SHARP

SCIENCE

MATHEMATICS

TECHNOLOGY

ENGINEERING

GEOGRAPHY

2002 FINAL REPORT

SHARP UNITY → EXPANDED OPPORTUNITY

WRITTEN AND SUBMITTED BY MODERN TECHNOLOGY SYSTEMS, INCORPORATED

NASA

TO INSPIRE THE NEXT GENERATION OF EXPLORERS

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EXECUTIVE SUMMARY

The Year 2002 was another successful year for SHARP. Even after 22 years of SHARP, the Program continues to grow. There were 12 NASA Field Installations with a total of 210 apprentices who participated in the summer 2002 Program supported by 215 mentors in the fields of science and engineering. The apprentices were chosen from a pool of 1,379 applicants. This was a record year for applications exceeding the previous year by over 60%. For the second consecutive year, the number of female participants exceeded the number of males with 53% female and 47% male participants in the program. The main thrust of our recruiting efforts is still focused on underrepresented populations; especially African American, Hispanic, and Native American. At the conclusion of the summer program, most SHARP Apprentices indicated on the EDCATS that they would be interested in pursuing careers in Aerospace (56.2%) while the second largest career choice was a job at NASA (45.7%). The smallest number (11.9%) were interested in careers in the government. The table of responses is listed in the Appendix.

Once again this year we were fortunate in that the SHARP COTR, Ms. Deborah Glasco, gained the support of MURED funding sources at NASA to fully fund additional apprentices and boost the number of apprentices to 210.

The 2002 Program was strongly supported by the MTSI team of Mr. James Strandquist as SHARP Program Manager, Ms. Lisa Williams and Dr. Vickie Claflin as SHARP Deputy Program Managers, and Ms. Laurel Grosjean, the SHARP Program Associate. The collaboration of this dynamic team created many innovations in the management of the program this year. Among the changes were that evaluations' numeric indicators were expressed not only in numeric form but also in visual displays in charts and reports. Two different CD-ROMs were created to support SHARP. A small three-inch disc was "burned" for promotional purposes. It contained the entire SHARP promotional movie and a pdf file of a student application that could be used to develop the application package. The second CD-ROM contained the *SHARP College Scholarship and Financial Aid Guide,* which was made interactive through click-on indexing and web-linked URLs for each group offering scholarships or aid. The SHARP Program Associate, Ms. Laurel Grosjean, produced the artwork on both the CD-ROM disc and the CD jacket. These were distributed to every apprentice in the program.

The SHARP Management Team continues to strive towards the goal of increasing the number of Native American and Hispanic participants as well as African Americans. Recruitment expanded to schools, newspapers, magazines, and organizations that support these underrepresented groups. This year saw a record number of applicants for SHARP. Over 1,379 applications were received. A large database had been constructed, with mailing addresses and contact names for hundreds of schools and community organizations. This database was instrumental in expanding the exposure to underrepresented groups who are often distant from the mainstream media. To prepare for the next recruitment period, the database has been further

developed with high school addresses and ethnic data to better target underrepresented populations.

There was no planned Joint Program Activity this year with the SHARP PLUS sites. However some NASA sites were visited by SHARP PLUS sites; such as Stennis Space Center and Jackson State University. The number of SHARP PLUS sites had dropped to eight, and not all NASA Field Installations would have had a match. The Joint Program Activity had been successful in the past in providing an arena for social interaction, NASA outreach, and the sharing of research information.

Conference Overview

The SHARP Management Team conducted its annual Planning Conference at the Hilton Garden Inn in White Marsh, Maryland, April 24 - 27, 2002. The conference participants included major representatives from NASA Headquarters: Deborah Glasco, the NASA/SHARP Contracting Officer's Technical Representative (COTR) Agency SHARP Program Manager; Mr. Frank C. Owens, Director, NASA Education Division; Dr. BJ Bluth, Technical Assistant to the Director; and Dr. James Gorman, Director of Undergraduate Student Research Programs. Also in attendance was Dr. Stanley Jones, Assistant Director Washington DC Operations for Classroom of the Future (COTF), the SHARP Management Staff from Modern Technology Systems, Incorporated; Ms. Pamela H. Piper, President and CEO, Mr. James Strandquist, SHARP Program Manager, Ms. Lisa Williams, SHARP Deputy Program Manager, Dr. Vickie Claflin, SHARP Deputy Program Manager, Ms. Laurel Grosjean, SHARP Program Associate, Ms. Claire Roach, Financial Analyst, and Mr. Irvin Lee, the Technical Specialist. Also in attendance were

representatives from the following NASA Field Installations: Ames Research Center, Dryden Flight Research Center, Glenn Research Center, Goddard Institute for Space Studies, Goddard Space Flight Center, Kennedy Space Center, Langley Research Center, Marshall Space Flight Center, and Stennis Space Center. This year also included representatives from two potential SHARP sites: White Sands Test Facility and Jet Propulsion Laboratory.

NASA Center Site Visits

This year's site visits were conducted at Dryden Flight Research Center in Edwards, California and the Ames Research Center in Moffett Field, California, with a side visit to tour the Jet Propulsion Laboratory in Pasadena, California with Ms. Lisa Campbell.

Close-out ViTS

On Monday, July 22, 2002, MTSI and the SHARP COTR, Ms. Deborah Glasco conducted the annual SHARP Close-Out ViTS. All NASA Field Installations attended the ViTS. The Goddard Institute for Space Studies (GISS) attended for the first time by means of the Columbia University distance learning laboratory.

This year, there were three new SHARP Coordinators hired for the program. Ms. Donna Tate for Johnson Space Center, Ms. Sonya Lawrence for Langley Research Center, and Mr. Mark Mullins was rehired for Kennedy Space Center.

The number of SHARP Apprentices who have benefited from SHARP in the 22 years of the program hovers around 3,000. This is a milestone for public outreach into the communities by

NASA and MTSI where SHARP can make a difference in the lives of our youth. NASA and MTSI continue to support the national educational goal of helping to propel America's underrepresented students to the forefront in the fields of science, mathematics, technology, engineering, and geography.

I. 2002 SHARP Overview

End of the Program Evaluation Summary

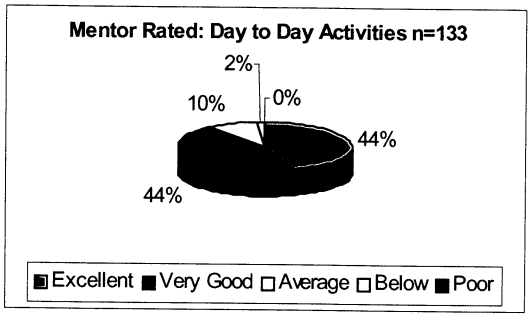
The total number of respondents for the 2002 End-of-the-Program Evaluations was 152; consisting of nine NASA Field Installation SHARP Managers (managers who are employed by the field installation), nine SHARP Coordinators (teachers who coordinate the SHARP program at a given site), and 134 Mentors (NASA researchers who work directly with the Apprentices). This year's evaluation statistics are based upon the information collected from the revised End-of-the-Program Evaluation Forms. The new forms allowed the evaluators to rate specific areas of performance. Listed below are responses for each group and the three dimensional pie charts generated from the evaluations. (The actual questions can be found in the appendix.)

It is important to note that not all of the questions were answered by the 134 respondents so for each graph, n = the number of responses to that question. One of the reasons for the discrepancy is that some questions were not applicable to all mentors. For instance, a mentor may not have had the responsibility of signing time sheets or did not work with students on the technical research paper.

Mentors

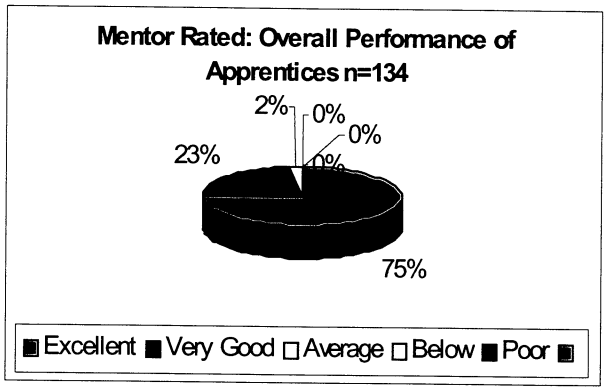
The Mentors had an opportunity to rate four components: the Program, the Apprentice, the SHARP Coordinator, and himself or herself. The range of ratings were excellent, very good, average, below average, and poor. Listed below are graphs that illustrate the degree to which the Mentors observed the particular activity. It is interesting to note that not one item received a poor rating.

1. How would you rate the day-to-day activities of this year's SHARP Program?



Eighty-eight percent of the Mentors who worked with the SHARP Program during the summer 2002 rated the day-to-day activities as excellent or very good while only twelve percent rated the day-to-day activities to be average or below average. No Mentors rated this item as poor.

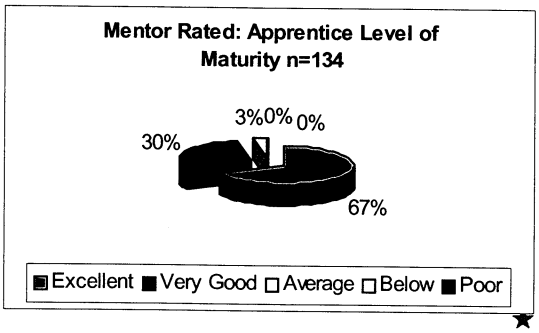
2. How would you rate the overall performance of your Apprentice(s) during the program?



Ninety-eight percent of the Mentors rated their Apprentices' performance during the program to be excellent or very good while only two percent rated their students to be average. No Mentors rated their Apprentices below average or poor. It is interesting to note that there is a positive correlation between the day to day activities in the SHARP program and the performance levels of the Apprentices.

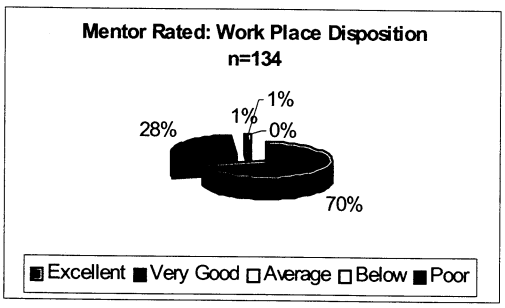
Two hundred and ten Apprentices were evaluated with some mentors having more than one apprentice. N = the number of responses to the questions.

3. How would you rate your Apprentice(s)' level of maturity?



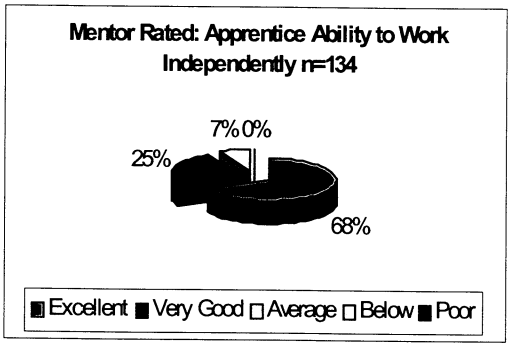
While ninety-seven percent of the Mentors rated their Apprentice's maturity to be excellent or very good, only three percent rated the level of maturity to be average and three percent rated the students to be immature as indicated by the below average rating. No Mentors assigned a poor rating for maturity.

4. How would you rate your Apprentice(s)' work place disposition?



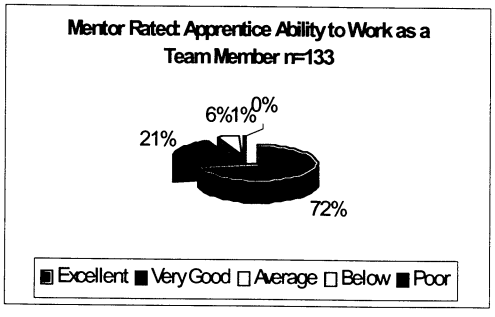
Ninety-eight percent of the Mentors rated their Apprentice's work place disposition to be excellent or very good. One percent rated average and one percent rated below average. No students' work place disposition was considered poor.

5. How would you rate your Apprentice(s)' ability to work independently?



Ninety-three percent of the Mentors rated their Apprentice's ability to work independently to be excellent or very good. Seven percent reported the level of independence to be average while no one assigned a below average or poor rating.

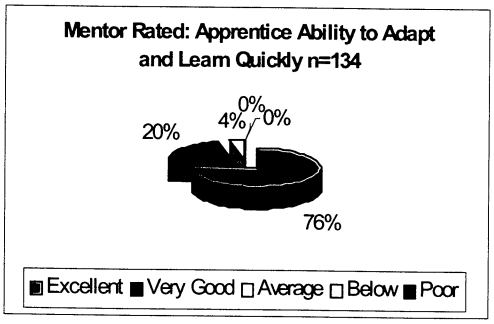
6. How would you rate your Apprentice's ability to work as a member of a team?



Ninety-three percent of the Mentors rated their Apprentice's ability to work in a team environment as excellent or very good. Six percent rated the students as average on this item, one percent rated below

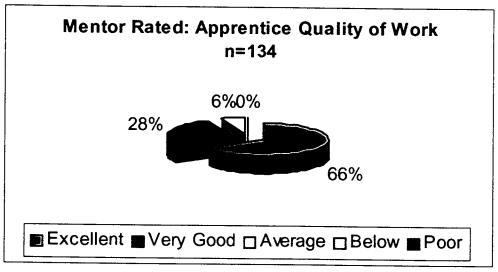
average while no Mentors rated the student's team dynamics as poor.

7. How would you rate your Apprentice's ability to adapt and learn quickly?



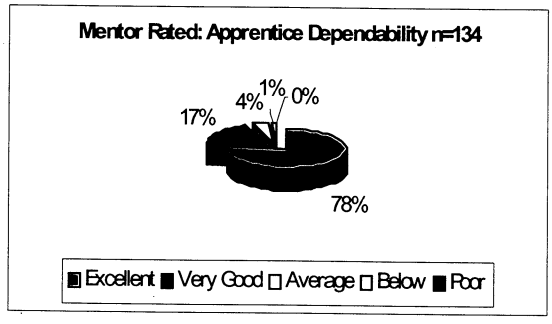
Ninety-five percent of the Mentors rated the Apprentice's ability to adapt and learn quickly as excellent or very good. Four percent were rated average while one percent rated the learning ability below average and no one as poor.

8. How would you rate your Apprentice's quality of work?



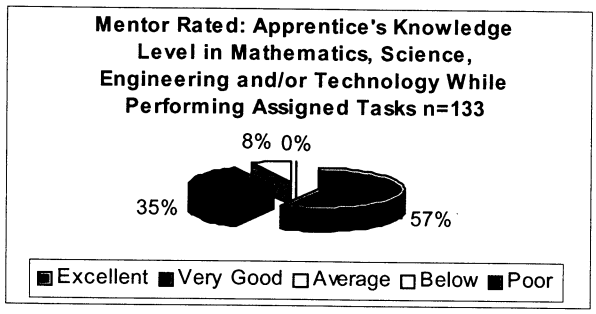
Ninety-four percent of the Mentors rated the Apprentice's quality of work to be excellent to very good. While only six percent of the Mentors rated the student's work to be average, no one assigned a below average or poor rating.

9. How would you rate your Apprentice's dependability?



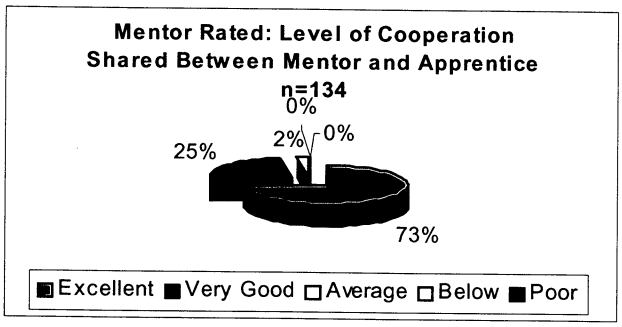
Ninety-five percent of the Mentors rated the Apprentice's dependability as excellent or very good while only four percent rated dependability as average. One percent of the Mentors rated the Apprentice's dependability below average and no ratings were made at the poor level.

10. How would you rate your Apprentice's knowledge level of mathematics, science, engineering and/or technology while performing the assigned tasks?



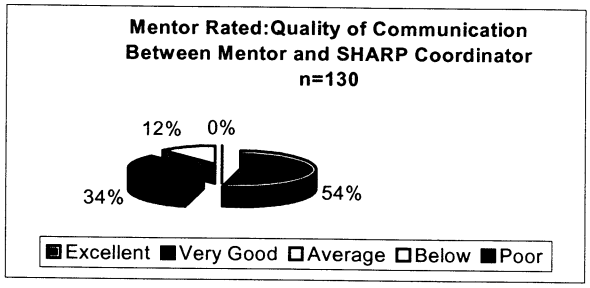
Ninety-two percent of the Mentors rated the Apprentice's analytical knowledge level to be excellent or very good. Analytical skills include mathematics, science, engineering, and technology. Only eight percent rated their students as average in this area while no one reported below average or poor skill levels.

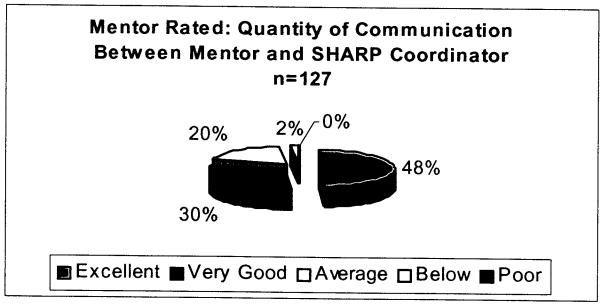
11. How would you rate the level of cooperation shared between you and your Apprentice?



Ninety-eight percent of the Mentors rated the Apprentices' cooperation to be excellent or very good. Only two percent rated this category as average while no one assigned a below average or poor rating.

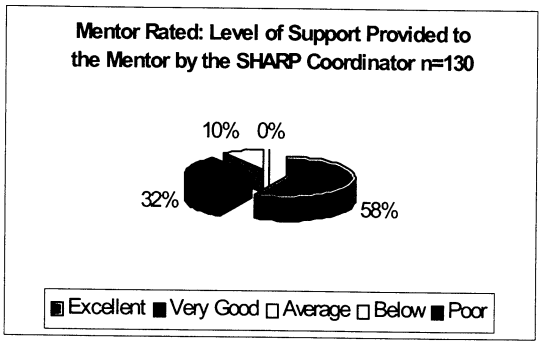
12. How would you rate the quality and quantity of communication shared between you and the SHARP Coordinator?





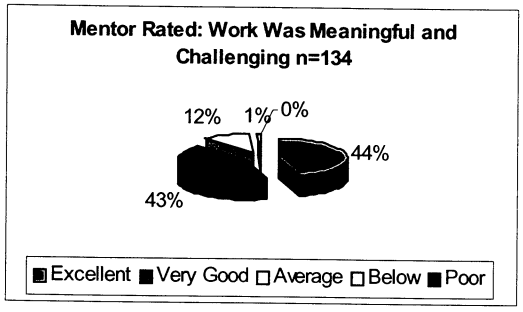
The Mentors consistently rated the quality and quantity of communication to be excellent or very good. Between twelve and twenty percent rated communication to be average while two percent found communication to be below average. No Mentor rated communication as poor in any of the three aforementioned categories.

13. How would you rate the level of support provided to you by the SHARP Coordinator?



Ninety percent of the Mentors rated the coordinator's support to be excellent or very good. While ten percent reported the support received from the coordinator as average, no one rated the support as below average or poor.

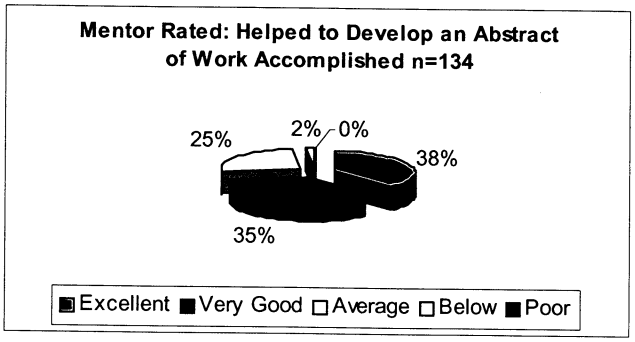
14. How would you rate your level of performance as a SHARP Mentor in the following areas:



(14.A) Provided meaningful and challenging work for the Apprentices:

Eighty-seven percent of the Mentors rated themselves as having assigned challenging work for the Apprentice. While twelve percent felt that the work lacked challenge as indicated by the average rating, only one percent rated the level of work challenge to be below average and zero percent assigned a poor rating.

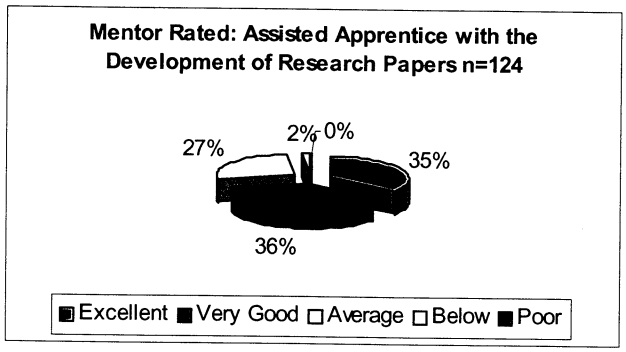
(14.B) Helped apprentices develop an abstract of his/her work:



Seventy-three percent of the Mentors rated their level of writing-help for the Apprentice to be excellent or very good. While twenty-five percent rated their help to be average, two percent rated himself/herself as below

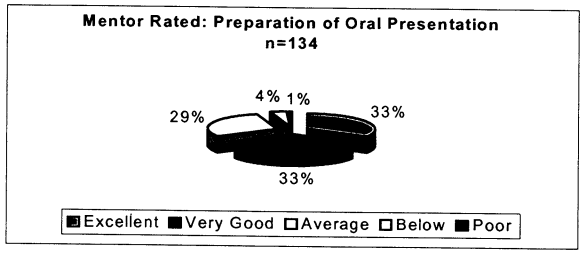
average and zero stated a poor rating.

