

AMERICAN SOCIETY FOR ENGINEERING EDUCATION

**NAVY-ASEE SUMMER FACULTY RESEARCH PROGRAM
NAVY-ASEE SABBATICAL LEAVE PROGRAM**

**RESEARCH GRANT: N00014-90-J-1422
ANNUAL REPORT**

Prepared by:
Debbie Aho
Program Manager,
American Society for Engineering Education

Submitted by:
Tim Turner,
Manager, Projects
American Society for Engineering Education

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**Date of Report:
September 1, 1994**

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AMERICAN SOCIETY FOR ENGINEERING EDUCATION

**1993 NAVY-ASEE SUMMER FACULTY
RESEARCH PROGRAM**

1993 NAVY-ASEE SABBATICAL LEAVE PROGRAM

RESEARCH GRANT N00014-90-J-1422 (ANNUAL REPORT)

GRANT PERIOD: 1, OCT., 1989-30, SEPT., 1993

ANNUAL REPORT

DATE PREPARED: September 1, 1994

Prepared by:

**Debbie Aho,
Program Manager,
American Society for Engineering Education**

Submitted by:

**Tim Turner
Manager, Projects
American Society for Engineering Education**

INTRODUCTION

During the summer of 1993, 141 engineering and science faculty members from 102 universities and colleges in 31 states, the District of Columbia and Puerto Rico, conducted research at 17 Navy Research and Development Centers. This brings the number of participants since the program started in 1979 to over 1,600. In addition to the 141 participants, 2 graduate students accompanied returning faculty participants to the sponsoring laboratory. During the fourteen years, ASEE has administered the Summer Faculty Program under a series of contracts from the Office of Naval Research.

The grant was modified on 1 October 1990 to include appointments to university faculty to conduct research at Navy laboratories while on sabbatical leave. By 1

September 1994, 22 faculty members had completed sabbatical appointments in this program. Currently, 2 faculty members hold appointments and 1 appointment will begin in January 1995.

Copies of this report are being sent to those designated in the grant to receive reports which are not technical reports as follows:

<u>ADDRESSEE</u>	<u>DOD CODE</u>	<u># OF COPIES</u>
Scientific Officer (Dr. Don Polk)	Code 11SP	2*
Administrative Grant Officer	N66002	1*

*unclassified/unlimited

On an informal basis copies are being sent to the Summer Faculty Program management at each of the 17 participating laboratories, to members of ASEE's Summer Faculty Programs Committee and to ASEE's Projects Board.

GRANT HISTORY

A one year research grant, NO0014-90-J-1422 was awarded 1 October, 1989 to conduct the 1990 summer program. This grant was revised (Modification P00005#) to continue to administer the summer program in FY 1991, FY 1992, and FY 1993. Through modification #P00013, ONR has allocated \$14,046,532.00 to administer this program.

GRANT: N00014-90-J-1422
GRANT PERIOD: 4/1/90-9/30/93
AMOUNT AUTHORIZED: \$14,046,532.00
AMOUNT AVAILABLE: \$10,162,887.50

FINANCIAL REPORT

A financial statement for the grant is **Attachment A**. This report covers the expenses for the FY 1993 program including summer participants, graduate students

accompanying summer faculty and sabbatical leave appointments. This report also includes a cumulative financial report since the beginning of the grant period. Total expenses for the period 4/1/90-9/30/93 were \$10,016,590. Total program expenses for 141 summer participants, 2 graduate students and 4 sabbatical appointments in FY 93 were \$2,247,037.

FINANCIAL MANAGEMENT

Monies received from the Navy are credited to ASEE's account PR10. Provisional indirect cost rate applied to direct costs, exclusive of participant stipends, relocation allowances and travel reimbursements was 58.19%.

Three levels of stipends were paid as follows:

	<u>FELLOW</u>	<u>SENIOR</u>	<u>DISTINGUISHED</u>
At the Beginning	\$3,625	\$4,458	\$5,292
After 4 Weeks	\$3,625	\$4,458	\$5,292
After 8 Weeks	\$3,625	\$4,458	\$5,292
Upon Submission of Abstract	\$ 125	\$ 126	\$ 125
TOTALS	\$11,000	\$13,500	\$16,000

Withholding payment of approximately 1% of the stipend has proven relatively effective in motivating participants to promptly submit their final report in the form of a technical abstract or research summary.

YEARLY COMPARISONS - AVERAGE PARTICIPANT TRAVEL COST

1987 PROGRAM	\$ 585
1988 PROGRAM	\$ 562
1989 PROGRAM	\$ 587
1990 PROGRAM	\$ 534
1991 PROGRAM	\$ 512
1992 PROGRAM	\$ 397
1993 PROGRAM	\$ 690*

*(includes travel for 141 summer participants & 2 graduate students)

The following illustrates the comparative expenses for all 14 years (1979 through 1993) of the Navy-ASEE Summer Faculty Research Program.

<u>Year</u>	<u>Total Expenses</u>	<u>Dir. & Ind. Admin. Exp.</u>	<u># of Part.</u>	<u>Cost per Part.</u>
1979	96,696	25,857	16	6,043
1980	160,622	32,342	26	6,177
1981	338,554	38,413	59	5,738
1982	650,888	62,754	97	6,710
1983	767,000	62,790	111	6,909
1984	941,126	74,112	122	7,714
1985	1,250,897	117,457	159	7,867
1986	1,728,534	120,556	167	10,350
1987	1,787,192	97,279	162	11,032
1988	2,025,924	98,087	180	11,255
1989	2,408,387	110,286	207	11,634
1990	2,426,931	111,955	178	13,634
1991	2,792,723	162,571	185	15,095
1992	2,467,674	193,273	143	17,256
1993	2,416,290	169,253	141	15,714

1993 SUMMER & SABBATICAL PROGRAM ANNOUNCEMENT

Preparation for the 1993 program included printing and distribution during late October 1992 of an announcement and application form to the ASEE membership mailing list as well as to the following:

Engineering College Faculty (including ASEE members):	30,728
Senior College Faculty:	
Astronomy (all disciplines & Dept. Heads)	2,401
Biological Sciences	4,708
Chemistry (all disciplines & Dept. Heads)	11,214
Geology/Earth Sciences (all disciplines & Dept. Heads)	4,619
Mathematics (total includes):	3,730
Dept. Chairs	
Applied Mathematics	
Probability & Statistics	
Applied Statistics	
Physics (all disciplines & Dept. Heads)	6,908
Social Sciences	1,612
Business/Management/Finance (total)	2,924
Computer Science	3,988
Health Education/Medical Sciences	3,007
Military, Naval, Aerospace	2,353
National Council of University Research Administrators	<u>2,466</u>
TOTAL:	80,742

1993 NAVY-ASEE SUMMER FACULTY RESEARCH PROGRAM-APPLICANTS & PARTICIPANTS

By the January 15, 1993 deadline 649 faculty applications had been received. An analysis of the distribution of both applicants and participants including a breakdown by sex and race is **Attachment B**. One hundred forty one (141) or 22% were appointed. The applications were sent to the laboratories chosen by the applicants for review and recommendation. The designated Navy program administrator at each laboratory coordinated the review process after which he or she submitted a priority list to ASEE. The ASEE program office offered appointments by telephone based on these lists and upon verbal acceptance, followed-up with an appointment letter (**Attachment C**). Each appointee was asked to sign and return a formal acceptance (**Attachment D**).

SOURCE OF FUNDS

<u>CENTER</u>	<u>FUNDED BY</u>				<u>TOTAL/WEEKS</u>
	<u>ONR</u>	<u>M/ONR</u>	<u>CENTER</u>	<u>EXTENDED</u>	
DEOMI	0	1	2	0	3/30
NAMRL	0	1	1	0	2/20
NAWC/AD	0	5	12	0	17/170
NAWC/WD	0	1	1	0	2/20
NBL	0	0	0	0	0
NCCOSC	0	4	13	0	17/170
NCEL	0	1	6	0	7/70
NHRC	0	0	3	0	3/30
NMRI	0	0	2	0	2/20
NPRDC	0	4	10	0	14/140
NRL	0	11	29	5	40/405
NSMRL	0	0	1	0	1/10
NSWC/CD	0	1	13	0	14/140
NSWC/CSS	0	3	6	0	9/90
NSWC/DD	1	1	1	0	3/30
NTSC	1	0	0	0	1/10
NUWC	1	1	4	0	6/60
TOTAL	3	34	104	5	141/1415

A 5 week extension was granted to one individual at NRL.

Stipends were paid at three levels: Fellow (\$1,100/week), Senior (\$1,350/week) and

Distinguished (\$1,600/week). Each participant who needed to relocate his/her residence received a \$1,000 relocation allowance. Each participant is entitled to a pre-site visit before beginning their 10 week appointment as well as reimbursement for travel expenses to report to the Navy R&D laboratory and to return to his/her home institution.

APPOINTMENT ANALYSIS

<u>CENTER</u>	<u>APPLICANTS</u>	<u>OFFERS</u>	<u>ACCEPTANCES</u>
DEOMI	19	3	3
NAMRL	13	2	2
NAWC/AD	65	18	17
NAWC/WD	39	2	2
NBL	4	0	0
NCCOSC	60	18	17
NCEL	18	7	7
NHRC	16	3	3
NMRI	27	2	2
NPRDC	58	18	14
NRL	162	42	40
NSMRL	6	1	1
NSWC/CD	37	14	14
NSWC/CSS	32	7	6
NSWC/DD	28	2	2
NTSC	21	5	4
NUWC	44	9	7
TOTAL	649	151	141

DISTRIBUTION BY CENTER OF APPOINTMENT LEVELS

<u>CENTER</u>	<u>FELLOW SENIOR DISTINGUISHED</u>		
DEOMI	1	2	0
NAMRL	1	1	0
NAWC/AD	4	11	2
NAWC/WD	0	2	0
NBL	0	0	0
NCCOSC	5	10	2
NCEL	1	6	0
NHRC	0	3	0
NMRI	1	1	0
NPRDC	6	6	2
NRL	8	26	6
NSMRL	1	0	0
NSWC/CD	4	8	2
NSWC/CSS	3	6	0
NSWC/DD	2	0	1
NTSC	0	1	0
NUWC	0	3	3
TOTAL	37	86	18

Based on the numbers in Attachment B, 43 or 6% of the applications received were from underrepresented groups (African-American, Hispanics & Native Americans). Of these forty-three, 8, or 6% were appointed to the 1993 summer program.

