

ANNUAL REPORT
TO
OFFICE OF NAVAL RESEARCH

DoD Science and Engineering Apprenticeship Program for
High School Students

1994-'95 Activities
Contract No. N00014-91-J-1825

Principal Manager: Dr. Richard L. Pfeffer
Geophysical Fluid Dynamics Institute
The Florida State University
Tallahassee, FL 32306-3017
(904)-644-5594



June 1995
The Florida State University
Tallahassee, Florida

DTIC QUALITY INSPECTED 8

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REPORT DOCUMENTATION PAGE

FORM APPROVED
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing the burden to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302 and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503

1. AGENCY USE ONLY (Leave blank)

2. REPORT DATE

June 1995

3. REPORT TYPE AND DATES COVERED

April 1, 1994-March 31, 1995

4. TITLE AND SUBTITLE OF REPORT

DoD Science and Engineering Apprenticeship Program for
High School Students

5. FUNDING NUMBERS

N00014-91-J-1825

6. AUTHOR(S)

Richard L. Pfeffer

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Florida State University
Geophysical Fluid Dynamics Institute
Tallahassee, FL 323068. PERFORMING ORGANIZATION REPORT
NUMBER:

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING/MONITORING AGENCY
REPORT NUMBER:

11. SUPPLEMENTARY NOTES:

19960715 130

12a. DISTRIBUTION AVAILABILITY STATEMENT

Unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

In the spring of 1994 the guidance counselors of five local high schools were asked to recommend outstanding college-bound students who they thought would benefit most from our program. Nine students were selected to participate starting in the summer 1994 and four during the school year, two of whom were from the summer program. Our student group consisted of two seniors, five juniors and four exceptional sophomores. The departure from our past concentration on seniors was motivated by our desire to expose students to science and scientific methodology at an earlier age. This report contains background information concerning the students who were selected.

Students spent a total of 30 hours per week with the program for 10 weeks in summer and 10-20 hours per week during the school year. They participated in the research program via data handling and data processing with the aid of computer operated equipment, and in enrichment activities during the summer; 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.

14. SUBJECT TERMS

15. NUMBER OF PAGES:

26 pages

16. PRICE CODE

17. SECURITY CLASSIFICATION
OF REPORT:18. SECURITY CLASSIFICATION OF
THIS PAGE19. SECURITY CLASSIFICATION
OF ABSTRACT

20. LIMITATION OF ABSTRACT

DATA QUALITY INSPECTED 1

1. INTRODUCTION

The year 1994-'95 represented our thirteenth successful DoD Science and Engineering Apprenticeship Program for High School 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 Dr. Richard L. Pfeffer. Student activities were centered at GFDI and included work experience in GFDI.

In the spring of 1994 the guidance counselors of five local high schools were asked to recommend outstanding college-bound students who they thought would benefit most from our program. Nine students were selected to participate starting in the summer of 1994 and four during the school year, two of whom were from the summer program. Our student group consisted of two seniors, five juniors and four exceptional sophomores. The departure from our past concentration on seniors was motivated by our desire to expose students to science and scientific methodology at an earlier age. Some background information concerning the students who were selected appears in the following section. Further information pertaining to each apprentice is attached at the end of the report.

Students spent a total of 30 hours per week with the program for 10 weeks in summer and 10-20 hours per week during the school year. They participated in the research program via data handling and data processing with the aid of computer operated equipment, and in enrichment activities during the summer; 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.

2. STUDENTS' VITAS

NAME: Elboni Austin
RACE: Black
SEX: Female
HIGH SCHOOL: Godby High School
ANTICIPATED COLLEGE: Still in High School (11th grade)
ANTICIPATED MAJOR:
AWARDS/SCHOLARSHIPS: NHS, Honor Roll each marking period, Spanish Award, Who's Who Among American High School Students, A representative in Leon County Association of Science Teaching
ACTIVITIES/HOBBIES: Cheerleading ('89-'94), working at Legends, Church Choir

NAME: Jennifer Chen
RACE: Asian
SEX: Female
HIGH SCHOOL: Lincoln High School
ANTICIPATED COLLEGE: Cornell University
ANTICIPATED MAJOR: Mechanical Engineering
AWARDS/SCHOLARSHIPS: Awarded scholarships from Bracknell, Cornell, University of Florida, University of Virginia; JETS (Engineering) Team Competition Award; Magna Cum Laude; Pride Awards in Science and Mathematics; Academic Fitness Award; National Merit Scholar Nominee; Member National Honor Society; Silver Medal on National Latin Exam; 6th Place in Capital City Mu Alpha Theta; Supervisor of the Piano Guild
ACTIVITIES/HOBBIES: Mu Alpha Theta, Latin Club, Piano

NAME: Brian Draper
RACE: White
SEX: Male
HIGH SCHOOL: Godby High School
ANTICIPATED COLLEGE: Florida State University
ANTICIPATED MAJOR:
AWARDS/SCHOLARSHIPS: Achievement Awards in Art, Science; American Legion Award for School; Service Medallion (ROTC); Good Cougar Award; Departmental Award in Computer Science
ACTIVITIES/HOBBIES: Computer Programming, Computer Manufacturing, Running a BBS, Computer Graphics, Marine Biology, Teaching classes on the Internet in Word, DOS, Windows, VAX, UNIX, Macintosh