(14C) Assisted apprentices with the development of his/her research paper:



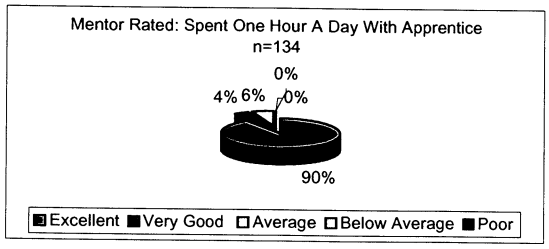
Seventy-one percent of the Mentors rated their contributions to the research paper to be excellent or very good. Twenty-seven percent rated their level of assistance as average while two percent assigned themselves a below average rating. In future evaluations, it may be necessary to make a clearer distinction between the Mentor engaging in the *activity of assisting* and the *need for assisting* the Apprentice. As the question is worded, a distinction cannot be determined. Also, many of the comments offered by the Mentors suggested that time was a constraint in some cases.

(14.D) Assisted Apprentices in the preparation of their oral presentation including visuals:



Sixty-six percent of the mentors rated their contributions to the Apprentice's oral presentation to be excellent or very good. While twenty-nine percent rated their contributions to be average, four percent assigned a below average rating and one percent for the poor rating.

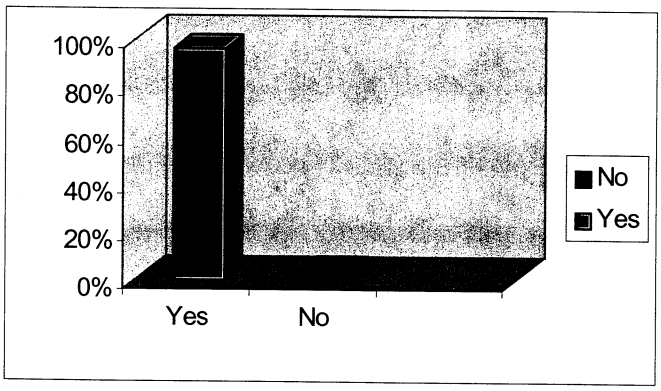
(14.E) Spent approximately one hour per day with your apprentice:



Ninety-four percent of the mentors rated their time spent with the Apprentice as excellent to very good. Six percent reported their time spent with

the Apprentice as being on the mark with an average rating and zero percent reported their time as below average or poor in this category.

15. Would you consider being a SHARP Mentor again?



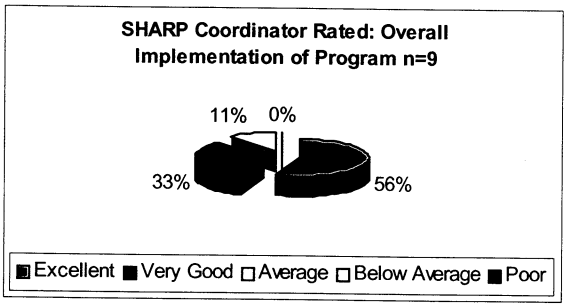
Ninety-six percent responded positively without reservation. Only four percent of the Mentors stated that they would not be available for the following year. It is interesting to note that **one hundred percent of the experienced Mentors are willing to continue to work with the SHARP program**. Of those Mentors who responded negatively, this was their first year as a Mentor and provided the following reasons:

- "SHARP students spend too much time in and out of the office activities. This detracted them from available work time. I would only consider taking another student if there were significantly fewer extracurricular activities.
- "I would like to participate again contingent upon the 2003 summer research-schedule and if that schedule would accommodate a student apprentice."
- "I had to travel a good portion of the time and next summer looks like I will have a similar schedule."

SHARP Coordinators

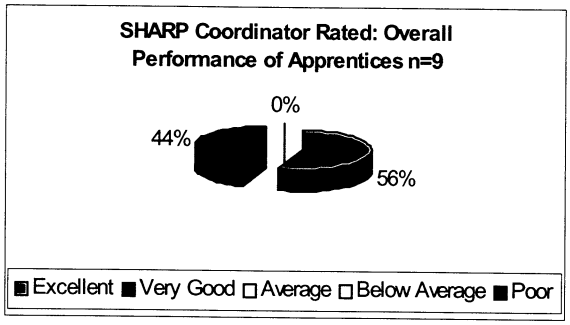
Nine Coordinators responded to the 2002 end-of-the-year program evaluation. The Coordinators had an opportunity to rate key individuals connected to SHARP Program with regard to performance, communication, cooperation, and assistance. The range of ratings was excellent, very good, average, below average, and poor. Listed below are graphs that illustrate the degree to which the Coordinators observed key players and contributors.

1. How would you rate the overall implementation of this year's SHARP Program?



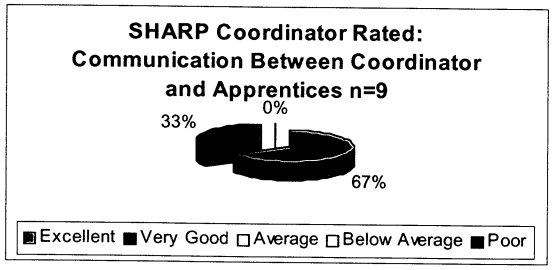
Overwhelmingly, eighty-nine percent of the NASA SHARP Coordinators rated the SHARP program as excellent or very good. Only eleven percent of the Coordinators assigned an average rating while no one rated the program below average or poor.

2. How would you rate the overall performance of this year's apprentices during the Program?



One hundred percent of the SHARP Coordinators rated their Apprentices as excellent to very good.

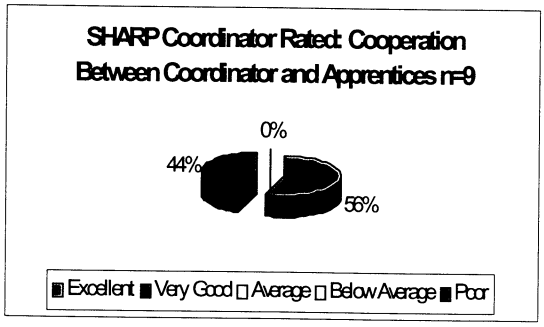
3. How would you rate the level of communication shared between you and the apprentices?



One hundred percent of the SHARP Coordinators

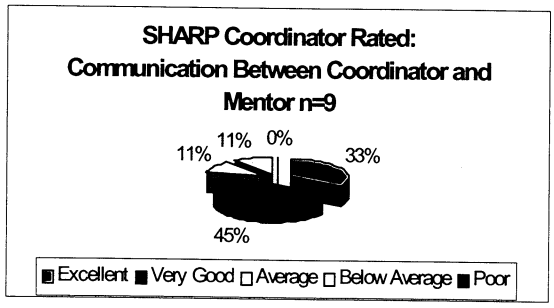
rated the communication between the Coordinator and Apprentice as excellent to very good.

4. How would you rate the level of cooperation shared between you and the apprentices?



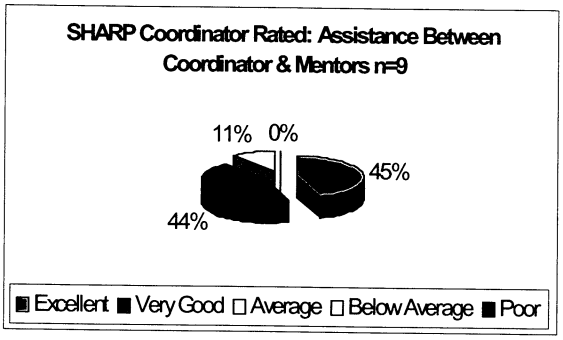
One hundred percent of the Coordinators rated the Apprentices' cooperation to be excellent or very good.

5. How would you rate the level of communication shared between you and the SHARP Mentors?



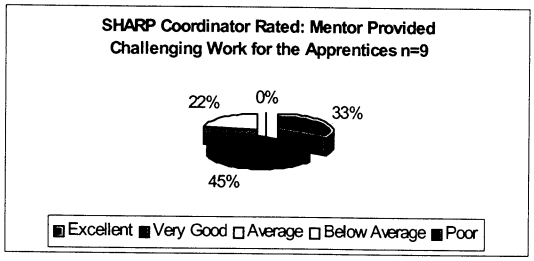
Thirty-three percent rated the communication between coordinator and mentors as excellent; however, forty-five percent rated the communication to be very good. While eleven percent rated communications as average, eleven percent assigned below average and no one assigned a poor rating in this category.

6. How would you rate the level of assistance shared between you and the SHARP Mentors?

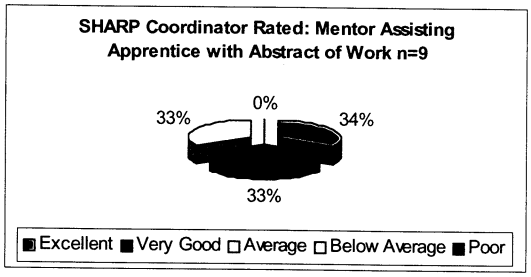


Eighty-nine percent of the SHARP Coordinators rated the level of assistance shared with the Mentors as excellent or very good. Only eleven percent rated assistance as average and no one assigned a below average or poor rating.

7. How would you rate the level of performance for SHARP Mentors in the following area:

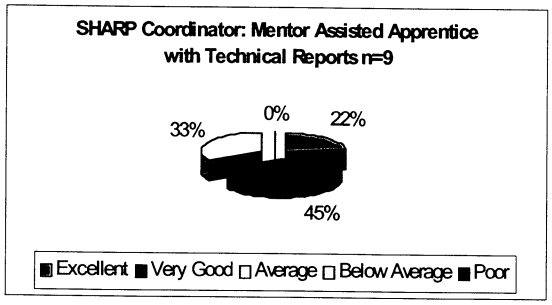


(7.A) Provided meaningful and challenging work for the apprentices. Seventy-eight percent of the Coordinators rated the Mentor as excellent or very good. Twenty-two percent rated as average in this category.



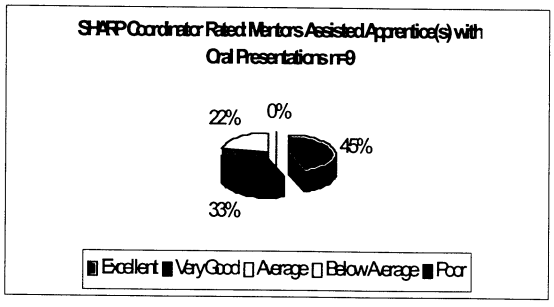
(7.B) Helped Apprentices develop an abstract of his/her work.

Sixty-seven percent of the SHARP Coordinators rated the Mentors' assistance with the written abstract as excellent or very good whereas thirty-three percent rated the Mentors' assistance to be average.



(7.C) Assisted apprentices in the preparation of their research/technical papers.

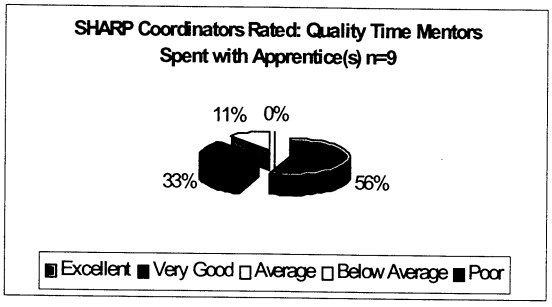
Sixty-seven percent of the SHARP Coordinators rated the Mentors in this area as excellent or very good. As with the assistance with an abstract, thirty-three percent rated the mentors to be average with no below average or poor assignments.



(7.D) Assisted apprentices in the preparation of their oral presentation including visuals?

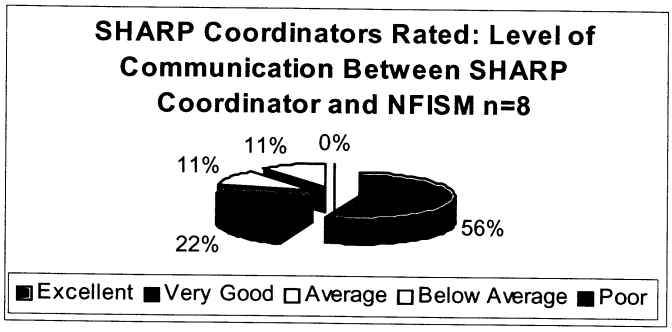
Seventy-eight percent of the SHARP Coordinators rated the Mentors' assistance with presentations as excellent or very good. While twenty-two percent assigned an average rating, zero rated below average or poor.

(7.E) Spent approximately one hour per day with the apprentice(s).



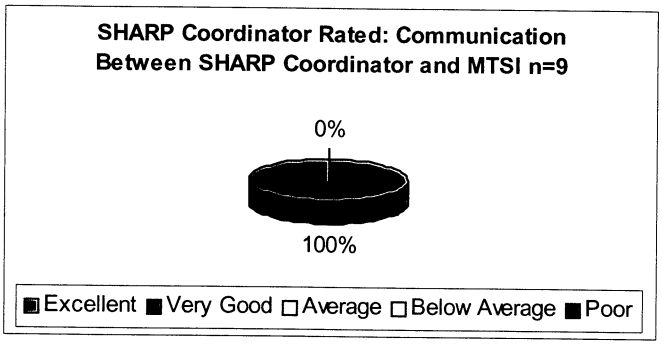
Eighty-nine percent of the SHARP Coordinators rated the quality of time Mentors spent with Apprentices as excellent to very good. While only eleven percent rated the Mentors as average, no one assigned the below average or poor ratings.

8. How would you rate the level of communication shared between you and the NASA Field Installation SHARP Manager?



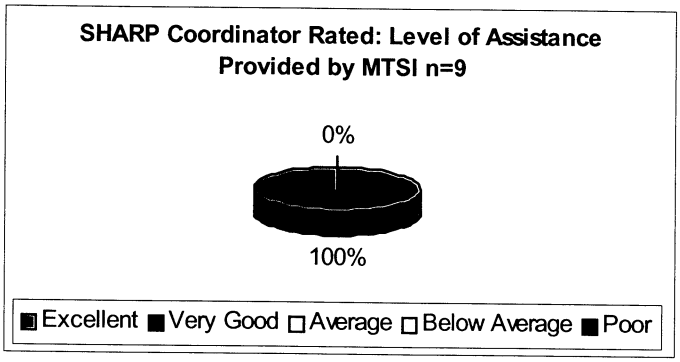
Seventy-eight percent of the SHARP Coordinators were pleased with the level of communication with the NASA Field Installation SHARP Manager as exemplified by the excellent or very good ratings. Only eleven percent assigned an average rating and eleven percent rated below average. No coordinators rated this category as poor. The below average rating reflects an issue with the ARC SHARP Coordinator. This is discussed further in the Issues and Concerns Section of the report.

9. How would you rate the level of communication shared between you and MTSI?



One Hundred percent of the SHARP Coordinators rated MTSI as communicative with excellent ratings.

10. How would you rate the level of assistance shared between you and MTSI?

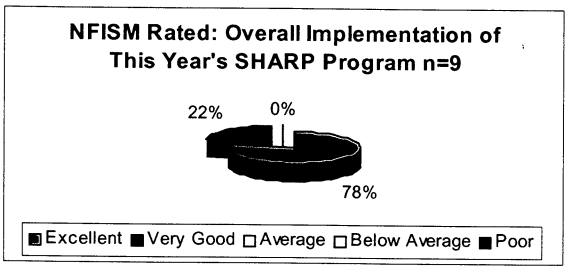


As with communication, the level of assistance perceived by the SHARP Coordinators from MTSI was excellent. **One hundred percent of the SHARP Coordinators rated assistance as excellent.**

NASA Field Installation SHARP Managers

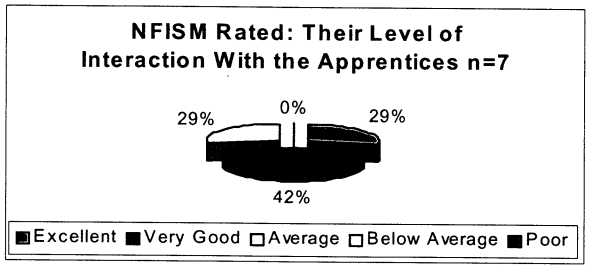
Nine NASA Field Installation SHARP Managers responded to the 2002 end of the year program evaluation. The Managers had an opportunity to rate key individuals connected to SHARP with regard to performance, communication, cooperation, and assistance. The ratings were excellent, very good, average, below average, and poor. Listed below are graphs that illustrate the degree to which the Managers observed key players and contributors.

1. How would you rate the overall implementation of this year's SHARP Program?



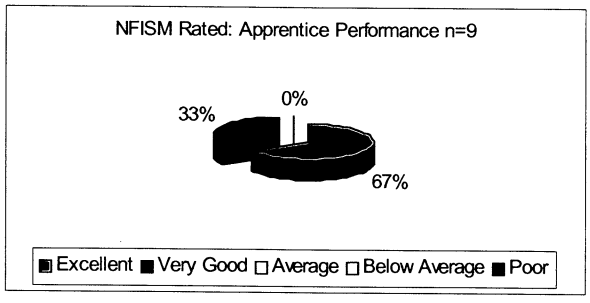
One hundred percent of the Managers rated the program to be excellent or very good. No one reported average to poor in this category.

2. What was your level of interaction with the SHARP Apprentices?

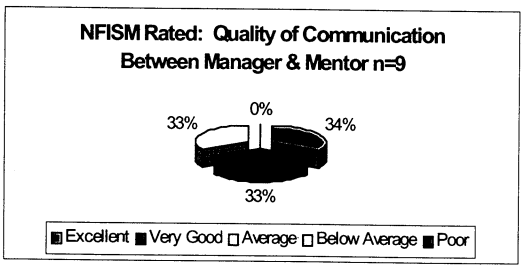


Seventy-one percent of the NFISMs rated their contact with the Apprentices as excellent to very good while twenty-nine percent believed their contact to be average. No one rated his or her level of contact as below average or poor.

3. How would you rate the Apprentice's performance during the Program based on your level of interaction with them? One hundred percent of the NFISMs rated Apprentice's performance as excellent or very good.

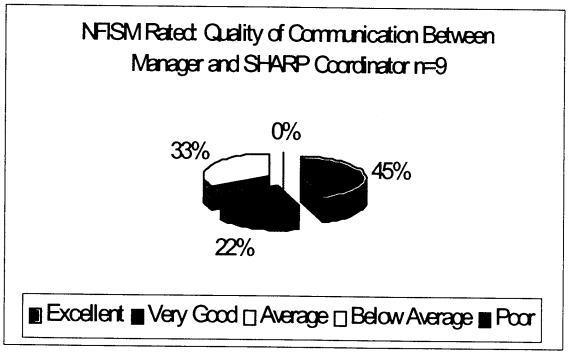


4. How would you rate the level of communication shared between you and the SHARP Mentors?



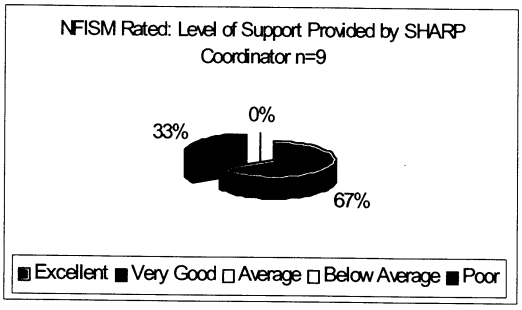
Sixty-seven percent of the NFISMs reported the quality of communication with the Mentors to be excellent or very good and while thirty-three percent rated communication to be average. This might indicate a need for increased communication between offices.

5. How would you rate the level of communication shared between you and the SHARP Coordinator?



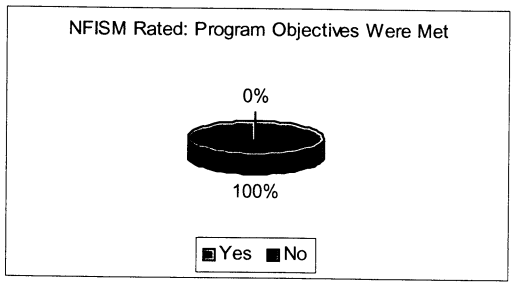
It is interesting to note that forty-five percent of the NFISMs rated communication with the Coordinator to be excellent, twenty-two percent assigned a very good rating; and thirty three percent reported average. No one rated below average or poor in this category.

6. How would you rate the level of support provided to you by the SHARP Coordinator?



One hundred percent of the NFISMs reported the level of support from the coordinator to be excellent or very good.

7. Did you meet your program objectives for this year?



It is very enlightening to see that one hundred percent of the NFISMs believe that the objectives of the program were met.

EDCATS Student Data Feedback Form

The total number of respondents for the 2002 EDCATS Student Data Feedback Form was 210. The questions asked of Apprentices were changed this summer. The statements about program outcomes are shown in the table below.

Average rating based on the following scoring definitions.