The 17 African-Americans who applied constituted 3% of the total applicants, and the 4 who were appointed constituted 3% of the participants. Of the African-Americans who applied, 24% were appointed, as compared to 22% for all applicants.

The 24 Hispanics who applied constituted 4% of the applicants and the 4 Hispanic participants represented 3% of the total appointees. Of the Hispanics who applied 17% were appointed as compared to 22% for all applicants.

Three applications from Native-Americans were received however none were appointed.

Sixty-three or 10% of the applicants were female. Thirteen percent of the female applicants were appointed as compared to 22% for all applicants. Of those 63 applications, 8 were appointed representing 6% of the total appointees.

Attachment E is a list of the 141 participants showing their institutional addresses.

Attachment F lists by state the institutions represented by both applicants and participants.

Attachment G is a list of the applicants/participants from Historically Black Colleges & Universities including the breakdown by state and ethnic background.

Attachment H lists the disciplines for all the applicants and participants by Navy laboratory.

PROGRAM EVALUATION QUESTIONNAIRE

At the time this report was prepared, 127 of the 143 participants and five graduate students had completed and returned the evaluation questionnaires.

The analysis of applicants and participants by laboratory, academic rank, highest degree and age reveals that both applicants and participants were about evenly divided among the professional ranks. Eighty-nine percent of all applicants and 95% of the participants held doctoral degrees. The average age of the applicants was 45 years and 41 for the participants. The youngest applicant was 26 and the oldest 80.

One hundred and eleven (87%) felt that they had been engaged very effectively in research of importance to the mission of their laboratories and the Navy and another 14 (11%) felt they had been engaged somewhat effectively.

One hundred nineteen (94%) respondents considered it either "very likely" or "likely" that their summer experience would be the basis for continuing research of interest to the Navy and all expected or were willing to maintain relations with their professional peers in the laboratories.

All respondents thought that the summer program had enhanced their research interest and capabilities and would recommend the program to their faculty colleagues.

The questionnaire results show that the summer program experience will influence the respondents' teaching in one or more of five ways, but mostly by integrating new information into their courses (92%), by sharing research experience or by revealing opportunities for future

employment in government agencies (54%).

Respondents learned of the program mostly by receiving the announcement in the mail (54%) or by communication from colleagues (37%).

All but six respondents mixed with and learned of the research of at least a few laboratory researchers.

Six respondents (5%) complained of security clearances being late and an obstacle to their research.

Based on the responses of the 127 participants the program continues to provide them with a professionally rewarding experience. Their effectiveness in advancing Navy research should be assessed by responsible Navy officials.

1993 NAVY-ASEE SABBATICAL LEAVE PROGRAM

This program provides faculty members an opportunity to conduct research initiated during the summer for a longer period of time or can provide university faculty an extended opportunity to conduct research of interest to both the Navy and faculty participants. Applications are accepted anytime during the year. ASEE will review the application to see if all the appropriate information has been submitted and then send a copy to the designated R&D center of interest for their initial review to determine whether or not the Center can support such a project. If the Center indicates an interest in the applicant, the application and proposed research statement is sent to members of the ASEE Faculty Programs Committee for their review. ASEE is responsible for reviewing applications received for the Sabbatical Program to insure the proposed research meets the stated goals of the program and to determine the match between the proposed research and Navy colleague. Upon approval, the ASEE committee will send a summary of the review comments. The information regarding salary and retirement benefits provided by the institution is verified by ASEE staff and an estimation of cost for the proposed research is sent to the center. The center is asked to sign off on the cost estimate and then a verbal offer is made to the candidate. Upon his/her acceptance, funds are then due to ONR and the formal offer is processed.

The participants in the sabbatical program receive a monthly stipend making up the difference between their salary and the pay they receive while on sabbatical. In addition, participants will receive reimbursement for travel to and from the laboratory site and a relocation allowance for

those who must relocate their residence during their sabbatical leave tenure. Sabbatical leave appointments are contingent on the availability of sabbatical leave positions.

During the period October 1990 through August 1994, ASEE has received 50 complete applications to the Sabbatical program of which 25 were funded. Twenty applications were either not funded or withdrawn and the remaining were incomplete. To date, 22 sabbatical participants have completed their appointments, 1 withdrew and 2 are currently participating. **Attachment I** is a brief description of each of those sabbatical participants who were on tenure between May 1992 and June 1993 and July 1993 and August 1994.

ASEE SUMMER FACULTY PROGRAMS COMMITTEE

The ASEE Summer Faculty Program Committee met in December 1993 at the ASEE Headquarters. The list of the Summer Faculty Programs Committee is **Attachment J**.

On March 4, 1993, ASEE convened a panel to review the list of selections received from each laboratory. This panel was represented by members of the ASEE Summer Faculty Programs Committee, Navy personnel and university faculty members. As one of the requirements of the new research grant, ASEE is responsible to review and assign the level of each appointment for the summer faculty participants.

CONCLUSIONS AND RECOMMENDATIONS

This program continues to enhance research interests and capabilities of faculty members and the establishment of continuing relations among the faculty participants and Navy colleagues. Since 1979, ASEE has successfully managed this program which has provided engineering and science faculty from U.S. colleges and universities the opportunity to participate in research at Navy laboratories. For the past 30 years, ASEE has been involved in administering summer faculty research programs for various federal sponsors as part of its commitment to the professional development of its members as well as fulfilling its mission to improving engineering and science education. Programs such as the Navy Summer Faculty Research/Sabbatical Leave Program fit well into the stated mission of the Society.

Only one extension was granted at the direction of ONR. Past programs provided flexibility to meet the desires of the laboratories and participants while ASEE was faced with increasingly complicated administrative arrangements. ASEE feels that ten weeks provide participants with a reasonable opportunity to achieve significant research results. Anything less is objected to as

not compatible with the most effective use of the summer opportunities. Therefore, the policy of making appointments only to those applicants available for ten consecutive weeks and granting extensions only in extraordinary circumstances should remain in effect.

The ASEE Summer Faculty Programs Committee continues to feel that all ASEE managed programs should include opportunities for participation from underrepresented minority groups including women. In the 1993 program, 24% or 34 of the total 141 participants were from underrepresented minority groups (refer to Attachment B).

The greatest number of applications to the 1993 program came from electrical engineers and physicists followed by mechanical engineers and chemists. Previous years have shown the greatest number of applications from physicists and mathematicians. Total engineering applicants were 38% of the total number of applications while the total science applications represented 58% of the total. Of those participating in the program, 58 (41%) were from engineering, 39 (28%) were from physical sciences, 19 (13%) from mathematics/computer science, and 19 (13%) from the behavioral sciences. Although ASEE is an organization devoted to the improvement of engineering education, it is capable of administering programs in science and basic research as well.

Nearly all of the respondents to the ASEE evaluation questionnaire indicated that they had a successful summer and that the administrative aspects of the program were satisfactory. Again, a large number (42%) indicated that they had not received any guidance from their laboratory about submission of proposals for continuation of their research at their home institution.

The committee agreed that the Navy program has proven very worthwhile for participating faculty members and the Navy should be encouraged to continue to expand it.