NAME: Andrea Hsia
 RACE: Asian
 SEX: Female
 HIGH SCHOOL: Leon High School
 ANTICIPATED COLLEGE: Still in High School (12th grade)
 ANTICIPATED MAJOR: Medicine
 AWARDS/SCHOLARSHIPS: Latin District Competition, Honorable Mention in Piano Concerto Competition, Magna Cum Laude on National Latin Exam, Superior in District Piano Festival.
 ACTIVITIES/HOBBIES: Latin Club, Mu Alpha Theta, Choral Clubs, Pierian National Honor Society, Anchor Service Club, Cosmos Science Club, MOSAIC, Piano, Swimming

NAME: April Ivery
 RACE: Black
 SEX: Female
 HIGH SCHOOL: Godby High School
 ANTICIPATED COLLEGE: Florida State University
 ANTICIPATED MAJOR: Medical
 AWARDS/SCHOLARSHIPS: High Honor Roll, 2-year Honor from Who's Who of American High School Students, Congressional National Leadership Council
 ACTIVITIES/HOBBIES: Gospel Choir, Church Choir, Unity Club, Anchor Club, FBLA, VOE, Spanish Club

NAME: Avesh Jain
 RACE: Asian
 SEX: Male
 HIGH SCHOOL: Lincoln High School
 ANTICIPATED COLLEGE: Still in High School (11th grade)
 ANTICIPATED MAJOR: Medicine
 AWARDS/SCHOLARSHIPS: Math Competition top 10, Numerous Tennis Awards
 ACTIVITIES/HOBBIES: Computer, Tennis, Music

NAME: Craig Morris
 RACE: Hispanic
 SEX: Male
 HIGH SCHOOL: Lincoln High School
 ANTICIPATED COLLEGE: Florida State University
 ANTICIPATED MAJOR: Biology
 AWARDS/SCHOLARSHIPS: Honor Roll, Exceptional Student Award (freshman), State Convention awards for sports writing
 ACTIVITIES/HOBBIES: Using Computers, Watching TV, Going out with friends

NAME: Matthew Nemethy
RACE: White
SEX: Male
HIGH SCHOOL: Godby High School
ANTICIPATED COLLEGE: Florida State University
ANTICIPATED MAJOR: Environmental Engineering
AWARDS/SCHOLARSHIPS: Who's Who of American High School Students, Commemorated National Merit Scholar, University Scholarship, Wal-Mart Scholarship, Florida Academic Scholarly Academic High School Scholar, High Honor Roll
ACTIVITIES/HOBBIES: NME Participant, Second Place Team Chemathon, First Place Oratory Impromptu Speech Competition and Young Engineer of Florida

NAME: Smitha R. Pabbathi
RACE: Asian
SEX: Female
HIGH SCHOOL: Leon High School
ANTICIPATED COLLEGE: Florida State University
ANTICIPATED MAJOR: Engineering
AWARDS/SCHOLARSHIPS: National Honor Society
ACTIVITIES/HOBBIES: Anchor, Latin Club, MAΘ, National Honor Society, Drawing, Reading

NAME: Jason Patterson
RACE: White
SEX: Male
HIGH SCHOOL: Lincoln High School
ANTICIPATED COLLEGE: Florida State University
ANTICIPATED MAJOR: Math/Computer Science
AWARDS/SCHOLARSHIPS: Rock Little Math Award, PRIDE Nominee, Presidential Academic Fitness Award, Florida Undergraduate Scholar Nominee, Magna Cum Laude, In top 4 in Regional Mu Alpha Theta Individual Contests
ACTIVITIES/HOBBIES: Music, Computers, Math, Science

NAME:	Marion Smith
RACE:	White
SEX:	Male
HIGH SCHOOL:	Lincoln High School
ANTICIPATED COLLEGE:	Carnegie Mellon
ANTICIPATED MAJOR:	Engineering
AWARDS/SCHOLARSHIPS:	Valedictorian; President, Latin Club; Vice President, Science Club; Captain, First Place Lincoln Academic Team; Top Scorer, First Place (In the State) Science Bowl Team; Andrew Carnegie Scholarship; National Merit Finalist; 6 th Nationally in Roman Life Test at Junior Classical League Convention; Member of First Place Varsity JETS Team; Member of First Place Florida Chem-a-thon Team; Second Place in Individual Contests, Florida Chem-a-thon; Mu Alpha Theta for Computers, Calculus, Integral Calculus, and Precalculus; 1994 Georgia Tech Distinguished Math Scholar; Captain of First Place Brain Bowl Academic Team; 3 Consecutive Medals in National Latin Exam
ACTIVITIES/HOBBIES:	Computer Programming, Charter Member and Vice President of Lincoln High School Science Club, President of the Junior Classical League, Writer's Exchange

3. STUDENT WORK PROJECTS AND INSTRUCTION

Seven of the students participated in digitizing velocity vector data from photographs of flow fields obtained in laboratory experiments that simulate the influence of mountains on the atmospheric jet stream, and three assisted in data analysis using computer programs on PCs and the VAX. One student worked with Dr. Long on a special project to develop a method of objective analysis of digitized fluid flow data and will give a seminar about his results to next year's high school student group in July. These activities were 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. Eugene Arbogast and assisted by Messrs. Mike Ivey and Lester Joe Dennis.