5 = Excellent 4 = Very Good 3 = Average 2 = Below Average 1 = Poor

Question/objective	Average (Non responses have been removed.)
1. This was a valuable experience for me.	4.69
2. This experience matched my educational and research objectives.	3.94
3. This experience met my education/career objectives.	3.85
4. I expect to apply what I learned as a result of this experience.	4.37
5. I would recommend this experience to others who have similar education/career interests.	4.57
6. Participation in SHARP was a good investment of my time.	4.60
7. Offering SHARP to students is a good use of NASA resources.	4.75
8. NASA 's offering SHARP to students is a good investment of taxpayer funds.	4.55
Excellent to Very Good Evaluation **Overall Average =**	**4.41**

Impact of the SHARP experience

The SHARP Apprentice indicates the answer that best describes the impact of this experience.

Experience/Impact on Apprentice	Average
As a result of this experience, my interest in my research or academic field of study has…	4.13
As a result of this experience, my desire to pursue a NASA or Aerospace-related career has…	4.04

5=Increased significantly 4=Increased some 3=Remained the same 2=Decreased some 1=Decreased significantly

II. YEAR END REVIEW OF SHARP PROGRAM ACTIVITIES

SHARP Planning Conference

The SHARP Management Team conducted their annual Planning Conference at the Hilton Garden Inn in White Marsh, Maryland April 24 - 27, 2002. The conference participants included major representatives from NASA Headquarters, NFISMs, MTSI SHARP Management Staff and SHARP Coordinators.

Frank Owens, Director of NASA Education Division, briefed the conference participants on NASA's vision and answered many questions. Dr. BJ Bluth provided an overview of program evaluation and the uses of EDCATS, and Dr. James Gorman introduced pipeline issues and NASA's Undergraduate Student Research Program. Dr. Stanley Jones facilitated a session entitled "Classroom of the Future," during which he provided a brief insight into the programmatic innovations that are developing in connection with electronic learning environments. Following Dr. Gorman's session, Celeste Baine, celebrated author of Is There an Engineer Inside You? talked about tactics and strategies for encouraging today's youth to identify and pursue a career in engineering. Thursday was concluded with the "Open Forum" and "Breakout" sessions during which the participants were able to discuss topics that were of primary concern. Some of the topics discussed during the open forum were enrichment activities, computer accessibility, guidelines for selecting SHARP apprentices, disciplinary actions for apprentices, and limiting the number of NASA employees' children accepted into the Program. Immediately following the open forum, the participants separated into NASA staff and MTSI staff for the break out sessions.

Friday morning was concluded by Dr. Claflin's presentation that stressed the importance of "Setting Research Standards" and Mr. Strandquist's discussion on "Exploring Options for Joint Program Activities." That afternoon, the participants traveled to the Baltimore Inner Harbor to tour the Maryland Science Center's Hubble Space Telescope Operations Exhibit.

The professional development session kicked off the final day of the conference with Ms. Kimberly Geddings facilitating the workshop titled "Maximizing Your Communication Skills." The conference participants reconvened after lunch for a guest speaker, Mr. R. Guy Vickers, President of the Tommy Hilfiger Corporate Foundation, Inc. He stressed the importance of networking and working collaboratively. The "Program Development" session conducted by Mr. Strandquist consisted of two parts. (1) Moving more information electronically, and (2) Sharing apprentice success through abstracts. During the conference wrap-up, MTSI reviewed the action items generated by the conference sessions and thanked the participants for attending.

Administrative Modifications

The SHARP Management Team welcomed several new members to the team this year. Three new SHARP Coordinators joined the team at the beginning of the year. Mr. Mark Mullins rejoined the staff at Kennedy Space Center, Ms. Donna Tate was hired for Johnson Space Center, and Ms. Sonya Lawrence was hired for Langley Research Center.

III. SHARP SUMMER SESSIONS

SHARP Summer Sessions consist of descriptions of sites and events, which took place during the 2002 summer program. The sessions include: NASA Field Installation sites visits, ViTS, and Joint Program Activities.

Site Visits

This summer, site visits were conducted at Dryden Flight Research Center in Edwards, California and the Ames Research Center in Moffett Field, California.

Dryden Research Center

Site Visit Report

On July 31, 2002 SHARP Deputy Program Manager, Lisa Williams and SHARP Financial Analyst, Claire Roach conducted a site visit at the Dryden Flight Research Center (DFRC). Dryden Flight Research Center is located in Edwards, CA. DFRC's primary responsibility is conducting safe and timely flight research and aircraft operations for current and future aerospace vehicles, supporting development and operations for shuttle and future access-to-space vehicles, and enhancing competitiveness to US aerospace industry.

I. PROGRAM IMPLEMENTATION

The SHARP Program at DFRC is supported by the Public Affairs Office. The SHARP Team includes the NASA Field Installation SHARP Manager, James Lucero and the SHARP Coordinator, Roberto Garza. Mr. Garza has been a SHARP Coordinator for nineteen years.

Each year Mr. Garza recruits students from 5 schools in the five surrounding counties. Mr. Garza and the DFRC staff screen the applications for eligibility. After the applications are screened, they select 15 students for interviews. The students and mentors are provided with a two-part orientation session. In the first segment of the orientation session, the students receive a handbook. The handbook delineates work hours, pay procedures, and program expectations. The students also complete a questionnaire to determine their skill levels and interests. The mentors are provided with the SHARP Mentor's Guide and complete and application form describing the nature of their work. The responses from the mentors' applications and the students' questionnaires are used to match the mentors with the students. During the second part of the orientation the students and their parents meet the mentors.

II. APPRENTICE INTERACTION

Ms. Williams and Ms. Roach had the privilege of meeting all of the students in a group session prior to individual work site visits. This allowed the MTSI staff the opportunity to interact with all of the apprentices. During this session, Ms. Williams and Ms. Roach provided an overview of MTSI and explained the objectives of the SHARP Program. The MTSI staff informed students that MTSI would maintain contact with them after their apprenticeship. Every other year the students would receive a survey to complete, so MTSI could track their educational and career paths. The information provided will assist NASA in measuring the long-term outcomes of the program. Following the group session, Ms. Williams and Ms. Roach visited four apprentices at their work sites. Next is a list of projects conducted by the apprentices.

APPRENTICE: **James Gutierrez**
MENTOR: **Peter Reuter**
PROJECT: **Network Support**

James assisted the Network Support Staff by fixing physical wiring and termination points, installing network infrastructure equipment, and configuring systems to the network.

APPRENTICE: **Carla Hernandez**
MENTOR: **Kim Ennix and Ron Ray**
PROJECT: **Flight Research on Propulsion Systems and Aircraft Performance**

Carla conducted research on formation flight performance benefits. She supported completion of flight data reduction. Carla also conducted experiments on the uncertainty analysis of thrust and performance calculation and the weight (fuel-burn) effects on the performance of the trail aircraft. Carla gained knowledge on various jet engine types, the physics of formation flight and flight test data analysis. In performing these tasks she also became familiar with data analysis tools such as the SUN workstation, PC excel, and MATLAB.

APPRENTICE: **Brian Witt**
MENTOR: **Ed Fuller**
PROJECT: **Fiber Optics/Cable Survey Project**

Brian assisted his mentor in the resurfacing of the WATR warehouse floor and modifying the central emergency generator system. Through this project Brian learned the fundamentals of configuration management and project planning. He was exposed to training in the areas of safety, security, and risk management.

APPRENTICE: **Crystal Powell**
MENTOR: **Sandy McWilliams**
PROJECT: **Calibrating Instruments**

Crystal was a member of the instrument calibration laboratory. She assisted the lab with calibrating instruments used throughout the Center so that readings obtained from them were accurate. The instruments must be calibrated so that they will function properly in high and low pressure, temperature, and vibration-hostile environments. Crystal learned testing procedures and was exposed to hardware and software.

III. NASA PERSONNEL INTERACTION

Following the visits to the apprentice work sites, Ms. Williams and Ms. Roach met with James Lucero and Roberto Garza to discuss program implementation. Both DFRC SHARP staff mentioned that they had a really good group of apprentices this year. Mr. Garza brought up an issue he mentioned at the conference and that was a letter received by an eligible applicant who wanted an explanation of why he was not selected for the program. In response to his issue and many other Field Installation's concerns, Ms. Williams informed Mr. Garza that the MTSI staff is in the process of rewriting program literature to give a broader definition of the student selection criteria. Mr. Lucero also mentioned that off-site trips were harder to plan since there are new regulations concerning the use of NASA 15-passenger vans. Since they had such a small group they were able to conduct their off-site trips in a smaller NASA van. The larger vans must comply with the new regulations. Both Mr. Garza and Mr. Lucero agreed that overall they had a very successful program this year.

Ames Research Center

Site Visit Report

On August 1, 2002 SHARP Deputy Program Manager, Lisa Williams and SHARP Financial Analyst, Claire Roach conducted a site visit at Ames Research Center (ARC). Ames is located in Moffett Field, CA. ARC's primary mission in the space program is to conduct laboratory and flight research in space missions and in aeronautics.

I. PROGRAM IMPLEMENTATION

The SHARP Program at ARC is supported by the Public Affairs Office. The SHARP Team includes the NASA Field Installation SHARP Manager, Brenda Collins and the SHARP Coordinator, Dr. Ray Allen Hill.

II. APPRENTICE INTERACTION

The ARC site visit was very insightful for the MTSI staff. They not only had the opportunity to visit the apprentices at their individual worksites but they also had the privilege of attending the apprentices' oral presentations. Most site visits are conducted during the middle of the summer program. This site visit was conducted one week prior to the culminating date. Ms. Williams and Ms. Roach began their day by visiting three apprentices' work sites. After the work site visits, all students were brought into a conference room for a group meeting. Ms. Williams and Ms. Roach asked the apprentices to introduce themselves by stating their name and project title. The apprentices were then asked to share some of the benefits that they gained from participating in SHARP. Some of the responses were SHARP gave them a broader perspective of the various

fields offered in the science and engineering fields, and SHARP gave them an insight into the work environment. Ms. Williams and Ms. Roach concluded the session by asking the apprentices to assist in promoting the program by sharing their SHARP experience with their peers. Following the group session, the apprentices met in the auditorium for oral presentations. Each student gave a fifteen-minute presentation on his or her research project. The presentations were split into two sessions. On this day, ten students presented. Almost all of the mentors supported their students by attending the presentations. At the end of each presentation, Dr. Hill presented the mentors with a Certificate of Recognition for participating in the Program. They also received a travel coffee mug with the inscription "Thank you SHARP Mentor". Ms. Williams and Ms. Roach were very pleased to have been able to participate in this activity.

APPRENTICE: **Tim Machado**
MENTOR: **Dr. James H. Bell**
PROJECT: **Constructing a Feedback Thermal Control System Using A Thermoelectric Cooler**

Tim's project goal was to construct a simple feedback circuit in which a thermistor was connected to a circuit containing potentiometers used to control the amount of voltage entering the thermoelectric cooler based on the intensity of the temperature of the LEDs. This project involved researching how thermoelectric coolers and thermocouples work. It also involved electronic skills such as knowledge of electrical components, soldering, and knowing how to read an electrical schematic.

APPRENTICE: **Tracy Duncan**
MENTOR: **Dr. Rabindra D. Mehta**
PROJECT: **Development of Wind Tunnel Design Website**

Tracy created a new format for an existing website that describes the basic design of wind tunnels for the Fluid Mechanics Laboratory. She utilized her web-designing techniques to make the site more user friendly.

APPRENTICE: **Jad Mogannam**
MENTOR: **Jacob Cohen**
PROJECT: **Space Station Biological Research Project (SSBRP) Incubator Biocompatibility Testing.**

Jad was responsible for inducing genetic mutagenesis in *S. Cerevisiae* yeast cells using either UV light or Ethidium dibromide as a mutagen. He quantified the resultant mutagenesis by counting surviving yeast colonies.

III. NASA PERSONNEL INTERACTION

Prior to the site visit, Ms. Williams and Ms. Roach met with the NASA Field Installation SHARP Manager, Brenda Collins. Ms. Collins informed the MTSI SHARP staff that she had some concerns with Dr. Hill's performance this year. Dr. Hill failed to communicate with her regarding the implementation of the summer program. He selected the students without assistance from a committee and he scheduled activities and events without her knowledge. Ms. Collins also felt the apprentices were bright, mature students but the group should have been more diverse. There were a larger number of Asian students than any other ethnic group. This year's group was 57% Asian. Ms. Collins felt that if a committee were utilized during the selection process, the program would have been more balanced. The MTSI staff met with Dr.

Hill at the end of their site visits. They expressed some of the concern that they had with his performance and not working as a team with the ARC NASA Management Staff. Dr. Hill did express that some of the events he planned were planned prior to Ms. Collins appointment as the new NASA Field Installation SHARP Manager. He reserved rooms and scheduled events in advance to ensure that he had meeting rooms available for the next year. The previous NASA Field Installation SHARP Manager, Donald James, allowed Dr. Hill the flexibility to make those decisions. Prior to leaving the site, Ms. Williams and Ms. Roach spoke with Dr. Hill to ensure he was aware that he is expected to work as a team with the NASA personnel and he is responsible for keeping the ARC SHARP Management staff informed of all phases of program planning.

Close-out Video Teleconference (ViTS)

There was one Videoteleconference scheduled for this program year. The Closeout ViTS was held near the end of all centers' summer programs. The ViTS was held on Monday, July 22, 2002 at NASA Headquarters in Washington, DC. The SHARP COTR, Ms. Deborah Glasco and MTSI conducted the annual SHARP Close-Out ViTS. All twelve NASA Field Installations attended the ViTS. The ViTS allows program participants to interact via NASA's Videotelecommunications system. Each Field Installation is allotted seventeen (17) minutes to introduce the coordinators, apprentices, and present the mission of the NASA Field Installation. During this time, all of the apprentices are given an opportunity to state their names and their project titles. The ViTS was a success and the students selected to make their center presentations performed in a professional manner.

Unfortunately, because of high cost of the connection at Columbia University, Goddard Institute for Space Studies could only participate for two of the four-hour program. The question and answer session started off slowly until Dr. Vickie Claflin asked a question about the skills learned from being involved in the program. Each center was responding in turn with examples of the kinds of intellectual growth observed over the summer. The agenda for the ViTS may be found in the **Appendix**.

IV. 2002 PROGRAM ACCOMPLISHMENTS AND HIGHLIGHTS

The SHARP Management Team is a devoted group of professionals committed to the encouragement and advancement of students. The NASA Field Installations reported the following accomplishments and highlights in their Final Reports.

Ames Research Center

Mentors – Identifying mentors for the 30 Apprentices at Ames Research Center was a major accomplishment. Ames is host to several university faculty and college students during the summer, all of whom need laboratory space and an on-site mentor.

NASA Ames' Science Fair Day – Twelve SHARP Apprentices participated in the Science Fair College Information Workshop – Conducted by Mr. Robert Jow, Guidance Counselor, Lowell High School. Mr. Jow discussed the college admissions process, financial aid, and the testing processes. He provided the students with a packet of the college information he presented.

Dryden Flight Research Center

Ten SHARP students were selected to participate in the 2002 SHARP Program conducted at the NASA Dryden Flight Research Center. These ten students were selected from 91 applicants representing 13 schools in the surrounding area as well as from several schools beyond the normal commuting area and even a few out of state. The ten SHARP participants successfully blended into the Dryden work force and the enrichment activities normal to the program. All ten students successfully completed the program and submitted the program's required deliverables. There were no major problems. Some highlights of the program included the shuttle landing

during the stay at the center and the ViTS conference. The students thoroughly enjoyed the ViTS.

Glenn Research Center

Major highlights at GRC this year included a visit from SHARP PLUS Apprentices from the University of Michigan, a workshop given by the NASA Glenn Research Center Aerospace Education Services Program (AESP), a Career Awareness Workshop, and the summer video teleconference.

AESP Workshop – The AESP Workshop served two goals: (1) to provide an opportunity for apprentices to get to know one another and (2) to provide apprentices with a hands-on learning opportunity that utilized thinking skills. This year's activities were accessed from the NASA Earth-to-Orbit Engineering Design Challenges series. Students experienced the Thermal Protection Systems Activity and the Spacecraft Structures activity. The apprentices appreciated having this type of activity early in the apprenticeship.

SHARP PLUS – SHARP Apprentices shared an activity pertaining to robotics in the Aerospace Education Lab with SHARP PLUS Apprentices. All students enjoyed meeting each other and comparing experiences.

Career Awareness Workshop – GRC's Deputy Director, Dr. Julius Earls, conducted a Career Awareness Workshop for the apprentices. Dr. Earls gave an overview of planning for college

and careers and he arranged to have college interns interact with the high school apprentices in order for them to exchange information about college life and course work.

Individual Apprentice Accomplishments include:

Janid Rodriguez – gave a presentation on her SHARP experience to the Hispanic Advisory Council (HAC). The talk was intended to provide an opportunity to present educational, career and internship information.

Sarah Rovito – Presented her SHARP experience to a group of Upward Bound students.

Nambi Nallasamy, Janelle Jones, and Cirse Gonzalez - all three were featured in a special section "Senior Standouts" in *The Cleveland Plain Dealer*.

Goddard Institute for Space Studies

- Each of the six SHARP Apprentices became an integral part of the NASA GISS Institute on Climate and Planets (ICP) research team and gave an excellent oral presentation at the final ICP Conference.
- Science Lecture Series with such well known scientists as Dr. James Hansen (Head of NASA GISS), Dr. Gordon Albrecht (the Ohio State University), Mr. G (WB 11 Weatherman) and James Witt (former head of Fleet Weather Service).
- Visits to NASA's Remote Sensing Lab and Aerospace Education Laboratory.
- Participation in NSF/CUNY Alliance for Minority Participation (AMP) Summer 2002 Research Conference.

Goddard Space Flight Center (There is no report as of this printing.)

Independent Verification and Validation

The final presentations given at the NASA IV&V Facility as part of the closing ceremony were the highlight of the program. Parents, peers, facility employees, and mentors watched as these three apprentices presented the work they had done over the eight weeks of the Program.

Johnson Space Flight Center

One of the most useful activities was the Co-op College Panel where seven JSC College Co-ops provided honest and useful information to these college-bound high school students.

The other highlight of the summer was the Closing Awards Ceremony. The reception and ceremony were held at Teague Auditorium at JSC. JSC Deputy Director Randy Stone was the guest speaker and he engaged the apprentices and inspired them to continue their studies and career goals.

Kennedy Space Flight Center

Highlights of SHARP 2002 at KSC include:

- Increase in under-represented apprentices from previous years.
- Approximately six new mentors provided high quality projects.
- Over 200 guests including mentors, NASA Management, teachers, principals, and fellow students attended the Final Program. Former astronaut Story Musgrave was the guest speaker.

- Toured University of Central Florida's Creole Center for Laser Technology. The tour included a one-hour lecture with internationally renowned scientist Dr. Delisaro. Apprentices were overwhelmingly impressed with Dr. Delisaro's multi-media presentation, which was not only informative but also very entertaining.
- Orlando Sentinel newspaper highlighted the Orange and Seminole County apprentices in an extensive article.

Langley Research Center

- July 26, 2002 College Day held at LaRC with 14 major engineering universities and colleges in attendance for students to discuss further college and career goals.
- Coordination of a site visit by North Carolina A&T State University and Hampton University SHARP PLUS sites

Marshall Space Flight Center

- The participants realized the importance of compiling a portfolio.
- The participants were selected to participate in a video that will be aired entitled "From Earth to Orbit".
- All participants were able to give an oral presentation about their project.
- One mentor received recognition for having used the education programs sponsored by NASA from 11th grade through college.

Stennis Space Center

The major accomplishments of SHARP 2002 at Stennis were the additional training and technology skills acquired by the apprentices. Many apprentices were not familiar with PowerPoint presentations and the apprentices employed with Lockheed Martin/Information Technology were trained in additional computer program usage and software packages.

Wallops Flight Facility

All four students completed the full eight weeks of the program. Greater interaction with students was achieved compared to previous years. The four students expressed satisfaction with the Program.

MTSI's Program Highlights

Apprentice Handbook and PowerPoint Presentation

This year, in addition to distributing the latest edition of the SHARP Apprentice Handbook, MTSI also developed a Power Point Presentation to accompany this year's guide, which SHARP Coordinators could use for Apprentice orientation. The PowerPoint Presentation highlights the key points of the Apprentice Guide. The presentation can be used during the student/parent orientation session as a tool to enhance the information. The handbook was designed to provide general guidance and direction to the apprentices. The handbook specifies Program policies and procedures as well as defines the students' role as an apprentice. Some of the key topics addressed in the document include Program goals and objectives of the Program, administrative procedures and employment practices. An appendix section is included in the handbook to allow each Field Installation to add center specific information.

Mentor's Guide

MTSI revised and distributed the SHARP Mentor's Guide and PowerPoint Presentation for the 2002 Program Year. The Mentor's Guide contains information on the history, goals, and objectives of SHARP. The Mentor's Guide also outlines the policies and procedures of the Program and delineates the roles and responsibilities of SHARP Mentors. This year's guide was revised to include safety issues discussed during the 2002 Planning Conference.

SHARP Web Page

MTSI continued to enhance the SHARP Homepage. In addition to serving as a site to download the SHARP Apprentice Information Form, the site was also used a communication tool for the SHARP Management Team. The MTSI/SHARP Homepage can be accessed at http://www.nasasharp.com

SHARP Poster

MTSI distributed promotional SHARP Posters to all of the Coordinators to use to promote the Program. Coordinators are encouraged to send the posters to their contacts at high schools where they can be posted. The primary goal of the poster is to distribute Program information directly to students without relying solely on teachers and counselors.