ATTACHMENT A

FINANCIAL STATEMENTS



AMERICAN SOCIETY FOR ENGINEERING EDUCATION

INTERIM FINANCIAL REPORT
10/01/92-9/30/93

GRANT: N00014-90-J-1422
GRANT PERIOD: 4/1/90-6/30/94
GRANT AMOUNT: \$14,046,532
AMOUNT AVAILABLE: \$10,162,887.50

BASE ACCOUNT # PR10

	1st QUARTER 01-Oct-92 31-Dec-92	2nd QUARTER 01-Jan-93 31-Mar-93	3rd QUARTER 01-Apr-93 30-Jun-93	4th QUARTER 01-Jul-93 30-Sep-93	TOTAL 01-Oct-92 30-Sep-93
ADMINISTRATIVE EXPENSES:					
SALARIES	\$13,541.40	\$10,179.70	\$1,384.14	\$28,468.87	\$53,574.11
TEMPORARY SALARIES	0.00	0.00	0.00	0.00	0.00
BENEFITS @ 38.49%	5,212.08	3,918.17	532.76	10,957.67	20,620.67
POSTAGE	41.15	588.33	202.37	175.20	1,007.05
POSTAGE 3RD CLASS	0.00	0.00	0.00	0.00	0.00
EXPRESS/COURIER	307.35	301.75	55.70	35.05	699.85
TELEPHONE	260.11	0.00	415.00	18.18	693.29
TOLLS/FAX	0.00	68.78	19.32	30.05	118.15
FREIGHT	53.33	0.00	0.00	0.00	53.33
ACCOUNTANTS	0.00	135.42	0.00	0.00	135.42
CONSULTANTS/HONORARIA	139.58	0.00	0.00	0.00	139.58
OTHER PROF. SERVICES	258.84	395.30	472.20	615.90	1,742.24
SUPPLIES	142.50	0.00	140.66	0.00	283.16
MACHINE MAINT./RENTAL	0.00	0.00	1,239.45	326.03	1,565.48
PRINTING	17,032.60	115.25	0.00	0.00	17,147.85
MAILING LABELS	0.00	0.00	0.00	0.00	0.00
TYPESETTING/DESIGN	132.01	0.00	0.00	300.00	432.01
PHOTOCOPYING	0.00	1.77	127.63	8.22	137.62
MAIL HOUSE CHARGES	2,102.55	0.00	0.00	0.00	2,102.55
COMMERCIAL ADS.	1,940.00	0.00	0.00	0.00	1,940.00
TRAVEL	0.00	36.50	801.33	(47.00)	790.83
COMMITTEE TRAVEL	0.00	1,466.18	544.00	0.00	2,010.18
DUES	0.00	0.00	1,800.00	0.00	1,800.00
TOTAL DIRECT EXPENSE	\$41,163.50	\$17,207.15	\$7,734.56	\$40,888.17	\$106,993.37
INDIRECT @ 58.19%	23,953.04	10,012.84	4,500.74	23,792.82	62,259.44
TOTAL ADMIN. EXPENSE	\$65,116.55	\$27,219.99	\$12,235.29	\$64,680.99	\$169,252.82
PARTICIPANT EXPENSES:					
STIPENDS	80,912.30	54,942.30	870,333.30	1,023,163.54	2,029,351.44
TRAVEL	2,830.13	300.60	69,288.63	26,266.65	98,686.01
RELOCATION ALLOWANCE	8,000.00	0.00	76,000.00	35,000.00	119,000.00
TOTAL PART. EXPENSE	\$91,742.43	\$55,242.90	\$1,015,621.93	\$1,084,430.19	\$2,247,037.45
TOTAL PROGRAM EXPENSE	\$156,858.98	\$82,462.89	\$1,027,857.22	\$1,149,111.18	\$2,416,290.27

AMERICAN SOCIETY FOR ENGINEERING EDUCATION

INTERIM FINANCIAL REPORT
4/1/90-6/30/93

GRANT: N00014-90-J-1422
GRANT PERIOD: 4/1/90-9/30/93
AMOUNT AUTHORIZED: \$14,046,532
AMOUNT AVAILABLE: \$10,162,887.50

BASE ACCOUNT # PR10

	FY90	FY91	FY92	FY93	TOTAL
	01-Apr-90	01-Oct-90	01-Oct-91	01-Oct-92	01-Apr-90
	30-Sep-90	30-Sep-91	30-Sep-92	30-Sep-93	30-Sep-93
ADMINISTRATIVE EXPENSES:					
SALARIES	\$22,128.54	\$48,045.56	\$51,756.41	\$53,574.11	\$175,504.62
TEMPORARY SALARIES	693.75	3,465.24	283.73	0.00	4,442.72
BENEFITS	7,988.72	16,503.64	18,668.54	20,620.67	63,781.57
POSTAL SERVICE	452.46	1,421.98	5,460.57	1,007.05	8,342.06
MAIL HOUSE POSTAGE	0.00	1,400.00	0.00	0.00	1,400.00
EXPRESS/COURIER	991.00	1,545.32	533.55	699.85	3,769.72
TELEPHONE	275.71	481.02	2,246.65	693.29	3,696.67
TOLLS/FAX	0.00	0.00	0.00	118.15	118.15
FREIGHT	0.00	0.00	0.00	53.33	53.33
ACCOUNTANTS FEES	0.00	7,638.69	3,955.50	135.42	11,729.61
CONSULTANTS/HONORARIA	0.00	550.60	0.00	139.58	690.18
LEGAL/COPYRIGHT	0.00	720.00	100.20	0.00	820.20
COMP/OTHER PROF SERVICE	0.00	5,760.36	1,744.45	1,742.24	9,247.05
RECRUITMENT	0.00	1,278.06	42.79	0.00	1,320.85
SUPPLIES	647.00	2,326.19	761.07	283.16	4,017.42
REGISTRATION	0.00	25.00	710.00	0.00	735.00
MACHINE RENTAL/MAINT	0.00	718.39	0.00	1,565.48	2,283.87
SMALL EQUIPMENT	0.00	0.00	1,500.00	0.00	1,500.00
PRINTING	418.78	6,920.55	6,577.36	17,147.85	31,064.54
TYPESETTING/DESIGN	0.00	1,603.00	2,030.95	432.01	4,065.96
PHOTOCOPYING	314.56	1,770.75	908.60	137.62	3,131.53
MAIL HOUSE CHARGE	0.00	0.00	630.36	2,102.55	2,732.91
TRAVEL	727.67	1,883.35	2,320.60	790.83	5,722.45
COMMITTEE TRAVEL	0.00	1,806.98	2,795.64	2,020.18	6,622.80
MEETING EXPENSE	41.65	0.00	0.00	0.00	41.65
MEALS/LODGING	0.00	0.00	0.00	0.00	0.00
CATERING	0.00	5.88	131.40	0.00	137.28
COMMERCIAL ADS.	0.00	0.00	0.00	1,940.00	1,940.00
DUES	0.00	0.00	900.00	1,800.00	2,700.00
MAILING LABELS	0.00	1,276.57	1,223.94	0.00	2,500.51
RENT/OCCUPANCY	0.00	4,770.59	0.00	0.00	4,770.59
PROJECT COST	770.00	0.00	0.00	0.00	770.00
DATA PROCESSING	316.15	0.00	0.00	0.00	316.15
TOTAL DIRECT EXPENSE	\$35,765.99	\$111,917.72	\$105,282.31	\$107,003.37	359,969.39
INDIRECT	15,708.42	50,653.96	60,705.78	62,265.26	189,333.42
RETURNED CHECK TO ONR	15,000.00	112,000.00	0.00	23,000.00	150,000.00
TOTAL ADMIN. EXPENSE	\$66,474.41	\$274,571.68	\$165,988.09	\$192,268.63	699,302.81
INDIRECT RATE	43.92%	45.26%	57.66%	58.19%	
PARTICIPANT EXPENSES:					
STIPENDS	1,942,230.00	2,368,695.80	2,103,594.29	2,029,351.44	8,443,871.53
TRAVEL	91,966.38	106,275.20	58,306.36	98,686.01	355,233.95
RELOCATION ALLOWANCE	131,500.00	155,181.31	112,500.00	119,000.00	518,181.31
TOTAL PART. EXPENSE	\$2,165,696.38	\$2,630,152.31	\$2,274,400.65	\$2,247,037.45	9,317,286.79
TOTAL PROGRAM EXPENSE	\$2,232,170.79	\$2,904,723.99	\$2,440,388.74	\$2,439,306.08	10,016,589.60

AMERICAN SOCIETY FOR ENGINEERING EDUCATION

INTERIM FINANCIAL REPORT
4/1/90-6/30/94

GRANT: N00014-90-J-1422
GRANT PERIOD: 4/1/90-9/30/94
AMOUNT AUTHORIZED: \$14,046,532
AMOUNT AVAILABLE: \$10,249,887.5

SEE ACCOUNT # PR10

	FY90	FY91	FY92	FY93	TOTAL
	01-Apr-90	01-Oct-90	01-Oct-91	01-Oct-92	01-Apr-90
	30-Sep-90	30-Sep-91	30-Sep-92	30-Sep-93	30-Jun-94
ADMINISTRATIVE EXPENSES:					
SALARIES	\$22,128.54	\$48,045.56	\$51,756.41	\$53,574.11	\$175,504.62
TEMPORARY SALARIES	693.75	3,465.24	283.73	0.00	4,442.72
BENEFITS	7,988.72	16,503.64	18,668.54	20,620.67	63,781.57
POSTAL SERVICE	452.46	1,421.98	5,460.57	1,007.05	8,342.06
MAIL HOUSE POSTAGE	0.00	1,400.00	0.00	0.00	1,400.00
EXPRESS/COURIER	991.00	1,545.32	533.55	699.85	3,769.72
TELEPHONE	275.71	481.02	2,246.65	693.29	3,696.67
TOLLS/FAX	0.00	0.00	0.00	118.15	118.15
FREIGHT	0.00	0.00	0.00	53.33	53.33
ACCOUNTANTS FEES	0.00	7,638.69	3,955.50	135.42	11,729.61
CONSULTANTS/HONORARIA	0.00	550.60	0.00	139.58	690.18
LEGAL/COPYRIGHT	0.00	720.00	100.20	0.00	820.20
COMP/OTHER PROF SERVICE	0.00	5,760.36	1,744.45	1,742.24	9,247.05
RECRUITMENT	0.00	1,278.06	42.79	0.00	1,320.85
SUPPLIES	647.00	2,326.19	761.07	283.16	4,017.42
REGISTRATION	0.00	25.00	710.00	0.00	735.00
MACHINE RENTAL/MAINT	0.00	718.39	0.00	1,565.48	2,283.87
SMALL EQUIPMENT	0.00	0.00	1,500.00	0.00	1,500.00
PRINTING	418.78	6,920.55	6,577.36	17,147.85	31,064.54
TYPESETTING/DESIGN	0.00	1,603.00	2,030.95	432.01	4,065.96
PHOTOCOPYING	314.56	1,770.75	908.60	137.62	3,131.53
MAIL HOUSE CHARGE	0.00	0.00	630.36	2,102.55	2,732.91
TRAVEL	727.67	1,883.35	2,320.60	790.83	5,722.45
COMMITTEE TRAVEL	0.00	1,806.98	2,795.64	2,020.18	6,622.80
MEETING EXPENSE	41.65	0.00	0.00	0.00	41.65
MEALS/LODGING	0.00	0.00	0.00	0.00	0.00
CATERING	0.00	5.88	131.40	0.00	137.28
COMMERCIAL ADS.	0.00	0.00	0.00	1,940.00	1,940.00
DUES	0.00	0.00	900.00	1,800.00	2,700.00
MAILING LABELS	0.00	1,276.57	1,223.94	0.00	2,500.51
RENT/OCCUPANCY	0.00	4,770.59	0.00	0.00	4,770.59
PROJECT COST	770.00	0.00	0.00	0.00	770.00
DATA PROCESSING	316.15	0.00	0.00	0.00	316.15
TOTAL DIRECT EXPENSE	\$35,765.99	\$111,917.72	\$105,282.31	\$107,003.37	359,969.39
INDIRECT	15,708.42	50,653.96	60,705.78	62,265.26	189,333.42
RETURNED CHECK TO ONR	15,000.00	112,000.00	0.00	23,000.00	150,000.00
TOTAL ADMIN. EXPENSE	\$66,474.41	\$274,571.68	\$165,988.09	\$192,268.63	699,302.81
INDIRECT RATE	43.92%	45.26%	57.66%	58.19%	
PARTICIPANT EXPENSES:					
STIPENDS	1,942,230.00	2,368,695.80	2,103,594.29	2,029,351.44	8,443,871.53
TRAVEL	91,966.38	106,275.20	58,306.36	98,686.01	355,233.95
RELOCATION ALLOWANCE	131,500.00	155,181.31	112,500.00	119,000.00	518,181.31
TOTAL PART. EXPENSE	\$2,165,696.38	\$2,630,152.31	\$2,274,400.65	\$2,247,037.45	9,317,286.79
TOTAL PROGRAM EXPENSE	\$2,232,170.79	\$2,904,723.99	\$2,440,388.74	\$2,439,306.08	10,016,589.60