The major project in which the students participated during the summer was the analysis 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 experiments were conducted in a thermally driven rotating annulus of fluid.



Craig Morris digitizes flow velocity data.

The data from the experiments were obtained by means of a camera, mounted at the top of a rotating annulus of fluid, which recorded the movements of laser-illuminated particles suspended in the fluid. The camera produced a sequence of still photographs; in each photograph the movement of every particle appeared as a string of dots. By digitizing the positions 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 waves 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 digitized data performed on the GFDL DEC VAX computer cluster. During the course of the summer, the students worked with the 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.

The instruction and training given to the high school students concerning their work as apprentices went well beyond that needed to do the job. Efforts were made by the faculty and staff to make their work experience a learning process and an introduction to scientific methodology. Our goal was to ensure the students' understanding of the relationships between theoretical models and observable phenomena, such as the jet stream and ocean currents, such as the Gulf Stream and Kuroshio Current, which affect the transfer of heat from the tropics to the arctic. This was accomplished by explaining in detail the goals of the program, the scientific methodology, the implications of the experimental and related theoretical results and the contributions of the students' work to the overall project.

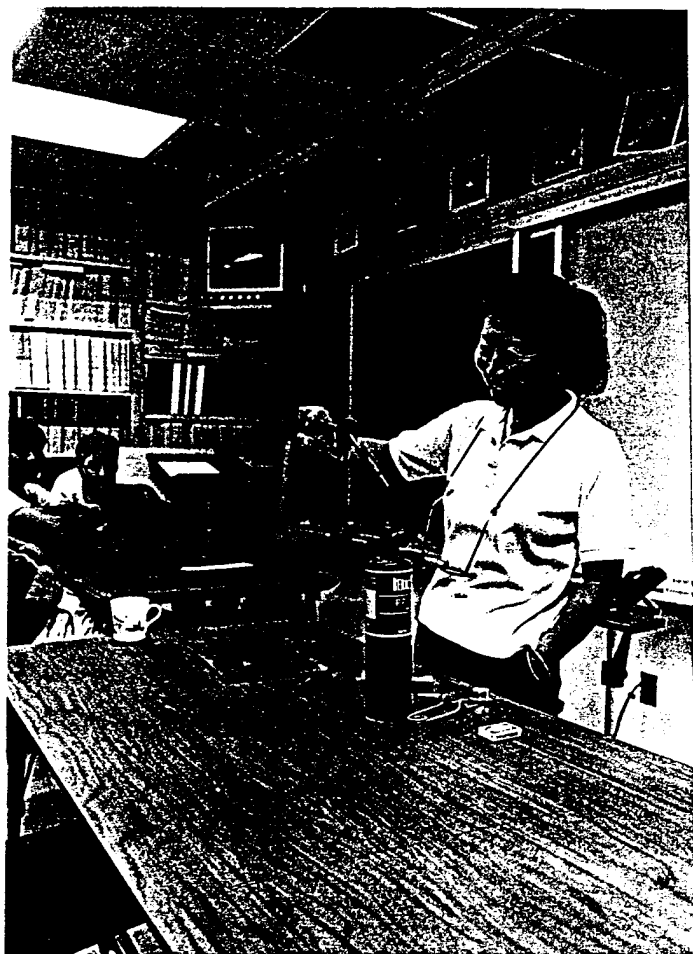
4. ENRICHMENT ACTIVITIES

Aside from the students' activities as apprentices, they participated in a variety of other educational activities. These included a series of talks on research topics covering a broad spectrum of scientific disciplines. Talks were given by Drs. Blumsack, Elliott, Elsner, Furbish, Gruender, Howard, Kloesel, Ruby Krishnamurti, Kung, Long, Meacham, Nicholson and Pfeffer on topics ranging from the modeling of the Black Sea to Immunology and the HIV virus. In addition, the students participated in discussions with Dr. Long on the *Coming of Age in the Milky Way*, an exciting book on the history and methodology of physical science by Timothy Ferris. A series of scientific films was also selected and shown by Dr. Kung. These covered topics such as astronomy, the strange new science of deterministic chaos, space exploration, the oceans and others. Drs. Kung and Ruby Krishnamurti also engaged the students in a series of scientific experiments in which different natural phenomena were simulated in the laboratory. A list of these activities is given in Table 1.

