, college, and their chosen careers.
INFORMATION FOR EACH APPRENTICE

1 NAME ___________________________ Darwin  
   last name ___________________________ first name ___________________________  

2 ADDRESS ___________________________ 2100 Oreans Drive  
   (permanent) street & number ___________________________ (904) 878-5902  
   city Tallahassee  state FL  zip code 32308  

2a (school address; '89-'90, if applicable) Florida High  116 West Call St.  
   (904) 644-1025  

3 LAST GRADE COMPLETED ____________ 12th TYPE OF SCHOOL: (x)Public ( )Private  

4 SEX (x)Male ( )Female  

5 RACE/ETHNICITY: (Voluntary) ( )Black ( )White ( )Hispanic (x)Asian ( )Other  

6 INSTALLATION Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee, FL  
   name Dr. R.L. Pfeffer, Professor and Director  
   MENTOR name Dr. R.J. Kung, Research Associate  
   title  

7 PRINCIPAL DISCIPLINE OF RESEARCH Atmospheric Science  

8 MAJOR TASKS PERFORMED Digitizing of Velocity Vectors from photographs of Flow fields obtained in Laboratory experiments.  

9 HONORS Florida Academic Scholarship
INFORMATION FOR EACH APPRENTICE

1 NAME Hayes Teresa

2 ADDRESS 322 Gaile Ave. (904) 656-3817
(permanent) street & number phone
Tallahassee Florida 32311

city state zip code

2a (school address, '89-'90, if applicable) FAMU High (904) 599-3325
P.O. A19 Tallahassee, FL 32307

3 LAST GRADE COMPLETED 10th TYPE OF SCHOOL: ( )Public (x)Private

4 SEX ( )Male (x)Female

5 RACE/ETHNICITY: (Voluntary) (x)Black ( )White ( )Hispanic ( )Asian ( )Other

6 INSTALLATION Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee, FL

7 MENTOR Dr. R.J. Kung, Research Associate

8 PRINCIPAL DISCIPLINE OF RESEARCH Atmospheric Science

9 MAJOR TASKS PERFORMED Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.

10 HONORS Honor Roll at FAMU High School
INFORMATION FOR EACH APPRENTICE

1 NAME Jessup Amber

last first

ADDRESS 2907 Morningside Drive (904) 877-7893
(permanent) street & number phone

Tallahassee Florida 32301 city state zip code

2a (school address; '89-'90, if applicable) Rickards H.S. (904) 488-1783

3013 Jim Lee Road phone

LAST GRADE COMPLETED 12th TYPE OF SCHOOL: (x)Public ( )Private

SEX ( )Male (x)Female

RACE/ETHNICITY: (Voluntary) ( )Black (x)White ( )Hispanic ( )Asian ( ) Other

INSTALLATION Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee, FL

Dr. R.L. Pfeffer, Professor and Director

MENTOR Dr. R.J. Kung, Research Associate

name title

PRINCIPAL DISCIPLINE OF RESEARCH. Atmospheric Science

MAJOR TASKS PERFORMED Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.

HONORS National Merit Scholar; Florida Academic Scholar; Governor's College Scholar; Salutatorian at Rickards High School
INFORMATION FOR EACH APPRENTICE

1. NAME ______________ last ______________ first ______________

2. ADDRESS 6237 Quarterhorse Trail (904) 893-8958
   (permanent) street & number phone
   Tallahassee Florida 32308
city state zip code

2a. (school address; '89-'90, if applicable) Leon High School (904) 488-1971
   550 East Tennessee Street phone

3. LAST GRADE COMPLETED 12th TYPE OF SCHOOL: ( )Public ( )Private

4. SEX ( )Male ( )Female

5. RACE/ETHNICITY: (Voluntary) ( )Black ( )White ( )Hispanic ( )Asian ( )Other

6. INSTALLATION Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee, FL
   name Dr. R.L. Pfeffer, Professor and Director
   MENTOR Dr. R.J. Kung, Research Associate
   name title

7. PRINCIPAL DISCIPLINE OF RESEARCH Atmospheric Science

8. MAJOR TASKS PERFORMED Digitizing of velocity vectors from photographs of flow
   fields obtained in laboratory experiments.

