1992
LANGLEY AEROSPACE RESEARCH SUMMER SCHOLARS (LARSS) PROGRAM

FINAL REPORT
June 2, 1993

Submitted to: Mr. Robert L. Yang
Assistant University Affairs Programs Office
Mail Stop 400
NASA Langley Research Center
Hampton, VA 23681-0001

NASA Center for Aerospace Information
P. O. Box 8757
Baltimore/Washington International Airport, MD 21240

NASA GRANT NO: NCC1-166
# TABLE OF CONTENTS

## Introduction ................................................................................................................... i

## I. Statistical Profile ........................................................................................................ 1

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1992 LARSS Student By Classification</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>1992 LARSS Student By Gender</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>1992 LARSS Student By Ethnicity</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>1992 LARSS Student By Ethnicity and Gender</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>1992 LARSS Student By Institution</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>1992 LARSS Student By State</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>1992 LARSS Student By Directorate</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>1992 LARSS Student By Distribution of Office of the Directorate</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>1992 LARSS Student By Distribution of Aeronautics Directorate</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>1992 LARSS Student By Distribution of Electronics Directorate</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>1992 LARSS Student By Distribution of Flight Systems Directorate</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>1992 LARSS Student By Distribution of Management Operations Directorate</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>1992 LARSS Student By Distribution of Space Directorate</td>
<td>11</td>
</tr>
<tr>
<td>14</td>
<td>1992 LARSS Student By Distribution of Structures Directorate</td>
<td>12</td>
</tr>
<tr>
<td>15</td>
<td>1992 LARSS Student By Distribution of Systems Engineering Directorate</td>
<td>12</td>
</tr>
<tr>
<td>16</td>
<td>HBCU Participation in LARSS Program 1989-1992</td>
<td>13</td>
</tr>
</tbody>
</table>

## II. Program Changes .................................................................................................... 14

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Changes</td>
<td>15</td>
</tr>
<tr>
<td>Application Process</td>
<td>15</td>
</tr>
<tr>
<td>Correspondence</td>
<td>15</td>
</tr>
<tr>
<td>Housing</td>
<td>16</td>
</tr>
<tr>
<td>Orientation</td>
<td>16</td>
</tr>
<tr>
<td>LARSS Activities Committee (LAC)</td>
<td>16</td>
</tr>
<tr>
<td>Mentor Roles and Responsibilities</td>
<td>17</td>
</tr>
</tbody>
</table>
### TABLE OF CONTENTS (continued)

- Picnic ................................................................................................................... 17
- Paychecks ........................................................................................................... 17
- Technical Lecture Series ............................................................................. 17
- Longitudinal Study .......................................................................................... 18
- Survey Development .................................................................................... 18
- Worksite Visits with LARSS Students ................................................ 18
- Researcher News Project ............................................................................ 19
- LARSS Newsletter ........................................................................................... 19
- Banquet ................................................................................................................. 20
- Final Report and Presentations ........................................................................... 20

### III. Measures of Success ........................................................................... 21
- Measures of Success ...................................................................................... 22
  - A. Longitudinal Study .................................................................................... 22
  - B. Orientation Evaluation ............................................................................ 22
  - C. Student Exit Survey .................................................................................. 23
  - D. Evaluation of LARSS Participant By Mentor Survey ................... 24

### TABLE OF APPENDICES

- A. 1992 LARSS Student By Academic Discipline
- B. 1992 LARSS Program Briefing Via: Program Changes
- C. 1992 LARSS Timeline
- D. 1992 LARSS Administrative Timeline
- E. 1992 LARSS Orientation Agenda
- G. 1992 Technical Lecture Series
- H. 1992 Sample Program
- I. 1992 LARSS Longitudinal Study Timeline
- J. 1992 LARSS Longitudinal Study
- K. 1992 LARSS Sample Memo of LARSS Worksite Visit
- L. 1992 LARSS Articles
- M. 1992 LARSS Newsletter
- N. 1992 LARSS Final Report Format
- P. 1992 LARSS Program Student Exit Survey Report
- Q. 1992 Evaluation of LARSS Participant by Mentor Survey
Introduction

The Langley Aerospace Research Summer Scholars (LARSS) Program was established in 1986 for the benefit of rising undergraduate juniors and seniors, and first-year graduate students who are pursuing degrees in aeronautical engineering or selected space disciplines of interest to NASA Langley Research Center (LaRC). Since its inception in 1986, the LARSS Program has reached unprecedented heights. That is, the number of participants has increased from 20 to 91, the stipend has increased from $2,500.00 to $4,000.00, and the length of the Program has increased from eight weeks. These increases signify that the summer research experiences of the LARSS participants are contributing to the scientific efforts of NASA LaRC and to the body of scientific knowledge as a whole.

The LARSS Program is intended to encourage high-caliber college students to both pursue and earn graduate degrees and to enhance their interest in aerospace research by exposing them to the professional research resources and facilities of LaRC. Two primary elements of the LARSS Program are (1) a research project to be completed by each participant under the supervision of a researcher who will assume the role of a mentor for the summer and (2) technical lectures by prominent engineers and scientists. Additional elements of this program include tours of LaRC wind tunnels, computational facilities, and laboratories. Library and computer facilities are available for all participants.

The LARSS Program is under the administrative control of the University Affairs Office within the Office of the Chief Scientist at NASA LaRC, and the sponsoring university, Hampton University. The purpose of this final program report is three-fold: (1) to address the changes the LARSS Program has experienced this year and provide recommendations for next year, (2) to identify the measures of success that were used this year to determine the overall health of the Program, and (3) to combine into one document pertinent information on the Program.
STATISTICAL PROFILE
The 1992 LARSS Program consisted of 91 summer research scholars. Of the 91 participants, the majority (38.46%) were classified as seniors, followed by juniors (31.87%), graduate students (17.58%), and others (12.09%). (See Table 1 below).

Table 1. 1992 LARSS Students By Classification
The majority of the participants (61.54%) were male, leaving 38.46% female participants. (See Table 2 below).

Table 2. 1992 LARSS Students By Gender
The majority (79.12%) of the participants were classified as Non-Minority, leaving 20.88% of the participants Minorities. Asian and Black representation in the Program were equal (7.69%, respectively), followed by Hispanic representation (4.40%), and Native American representation (1.10%). There was no Pacific Islander representation. (See Table 3 above).

Table 3. 1992 LARSS Students By Ethnicity

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>7.69%</td>
<td>7</td>
</tr>
<tr>
<td>Black</td>
<td>7.69%</td>
<td>7</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4.40%</td>
<td>4</td>
</tr>
<tr>
<td>Native American</td>
<td>1.10%</td>
<td>1</td>
</tr>
<tr>
<td>Pacific Islander**</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Non-Minority</td>
<td>79.12%</td>
<td>72</td>
</tr>
</tbody>
</table>

*This area includes, for example, China, India, Japan and Korea.
**This area includes any of the original peoples of Hawaii; the U.S. Pacific Territories of Guam, American Samoa, and the Northern Marianas, the U.S. Trust Territory of Palau; the Islands of Micronesia and Melanesia; and the Philippines.
Slightly over half of the LARSS participants consisted of Non-Minority males (50.55%), while Non-Minority male representation in the five ethnic groups was greatest in the Asian ethnic group (5.50%), followed by Hispanic male representation (3.30%). Black male representation (1.10%) and Native American male representation (1.10%) were equal. There was no Pacific Islander male representation. Non-minority female representation was 28.56%. Female representation in the five ethnic groups was greatest in the Black ethnic group (6.59%), followed by Asian female representation (2.20%), and Hispanic female representation (1.10%). There was no female representation in either the Native American ethnic group or the Pacific Islander ethnic group. (See Table 4 below).

Table 4. 1992 LARSS Students By Ethnicity and Gender

![Bar Chart]

**1992 LARSS STUDENTS BY ETHNICITY AND GENDER**

- **Non-Minority Male**: 28.56% (26)
- **Non-Minority Female**: 50.55% (46)
- **Asian Male**: 5.50% (5)
- **Asian Female**: 2.00% (2)
- **Black Male**: 6.55% (6)
- **Black Female**: 1.10% (1)
- **Hispanic Male**: 3.00% (3)
- **Hispanic Female**: 1.10% (1)
- **Native American Male**: 1.10% (1)
- **Native American Female**: 0%
- **Pacific Islander Male**: 0%
- **Pacific Islander Female**: 0%

*Ethnicity and Gender:

- Male
- Female*
The 91 LARSS participants represented 38 out-of-state institutions including Puerto Rico and 11 in-state institutions. (See Table 5 below).

Table 5. 1992 LARSS Students By Institution
The 91 participants were representative of 24 of the 52 states (See Table 6 below).

Table 6. 1992 LARSS Students By State
The mean G.P.A. for the 91 participants was 3.46, the highest in the history of the LARSS Program. In terms of academic disciplines, 17 of the 91 LARSS participants (18.68%) were double majors. Both Aerospace Engineering and Electrical Engineering represented 18.68% of the academic disciplines, respectively, followed by Mechanical Engineering (7.69%), Physics (7.69%), and Chemistry (4.40%). (See Appendix A. 1992 LARSS Students By Academic Discipline).

The 91 participants were placed in each Directorate, including the Office of the Director. The Structures Directorate had one-fourth (23) of the program participants, followed by Space (18), Aeronautics (15), Electronics (12), Flight Systems (9), Management Operations (6), Office of the Director (4), and Systems Engineering and Operations (4). (See Table 7 below). (See Tables 8-15 for 1992 LARSS Student Distribution for each Directorate, including the Office of the Director).

Table 7. 1992 LARSS Students By Directorate

<table>
<thead>
<tr>
<th>Directorate</th>
<th>Percentage of Students (N=91)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office of the Director</td>
<td>4.40% (4)</td>
</tr>
<tr>
<td>Electronics</td>
<td>13.19% (12)</td>
</tr>
<tr>
<td>Structures</td>
<td>25.27% (23)</td>
</tr>
<tr>
<td>Aeronautics</td>
<td>16.48% (15)</td>
</tr>
<tr>
<td>Management Operations</td>
<td>6.59% (6)</td>
</tr>
<tr>
<td>Systems Eng. and Operations</td>
<td>4.40% (4)</td>
</tr>
<tr>
<td>Space</td>
<td>19.78% (18)</td>
</tr>
<tr>
<td>Flight Systems</td>
<td>9.89% (9)</td>
</tr>
</tbody>
</table>
Table 8. 1992 LARSS Student Distribution Of Office of the Director

1992 LARSS STUDENT DISTRIBUTION OF OFFICE OF THE DIRECTOR

<table>
<thead>
<tr>
<th>Percentage of Students (N=91)</th>
<th>External Affairs</th>
<th>Equal Opportunity Programs Division</th>
<th>Public Affairs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.10% (1)</td>
<td>1.10% (1)</td>
<td>2.20% (2)</td>
<td></td>
</tr>
</tbody>
</table>

Table 9. 1992 LARSS Student Distribution Of Aeronautics Directorate

1992 LARSS STUDENT DISTRIBUTION OF AERONAUTICS DIRECTORATE BY DIVISION

<table>
<thead>
<tr>
<th>Percentage of Students (N=91)</th>
<th>Advanced Vehicles</th>
<th>Applied Aerodynamics</th>
<th>Flight Applications</th>
<th>Fluid Mechanics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.20% (2)</td>
<td>6.59% (6)</td>
<td>2.20% (2)</td>
<td>5.50% (5)</td>
<td></td>
</tr>
</tbody>
</table>
Table 10. 1992 LARSS Student Distribution of Electronics Directorate

1992 LARSS STUDENT DISTRIBUTION OF SYSTEMS ENGINEERING AND OPERATIONS DIRECTORATE BY DIVISION

<table>
<thead>
<tr>
<th>Division</th>
<th>Percentage of Students (N=91)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations Support</td>
<td>1.10% (1)</td>
</tr>
<tr>
<td>Systems, Safety, Quality and Reliability</td>
<td>1.10% (1)</td>
</tr>
<tr>
<td>Facilities Engineering</td>
<td>1.10% (1)</td>
</tr>
<tr>
<td>Systems Engineering</td>
<td>1.10% (1)</td>
</tr>
</tbody>
</table>

Table 11. 1992 LARSS Student Distribution Of Flight Systems Directorate

1992 LARSS STUDENT DISTRIBUTION OF FLIGHT SYSTEMS DIRECTORATE BY DIVISION

<table>
<thead>
<tr>
<th>Division</th>
<th>Percentage of Students (N=91)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Systems</td>
<td>4.40% (4)</td>
</tr>
<tr>
<td>Guidance and Control</td>
<td>5.50% (5)</td>
</tr>
</tbody>
</table>
Table 12. 1992 LARSS Student Distribution of Management Operations Directorate