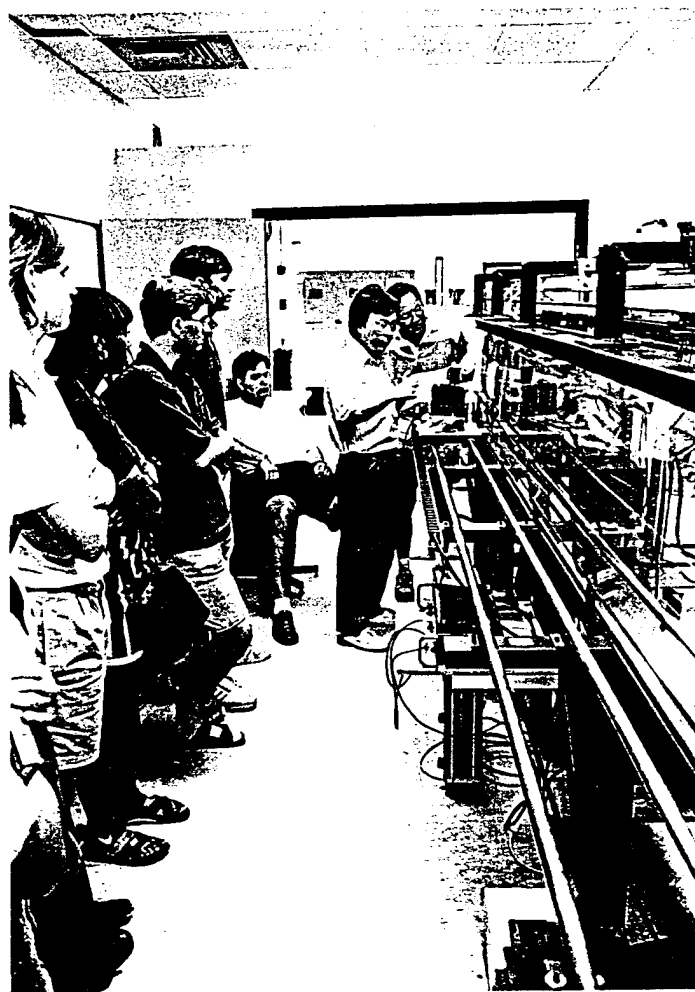
The students also took advantage of another opportunity offered by the program — namely, a course of their choice, with tuition and books paid for by the program. They took a Meteorology course for college credit given by Ms. Nancy Dignon.

5. CONCLUSION

Questionnaires completed at the end of the summer program of enrichment activities revealed that the students felt that, aside from the monetary rewards, they had benefited a great deal from both the hands on work experience and the enrichment program. This was especially true of the younger students. They were grateful for the opportunity to work in a scientific environment and acquire new skills and experience. Faculty and staff mentors reported that the students were bright, attentive, well motivated and willing to work. 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.

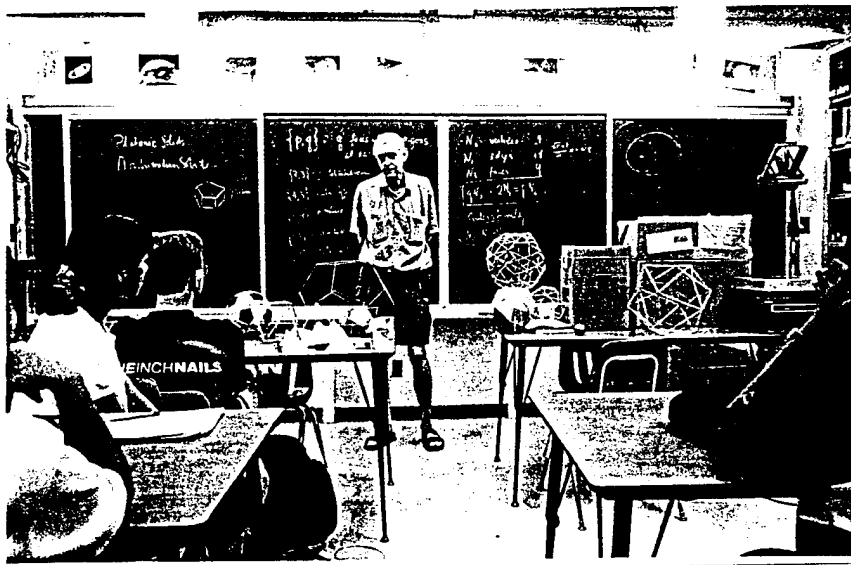


Dr. Ruby Krishnamurti demonstrates thermal oscillators.

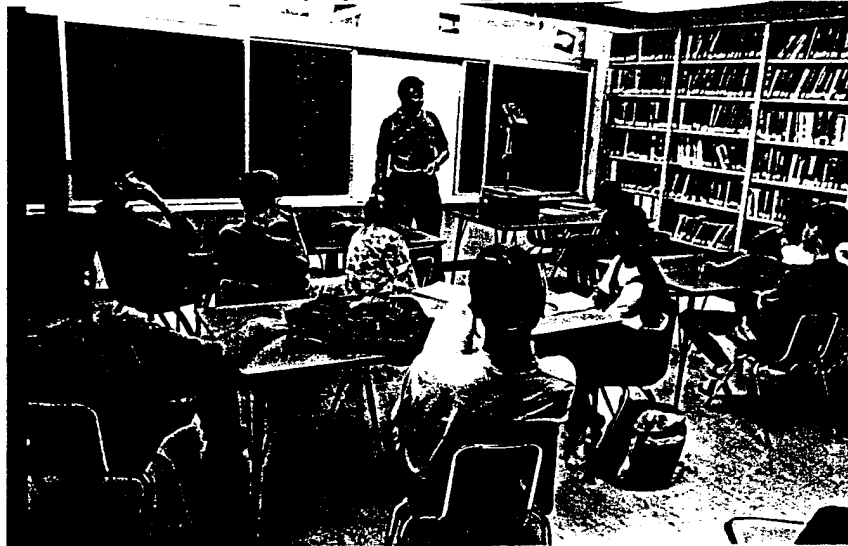


The students visit the Mechanical Engineering Lab.