9. HONORS University of Florida Scholarship (1990-1994); Presidential Scholarship;
   Who's Who Among Highschool Students; Foreign Language Award (State); Leon Foundation
   Award
<table>
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<tr>
<td><strong>1 NAME</strong>Navon Daria last first</td>
</tr>
<tr>
<td><strong>2 ADDRESS</strong>3148 Ferns Glen Drive (permanent) street &amp; number (904) 893-7606 phone Tallahassee Florida 32308 city state zip code</td>
</tr>
<tr>
<td>**2a (school address; '89-'90, if applicable)**Lincoln High phone (904) 487-2110 3838 Trojan Trail</td>
</tr>
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<td><strong>3 LAST GRADE COMPLETED</strong>12th TYPE OF SCHOOL: (x)Public ( )Private</td>
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<td><strong>4 SEX</strong>( )Male (x)Female</td>
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<td><strong>5 RACE/ETHNICITY:</strong>(Voluntary) ( )Black (x)White ( )Hispanic ( )Asian ( )Other</td>
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<td><strong>6 INSTALLATION</strong>Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee, name Dr. R.L. Pfeffer, Professor and Director FL</td>
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<tr>
<td><strong>7 MENTOR</strong>name Dr. R.J. Kung, Research Associate title</td>
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<td><strong>8 PRINCIPAL DISCIPLINE OF RESEARCH</strong>Atmospheric Science</td>
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<td><strong>9 MAJOR TASKS PERFORMED</strong>Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.</td>
</tr>
<tr>
<td><strong>10 HONORS</strong>Florida Academic Scholarship; Salutatorian at Lincoln High School; Florida Academic Fitness Award; National Merit Commended Scholar; Outstanding French Student at Lincoln High School; 3rd Place in the State of Florida on the National French Exam; Outstanding High School Student of America; Who's Who Among American High School Students; National Honor Society; French Honor Society; Mu Alpha Theta.</td>
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INFORMATION FOR EACH APPRENTICE

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<thead>
<tr>
<th>Field</th>
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<tbody>
<tr>
<td>1. NAME</td>
<td>Ohazama Chikai</td>
</tr>
<tr>
<td>2. ADDRESS</td>
<td>1713 Old Fort Drive (904) 878-6739</td>
</tr>
<tr>
<td></td>
<td>Tallahassee, Florida 32301</td>
</tr>
<tr>
<td>3a. (school address; '89 - '90, if applicable)</td>
<td>Florida High School (904) 644-1025</td>
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<td>B-166 West Call St.</td>
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<td>6. SEX</td>
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<td>7. RACE/ETHNICITY: (Voluntary)</td>
<td>( ) Black ( ) White ( ) Hispanic (x) Asian ( ) Other</td>
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<td>8. INSTALLATION</td>
<td>Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee, FL</td>
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<td>9. MENTOR</td>
<td>Dr. R.L. Pfeffer, Professor and Director</td>
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<td>Dr. R.J. Kung, Research Associate</td>
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<td>10. MAJOR DISCIPLINE OF RESEARCH</td>
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<td>11. MAJOR TASKS PERFORMED</td>
<td>Digitizing velocity vector data from photographs of flow fields obtained in laboratory experiments.</td>
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<td>12. HONORS</td>
<td>Vanderbilt Chancellor's Scholarship; Valedictorian of Florida High School, 1990</td>
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</table>
INFORMATION FOR EACH APPRENTICE

NAME: Owen Vivine

ADDRESS: 1502 Inwood Drive
Tallahassee, FL 32304

PERMANENT ADDRESS: street & number

(904) 386-7603 phone

city state zip code

Famu High (904) 599-3325

P.O. Box A19 Tallahassee, FL 32307

(school address, '89-'90, if applicable)

LAST GRADE COMPLETED: 11th
TYPE OF SCHOOL: (X)Public ( )Private

SEX: ( )Male (X)Female

RACE/ETHNICITY: (Voluntary) (X)Black ( )White ( )Hispanic ( )Asian ( )Other

INSTALLATION: Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee, FL

MENTOR: Dr. R.L. Pfeffer, Professor and Director

name title

PRINCIPAL DISCIPLINE OF RESEARCH: Atmospheric Science

MAJOR TASKS PERFORMED: Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments

<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th>Starr Gina</th>
</tr>
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<tbody>
<tr>
<td><strong>ADDRESS</strong></td>
<td>1508 Davis St. (904) 878-129</td>
</tr>
<tr>
<td><strong>city</strong></td>
<td>Tallahassee</td>
</tr>
<tr>
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<td>Florida</td>
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<td><strong>zip code</strong></td>
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<td><strong>INSTALLATION</strong></td>
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<tr>
<td><strong>MENTOR</strong></td>
<td>Dr. R.L. Pfeffer, Professor and Director</td>
</tr>
<tr>
<td><strong>NAME</strong></td>
<td>Dr. R.J. Kung, Research Associate</td>
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<td>Atmospheric Science</td>
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<td>Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments</td>
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<td><strong>HONORS</strong></td>
<td>Alex Means Scholar; Emory National Achievement Scholar</td>
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</tbody>
</table>
INFORMATION FOR EACH APPRENTICE

1 NAME ________________________ Wang John

2 ADDRESS ________________________ 2409 Cadney Court (904) 893-5485
(permanent) street & number
Tallahassee Florida 32308

city state zip code

2a (school address; '89 - '90, if applicable) ________________________ Lincoln (904) 487-2110

3 LAST GRADE COMPLETED ____________ 12th TYPE OF SCHOOL: (X)Public ( )Private

4 SEX ( X)Male ( )Female

5 RACE/ETHNICITY: (Voluntary) ( )Black ( )White ( )Hispanic (X)Asian ( )Other

6 INSTALLATION ________________________ Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee, FL

7 MENTOR ________________________ Dr. Steve Stage, Associate Professor

8 PRINCIPAL DISCIPLINE OF RESEARCH ________________________ Meteorology

9 MAJOR TASKS PERFORMED ________________________ Plotting graphs of the Atmospheric Boundary layer using the computer program on the Microcomputer.