1992 LARSS STUDENT DISTRIBUTION OF MANAGEMENT OPERATIONS DIRECTORATE BY DIVISION

<table>
<thead>
<tr>
<th>Division</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Management</td>
<td>1.10% (1)</td>
</tr>
<tr>
<td>Human Resources Management</td>
<td>2.20% (2)</td>
</tr>
<tr>
<td>Research Information and Applications</td>
<td>3.30% (3)</td>
</tr>
</tbody>
</table>

Table 13. 1992 LARSS Student Distribution of Space Directorate

1992 LARSS STUDENT DISTRIBUTION OF SPACE DIRECTORATE BY DIVISION

<table>
<thead>
<tr>
<th>Division</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atmospheric Sciences</td>
<td>10.99% (10)</td>
</tr>
<tr>
<td>Space Station Freedom Office</td>
<td>4.40% (4)</td>
</tr>
<tr>
<td>Space Systems</td>
<td>2.20% (2)</td>
</tr>
<tr>
<td>Space Exploration Initiative Office</td>
<td>2.20% (2)</td>
</tr>
</tbody>
</table>
Table 14. 1992 LARSS Student Distribution Of Structures Directorate

1992 LARSS STUDENT DISTRIBUTION OF STRUCTURES DIRECTORATE BY DIVISION

<table>
<thead>
<tr>
<th>Division</th>
<th>Percentage of Students (N=91)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Mechanics</td>
<td>3.30% (3)</td>
</tr>
<tr>
<td>Structural Dynamics</td>
<td>7.69% (7)</td>
</tr>
<tr>
<td>Materials</td>
<td>10.99% (10)</td>
</tr>
<tr>
<td>Acoustics</td>
<td>3.30% (3)</td>
</tr>
</tbody>
</table>

Table 15. 1992 LARSS Student Distribution Of Systems Engineering and Operations Directorate

1992 LARSS STUDENT DISTRIBUTION OF ELECTRONICS DIRECTORATE BY DIVISION

<table>
<thead>
<tr>
<th>Division</th>
<th>Percentage of Students (N=91)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis and Computation</td>
<td>1.10% (1)</td>
</tr>
<tr>
<td>Instrument Research</td>
<td>7.69% (7)</td>
</tr>
<tr>
<td>Flight Electronics</td>
<td>4.40% (4)</td>
</tr>
</tbody>
</table>
In terms of Division participation, the Atmospheric Sciences Division (ASD) and Materials Division (MD) both had 10 participants, followed by the Instrument Research Division (IRD) and the Structural Dynamics Division (SDYD) which had 7 participants each. The Applied Aerodynamics Division (AAD) had 6 participants, the Fluid Mechanics Division had 5, and the Guidance and Control Division (GCD) had 5.

Two Historically Black Colleges and Universities (HBCU's) were represented in the 1992 LARSS Program: Hampton University and North Carolina Agricultural and Technical State University. (See Table 16 below).

Table 16. HBCU Participation in the LARSS Program; 1989-1992

<table>
<thead>
<tr>
<th>HBCU* PARTICIPATION IN LARSS PROGRAM 1989-1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>-------</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

*Historically Black Colleges and Universities

Other Minority Universities (OM’s) represented include the University of Puerto Rico-Mayaguez, with two Program participants.
PROGRAM CHANGES
Program Changes

The 1992 LARSS Program has experienced many changes, which have contributed to the overall success of the Program. Even though all program changes do not have the same impact, each is nonetheless important. Following is a discussion of some of the more significant program changes that were implemented this year, and the impact, whether positive or negative, on the Program. Recommendations for the 1993 LARSS Program follows each section. (See Appendix B. 1992 LARSS Program Briefing Via: Program Changes).

Application Process

Applications for the 1992 LARSS Program were due on the same date as the other programs run by the University Affairs Office; thus, other staff members were not able to assist with the application process. This had a negative impact on the overall Program due to the increased amount of work. In 1993, it is recommended that clerical support be obtained from the sponsoring university to assist with entering the information from each application into the database. Additionally, the core set of database fields for all University Programs should be continued in 1993. Software program options for the LARSS Program need to be explored; that is, the software used this year was not appropriate for the size of the LARSS Program.

Correspondence

This year the distribution of correspondence to the participants in a timely manner was identified as a major area of concern. To ensure distribution of correspondence in a more timely manner for 1993, the following changes have been made on the LARSS Timeline: (1) the Housing and Welcome information will be combined with the Award Letter Package, and (2) dates have been established for all outgoing correspondence on the LARSS Timeline. (See Appendices C. 1993 LARSS Timeline and D. 1993 LARSS Administrative Timeline).
Housing

This year housing overall has not necessarily been an improvement to the LARSS Program, but rather a learning experience. The broader range of both housing options and prices was an improvement over previous years, but a concern voiced from the Program participants was not having enough social interactions with their colleagues. As opposed to this year, 1993 LARSS students need to be housed in two or three apartment complexes only, instead of being spread out geographically. Suggested complexes for 1993 include Grafton Station, Oakwood, Chelsey, and possibly, Hampton Harbor. Housing information also needs to be distributed earlier. By moving the date up in the timeline, the information will be sent in a more timely manner.

Orientation

The 1992 LARSS Orientation was well organized and ran smoothly. The mentors lined up at the end of the Program Breakout Session and called out the name of his/her student; this worked well and should be continued into 1993. Next year, the orientation should follow the same format, with each presenters' time being limited to 12 minutes. Also, NASA Form 531, Name Check Request, will be mailed in the Award Package to facilitate the check-in process. The 1993 Welcome Package should also include a LARSS Timeline. (See Appendix E. 1992 LARSS Orientation Agenda).

LARSS Activities Committee (LAC)

The establishment of the LARSS Activities Committee (LAC) placed the responsibility of planning social activities for the students on the students rather than the University Affairs Office staff itself. Activities this year included a trip to Virginia Beach, Busch Gardens, Washington D.C. (National Air and Space Museum), nights of bowling and going to the movies. This committee should be continued next year; however, it has been determined that liability issues surrounding LAC activities need to be explored further. After consultation with legal council, a release form needs to be developed in 1993 for all activities related to the LARSS Program.
Mentor Roles and Responsibilities

This year was the first year that the LARSS Mentors were made aware of their roles and responsibilities in writing. This letter clarified many areas which had previously been unclear to the mentors, and also clarified the roles and responsibilities of the University Affairs Office. This should be continued into the 1993 LARSS Program. Additionally, a Policies, Practices, and Procedures Manual has been developed for the Program. (See Appendix F. 1992 LARSS Policies, Practices, and Procedures Manual).

Picnic

The 1992 LARSS Picnic, held on June 12, 1992, was well-attended. Changes this year include the elimination of decorations, a theme, and nametags. Also, a nominal fee was charged for admission to the picnic to help defray the costs of the entertainment (i.e. D.J. and clown). For 1993, it is recommended to increase the cost of admission to $3.00 per adult and $1.50 per child, eliminate the clown, and distribute tickets for alcoholic beverages. A designated individual should be at the keg at all times.

Paychecks

Another major change in this year's Program was the distribution of paychecks by University Affairs Office staff, as opposed to the staff of the sponsoring university. This enhanced the overall communication between LARSS participants and the University Affairs Office staff by offering five additional points of contact, as opposed to less points of contact in previous years. In 1993, paychecks should again be issued bi-weekly by the University Affairs Office Staff, beginning the second Monday of the Program.

Technical Lecture Series

The 1992 LARSS Technical Lecture Series consisted of five technical lectures by prominent NASA scientists and engineers. (See Appendix G. 1992 ASEE/LARSS Technical Lecture Series Schedule). Additionally, a program was developed to distribute at each lecture. (See Appendix H.
1992 Sample Program). This Program included a summary of the presenters biographical information, an abstract of the lecture to be given, and the announcement of the next lecture. The 1992 Technical Lecture Series was an integral part of the LARSS Program. Next year, technical lectures should not exceed 45 minutes, and the question and answer session should be extended to 20 minutes. A program needs to be distributed at each lecture. The number of technical lectures needs to be increased from five to six or possibly seven.

Longitudinal Study

The establishment of a longitudinal study examining the effect of the intervention of Mathematics, Science, and Engineering Research Projects (conducted in conjunction with Langley Researchers), on LARSS participants' decisions to pursue or further their graduate studies has had a significant impact on the LARSS Program this year. Sponsored by NASA LaRC and Hampton University, this study will also enhance the tracking of former LARSS participants. It is recommended that this study continue during the academic year and following years. (See Appendices I. 1992 Longitudinal Study Timeline and J. 1992 LARSS Longitudinal Study).

Survey Development

The development of the following three new survey instruments has also had a positive impact on the Program: (1) 1992 LARSS Orientation Evaluation Survey, (2) 1992 LARSS Student Exit Survey, and (3) 1992 Evaluation of LARSS Participant By Mentor. Each instrument allows certain variables to be measured and will be discussed in the third part of this document. It is recommended that these three instruments be continued into next year, and that additional survey instruments are developed to measure different aspects of the Program. Additionally, a mid-term survey needs to be developed and implemented next year.

Worksite Visits With LARSS Students

This summer the LARSS Program Coordinator and the Acting University worksites; one in each Directorate. The purpose of these visits was to (1) see the student "in action" performing his/her research duties, and (2)
solicit suggestions, on an informal level, for continuous improvement of the LARSS Program. (See Appendix K. Sample Memo of LARSS Worksite Visit). Additionally, the Assistant University Affairs Officer and LARSS Program Coordinator had informal working luncheons with random LARSS participants after two Technical Lecture Series. Both visits enhanced the Program by getting student suggestions for continuous program improvement. The worksite visits should be continued in 1993, as should the informal working luncheons.

**Researcher News Project**

In previous years, the LARSS participants have not been featured in the Researcher News, a Langley news publication. This year there was a series of articles written on both the LARSS and ASEE Programs. These articles heightened the awareness of the LARSS Program. To ensure that the articles are written in a timely manner, a roster of the LARSS participants needs to be routed to the Office of External Affairs during the first week of the 1993 Program. (See Appendix L. 1992 LARSS Articles).

**LARSS Newsletter**

To facilitate communication among the Program participants, a LARSS Newsletter was developed towards the end of the Program this year. Six students contributed to this effort. (See Appendix M. 1992 LARSS Newsletter). This newsletter should be carried into the 1992-93 academic year to keep past participants abreast of one another's activities and to enhance the overall tracking process. A weekly newsletter should also be distributed during the ten-week LARSS Program.


The 1993 LARSS Policies, Practices, and Procedures Manual is currently being developed to not only serve as a quick reference guide for the participants, but to facilitate their ten-week summer research experience at LaRC. This has had a positive impact on the Program in that this document combines much of the information which was traditionally distributed at Orientation. (See Appendix F. 1992 LARSS Policies,
Practices, and Procedures Manual). It should be included in the 1993 Welcome Packet and be updated each year thereafter.

Banquet

The 1992 LARSS Banquet was held at the Langley Officers' Club. Each LARSS participant's dinner was paid in full ($16.05) by the grant and civil servants had to pay $16.05 per person. It is recommended in 1993 that each LARSS participant be charged $5.00 or so to help defray the cost not only to the grant, but to guest and civil servants as well. Also, another location for the banquet should be explored.

Final Report and Presentations

This year a Final Report was required of all LARSS participants and the Mid-term Report was eliminated. (See Appendix N. Final Report Format). Additionally, all Final Reports will be combined into one document and distributed to the LARSS participants and their mentors. It is recommended in 1993 that a more lengthy technical report be required, and participants should strongly be encouraged to present their research orally to each respective Directorate.
MEASURES OF SUCCESS
MEASURES OF SUCCESS

The purpose of the following three survey instruments: (1) 1992 LARSS Orientation Evaluation, (2) 1992 LARSS Student Exit Survey, and (3) 1992 Evaluation of L'ARSS Participant By Mentor Survey, and the longitudinal study implemented this year in the LARSS Program, is to serve as a starting point for measuring the Program over a number of years to ensure significant improvement over time. Thus, measuring variables independently was a beginning of this process. The survey instruments measure the success of certain variables related to the Program; each of which will be discussed below.

A. Longitudinal Study

The longitudinal study was established to measure the effect of the intervention of Mathematics, Science, and Engineering Research Projects (conducted in conjunction with Langley Researchers), on LARSS participants decision to pursue or further their graduate studies. Sponsored by NASA LaRC and Hampton University, this study will continue into the academic year. (See Appendix J. 1992 LARSS Longitudinal Study).