In general, the students felt financially rewarded and scientifically enriched by their experience in the 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.



Dr. Howard discusses the properties of regular polyhedrons with the students.



Dr. Buzyna lectures on supersonic flow after a visit to the Mechanical Engineering Fluids Lab.



Dr. Pfeffer interprets the results of the students' data analysis at an end of summer party. From left to right: Jennifer Chen, Trey Smith, Elboni Austin, April Ivery, Matthew Nemethy.

1994 ONR/GFDI Summer Enrichment Program Schedule

Time: 11:00 am to 12:00 noon; Place: GFDI Reading Room or as indicated

Monday Films	Tuesday Lab. Demonstrations	Wednesday Discussions**	Thursday Talks
June 6 (V70492) <i>The Shores of the Cosmic Ocean</i> (COSMOS Episode 1)	7 Dr. Robin Kung <i>Lab. Experiments at GFDI</i>	8 Dr. Christopher Long <i>The Dome of Heaven & Raising the Roof</i>	9 Dr. Richard Pfeffer <i>Simulating the Atmospheric Jet Stream in the Laboratory</i>
13 (V70494) <i>The Traveler's Tales</i> (COSMOS Episode 6)	14 Dr. Ruby Krishnamurti <i>Rayleigh-Benard Convection</i>	15 Dr. Christopher Long <i>The Discovery of the Earth</i>	16 Dr. Louis Howard <i>Semi Regular Polyhedra</i>
20 (V70495) <i>Travels in Space and Time</i> (COSMOS Episode 8)	21 (Discussion) Dr. Christopher Long <i>The Sun Worshippers</i>	22 (Lab. Demonstration) Dr. George Buzyna (at M. E. Lab.) <i>Supersonic Flow</i>	23 Dr. James Elsner <i>Searching for Certainty- What Meteorologists Can Know About the Future</i>
27 (V70498) <i>Who Speaks for Earth</i> (COSMOS Episode 13)	28 Dr. Ruby Krishnamurti <i>Double-Diffusive Instability</i>	29 Dr. Christopher Long <i>The World in Retrograde</i>	30 Dr. Steven Blumsack <i>Conjectures of Mathematics</i>
July 4 Holiday	5 Dr. Robin Kung <i>Annulus Experiments</i>	6 Dr. Christopher Long <i>Newton's Reach</i>	7 Dr. David Gruender <i>Galileo and How the World Turns</i>
11 (V70306) <i>Strange New Science of Chaos</i> (NOVA)	12 Dr. Ruby Krishnamurti <i>Thermal Oscillators</i>	13 Dr. Christopher Long <i>A Plumb Line to the Sun</i>	14 Dr. Paul Elliott <i>Immunology and the HIV Virus</i>
18 (V70927) <i>Astronaut's View of Earth</i>	19 Dr. Robin Kung <i>Rotating Fluid Flows</i>	20 Dr. Christopher Long <i>Deep Space</i>	21 Dr. Kevin Kloesel <i>The Rocket Ozone Experiment</i>
25 (F382440) <i>The Trigger Effect</i> (Connections 1)	26 Dr. Chiang Shih (at M. E. Lab.) <i>Velocity Measurements by Particle Image Method</i>	27 Dr. Christopher Long <i>Island Universes</i>	28 Dr. Stephen Meacham <i>Modeling of Black Sea</i>
August 1 (F382450) <i>Death in the Morning</i> (Connections 2)	2 Dr. Ruby Krishnamurti <i>Mixing and Unmixing</i>	3 Dr. Christopher Long <i>Einstein's Sky</i>	4 Dr. David Furbish <i>Ocean Tides, Atmospheric Pressure and Ground Water Flow</i>
8 (F382510) <i>Eat, Drink and Be Merry</i> (Connections 8)	9 Dr. Robin Kung <i>Temperature Calibrations</i>	10 Dr. Christopher Long <i>The Expansion of the Uni- verse</i>	11 Dr. Sharon Nicholson <i>The Namib Desert — An example of Earth System Interaction</i>

** Chapter by chapter discussion of "Coming of Age in the Milky Way" by Timothy Ferris, Anchor Books, 1988.

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: AUSTIN ELBONI
last first
2. [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED]
3. School Address, 19 93-'94, if applicable Godby (904) 488-1325
name phone
1717 W. Tharpe St., Tallahassee, FL
4. Expected Major/University Enrolled in: _____
5. Last Grade Completed 10 Type of School: ☒ Public ☐ Private
6. Race/Ethnicity: (Voluntary) ☒ Black ☐ White ☐ Hispanic ☐ Asian ☐ Other
7. Sex: ☐ Male ☒ Female W GPA: 4.28
8. Installation Geophysical Fluid Dynamics Institute, Florida State University
name
Dr. Robin J. Kung, Associate Scholar/Scientist
9. Mentor(s): Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
name title
10. Principal Discipline of Research: Atmospheric Sciences
11. Major Tasks Performed: Digitizing of velocity vectors from photographs of
flow fields obtained in laboratory experiments.
12. Honors, Awards and Scholarships: NHS, Honor roll each marking period,
Spanish Award, Who's Who Among American Highschool Students, A Representative
in Leon County Association of Science Teaching.
13. Activities/Hobbies: Cheerleading ('89-'94), Working out of Legends, Singing
in Church Choir.