Intel Science Talent Search

The Intel Science Talent Search is a science research competition, sponsored by Science Service, Inc. and the Intel Corporation, which identifies the best of precollege research conducted by high school seniors. Each year the Science Talent Search (STS) helps the nation find and encourage especially talented high school seniors to pursue careers in science, math, engineering and medicine. MTSI mailed formal applications to all seniors who participated in the 2002 program. Since much of the research conducted by the SHARP Apprentices is worthy of publication, this competition was another mechanism for the apprentice to gain recognition and possibly college scholarships.

Siemens Westinghouse Competition

An information packet consisting of a detailed letter about the *Siemens Westinghouse Competition* from its Executive Vice President including a booklet and application forms was also sent to SHARP Apprentices who would be seniors. Siemens is an organization devoted to providing scholarships and increasing access to higher education for talented and enthusiastic science, mathematics, and technology focused students in the United States. Competitors are required to submit a research project and prepare a detailed written report about their research. Apprentices were encouraged to submit their research project for consideration; however, they were instructed to contact the NFISM to ensure that their project material was not proprietary information. Along with their research information, competitors are required to provide a Candidate Data Sheet, current transcript, and Project advisor/mentor comments. The *Siemens Westinghouse Competition* will present up to 300 awards to semifinalists, 60 regional finalists and six individuals and six team National Awards. Regional finalists will receive scholarships of $1,000 to $3,000. The six individual and six teams National Awards will range from $10,000 to $100,000. The Siemens entry deadline was October 1, 2002.

Scholarship Directory

The seventh edition of the *SHARP Apprentice Scholarship and Financial Aid Guide* was developed and distributed to the 2002 SHARP Apprentices. MTSI developed the guide to provide the SHARP Apprentices with information on financial aid, scholarships, and college admission requirements. The scholarships listed in the guide are specifically geared towards students with an interest in science, mathematics, engineering, and technology fields. Each year coordinators, parents, and apprentices look forward to the update and distribution of this

document. Accompanying the guide was a CD-ROM with the guide that could be indexed and searched as well as other documents from the Department of Education describing the college application process.

Newsletter

MTSI published the ninth edition of the SHARP Newsletter. This year's publication reached an all time high of containing 24 pages of stimulating news articles and photos contributed by the apprentices, mentors and the SHARP Management Team. The SHARP Coordinators are encouraged to use copies of the newsletter in the SHARP Information Kits as a promotional tool.

V. PROGRAM ISSUES/CONCERNS AND STEPS FOR RESOLUTION

The 2002 Program was an overall success. As the Program Manager for SHARP, however, MTSI experienced some issues. Below are questions raised at the Open Forum during the Planning Conference and the resolutions.

1. Where should computer rental accounts be charged for SHARP?

Many coordinators submitted this question as a concern for the upcoming program year. NASA had contracted its computers through ODIN. This means that every computer has to be charged to a specific account. Many coordinators who were afforded the luxury of maintaining a computer year-round were no longer able to do so as of Fall 2000. Currently, the computers are not provided for the apprentices or the SHARP coordinators until the commencement of the summer program. Ms. Williams indicated that, in response to the question of where computers should be charged, there is not a uniform response that will cover all situations. The computer charge accounts vary at each Field Installation. She recommended that the SHARP Coordinator work with the NFISM to determine where the computers should be charged. The SSC SHARP Coordinator, Cassandra Ebanks, inquired when the computers would be available. Ms. Williams deferred the question to the group who agreed that in most cases computers are not accessible until the first day of the Program. Roberto Garza, DFRC SHARP Coordinator, commented that last year there was a lot of confusion at his Field Installation regarding which department to charge for the leased equipment and knowing this information up front would be helpful in preparing for the upcoming year.

2. Enrichment Activities: Do they have any effects on the research component?

Ms. Williams broached this topic by stating many of the comments from the EDCATS and End-of-the-Program Evaluations indicated program participants felt the number of enrichment activities was excessive. Ms. Williams reminded Coordinators that the program requires 80% of the apprentices' time devoted to research and 20% devoted to enrichment activities. Ms. Williams speculated that the implementation of the Joint Program Activity along with the enrichment activities might have been overwhelming. Her recommendation was to decrease the number of enrichment activities when there is a joint program activity conducted. Another approach to reducing the amount of time away from projects for enrichment is to conduct some of these activities during lunch. The LaRC SHARP Coordinator, Ms. Sonya Lawrence, asked how often enrichment activities should be conducted. Fellow coordinators' response was that typically no more than one day a week should be devoted to enrichment activities. President/CEO of MTSI, Ms. Pamela Piper, recommended that the mentors be provided with a schedule in the beginning of the summer delineating the schedule of enrichment activities. This would allow the mentor to prepare accordingly.

3. Recruitment: What is considered a "physically" challenged student?

This topic was brought up from a situation that occurred this year. An applicant's father called MTSI and revealed that his son had a mild case of "Tourette's Syndrome". Ms. Williams stated that according to American Disabilities Act, Tourette's Syndrome is considered a learning disability. This type of learning disability is considered a physical challenge as opposed to a mental challenge. Ms. Williams wanted all coordinators to be fully aware of how to handle this type of situation in the future. Ms. Williams recommended that in the event you receive an

eligible applicant with a disability discussed, contact MTSI and your Field Installation's Disabilities office. This way we could ensure that the student might receive the necessary accommodations. For this particular case there were concerns regarding the student's rights and the student's safety. It is possible for a student with Tourette's to have an episode that could cause bodily harm to someone in a laboratory setting. In accordance with the law, you are not allowed to disclose the disability with fellow co-workers, including the mentor. Ms. Brenda Collins informed the group that the law also states "reasonable accommodations" does not include putting someone in harm's way. Therefore, if the disability makes the person incapable of doing their assigned job then you are within your rights to obtain documentation from the physician. Ms. Williams re-emphasized the importance of coordinating with the disabilities office, because they are familiar with the ADA policies and procedures. As a result of the Planning Conference discussions, proposed changes to the manner in which the wording in SHARP documents was sent to Ms. Glasco for approval. The wording that was approved was to reflect the ADA guidelines. The documents affected by this change are: *2002 Program Guidelines, SHARP Brochure, 2002 SHARP InfoKit,* SHARP Promotional Videotape, SHARP Web Site, and additional qualifying information from EEOC. The approved changes and an ADA summary can be found in the Appendix.

4. Should seniors be allowed to participate in the Program?

Ms. Williams mentioned that after viewing the profile of participants last year during the 2001 Program Review session, we saw that only 17% out of 204 students were senior apprentices. Out of the 17%, the majority of those students were returning apprentices. Therefore, only about 17 slots were allotted for seniors. Ms. Williams posed a question to the group, "Should the

program be open to seniors?" The number of Field Installations that accepted seniors was split. Some Field Installations felt it was one final opportunity for applicants who were not accepted into the Program the previous year. Other Field Installations felt they should not participate, because once the Program begins they are rising college freshmen. Ms. Williams asked the group to ponder on this over the next few days, and at the end of the conference revisit the issue and come up with a standard policy that all NASA Field Installations would adhere to regarding senior students. MTSI and NASA have been working to standardize practices among the various Field Installations. This is an example of another issue that should be standardized the same across the board. At the end of the conference there was not a consensus on this issue. During the conference, a committee was established to review the eligibility criteria. The group decided to also let the committee decide whether seniors should be eligible to participate in the Program.

5. The final issue for discussion was insubordination.

Ms. Williams recapped the termination policy in the SHARP Program Guidelines. She cited that if an apprentice violates the established rules then he/she is to be given a verbal warning. If the apprentice violates the rules again, written documentation is sent home to the parent. The parent and apprentice both must sign the document acknowledging the infraction. If the behavior is repeated, the apprentice can be dismissed after conferencing with NASA Headquarters and MTSI. Ms. Williams further indicated in accordance with MTSI's policies, there are certain disciplinary actions that are grounds for immediate termination. She stated that these actions are listed in the Program Guidelines, the Apprentice Handbook, and the SHARP Coordinator's guide. These actions are: falsifying records, possession and/or usage of controlled substances,

insubordination, sleeping on duty, theft or fraud, and leaving the workplace without authorization during work hours. Ms. Williams stated that although SHARP Coordinators cannot terminate an apprentice without contacting NASA HQ and MTSI, they can suspend an apprentice from the position until further notice. This would remove the apprentice from the situation and allow the coordinator to contact the appropriate personnel to take action. Ms. Williams shared an incident last year where an apprentice was insubordinate to her mentor. The apprentice was suspended immediately and two days later was terminated from the program. Ms. Williams advised the SHARP Coordinators to discuss with the apprentices the possible ramifications of being terminated from the program.

Several concerns were placed on the agenda to be discussed during the Open Forum session at the 2003 planning conference.

I. Exit Interviews

Ms. Williams recommended that each Field Installation conduct exit interviews at the end of the summer program. The exit interviews should be conducted by the NFISM and the SHARP Coordinator and will allow them to review the previous summer and plan for the upcoming year. Suggested topics for discussion during the exit interviews include

- Procedures for gaining access during the year.
- Resources available (copying, mailing) during this time
- Set up communication schedule during recruitment selection period
- Review Goals and/or recommendations for the next year

II. Standards for Abstracts

Viewing high school students' project abstracts from other summer programs on the Internet, Mr. Strandquist was impressed with the format and professional appearance of the abstracts and the ability to quickly get an idea of student work accomplished. The applicability to SHARP immediately drew his attention, as abstracts would form a standard means of sharing what each apprentice accomplished during the summer and provide a window into SHARP for other students, mentors, and SHARP Management. Abstracts can be one of the most revealing tools for summarizing the quality of the apprentices' experiences. A standardized abstract format throughout SHARP could prove invaluable as an apprentice resource and also as an archive for SHARP.

Abstracts would give SHARP apprentices national recognition, as the abstracts could be available to the public on the web site. These same abstracts could assist in the promotion of SHARP, serving, for example, to give a sneak peek into SHARP for potential applicants. Abstracts can be a motivational tool, stirring up excitement in the areas of science, mathematics, technology, engineering, and geography. They would give credit to the SHARP Mentor as mentors' research and names would be included in the abstracts. Further, the quality of the mentored research could be identified and published for all to see, allowing targets for programmatic improvement to be set, and new goals to be developed. In this sense, abstracts would set a standard for research as mentors, coordinators, and apprentices could see the types and caliber of research that meet SHARP standards. Standards for abstracts were designed and published in the SHARP Planning Conference Report.

Field Installation Issues/Concerns and Steps for Resolution

Ames Research Center – Dr. Hill stated that there were some serious concerns about his role as Coordinator throughout the summer program. As a highly lettered, seasoned professional I am accustomed to project performance and project delivery, with up front respect and discussions about programs. I was frightened in the beginning of the program when I felt that I had no place to meet with parents. I felt also that I had not received the needed back-up support in securing mentors (this seemed, however, to be related to a computer server problem). In short, I did not understand the new chain of command as it evolved to exist for this year's program. I did not begin to fully understand that chain until early/mid June.

Resolution: There have been brief targeted talks with persons directly involved/responsible for the SHARP Program here at NASA Ames, and I believe that the framework is now clear to start off on a new, informed basis of interaction, plans.

Dryden Flight Research Center – No major problems reported at this time

Goddard Institute for Space Studies – No issues reported at this time

Goddard Space Flight Center – No issues reported at this time

Glenn Research Center – No issues or concerns at this time.

Independent Verification and Validation – The only problem encountered was a mentor was called to serve in the National Guard duty.

Resolution: The mentor did a remarkable job of keeping in contact with his apprentice via email and telephone. However, this posed more of a problem for the Coordinator who needed forms

completed, etc. We were able to complete most needed items via email, but signature is needed in person.

Johnson Space Center - There was one area of concern for the 2002 SHARP experience at JSC. One of the apprentices elected to attend a youth conference in Canada, which included the July 22-26 workweek.

Resolution: The apprentice was removed from the program. Protocol and procedures were followed to ensure that the apprentice understood the consequences to the choice. The apprentice was counseled as to the employment termination if he chose to attend the youth conference. He was given an evening to return home and discuss it with his parents and return to JSC and submit his decision. During this counseling time, he was also given a letter explaining the consequences and reminding the apprentice and his parents of the contract that each had signed stating full participation was required in the program. The student returned the next day to the NFISM and submitted the signed letter and finished out the day at JSC.

Kennedy Space Center – The entire program was implemented virtually incident free. The application deadline made it challenging for the SHARP Coordinator and NFISM to review, interview, and select apprentices within the end of the school year. However, apprentices were selected and notified within three weeks of the end of the school year. As previously mentioned, one apprentice was placed with a mentor whose project did not materialize as anticipated.

Resolution: The SHARP Coordinator and NFISM became aware of this situation early due to immediate site visits. The apprentice was placed with a new mentor by the end of the second

week of the program. The result was overwhelmingly positive for both the apprentice and the new mentor.

Langley Research Center

No major issues or problems developed.

Minor Problems included lack of software and hardware to run the program smoothly. For example the coordinator needs a portable CD burner. This was a problem because many of the students' presentations and papers were too large for a floppy disk. It was extremely difficult to get their information burned on a CD for transport to presentations and to the coordinator for archival purposes. There is also a need for PhotoShop software for PC to create graphics for programs and apprentices, a digital camera, etc. The lack of these tools made the coordinators' job much more difficult.

The problem from last year's coordinator existed this year with the assignment of computers to apprentices by mentors. Several of the mentors did not have access to extra computers for the apprentices.

Resolution There needs to be money set aside for rental of computers for apprentices whose mentors do not have them in their facility.

Marshall Space Flight Center

1. Several changes in the planned activities occurred. This was frustrating to the participant. The facilitators have jobs and other commitments and this was explained. A tentative calendar was issued but it was revised several times. The participants did not understand that

the second component of the program was enrichment and they wanted only to work on the project.

2. Mentors leaving on vacation. Very little, if anything can be done. However, most mentors assigned an assistant if they were absent.
3. Short projects. The coordinator conferred with chiefs and team leads to find other projects.
4. Participants wanting leave time. It is stressed in the interview that leave time is not permitted but parents will call anyway.
5. Difficulty in getting forms from mentors
6. Mentors changing titles and projects during the latter part of the session
7. Requesting abstracts very early in the program. Many of the mentors were not sure of the reasoning behind this request.

Stennis Space Center

There was a challenge presented by one apprentice who did not properly notify the SHARP Coordinator of her intended days of absence.

Resolution: After numerous conferences with all authorities MTSI, NASA personnel, parents of the apprentice, and the SHARP Coordinator, the apprentice was notified prior to absent days of possible consequences for violation of contractual agreement. The apprentice was given a three-day suspension as opposed to immediate termination.

Wallops Flight Facility

Wallops Flight Facility still needs to expand the number of applications.

VI. Recommendations for Program Enhancements

This section of the Final Report allows the coordinators to provide recommendations for the Program as a whole or state recommendations that they would like to implement at their individual Field Installations. These recommendations are instrumental in the continued advancement of the Program. Many of the recommendations that the Coordinators have offered in the past have been instituted and have helped to elevate the performance of the Program.

Ames Research Center

Mentor Recruitment

The successful recruitment of mentors will always present its share of challenges. We can never take for granted that there will always be a pool of willing, dedicated scientists who will mentor our SHARP Apprentices. Continued recognition of the mentors for their outstanding, generous work with our students is a must. We must also be mindful of the competition for laboratory space and mentor resourcefulness that the SHARP Program faces. Such awareness keeps up constantly functioning as ambassadors for the program at our respective sites, and constantly seeking ways in which we can be of assistance to our mentors.

African American Participation

One continued goal for next year is to increase the participation of African American applications for participation in the ARC SHARP Program. This year there were only four African American students, and only four applications were received from African Americans. All four possessed the qualifications for competitive acceptance, and were accepted into the

program. One continued suggestion is to visit schools with a high percentage of African Americans and recruit directly.

Dryden Flight Research Center

No recommendations at this time.

Glenn Research Center

Several mentors requested that evaluation forms be placed on-line. Mentors also mentioned that it would be a nice gesture to have mementos for those employees who served as alternate mentors to apprentices.

The SHARP Apprentices and the SHARP PLUS Apprentices expressed a desire to have a longer period of time in which to get to know each other. They felt that an hour and a half were not enough, especially since during that time they had to concentrate on the task at hand.

Goddard Institute for Space Studies

Increase the number of NASA GISS SHARP Apprentices from six to 20-25. We could replicate the GISS ICP research team model, by assigning a large number of SHARP Apprentices to CUNY, SUNY, NY, and CT Universities within a 50 mile radius of GISS, that have on-going NASA research projects. Research would be conducted on the campus four days a week and the SHARP Apprentices would travel to GISS one day a week for enrichment activities and interaction with GISS scientists.

Goddard Space Flight Center

No recommendations at this time.

Independent Verification and Validation

For our apprentices, a chance to visit Goddard Space Flight Center would be ideal. Their high school counterparts in the Science and Engineering Apprenticeship Program (SEAP) get this opportunity, and it would be nice for the SHARP students to go as well.

Johnson Space Center

No recommendations at this time.

Kennedy Space Center

- Move application deadline date to at least February 1, 2003.
- Meet with KSC summer student program managers to coordinate student programs summer calendar and activities.
- Consider new enrichment activities to include Steven Covey's "Seven Habits of Highly Effective People" and a community outreach activity where SHARP Apprentices interact with summer middle school students.

Langley Research Center

There is a significant need for continuous marketing of the SHARP Program. Many educators and students are unaware of the program. Recruitment needs to take place through organizations such as Cooperation Hampton Roads Organization for Minorities in Engineering (CHROME).

Representation at the National and State level Science Teachers and Mathematics Teachers annual conferences needs to be established. Increased funding to each center for marketing efforts that work best in their given area.

A clearer definition of what constitutes a handicap and a procedure for establishing whether a student actually has the handicap.

Videoconferences broken up into two-day session or if one day, have students introduce themselves and titles of projects and have an open floor dialogue which would encourage more interaction.

Marshall Space Flight Center

1. Devise a method for forms to be prepared electronically.
2. Prepare a packet on harassment for the mentors-- the video does not circulate in a reasonable amount of time, and when it is shown many are absent, in a meeting, etc.

Stennis Space Center

Presently, there are no recommendations for program enhancement.

Wallops Flight Facility

Emphasize recruiting efforts.

VII. Conclusion

The 2002 Program year was once again a success. Utilizing strong program management principles and effective cooperation from the SHARP Management Team, we overcame obstacles and solved problems as they arose. One hundred percent of the NASA Site Management rated SHARP as excellent or very good in the areas of program support, overall implementation, and meeting program objectives. According to the EDCATS Student Data Feedback Form students indicated, with an average score of 4.69, that the Program was a valuable experience. A 4.69 is in the very good to excellent range.

Some of the individual Field Installation's goals included introducing students to NASA and other educational technology; exposing students to careers in science, mathematics, and engineering; and increasing the number of program participants. All of these goals were accomplished at each Field Installation. The apprentices utilized the Internet to complete research or identify scholarship information. SHARP Apprentices interested in careers in aerospace rated a 56.2% while those interested in a career at NASA rated a 45.7%. They participated in a variety of enrichment activities and trips. Some of these trips included visits to local industry such as science or engineering corporations.

The success of SHARP is due to a diligent team of dedicated professionals from the educational community, private industry, and the NASA civil servants who are student-focused in their philosophy and proactive in their management. The SHARP Management Team takes pride in ensuring that SHARP will remain a strong force in the pipeline of NASA's Educational Programs.

Appendix

Changes in SHARP documents regarding ADA references

These are the changes in SHARP documents reflecting a closer alignment with ADA Guidelines. In every case, the current wording is shown followed by the phrase "Changes in Bold Below:" and the suggested revised wording. The proposed revised wording is based on the NASA document entitled "Reasonable Accommodation" and **EEOC TITLE 29--LABOR COMMISSION PART 1630--REGULATIONS TO IMPLEMENT THE EQUAL EMPLOYMENT PROVISIONS OF THE AMERICANS WITH DISABILITIES ACT.**

The list of documents for proposed amendments is shown below with the details on the following pages.

SHARP Document Name	Documentation and suggested corrections found on page(s)
2002 Program Guidelines *	2,3,4,5,6
SHARP Brochure	6
2002 SHARP InfoKit	7
SHARP Promotional Videotape	7
SHARP Web Site	8
Additional qualifying information from EEOC	9

* There are significant changes in the *2002 Program Guidelines* regarding the wording on disabilities. In the *2002 Program Guidelines*, page 100, under "Disability" there are changes to the description and the definition which characterizes the technically "disabled person" in addition to changes of the safety, accommodations, and hiring practices necessitated by the ADA law.

From *2002 Program Guidelines*, Page 4:

Traditionally underrepresented and physically challenged students have been especially encouraged to apply to SHARP.

Changes in Bold Below:

Students traditionally underrepresented by race, gender, national origin, and disability have been especially encouraged to apply to SHARP.

From the *2002 Program Guidelines*, page 91:

Equal Employment Opportunity
MTSI and NASA are equal employment opportunity employers. Although SHARP is primarily designed to serve students who are traditionally underrepresented in MSET fields, it is prohibited for any employer to refuse to hire, train, promote, or provide equitable employment conditions to any employee (apprentice) or applicant, or to discipline or terminate an employee solely on the basis of race, national origin, age, sex, marital status, religious beliefs, or physical disability. Therefore, all students may apply to the Program as long as they meet the basic eligibility requirements and should be treated accordingly if accepted into the Program.