B. Orientation Evaluation

The purpose of the LARSS Program Orientation is: (1) to provide LARSS Program participants with pertinent information regarding NASA LaRC and (2) to facilitate their 10-week stay at the Center. In order to evaluate the orientation, as well as the pre-conference communication with the participants, the 1992 LARSS Orientation Evaluation was developed to measure the effectiveness of the following five areas: (1) Overall Organization, (2) Pre-conference Notification, (3) Information and Knowledge Gained at the Orientation, (4) Program Breakout Session, and (5) General Rating of the Orientation. This evaluation is also used as a tool to follow with NASA’s goal of "continuous improvement". That is, by critically examining the five aspects of the orientation from an objective viewpoint, the appropriate changes can be implemented or made within the LARSS Program. The recommendations made will ensure a more successful and improved 1993 LARSS Orientation and overall program.
The overall organization of the 1992 LARSS Program Orientation, as well as the general rating of the orientation, yielded favorable comments from 94% of the respondents. Thus, these two areas are not of major concern at this time. Similarly, the overwhelming majority of the respondents rated the program breakout session highly. Hence, the overall organization of the orientation, as well as that of the program breakout session will remain the same. The information and knowledge gained at the orientation was rated as beneficial by 95% of the respondents and appears to facilitate the student's transition to LaRC. Even though four of the five areas addressed in the survey were rated favorably overall, the one area which reflects an inherent weakness is the pre-conference notification. Close examination of the comments made by the respondents reflect that correspondence and notification must be done roughly one month earlier in the future. This orientation evaluation is reflective of both the strengths and weaknesses of the 1992 LARSS Orientation, as well as some general elements of the LARSS Program, like timeliness of correspondence. (See Appendix O).

C. Student Exit Survey

The 1992 LARSS Student Exit Survey is intended to serve as a tool for continuous improvement of the overall LARSS Program. That is, the LARSS Program participants are able to provide valuable information about the overall Program by identifying those areas of the Program which need enhancing. The recommendations provided from this survey will be considered for the 1993 LARSS Program. This survey is a measure of success in that it is reflective of the overall summer research experience the LARSS Program provided for its participants. That is, the overwhelming majority of the LARSS participants rated their overall summer research experience as good or excellent. Even though the 1992 LARSS Program has met its' goals, all areas of the Program need to be considered for continuous improvement. Of the various recommendations provided by the participants, the following will be implemented in the 1993 LARSS Program: (1) LARSS participants will be housed in two or three apartment complexes, (2) mentors will be encouraged to contact their student before the beginning of the LARSS Program, (3) LARSS participants will be notified of a tentative payroll schedule before the Program begins, (4) LARSS participants will be strongly encouraged to
give an oral presentation on their research project in their respective Divisions, and (5) a Career Conference, in conjunction with a forum where the participants can share their individual research projects, will be held. The participant recommendations made in the 1992 LARSS Student Exit Survey will ensure a more successful and improved LARSS Program in 1993. (See Appendix P).

D. Evaluation of LARSS Participant By Mentor Survey

The 1992 Evaluation of LARSS Participant By Mentor Survey is intended to serve as a tool for the Langley Mentors to measure the student's ability as compared to a representative group of students who have approximately the same amount of experience and training on the following four levels: (1) degree of mastery of fundamental knowledge in the general field, (2) knowledge of and ability to use basic research techniques in this field, (3) self-reliance and independence in scientific work, and (4) motivation toward a successful productive scientific career. This survey is a measure of success in that it represents the quality of the student researcher and his/her abilities to contribute to NASA LaRC. (See Appendix Q).

The majority of the students (56.58%) were rated by their mentor as having an outstanding degree of mastery of fundamental knowledge in the general field, followed by a truly exceptional degree of mastery (19.74%), unusual (11.84%), good (9.21%), and somewhat above average (2.63%). Similarly, the majority of students (52.63%) were rated as having knowledge of and ability to use basic research techniques in this field, followed by truly exceptional (26.32%), unusual (9.21%), good (7.89%), and somewhat above average (3.95%).

The majority of the students (52.63%) were rated as truly exceptional in terms of self-reliance and independence in scientific work, followed by outstanding (27.63%), good (10.53%), and unusual (9.21%). Similarly, the majority of the students (53.95%) were rated as truly exceptional in terms of motivation toward a successful productive scientific career, followed by outstanding (39.26%), unusual (10.53%), good (2.63%), and somewhat above average (2.63%).
When the mentors compared their student overall with other students they had previously supervised, the majority of the students (52.63%), were rated as equal to the best, followed by very good (32.89%), above average (10.53%), and average (3.95%). None of the students were rated as below average. The results of this survey suggest that even though the majority of the students were rated as outstanding in the first two areas, they were rated truly exceptional in the last two areas; self-reliance, independence, and motivation are important attributes to have to gain further knowledge and research skills in a chosen field. In general, the remarks made by the mentors were very positive; they signify how enriching a summer research experience is to a student in the short-term. It will be interesting to (1) see if these surveys have the same continuing effect in 1993 and (2) to measure the longevity of the LARSS summer research experience.
# 1992 LARSS Students by Academic Discipline

<table>
<thead>
<tr>
<th>Academic Discipline</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeronautical Engineering/Aerodynamics</td>
<td>1</td>
</tr>
<tr>
<td>Aeronautical Engineering/Astronautical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Aerospace/Aeronautical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Aerospace/Mechanical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Aerospace/Ocean Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Aerospace Engineering</td>
<td>17</td>
</tr>
<tr>
<td>Applied Optics</td>
<td>1</td>
</tr>
<tr>
<td>Applied Optics/Mathematics</td>
<td>1</td>
</tr>
<tr>
<td>Biology</td>
<td>1</td>
</tr>
<tr>
<td>Business Administration</td>
<td>1</td>
</tr>
<tr>
<td>Ceramic Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry/Chemical Engineering</td>
<td>2</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Clinical Psychology</td>
<td>1</td>
</tr>
<tr>
<td>Communication</td>
<td>1</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Computer Science/Mathematics</td>
<td>1</td>
</tr>
<tr>
<td>Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>Electrical Engineering/Computer Science</td>
<td>1</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>17</td>
</tr>
<tr>
<td>Engineering Physics</td>
<td>1</td>
</tr>
<tr>
<td>English</td>
<td>1</td>
</tr>
<tr>
<td>Environmental Health</td>
<td>1</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>1</td>
</tr>
<tr>
<td>Industrial Technology</td>
<td>1</td>
</tr>
<tr>
<td>Journalism</td>
<td>1</td>
</tr>
<tr>
<td>Marketing/PR</td>
<td>1</td>
</tr>
<tr>
<td>Mass Media Arts</td>
<td>1</td>
</tr>
<tr>
<td>Materials Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Material Sciences &amp; Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Mechanical/Aeronautical Engineering</td>
<td>2</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>7</td>
</tr>
<tr>
<td>Metallurgical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Photography</td>
<td>1</td>
</tr>
<tr>
<td>Physics</td>
<td>7</td>
</tr>
<tr>
<td>Physics/Mathematics</td>
<td>1</td>
</tr>
<tr>
<td>Psychology</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Psychology</td>
<td>1</td>
</tr>
<tr>
<td>Systems Science Engineering</td>
<td>1</td>
</tr>
</tbody>
</table>

Total = 91
**UPDATED**

1992 LARSS PROGRAM BRIEFING VIA: PROGRAM CHANGES
Presented by Suzanne Boyd

1. **Switching Universities** - Hampton University has been very cooperative and accessible and is working well with us in terms of conducting a longitudinal study and tracking LARSS students.

2. **Longitudinal study** - This will enhance tracking of LARSS students in the future and allow us to determine whether the intervention with mathematics, science and engineering research projects conducted in conjunction with Langley researchers will channel and encourage students to either pursue graduate school or further their graduate education in areas of interest to NASA.

3. **Applications** - Applications for all programs, including LARSS, were due on the same date this year. Even though this facilitated the application process, staff members were not able to help one another as much as in the past because they were each busy with their respective programs. Next year, due dates should perhaps be spaced accordingly. **Recommendation:** Obtain clerical support from HU next year to assist with the application process.

4. **Database** - This year as opposed to last year, there was a core set of information for all programs. Next year, the application form should conform to the database to save time putting the information into the computer; the core set of information for all programs should continue. **Recommendation:** Explore software program options for next year as software used for the LARSS Program this year was not appropriate.

5. **Distribution Meeting** - One distribution meeting for all programs for selections was an improvement in terms of time efficiency. The only down-side is that too much information is being distributed at one time; there may not be enough time to process information from the Directorate perspective. Two distribution meetings, as opposed to one, should be considered for next year. **Recommendation:** Distribute a schedule as to when the applications will be routed to the Directorate for each specific program.
6. **Individual Files** - There was not an individual file for each applicant this year in 1219 or 1312; thus, saving time in terms of clerical work. Only those individuals selected had an individual file made for 1312. Next year continue to make files for only those selected.

7. **Selections** - No mailings of selections were made until after PR's were processed. Next year, a date needs to be established for all PR's to be processed. **Recommendation:** Establish date on 1993 timeline when all PR's have to be processed.

8. **Rejection Letters** - Rejection letters went out as scheduled because the deadline was moved up. Date will be recommended on PY 93 Timeline.

9. **PR's** - PR's were done as requests came in as opposed to requesting funding for 10 slots beforehand. That is, once a student was selected, a PR was cut for that student. Previously, the Directorates were asked for funding for 10 students before the students were selected. Next year continue to cut PR's as requests come in.

10. **Mailing Packages** - It has been determined that combining welcome information, housing, and selection packages needs to be done simultaneously next year to facilitate mailings being completed in a timely manner. Date will be recommended on PY 93 Timeline.

11. **Housing** - This year has not necessarily been an improvement, but a learning experience. That is, it is suggested to locate LARSS students in two or three apartment complexes only, instead of spreading them out geographically. Also, apartment complexes need to be "locked-in" early. If a student chooses not to live in one of the three suggested complexes, perhaps it should be made clear that they are on their own in terms of finalizing housing arrangements. However, we should provide them with as much assistance as possible. Suggested complexes for next year are Oakwood, Grafton, and Chelsey. **Recommendation:** Dr. Venable will follow-up with Hampton Harbor Apartments to explore what arrangements could possibly be made for housing LARSS participants in 1993.
12. **Orientation** - Overall, organization was good. Evaluations were positive (a useful tool for program improvements). Also, sending 501's with welcome package made the student's check-in much smoother and the students' introducing themselves helped the mentor identify them early on. A timeline for students should be included in the welcome packet next year.

13. **Picnic** - The elimination of decorations, a theme, and nametags facilitated the planning process and allowed the money which was charged for the picnic to be contributed toward entertainment (DJ and Clown) to help defray the costs. Checking I.D.'s also an improvement. Continue this year's changes for the 1993 picnic. **Recommendation:** The cost of the picnic should be increased to $3.00 per adult and $1.50 per child.

14. **Lecture Series** - Writing the Directorate POC's and asking for recommendations for each Directorate for Lecture Series assisted with selection of speakers. However, one or two more lectures are needed. Suggested areas for additional lectures are the Long Duration Exposure Facility (LDEF) or the HL20 Personnel Launch System. Program for lecture series was also a positive change and should be continued next year. **Recommendation:** Presentations should be 45 minutes in length with more time for questions and answers and the idea of an outside speaker should be entertained.

15. **LARSS Activities Committee (LAC)** - The students who were interested in this committee signed up at orientation and one person was voted to be chair. Activities thus far have been well attended because the student's themselves selected them. Most importantly, however, is the fact that it has not taken UAO staff time to plan these activities. LAC should be continued next year. **Recommendation:** It was determined that liability issues definitately need to be discussed further between Mr. Robert L. Yang and Dr. Demetrius Venable; after consultation with legal council, a release form (in terms of liability) needs to be developed for all activities related to the LARSS Program; policies and procedures manual will be developed by Suzanne Boyd.
16. **Final Report** - The format is reader friendly and the midterm report has been eliminated. Plan of Research was also eliminated. It is tentatively planned to put all LARSS final reports into a final publication. Next year review final report format for appropriate changes. **Recommendation:** Final presentations need to be made by students to their respective division or branch.

17. **Exit Survey** - A new exit survey was developed and serves as a vehicle of how to improve the LARSS Program. Next year review exit survey for appropriate changes.

18. **Paychecks** - This year paychecks were distributed by UAO staff members as opposed to the university, like GWU last year. This offered five additional points of contact with the students as opposed to only the technical lecture series last year. If possible, continue arrangements such as these next year. **Recommendation:** If a paycheck is to be ready for the LARSS participants on the first Friday of the program, the grants document and a list of the students participating in the program must be at Hampton University at least **2 weeks** prior to the beginning of the program.

19. **Banquet** - Student's dinner is paid in full. Next year, it is recommended that they be charged a nominal fee (like $5.00 or so) to help defray the costs not only to the guests and civil servants, but to the UAO as well.

