FISCAL YEAR 1999
ANNUAL PLAN TO ASSIST
HISTORICALLY BLACK COLLEGES
AND UNIVERSITIES (HBCU)

Office of Equal Opportunity Programs
December 1997

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EXECUTIVE SUMMARY

The National Aeronautics and Space Administration (NASA) is strongly committed to broadening the participation of Historically Black Colleges and Universities (HBCU) in the Agency's research programs and missions. The Fiscal Year (FY) 1999 Annual Plan to Assist Historically Black Colleges and Universities outlines NASA's commitment to fulfill and implement the Federal mandate issued by President William J. Clinton in Executive Order 12876, dated November 1, 1993. The FY 1999 Annual Plan continues its strong links with the Agency's key Strategic Enterprises--Aeronautics and Space Transportation Technology, Human Exploration and the Development of Space, Space Science, and Mission to Planet Earth. The Annual Plan reflects the critical steps that NASA is committed to taking, in partnership with HBCU's, to achieve educational excellence while furthering the Agency's mission.

The Agency encourages and promotes the involvement of HBCU's in all of NASA's educational and research opportunities. The vision, mission, and goals for achieving full participation of HBCU's in the development and application of new cutting-edge technologies have been correlated with NASA's Strategic Plan, each of the Enterprise's Strategic Plans, and the Agency's Education Plan. Measurable objectives have been developed that foster competition among HBCU faculty and students and more collaborative research efforts with NASA Centers, the Jet Propulsion Laboratory (JPL), the aerospace industry, and with other institutions of higher education. Special emphasis will continue to be placed on developing a "competent, contemporary, and scientific and technical workforce" of outstanding U.S. citizens. The goals of NASA's Minority University Research and Education Programs, including the HBCU Program, are as follows:

- Facilitate research and development activities at Minority Institutions (MI) that contribute substantially to NASA's mission.
- Create systemic and sustainable change at HBCU's through partnerships and programs that enhance research and educational outcomes in NASA-related fields.
- Prepare faculty and students at HBCU's to successfully participate in the competitive research and educational processes of the NASA Strategic Enterprises.
- Partner with HBCU's to increase the number of students that are prepared to enter college and successfully pursue and complete the curriculum requirements for undergraduate degrees in NASA-related fields.

To achieve these goals, NASA's FY 1999 investment in HBCU's includes planned outlays of $52.1 million in support of the Agency's research and education objectives. In spite of budget reductions, the $52.1 million is slightly more than the FY 1997 plan of $52.0 million and slightly less than the FY 1998 plan of $53.2 million. As a result of this investment and the Agency's growing partnership with HBCU's, significant progress will be made toward NASA's mission and the national priorities of ensuring equitable educational opportunities and high levels of educational achievements for all students.

SUMMARY OF NASA AWARDS TO HBCU'S

FY 1999 Annual Plan:

FY 1998 Projected Award: $53,216,000*

FY 1999 Projected Award: $52,060,000

Amount of projected increase/decrease in awards: $1,156,000
(Compared to FY 1998 awards)

Percent of projected increase/decrease in awards: 2.1%
(Compared to FY 1998 awards)

* Actual awards will not be known until November 1998. The FY 1998 estimated obligations for HBCU's are provided in lieu of actual awards.

NASA FY 1999 MEASURABLE OBJECTIVES

The Office of Equal Opportunity Programs' (OEOP) Minority University Research and Education Division has developed strategic implementation guidelines for the Agency's Minority University Research and Education Program (MUREP). These guidelines encompass the Agency's MUREP goals, objectives, and milestones. The following four measurable objectives are included in the NASA MUREP Strategic Implementation Guidelines.

1. Jointly sponsor, with the four Strategic Enterprises, an activity that will increase the quantity and quality of HBCU involvement in each Enterprise's mission and support the achievement of their educational outcome goals.