INFORMATION FOR EACH APPRENTICE

1. Name: Chen Jennifer
last first
2. [REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED] [REDACTED]
3. School Address, 1993-'94, if applicable Lincoln (904) 487-2110
name phone
3838 Trojan Trail, Tallahassee, FL
4. Expected Major/University Enrolled in: Mechanical Engineering/Cornell Univ.
5. Last Grade Completed 11 Type of School: (☒)Public ()Private
6. Race/Ethnicity: (Voluntary) ()Black ()White ()Hispanic (x)Asian ()Other
7. Sex: ()Male (x)Female WGPA: 4.41 4.41
8. Installation Geophysical Fluid Dynamics Institute, Florida State University
name
Dr. Robin J. Kung, Associate Scholar/Scientist
9. Mentor(s): Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
name title
10. Principal Discipline of Research: Atmospheric Sciences
11. Major Tasks Performed: Digitizing of velocity vectors from photographs of
flow fields obtained in laboratory experiments.
12. Honors, Awards and Scholarships: Silver medal on National Latin exam; 6th, Pre-
calculus Capital City Mu Alpha Theta; 1st and 3rd, Latin State; Superior
rating from Piano Guild; Awarded Scholarships from Bracknell, Cornell, Univ.
of Florida, Univ. of Virginia; JETS (Engineering) team competition award;
Graduating with Magna Cum Laude; Pride wards in Science and Mathematics;
Academic Fitness Award; National Merit Scholar nominee; Member, National
Honor Society.
13. Activities/Hobbies: Mu Alpha Theta, Latin Club, Piano.

INFORMATION FOR EACH APPRENTICE

1. Name: Draper Brian
last first
2. [REDACTED]
[REDACTED]
3. School Address, 1993-'94, if applicable Godby (904) 488-1325
name phone
1717 W. Tharpe St., Tallahassee, Fl
4. Expected Major/University Enrolled in: Florida State University
5. Last Grade Completed 11 Type of School: (☒)Public ()Private
6. Race/Ethnicity: (Voluntary) ()Black (☒)White ()Hispanic ()Asian ()Other
7. Sex: (☒)Male ()Female WGPA: 3.3
8. Installation Geophysical Fluid Dynamics Institute, Florida State University
name
Dr. Robin J. Kung, Associate Scholar/Scientist
9. Mentor(s): Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
name title
10. Principal Discipline of Research: Atmospheric Sciences
11. Major Tasks Performed: Digitizing of velocity vectors from photographs of
flow fields obtained in laboratory experiments.
12. Honors, Awards and Scholarships: Achevement Award in Art, Science; Good Congus
Award, American Legeon Award for School; Departmental Award in Computer Science;
Medallion (ROTC).
13. Activities/Hobbies: Computer Programming, Computer manufacturing, Running a
BBS, Computer graphics, Marine Biology, Teaching classes on Internet, Word,
DOS, Windows, VAX, UNIX, Macintosh.

INFORMATION FOR EACH APPRENTICE

1. Name: Hsia Andrea
last first
2. [REDACTED] [REDACTED]
[REDACTED] [REDACTED]
- ed
3. School Address, 19^{93-'94}, if applicable Leon High (904) 488-1971
name phone
Tennessee St., Tallahassee, FL
4. Expected Major/University Enrolled in: Probably Medicine (don't know what university)
5. Last Grade Completed 11 Type of School: (☒)Public (☐)Private
6. Race/Ethnicity: (Voluntary) (☐)Black (☐)White (☐)Hispanic (☒)Asian (☐)Other
7. Sex: (☐)Male (☒)Female WGPA: _____
8. Installation Geophysical Fluid Dynamics Institute, Florida State University
name
Dr. Robin J. Kung, Associate Scholar/Scientist
9. Mentor(s): Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
name title
10. Principal Discipline of Research: Atmospheric Sciences
11. Major Tasks Performed: Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.

12. Honors, Awards and Scholarships: Latin District Competition - Placed in several categories. Piano Concerto Competition; Honorable Mention; Magna Cum Laude on National Latin Exam; Superior in District Piano Festival.

13. Activities/Hobbies: Latin Club, Mu Alpha Theta, Choral Clubs, Pierian National Honor Society, Anchor Service Club, Cosmos Science Club, MOSAIC Member of Leon's Literary Magazine Staff, Hobbies: Playing the piano, swimming.