20. **Researcher News Project** - Articles were written by Whitney Bartlett, a summer intern in the Office of External Affairs, featuring LARSS students and mentors, as well as ASEE Summer Faculty Fellows and LaRC Associates, from the seven Directorates. A list of all LARSS and ASEE program participants will appear in the last issue of the Researcher. This project should be continued for next year, but started immediately when the students and Fellows arrive.

21. **LARSS Newsletter** - **Recommendation:** Develop a newsletter to be distributed biweekly to students during the summer and quarterly during the academic year.
1993 LARSS TIMELINE

Keep Open Line of Communication with HU (Dr. Demetrius Venable) Ongoing

Distribute 1993 Information Guide September-----

Track Former LARSS Participants (In general) September-December

Recruit 1993 LARSS Students September-January 1

Prepare Summer Serge Input November

Applications Due February 1

Letter - Directorate re: Application, Distribution Meeting, Directorate Selection Form, and Sample PR's February 1

Process Applications January 1-February 14

Distribute to Directorates February 15

Directorate Review February 15-March 1

Prepare Award Letter Package (Includes Housing & Welcome Information) January-February

Selections Due in UAO March 1

Processing of all PR's Due March 1

Finalize Technical Lectures March 1-5

Finalize Orientation Agenda March 1-5

Rejection Letters Mailed March 1-12

Award Letter Package Mailed March 1-5
Rejection Letters Mailed
March 1-12

Award Letter Package Mailed
March 1-5

Welcome Package Mailed
March 1-5
Housing Package Mailed
March 1-5
Housing Forms Due in UAO
March 15-19

Acceptance Letters Due in UAO
March 15-19

Letter - Mentors re: Students Acceptance and
Mentors Roles and Responsibilities
April

Notify Students of Housing
March 29-April 2

Orientation Agenda Mailed
March 29-April 2

Technical Lecture Schedule Mailed
March 29-April 2

Schedule Meeting with UAO
re: orientation, picnic, and banquet
April 5-9

Prepare Orientation Packet
April 12-16

Letter - Activities Center re:
Lecture Series and Schedule
April 19-23

Rosters to Security, Badge & Pass, Credit Union,
Telephone Operators, Fitness Center, Library,
Official Files
April 26-30

Letter - Credit Union and LAFB re:
check cashing privileges and use of open mess facilities
May 3-8

Designate Date For Group Photo
May 3-8

Grants Documents and Roster to HU for Payroll Purposes
May 10-14
Letter - Mentors re: picking up student, orientation agenda, and TLS schedule  
May 10-14

Letter - TA's/SA's; Directors For; Additional Senior Staff re: orientation agenda, roster, & TLS schedule  
May 10-14

Contact Susan Linton in Security - make arrangements for orientation  
May 10-14

Roster to Jane Derby (Learning Center) re: training for LARSS students  
May 10-14

Roster to Researcher News for articles  
May 17-21

Directorate roster of LARSS and ASEE participants to TA's/SA's for directorate recommendations  
May 17-21

Letter - Picnic Invitations  
May 24-28

Orientation/Program Starts  
June 7

Letter - Orientation Presenters re: thank you  
June 7-11

Organize LAC and LARSS Newsletter  
June 7-11

Revision of LARSS Certificate to Graphics  
June 14-18

Technical Lecture - Aeronautics Directorate  
June 15

Payday #1  
June 18

Picnic  
June 18

Technical Lecture - Electronics Directorate  
June 22

Technical Lecture - Space Directorate  
June 29

Payday #2  
July 2
Technical Lecture - Structures Directorate  July 6

Technical Lecture - Flight Systems Directorate  July 13

Payday #3  July 16

Graphics - work order for names on certificates  July 12-16

Awards Banquet  July 28

Payday #4  July 30

Payday #5  August 13

Final Reports Due in UAO  August 9-13

Final Checkout Records Due  Prior to August 13 Payday
1993 LARSS ADMINISTRATIVE TIMELINE

Keep Open Line of Communication with HU (Dr. Demetrius Venable) Ongoing

Distribute 1993 Information Guide September-----

Track Former LARSS Participants (In general) September-December

Recruit 1993 LARSS Students September-January 1

Prepare Summer Serge Input November

Initial Contact With Manager of Activities Center to Schedule Orientation, Lecture Series, Picnic January 4-8

Applications Due February 1

Letter - Directorate re: Application, Distribution Meeting, Directorate Selection Form, and Sample PR's February 1

Process Applications Jan 1-Feb 14

Distribute to Directorates February 15

Directorate Review February 15-March 1

Prepare Housing Package & Welcome Package January-February

Selections Due in UAO March 1

Processing of all PR's Due March 1

Finalize Technical Lectures March 1-5

Finalize Orientation Agenda March 1-5

Discuss list of disabled students with Diane Forrest March 8-12
Acceptance Letters Due in UAO

March 15-19

Notify Students of Housing

March 29-April 2

UAO & Support Staff Meeting

re: Orientation, Picnic, and Banquet

April 5-9

Letter - Mentors re: Picking Up Student, Orientation Agenda, and TLS Schedule

May 10-14

Letter - Division Coordinators; Directors For; Additional Senior Staff re: Orientation Agenda, Roster, & TLS Schedule

May 10-14

Letter - Picnic Invitations

May 24-28

Orientation/Program Starts

June 7

Technical Lecture - Aeronautics Directorate

June 15

Payday #1

June 18

Picnic

June 18

Technical Lecture - Electronics Directorate

June 22

Technical Lecture - Space Directorate

June 29

Payday #2

July 2

Technical Lecture - Structures Directorate

July 6

Technical Lecture - Flight Systems Directorate

July 13

Payday #3

July 16

Midterm Survey

July 16

Career Conference

July 23
<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awards Banquet</td>
<td>July 28</td>
</tr>
<tr>
<td>Payday #4</td>
<td>July 30</td>
</tr>
<tr>
<td>Final Presentations</td>
<td>August 2-13</td>
</tr>
<tr>
<td>Payday #5</td>
<td>August 13</td>
</tr>
<tr>
<td>Final Reports Due in UAO</td>
<td>August 9-13</td>
</tr>
<tr>
<td>Final Checkout Records Due</td>
<td>Prior to August 13 Payday</td>
</tr>
<tr>
<td>LARSS 93 Timeline</td>
<td>Sept '92</td>
</tr>
<tr>
<td>------------------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>30 6 13 20 27 4 11</td>
</tr>
<tr>
<td>Open Line of Communication</td>
<td></td>
</tr>
<tr>
<td>With HU (Dr. Venable)</td>
<td></td>
</tr>
<tr>
<td>Distribute 1993 Information Guide</td>
<td></td>
</tr>
<tr>
<td>Track Former LARSS Participants (In General)</td>
<td></td>
</tr>
<tr>
<td>Recruit 1993 LARSS Students</td>
<td></td>
</tr>
<tr>
<td>Prepare Summer Serge Input</td>
<td></td>
</tr>
</tbody>
</table>
| Applications Due | | | | | | | |*
| Letter - Directorate re: Application, Distribution Meeting, Directorate Selection Form, Sample PR | | | | | | | |*
| Process Applications | | | | | | | |*
| Distribute to Directorates | | | | | | | |*
| Directorate Review | | | | | | | |*
| Prepare Award Letter Package (Includes Welcome and Housing Information) | | | | | | | |*
| Selections Due in UAO | | | | | | | |*
| Processing of all PR's Due | | | | | | | |*
| Finalize Technical Lectures | | | | | | | |*
| Finalize Orientation Agenda | | | | | | | |*
<table>
<thead>
<tr>
<th>LARSS 93 Timeline</th>
<th>Mar '93</th>
<th>Apr '93</th>
<th>May '93</th>
<th>Jun '93</th>
<th>Jul '93</th>
<th>Aug '93</th>
</tr>
</thead>
<tbody>
<tr>
<td>Award Letter Package Mailed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptance Letters Due in UAO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notify Students of Housing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UAO &amp; Support Staff Meeting re: Orientation, Picnic, &amp; Banquet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter-Mentors re: Picking Up Student, Orientation Agenda, &amp; TLS Schedule</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter-Division Coordinators, Directors For, Senior Staff re: Orientation Agenda, Roster, &amp; TLS Schedule</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter-Picnic Invitations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orientation/Program Starts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Lecture - Aeronautics Directorate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payday #1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picnic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Lecture - Electronics Directorate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Lecture - Space Directorate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payday #2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix E

Agenda
1992 ASEE Summer Faculty Fellowship Program and
Langley Aerospace Research Summer Scholars (LARSS) Program

NASA Langley Research Center
H.J.E. Reid Conference Center, Building 1222
Monday, June 1, 1992

7:30-9:00 a.m.  Registration

9:00-9:30 a.m.  Welcome  Mr. Edwin J. Prior
                Acting University Affairs Officer

                Greetings  Dr. H. Lee Beach, Jr.
                Deputy Director

                Langley Overview  Dr. Michael F. Card
                Chief Scientist

                Schedule Overview  Mr. Robert L. Yang
                Assistant University Affairs Officer

9:30-10:00 a.m.  Library Overview  Mr. George J. Roncaglia
                Technical Library Branch

                Computational Facilities
                Overview  Dr. Jules J. Lambi
tote
                Analysis and Computation Division

                Mail Room Overview  Ms. Barbara G. Newton
                Correspondence and Records
                Management Section

10:00 a.m.  BREAK

10:10-11:20 a.m.  Cafeteria Overview  Mr. Richard C. Weeks
                  NASA Cafeteria

                  Activities Center Overview  Ms. Pamela J. Vernie
                  H.J.E. Reid Conference Center

                  Security Briefing  Mr. O. J. Cole
                  Security Office

                  Occupational Health Services
                  Overview  Mr. Peter J. Edgette
                  Occupational Health Services Office

                  Safety Video  Mr. Clarence F. Breen
                  Safety Management Section

11:20 a.m.  Program Breakout

12:00 p.m.  Depart for Worksites

Rev. 5/19/92
DRAFT

Langley Aerospace Research Summer Scholars (LARSS) Program

1992-93

Policies,

Practices, and

Procedures

A Handbook for LARSS Awardees
Introduction

As a Langley Aerospace Research Summer Scholars (LARSS) Program participant, you join the ranks of the distinguished summer scholars who have been chosen to participate in the eighth LARSS Program. Since the Program's inception in 1986, the summer research experiences of the LARSS participants have greatly contributed to the scientific efforts of NASA Langley Research Center (LaRC) and to the body of scientific knowledge as a whole.

The LARSS Program was established for the benefit of rising undergraduate juniors and seniors, and first-year graduate students who are pursuing degrees in aeronautical engineering or selected space disciplines of interest to LaRC. The program is intended to encourage high-caliber college students to both pursue and earn graduate degrees and to enhance their interest in aerospace research by exposing them to the professional research resources and facilities of LaRC.

Two primary elements of the LARSS Program are (1) a research project to be completed by each participant under the supervision of a LaRC researcher who will assume the role of a mentor for the summer and (2) technical lectures by prominent engineers and scientists. Additional elements of this program include tours of LaRC wind tunnels, computational facilities, and laboratories. Library and computer facilities will be available for all participants.

The Policies, Practices, and Procedures handbook sets forth the conditions of your award, your responsibilities as a LARSS participant, and the procedures observed by the University Affairs Office (UAO) in supporting and implementing your summer research program. Please retain this handbook for reference during your stay.
1 Definitions

1.1 LARSS Summer Scholar

As a LARSS Summer Scholar, you are an upcoming undergraduate junior, senior, or first-year graduate student chosen by the UAO or respective Directorate in a national competition, who has been offered an award to perform scholarly research on a problem of interest to NASA LaRC approved for participation in the LARSS Program.

You enjoy the status and privileges of a guest summer scholar at a laboratory. You are not an employee of the LARSS Program or the sponsoring Directorate and do not perform personal services for either organization.

1.2 Langley Research Center

For the purposes of the LARSS Program, the term "Center" is used to refer to NASA's Langley Research Center.

1.3 LARSS Mentor

A LARSS Mentor is the scientist or engineer at a laboratory with whom you will work most closely. All matters relating to your research program will fall under his or her purview. The Mentor also assists as needed in securing space, equipment, or technical and clerical support.

1.4 LARSS Program Director

The LARSS Program Director, the University Affairs Officer or Assistant University Affairs Officer, is responsible for the proper conduct of the program. The name of the Program Director appears at the bottom of your award letter. He is available to discuss any and all aspects of your program with you.
1.5 LARSS Program Coordinator

The LARSS Program Coordinator is a support-staff member of the UAO who is assigned to work closely with the LARSS Program Director. Just as the LARSS Program Director, the Program Coordinator is available to discuss any and all aspects of your program with you and is your prime contact person in the UAO.