**1993 NAVY SUMMER FACULTY RESEARCH PROGRAM
FINAL FUNDING DATA**

Center	Center Funded	ONR Funded	ONR HBCU/MI	Grad. Students	TOTAL
DEOMI	2	0	1	0	3
NAMRL	1	0	1	0	2
NAWC/AD	12	0	5	0	17
NAWC/WD	1	0	1	0	2
NBL	0	0	0	0	0
NCCOSC	13	0	4	0	17
NCEL	6	0	1	0	7
NHRC	3	0	0	0	3
NMRI	2	0	0	0	2
NPRDC	10	0	4	1	14
NRL	29	0	11	0	40
NSMRL	1	0	0	0	1
NSWC/CD	13	0	1	1	14
NSWC/CSS	6	0	3	0	9
NSWC/DD*	1	1	1	0	3
NTSC*	0	1	0	0	1
NUWC*	4	1	1	0	6
TOTAL	104	3	34	2	141

*Each used a 1992 ONR Carryover (NSWC/DD, NTSC & NUWC)

Note: NSWC, Dahlgren Division still has an additional (1) ONR FY92 carryover which they have not used

COST PER CENTER (CENTER FUNDED):

Center	No. of Faculty	Amount Due	\$ Paid for Sabbaticals	No. of Grads.	\$ Paid for Grad Student	TOTAL PAID
DEOMI	2	\$34,000.00		0	\$0.00	\$34,000.00
NAMRL	1	\$17,000.00		0	\$0.00	\$17,000.00
NAWC/AD	12	\$204,000.00		0	\$0.00	\$204,000.00
NAWC/WD	1	\$17,000.00		0	\$0.00	\$0.00
NBL	0	\$0.00		0	\$0.00	\$0.00
NCCOSC	13	\$221,000.00		0	\$0.00	\$221,000.00
NCEL	6	\$102,000.00		0	\$0.00	\$102,000.00
NHRC	3	\$51,000.00		0	\$0.00	\$51,000.00
NMRI	2	\$34,000.00		0	\$0.00	\$34,000.00
NPRDC	10	\$170,000.00		1	\$6,000.00	\$176,000.00
NRL*	29	\$501,500.00	\$100,399.00	0	\$0.00	\$601,899.00
NSMRL	1	\$17,000.00		0	\$0.00	\$17,000.00
NSWC/CD	13	\$221,000.00		1	\$0.00	\$221,000.00
NSWC/CSS	6	\$102,000.00		0	\$0.00	\$102,000.00
NSWC/DD	1	\$17,000.00		0	\$0.00	\$17,000.00
NTSC	0	\$0.00		0	\$0.00	\$0.00
NUWC	4	\$68,000.00		0	\$0.00	\$68,000.00
TOTAL	104	\$1,776,500.00	\$100,399.00	2	\$6,000.00	\$1,865,899.00

*NRL's Total Due includes an additional \$8,500 for a faculty member who will be staying for an additional 5 weeks.

ATTACHMENT B

APPLICANT/PARTICIPANT ANALYSIS



1993 NAVY SUMMER FACULTY FELLOWSHIP PROGRAM
DISTRIBUTION BY GENDER AND RACE
 Total Applications by 1st Choice Center

CENTER	Non-Minority		African American		Asian		Hispanic		Native American		Pacific Islander		TOTAL
	M	F	M	F	M	F	M	F	M	F	M	F	
DEOMI	8	7	2	2	0	0	0	0	0	0	0	0	19
NAMRL	9	1	0	0	1	0	2	0	0	0	0	0	13
NAWC/AD	49	2	0	0	11	0	2	0	1	0	0	0	65
NAWC/WD	33	1	0	0	4	0	1	0	0	0	0	0	39
NBL	1	1	0	1	1	0	0	0	0	0	0	0	4
NCCOSC	34	2	1	0	18	0	5	0	0	0	0	0	60
NFESC	10	1	0	0	6	0	1	0	0	0	0	0	18
NHRC	12	2	0	0	1	0	0	0	0	1	0	0	16
NMRI	17	4	2	0	4	0	0	0	0	0	0	0	27
NPRDC	33	14	1	0	8	1	0	1	0	0	0	0	58
NRL	109	7	5	0	32	2	3	3	1	0	0	0	162
NSMRL	3	3	0	0	0	0	0	0	0	0	0	0	6
NSWC/CD	25	1	0	0	9	0	2	0	0	0	0	0	37
NSWC/CSS	26	1	0	0	5	0	0	0	0	0	0	0	32
NSWC/DD	24	0	1	0	1	1	1	0	0	0	0	0	28
NTSC	15	2	0	0	1	0	2	1	0	0	0	0	21
NUWC	33	1	2	0	8	0	0	0	0	0	0	0	44
Totals	441	50	14	3	110	4	19	5	2	1	0	0	649

ATTACHMENT C

LETTER OF APPOINTMENT





American Society for Engineering Education

11 Dupont Circle, Suite 200 • Washington, D.C. • 20036-1207 • Tele: (202) 986-8500 • Fax: (202) 265-8504

April 7, 1993

Prof. Brockenbrough Allen
San Diego State University
Educational Technology Department
San Diego, CA 92182

Dear Prof. Allen:

I am pleased to confirm your appointment to a 1993 summer faculty research associateship in the Navy-ASEE Summer Faculty Research Program.

Under the terms of the appointment, you will receive a senior level stipend of \$13,500 for ten weeks. You will be paid \$4,458.33 after the first week, \$4,458.33 at the end of the fifth week, \$4,458.33 at the end of the ninth week, and \$125 upon submission of an abstract of your summer's research, evaluation questionnaire and patent form. All stipends will be paid directly to you by ASEE via direct deposit. See the enclosed memorandum concerning direct deposit for further details. Please complete the enclosed authorization for direct deposit along with your acceptance form as soon as possible in order to insure the timely payment of your stipend. The stipend for the program is taxable; see enclosure #1.

Before the beginning of your 10-week appointment, the Office of Naval Research has authorized funds for you to visit the Navy center at which you will carry out your research. The dates for this pre-program visit should be decided by you and your colleague at the Navy research center. Your travel to and from the research site for the 10-week summer period will also be reimbursed. For both flights you will be able to claim reimbursement for economy class airfare between the airport nearest your residence and the airport nearest your research site. And, during your pre-program visit, we will reimburse you for lodging at the government per diem rate for that area as well as meals for not more than two (2) days. If you drive your personal car to the research site to have it available during the summer, we will reimburse you at the rate of 28 cents per mile up to a total not to exceed the economy Y-class airfare. We can not cover the added cost of food and lodging while you are on the way to and from the site for your 10-week research period. Enclosed are the travel forms which you must submit to ASEE to claim reimbursement for your expenses. This amount will be paid to you with your first stipend payment at the end of the first week.

You must use our travel agent, Connections - The Travel Company, to reserve airline tickets. Please contact me as

soon as possible with the approximate dates and destinations so that I may authorize your travel and provide you with Connection's telephone number. By using our travel agent, ASEE will be billed directly for your travel, and you may thus avoid paying the entire airfare.

If you relocate in order to be closer to your R&D center, you are entitled to a \$1,000 allowance in order to help you offset the expenses of maintaining two residences. In order to claim the allowance, kindly fill out the enclosed form, supplying your permanent and summer addresses, and send it to ASEE. You will be responsible for obtaining and paying for whatever housing you may require. The Navy center may be able to assist you in finding a suitable place to stay during your 10-week sojourn.

Although June 1 is the announced starting date, we are aware that this may not be compatible with all university calendars. Therefore, if necessary, you may arrange a more convenient starting date. Any Monday after May 3 and before July 1 is acceptable to ASEE, but the starting date should also be acceptable to your colleague at the Navy R&D center. We do insist that ten contiguous weeks be devoted to the summer research. As soon as you decide on a starting date, please let me know at least four weeks before you begin to allow time for accounting procedures.

Your file and pay record will be maintained at ASEE headquarters, and questions concerning your stipends and travel reimbursements should be directed to ASEE. If you have questions related to your research activities at the center, you should address them to your colleague there. Your colleague or the laboratory's summer program coordinator may be contacting you soon to obtain information needed for a security clearance. Because the clearance procedure is time consuming, please respond promptly so that it can be completed prior to the time you arrive for the summer. Even though not all research assignments require clearance, some Navy Labs may deny access to certain areas (for example, the library) to uncleared participants.