2. Establish at least five new Partnership Awards between NASA Centers and JPL and HBCU's that enhance the NASA-related research and/or educational outcomes.

3. Increase by 25 percent the number of HBCU faculty researchers involved in NASA Centers of Excellence areas of responsibility and selected through competitive peer evaluation and merit review.

4. Establish three new awards with HBCU's that will increase the number of students prepared to enter college and successfully pursue degrees in NASA-related fields.

Research and Development (R&D)

Research and Development programs are implemented and accomplished by facilitating the development of partnerships among members of the academic community, other Federal, State and local agencies, the aerospace industry, and NASA's Centers of Excellence. The specific R&D programs selected for funding must focus on the areas directly relevant to the following NASA Strategic Enterprises.

- **Aeronautics & Space Transportation Technology** - The Three Pillars of Success of the Office of Aeronautics and Space Transportation Technology (OASTT), also known as the Aeronautics and Space Transportation Technology Enterprise, are to enable U.S. leadership in the global aircraft market through safer, cleaner, quieter, and more affordable air travel; revolutionize air travel and the way in which aircraft are designed, built, and operated; and unleash the commercial potential of space and greatly expand space research and exploration. All play vital roles in the economic health and national security of the Nation. The OASTT Enterprise emphasizes customer involvement in the planning, conduct and technology transfer of its programs. For over 80 years, NASA and its predecessor, the National Advisory Committee for Aeronautics (NACA), have worked closely with U.S. industry, universities, and other Federal agencies to give the United States a preeminent position in aeronautics. NASA has expanded this relationship to include aerospace companies and is now working to revolutionize America's space launch capabilities.

- **Human Exploration and Development of Space** - NASA's Office of Space Flight (OSF) and the Office of Life and Microgravity Sciences and Applications (OLMSA) together lead the Human Exploration and Development of Space Enterprise (HEDS). HEDS opens the space frontier by exploring, using, and enabling the development of space. HEDS seeks to use the environment of space to expand scientific knowledge, to prepare to conduct human missions of exploration to planetary and other bodies in the solar system, to provide safe and affordable human access to space, establish a human presence in space, and to share the human experience of being in space. This Enterprise also enables the commercial development of space and shares knowledge, technologies and assets to enhance the quality of life on Earth. The Space Shuttle and the future International Space Station serve as research platforms to pave the way for sustained human presence in space.

- **Mission to Planet Earth** - Since the Agency's creation in 1958, NASA has been studying the Earth and its changing environment by observing the atmosphere, oceans, land, ice, snow, and their influence on climate and weather. In 1991, NASA launched a more comprehensive program to study the Earth as an environmental system, known as the Mission to Planet Earth (MTPE). This Enterprise uses satellites and other tools to intensively study the Earth, expand our understanding of how natural processes affect humans, and how humans might be affecting natural processes. Such studies yield improved weather forecasts, tools for managing agriculture and forests, information for fishermen and local planners, and eventually, the ability to predict how the climate will

change in the future. MTPE has three main components--a series of Earth-observing satellites, an advanced data system, and teams of scientists who will study data, along with those from ground-, ship-, and aircraft-based field experiments as well as fundamental studies of processes important in Earth system science. Key areas of study include clouds, water and energy cycles, oceans, the chemistry of the atmosphere, land surface, water and ecosystem processes, glaciers and polar ice sheets, and the solid Earth.

- **Space Science** - NASA's Space Science Enterprise seeks to discover the mysteries of the universe, explore the solar system, locate planets around other stars, and search for life beyond Earth. From origins to destiny, NASA's Office of Space Science (OSS) seeks to chart the evolution of the universe, its galaxies, stars, planets, and life; seeks to understand the structure and evolution of the universe to explore the solar system, to better understand the Sun-Earth connection, to study the origin and distribution of life in the universe; and, to conduct an astronomical search for origins and planetary systems. The intellectual destinations of the quest "to explain" are 1) an understanding of the origin of the solar nebula and the forces that formed Earth and the other planets; 2) a determination of the evolutionary processes that led to the diversity of solar system bodies and the uniqueness of planet Earth; and 3) the use of the exotic worlds of our solar system as natural science laboratories.