1.6 Approval

Throughout this handbook, various procedures are cited that require the approval of the UAO through its Program Director. The use of the word "approval" means written approval, and any actions taken on the basis of verbal concurrence are not binding on the UAO unless followed by appropriate written authorization.

2 Accepting an Award and Beginning Tenure

2.1 Notification of an Award

You will be notified of your LARSS award by an official award letter that states the primary conditions of your award, information concerning your stipend, and the period of your tenure at NASA Langley Research Center.

2.2 Acceptance Form

Included with your award letter is an Acceptance Form. Use this form to report your decision to accept or decline an award.

If you are requesting a starting or end date that is different from that required starting or end date of the LARSS Program, the approval of both the UAO and the Directorate is required before your tenure may officially begin. These approvals are necessary to ensure compliance with the laboratory's scheduling of research and its availability of support facilities.

Return the completed Acceptance Form to the UAO as soon as possible, but not later than the date specified on your award letter as your offer may be retracted if it is not received by the specified date.
2.3 Welcome Package

Also included with your award letter is a Welcome Package. The purpose of this package is to provide you with information which will facilitate your stay at LaRC. Included in this package will be the following:

(a) Name Check Request, NASA Form 531  
(b) Sample Name Check Request, NASA Form 531  
(c) Security Information Traffic Regulations, NASA LMI 1700.7  
(d) NASA Fact Sheet  
(e) Map of the Area  
(f) Directions to NASA  
(g) Mail Processing Information, NASA LMI 1500.4  
(h) Return Envelope

2.4 Working with the Mentor

Maintain close contact with your assigned mentor who will offer guidance in all aspects of your technical activities and assistance in acquiring research support facilities.

2.5 Change of LARSS Mentor

If for any reason your assigned LARSS Mentor changes, notify the UAO immediately.

2.6 Conforming to Laboratory Policies

LARSS participants are expected to

(a) conform to all established policies and procedures of the sponsoring laboratory as they pertain to guest researchers;

(b) observe established guidelines for the safety and health of individuals working in the laboratory, which may preclude unusual hours for conduct of research.

Your mentor will further advise you in these matters.
3 **Stipend**

3.1 Stipend Amount

The amount of your stipend is shown in your award letter. Stipends are paid on the basis of a 5-day work week and are issued biweekly, beginning the second Friday of the LARSS Program. Therefore, all summer scholars must be prepared to provide for themselves financially the first two weeks of the program before the first stipend check is released. A payroll schedule will be included in the Orientation Packet. The contents of the Orientation Package, which will facilitate your transition to LaRC, are as follows:

To Be Determined

3.2 Acceptance Form

The Acceptance Form (Section 2.2), which is included with your award letter, certifies that your tenure will begin on the program starting date and will continue until the date on which tenure officially ends. This form must be received by the UAO before stipend payments are authorized and released.

3.3 Receiving Stipend Payments

Your biweekly stipend payments are not available for deposit by electronic funds transfer (EFT). They must be picked up in person from the appropriate UAO staff member.

In order to receive a stipend payment, your time sheet must be complete and signed by both you and your mentor. Stipend payments cannot be released unless a pictured I.D. and a completed and signed time sheet are turned in.

Final stipend payment will be made only after you have submitted your Final Report, completed the Checkout Record with the appropriate signatures, and any additional required information. If you will not be on the Center the last day when stipend checks are available, a memo to the University Affairs Officer including the address to where you want your paycheck sent, must be written to release your check.
4 Insurance

4.1 Health and Medical Insurance

It is the responsibility of the LARSS Participant to have the appropriate health and medical insurance coverage. The LARSS Program does not provide any insurance coverage.

Experience has shown that coverage for you and your dependents (if any) is extremely beneficial. Unless you already have insurance coverage, you are advised to weigh carefully the cost/risk factor in reaching a decision to participate in this program.

4.2 Worker's-Compensation-Type Insurance [NEEDS TO BE CONFIRMED]

You are insured by worker's-compensation-type insurance (accident coverage while engaged in normal research activities) under the award. You must immediately report any injury, however slight, that you receive while on duty to your mentor, and the UAO. Medical help is provided in the Clinic-Occupational Health Services Facility. Hours of operation are from 7:00 a.m. to 4:30 p.m. In any medical emergency, dial extension 2222 or go directly to Building 1149.

4.3 Automobile Insurance and Driver's License

You must have a valid driver's license and automobile insurance to be eligible for driving privileges at Langley.

5 Taxes

5.1 Federal Tax Liability of United States Citizens

Since you are not an employee of NASA LaRC, but are a LARSS summer research scholar, the UAO and sponsoring university do not withhold taxes from stipend payments to you.

You should study the pertinent tax publications; plan ahead to meet any tax obligations, both federal and state; prepare income-tax estimation; make quarterly payments; and file your final returns as required by Federal law.
The responsibility for the payment of your income taxes rests solely with you. The UAO/sponsoring university does not provide information or consultation concerning income taxes.

5.2 Social Security

Since you are not an employee of NASA LaRC, but are a LARSS summer research scholar, the UAO and sponsoring university, do not withhold Social Security Taxes from your stipend payments. You should study the pertinent publications on Social Security taxes to determine whether you have incurred any tax obligation.

Although Social Security taxes are not withheld from stipend payments, you are nonetheless required to have an assigned Social Security Number.

5.3 State Tax Liability

You may be liable for state income taxes and should file the appropriate tax return in compliance with the laws of the state in which you reside. You should consult a local government tax authority at the beginning of tenure for further details concerning this liability.

6 Leave

6.1 Leave

As a guest researcher in the ten-week LARSS Program, you are not eligible for annual leave, sick leave, or personal leave.

If there are reasons why you need any type of leave or absence from work during your summer research experience, write the University Affairs Officer for consideration of requested leave. Approval of the University Affairs Officer and your mentor will be required for requested leave. If such leave is approved, all missed time must be made up.
6.2 Working Hours

All LARSS Participants will work an 8-1/2 hour workday, which includes a 30 minute lunch, from one of the following shifts:

(a) 7:00 a.m. - 3:30 p.m.
(b) 7:30 a.m. - 4:00 p.m.
(c) 8:00 a.m. - 4:30 p.m.
(d) 8:30 a.m. - 5:00 p.m.

6.6 Working After Hours

Approval from the appropriate individuals must be obtained prior to any LARSS participant working on Center after regular working hours.

7 Housing

7.1 Housing Package

The UAO provides information on short-term leasing to those students who require housing while they are participating in the LARSS Program. Included with your award letter is a Housing Package. Included in this package is the following:

To Be Determined

7.2 Housing Request Forms

The Housing Request Form must be submitted by the specified date on the form. If the form is submitted after that date, the UAO is not responsible for providing you with additional assistance. A completed Housing Request form does not finalize the housing assignment. It is the student’s responsibility to contact the apartment complex to finalize all housing arrangements. LARSS does not provide financial assistance with security deposits, etc.
8 Technical Lecture Series

8.1 Attendance

Weekly attendance at the ASEE/LARSS Technical Lecture Series is required of all LARSS Participants.

8.2 Absence from the Technical Lecture Series

If there are reasons you will be unable to attend a technical lecture, written notification must be submitted to the University Affairs Officer prior to your absence.

Information from the following has been solicited and will be included in this manual:

9 Technical Library

10 Analysis and Computation Division

11 Mail Room

12 Cafeteria

13 Activities Center

14 Security

15 Occupational Health Services
## Technological Lecture Series

**Location:** Activities Center Auditorium, Bldg. 1222  
**Time:** 10:00 a.m. - 11:00 a.m. - Lecture  
11:00 a.m. - 11:15 a.m. - Questions and Answers

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
</table>
| June 9     | High-Performance Computing and Communications      | Dr. Thomas Zang  
Fluid Mechanics Division  
Aeronautics Directorate |
| June 16    | Looking With New Eyes                             | Dr. Joseph Heyman  
Instrument Research Division  
Electronics Directorate |
| June 23    | Global Warming: Atmospheric and Climatic          | Dr. Joel Levine  
Atmospheric Sciences Division  
Space Directorate |
| June 30    | Sonic Boom Research                               | Mr. W. L. Willshire  
Acoustics Division  
Structures Directorate |
| July 7     | Wind Shear Research                               | Dr. Roland Bowles  
Wind Shear Program Office  
Flight Systems Directorate |

May 28, 1992
NEXT LECTURE

July 7, 1992

WIND SHEAR RESEARCH
presented by
Dr. Roland Bowles
Flight Systems Directorate
Wind Shear Program Office

NASA Langley Research Center
ASEE Summer Faculty Fellowship Program
and
Langley Aerospace Research Summer Scholars (LARSS) Program

TECHNICAL LECTURE SERIES

June 30, 1992
Sonic Boom Research  
presented by  
William L. Willshire  
Structures Directorate - Acoustics Division

The fact that supersonic aircraft travel faster than the propagating pressure disturbances they create, leads to the topic of sonic booms. A goal of the Langley High Speed Research (HSR) Program is to have an aircraft with an acceptable boom which is economically viable. Overland supersonic flight greatly improves the economics, but will it be acceptable? Sonic boom research has three elements: airplane configuration, acoustic propagation, and sonic boom acceptability. The configuration research is aimed at shaping the airplane to change the shape of the sonic boom so that it will be less annoying. Propagation research is aimed at investigating the influence of turbulence on shaped sonic booms. Sonic boom acceptability research sets goals on sonic boom levels and predicts community exposure and reaction to sonic booms. The results from these three sonic boom research elements should combine to yield an achievable, acceptable, and economically feasible supersonic civil transport.

Airport noise and sonic boom minimization is a clear requirement for a successful aircraft design. The goal is to have the HSCT meet existing federal airport noise regulations. In order to achieve this goal new engines which make 15 to 20 dB less noise than Concord engines must be developed. If this were not challenge enough, the regulated noise levels will most probably be reduced 4 to 6 dB before the High Speed Civil Transport flies!

Mr. William L. Willshire

- Graduated from the University of Mississippi in 1975 with a physics degree.
- Studied engineering at the University of Texas-Austin, earning a MSME in 1977.
- Was a research assistant and performed research in the area of nonlinear atmospheric propagation of sound at the Applied Research Laboratory while in graduate school.
- Accepted a research position with Acoustics Division of NASA Langley Research Center upon graduation from the University of Texas.
- Performs basic and applied research in atmospheric propagation of aircraft noise.
- Has authored or co-authored 28 technical papers.
TIMELINE FOR LONGITUDINAL STUDY
August 7, 1992

The Effects of the Intervention of Mathematics, Science, and Engineering Research Projects, Conducted In Conjunction With Langley Researchers, On LARSS Students' Decision to Pursue or Further Graduate Studies

NASA Langley Research Center
LARSS Program Coordinator
Suzanne Boyd

Hampton University
Graduate Assistant
Cynthia Gore

Provide roster of students and copies of previous surveys to graduate assistant

Complete

Develop first draft of Interview Code Sheet

Complete

Finalize and prepare Final Interview Code Sheet

Complete

Develop first draft of Consent Form

Complete

Finalize and Prepare Consent Form

Complete

Interview Student Sample

Complete

Data Analysis (includes developing student profiles)

Complete

Develop and distribute Student Exit Survey

Complete

Report on Student Exit Survey

Due-August 14

Develop and distribute Evaluation of LARSS Participant by Mentor Survey

Complete

Report on Evaluation of LARSS Participant by Mentor Survey

Due-August 17

Technical Report on study to be included in 1992 LARSS Program Final Report

Due-August 19

1992 LARSS Program Final Report to Dr. Venable

Due-August 21

Develop Follow-Up Survey to "Determine the Value of the Summer Experience" (Survey '91 students)

Due September 19 to UAO
Provide access to DB to print labels, provide envelopes and other necessary materials

- Distribute Follow-Up Survey
  - Due: October 1

- Due-As Needed:
  - Follow-Up Surveys will be returned to LaRC
  - Follow-up phone calls
  - Analysis of Data

- Due: October 23:
  - Interim Report to Be Given to LaRC

- Due: October 23:
  - Distribute Follow-Up Survey
    (Survey '92 students)

- Due: December 18:
  - Follow-Up Surveys will be returned to LaRC
  - Follow-up phone calls
  - Analysis of Data

- Due: December 18:
  - Develop Survey to Assess Long-term Effects of the Program

- Due: April 30:
  - First Copy of 1992 LARSS Program
  - Final Report to UAO

- Due: May 31:
  - Final 1992 LARSS Program
  - Final Report
FINAL DESCRIPTIVE REPORT

1992 LANGLEY AEROSPACE RESEARCH SUMMER SCHOLARS PROGRAM (LARSS)

AUGUST 19, 1992
In 1986, NASA Langley Research Center (LaRC) established the Langley Aerospace Research Summer Scholars (LARSS) Program. This Program was designed to benefit upcoming undergraduate juniors and seniors as well as first-year graduate students who are pursuing careers in Aerospace disciplines or selected space disciplines of interest to LaRC.