INFORMATION FOR EACH APPRENTICE

1. Name: Ivery April
last first
2. [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED]
3. School Address, 19 93-'94, if applicable Godby (904) 488-1325
name phone
1717 W. Tharpe St., Tallahassee, FL
4. Expected Major/University Enrolled in: Pre-Med/Florida State University
5. Last Grade Completed 10 Type of School: (☒) Public (☐) Private
6. Race/Ethnicity: (Voluntary) (☒) Black (☐) White (☐) Hispanic (☐) Asian (☐) Other
7. Sex: (☐) Male (☒) Female W GPA:
8. Installation Geophysical Fluid Dynamics Institute, Florida State University
name
Dr. Robin J. Kung, Associate Scholar/Scientist
9. Mentor(s): Dr. Richard L. Pfeffer, Professor of Meteorology and GFDT Associate
name title
10. Principal Discipline of Research: Atmospheric Sciences
11. Major Tasks Performed: Digitizing of velocity vectors from photographs of
flow fields obtained in laboratory experiments.
12. Honors, Awards and Scholarships: High Honor Roll, 2-year Honor from Who's
Who of American High School Student, Congressional National Leadership
Council.
13. Activities/Hobbies: Gospel Choir, Church Choir, Unity Club, Anchor Club,
FBLA, VOE, Spanish Club.

INFORMATION FOR EACH APPRENTICE

PII Redacted

13. Activities/Hobbies: Computers, Tennis, Music.

INFORMATION FOR EACH APPRENTICE

1. Name: Morris Craig
last first
2. [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
3. School Address, 1993-'94, if applicable Lincoln (904) 487-2110
name phone
3838 Trojan Trail, Tallahassee, FL
4. Expected Major/University Enrolled in: Biology/FSU
5. Last Grade Completed 10 Type of School: (☒)Public (☐)Private
6. Race/Ethnicity: (Voluntary) (☐)Black (☐)White (☒)Hispanic (☐)Asian (☐)Other
7. Sex: (☒)Male (☐)Female WGPA: _____
8. Installation Geophysical Fluid Dynamics Institute, Florida State University
name
Dr. Robin J. Kung, Associate Scholar/Scientist
9. Mentor(s): Dr. Richard L. Pfeffer, Professor of Meteorology and GFDL Associate
name title
10. Principal Discipline of Research: Atmospheric Sciences
11. Major Tasks Performed: Digitizing of velocity vectors from photographs
of flow fields obtained in laboratory experiments.
12. Honors, Awards and Scholarships: Honor Roll, Various Academic and Journalistic
Achievements (i.e., Exceptional Student Award as a Freshman, State Conception
Awards for Sports Writing).
13. Activities/Hobbies: Using computer, watching TV, going out with friends.

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Nemethy Matthew
last first
2. [REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED] [REDACTED]
3. School Address, 19 93-'94, if applicable Godby (904) 488-1325
name phone
1717 W. Tharpe St., Tallahassee, FL
4. Expected Major/University Enrolled in: Environmental Engineering/FSU
5. Last Grade Completed 12 Type of School: (☒) Public () Private
6. Race/Ethnicity: (Voluntary) () Black (☒) White () Hispanic () Asian () Other
7. Sex: (☒) Male () Female WGPA: 4.04
8. Installation Geophysical Fluid Dynamics Institute, Florida State University
name
Dr. Robin J. Kung, Associate Scholar/Scientist
9. Mentor(s): Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
name title
10. Principal Discipline of Research: Atmospheric Science
11. Major Tasks Performed: Digitizing of velocity vectors from photographs
of flow fields obtained in laboratory experiments.
12. Honors, Awards and Scholarships: Who's Who Among American Highschool Students;
Commerated National Merit Scholar; University Scholarship; Walmart Scholarship
Recipiant; Florida Academic Scholarship; Academic High School Scholar; High
Honor Roll; NME participant; Second Place Team Chemathon, First Place
Oratory/Impromptu Speech Competition and Young Engineer of Florida.
13. Activities/Hobbies: _____

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Pabbathi Smitha R.
 last first
2. [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
PII Redacted
3. School Address, 19_____, if applicable Leon High, (904) 488-1971
 name phone
W. Tennessee Street, Tallahassee FL
4. Expected Major/University Enrolled in: Engineering/FSU
5. Last Grade Completed 12 Type of School: (☒)Public ()Private
6. Race/Ethnicity: (Voluntary) ()Black ()White ()Hispanic (☒)Asian ()Other
7. Sex: ()Male (☒)Female WGPA: 4.28
8. Installation Geophysical Fluid Dynamics Inst., FSU, Tallahassee, FL 32306
 name
 Dr. Robin Kung, Associate Scholar/Scientist
9. Mentor(s): Dr. Richard L. Pfeffer, Professor of Meteorology and GFDL Associate
 name title
10. Principal Discipline of Research: Atmospheric Science
11. Major Tasks Performed: Digitizing of velocity vectors from photographs of
flow fields obtained in laboratory experiments.