10 HONORS ________________________ HCA Foundation Scholarship; Duke University Grant; 4-year NROTC; AROTC and 3-year ROTC; Valedictorian of Lincoln High School, 1990
<table>
<thead>
<tr>
<th>INFORMATION FOR EACH MENTOR</th>
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<tbody>
<tr>
<td><strong>NAME:</strong> Arnold Gerald</td>
<td></td>
</tr>
<tr>
<td><strong>INSTALLATION:</strong> Florida State University, Geophysical Fluid Dynamics Institute</td>
<td></td>
</tr>
<tr>
<td><strong>DATE OF BIRTH:</strong> March 2, 1967</td>
<td></td>
</tr>
<tr>
<td><strong>SEX:</strong> ( ) FEMALE (x) MALE</td>
<td></td>
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<td><strong>RACE/ETHNICITY:</strong> (Voluntary) ( ) Black ( ) White ( ) Hispanic ( ) Asian ( ) Other</td>
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<tr>
<td><strong>HIGHEST DEGREE EARNED:</strong> M.A., Graduate Student, Darkroom Technician</td>
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<tr>
<td><strong>PRINCIPAL FIELD OF RESEARCH:</strong> Geophysical Fluid Dynamics</td>
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<td>1</td>
<td>NAME: Boyles Scott</td>
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<tr>
<td>2</td>
<td>INSTALLATION: Florida State University, Geophysical Fluid Dynamics Institute</td>
</tr>
<tr>
<td></td>
<td>phone: (904) 644-1262</td>
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<td>3</td>
<td>DATE OF BIRTH: July 1, 1969</td>
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<td>4</td>
<td>SEX: ( ) FEMALE (x) MALE</td>
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<td>RACÉ/ETHNICITY: (Voluntary) ( ) Black (x) White ( ) Hispanic ( ) Asian ( ) Other</td>
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<td>HIGHEST DEGREE EARNED: Undergraduate Student, Laboratory Technician</td>
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INFORMATION FOR EACH MENTOR

1 NAME: Kung Robin

2 INSTALLATION: Florida State University, Geophysical Fluid Dynamics Institute

3 DATE OF BIRTH: May 27, 1939

4 SEX: ( ) FEMALE ( X) MALE

5 RACE/ETHNICITY: (Voluntary) ( ) Black ( ) White ( ) Hispanic (X) Asian ( ) Other

6 HIGHEST DEGREE EARNED: Ph.D.

7 PRINCIPAL FIELD OF RESEARCH: Geophysical Fluid Dynamics

8 NUMBER OF YEARS OF MENTORSHIP: 6

9 NUMBER OF APPRENTICES SUPERVISED THIS YEAR, 1990: 9
INFORMATION FOR EACH MENTOR

NAME: Lewis Clayton

INSTALLATION: Florida State University, Geophysical Fluid Dynamics Institute (Suggested Form)

(904) 644-1262

DATE OF BIRTH

SEX: ( ) FEMALE (X) MALE

RACE/ETHNICITY: (Voluntary) (X) Black ( ) White ( ) Hispanic ( ) Asian ( ) Other

HIGHEST DEGREE EARNED: A.A., Research Assistant

PRINCIPAL FIELD OF RESEARCH: Geophysical Fluid Dynamics

NUMBER OF YEARS OF MENTORSHIP: 2

NUMBER OF APPRENTICES SUPERVISED THIS YEAR, 1990: 9
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<td><strong>INSTALLATION</strong></td>
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<td>(904) 644-5594</td>
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<td><strong>3</strong></td>
<td><strong>DATE OF BIRTH</strong></td>
<td>November 26, 1930</td>
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INFORMATION FOR EACH MENTOR

NAME: Stage Steve

INSTALLATION: Meteorology Department

DATE OF BIRTH

SEX: ( ) FEMALE  (X) MALE

RACE/ETHNICITY: (Voluntary) ( ) Black (X) White ( ) Hispanic ( ) Asian ( ) Other

HIGHEST DEGREE EARNED: Ph.D.

PRINCIPAL FIELD OF RESEARCH: Meteorology

NUMBER OF YEARS OF MENTORSHIP: 1

NUMBER OF APPRENTICES SUPERVISED THIS YEAR, 1990: 1

(904) 644-2037