Changes in Bold Below:

Equal Employment Opportunity
MTSI and NASA are equal employment opportunity employers. Although SHARP is primarily designed to serve students who are traditionally underrepresented in **SMTEG** fields, it is prohibited for any employer to refuse to hire, train, promote, or provide equitable employment conditions to any employee (apprentice) or applicant, or to discipline or terminate an employee solely on the basis of race, national origin, age, sex, marital status, religious beliefs, or **disability**. Therefore, all students may apply to the Program as long as they meet the basic eligibility requirements and should be treated accordingly if accepted into the Program.

From *2002 Program Guidelines*, Page 100:

Disabilities

SHARP is committed to complying with the Americans with Disabilities Act (ADA) which prohibits discrimination on the basis of disabilities. SHARP is designed for groups who are traditionally underrepresented - including persons with disabilities that limit a major life function. When accommodating any special needs of physically challenged students, especially with regard to field trips, the NFISM and the SHARP Coordinator should work with the NASA Disabilities

Program Coordinator, the EEO Office, or the Technology Transfer Office to resolve any special needs issues. SHARP Coordinators should pre-plan group events in such a way that they are open and accessible to all participants. Please be advised that special accommodations are not required for a physical disability that has not been disclosed.

Note: The Disabilities section below has been totally revised:

Disabilities

SHARP is committed to complying with the Americans with Disabilities Act (ADA) which prohibits discrimination on the basis of disabilities. SHARP is designed for groups who are traditionally underrepresented, including persons with disabilities. Like the Civil Rights Act of 1964 that prohibits discrimination on the bases of race, color, religion, national origin, and sex, the ADA seeks to ensure access to equal employment opportunities based on merit. **It does not guarantee equal results, establish quotas, or require preferences favoring individuals with disabilities over those without disabilities.**[1] In most circumstances, the ADA only prohibits employment discrimination against a "qualified individual with a disability." **It is necessary to determine whether the individual has a <u>disability</u> and is also <u>qualified</u>.**

Description of terms for Disability and Qualified:

1. **Disability**
   a. Physical or mental impairment that substantially limits one or more major life activities
      (1.) Major life activities are those basic activities that the average person in the general population can perform with little or no difficulty. Major life activities include caring for oneself, performing manual tasks, walking, seeing, hearing, speaking, breathing, learning, and working; for example.
      (2.) Determining whether a physical or mental impairment exists is only the first step in determining whether or not an individual is disabled. Many impairments do not impact an individual's life to the degree that they constitute disabling impairments. An impairment rises to the level of disability if the impairment substantially limits one or more of the individual's major life activities. Multiple impairments that combine to substantially limit one or more of an individual's major life activities also constitute a disability.
   b. Record of such an impairment **or**

c. Being regarded as having such an impairment

2. **Qualified**
   a. Satisfies the requisite skills, education, experience, and other eligibility requirements for SHARP, and
   b. Can perform the essential functions of such position with or without reasonable accommodation.

Direct Threat/Risk

An employer may require, as a qualification standard that an individual not pose a direct threat to the health or safety of himself/herself or others. Like any other qualification standard, such a standard must apply to all applicants or employees and not just to individuals with disabilities. If, however, an individual poses a direct threat as a result of a disability, the employer must determine whether a reasonable accommodation would either eliminate the risk or reduce it to an acceptable level. If no accommodation exists that would either eliminate or reduce the risk, the employer may refuse to hire an applicant or may discharge an employee who poses a direct threat. An employer, however, is not permitted to deny an employment opportunity to an individual with a disability merely because of a slightly increased risk.

Accommodation:

When accommodating any special needs of disabled students, especially with regard to field trips, the NFISM and the SHARP Coordinator must work with the NASA Disabilities Program Coordinator, the EEO Office, or the Technology Transfer Office to resolve any special needs issues. SHARP Coordinators should pre-plan group events in such a way that they are open and accessible to all participants. The program is obligated to make reasonable accommodation only to the physical or mental limitations resulting from the disability of a qualified individual with a disability that is known to the employer. Thus, an employer would not be expected to accommodate disabilities of which he/she is unaware.

(1) [Code of Federal Regulations] [Title 29, Volume 4, Parts 900 to 1899] [Revised as of July 1, 2000] From the U.S. Government Printing Office via GPO Access [CITE: 29CFR1630.16] [Page 348-373] TITLE 29--LABOR COMMISSION PART 1630--REGULATIONS TO IMPLEMENT THE EQUAL EMPLOYMENT PROVISIONS OF THE AMERICANS WITH DISABILITIES ACT

SHARP Reasonable Accommodation *

MTSI's policy, as NASA's, is to fully comply with the reasonable accommodation requirements of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA), 42 U.S.C. 12101 et seq. (1990), which prohibits employment discrimination on the basis of

disability. Under the law, Federal agencies must provide reasonable accommodation to qualified employees or applicants with disabilities, unless to do so would cause undue hardship. MTSI is committed to providing reasonable accommodations to its employees and applicants for SHARP in order to assure that those individuals with disabilities enjoy full access to equal employment opportunity. These guidelines cover applicants for SHARP as well as contracted SHARP Apprentices for part-time positions. SHARP Apprentices working at a NASA facility will be provided reasonable accommodations:

1. when a qualified applicant with a disability needs to apply for a position with SHARP.
2. when a qualified employee with a disability needs to perform the essential functions described under SHARP and/or to gain access to the workplace.
3. when an employee with a disability needs to enjoy equal benefits and privileges of SHARP such as participating in enrichment activities.

MTSI will work closely with the NASA facility to process requests for reasonable accommodation and, where appropriate, provide reasonable accommodation in a prompt, fair, and efficient manner.

Undue Hardship: If a specific type of accommodation causes significant difficulty or expense, NASA does not have to provide that particular accommodation. A determination of undue hardship is always made on a case-by-case basis, considering factors that include the nature and cost of the accommodation needed, and the impact of the accommodation on safety and other operations of the Agency.

* **Reasonable Accommodation: An adjustment made to the job requirements and/or any change in the work environment enabling a qualified individual with a disability to perform the essential duties of the job to which she/he is assigned, thereby enabling the individual to enjoy equal employment opportunities.**

From *2002 Program Guidelines*, Page 127:

UNDERREPRESENTED - Persons who come from groups who are not adequately depicted in science, engineering, and technology career fields. The primary focus of SHARP is directed towards groups that are traditionally underrepresented, such as females, African Americans, Hispanics, and American Indians.

Changes in Bold Below:

UNDERREPRESENTED - Persons who come from groups who are not adequately depicted in **science, mathematics, technology, engineering, and geography (SMTEG) career fields**. The primary focus of SHARP is directed towards groups that are traditionally underrepresented, such as females, African Americans, Hispanics, Pacific Islanders (natives of the Philippines, Guam, American Samoa, or Micronesia), **Native Americans, and disabled students**.

***SHARP Brochure*, 2002**

Traditionally underrepresented and physically challenged students are especially encouraged to apply to SHARP.

Changes in Bold Below:

Students traditionally underrepresented by race, gender, national origin and disability are especially encouraged to apply to SHARP.

***SHARP Brochure*, 2002**

Traditionally underrepresented groups in the fields of science, engineering, and technology include females, African Americans, Native Alaskans, Native Americans, Hispanics, and Pacific Islanders (natives of the Philippines, Guam, American Samoa, or Micronesia).

Changes in Bold Below:

Traditionally underrepresented groups in the fields of **science, mathematics, technology, engineering, and geography** include females, African Americans, Native Alaskans, Native Americans, Hispanics, Pacific Islanders (natives of the Philippines, Guam, American Samoa, or Micronesia), **and disabled students.**

SHARP 2002 InfoKit, Page 2

SHARP is specifically designed to attract and increase underrepresented students' participation and success rates in mathematics and science courses as well as to encourage career paths that help build a pool of underrepresented science and engineering professionals in the workplace. NASA also seeks diversity in all student support programs. Traditionally underrepresented and physically challenged students are especially encouraged to apply to SHARP. The following groups are traditionally underrepresented in science, mathematics, technology, engineering, and geography - Females, African Americans, Native Alaskans, Native Americans, Hispanics, and Pacific Islanders (Natives of the Philippines, Guam, American Samoa, or Micronesia).

Changes in Bold Below:

SHARP is specifically designed to attract and increase underrepresented students' participation and success rates in mathematics and science courses as well as to encourage career paths that help build a pool of underrepresented science and engineering professionals in the workplace. NASA also seeks diversity in all student support programs. Traditionally underrepresented and **disabled students** are especially encouraged to apply to SHARP. The following groups are traditionally underrepresented in science, mathematics, technology, engineering, and geography - females, African Americans, Native Alaskans, Native Americans, Hispanics, Pacific Islanders (Natives of the Philippines, Guam, American Samoa, or Micronesia), **and disabled students**.

SHARP Promotional VHS Videotape, (at 1 minute:26 seconds)

Narrator: "To join the SHARP team, talented students are encouraged to apply for SHARP with the understanding that the program gives priority to underrepresented students."

Changes in Bold Below:

Narrator: "To join the SHARP team, **all** talented students are encouraged to apply with the understanding that the program **is designed to increase the numbers of traditionally underrepresented students in SMTEG career fields.**

SHARP Web Site (Overview Page)

The following groups are traditionally underrepresented in science, mathematics, technology, engineering, and geography - Females, Blacks, American Indians, Hispanics, Pacific Islanders (Natives of the Philippines, Guam, American Samoa, or Micronesia), and the physically challenged.

Changes in Bold Below:

The following groups are traditionally underrepresented in science, mathematics, technology, engineering, and geography - females, **African Americans, Native Americans,** Hispanics, Pacific Islanders (Natives of the Philippines, Guam, American Samoa, or Micronesia), and **disabled students**.

SHARP Web Site (FAQ Page)

The following groups are traditionally underrepresented in science, mathematics, technology, engineering, and geography - Females, Blacks, American Indians, Hispanics, Pacific Islanders (Natives of the Philippines, Guam, American Samoa, or Micronesia), and the physically challenged.

Changes in Bold Below:

The following groups are traditionally underrepresented in science, mathematics, technology, engineering, and geography - **females**, **African Americans**, **Native Americans,** Hispanics, Pacific Islanders (Natives of the Philippines, Guam, American Samoa, or Micronesia), and **disabled students.**

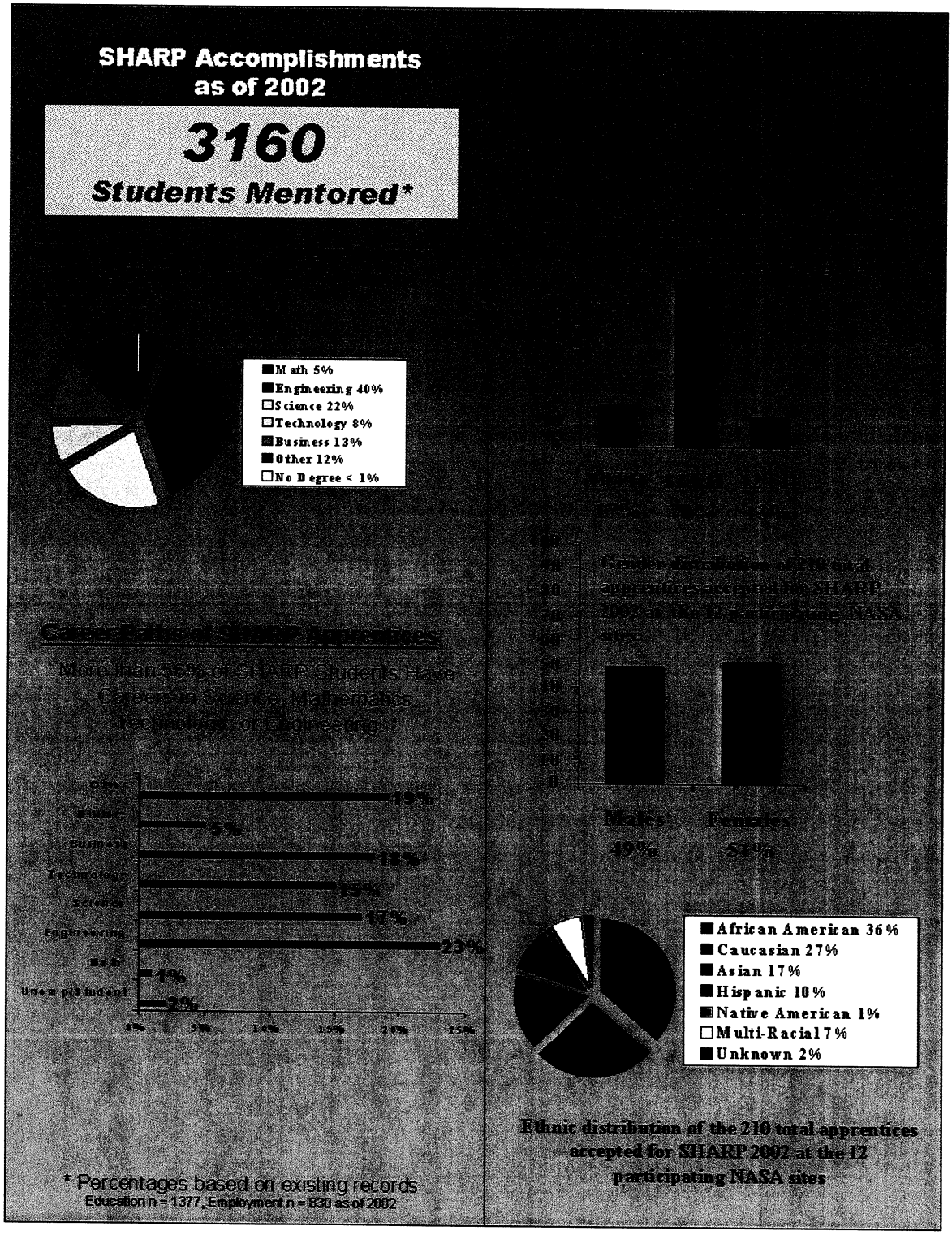
From EEOC FAQ
(Qualifying information for reference only)

Career Interest

From the 2002 EDCATS, SHARP Apprentices indicated the following career interests.

CAREER AEROSPACE FIELD	CAREER NON AEROSPACE FIELD	CAREER PRIVATE INDUSTRY	CAREER AT NASA	CAREER IN GOVERNMENT	CAREER IN UNIVERSITY RESEARCH	CAREER OTHER
56.2%	43.3%	22.9%	45.7%	11.9%	37.1%	22.4%

SHARP Fact Sheet



2002 SHARP ViTS
Monday, July 22, 2002
12:00 AM – 4:00 PM ET

Activity	Lead Person
Roll Call and Introductions (5.0 minutes)	Ms. Deborah Glasco
Field Installation Presentations (189 minutes)*	
Introduction of NASA Field Installation SHARP Managers and SHARP Coordinators (State name and position)	Field Install. Staff
Introduction of Apprentices (Apprentices should introduce themselves by stating their name, lab, and the topic of their research project)	Apprentices
Presentation of Field Installation Mission (One apprentice reports on Field Installation Mission supporting presentations could discuss projects conducted in relation to the Field Installations Mission)	Selected Apprentice(s)
Questions, Answers, and Remarks (10 minutes)	All Participants

Each Field Installation will be given a total of 17 minutes to introduce apprentices and give presentation. We are recommending 2 minutes for introductions and 15 minutes for presentation. IV&V, GISS, and Wallops will be given 12 minutes.

2002 ViTS Agenda

Monday, July 22, 2002
12:00 AM – 4:00 PM ET

Time	Field Installation	Presenter
12:00	*NASA HQ - Introductions and Roll Call*	*Ms. Deborah Glasco*
12:05	*Marshall Space Flight Center*	*Nicholas Case*
12:22	*Johnson Space Center*	*Pegah Javidpour*
12:39	*Goddard Institute for Space Studies*	*Damilola Alade*
12:51	*Kennedy Space Center*	*Lauren Milne, Jennifer Yates Caroline Peterson, Joshua Wales Tracey Harrop, Nicole Barreto*
1:08	*Stennis Space Center*	*Jane Doe*
1:25	*Wallops Flight Facility*	*Sidrah Ahmad*
1:37	*Langley Research Center*	*Sherrica Newsome, Aneesh Venkat, Justin Holloman, Whitney Johnson, Malik Saunders*
	GISS Signs Off Due to Logistics	
1:54	*Ames Research Center*	*Jennifer Chien*
2:11	*Independent Verification & Validation*	*Thomas Kromer, Brendan Gibat*
2:23	*Glenn Research Center*	*Allen Guzik, Torik Blankson, Julian Crawford*
2:40	*Dryden Flight Research Center*	*Carla Hernandez*
2:57	*Goddard Space Flight Center*	*Luke Stewart, Nicholas Gordon Jacob Flatter, David Lemus*
3:14	*Questions and Answers*	*All participants*
3:24	*Conference Summation*	*Ms. Deborah Glasco*

SHARP Evaluation Questions

Mentors

SHARP Mentor Evaluation

Basic Mentor Information

How many Apprentices did you have?

How would you rate the overall implementation of this year's SHARP Program?

How would you rate the day to day activities of this year's SHARP Program?

Mentor Evaluation of the Apprentice

Please rate the following by clicking the button that best describes the quality of your Apprentice's work.

How would you rate the overall performance of your Apprentice during this year's program?

How would you rate your Apprentice's level of maturity?

How would you rate your Apprentice's work place disposition?

How would you rate your Apprentice's ability to work independently?

How would you rate your Apprentice's ability to work as a member of a team?

How would you rate your Apprentice's ability to adapt and learn quickly?

How would you rate your Apprentice's quality of work?

How would you rate your Apprentice's dependability?

How would you rate the level of cooperation shared between you and your Apprentice?

How would you rate your Apprentice's knowledge level of mathematics, science, engineering and/or technology while performing the assigned tasks?

Mentor Evaluation of NFISM

Please click the button that best corresponds with your observations and interactions with the NFISM

How would you rate the level of communication shared between you and the NFISM?

How would you rate the level of assistance shared between you and the NFISM?

Mentor Evaluation of the SHARP Coordinator

Please click the button that best corresponds with your observations and interactions with the SHARP Coordinator.

How would you rate the quality of communication shared between you and the SHARP Coordinator?

How would you rate the quantity of communication shared between you and the SHARP Coordinator?

How would you rate the receptiveness of communication with the SHARP Coordinator?

How would you rate the level of support provided to you by the SHARP Coordinator?

Mentor's Self-Evaluation

How would you rate your level of performance as a SHARP Mentor in the following areas?

Provided meaningful and challenging work for the Apprentice

Helped Apprentice to develop an abstract of his/her work

Assisted Apprentice in the preparation of his/her research/technical papers

Assisted Apprentice in the preparation of his/her oral presentation including visuals

Signed and dated time sheets of the contractor Apprentice

Spent approximately one hour per day with the Apprentice

Would you consider being a SHARP Mentor again?

If not, please explain:

Mentor Recommendations

In order to make the program an enjoyable experience for all, we welcome your comments and recommendations.

What recommendations would you like to make toward the improvement of the SHARP Program?

Would you like to share any comments about your Apprentice or the Program?

SHARP Coordinator Evaluation Questions:

How would you rate the overall implementation of this year's SHARP program?

How would you rate the day-to-day activities of this year's SHARP program?

Coordinator Evaluation of Apprentices

How would you rate the overall performance of this year's Apprentices during the program?

How would you rate the Apprentice's level of maturity?

How would you rate the level of communication shared between you and the Apprentices?

How would you rate the level of cooperation shared between you and the Apprentices?

Coordinator Evaluation of Mentors

How would you rate the level of communication shared between you and the SHARP mentors?

How would you rate the level of assistance shared between you and the SHARP mentors?

How would you rate the quality of meaningful and challenging work for the Apprentices provided by the Mentor?

How would you rate the level of help provided from the Mentor for Apprentices to develop an abstract of his/her work?

How would you rate the quality of assistance to Apprentices in the preparation of their research/technical papers provided by the Mentor?

How would you rate the quantity of assistance Apprentices received in the preparation of their oral presentation including visuals provided by the mentor?

Rate the consistency at which the Mentor signed and dated time sheets of the contractor Apprentices.

Mentor spent approximately one hour per day with the Apprentice.

Coordinator Evaluation of NFISM

How would you rate the level of communication shared between you and the NFISM?

How would you rate the level of assistance shared between you and the NFISM?

Did you meet with the NFISM for a mid-program review?

Did you meet with the NFISM for an end-of-program exit interview?

Coordinator Evaluation of MTSI

How would you rate the level of communication shared between you and MTSI?

How would you rate the level of assistance shared between you and MTSI?

Joint Project between the Commuter Program

How would you rate the overall quality of the project?

What was the rate of participation?

Coordinator Self Evaluation

How often did you visit the Apprentices at their work site?

What recommendations would you like to make that could help to enhance the SHARP experience?

Would you like to share any comments about the Apprentices or the Program?

NASA Field Installation SHARP Manager Evaluation Questions:

NFISM Basic Information

How would you rate the overall implementation of this year's SHARP program?

How would you rate the day-to-day activities of this year's SHARP program?

NFISM Evaluation of Apprentice

How would you rate the Apprentices' performance during the Program based on your level of interaction with them?

What was your level of interaction with the SHARP Apprentices?

NFISM Evaluation of Mentors

How would you rate the quality of communication shared between you and the SHARP Mentors?

How would you rate the quantity of communication shared between you and the SHARP Mentors?

How would you rate the receptiveness of communication shared between you and the SHARP Mentors?

How would you rate the level of assistance shared between you and the SHARP Mentors?