12. Honors, Awards and Scholarships: National Honor Society

13. Activities/Hobbies: Anchor, Latin Club, MAE, National Honor Society,
enjoy drawing and reading.

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Patterson Jason
last first
2. [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED]
PII Redacted
3. School Address, 19 93-'94, if applicable Lincoln (904) 487-2110
name phone
3838 Trojan Trail, Tallahassee, FL
4. Expected Major/University Enrolled in: Math & Computer Science/Florida State
5. Last Grade Completed 11 Type of School: (☒) Public (☐) Private
6. Race/Ethnicity: (Voluntary) (☐) Black (☒) White (☐) Hispanic (☐) Asian (☐) Other
7. Sex: (☒) Male (☐) Female WGPA: 4.41
8. Installation Geophysical Fluid Dynamics Institute, Florida State University
name
Dr. Robin Kung, Associate Scholar/Scientist
9. Mentor(s): Dr. Richard L. Pfeffer, Professor of Meteorology and GFDL Associate
name title
10. Principal Discipline of Research: Atmospheric Sciences
11. Major Tasks Performed: Digitizing of velocity vectors from photographs of flow
fields obtained in laboratory experiments, Computer programming.
12. Honors, Awards and Scholarships: Consistently placed in top 4 in regional
Mu Alpha Theta individual contests; Rock Little Math Award; PRIDE Nominee;
Presidential Academic Fitness Award, Florida Undergraduate Scholar Nominee;
Graduating Magna Cum Laude.
13. Activities/Hobbies: Music, computers, math, science.

INFORMATION FOR EACH APPRENTICE

1. Name: Smith Marion
last first
2. [REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED]
3. School Address, 19 93-'94, if applicable Lincoln (904) 487-2110
name phone
3838 Trojan Trail, Tallahassee, FL
4. Expected Major/University Enrolled in: Engineering/Carnegie Mellon
5. Last Grade Completed 11 Type of School: (x)Public ()Private
6. Race/Ethnicity: (Voluntary) ()Black (x)White ()Hispanic ()Asian ()Other
7. Sex: (x)Male ()Female WGPA: 4.7
8. Installation Geophysical Fluid Dynamics Institute, Florida State University
name
Dr. Robin J. Kung, Associate Scholar/Scientist
9. Mentor(s): Dr. Richard L. Pfeffer, Professor of Meteorology and GFDL Associate
name title
10. Principal Discipline of Research: Atmospheric Sciences
11. Major Tasks Performed: Digitizing of velocity vectors from photographs of
flow fields obtained in laboratory experiment, programming.
12. Honors, Awards and Scholarships: Valedictorian; President, Latin Club; Vice
President, Science Club; Captain, First Place Lincoln Academic Team; Top
Scorer, First Place (in the State) Science Bowl Team; Andrew Carnegie
Scholarship; National Merit Scholar Finalist; 6th Nationally in Roman Life
Test at Junior Classical League Convention; Member of First Place Varsity
JETS Team; Member of First Place Florida Chem-a-thon; Mu Alpha Theta for
Computers, Calculus, Integral Calculus, and Precalculus; 1994 Georgia Tech
Distinguished Math Scholar; Captain of First Place Brain Bowl Academic Team;
3 Consecutive Medals in National Latin Exam.
13. Activities/Hobbies: Computer Programming, Charter Member and Vice President of Lincoln High
School Science Club, President of the Junior Classical League, Writer's
Exchange.

INFORMATION FOR EACH MENTOR

- 1 NAME Arbogast Eugene
last first
- 2 INSTALLATION Florida State University, Geophysical Fluid Dynamics Institute
name
- (904) 644-5594
phone
- 3 [REDACTED] [REDACTED]
[REDACTED]
- 4 SEX () FEMALE (X) MALE
- 5 RACE/ETHNICITY: (Voluntary) () Black (X) White () Hispanic () Asian () Other
- 6 HIGHEST DEGREE EARNED Highschool Diploma
- 7 PRINCIPAL FIELD OF RESEARCH Geophysical Fluid Dynamics
- 8 NUMBER OF YEARS OF MENTORSHIP 2
- 9 NUMBER OF APPRENTICES SUPERVISED THIS YEAR, 1994 10

INFORMATION FOR EACH MENTOR

1. Name: Long Christopher
last first
2. Installation: Florida State University, Geophysical Fluid Dynamics Institute
name
(904) 644-5594
phone
3. [REDACTED] [REDACTED]

PII Redacted
4. Sex ☐ Female ☒ Male
5. Race/Ethnicity: (Voluntary) ☐ Black ☒ White ☐ Hispanic ☐ Asian ☐ Other
6. Highest Degree Earned: Ph.D.
7. Principal Field of Research: Atmospheric Sciences
8. Number of Years of Mentorship: 1
9. Number of Apprentices Supervised this Year, 19 ⁹⁴ : 1

INFORMATION FOR EACH MENTOR

- 1 NAME Kung Robin
last first
- 2 INSTALLATION Florida State University, Geophysical Fluid Dynamics Institute
name
- (904) 644-5594
phone
- 3 [REDACTED] [REDACTED]
- 4 SEX () FEMALE (☒) MALE
- 5 RACE/ETHNICITY: (Voluntary) () Black () White () Hispanic (☒) Asian () Other
- 6 HIGHEST DEGREE EARNED Ph. D.
- 7 PRINCIPAL FIELD OF RESEARCH Geophysical Fluids Dynamics
- 8 NUMBER OF YEARS OF MENTORSHIP 10
- 9 NUMBER OF APPRENTICES SUPERVISED THIS YEAR, 10

[PII Redacted]