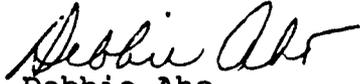
To complete our official record, we would appreciate your signing and returning the enclosed acceptance form. We must receive both the acceptance form and direct deposit form at least four (4) weeks before your start date so that your stipend can be processed. We cannot pay any stipend until these forms are received. Also enclosed is a memorandum concerning patent rights and regulations that apply to research conducted within the Navy-ASEE program. If you have questions concerning the patent rights or need further information, please contact ASEE.

Feedback from participants and from laboratory personnel involved in the Navy-ASEE Summer Faculty Program has been

uniformly positive since the program began in 1979. I look forward to helping you enjoy a personally and professionally rewarding experience this summer.

We have also enclosed a membership application in this mailing. We encourage you to join ASEE and take advantage of the generous benefits it offers.

Sincerely,



Debbie Aho
Program Manager
Contracts & Grants Office

Enclosures

ATTACHMENT D

ACCEPTANCE OF APPOINTMENT



**AMERICAN SOCIETY FOR ENGINEERING EDUCATION
1993 NAVY-ASEE SUMMER FACULTY RESEARCH
PROGRAM**

ACCEPTANCE OF APPOINTMENT FORM

Name: _____

I hereby accept the ten week research appointment as described in the letter of appointment from Debbie Aho, Program Manager for ASEE of the Navy-ASEE Summer Faculty Research Program. This acceptance acknowledges that I understand terms of the appointment specified in that letter, and that I understand the conditions set forth in the memorandum from ASEE concerning the patent rights pertaining to my participation in the 1993 Navy-ASEE Summer Faculty Research Program.

Signed: _____

NOTE: This appointment is not a contract by the Navy or ASEE for your personal services. The role is that of a self-employed professional who has agreed to conduct and report on research of interest both to yourself and the Navy.

Please indicate the date you propose to start your summer research. This should be preferably on June 1, 1993 or a Monday as close to that date as possible.

Proposed starting date: _____

ATTACHMENT E

PARTICIPANTS' DEPARTMENTS & HOME INSTITUTIONS



**1993 Navy-ASEE Summer Faculty Fellowship Program
Participants' Departments and Universities**

Last Name	Department	University
Abushagur	Elec. & Comp. Eng.	Univ. of Alabama in Huntsville
Achtarides	Naval Arch. & Marine Eng.	Univ. of New Orleans
Aiello	Psychology	Rutgers, St. Univ. of NJ.
Akundi	Physics/Eng.	Xavier Univ. of Louisiana
Aleamar	Physics	Univ. of Puerto Rico, Mayaguez Campus
Allen	Educational Technology	San Diego State University
Arnall	Physical Therapy	N. Arizona Univ.
Azimi-Sadjadi	Elec. Eng.	Colorado St. Univ.
Baird	Chem.	Univ. of Alabama in Huntsville
Bandy	Mech. Eng.	California St. Univ., Sacramento
Bang	Civil Engineering	S. Dak. School of Mines & Tech.
Barghouty	Physics	Roanoke Coll.
Beale	ECE	George Mason Univ.
Benumof	Applied Science	CUNY, Coll. of Staten Island
Bhar	Elec. Eng.	Univ. of the District of Columbia
Boerner	UIC-EECS Comm. & Sensing Lab.	Univ. of Illinois at Chicago
Borgiotti	Elec. Eng. & Comp. Sci.	The George Washington University
Botros	Elec. Eng.	S. Illinois Univ.
Bowers	Team Performance Lab	Univ. of Central Florida
Brown	Mech. Eng.	Virginia Polytech. Inst. & St. Univ.
Bull	Aerospace Eng.	California State Univ.-Long Beach
Buono	Biology & P.E.	San Diego State Univ.
Bush	Electrical & Computer Eng.	Wilkes Univ.
Butcher	Chem.	Howard Univ.

**1993 Navy-ASEE Summer Faculty Fellowship Program
Participants' Departments and Universities**

Last Name	Department	University
----- Ceccio	Mech. Eng. & Applied Mech.	Univ. of Michigan
Chen	Physics	New Mexico State Univ.
Choudhury	Elec. Eng.	Howard Univ.
Cribbs	Biology	St. Mary's Coll. of Maryland
Curran	Chem.	Univ. of Massachusetts
Dansby	Psych.	Florida Inst. of Tech.
Darby	Elec. Eng.	Univ. of the District of Columbia
Dayhoff	Inst. for Sys. Research	Univ. of Maryland
Derman	Electromechanical Eng. Tech.	N.Y. City Technical College
Dickey	Stats.	Univ. of Minnesota
Dravinski	Mech. Eng.	Univ. of S. Cal.
Eaton	History	Florida A&M University
Faas	Geology	Lafayette Coll.
Fettahlioglu	Mech. & Aero. Eng.	NY Inst. of Technology
Foster	Math.	Florida A&M Univ.
Foutch	Chem. Eng.	Oklahoma St. Univ.
Frieden	Optical Sci. Center	Univ. of Arizona
Fuller	Comp. Sci.	W. Virginia Inst. of Tech.
Gad-el-Hak	Aerospace/Mech. Eng.	Univ. of Notre Dame
Gandhi	Elec. & Comp. Eng.	Villanova Univ.
Gleeson	Physics	Trenton St. Coll.
Goetz	Biological Sci.	Mankato St. Univ.
Gross	Elec. Eng.	Florida A&M Univ./Florida St. Univ.
Grosshans	Math.	West Chester Univ.
Hamel	Psych.	Univ. of Central Florida
Harihar	Physics	Univ. of Massachusetts-Lowell
Harris	Psych.	Mankato St. Univ.

**1993 Navy-ASEE Summer Faculty Fellowship Program
Participants' Departments and Universities**

Last Name	Department	University
Harrison	Chem. Eng.	Univ. of S. Alabama
Hartin	Mech. Eng. Technology	Univ. of Pittsburgh at Johnstown
Hira	Div. of Sci. & Math.	Jarvis Christian College
Holman	Chem.	W. Kentucky Univ.
Hrebien	Elec. & Comp. Eng.	Drexel Univ.
Hughes	Computer Science	Kentucky St. Univ.
Hui	Math. Sciences	San Diego St. Univ.
Ikossi-Anastasiou	Elec. & Comp. Eng.	Louisiana St. Univ.
Ilovici	Comp. & Inf. Sciences	The Hartford Graduate Center
Jang	Math.	Shaw Univ.
Jarmul	Gen. Eng.	Pennsylvania St. Univ.
Jen	Mech. Eng.	Villanova Univ.
Johnson	Natural Science	LeTourneau Univ.
Jones	Mech. Eng.	Villanova Univ.
Joye	Chem. Eng.	Villanova Univ.
Kamman	Mech. & Aero. Eng.	W. Michigan Univ.
Kaufman	Physics	Univ. of Rhode Island
Kim	Astronomy/Geosci./Physics	Saddleback Coll.
Knirk	Education	Univ. of S. California
Knouse	Management	Univ. of S.W. Louisiana
Kowalak	Chem.	Univ. of Massachusetts, Lowell
Lee	Elec. & Comp. Eng.	Syracuse Univ.
Lefkovitz	Comp. & Info. Sci.	Temple Univ.
Lewis	Geology	Auburn Univ.
Liebowitz	Management Sci.	George Washington Univ.
Lindell	Psych.	Michigan St. Univ.
Lindner	Elec. Eng.	Virginia Tech.
Lopez-Benitez	Elec. Eng.	Louisiana Tech. Univ.

**1993 Navy-ASEE Summer Faculty Fellowship Program
Participants' Departments and Universities**

Last Name	Department	University
Lopez-Lopez	Physics	Southwestern College
Ma	Eng. Science	Penn. St. Univ.
Main	Comm. Design	California St. Univ., Chico
Mania, Jr.	Div. of Math. & Sci.	Kentucky St. Univ.
Marshall	Ocean Eng.	Florida Atlantic Univ.
Massa	Chem. & Physics	Hunter Coll., CUNY
Mathews	Civil Engineering	Kansas State Univ.
McGrath	Math.	Pittsburg St. Univ.
McShane	Mathematics	Northern Arizona Univ.
Miller	Chem. & Biochem.	Univ. of Maryland
Moghaddasi	Elec. Eng.	City Univ. of NY
Mund		University of New Orleans
Myers	Applied Stat. & Operations Research	Bowling Green St. Univ.
Nosseir	Aero. Eng. & Eng. Mech.	San Diego St. Univ.
Pandey	Physics & Astronomy	Univ. of S. Mississippi
Pardee	Eng./Electronics	Riverside Community College
Patra	Gen. Eng.	Univ. of Puerto Rico-Mayaguez Campus
Putcha	Civ. Eng.	Calif. State Univ.-Fullerton
Rabbany	Eng.	Hofstra Univ.
Raichel	Mech. Eng.	Cooper Union
Raj	Mech. Eng.	CUNY, City College
Reed	Psych.	San Diego St. Univ.
Reeves	Elec. Eng.	Auburn Univ.
Rogers	Math./Mech. Eng.	Polytechnic Univ.
Root	Math. Sci.	San Diego St. Univ.
Sacci, Jr.	Microbio. & Immunology	Univ. of Maryland at Baltimore Med. School

**1993 Navy-ASEE Summer Faculty Fellowship Program
Participants' Departments and Universities**

Last Name	Department	University
Sahin	Mech. & Aero. Eng.	Western Michigan Univ.
Sarper	Engineering	Univ. of S. Colorado
Sarwar	Geology & Geophysics	Univ. of New Orleans
Sasaki	Comp. Sci.	Univ. of Maryland, Baltimore County
Scerbo	Psych.	Old Dominion Univ.
Shadaram	Elec. Eng.	Univ. of Texas at El Paso
Shaw	Math.	Virginia Tech Univ.
Sheu	Elec. & Comp. Eng.	Rutgers Univ.
Sink	Chem.	Edinboro Univ. of Pennsylvania
Smith	Criminal Justice	Univ. of Alabama at Birmingham
	Physics	Univ. of Vermont
Soumekh	Elec. & Comp. Eng.	SUNY at Buffalo
Stearns	Info. Sys. & Analysis	Howard Univ.
Stumborg	Physics	Catholic University
Tabet	Elec. Eng.	Florida A&M Univ./Florida St. Univ.
Tang	Math.	SUNY, Coll. at Geneseo
Tawfik	Mech. & Manuf. Eng.	St. Univ. of New York
Thompson	Psych.	CUNY-Baruch College
Tobias	School of Educ.	CUNY, City College
Trahan	Psych.	Univ. of Wisconsin-Oshkosh
Trevino	Mech. Eng.	Michigan Tech. Univ.
Tyagi	Physics	Drexel University
Uberall	Physics	Catholic Univ. of America
Van Winkle	Physics	Florida St. Univ.
Wachman	Math.	Univ. of Connecticut
Wasytkiowskyj	Elec. Eng. & Comp. Sci.	George Washington University
Weis	Eng.	Texas Christian Univ.