NFISM Evaluation of SHARP Coordinator

How would you rate the quality of communication shared between you and the SHARP Coordinator?

How would you rate the quantity of communication shared between you and the SHARP Coordinator?

How would you rate the receptiveness of communication shared between you and the SHARP Coordinator?

How would you rate the level of assistance shared between you and the SHARP Coordinator?

NFISM Self Evaluation

Did you meet your Program objectives for this year?

Did you meet with the SHARP Coordinator for a mid-program review?

Did you meet with the SHARP Coordinator for an end-of-program exit interview?

What program objectives were not met this year and how can that be improved or changed for next year?

What recommendations would you like to make that could help to enhance the SHARP experience?

Would you like to share any comments about the Apprentices or the Program?

Dryden Flight Research Center

First Name	Last Name	Address	City	State	Zip Code	Project Title
James	Gutierrez	14831 Sandy Ridge Road	Elizabeth Lake	CA	93532	Network Support
Carla	Hernandez	43731 22nd St E	Lancaster	CA	93535	Flight Propulsion
Jeanette	Janvrin	6322 Prairie Court	Quartz Hill	CA	93536	Network Support
Rocio	Ortega	44629 Kingtree Ave	Lancaster	CA	93534	C-17 Propulsion Health ManagementProgram
Crystal	Powell	38339 Sierra Grande Avenue	Palmdale	CA	93551	Calibrating Instruments
Tania	Solis	37746 Smoke Tree St	Palmdale	CA	93552	Installing Operating System
Kelly	Toledano	3102 Merricotte Dr	Palmdale	CA	93550	Flight Operations
Antony	Tran	44215 32nd St West	Lancaster	CA	93536	Installing Operating System
Bryan	Witt	44345 Shad St	Lancaster	CA	93536	WATR Fiber Optics/cable Survey Project
Kendra	Titus	3443 Whisper Sands	Rosamond	CA	93560	F-15 Intelligent Flight Controls (IFCS) Project

Apatira, Latifat "Studying the Physiological Effects of Sleep Deprivation"	50 Eastwood Drive San Francisco, CA 94112 muslimah4ever@hotmail.com
Armas-Cardona, Gabriel "Clicking on the Stuff Life is Made of"	5705 Keith Avenue Oakland, CA 94618 gaccm@techie.com
Ashley, Marcus "Mars Exploration in the Classroom Final Report"	735 Boyd Avenue Richmond, CA 94805 marcus440950124@aol.com
Bitton, Ephrat "Intrinsyx Technologies and the Space Station Biological Research Project"	3150 Greer Road Palo Alto, CA ephrat@hotmail.com
Carreon, Paul "Postdoc"	414 Ford Street Daly City, CA 94014 RiCe8oY65o@aol.com
Casanova, Robert "Aerodynamics and Wind Tunnel Operations"	71 Millar Avenue San Jose, CA 95127
Chen, Anna "Effects of Facial Orientation and Edema on the Identification of Words Based on a Given Viseme"	21836 Woodbury Drive Cupertino, CA 95014 annachen08@hotmail.com
Chi, Jonathan "The Effects of Micro-Gravity on Speech Intelligibility"	3687 LaDonna Avenue Palo Alto, CA 94306 ChiB3nY33@cs.com
Conell-Price, Jessamyn "Viability of *Drosphilia melanogaster* Larvae in Hypergravity"	873 Clara Drive Palo Alto, CA 94303 jcpenni@juno.com
Dayaw, Jason "The Requirements Development Process for the SSBRP Software Control Panel"	574 Arastradero Road Palo Alto, CA 94306 jdayaw@aol.com
Gesek, Caleb "Studying The Physiological Effects of Sleep Deprivation"	740 Hillock Drive Hollister, CA 95023 csgesek@yahoo.com
Hilgareda, Alexandra "En Route Data Exchange (EDX) Improving CTAS"	2326 Four Seasons Court San Jose, CA 95131 ahigareda@moonman.com

Glenn Research Center

Jonathan Ballard
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Maple Heights, OH 44127

Measuring the Temperature Gradient in the Deposition of Various Metals

Jamal Baz
3184 West 52 Street
Cleveland, OH 44102

MOBI: Microgravity Observations of Bubbles

Thomas Blank
15303 Lake Avenue
Lakewood, OH 44107

Beta testing Visual Basic Calibration Software

Kirsten Bossenbroek
1269 Cherry Wood Way
Uniontown, OH 44685

Data Analysis for Use in Pulse Detonation Engines

Robert Browning, III
677 Lakeview
Cleveland, OH 44108

My Contribution to NASA: The PRACA System

Jocelynn Casselle
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Elyria, OH 44035

Polymer Analysis

Shannon Conrad
527 Princeton Avenue
Barberton, OH 44203

The NASA SHARP Experience: Launching into a Successful Future

Timothy Day
16884 S. Meadowpark
Walton Hills, OH 44146

Analyzing the Flow Parametrics of Combustion Systems using FPVortex

Timothy Garcia
2754 East Erie Avenue
Lorain, OH 44052

IT Support

Cirse Gonzalez
1569 Clarence Avenue
Lakewood, OH 44107

My Summer As A Techie

Christopher Gruber
394 Evergreen Court
Avon Lake, OH 44012

Structural Analysis of a Microgravity Research Rig

Noelle Gwin
3760 Thurgood Avenue
Cleveland, OH 44115

The Exciting World of Microgravity

Donea James
1657 East 73 Street
Cleveland, OH 44103

Working As An Electrical Technician

Janelle Jones
4208 Woodstock Drive
Lorain, OH 44053

My Lesson in Web Page Modification and Research Assistance

Marjorie Martorell
4013 Henritze Avenue
Cleveland, OH 44109

DNA Gold Nanoparticle Assembly

Myron Matlock, Jr.
25570 Tungsten Road
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My Summer Quest at NASA: Myron in the Research and Technology Sector

Benjamin McCann
4341 Prestwick Crossing
Westlake, OH 44145

The Behavior of Droplets on Impact

Shauna Mintz
34280 Sherbrook Park Drive
Solon, OH 44139

Firing Up My Future

Nambi Nallasamy
19708 Summer Place Drive
Strongsville, OH 44149

A Study of Microphone Stand Reflection

Monica Patel
7625 Lindsay Lane
Solon, OH 44139

Photovoltaic Education

Charlena Pierce
1425 East 112 Street
Cleveland, OH 44106

Multimedia Project

Marcus Roddy
3715 East 104 Street
Cleveland, OH 44105

Project Venus Animation

Theresa Serna
3215 Trowbridge Avenue
Cleveland, OH 44109

Measuring Viscosity Using Stokes' Law

Krystyna Shaffer
4230 Brookside Blvd.
Cleveland, OH 44135

An Opportunity of a Lifetime : NASA Glenn Research Center 2001

Rashi Singhal
20232 Winding Trail
Strongsville, OH 44149

Applying Web Development to NASA Activities and Information

Marcus Sutton
3435 Regent Road
Cleveland, OH 44127

Project Venus Animation

Priya Vijay
4260 Marquette Blvd.
North Olmsted, OH 44070

Topics of Tribology

Shanthi Vuppala
3818 Willow Run
Westlake, OH 44145

Different Video Techniques to Show Fluid Flow

Fred Wilhelm
6437 Columbia Road
Olmsted Falls, OH 44138

The World of Combustion

SHARP APPRENTICE PROJECT TITLES

NAME	PROJECT TITLE
Justin Holloman	CERES Instrument Working Group Web Site
Rachael Owens	Modeling the Tumbleweed
Meredith Dunbar Whitney Johnson	Effects of Atmospheric Aerosols on Isolation Levels
Sherrica Newsome	The Environmental Effects Coal Waste Impoundments
Ryan Pope	Remote Sensing Applied to Louisiana FUDS Initiatives
Joel Galvin	Website Design & Development
Alonzo Coleman	Gemini Rider
Zaid Abdullah	Flutter In Flight
Aaron Albin	Flutter In Flight
Andre Williams	The SHARP Newsletter & Creating A Media Contact List
Jahmil Edwards	Transonic Smart Vehicle Force & Moment Model
Stefanie Harper	The Calibration of Electrical Microphones
Miles Davis	The Evaluation of The Coefficient of Friction on Various Runway
Bradford White	The Evaluation of The Coefficient of Friction on Various Runway
Malik Saunders	The Study of Aerodynamic Characteristics of a Model VTOL Airplane Design on finding the Best Wind Tunnel Balance
Aneesh Venkat	A non-linear Optical Depth Model to Predict Global Warming
Turhan Carroll	Flow Field Analysis of the 14x22 Subsonic Wind Tunnel
Marcus Smith	Designing and Modeling the Interface for 3DS Max 4.0
William Davis	Education Outreach
Cynthia Shepheard	The Validation of Structural Applications According to Principles of the Scientific Method
Franklin Roberson	Pushing the Limit
Mark Rawls	Innovative Methodologies for the Analyses of Physiological and Subjective Data in a Crew Systems Environment
Stephen Rawls	Sensor based control of Mobile Robot
Arrion Dennis	Honey, We Shrunk the Rocket
Robert Taylor	Honey, We Shrunk the Rocket
Jane Wie	The Physiological Effects of Prolonged Stay at Microgravity and Current Counter Measures along with Artificial Gravity

2002 JSC SHARP Apprentices, Address, and Project Title

Cyril	Alikah	8911 Pecan Place Drive	Houston	TX	77071
		X-38 Vehicle 201 Mechanical Integrations Aid			
David	Blackstock	628 West Brentwood	Channelview	TX	77530
		Improving Computerized Test Monitoring Systems			
Myles	Goodman	6514 Wynnwood	Houston	TX	77008
		Information Modeling Tool			
Russell	Goodman	6514 Wynnwood	Houston	TX	77008
		SES External Web Page Update and RMS Software Revision			
Chris	Harding	122 Rollingwood	Baytown	TX	77520
		Call Detail Report			
Daniel	Hernandez	206 Skylark	Pasadena	TX	77502
		Exit Presentations Box Assembly (EPBA)			
Krystal	Horace	14211 Candleshade	Houston	TX	77045
		ISD Web Development			
Pegah	Javidpoor	11911 Briar Forest Dr.	Houston	TX	77077
		Development of Systems Briefs Document (ISS Console Handbook)			
Matthew	Johnson	8515 Greenbush	Houston	TX	77025
		T-38 Equipment Stowage for Martin-Baker Ejection Seat;			
		T-38 Instrument Panel Mockup for Instrument Location Determination			
Julie	Len	4804 Linden	Bellaire	TX	77401
		Preserving Acetaminophen and Promethazine Metabolites in Urine Samples at Ambient Temperatures			
Tony	Lu	15514 Heritage County Court	Friendswood	TX	77546
		X-38 Secondary Pyro System, Zworld BL2100			
Carol	Martinez	7017 Brownwood	Houston	TX	77020
		The Robonaut Chest Plate			
Catrina	Nelson	815 Knotty Elmwood Trail	Houston	TX	77062
		Technology Information Management			

SHARP 2002
Apprentice Information

	Last	First	Street	City	St	Zip	H Phone	Personal Email
1	Atmaram	Neil	985 Audubon Road	Merritt Island	FL	32953	321-453-5444	AtmaramK@aol.com
2	Barreto	Nicole	692 Pickfair Terrace	Lake Mary	FL	32746	407-323-9782	kina2255@msn.com
3	Brown	Leslie	13631 Dornoch Dr.	Orlando	FL	32828	407-282-8943	starspace1@aol.com
4	Caesar	Jessica	507 Paw Paw Street	Cocoa	FL	32922	321-633-2312	alexi756@yahoo.com
5	Cereska	Angela	640 Caribbean Rd.	Satellite Beach	FL	32937	321-773-9897	Tangela830@aol.com
6	Clark	Jocelyn	201 International Dr. #735	Cape Canaveral	FL	32920	321-784-6543	m_jocelyn1@yahoo.com
7	Culver	Lauren	470 Bella Capri Dr.	Merritt Island	FL	32952	321-454-7385	wakeboardcowgirl@cfl.rr.com
8	Ehrhardt	Rebekah	20591 Nettleton Street	Orlando	FL	32833	407-568-3806	griffin49@excite.com
9	Goldin	Gideon	470 River Grove Court	Merritt Island	FL	32953	321-454-4318	gideongoldin@yahoo.com
10	Harrop	Tracey	15 Trilaby Branch	Longwood	FL	32779	407-333-3396	traceyharrop@hotmail.com
11	Kelley	Iris	170 Elm Ave.	Satellite Beach	FL	32937	321-779-4955	shibby77k@hotmail.com
12	Kemmerer	Charlene	448 Carmine Drive	Cocoa Beach	FL	32931	321-783-1599	redstar720@aol.com
13	Kersten	Stephanie	400 Banyon Tree Circle, #102	Maitland	FL	32751	407-681-2170	Ikonnekt@msn.com
14	Lee	Charlene	3200 Chatsworth Lane	Orlando	FL	32812	407-282-6071	navi186@hotmail.com
15	Lewis	Shaqueena	1130 Wedgewood Lane	Titusville	FL	32780	321-268-4492	shaqcovey34@hotmail.com
16	Londono	Andrea	2767 Devie Court	Orlando	FL	32822	407-380-1525	soilaunica1@yahoo.com
17	Marshall	William	834 Algaringo Ave., S.E.	Palm Bay	FL	32909	321-768-0909	Star77x@hotmail.com
18	McElroy	Kourtney	6730 Hundred Acre Dr.	Port St. John	FL	22927	321-504-4204	kourtney_0000@yahoo.com
19	Miller	Tiffany	971 Bouganvillea Drive	Rockledge	FL	32955	321-636-0273	tmtime@bellsouth.net
20	Milne	Lauren	2250 Plantaton Drive	Melbourne	FL	32935	321-255-1721	Lauren4929@aol.com
21	Ortiz	Enrique	1538 Bullbush Way	Oviedo	FL	32765	407-971-0878	gabriel1425@hotmail.com
22	Peterson	Caroline	1620 Wilmington Drive	Melbourne	FL	32940	321-259-1581	caropetrs@aol.com
23	Rodriguez	Eva	P.O. Box 780101	Orlando	FL	32878	407-273-0886	elr6882@aol.com
24	Smith	Leroy	1919 Woodhaven Circle	Rockledge	FL	32955	321-504-3329	streetblazer2003@aol.com
25	Wales	Joshua	701 Solona Shores Drive, A208	Cape Canaveral	FL	32920	321-868-5592	walesjd@yahoo.com
26	Williams	Jessica	5355 Broad Acres Street	Merritt Island	FL	32953	321-452-4614	jwilliams98@cfl.rr.com
27	Wright	Christine	733 Spring Island Way	Orlando	FL	32828	407-384-8679	crwright85@hotmail.com
28	Yates	Jennifer	3145 Treetop Drive	Titusville	FL	32780	321-264-3444	yatesptjr@netzero.net

Name	Address	Project
Alexis J. Adams	6001 Cherokee Hills Drive Huntsville, AL 35810	*Materials Compatibility With Precipitant Solution for Protein Crystal Growth Experience*
Justine Betts	784 Toney School Road Toney, AL 35773	*TD30 Data Repository*
Swaroop Bommareddi	600 Wellingburg Road Huntsville, AL 35803	*Assessing theFfunctionality of the LN200 Information tool and the Amalgamation of the Inertial Navigation System*
Letisha R. Brazile	120 Matt Phillips Road Huntsville, AL 35806	*Electron Microscopy*
Tracy A. Brewster	1113 Summerwood Circle Huntsville, AL 35803	*Causes and Trends in Rocket Engines Failures*
Nicholas L. Case	26654 Copland Road Athens, AL 35613	*Flight Critical Faulty Tolerance Using Reduandant Voting Algorithms*
Cynthia E. Chester	22284 Mooresville Road Athens, AL 35613	*Chemical Stability of Aqueous and Organic Solutions for Solute Degradation in Preparation of Iterative Biological Crystallization Flight Investigations*
Joel T. Gabre	6306 Cedar Point Drive Huntsville, AL 35810	*Flight Mechanics for the 2nd Generation Reusable Launch Vehicle Program*
Jerry H. Hsu	9731 Wallwood Drive Huntsville, AL 35803	*Fabrication & Analysis of Advanced Composite Structures*
Gregory J. Isaacs	2835 Winterberry Way Hampton Cove, AL 35763	*Manufacturing and Testing of Advanced Composite Materials*
Alisia D. Goree	2627 Oakdale Terrace Huntsville, AL 35810	*RICO Data Operations Methodology*
Julie L. Kiessling	828 Jacqueline Drive Huntsville, AL 35802	*The Expression and Purification of Green Fluorescent Protein*
Alicia C. Lane	4306 Lakeview Drive Huntsville, AL 35811	*Prototype Fabrication of the Patent: Cross-cell Sandwich Core and Meteoroid/Orbital Debris Impact Probability Calculations*
Kendrick T. Lightfoot	4902 B Cotton Row Huntsville, AL 35816	*Cabling Effects on the Structural Dynamics Behavior of the Space Shuttle Main Engine (SSME) Preburner Fuel Pressure Transducer Assembly*
Demetrice L. Moore	5025 Kyle Lane Huntsville, AL 35810	*Compatibility With Precipitant Solutions for Protein Crystal Growth*
Porsha V Pettaway	195 Golden Harvest Road New Market, AL 35761	*Reusable Launch Vehicle Concepts*
Joyce L. Pressley	1081 Sandy Springs Road Huntsville, AL 35805	*The Design of the Individual Development Plan Database*
Timothy J. Reyes	121 KittyHawk Lane Harvest, AL 35749	*OPAD/EDIFIS Neural Network Hardware Assembly*
Fedoria E. Rugless	24884 Dear Ridge Lane Athens, AL 35613	*Developing A User's Guide for the Sensor Optical Calibration Robot*
Ashley N. Smith	102 Reba Road Hazel Green, AL 35750	*Oxygen Compatibility Reference System*
Annette S. Wilson	102 Eden Brook Drive Madison, AL 35757	*Assessment of MSC/Dytran Capabilities of Fluid/Structure Interaction of a Turbine Blade*

Ariel Aguillard
9720 Hammond St.
New Orleans, LA 70127
"Calibration Processing"

Erica Fornea
415 F.Z. Gross Rd.
Picayune, MS 39455
"Microgravity and its Effects on the Human Sensory Organs"

Vernon Ladner
1905 McLaurin St.
Waveland, MS 39576
"Network Verification"

Dominique Lindsey
2401 Middlecoff Dr.
Gulfport, MS 39503
"Remote Sensing and its Application at Jackson State University"

Crystal Magee
211 Rosa St.
Picayune, MS 39455
"Network Services"

Brandon Mainer
317 West Honors Point Ct.
Slidell, LA 70458
" Windows 2002- Upgrading Network Services"

Robert Morell
19221 Champion Cir.
Gulfport, MS 39503
"Remote Sensing Applications"

Brittany Spikes
1201 Pine Wood Dr.
Picayune, MS 39455
" The Composition of Metals and Alloys"

Independent Verification and Validation

1. Codey Smith
   349 Merle Yost Road
   Core, WV, 26529
   Project Title: Design Calculator for a Single Stage Rocket

2. Brendan Gibat
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   Project Title: The Basic Orbital Mechanics of Celestial Objects

3. Thomas Kromer
   Rt. 1, Box 85
   Independence, WV 26374
   Project Title: Project Information and Tracking System (PITS) Maintenance and Upgrade

Wallops Flight Facility

1. Neil Bonsteel
   30517 E. Rustic Dr.
   Salisbury, MD 21804
   Project: Ocean Research Project Web Page Development

2. Sidrah Ahmad
   712 Walnut St.
   Pocomoke, MD 21851
   Project: Human Stress Lab Web Page Development

3. Lucita Waters
   P.O. Box 110
   Wattsville, VA 23483

4. Amanda Deal
   4221 Division St.
   Chincoteague, VA 23336
   Project: Research and Compare Ozone Levels in the Region

INTRODUCTION

The Summer of 2002 was the twenty second year of the Summer High School Apprenticeship Research Program (SHARP) at Ames Research Center (ARC) in Moffett Field California. This program continues to be the result of a mutually productive relationship between NASA Headquarters, Ames Research Center and Modern Technology Systems, Incorporated (MTSI).

The ARC SHARP Program was headed by Dr. Ray A. Hill, SHARP Faculty Coordinator and Ms. Brenda Collins, NASA Field Installation Manager, in the Education Branch which is headed by Mr. Donald James. There were 30 apprentices selected to participate in the ARC SHARP 2002 Program, a 20% increase over the 25 participants in the 2001 program. The official program commenced on Monday, June 17, with welcome addresses from Deputy Director Nancy Bingham and University Affairs Specialist Ms. Brenda Collins. Following a detailed introduction to the goals and expectations of the SHARP Program, SHARP Apprentices, Mentors, and specific attention to safety issues, the 2002 SHARP Apprentices were then introduced to their Mentors. A group photograph was taken, and the apprentices were officially "led off" to their respective work sites for the summer SHARP experience. The program ended on Friday, August 09. Mentors, parents and families were invited to attend the Culminating Program held on Thursday, August 08. A Certificate of Participation in SHARP was presented to each of the SHARP apprentices at the Culminating Program. Certificates of Appreciation and "mugs" were also presented to all of the Mentors, as a token expression of our gratitude for generously sharing their time, laboratory space, and expertise with the SHARP Apprentices.