Sponsored by NASA LaRC, in conjunction with Hampton University, this program is designed to motivate high-caliber students to both pursue and earn graduate degrees and to enhance their interest in Aerospace research by exposing them to the professional research resources and facilities of LaRC.

PURPOSE

The purpose of this research was to determine whether the intervention with mathematics, science and engineering research projects, at the undergraduate and graduate levels, channel and encourage students to pursue (or further) graduate studies in areas of interest to NASA.

SUBJECTS

The subjects of this research were approximately 30 randomly-selected students who met the following criteria: a) undergraduate junior; b) undergraduate senior or c) first-year graduate students who are pursuing careers in Aerospace disciplines.

METHOD/PROCEDURE

The methods used in this study were two-fold. first, a questionnaire was developed to probe five main points of interest. Since the author wished to investigate Langley Aerospace Research Summer Scholar (LARSS) participant's, questions were first formulated to identify what, if anything, became the influential factor in participant's decision to accept the offer for summer internship.

The questionnaire was then presented to the students in an informal interview. Interviews were conducted by the graduate assistant. Interviews met the following criteria: 15 minute in
length; b) were held in the student's place of work; and c) were audiotaped for reliability and validity.

RECORDING DATA

Charts, with each question listed at the top, was designed to track responses. Information listed under a question was tallied on the form, including comments (See Charts).

ANALYZING DATA

The data received was evaluated by dividing the number of responses under YES and NO by the percentage of students. This data consisted of listings and comments and are provided in the Appendix (See Appendix A).

RESULTS

The results from the study are as follows:

Question 1  Is this your first time participating in the LARSS Program?

This question was intended to focus upon the number of new participants in the summer internship with LaRC. (See Table 1)

Question 2. How certain do you feel the LARSS Program will motivate you to pursue a higher level of education in the Aerospace Discipline?

This question was intended to highlight those students whom were motivated by their active participation in the LARSS Program to pursue a higher level of education in either the Master's or Doctoral level. (See Table 2)

Question 3. How has your experience at NASA Langley influenced this decision (from question #3?)

To determine if the experience of working in a Federal Laboratory at NASA Langley was a motivational factor in students' decision to pursue higher education, this question was included (See Appendix A).
Question 4. Do you feel 10 weeks will be long enough to complete your research project?

This question was designed to seek student's opinions concerning the time period allowed by LaRC to complete research projects. (See Table 3)

Question 5. Would you like to continue your research at your own institution?

As ongoing research is an important contributor to any scientific field, this question was included to illustrate to what degree students would consider continuing their present research projects. (See Table 4).
Table 1. Student Participation

Percentage of Students (n=26)

<table>
<thead>
<tr>
<th>Responses</th>
<th>17- (69%)</th>
<th>9- (34.6%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>no</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Student's Pursuing Higher Education

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11%</td>
</tr>
<tr>
<td>2</td>
<td>23%</td>
</tr>
<tr>
<td>3</td>
<td>15%</td>
</tr>
<tr>
<td>4</td>
<td>38%</td>
</tr>
<tr>
<td>5</td>
<td>11%</td>
</tr>
</tbody>
</table>
TABLE 3. STUDENT RESPONSES CONCERNING LENGTH OF PROGRAM.

<table>
<thead>
<tr>
<th>Length</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7%</td>
</tr>
<tr>
<td>2</td>
<td>19%</td>
</tr>
<tr>
<td>3</td>
<td>19%</td>
</tr>
<tr>
<td>4</td>
<td>35%</td>
</tr>
<tr>
<td>5</td>
<td>3%</td>
</tr>
</tbody>
</table>
### Table 4. Student Responses to Continuation of Research

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27%</td>
<td>23%</td>
<td>15%</td>
<td>11%</td>
<td></td>
</tr>
</tbody>
</table>

![Bar Chart](chart.png)
June 23, 1992

TO: Bob

FROM: Suzanne

SUBJECT: 6/22 Worksite Visit With Chris Cosby (LARSS Student)

Ed and I met with Mr. Cosby and his mentor, Mr. Lightfoot, from 2:00 p.m. until 2:45 p.m. on June 22, 1992. Mr. Cosby is working in the Electronics Directorate, Instrument Research Division. He expressed his experience thus far in the LARSS Program has been challenging and exciting. Mr. Cosby will be graduating from Old Dominion University in the Fall of 1993 with a B.S. in Electrical Engineering and plans to pursue a Master's Degree in Electrical Engineering immediately thereafter. He was accepted to such prestigious universities as MIT, Harvard, Caltech, Duke, and Georgia Tech for his undergraduate work; however, he chose to attend Old Dominion University because they offered him a full academic scholarship. The importance of pursuing the more prestigious universities for his graduate work, as well as the importance of pursuing his Ph.D., were stressed as he had stated he planned to stay at Old Dominion for his Master's Degree. His suggestions for continuous program improvement included the following: (1) continue the orientation, possibly adding a tour of the Center, and (2) add a few more technical lectures. Mr. Cosby was encouraged to get more information on the GSRP Program for graduate school.
New Faces On Center Are Summer Scholars

BY WHITNEY BARTLETT

If you see an unfamiliar face at Langley, it could be one of the 91 students taking part in the Langley Aerospace Research Summer Scholars (LARSS) Program. Or, it could be the face of a summer faculty fellow participating in the American Society for Engineering Education (ASEE) Program.

Every summer a select number of students and educators from colleges and universities across the country, including Hawaii and Puerto Rico, come to the Center to participate in these guest researcher programs.

The 10-week LARSS program was established in 1986 for rising juniors, seniors and first-year graduate students in an effort to motivate science and engineering students to earn advanced degrees and pursue careers in aerospace research. Each scholar conducts a research project under the supervision of a Langley researcher who assumes the role of a mentor.

"This is the most competitive LARSS program since its inception in 1986. The mean G.P.A. of the 1992 scholars is 3.46," said Robert Yang, Assistant University Affairs Officer.

This year, 318 undergraduates and 46 graduate students applied. The 91 scholars represent 49 colleges and universities.

The ASEE program was established in 1964 as a 10-week summer research program for college and university faculty. One hundred and twenty-three educators applied for an ASEE fellowship and 38 were selected, bringing the total number of participants to date over 5,500.

"We take pride in our collaborative university programs under which high-caliber students and faculty are offered direct participation in our aeronautics and space technology research programs, and one-on-one access to our world class researchers," said Yang.
LARSS, ASEE Participants Spend Time Researching And Learning

BY WHITNEY BARTLETT

Langley has a total of 91 Langley Aerospace summer scholars (LARSS) and 38 American Society for Engineering Education (ASEE) summer faculty fellows this summer.

More than half of the LARSS and ASEE participants are working in the offices of director for flight systems, structures and space.

Dr. W. Steven Gray is one of the four ASEE educators in the office of the Director for Flight Systems. He is working with Donald Soloway, aerospace technologist for robotics research in the Automation Technology Branch.

Gray has been a professor at Drexel University in Philadelphia for three years. The Saint Davids, Penn. resident received his doctorate from Georgia Institute of Technology in Atlanta.

This is Soloway's first time working with an educator in the ASEE program. His research interests include the fundamentals of neural networks for controls. He came to Langley in 1980 as a co-op and became a NASA employee in 1982.

Jose L. Maldonado-Salgado is one of the 13 LARSS students in Flight Systems. He is working under Robert L. Jones, aerospace technologist for the Information Processing Technology Branch.

Maldonado-Salgado's research includes the investigation through literature searches and experimenting the behavior of data dependent on algorithms executed in Algorithm to Architecture Mapping Model-based systems.

"Jose's experimental results are intended to lead to theories about the statistical behavior of the performance metrics which are characterized by random variables," Jones said.

Maldonado-Salgado has a bachelor of science degree in computer engineering from the University of Puerto Rico. "I'm not used to the cool air here," he said when temperatures were in the 70's. He will attend George Washington University to earn a master's degree in aeronautics and controls.

Jones has worked at Langley for two years. He has several research duties including, aiding in the development and implementation of operating systems and the characterization of their performance on various multicomputer architectures.

Andrea L. Schmidt is a LARSS student who is doing research in the Office of Director for Space. There are 18 students in this directorate.

"I am studying how the crew aboard the Mars Transport Vehicle (MTV) will be affected by radiation," Schmidt said. The MTV's first scheduled mission is in 2014.

Schmidt's mentor is Lisa C. Simonsen, an aerospace engineer in the Vehicle Analysis Branch. Simonsen's research includes human factors engineering and radiation shielding.

A rising senior at Kansas State University, she is majoring in mechanical engineering.

Dr. Fazley B. Malik is one of the five ASEE educators in the Space Directorate. He is a physics professor at Southern Illinois University at Carbondale. Malik is researching how the instruments and crew are affected by the radiation that penetrates the shields on spacecraft.

Dr. Lawrence W. Townsend, senior research scientist of the High Energy Science Branch, is working with Malik. This is Townsend's third time working with an ASEE Summer Faculty Fellow. His research includes the study of galactic cosmic rays and radiation in space.

A native of Bankura, India, Malik received his doctorate in physics with professor Heisenberg at the University of Gottingen in Germany.

The Office of Director for Structures has 23 LARSS and 12 ASEE participants, more than any other directorate.

Dr. David Dillard is one of the ASEE participants. He is working with Dr. Terry L. St. Clair and Dr. W. Steve Johnson. They are researching high temperature adhesives for...
polymers to be used on the High Speed Civil Transport (HSCT).

"The HSCT is expected to reach a maximum speed between Mach 2.0 and 2.4, which could see a temperature as high as 400 degrees Fahrenheit," Dillard said.

St. Clair is head of the Polymaterials Branch and has worked with several ASEE educators. He has been at Langley since 1972.

Johnson is the senior scientist for the Mechanics of Materials Branch. He has been a NASA employee since 1979 and is a team leader for the National Aero-Space Plane program.

Henry E. Lippard is one of the 23 LARSS students in the Office of Structures. He is working with Dr. Stephen J. Hales, an employee of Analytical Services and Materials, Inc. The two are studying the formation of superplastics of aluminum-lithium alloys for use on National Launch Systems.

Lippard’s mentor is John A. Wagner, materials engineer for the Metallic Materials Branch. Wagner has been a NASA employee since 1983. He is responsible for coordinating activities for the innovative processing of advanced materials.

“This is my third summer as a LARSS student. I have informed other students at my university about the LARSS program, and now there are five from N. C. State in this directorate," Lippard said.

Having earned his bachelor’s degree in materials sciences from North Carolina State University, Lippard plans to enter graduate school this fall at Northwestern University in Illinois.
Scholars And Fellows Learn About Langley
LARSS, ASEE Participants At Work In All Directorates

BY WHITNEY BARTLETT

There are 33 Langley Aerospace Research Summer Scholars (LARSS) and 16 American Society for Engineering Education (ASEE) fellows working in the Offices of the Directorates for Systems Engineering & Operations, Management Operations, Aeronautics and Electronics.

The head of the Aeronautical Engineering Section, Allen C. Royal in the Systems Engineering & Operations Directorate, is acting as a mentor for LARSS participant Heather F. Hayden. The rising senior is majoring in aerospace engineering at Virginia Polytechnic Institute and State University. Hayden is working on is the OV-10A Wake-Vortex Flight Project. This project involves the detection of an aircraft's vortex.

"NASA researchers are trying to find a way smaller aircraft can identify the vortex of a larger airplane so they will not get pulled into it," said Royal.

Booms will be attached to the wings of the OV-10A, which will aid in the experimentation of vortex detection. "I am working on an instrumentation pallet, which will read the OV-10A test results," said Hayden.

Royal came to Langley in December of 1987. Two years ago he assumed the role as a section head.

David Johnson is an ASEE fellow working in the Electronic Systems Branch with the group leader for the imaging and Computer Aided Design and Drafting (CADD) projects, W. Brad Ball.

Ball was Johnson's ASEE associate last summer. "This summer we're looking at advanced information systems interfacing-especially virtual reality, and identifying applications across Langley that will service a demonstration project," Johnson said. His man-utilization project from last summer is currently in-systems development for the Facilities Engineering Division.
Sheri Lee is working in the Electronics Directorate as an ASEE fellow.

FELLOWS:

Continued from Page 1

Lawrence E. Punnam, branch head.

"Dr. Wu is using applied CFD (computational fluid dynamics) to compute the effect of Reynolds number and the leading edge radius of the vertical flow over a 65 degree delta wing configuration," said Punnam.