1993 Navy-ASEE Summer Faculty Fellowship Program
Participants' Departments and Universities

Last Name	Department	University
Wernicki	Elec. Eng.	NY Inst. of Technology
Williams	Physics	Morgan State Univ.
Wilson	Astronomy	Univ. of Florida
Yang	Statistics	Univ. of Florida
Yim	Civ. Eng.	Oregon St. Univ.
Yuster	Comp. & Elec. Eng.	Queensborough Comm. Coll. of CUNY
Zalosh	Fire Protection Eng.	Worcester Polytechnic Inst.
Zietz	Math. & Comp. Sci.	Drexel Univ.
Zvanut	Physics	Univ. of Alabama at Birmingham

ATTACHMENT F

PARTICIPANTS BY STATE AND UNIVERSITY



**1993 Navy-ASEE Summer Faculty Fellowship Program
Participants' States and Home Institutions**

State	University	Last Name
AL	Auburn Univ.	Lewis
AL	Auburn Univ.	Reeves
AL	Univ. of Alabama at Birmingham	Smith
AL	Univ. of Alabama at Birmingham	Zvanut
AL	Univ. of Alabama in Huntsville	Abushagur
AL	Univ. of Alabama in Huntsville	Baird
AL	Univ. of S. Alabama	Harrison
AZ	N. Arizona Univ.	Arnall
AZ	Northern Arizona Univ.	McShane
AZ	Univ. of Arizona	Frieden
CA	Calif. State Univ.-Fullerton	Putch
CA	California St. Univ., Chico	Main
CA	California St. Univ., Sacramento	Bandy
CA	California State Univ.-Long Beach	Bull
CA	Riverside Community College	Pardee
CA	Saddleback Coll.	Kim
CA	San Diego St. Univ.	Hui
CA	San Diego St. Univ.	Nosseir
CA	San Diego St. Univ.	Reed
CA	San Diego St. Univ.	Root
CA	San Diego State Univ.	Buono
CA	San Diego State University	Allen
CA	Southwestern College	Lopez-Lopez
CA	Univ. of S. Cal.	Dravinski
CA	Univ. of S. California	Knirk
CO	Colorado St. Univ.	Azimi-Sadjadi
CO	Univ. of S. Colorado	Sarper
CT	The Hartford Graduate Center	Ilovici
CT	Univ. of Connecticut	Wachman

**1993 Navy-ASEE Summer Faculty Fellowship Program
Participants' States and Home Institutions**

State	University	Last Name
DC	Catholic Univ. of America	Uberall
DC	Catholic University	Stumborg
DC	George Washington Univ.	Liebowitz
DC	George Washington University	Wasyliwskyj
DC	Howard Univ.	Butcher
DC	Howard Univ.	Choudhury
DC	Howard Univ.	Stearns
DC	The George Washington University	Borgiotti
DC	Univ. of the District of Columbia	Bhar
DC	Univ. of the District of Columbia	Darby
FL	Florida A&M Univ.	Foster
FL	Florida A&M Univ./Florida St. Univ.	Gross
FL	Florida A&M Univ./Florida St. Univ.	Tabet
FL	Florida A&M University	Eaton
FL	Florida Atlantic Univ.	Marshall
FL	Florida Inst. of Tech.	Dansby
FL	Florida St. Univ.	Van Winkle
FL	Univ. of Central Florida	Bowers
FL	Univ. of Central Florida	Hamel
FL	Univ. of Florida	Wilson
FL	Univ. of Florida	Yang
IL	S. Illinois Univ.	Botros
IL	Univ. of Illinois at Chicago	Boerner
IN	Univ. of Notre Dame	Gad-el-Hak
KS	Kansas State Univ.	Mathews
KS	Pittsburg St. Univ.	McGrath
KY	Kentucky St. Univ.	Hughes
KY	Kentucky St. Univ.	Mania, Jr.
KY	W. Kentucky Univ.	Holman

1993 Navy-ASEE Summer Faculty Fellowship Program
 Participants' States and Home Institutions

State	University	Last Name
LA	Louisiana St. Univ.	Ikossi-Anastasiou
LA	Louisiana Tech. Univ.	Lopez-Benitez
LA	Univ. of New Orleans	Achtarides
LA	Univ. of New Orleans	Sarwar
LA	Univ. of S.W. Louisiana	Knouse
LA	University of New Orleans	Mund
LA	Xavier Univ. of Louisiana	Akundi
MA	Univ. of Massachusetts	Curran
MA	Univ. of Massachusetts, Lowell	Kowalak
MA	Univ. of Massachusetts-Lowell	Harihar
MA	Worcester Polytechnic Inst.	Zalosh
MD	Morgan State Univ.	Williams
MD	St. Mary's Coll. of Maryland	Cribbs
MD	Univ. of Maryland	Dayhoff
MD	Univ. of Maryland	Miller
MD	Univ. of Maryland at Baltimore Med. School	Sacci, Jr.
MD	Univ. of Maryland, Baltimore County	Sasaki
MI	Michigan St. Univ.	Lindell
MI	Michigan Tech. Univ.	Trevino
MI	Univ. of Michigan	Ceccio
MI	W. Michigan Univ.	Kamman
MI	Western Michigan Univ.	Sahin
MN	Mankato St. Univ.	Goetz
MN	Mankato St. Univ.	Harris
MN	Univ. of Minnesota	Dickey
MS	Univ. of S. Mississippi	Pandey
NC	Shaw Univ.	Jang
NJ	Rutgers Univ.	Sheu
NJ	Rutgers, St. Univ. of NJ.	Aiello

**1993 Navy-ASEE Summer Faculty Fellowship Program
Participants' States and Home Institutions**

State	University	Last Name
NJ	Trenton St. Coll.	Gleeson
NM	New Mexico State Univ.	Chen
NY	City Univ. of NY	Moghaddasi
NY	Cooper Union	Raichel
NY	CUNY, City College	Raj
NY	CUNY, City College	Tobias
NY	CUNY, Coll. of Staten Island	Benumof
NY	CUNY-Baruch College	Thompson
NY	Hofstra Univ.	Rabbany
NY	Hunter Coll., CUNY	Massa
NY	N.Y. City Technical College	Derman
NY	NY Inst. of Technology	Fettahlioglu
NY	NY Inst. of Technology	Wernicki
NY	Polytechnic Univ.	Rogers
NY	Queensborough Comm. Coll. of CUNY	Yuster
NY	St. Univ. of New York	Tawfik
NY	SUNY at Buffalo	Soumekh
NY	SUNY, Coll. at Geneseo	Tang
NY	Syracuse Univ.	Lee
OH	Bowling Green St. Univ.	Myers
OK	Oklahoma St. Univ.	Foutch
OR	Oregon St. Univ.	Yim
PA	Drexel Univ.	Hrebien
PA	Drexel Univ.	Zietz
PA	Drexel University	Tyagi
PA	Edinboro Univ. of Pennsylvania	Sink
PA	Lafayette Coll.	Faas
PA	Penn. St. Univ.	Ma
PA	Pennsylvania St. Univ.	Jarmul

**1993 Navy-ASEE Summer Faculty Fellowship Program
Participants' States and Home Institutions**

State	University	Last Name
PA	Temple Univ.	Lefkovitz
PA	Univ. of Pittsbugh at Johnstown	Hartin
PA	Villanova Univ.	Gandhi
PA	Villanova Univ.	Jen
PA	Villanova Univ.	Jones
PA	Villanova Univ.	Joye
PA	West Chester Univ.	Grosshans
PA	Wilkes Univ.	Bush
PR	Univ. of Puerto Rico, Mayaguez Campus	Alemar
PR	Univ. of Puerto Rico-Mayaguez Campus	Patra
RI	Univ. of Rhode Island	Kaufman
SD	S. Dak. School of Mines & Tech.	Bang
TX	Jarvis Christian College	Hira
TX	LeTourneau Univ.	Johnson
TX	Texas Christian Univ.	Weis
TX	Univ. of Texas at El Paso	Shadaram
VA	George Mason Univ.	Beale
VA	Old Dominion Univ.	Scerbo
VA	Roanoke Coll.	Barghouty
Va	Virginia Polytech. Inst. & St. Univ.	Brown
VA	Virginia Tech Univ.	Shaw
VA	Virginia Tech.	Lindner
VT	Univ. of Vermont	Smith
WI	Univ. of Wisconsin-Oshkosh	Trahan
WV	W. Virginia Inst. of Tech.	Fuller