Enrichment activities for the 8 weeks included a tour of the Life Sciences Space Research area, a tour of the Super Computer Facility here at NASA Ames, a tour of one of the Wind Tunnels (always a favorite with the students), a lecture on "Astrobiology" by Dr. Christopher McKay, formal participation by several SHARP students in the annual Science Fair Day here at NASA Ames, formal presentations on the interview process and portfolio building, and a guest lecture presentation by Mr. Robert Jow, high school guidance counselor at Lowell High School, on the college admissions process. There was also a lecture on the "Aerodynamics of Sports Balls" which the students also enjoyed. There were other events on site to which the students were to attend – a lecture/reception by Dr. Frederick Humphries, President of NAFEO, and a special program hosted and presented by the African American Advisory Council. The students were also formally introduced to the need to be aware of safety issues in all aspects of their presence here.

Program Summary

The 2002 NASA GISS SHARP Program provided an opportunity for six students to see how science and the research process works. These six research apprentices had a unique opportunity to work on research teams, consisting of high school and college students and teachers, as well as NASA scientists and graduate students.

NASA GISS provided additional educational activities, such as weekly writing seminars, scientific book club, science content seminars and computer technology workshops; social and cultural activities, trips to NASA, NSF and NOAA sponsored research laboratories and an opportunity to interact with NSF sponsored research scholars.

Program Summary

The Summer High School Apprentice Research Program at the NASA Glenn Research Center was successful. Apprentices continue to possess outstanding skills and the ability to adapt to a new setting in a short period of time.

Thirty apprentices began on June 18 and twenty-nine apprentices completed the SHARP Program at this installation. The group, comprised of seventeen females and twelve males, was geographically and racially diverse. Three apprentices returned from last year's program and one apprentice who was in the GRC NASA Plus program last year became an apprentice this year.

Overall apprentice reactions to the program were positive. Returning apprentices found their tasks challenging and they were glad that they had returned for a second or third year. New apprentices welcomed the opportunity to interact with "real" engineers and scientists and to be part of a bona fide work environment.

This year's mentors were generally pleased with the program and the students. Some of the mentors had not participated in the program in recent years and they were impressed at how the program had grown.

"Ruminations of the Week" was continued as a way to help apprentices stay focused and to suggest tasks that could be done in the event of "down time." This concept was well received and several apprentices included their "ruminations" in their portfolios.

Many apprentices were disappointed in the fact that, due to scheduling problems, this installation was not able to participate in the Joint Program Activity. On the other hand, several students took advantage of a robotics seminar offered at the Aerospace Education Laboratory.

Apprentices' portfolios were displayed at this year's Awards Dinner. Parents and mentors who attended the Awards Dinner were impressed with the quality of work displayed in the portfolios.

Thomas Kromer
Rt. 1, Box 85
Independence, WV 26374
Project title: Project Information and Tracking System (PITS) Maintenance and Upgrade

8. Program Summary (overview of summer session)

The program began with recruiting from the 25 High Schools within a 50-mile radius of the facility. Applications were available to schools in January and interviews were held here in April. Students began working June 17 with their first day being composed primarily of paperwork. They completed all designated SHARP Apprentice forms as well as Facility in-processing forms. They were fingerprinted and given an ID badge for the summer. The also participated in orientation (attached agenda) which included Sexual Harassment training, building orientation, security training, etc. They also were directed to complete the Basic Computer Security IT training that was a facility requirement (attached copies of completion certificates). Throughout the eight weeks the apprentices worked on their projects as well as attended development opportunities. They toured West Virginia University Computer Science and Engineering department, Physics laboratories, Virtual Exploration laboratories, and took a tour of the campus. They also had "brown bag" lunches with Adam Bell, former apprentice who shared his experiences with completing and presenting the final paper, and Ned Keeler, director of the NASA IV&V Facility. These proved to be the most valuable to the students. To complete the summer, a closing ceremony was held in which the students shared their project with the facility, parents, peers, and mentors. Each apprentice was presented with his SHARP certificate, dean letter, the SHARP cooler/backpack and a NASA lapel pin. Each Mentor was also presented with the SHARP certificate, the SHARP coffee mug, and a NASA Christmas tree ornament. After all students had presented their projects, mentors, parents, and facility director joined in the ERC for light refreshments and social interaction. This was a wonderful opportunity for the parents to meet our director and share their appreciation for NASA hosting this program.

Valerie Graves — 8-19-02

SHARP Coordinator Signature — Date

NASA Field Installation SHARP Manager Signature — Date

Submit Final Reports to:

Lisa Williams
Modern Technology Systems, Inc.
6801 Kenilworth Ave., Suite 200
Riverdale, Maryland 20737

JSC Program Summary

The 2002 SHARP Program at JSC was very successful. The apprentices enjoyed a wide exposure to various opportunities at NASA and JSC and the surrounding communities. Enrichment activities included an overview of the SHARP experience (provided by SHARP II Apprentices), tours of Mission Control, Sonny Carter Neutral Buoyancy Lab (NBL), X-38, Shuttle Mission Simulator, Shuttle Engineering Simulators, and Ellington Field. The Rice University tour with admissions counseling, and personal tour of the campus from a Rice senior, and then an afternoon with a Rice Professor for science lab tours and presentation by the Center for Biological and Environmental Nanotechnology (CEBN) was noted by all as influential.

Perhaps one of the most useful activities was the COOP College Panel where seven (7) JSC College Coops provided honest and useful information to these college-bound high school students.

The other highlight of the summer was our Closing Awards Ceremony. The Reception and Ceremony was held at Teaque Auditorium at JSC. JSC Deputy Director Randy Stone was the quest speaker and he engaged the apprentices and inspired them to continue their studies and career goals.

The JSC SHARP Program will be enhanced next year with a more thorough mentor orientation, since there was not a formal one in 2002. This year, the mentors were given a personal visit by the Coordinator at which time their mentor manual was delivered. The Coordinator was able to offer a quick overview of the program and then answer more detailed questions as they arose during the summer. However, the misconception that SHARP students are to mimic College Coops persisted and it needs to be addressed in the formal orientation with the mentors. In this manner, the mentors will understand the purpose behind the enrichment activities.

2002 Program Summary
Kennedy Space Center

Twenty-eight students were selected from five counties, which surround Kennedy Space Center (Brevard, Seminole, Orange, Volusia and Osceola). One alternate apprentice was selected when the original selected apprentice declined the position due to the other opportunities. The main objective of the program was to provide the students with a working and learning environment to stimulate and motivate their interest in science, mathematics, technology, engineering and/or research. The second purpose was to provide a valuable school-to-work experience that gave the apprentices a link between the academic and work environments. Objectives were met by guiding apprentices through research-oriented projects, field trips, career awareness seminars, college and scholarship presentations and various enrichment activities (including resume building, public speaking, MBTI, and professional journal reviews).

The SHARP experience culminated with the Final Program Ceremony on July 26, 2002 in the Universe Theatre at the Visitor Center on Kennedy Space Center. The program included music performed by apprentices, apprentice project presentations (including multimedia support), mentor tribute, presentation of certificates and an address by guest speaker Story Musgrave (former astronaut) and Pamela Biegert (KSC Education Lead). The program concluded with a reception for all guests.

SUMMARY OF 2002 PROGRAM YEAR

The 2002 Summer High School Apprenticeship Research Program at NASA Langley Research Center, Hampton, Virginia had several notable achievements.

- There were twenty-seven (27) SHARP Apprentices participating in the program.
- Our underrepresented ration was 19 to 27.
- Eight apprentices participated in a pilot program in the Structures and Materials Competency. These students were apart of a more structured program. Students worked on group projects along side researchers and technicians. Students were given group-training sections each Friday morning in the Structures and Materials Competency Bldg., which focused on safety and on proper techniques, which students used during their daily activities. These students were truly made apart of the S&M Competency and expressed a real ownership to the projects they assisted with. Enclosed in this report is a copy of the pilot program developed by Structures and Materials.
- Completion of NASA Langley Research Centers SHARP web site. Site logo and layout was designed by coordinator and apprentices assisted with the writing of HTML code.

During the program, students had the opportunity to participate in weekly colloquia and seminars presented by top researchers on center. Apprentices were taken on tour of the most notable research areas here on center. They were also taken to our partner, Virginia Air and Space Museum, to tour the facility and see the IMAX film *Space Station.*

As in the past, the annual College Day continued and was very successful. Apprentices from A&T State University, Hampton University and LaRC were in attendance. Fourteen major engineering colleges and universities were in attendance. Students received application packages and information on the various vendors in attendance.

Several students will return during the school year to continue their work. Andre Williams did such an out standing job in the Office of External Affairs that he has been asked to return as an employee during the school year. Mark Rawls & Stephen Rawls will working with Mr. Jeff Seaton on the robotics team during the school year for a competition in the spring. Robert Taylor will be returning to the DEVELOP office to continue with research on several environmental problems. Marcus Smith has been asked to return during the school year and next summer to continue his work with mentor Mr. Richard Schwartz.

Program Summary

In January, the program coordinator met with the NFISM and planned the schedule for the 2002 session of the NASA/Summer High School Apprenticeship Research Program. In February the application were mailed to all counselors in schools with in the Fifth mile radius and who had a class of rising seniors. A phone call followed the mailing to verify that the counselors received the package.

Applications were received at the Center in March and interviews were scheduled. To accommodate students and parents the interviews were held at the public library from 4:00 p.m-8: 30 p.m. and on Saturday.

The information received from the student during the interview was given to a selection committee. The selection committee recommended the list of names to offer a position. The student were contacted and offered a position. One student refused and a name was chosen from the alternate list. All students were notified.

In May the coordinator and NFISM held a lunch meeting with the mentors. The Mentor's Guidebook was discussed and documents prepared by the mentor to support the program. The mentors also examined the applications and placed the students in various labs.

In addition to working in a lab and on a project, the students attended several enrichment sessions (the agendas are attached). The apprentices completed a project, made a major contribution to an ongoing project, or started a project necessary to be continued. The apprentices reported their finding or project design at The Closing Review (attached).

Dela Cruz

SHARP Coordinator Signature

8/12/02

Date

Alicia C Bean

NASA Field Installation SHARP Manager Signature

8-12-02

Date

6. Recommendations for program enhancement

Presently, there are no recommendations for program enhancement.

7. Names, addresses and project titles for apprentices

(See Attachment)

8. Program Summary (overview of summer session)

SHARP 2002 was an enjoyable experience shared by all. The program this year certainly presented a challenge to the participants and occasionally to the mentors. The challenge for the participants was the opportunity to grasp knowledge, to learn and to grow, while the challenge for the mentors was presenting valuable information at the high school level. The participants of SHARP 2002 were knowledgeable academically and adequately prepared to accept the challenges as new information was presented to them on a daily basis. There were ten participants this summer. Four were graduating seniors and the other six were rising seniors. There were no rising juniors participating in SHARP 2002; two were returning apprentices from the previous year. The apprentices participated in additional Enrichment Activities such as power point training classes, technology classes provided to LM/IT employees, a university tour, a visit with Jackson State University SHARP Plus apprentices and various activities around Stennis Space Center. The apprentices shared their ideas, creativity and leadership skills in SHARP Team Meetings and they were also directed toward other resources around the center such as the Self Paced Learning Center and the Educational Resource Center. The program ended with excitement as the apprentices shared their projects and research information during the closing activities.

Please include any pertinent documentation to support the contents of this report (i.e. agendas, programs, rosters, promotional items, newspaper articles)

Cassandra Clarke — 9-20-02

SHARP Coordinator Signature — Date

[signature] — 9-20-02

NASA Field Installation SHARP Manager Signature — Date

Submit Final Reports to: Lisa Williams
Modern Technology Systems, Inc.
6801 Kenilworth Ave., Suite 200
Riverdale, Maryland 20737

Program Summary
Wallops Flight Facility

Four students participated from three area high schools. Two of the four mentors were new to the Program. All of the students expressed satisfaction with participating in the program.

Congratulations!

You have successfully downloaded and launched the

2002 SHARP Apprentice Information Form.

Please read this page carefully for vital information on completing the pages in this form.

Thank you for downloading the SHARP Apprentice Information Form pdf file. We think that this ***pdf*** file format will help produce a more readable form for you, your teachers, and the SHARP Selection Committee who will have to read it.

The advantage of using this pdf style SHARP Apprentice Information Form is that the student can bring up the document on the computer screen and key in all of the fields, import the text for the essay and paste it on the essay page (300 word max.), and print it out as a hard copy. **This is an interactive document with pull-down menus, check boxes and text fields**. The file could be duplicated on a floppy disk for work at home, or it could be put on the school's server for easy access.

Please make sure that you use the pull-down menu on page 2 to select the NASA site, and that you use the last page to choose the proper NASA Field Installation Site address. The SHARP Apprentice Information Form must be mailed in its entirety. This means that the envelope that you send to the NASA Field Installation Site has all of the recommendation forms in their own sealed envelopes along with the complete and signed SHARP Apprentice Information Form.

PROGRAM OVERVIEW

Each year the **S**ummer **H**igh School **A**pprenticeship **R**esearch **P**rogram (SHARP) offers a select group of approximately 200 high school students the opportunity to participate in an intensive science and engineering apprenticeship program. Students are selected on the basis of having shown an aptitude for and interest in science and engineering careers. The Program operates during the summer months for a minimum of eight weeks or greater at a participating National Aeronautics and Space Administration (NASA) Field Installation. As apprentices, the students have the opportunity to learn and earn a salary.

After participating in an orientation program, apprentices are assigned to work with a NASA mentor in a specific area of science or technology. SHARP is specifically designed to attract and increase underrepresented students' participation and success rates in mathematics and science courses, as well as to encourage career paths that help build a pool of underrepresented science and engineering professionals in the work place. However, all talented high school students are encouraged to apply for SHARP.

NASA SHARP ELIGIBILITY REQUIREMENTS

To be considered for Program participation students must correctly complete this entire form and meet the following eligibility requirements:

- Be a U.S. citizen who will be at least 16 years old by the time the program starts in June.
- Demonstrate a strong interest in and aptitude for a career in mathematics, engineering geography, or the sciences.
- Completion of at least two college preparatory mathematics courses such as Algebra, Algebra II, and Geometry and two college preparatory science courses such as Biology, Chemistry or Physics with an average grade of "B" or better in each discipline and an overall average of "B" or better in all other coursework.
- Be a permanent resident (in accordance with state residency requirements) and attend a school within the 50-mile radius of a participating NASA Field Installation. (See addresses on the last page.)
- Be willing to participate in a formal interview, if chosen as a finalist, as part of the placement process.
- Be available on a full-time basis (Monday through Friday) for the **entire** duration of the Program.

To ensure the arrival of all parts of your form to the NASA Field Installation by the deadline, the following requirements apply:

- ✓ The applicant should mail all parts of the completed information form **as a single package** so that it arrives at the NASA Field Installation, or is postmarked by **February 28, 2002.** Completed recommendation forms should be given to the applicant in sealed envelopes to be enclosed with the student's Information Form. All parts are due by the indicated deadline!
- ✓ No Information Form or any parts thereof will be accepted by fax.
- ✓ Information Forms that are sent by U.S. mail must be postmarked no later than **February 28, 2002.**
- ✓ Information Forms that are sent by express mail must be sent by the applicant no later than **February 28, 2002.**
- ✓ Information Forms that are hand-delivered to the specified NASA Field Installation office must be received no later than close of business on **February 28, 2002.**

ABOUT THE PROGRAM MANAGER

M T S I

Modern Technology Systems, Inc. (MTSI) the current SHARP Program Manager, is a diversified technical services firm, whose focus centers around total information systems support which includes Client Server Development, Data Center Operations, Management Services and Education and Training. Since its formation in 1986, the company has grown to include customers in both the federal government and private sectors. MTSI is a small, minority female-owned firm headquartered in Riverdale, Maryland and has been the Program Manager for NASA's **S**ummer **H**igh School **A**pprenticeship **R**esearch **P**rogram (SHARP) since 1992. Like NASA, MTSI is committed to preparing our youth to make more informed college and career choices while providing guidance and insight into Science, Mathematics, Engineering Technology, and Geography fields.

≷ Please Read All Sections Carefully BEFORE You Complete This Form ≶

NASA SHARP is sponsored by the National Aeronautics and Space Administration

2002 SHARP Apprentice Information Form for the Summer High School Apprenticeship Research Program

Please Read All Sections Carefully BEFORE You Complete This Form

STUDENTS MUST PROVIDE THE FOLLOWING DOCUMENTS BY THE INDICATED DEADLINE OF FEBRUARY 28, 2002.

1. A completed SHARP Apprentice Information Form (Including the following and all required signatures; Unsigned forms will be disqualified)
   - ☐ Student Data sheet
   - ☐ Coursework sheet showing courses in science, mathematics, technology, engineering, & geography
   - ☐ Parental Data/Consent sheet
   - ☐ A 300-Word Essay (See attached Essay sheet for description)
   - ☐ Mathematics Teacher Recommendation (2 parts) in a sealed envelope
   - ☐ Science Teacher Recommendation (2 parts) in a sealed envelope
   - ☐ Computer/Technical Skills Assessment sheet
2. A recent transcript which includes final grades for courses taken through the current fall semester
   - ☐ *If an updated transcript is not available, attach current report card to most recent transcript.* (Unofficial photocopies are acceptable).

APPRENTICE INFORMATION FORMS MUST BE POSTMARKED BY FEBRUARY 28, 2002

Contact Glenn Research Center in Cleveland Ohio for its own unique form. **Forward the completed package to the appropriate NASA Field Installation Center listed on the last page. Use the pull-down menu below to find the program dates for the center nearest you.**

Langley Research Center, VA June 17 - August 16, 2002

(Glenn Research Center contact information is on the last page.)

SHARP Selection Process

- The **completed** SHARP Apprentice Information Form submissions are reviewed and evaluated by a selection panel at each NASA Field Installation.
- The SHARP Coordinators will notify students of their program status within 6 to 8 weeks of the submission deadline. Students are notified in writing as to whether they have been selected as a finalist, an alternate, or not selected to participate in the Program.
- Finalists are contacted to schedule formal interviews that will be held at the NASA Field Installations.
- Finalists whose qualifications, backgrounds, and interview results best match the overall goals and objectives of the Program will be offered the available SHARP Apprenticeships.

STUDENT DATA

Please type or print legibly using "black ink".

Last Name **First** **M.I.** **Date of Birth**

Home Address

City **State** **Zip Code** **Telephone No.**

Email Address _____ **Social Security Number** _____ **Age this June** _____

U.S. Citizen: ☐ Yes ☐ No **Gender:** ☐ Male ☐ Female

Ethnic Group: *(Check one that best applies):* ☐ **Black** ☐ **Asian** (Including Pacific Islander) ☐ **White** (Not Hispanic)

☐ **Hispanic** ☐ **American Indian** ☐ **Multiracial** (Please Specify) _____

EDUCATION

Name of High School

Address of High School

Current Classification: Sophomore ☐ Junior ☐ Senior ☐ **Overall Grade Point Average** (4 pt. scale) ☐

Name of Guidance Counselor Telephone No.

Standardized Test Scores: (If applicable, please provide this information even if it is provided on your transcript)

PSAT	SAT	ACT
Date:	Date:	Date:
Verbal:	Verbal:	English:
Math:	Math:	Math:
Writing:		Reading:
		Science:

Transcript:

Please attach your current transcript to this Apprentice Information *Form* (*Transcript should include final grades for courses through the 2001 fall academic semester. Unofficial photocopies are acceptable.*) **If an updated transcript does not include current course grades, attach current report card to your most recent transcript.**

I heard about the Program through: ◉ *Internet* ○ *News Media* ○ *School* ○ *SHARP Alumni* ○ *NASA Contact* ○ *Parent* ○ *Other*_____

I certify by my signature below that I understand and agree that any misrepresentation or inaccurate information on this completed information form or any parts thereof will be cause for my disqualification from consideration and participation in SHARP. I also understand that if selected to participate in SHARP, I must participate for the full duration of the Program, a minimum of eight weeks or greater (see Program date). I understand that failure to do so will result in the immediate termination of my SHARP Apprenticeship.

Student's Signature: _____ ***DATE*** _____

Student's Name:_____ Date: _____

Science/Mathematics/Engineering/Technology/Geography Courses

List each of the Mathematics/Science/Engineering/Technology courses you have taken for high school or college credit and complete the information requested. Please use letter grades only. Numerical grades must be converted to letter grades.

MATHEMATICS Courses	Grade Received	Credit Earned	Indicate if Honors or Advanced Placement	Indicate If College Level or Concurrent Enrollment	Grade Level When Taken (8,9,10,11,12)

SCIENCE Courses	Grade Received	Credit Earned	Indicate if Honors or Advanced Placement	Indicate If College Level or Concurrent Enrollment	Grade Level When Taken (8,9,10,11,12)

COMPUTER/TECHNOLOGY/ GEOGRAPHY/ENGINEERING	Grade Received	Credit Earned	Indicate if Honors or Advanced Placement	Indicate If College Level Or Concurrent Enrollment	Grade Level When Taken (8,9,10,11,12)

Student's Name: _____ Date: _____

COMPUTER/TECHNICAL SKILLS ASSESSMENT

Please indicate below your experience/skill level (definitions provided below) with the computer software categories listed and indicate specific software that you have used. *Note: This information will NOT be used in the apprenticeship selection process. Program staff will use this form to determine appropriate student research projects and to help determine enrichment/skills development sessions.*

EXPERIENCE/SKILL LEVEL DEFINITIONS*	
INEXPERIENCED	Have not used this type of software
NOVICE	Have been using this type of software less than 6 months and/or am familiar with basic features only
MODERATE	Have been using this type of software for up to 6 months and am familiar with basic features as well as some intermediate features. Have completed assignments using the software and am able to instruct beginners about software basics.
EXPERIENCED	Have been using this type of software up to 1 year and have mastered all basic and intermediate features. Have completed several, diverse assignments and projects using the software and am able to instruct others on how to use basic and intermediate features.
PROFICIENT	Have been using this type of software for at least 2 years and am very experienced with the software's basic, intermediate, and advanced features. Have completed numerous, diverse assignments and projects using the software and am able to instruct others at all preceding experience levels.