Wu is a mechanical engineering professor at California State University in Los Angeles. He has a master's degree in mechanical engineering from the University of Illinois and a bachelor's degree from Chong Kang University in Taiwan.

Punnam came to Langley in 1999. He has worked in several wind tunnels including his present position at the National Transonic Facility.

LARSS student Alexander M. Benoili is working with Zachary T. Appling on the Subsonic Aerosciences Branch, Aeronautics Directorate.

"Alex has been doing programming for us to help with the data reduction and analysis of the transport model currently being tested," Appling said.

Benoili is also working with Appling on a NASA report with Appling on the transport model testing.

Benoili majored in aerospace engineering at Virginia Commonwealth University and plans to attend graduate school in the fall.

Appling has been a Langley employee for 12 years. He is responsible for conducting wind tunnel research on civil transport aircraft, propulsion integration activities, high lift aerodynamics, and CFD.

Benel is a Ph.D. candidate in management information systems from Paul D. Camp Community College, is working in the Human Resource Management Division (HRMD) for the Management Operations Directorate.

"We're doing a variety of computer-related tasks. All of them are related to more effectively using personal computers and the information that they have," said Tureman.

"The main project that I am working on is personal computer productivity - information and then extra long communications from the mainframe to the personal computer. Therefore, they can become more productive in meeting special assignments and special projects they might have."

Tureman has a master's and a bachelor's degree in computer science from Old Dominion University. His associate in James Meyers, personnel management specialist in the Human Resources Management Division. This is his first time as an ASEE associate since he began working at Langley in 1973.

LARSS student Denise Hamlin works in the Management Operations Directorate. She works in the photographics section and her mentor, Allen T. Moore. Her current project involves photographing the student who are involved in university programs at Langley.

"I'm hoping my research project will unfold into a yearbook," said Hamlin.

Hamlin has a bachelor of arts in marine science from Hampton University. She participated in the LARSS program last year and worked in the video section. Hamlin comments on what she is learning this summer.

"I'm learning how things can look differently. I'm seeing that when you are standing right there with the photographer when he is taking the picture and then officially it's different..."

Intelligent sound.

"We want to learn how to generate sound intelligently and detect it intelligently, and be able to put ultra sound into materials in a way that is useful.

"We are trying to understand the physics of the theoretical and the experimental of the generation and the reception of ultra sound and investigation of ultra sound with complex materials like fiber reinforced composites," said Johnston.

Johnston came to Langley six years ago as a research scientist for Analytical Services and Materials Inc.

Benoili is a Ph.D. candidate in aerospace engineering at Virginia Commonwealth University and plans to attend graduate school in the fall.

Appling has been a Langley employee for 12 years. He is responsible for conducting wind tunnel research on civil transport aircraft, propulsion integration activities, high lift aerodynamics, and CFD.

"We're doing a variety of computer-related tasks. All of them are related to more effectively using personal computers and the information that they have," said Tureman.

"The main project that I am working on is personal computer productivity - information and then communication from the mainframe to the personal computer. Therefore, they can become more productive in meeting special assignments and special projects they might have."

Tureman has a master's and a bachelor's degree in computer science from Old Dominion University. His associate in James Meyers, personnel management specialist in the Human Resources Management Division. This is his first time as an ASEE associate since he began working at Langley in 1973.

LARSS student Denise Hamlin works in the Management Operations Directorate. She works in the photographics section and her mentor, Allen T. Moore. Her current project involves photographing the students who are involved in university programs at Langley.

"I'm hoping my research project will unfold into a yearbook," said Hamlin.

Hamlin has a bachelor of arts in marine science from Hampton University. She participated in the LARSS program last year and worked in the video section. Hamlin comments on what she is learning this summer.

"I'm learning how things can look differently. I'm seeing that when you are standing right there with the photographer when he is taking the picture and then officially it's different..."
I walked into that conference center nervous. "This is like taking the GRE," I thought smiling to myself. Working for the force behind Apollo does not exactly lay the heart to ease. In fact, when I found out that I was going to work for the Space Exploration Initiative Office a few weeks back...well, I opened up a book and started studying. Geek? Well sure I am, but in my mind, there is a lot to be said about being prepared. So, I came expecting to program trajectories for lunar and Mars mission scenarios.

My mentor walked up to me while the mentors were being paired up with students and said, "Stephen? Davy Haynes," with an extended hand.

"Yes, that's me...hi, how are you?", shaking his hand.

"Fine. There has been a change of plans though. I'm no longer going to be your mentor..."

And so my summer began. My mentor did change and charged me with the task of producing a baseline study on the layout, control, and detection schemes of a lunar interferometer; an array of optical telescopes on the Moon. I've graduated with an aerospace engineering degree and I have one more term to go in my mechanical engineering degree before I head to grad school. Putting aerospace and mechanical engineering in the same bag with optics gave me my first lesson: be prepared to delve deeply into aspects of other fields. Over these 10 weeks, I've stepped into specifics of electrical engineering, optics and other physics-related subjects, radiometry, all kinds of astronomical fields, and even dabbled into policy (the library is going to hunt me down...). On top of that, there has been the experience of being in an office that is working on a lunar rover and a concept for aerobraking; and where there is always a good crop of routings to read about everything else to do with space exploration. And then there was living in the hotel-like atmosphere of Oakwood Apartments (I'm not sure whether that is good or bad...), and going on day trips on the weekends, and making my first apple pie, or should I say, creating a BIG mess...

So, yeah, you should know that it's been a great experience, but I have one problem left...does anyone want any of my food so I don't have to cart it home? Just wondering...

---

As a LARSS student, I have gained "hands-on" experience in ceramics that I had not obtained while attending college. The lab work was with a novel slip casting technique for ceramics called the Lost Wax Technique. With this recently developed method of casting, fellow workers and I fabricated complex ceramic designs to be used on optical benches.

The LARSS program was rewarding, and from the work accomplished in the NASA LaRC labs, I was able to write 3 technical memos, abstracts for ACS, several patent disclosures, and possible tech briefs.

---

As a participant in this year's LARSS program, I have acquired many positive attributes that will prove to be beneficial to my career. With a major in Industrial Technology/Manufacturing, I received the opportunity to gain and apply practical knowledge to research in my field of study. The weekly seminars contributed, too. They provided interesting information on technology and its advances in the aeronautics industry. The positive and open work environment made it easier for me to adjust to my new surroundings. The recreational activities that were planned gave me the opportunity to get to know the other students and have some fun. This internship was more than a working experience, it was a learning experience. I can honestly say that the experience gained from this program has challenged me to set and achieve higher goals for myself and my career. I have had a wonderful summer experience and I count it as an honor and privilege to have been accepted to such a highly regarded program.

---

This summer I was involved in a continuing research project of a generic tactical transport (GTT) model being tested in the Langley 14- by 22 Foot Subsonic Tunnel. In particular, I was involved in the data reduction and analysis of a test completed...
I developed several software packages to aid in the presentation and evaluation of the pressure data and to compare the pressure data with the strain gauge balance data from the same test. An in-depth analysis of the pressure data was done with the intent to contribute to the overall report of this test which will be submitted by the test engineers of this project. Analysis of the data not only involved writing special codes to present particularly important parts of the data, but also included extensive research of previous work done on multi-element flaps by other researchers and application of aerodynamic theories that resulted in meaningful conclusions.

---

**Analytical Study of the Effects of Floor Location on Response of Composite Fuselage Frames**
by Cynthia Holland
North Carolina Agricultural & Technical State University

An understanding of how conventional structures fail is often required in the process of designing new and more crashworthy structures. The subfloor crushable structure in aircraft has often been cited as an important aspect in minimizing vertical crash accelerations because of their capabilities in absorbing energy. Although full-scale dynamic testing of aircraft structure is desirable, and often must be performed in the final stages of design; considerable information can be acquired from simple plastic static testing. Consequently, destructive static testing of a semi-circular composite frame with different floor positions, simulated by a horizontal beam attached at three different levels (180, 120, and 90 degree positions), was undertaken to study the strain distribution and stiffness. Intentions were to fail the specimen to find where the highest strains occur; hence, pinpointing where failures are likely to occur.

---

**My LARSS Experience**
by Christine M. Vogel
University of Notre Dame

Through participation in the LARSS Program, I have learned a great deal about my field of studies and myself. I am an aerospace engineering major and through my project, I was exposed to some of the most powerful computational fluid dynamics studies in the field of hypersonic aerodynamics. The experience I have gained in working with graphics software on high-powered computer systems will prove invaluable for my future career. Receiving acceptance into this program is almost a dream come true for a girl who has always been fascinated by the stars and dreamed of becoming an astronaut. I plan to continue my studies in graduate school and many people have told me that some prior technical experience would help me when applying. Thus, I came into this program with the goal of gaining some technical experience before I graduate with my bachelor's degree. What I have gained is a taste of working with a group of professionals who respect each other and are always communicating their ideas and asking questions. I now have experience living on my own with the responsibilities of making payments and providing for myself. I have learned about many areas of the field of aerospace which will help me choose my area of graduate studies. I have made some valuable contacts in the technical world and many new friends. Virginia is a beautiful place to live, work, and play. I could not think of a better way to spend my summer. Thanks for the opportunity.

---

**FAREWELL...**
by Suzanne Boyd

As a former LARSS participant and this year's LARSS Program Coordinator, I congratulate each of you on your participation in the LARSS Program. I wish you success in your future endeavors and hope that the time you have spent as a LARSS participant has been beneficial to you. You should expect to hear from the University Affairs Office from time-to-time as we follow your career developments. Good luck to each of you in the upcoming academic year!
1992 LARSS FINAL REPORT FORMAT

The final report is not to exceed three pages in length (including the cover sheet) and is to be single-spaced, typed, and paginated. Four copies of the final report should be returned to Suzanne Boyd, Bldg. 1312, Rm. 102, prior to receiving your final paycheck on Friday, August 7, 1992.

The technical report is to include the following:

Part I:

A. Cover Sheet
   1. Topic of Research
   2. Student's Name
   3. Mentor's Name
   4. Directorate, Division, Branch, Office
   5. Date of Submission

B. Abstract
C. Introduction/Background information
D. Summary of Research
   Briefly discuss the following:
   1. Approach
   2. Equipment and facilities used
   3. Results
E. Conclusion

Part II:

Please briefly discuss how your summer research experience has contributed to NASA Langley Research Center
1992
LANGLEY AEROSPACE RESEARCH SUMMER SCHOLARS
(LARSS) PROGRAM ORIENTATION EVALUATION REPORT

Submitted to: Mr. Robert L. Yang
Assistant University Affairs Officer
NASA Langley Research Center

Dr. Demetrius D. Venable
Vice President for Research &
Dean of the Graduate College
Hampton University

June 14, 1992

Submitted and prepared by:

Ms. Suzanne Boyd
1992 LARSS Program Coordinator
PREFACE

The purpose of the 1992 LARSS Program Orientation is to provide LARSS Program participants with pertinent information regarding NASA Langley Research Center (LaRC) to facilitate their 10-week stay at the Center. In order to evaluate the effectiveness of the orientation, the 1992 LARSS Orientation Evaluation was developed to serve as a tool to identify which of the following five areas need closer examination: (1) Overall Organization, (2) Pre-conference Notification, (3) Information and Knowledge Gained at the Orientation, (4) Program Breakout Session, and (5) General Rating of the Orientation. This evaluation is also used as a tool to follow with NASA's goal of "continuous improvement". That is, by critically examining the five aspects of the orientation from an objective viewpoint, the appropriate changes can be implemented or made within the LARSS Program. Following are the results of the 1992 LARSS Program Orientation Evaluation, recommendations for the 1993 LARSS Program Orientation Evaluation, and a summary.
RESULTS

Sixty-two of the 91 surveys distributed on the day of the orientation were returned, thus yielding a return rate of approximately 66%. The five areas addressed in the survey are as follows: (1) Overall Organization, (2) Pre-conference Notification, (3) Information and Knowledge Gained at the Orientation, (4) Program Breakout Session, and (5) General Rating of the Orientation.

A. Overall Organization

Eighty-one percent of the respondents rated the overall organization of the orientation as either good or excellent and 16% rated it as average. The comments from the respondents in terms of overall organization are as follows: (1) "checking in was very smooth" and (2) "check in flowed well and the format was efficient.

Table 1. Overall Organization

OVERALL ORGANIZATION

<table>
<thead>
<tr>
<th>Percentage of Responses (N=62)</th>
<th>POOR</th>
<th>FAIR</th>
<th>AVERAGE</th>
<th>GOOD</th>
<th>EXCELLENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0%</td>
<td>3.23% (2)</td>
<td>16.12% (10)</td>
<td>50.00% (31)</td>
<td>30.65% (19)</td>
</tr>
</tbody>
</table>
B. Pre-conference Notification

Seventy-five percent of the respondents rated the pre-conference notification as fair, average, or good, while only 18% rated it as excellent and 8% rated it as poor. The following comments of the respondents in terms of Pre-conference Notification are as follows: (1) "notify students of mentor and research area assignment in advance", (2) "housing notification was poor", (3) "notifications need to be done earlier; some students received forms that were due at NASA Langley two days earlier", and (4) "do not send notifications during exam period".