ATTACHMENT G

**APPLICANTS/PARTICIPANTS FROM HISTORICALLY BLACK
COLLEGES & UNIVERSITIES**



**1993 Navy-ASEE Summer Faculty Program
Applicants from HBCU/MI Institutions**

Last Name	Race	University	Lab	Accept
Akundi	E. Asian	Xavier Univ. of Louisiana	NRL	Yes
Alemar	Hispanic	Univ. of Puerto Rico, Mayaguez Campus	NAWC/AD	Yes
Benumof		CUNY, Coll. of Staten Island	NAWC/WD	Yes
Bhar	E. Asian	Univ. of the District of Columbia	NRL	Yes
Bhat	E. Asian	Lincoln University	NMRI	
Bolden	Black	Alcorn State Univ.	NMRI	
Butcher		Howard Univ.	NRL	Yes
Cabrera	Hispanic	Univ. of Texas at El Paso	NCCOSC	No
Centeno	Hispanic	Florida A&M Univ./Florida St. Univ.	NTSC	
Chen	E. Asian	Grambling St. Univ.	NAWC/WD	
	E.Asian	New Mexico State Univ.	NCCOSC	Yes
Chi	E. Asian	Univ. of D.C.	NRL	
Choudhury	E. Asian	Howard Univ.	NRL	Yes
Chriss	Black	Southern Univ. A&M College	NBL	
Darby	Black	Univ. of the District of Columbia	NRL	Yes
Davids		Polytechnic Univ.	NUWC	
Derman		N.Y. City Technical College	NRL	Yes
Dey	E. Asian	Hampton University	NCCOSC	
Dharwadkar	E. Asian	S. Carolina State Univ.	NPRDC	
Eaton	Black	Florida A&M University	DEOMI	Yes
	Black	Fort Valley State College	NRL	
Fettahlioglu		NY Inst. of Technology	NAWC/AD	Yes
Foster		Florida A&M Univ.	NSWC/CSS	Yes
Fox		NY Inst. of Technology	NUWC	

**1993 Navy-ASEE Summer Faculty Program
Applicants from HBCU/MI Institutions**

Last Name	Race	University	Lab	Accept
Gross		Florida A&M Univ./Florida St. Univ.	NSWC/CSS	Yes
Heard, Jr.	Black	CUNY/John Jay Coll.	NCCOSC	
Hira	E. Asian	Jarvis Christian College	NCCOSC	Yes
Hughes		Kentucky St. Univ.	NAWC/AD	Yes
Jang	E. Asian	Shaw Univ.	NRL	Yes
Johnson		St. Paul's College	NTSC	
Joshi	E. Asian	Prairie View A&M Univ.	NSWC/CD	
Kassim	Black	Howard University	NMRI	
Koeppel		Queens College of CUNY	NRL	
Lopez-Lopez	Hispanic	Southwestern College	NCCOSC	Yes
Mania, Jr.		Kentucky St. Univ.	NRL	Yes
Massa		Hunter Coll., CUNY	NRL	Yes
McLauchlan		Texas A&I Univ.	NUWC	
Mirshams		Southern University	NRL	No
Moghaddasi		City Univ. of NY	NCCOSC	Yes
Nedlin		Northern Virginia Comm. College-Annandale	NRL	
Pardee		Riverside Community College	NPRDC	Yes
Patra	E. Asian	Univ. of Puerto Rico-Mayaguez Campus	NAMRL	Yes
Putcha	E. Asian	Calif. State Univ.-Fullerton	NCEL	Yes
Raj	E. Asian	CUNY, City College	NUWC	Yes
Reddy	E. Asian	Virginia State Univ.	NSWC/CD	
Rogers		Polytechnic Univ.	NSWC/DD	Yes
Salu		Howard University	NSWC/DD	
Sarper		Univ. of S. Colorado	NSWC/CD	Yes
Schreur		Texas A&I Univ.	NTSC	
Shadaram		Univ. of Texas at El Paso	NAWC/AD	Yes

**1993 Navy-ASEE Summer Faculty Program
Applicants from HBCU/MI Institutions**

Last Name	Race	University	Lab	Accept
Shapiro		Northern Virginia Comm. College-Annandale	NRL	
Shie		Univ. of D.C.	NSWC/CD	
Smith		Tennessee State Univ.	NPRDC	
Stearns	Black	Howard Univ.	NRL	Yes
Tabet		Florida A&M Univ./Florida St. Univ.	NSWC/CSS	Yes
Thangada	E. Asian	Southern Univ. at New Orleans	NSWC/DD	
Thompson		CUNY-Baruch College	NPRDC	Yes
Tobias		CUNY, City College	NPRDC	Yes
Viswanath	E. Asian	S. Carolina State Univ.	NUWC	
Wernicki		NY Inst. of Technology	NAWC/AD	Yes
Williams	Black	Morgan State Univ.	NRL	Yes
Yuster		Queensborough Comm. Coll. of CUNY	NPRDC	Yes

ATTACHMENT H

APPLICANT/PARTICIPANT DISCIPLINE BY LABORATORY



Applicants by Discipline & Center

	DEOMI	NAMRL	NAWC/	NBL	NCCOS	NCEL	NHRC	NMRI	NPRDC	NRL	NSMRL	NSWC/	NSWC/	NTSC	NSWC	TOTAL
Physical Sciences																
Astronomy	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Chemistry	0	0	1	15	4	1	1	4	1	27	0	1	0	2	0	5
Physics	0	2	11	5	10	0	0	0	2	50	2	2	5	0	5	100
Math & Comp. Science																
Mathematics	0	0	7	7	10	0	3	0	6	5	0	2	4	8	2	59
Computer Science	0	0	4	0	10	0	0	0	1	14	0	0	1	5	1	39
Math. & Comp. Science	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Environmental Sciences																
Atmospheric Sciences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geological Sciences	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	4
Oceanography	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Sciences	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
Engineering																
Aerospace Engn.	0	0	4	1	2	0	0	0	0	3	0	3	1	1	0	20
Agricultural Engn.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chemical Engn.	0	0	1	0	0	1	0	1	0	3	0	1	0	0	0	7
Civil Engn.	0	0	1	0	0	8	0	0	1	2	0	2	0	0	2	16
Electrical Engn.	0	1	16	6	23	0	0	1	3	26	1	5	18	2	3	105
Industrial Engn.	0	0	1	3	0	0	0	0	4	0	0	2	0	1	3	15
Mechanical Engn.	0	0	9	2	0	4	0	0	0	9	0	18	3	4	0	65
Metalurgical Engn.	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	3
Nuclear Engn.	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Oceanographic Engn.	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
Engineering	0	0	3	0	1	1	0	0	0	1	0	1	0	0	3	10
Life Sciences																
Biological Sciences	0	2	0	0	0	0	1	12	1	3	0	0	0	0	0	20
Environmental Biology	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	3
Medical Sciences	0	7	1	0	0	0	7	3	0	3	1	0	0	0	0	22
Psychology																
Biological Psychology	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	3
Psychology	10	1	2	0	0	0	2	0	22	0	2	0	0	7	0	46
Social Sciences																
Linguistics	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Social Sciences	4	0	0	0	0	0	0	0	2	0	0	0	0	1	0	7
Other Sciences	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
All Other	5	0	1	0	0	0	2	1	14	3	0	0	0	2	0	28
TOTAL	19	13	65	39	4	60	18	27	58	162	6	37	32	28	21	649

Participants by Discipline & Center

	DEOMI	NAMRL	NAWC/A	NAWC/W	NBL	NCCOSC	NCEL	NHRC	NMRI	NPRDC	NRL	NSMRL	NSWC/C	NSWC/CS	NSWC/D	NTSC	NUWC	TOTAL	
Physical Sciences																			
Astronomy	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
Chemistry	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	1	1	7
Physics	0	0	4	1	0	4	0	0	0	0	15	0	2	1	0	0	1	1	28
Math & Comp Science																			
Mathematics	0	0	2	0	0	4	0	0	0	1	3	0	1	1	2	0	1	1	15
Computer Science	0	0	0	0	0	1	0	0	0	1	2	0	0	0	0	0	0	0	4
Math & Comp Science	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Sciences																			
Atmospheric Sciences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geological Sciences	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2
Oceanography	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environ. Sciences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineering																			
Aerospace	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	1	1	4
Agricultural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chemical	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	3
Civil	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	4
Electrical	0	0	4	0	0	6	0	0	0	1	5	1	4	5	1	0	0	0	27
Industrial	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Mechanical	0	0	2	0	0	0	2	0	0	0	4	0	4	1	0	0	2	2	15
Metallurgical	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oceanographic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineering	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	3	
Life Sciences																			
Biological Sciences	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Environmental Biology	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Medical Sciences	0	2	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	6
Psychology																			
Biological Psychology	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Psychology	2	0	0	0	0	0	0	1	0	6	0	0	0	0	0	1	0	0	10
Social Sciences																			
Linguistics	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Social Sciences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Sciences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Other	1	0	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	6
Total	3	2	17	1	0	16	7	3	2	14	40	1	16	9	3	1	6	6	141

ATTACHMENT I

SUMMARY OF SABBATICAL LEAVE PROGRAM PARTICIPANTS



**NAVY-ASEE SABBATICAL LEAVE PROGRAM
LIST OF PARTICIPANTS**

Dr. Alfonso Albano
Professor
Department of Physics
Bryn Mawr College
Bryn Mawr, PA

Host Laboratory: **Naval Air Warfare Center, Aircraft Division**
Period: September 1, 1992 thru May 31, 1993
Research Plan:

To continue studies of the use of higher-order correlation functions in the analysis chaotic time series and the use of neural networks to detect and extract chaotic signals embedded in noise; to follow their ramifications, and apply them to the detection, analysis, and identification of complex deterministic signals that are embedded in noise.