** Months/years of experience are provided as a general guide. You may have reached a particular skill level in less time than indicated in the definitions above.*

✔	Software Categories (Check all that apply in left column)	Technical Skill Level (✔Check your skill level in the columns below)				
		Inexperienced	Novice	Moderate	Experienced	Proficient
	WORD PROCESSING					
	MSWord					
	WordPerfect					
	Claris Works					
	Other:					
	DESKTOP PUBLISHING					
	PageMaker					
	Quark Express					
	Other:					
	SPREAD SHEETS					
	Excel					
	Lotus 1-2-3					
	Other:					
	DATABASE					
	SQL					
	MS Access					
	Oracle					
	FileMaker Pro					
	Other:					
	INTERNET BROWSERS					
	MS Internet Explorer					
	Netscape Navigator					
	Other:					
	PRESENTATIONS					
	MS PowerPoint					
	Other					
	WEB PAGE DESIGN					
	HTML					
	DHTML					
	CSS					
	Other:					
	PROGRAMMING					
	Java					
	Java Script					
	Visual Basic					
	C++					
	Basic					
	Other:					
	COMPUTER GRAPHICS					
	Adobe PhotoShop					
	Adobe Illustrator					
	Corel Draw					
	Fireworks					
	Flash					
	Visio					
	Other:					

PARENTAL DATA

THIS PAGE SHOULD BE COMPLETED BY THE PARENT OR GUARDIAN. THE SELECTION COMMITTEE WILL HOLD ALL INFORMATION IN CONFIDENCE.

Last Name of Father or Male Guardian **First** **M.I.**

Home Address

City State Zip Code Telephone No.

Occupation Employer Work Telephone No.

Last Name of Mother or Female Guardian **First** **M.I.**

Home Address

City State Zip Code Telephone No.

Occupation Employer Work Telephone No.

PARENTAL CONSENT

I understand that _____ is being considered for a position in
Student's Name
NASA's Summer High School Apprenticeship Research Program (SHARP) from Monday through Friday of each week. The dates for the chosen NASA center are on the pull-down menu on Page 2. A NASA sponsor or NASA contractor will provide the student's direct supervision. I certify by my signature below, that:

- **I give permission for my son/daughter to participate in SHARP and all Program related activities;**
- **I approve the release of my child's school transcript; and**
- **I guarantee my child's participation for the entire duration of the Program** (In the event he/she cannot fulfill this commitment, I understand that his/her position as a SHARP Apprentice will terminate immediately).
- **I authorize the Summer High School Apprenticeship Research Program to release my child's name and address to educational organizations so he/she can be provided with current information on other educational programs and college financial aid information.**

Emergency Contact:_____

Relationship **Telephone No.** **Cell/Pager No.**

Parent's/Guardian's Signature of Consent **Date**

300 WORD ESSAY

Student's Name:_____ **Date:** _____

Student must prepare a 300-word essay (Typed or legibly written using black ink) **addressing the following:**

- **Reason(s) for wanting to participate in SHARP**
- **Mathematics, Science, Engineering, Geography, and Technology study and career interests/aspirations**
- **Special talents, hobbies, work experience, community service, honors, awards, commendations and extra curricular activities**

Attach additional sheets as required. Do not go over your 300-word limitation.

This Box Must Be Completed By Student Before Submitting to Teacher for Recommendation

Student's Name

Last *First* *M.I.*

Name of High School

MATHEMATICS TEACHER RECOMMENDATION – PART I

Teacher's Name and Title

School/Organization

How long have you known the student and in what capacity?

How would you rate the student in the following areas? (Check one per category)

1. Ability to Follow Rules & Directions
- ❑ Always Follows
- ❑ Sometimes Follows
- ❑ Seldom Follows
- ❑ Never Follows

2. Acceptance of Responsibility
- ❑ Always Accepts Responsibility
- ❑ Usually Accepts Responsibility
- ❑ Sometimes Irresponsible
- ❑ Often Irresponsible

3. Leadership Ability
- ❑ Strong Leadership Ability
- ❑ Sometimes Exhibits Leadership
- ❑ Seldom Exhibits Leadership
- ❑ Always Follows Others

4. Written Communication Skills
- ❑ Excellent Writing Skills
- ❑ Good Writing Skills
- ❑ Average Writing Skills
- ❑ Poor Writing Skills

5. Ability to Work Well with Others
- ❑ Always Works Well
- ❑ Sometimes Works Well
- ❑ Seldom Works Well
- ❑ Does Not Work Well

6. Oral Communication Skills
- ❑ Very Articulate
- ❑ Articulate
- ❑ Somewhat Articulate
- ❑ Difficulty In Articulation
- ❑ Inarticulate

7. Initiative/Independence
- ❑ Seeks Extra Tasks
- ❑ Prepares Assigned Tasks
- ❑ Needs Occasional Reminders
- ❑ Needs Constant Reminding
- ❑ Seldom Shows Initiative

8. Level of Math Interest
- ❑ Exhibits High Interest
- ❑ Often Interested
- ❑ Seldom Interested
- ❑ Lacks Interest

9. Motivation
- ❑ Highly Motivated
- ❑ Sometimes Motivated
- ❑ Seldom Motivated
- ❑ Lacks Motivation

10. Maturity
- ❑ Always Exhibits Maturity
- ❑ Sometimes Exhibits Maturity
- ❑ Seldom Exhibits Maturity
- ❑ Immature

Identify skills that could most benefit this student through his/her participation with the Program: *(Check all that apply)*

- ❑ Oral Communication
- ❑ Leadership Skills
- ❑ Written Communication
- ❑ Career Awareness
- ❑ Time Management
- ❑ Interpersonal Skills
- ❑ Research Technique
- ❑ Computer/Technology

MATHEMATICS TEACHER RECOMMENDATION – Part II

Please tell us in narrative form why you recommend this student for the apprenticeship program. Address what you know about the student's academic performance, participation in school activities as well as his/her character, reliability, conduct and general qualifications for participation in SHARP. Attach additional sheets of paper if necessary.

PLEASE PLACE THE COMPLETED RECOMMENDATION IN A SEALED ENVELOPE *BEFORE* RETURNING TO STUDENT.

Signature: _____ Date: _____

May we contact you for additional information? Yes _____ No _____ Telephone No. _____

THIS FORM SHOULD BE RETURNED AS A PART OF THE STUDENT APPLICATION PACKAGE.

SHARP APPRENTICE INFORMATION FORM

SUBMISSION DEADLINE: FEBRUARY 28, 2002

This Box Must Be Completed By Student Before Submitting to Teacher for Recommendation

Student's Name

Last *First* *M.I.*

Name of High School

SCIENCE TEACHER RECOMMENDATION – Part I

Teacher's Name and Title

School/Organization

How long have you known the student and in what capacity?

How would you rate the student in the following areas? (Check one per category)

1. Ability to Follow Rules & Directions
- ❑ Always Follows
- ❑ Sometimes Follows
- ❑ Seldom Follows
- ❑ Never Follows

2. Acceptance of Responsibility
- ❑ Always Accepts Responsibility
- ❑ Usually Accepts Responsibility
- ❑ Sometimes Irresponsible
- ❑ Often Irresponsible

3. Leadership Ability
- ❑ Strong Leadership Ability
- ❑ Sometimes Exhibits Leadership
- ❑ Seldom Exhibits Leadership
- ❑ Always Follows Others

4. Written Communication Skills
- ❑ Excellent Writing Skills
- ❑ Good Writing Skills
- ❑ Average Writing Skills
- ❑ Poor Writing Skills

5. Ability to Work Well with Others
- ❑ Always Works Well
- ❑ Sometimes Works Well
- ❑ Seldom Works Well
- ❑ Does Not Work Well

6. Oral Communication Skills
- ❑ Very Articulate
- ❑ Articulate
- ❑ Somewhat Articulate
- ❑ Difficulty In Articulation
- ❑ Inarticulate

7. Initiative/Independence
- ❑ Seeks Extra Tasks
- ❑ Prepares Assigned Tasks
- ❑ Needs Occasional Reminders
- ❑ Needs Constant Reminding
- ❑ Seldom Shows Initiative

8. Level of Science Interest
- ❑ Exhibits High Interest
- ❑ Often Interested
- ❑ Seldom Interested
- ❑ Lacks Interest

9. Motivation
- ❑ Highly Motivated
- ❑ Sometimes Motivated
- ❑ Seldom Motivated
- ❑ Lacks Motivation

10. Maturity
- ❑ Always Exhibits Maturity
- ❑ Sometimes Exhibits Maturity
- ❑ Seldom Exhibits Maturity
- ❑ Immature

Identify skills that could most benefit this student through his/her participation with the Program: *(Check all that apply)*

- ❑ Oral Communication
- ❑ Leadership Skills
- ❑ Written Communication
- ❑ Career Awareness
- ❑ Time Management
- ❑ Interpersonal Skills
- ❑ Research Technique
- ❑ Computer/Technology

NASA Field Installation Information

Please note that the Field Installation where you are submitting your Information Form must be within fifty (50) miles of your permanent residence.
Questions? Contact the SHARP Program Manager, Modern Technology Systems, Inc. (MTSI) (301) 985-5171 or
Toll Free at (888) 985-0303
E-mail: sharpquestions@mtsibase.com
Web Site: www.mtsibase.com/sharp

AMES RESEARCH CENTER (ARC)

Education Office
Mail Stop 223/3
Moffett Field, CA 94035-1000
ATTN: SHARP Manager

DRYDEN FLIGHT RESEARCH CENTER (DFRC)

ATTN: SHARP Manager
P.O. Box 273, M/S D2407
Edwards, CA 93523-0273

GLENN RESEARCH CENTER (GRC)

Applicants to NASA SHARP at Glenn Research Center in Cleveland, OH should contact Glenn at the address below to request their specific entry form.
Office of Educational Programs
ATTN: Program Manager (SHARP)
Mail Stop 7-4
21000 Brookpark Road
Cleveland, OH 44135
intern@grc.nasa.gov

GODDARD INSTITUTE FOR SPACE STUDIES (GISS)

ATTN: SHARP Coordinator
Office 330A • 2880 Broadway
New York, NY 10025

GODDARD SPACE FLIGHT CENTER (GSFC)

Educational Programs Office
ATTN: SHARP Coordinator
Building 28, Room N165
Mail Stop 130.0
Greenbelt, MD 20771

INDEPENDENT VERIFICATION AND VALIDATION FACILITY (IV&V)

ATTN: Program Manager, Educational Outreach (SHARP)
100 University Drive
Fairmont, WV 26554

JOHNSON SPACE CENTER (JSC)

Education and Student Programs
ATTN: Education and Student Programs Manager (SHARP)
Mail Code AH2
Building 12, Room 212
Houston, TX 77058-3696

KENNEDY SPACE CENTER (KSC)

Education Programs and University Research Division
ATTN: Student Educational Programs Specialist (SHARP)
Mail Code XA-D2
Kennedy Space Center, FL 32899

LANGLEY RESEARCH CENTER (LaRC)

Education Office
ATTN: SHARP Coordinator
Mail Stop 400
Hampton, VA 23681

MARSHALL SPACE FLIGHT CENTER (MSFC)

Education Programs Office
ATTN: Education Programs Specialist (SHARP)
Mail Stop CD60
Marshall Space Flight Center, AL 35812

STENNIS SPACE CENTER (SSC)

Education Office
ATTN: Student Programs Coordinator (SHARP)
Building 1100, Mail Code AA10
Stennis Space Center, MS 39529-6000

WALLOPS FLIGHT FACILITY (WFF)

Public Affairs Office
ATTN: Public Affairs Specialist (SHARP)
Building F6, Mail Code 130.4
Wallops Island, VA 23337

SHARP 2002 PLANNING CONFERENCE AGENDA

Wednesday, April 24, 2002

5:00 p.m. – 7:30 p.m.	Registration	Ms. Laurel Grosjean, SHARP Program Associate
7:00 p.m. – 8:30 p.m.	Reception at the Hilton (Dinner Buffet)	Held in Nottingham I and II

Thursday, April 25, 2002

7:30 a.m. – 8:00 a.m.	Late Registration	Ms. Laurel Grosjean, SHARP Program Associate
7:45 a.m. – 8:30 a.m.	Continental Breakfast (Breakfast Buffet)	Campbell I Meeting Room
8:30 a.m. – 8:50 a.m.	Conference Welcome/Opening and Introductions	NASA Headquarters Ms. Deborah Glasco SHARP COTR Modern Technology Systems, Inc. Mr. James Strandquist, SHARP Program Manager Ms. Lisa Williams, SHARP Deputy Program Manager Dr. Vickie Claflin, SHARP Deputy Program Manager
8:50 a.m. – 9:50 a.m.	NASA's Vision and NEPER Report	Mr. Frank C. Owens, Director, NASA Education Division
9:50 a.m. – 10:30 a.m.	EDCATS	Dr. BJ Bluth, Technical Assistant to the Director
10:30 a.m. – 10:50 a.m.	Pipeline Issues and NASA USRP	Dr. James Gorman, Director of Undergraduate Student Programs
10:50 a.m. – 11:05 a.m.	Break	
11:05 a.m. – 11:40 a.m.	Classroom of the Future (COTF)	Dr. Stanley P. Jones, Asst. Director Washington DC Operations of the Classroom of the Future (COTF)

SHARP 2002 PLANNING CONFERENCE AGENDA

Thursday, April 25, 2002

11:50 a.m. – 12:25 p.m.	Luncheon	(Held in Nottingham II & III)
12:25 p.m. – 1:20 p.m.	Guest Speaker (Return to Campbell I)	Ms. Celeste Baine, Author of *Is There an Engineer Inside You?* Ms. Baine will share some of the tactics and strategies for encouraging today's youth to identify and pursue a career in engineering.
1:20 p.m. – 1:30 p.m.	Break	
1:30 p.m. – 1:55 p.m.	2002 SHARP Highlights	Ms. Deborah Glasco
1:55 p.m. – 2:10 p.m.	2001 SHARP Year-in-Review	Mr. James Strandquist
2:10 p.m. – 3:10 p.m.	Field Installation Presentations	(15 minutes/presentation) Ames Research Center, Dryden Flight Research Center, Glenn Research Center, Goddard Space Flight Center
3:10 p.m. – 3:20 p.m.	Break	
3:20 p.m. – 4:05 p.m.	Field Installation Presentations	(15 minutes/presentation) Kennedy Space Center, Marshall Space Flight Center, Stennis Space Center
4:05 p.m. – 4:50 p.m.	Programmatic Issues (Open Forum)	Ms. Lisa Williams Mr. James Strandquist
4:50 p.m. – 5:00 p.m.	Break	
5:00 p.m. – 6:00 p.m.	Break-Out Sessions (SHARP Coordinators stay in meeting room)	
	Session A--NASA F.I. SHARP Managers Session B--SHARP Coordinators	Ms. Deborah Glasco Mr. James Strandquist Ms. Lisa Williams
6:00 p.m.	(Dinner on your own)	

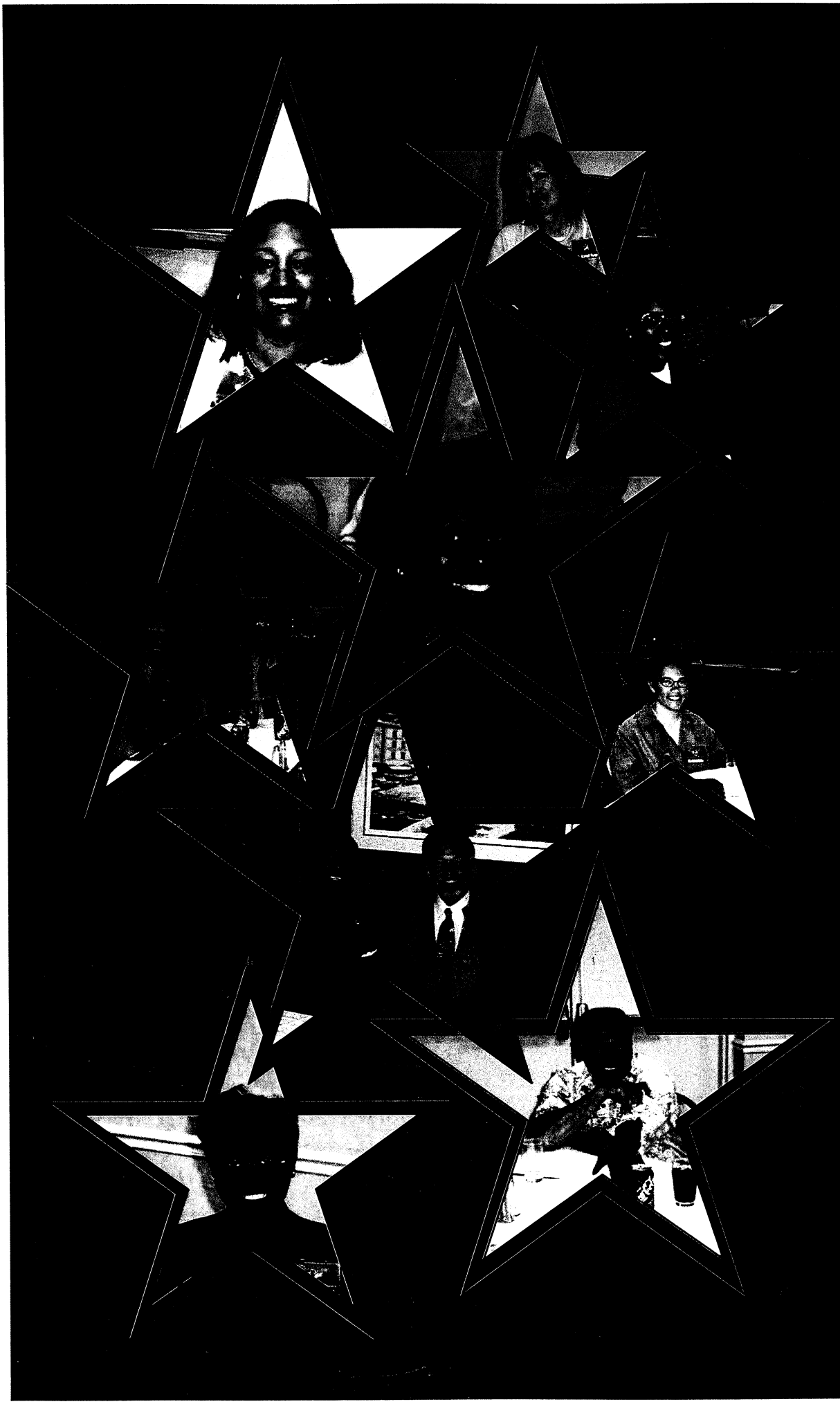
Friday, April 26, 2002

7:45 a.m. – 9:00 a.m.	Continental Breakfast	Campbell I Meeting Room
9:00 a.m. – 10:10 a.m.	Field Installation Presentations	New Centers and SHARP Coordinators Goddard Institute for Space Studies, Langley Research Center, Jet Propulsion Lab, White Sands Test Facility
10:10 a.m. – 10:20 a.m.	Break	
10:20 a.m. – 10:50 a.m.	Setting Research Standards	Dr. Vickie Claflin
10:50 a.m. – 11:20 a.m.	Exploring Options for Joint Program Activities	Mr. James Strandquist
11:30 a.m.	Board bus for Baltimore's Inner Harbor (Conference Participants only) Allow time to travel (walk) to the Maryland Science Center.	
2:00 p.m. – 5:00 p.m.	Maryland Science Center- Hubble Space Telescope Operations Exhibit	Mr. Flavio Mendez, Director SpaceLink
5:00 p.m.	Board bus to go to dinner at Chiapparelli's Restaurant in Little Italy. Return to Hotel.	

SHARP 2002 PLANNING CONFERENCE AGENDA

Saturday April 27, 2002

7:45 a.m. – 9:00 a.m.	Continental Breakfast	Campbell I Meeting Room
9:00 a.m. – 10:15 a.m.	Professional Development Session (Part I) Speaker "Maximizing Your Communication Skills"	Ms. Kimberly Geddings, President Harmony Works Incorporated
10:15 a.m. – 10:30 a.m.	Break	
10:30 a.m. – 11:45 a.m.	Professional Development Session (Part II) Speaker	Ms. Kimberly Geddings
11:45 a.m. – 12:20 p.m.	Luncheon (Campbell II -- for dining only)	
12:20 p.m. – 1:15 p.m.	Guest Speaker (Return to Campbell I)	Mr. Guy Vickers, President The Tommy Hilfiger Corporate Foundation, Inc. "Lessons Learned"
1:15 p.m. – 1:45 p.m.	2002 Program Guidelines	Ms. Lisa Williams
1:45 p.m. – 2:45 p.m.	Program Development Session 1. Moving More Information Electronically 2. Sharing Apprentice Success through Abstracts	Mr. James Strandquist
2:45 p.m. – 3:30 p.m.	Conference Summation/Closing Remarks	Mr. James Strandquist Ms. Deborah Glasco



SCIENCE

MATHEMATICS

TECHNOLOGY

ENGINEERING

GEOGRAPHY