Table 2. Pre-conference Notification

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>(Responses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>8.06%</td>
<td>(5)</td>
</tr>
<tr>
<td>Fair</td>
<td>20.97%</td>
<td>(13)</td>
</tr>
<tr>
<td>Average</td>
<td>22.58%</td>
<td>(14)</td>
</tr>
<tr>
<td>Good</td>
<td>30.65%</td>
<td>(19)</td>
</tr>
<tr>
<td>Excellent</td>
<td>17.74%</td>
<td>(11)</td>
</tr>
</tbody>
</table>
C. Information and Knowledge Gained

Sixty-five percent of the respondents rated the information and knowledge gained at this orientation as good or excellent, while 29% rated it as average and only 4% rated it as fair. The following comments of the respondents in terms of information and knowledge gained at the orientation are as follows: (1) "some information could have been presented in a briefer manner", (2) "some information could have been reading material only and not presented at all", (3) "need walking/bus tours of NASA LaRC", and (4) "limit presentation times of speakers".

Table 3. Information and Knowledge Gained
D. Program Breakout Session

Only 10% of the respondents rated the program breakout session as poor or fair; while 90% rated it as average, good, or excellent. The following comments of the respondents in terms of the Program Breakout Session are as follows: (1) "introductions of UAO staff helpful", (2) "good idea to have students introduce themselves", (3) "information discussed was very useful", and (4) "cold tone of LARSS coordinators".

Table 4. Program Breakout Session
E. General Rating of the Orientation

No respondents generally rated the orientation as poor and only 6.5% rated it as fair; thus, leaving 93% of the respondents with a beneficial rating of the orientation. The following comments of the respondents in terms of the general rating of the orientation are as follows: (1) "overall organization was great" and (2) "arrange lunch for students and mentors so they can "bond".

Table 5. General Rating of the Orientation
RECOMMENDATIONS

Based on the results of the 1992 LARSS Orientation Evaluation, the following recommendations are made for the 1993 LARSS Orientation:

(1) continue to send the NASA 531 security form with the welcome package; this reduces the amount of time to process the student's paperwork;

(2) if possible, notify student of assigned mentor and work area before arrival to the Center (even though this may change);

(3) housing information needs to be included in the welcome packet and the acceptance form mailing to ensure that the student receives the housing assignment in a timely manner;

(4) locate students in the same apartment complex (or same two or three complexes) to decrease a sense of 'isolation';

(5) revise timeline to reflect date changes which ensure correspondence is sent in a more timely manner;

(6) limit presenters time at the orientation to no more than 12 minutes;

(7) arrange bus or walking tours of the Center during the first two weeks of the program; and

(8) continue introductions of the UAO staff as well as of the students and mentors.
SUMMARY

The overall organization of the 1992 LARSS Program Orientation, as well as the general rating of the orientation, yielded favorable comments from the majority of the respondents. Thus, these two areas are not of major concern at this time. Similarly, the overwhelming majority of the respondents rated the program breakout session highly. Hence, the overall organization of the orientation, as well as that of the program breakout session will remain the same, with suggestions welcomed for future orientations. The information and knowledge gained at the orientation was rated as beneficial by 95% of the respondents and appears to facilitate the student's transition to LaRC. Even though four of the five areas addressed in the survey were rated favorably overall, the one area which reflects an inherent weakness is the pre-conference notification. Close examination of the comments made by the respondents reflect that correspondence and notification must be done in a more timely manner in the future. This orientation evaluation is reflective of both the strengths and weaknesses of the 1992 LARSS Orientation, as well as some general elements of the LARSS Program, like timeliness of correspondence. The recommendations made will ensure a more successful and improved 1993 LARSS Orientation and overall program.
Please rate each area on a scale of 1 to 5 with 5 being the highest possible rating. Any comments you wish to add will be appreciated.

**A. OVERALL ORGANIZATION**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Fair</td>
<td>Average</td>
<td>Good</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Comments: 


**B. PRE-CONFERENCE NOTIFICATION**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Fair</td>
<td>Average</td>
<td>Good</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Comments: 


**C. INFORMATION AND KNOWLEDGE GAINED AT THE ORIENTATION**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Fair</td>
<td>Average</td>
<td>Good</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Comments: 


**D. PROGRAM BREAKOUT SESSION**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Fair</td>
<td>Average</td>
<td>Good</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Comments: 


**E. IN GENERAL HOW DO YOU RATE THIS ORIENTATION**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Fair</td>
<td>Average</td>
<td>Good</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Comments: 


Please use the space below for overall comments, suggested changes or improvements: 


<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Presenter/Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30-9:00 a.m.</td>
<td>Registration</td>
<td></td>
</tr>
<tr>
<td>9:00-9:30 a.m.</td>
<td>Welcome</td>
<td>Mr. Edwin J. Prior</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acting University Affairs Officer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dr. H. Lee Beach, Jr.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deputy Director</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Greetings</td>
<td>Dr. Michael F. Card</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chief Scientist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Langley Overview</td>
<td>Mr. Robert L. Yang</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assistant University Affairs Officer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Schedule Overview</td>
<td>Mr. Robert L. Yang</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assistant University Affairs Officer</td>
</tr>
<tr>
<td>9:30-10:00 a.m.</td>
<td>Library Overview</td>
<td>Mr. George J. Roncaglia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Technical Library Branch</td>
</tr>
<tr>
<td></td>
<td>Computational Facilities Overview</td>
<td>Dr. Jules J. Lambiotte</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analysis and Computation Division</td>
</tr>
<tr>
<td></td>
<td>Mail Room Overview</td>
<td>Ms. Barbara G. Newton</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Correspondence and Records Management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>BREAK</td>
<td></td>
</tr>
<tr>
<td>10:10-11:20 a.m.</td>
<td>Cafeteria Overview</td>
<td>Mr. Richard C. Weeks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NASA Cafeteria</td>
</tr>
<tr>
<td></td>
<td>Activities Center Overview</td>
<td>Ms. Pamela J. Verniel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H.J.E. Reid Conference Center</td>
</tr>
<tr>
<td></td>
<td>Security Briefing</td>
<td>Mr. O. J. Cole</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Security Office</td>
</tr>
<tr>
<td></td>
<td>Occupational Health Services Overview</td>
<td>Mr. Peter J. Edgette</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Occupational Health Services Office</td>
</tr>
<tr>
<td></td>
<td>Safety Video</td>
<td>Mr. Clarence F. Breen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Safety Management Section</td>
</tr>
<tr>
<td>11:20 a.m.</td>
<td>Program Breakout</td>
<td></td>
</tr>
<tr>
<td>12:00 p.m.</td>
<td>Depart for Worksites</td>
<td></td>
</tr>
</tbody>
</table>

Rev. 5/19/92
1992

LANGLEY AEROSPACE RESEARCH SUMMER SCHOLARS (LARSS) PROGRAM STUDENT EXIT SURVEY REPORT

Submitted to: Mr. Robert L. Yang
Assistant University Affairs Officer
NASA Langley Research Center

Dr. Demetrius D. Venable
Vice President for Research &
Dean of the Graduate College
Hampton University

August 14, 1992

Submitted and prepared by:

Ms. Suzanne Boyd
1992 LARSS Program Coordinator
PREFACE

The 1992 LARSS Student Exit Survey is intended to serve as a tool for continuous improvement of the overall LARSS Program. That is, the LARSS Program participants are able to provide valuable information about the overall program by identifying those areas of the Program which need enhancing. The recommendations provided from this survey will be considered for the 1993 LARSS Program. Following are the results of the 1992 LARSS Program Student Exit Survey and the specific recommendations the participants have provided for continuous improvement of the LARSS Program.
RESULTS

Each of the 91 Student Exit Surveys distributed was returned, thus yielding a return rate of 100%. The overwhelming majority of the LARSS participants (96.70%) rated their overall LARSS summer research experience as either good (38.46%) or excellent (58.24), while only 3.20% rated their experience as average (2.20%) or fair (1.10%). None of the 91 participants rated their summer research experience as poor.

Table 1. Overall Rating of LARSS Summer Research Experience
STUDENT RECOMMENDATIONS FOR CONTINUOUS IMPROVEMENT OF THE LARSS PROGRAM

Following are student recommendations made for continuous improvement of the LARSS Program:

1. Students should be housed in the same apartment complexes;

2. Students should be notified of their mentor and research assignment prior to their tenure in the LARSS Program;

3. Mentors should be required to submit a proposed research project before the students are selected, and should be involved in more of the LARSS group activities;

4. Students should be notified of the payroll schedule and holidays prior to their tenure in the LARSS Program;

5. There should be both additional technical lectures and tours of the Center and Langley Air Force Base;

6. The length of the Program should be extended to twelve weeks;

7. A scholarship should be offered to one student from each Directorate for the best quality research project;

8. An oral presentation for each student should be required;

9. A Career Conference, combined with a forum where the students can share their individual research, should be held;

10. A more lengthy technical paper should be required;

11. A stipend scale should be matched to the student's educational level;

12. Provide more information on each individual Directorate; and

13. Possibly award college credit for the summer research experience.
SUMMARY

The overwhelming majority of the LARSS participants rated their overall summer research experience as good or excellent. Even though the 1992 LARSS Program has met its' goals, all areas of the Program need to be considered for continuous improvement. Of the various recommendations provided by the participants, the following will be implemented in the 1993 LARSS Program: (1) LARSS participants will be housed in two or three apartment complexes, (2) mentors will be encouraged to contact their student before the beginning of the LARSS Program, (3) LARSS participants will be notified of a tentative payroll schedule before the Program begins, (4) LARSS participants will be strongly encouraged to give an oral presentation on their research project in their respective Divisions, and (5) a Career Conference, in conjunction with a forum where the participants can share their individual research projects will be held. The participant recommendations made in the 1992 LARSS Student Exit Survey will ensure a more successful and improved LARSS Program in 1993.
1992 LARSS PROGRAM PARTICIPANT EXIT SURVEY OF THEIR SUMMER RESEARCH EXPERIENCE AT LANGLEY

Dear LARSS Participant:
You are in a unique position to advise prospective LARSS participants by summarizing your responsibilities, by sharing the knowledge you have gained, and also by offering advice. Please take a few minutes to answer the following questions. Summary data of this exit survey will be included in the 1992 LARSS Program Final Report.

1. What were the skills or specific knowledge you brought to this summer research experience that helped you the most?

2. Describe your duties and responsibilities in this program.

3. What was the most valuable experience you gained from this program?

4. What should an individual do to get the most out of this program?

5. What are your suggestions for continuous improvement of this program?

6. How would you rate your overall LARSS summer research experience?

   1  2  3  4  5
Poor Fair Average Good Excellent

Your Name (Optional): ____________________________________________

Please return the completed survey by August 7 to:

Suzanne Boyd, LARSS Program Coordinator
Building 1312, Room 102
OVERALL RATING OF LARSS EXPERIENCE

PERCENTAGE OF RESPONSES (N=91)

- POOR: 0%
- FAIR: 1.10% (1)
- AVERAGE: 2.20% (2)
- GOOD: 38.46% (35)
- EXCELLENT: 58.24% (53)
Evaluation of LARSS Participant by Mentor

Student's Name: ____________________________ Mentor's Name: ____________________________

1. Give a brief statement of the LARSS participant's research program, and comment on the principal accomplishments during the grant period (may be continued on the back):

______________________________________________________________________________

______________________________________________________________________________

2. In the rating scale below, describe the student by checking, after each trait to be evaluated, the box that most nearly represents your opinion. Compare the student with a representative group of students you have known during your professional career who have approximately the same amount of experience and training.

<table>
<thead>
<tr>
<th>Truly Exceptional</th>
<th>Outstanding</th>
<th>Unusual</th>
<th>Good</th>
<th>Somewhat Above Average</th>
</tr>
</thead>
</table>

a. Degree of mastery of fundamental knowledge in the general field.

b. Knowledge of and ability to use basic research techniques in this field.

c. Self-reliance and independence in scientific work.

d. Motivation toward a successful productive scientific career.

3. How does the student compare overall with other students you have supervised?

   Equal to  Very  Above  Below
   □ The Best  □ Good  □ Average  □ Average  □ Average

4. Remarks: ________________________________________________________________
   ________________________________________________________________

Signature of Mentor ____________________________ Date ____________________________

Note to Mentor: This form should be returned to Suzanne Boyd, Mail Stop 105A, by Friday, August 14, 1992.