Dr. Antony Beris
Associate Professor
Department of Chemical Engineering
University of Delaware
Newark, DE

Host Laboratory: **Naval Research Laboratory**
Period: September 1, 1992 thru May 31, 1993
Research Plan:

To contribute to the overall within NRL effort to develop links between ongoing remote sensing efforts at smaller scales (0.1 to 10 km) with signatures at resolutions of future global measurements and processes. Of interest is to understand the effect of surfactants on the very small scale ocean surface dynamics which is modulated at larger scales which are themselves often smaller than the resolution elements of global models. These smaller scale surface dynamics is most important to remote sensing for producing the signal, yet it is not resolved explicitly and must be inferred correctly. This is also related to the understanding of the basic phenomena underlying

vorticity/free-surface interactions. To build a mechanistic understanding of the complex, three-dimensional interrelations of vorticity (and vortices) with the nearby surface and surfactants will require an interdisciplinary approach combining theoretical, numerical and experimental efforts. The research will contribute in the modelling of the surfactants and their interactions with the ocean surface dynamics in a way that is most appropriate to large scale (spectral) simulations.

Dr. Chriswell Hutchens
Associate Professor
Department of Electrical & Computer Engineering
Oklahoma State University
Stillwater, OK

Host Laboratory: Naval Command, Control & Ocean Surveillance Center
Period: August 24, 1992 thru August 23, 1993
Research Plan:

The sabbatical will be devoted to the evaluation of current mode versus voltage mode performance of electronic neural networks (ENN) and sigma delta A/D converters, neural coprocessor paradigm development, a feasibility study for the applicability of trinary backpropagation to feedback linearization for nonlinear control, and general search for improved ENN paradigm performance. The specific ENNs to be evaluated include trinary backpropagation and a modified Grange-Lynch paradigm, both of which support on board learning.

Dr. Jamal A. Ghorieshi
Associate Professor
Engineering Department
Wilkes University
Wilkes-Barre, PA

Host Laboratory: Naval Surface Warfare Center, Carderock Division
Period: September 1, 1992 thru December 31, 1992
Research Plan:

The wave propagation in a finite laminated structure will be considered. It is assumed that there are M layers and each lamella is perfectly bonded along its major parallel plane faces to the adjacent layers. Furthermore, the composite structure

includes a mixture of elastic and viscoelastic lamellae. The j^{th} lamella, $1 \leq j \leq M$, has a thickness of h_j , mass density of ρ_j and Lamé's moduli of λ_j, μ_j . Lamé moduli are complex and, in general, real functions of the frequency except for the elastic layer in which the elastic constants have a vanishing imaginary part. The medium thickness is d . The structure is rigid at the base and traction free at the surface. In the Cartesian coordinate system, u and w are the complex displacements in the x and z directions, respectively. Considering an axisymmetric case (a 2-dimensional case), the governing differential equations in the j^{th} layer, $1 \leq j \leq M$, in the absence of body force, are given by general Navier's equation of motion.

Dr. Kei-Peng Jen
Associate Professor
Department of Mechanical Engineering
Villanova University
Villanova, PA

Host Laboratory: Naval Air Warfare Center, Aircraft Division

Period: September 1, 1992 thru December 31, 1992

Research Plan:

This study is to investigate the effect of anisotropy on the low-cycle fatigue behavior of Al-Li 8090 alloy. Two types of 8090 alloy are investigated. One of them is the superplastically formed with peak aged heat treatment. Axial low-cycle fatigue tests were conducted under the constant total strain controlled condition. The orientation of the superplastically formed specimens consist of 0, 30, 45, 60 and 90 degrees with respect to the rolling direction. Meanwhile, the orientations of the T851 specimens consist of 0, 45, and 90 degrees.

To show the strain hardening and softening behaviors, the curves of stress amplitude versus the number of cycles to failure are presented. Increasing the applied total strain will increase the corresponding stress amplitude and decrease the fatigue life. In addition, the Coffin-Manson curves are presented to show the effect of plastic strain on the reversal fatigue lives ($2N_f$). When these two materials were compared with each other, it clearly indicates that the low cycle fatigue life for superplastically formed material is superior to T851 material. Also the strain hardening and softening effects in superplastically formed material are more significant than that in T851 materials. Furthermore, since the fatigue lives for 45 to 60 degree orientations are significantly higher than other orientations, there is a profound effect of anisotropy on the low cycle fatigue behavior of 8090 Al-Li alloy. Evidence indicates that the

capability of strain hardening and softening behavior controlled the low cycle fatigue life of Al-Li alloy.

Dr. Stephen Letcher
Professor
Department of Physics
University of Rhode Island
Kingston, RI

Host Laboratory: **Naval Undersea Warfare Center**
Period: September 1, 1992 thru June 1993

Research Plan:

A laboratory research effort is proposed to test the theoretical predictions of Goodman regarding the magnitude and angular dependence of acoustic scattering from turbulence and its relationship to the three-dimensional scalar temperature spectrum. We will extend the measurements to include a study of velocity-field turbulence (Doppler spread). This will be done in collaboration and cooperation with other aspects of the OATS (Ocean Acoustics Turbulence Study) program at NUWC, Newport.

Dr. Douglas Lindner
Associate Professor
Department of Electrical Engineering
Virginia Tech
Blacksburg, VA

Host Laboratory: **Naval Research Laboratory**
Period: August 1992 thru December 1992

Research Plan:

The thrust of the research is to develop the control theories associated with metamorphic materials. The control system for metamorphic material must play an integration role in the design of the material in the sense that the design of the control system must be based on a mathematical description of all of the component parts. Thus, the research into control systems for metamorphic materials has three main objectives. First, an integrated model for the material and all of the component parts must be developed and experimentally validated. Secondly, a clear performance objective for the control system should be formulated, and the limitations imposed by

the material and component parts with respect to this performance objective determined. Finally, a control design methodology should be developed suitable for the design of future metamorphic materials.

Dr. R. L. Ram-Mohan
Professor
Department of Physics
Worcester Polytechnic Institute
Worcester, MA

Host Laboratory: **Naval Research Laboratory**
Period: May 18, 1992 thru October 16, 1992
Research Plan:

Layered semiconductor heterostructures provide unique opportunities for band tailoring and control of carrier lifetimes. This research program on the evaluation carrier eigen-energies in heterostructures has been of interest to the work of research groups at the NRL. The work, initiated at WPI and completed at the NRL, on multi-band tunneling and on the energy eigenvalues for carriers in layered structures in an external magnetic field should continue to provide the framework for the analysis of data in magneto-optics and on tunneling structures for a number of years.

Dr. Bilal M. Ayyub
Associate Professor
Department of Civil Engineering
University of Maryland
College Park, MD

Host Laboratory: **Naval Surface Warfare Center, Carderock Division**
Period: August 1993 to August 1994
Research Plan:

The research will be in areas that are related to the probabilistic analysis of marine structures. Activities will be in support of ongoing research projects at the Naval Surface Warfare Center (NSWC-CS), Carderock Division, under the leadership of Mr. Jeffrey Beach (Code 1730). Some suggested research areas may include reliability assessment of ship structures with ambiguity and vagueness in failure, reliability-based design, efficient reliability assessment techniques, limiting the tails of probability distributions in the extreme value analyses of wave pressure, and statistical

treatment of experimental data. Also, providing any needed support to other ongoing research projects at the NSWC-CD in the general areas of probabilistic analysis, and uncertainty modeling and analysis.

Dr. James P. Runt

Associate Professor

Department of Materials Science & Engineering

Penn State University

University Park, PA

Host Laboratory: Naval Research Laboratory

Period: July 1993 through September 1993

Research Plan:

Understanding the nature of the interface in crystalline polymers as well as mixtures of crystalline and amorphous polymer (see Macromolecules 24, 3466 (1991) and Macromolecules 25, 3902 (1992) for early research in this area). Experimental efforts have and will continue to involve extensive dielectric spectroscopy and small angle scattering and there is a real, critical need for more quantitative analysis.

Dr. Harold T. Stokes

Professor

Department of Physics and Astronomy

Brigham Young University

Provo, UT

Host Laboratory: Naval Research Laboratory

Period: September 1993 to July 1994

Research Plan:

Prof. Stokes has been involved in a research effort in applying group theoretical methods to phase transitions in crystalline solids. He has developed computer software for analyzing possible symmetry changes in crystals. He proposes working with the Complex Systems Theory Branch at NRL and learning how to apply his techniques to the types of structural problems being studied at NRL.

Dr. Laura K. Thompson
Professor
Department of Biology
Furman University
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Host Laboratory: Naval Research Laboratory

Period: August 1993 to May 1994

Research Plan:

Polyester polyurethane comprises the matrix of many naval aircraft paints which require hazardous organic solvents for removal. Soil bacteria were screened for degradation of colloidal polyester polyurethane as a first step towards development of an enzyme-based paint stripping formula that is biodegradable and nontoxic. Because of a hydrophobic surface layer on the paint, bacteria/paint surface contact may not induce production of polyurethanes. Thus, constitutive polyurethane-degrading strains were generated by mutagenesis. Eight environmental isolates were recovered from paint chip samples from a Naval paint stripping facility. Restriction fragment length polymorphic analyses revealed that four of these isolates may be similar strains. Comparison of the strains by restriction mapping of the hypervariable regions of the 16S rRNA showed two distinct groups. A representative strain from each group was mutagenized by transposition with mini-Tn5 and screened for ability to degrade polyester polyurethane on culture plates. Of 8,000 mutants screened, 10 produced much larger zones of clearing than the wild-type strain. These strains were further examined for their ability to degrade the matrix of the aircraft paint.

ATTACHMENT J

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