All NASA Centers and JPL are involved in providing technical assistance, peer review and selection, and technical management of research awards. The participants in these programs contribute directly to NASA's research efforts in the development of new cutting-edge technologies. The goals of the R&D awards are as follows:

1. Meet NASA's research objectives.

2. Increase diversity in the pool of Agency researchers by supporting faculty and students at institutions with significant enrollments of socially and economically disadvantaged and/or disabled students (hereafter referred to as disadvantaged students).

3. Foster R&D activities which contribute substantially to NASA's mission.

4. Participate in the conventional, competitive research and educational processes by faculty and students at HBCU's.

These goals are implemented through competitive peer-review processes and merit selection such as the Faculty Awards for Research (FAR), Institutional Research Awards (IRA), and University Research Centers (URC) at MI's. The HBCU's and other MI's are targeted under these programs to assist the Agency in maintaining its leadership in the areas of space, Earth science, and aeronautical research by building a scientific and technical workforce inclusive of those who have been traditionally underrepresented in science and engineering research careers.

Listed below are competitively selected research awards projected to be funded in FY 1999.

INSTITUTIONS	FY 1999
ALABAMA	
Alabama A&M University Center for Hydrology, Soil Climatology, and Remote Sensing (URC)	$999,969
Tuskegee University Center for Food and Environmental Systems for Human Exploration of Space (URC)	$1,000,000
DISTRICT OF COLUMBIA	
Howard University Center for the Study of Terrestrial and Extraterrestrial Atmospheres (URC)	$999,757
The Development of New Generation Trapped Radiation Data Base (FAR)	$95,299
FLORIDA	
Florida A&M University Center for Nonlinear and Nonequilibrium Aeroscience (URC)	$1,000,000
Control and Calibration of ARID (Automatic Radiator Inspection Device) (FAR)	$71,490
Development of Transdermal Delivery Device for Carbonaceous Grains (FAR)	$97,563
GEORGIA	
Clark Atlanta University High Performance Polymers and Ceramics (URC)	$999,924
The Accuracy of Earth Observing System Measurements of Middle Atmosphere Dynamics (FAR)	$100,000
Morehouse School of Medicine Space Medicine and Life Sciences Research Center (URC)	$937,193
Gravity Induced Changes on the Steroidgenesis by Lutual Cells of the Pregnant Rat (FAR)	$99,966
Simulated Microgravity: A Model for Human Neural Plasticity and Angiogensis (FAR)	$100,000

INSTITUTIONS	FY 1999
LOUISIANA	
Grambling State University	
NLO Polymers that have Enhanced Thermal Stability and Low Alignment Decay and the Use of Microgravity Processing to Optimize NLO Properties (FAR)	$99,960
MARYLAND	
Morgan State University	
Superconducting and Training Program for Earth Science Research	$250,000
Network Resources and Training Site (IRA)	$600,000
MISSISSIPPI	
Jackson State University	
Boundary Layer Processes Affecting Tropical Cyclone Intensity Change (FAR)	$100,000
A Prototype Object-Oriented GIS (FAR)	$83,979
NORTH CAROLINA	
Elizabeth City State University	
Regional Network Resources and Training Site at ECSU (IRA)	$550,000
North Carolina A&T State University	
Center for Aerospace Research (URC)	$1,000,000
Hybrid Motion Planning with Multiple Destinations (FAR)	$91,002
SOUTH CAROLINA	
South Carolina State College	
Network Resources and Training Site (IRA)	$650,000
Benedict College	
Identification and Isolation of Microgravity Responsive DNA's (FAR)	$103,506
TENNESSEE	
Fisk University	
Center for Photonic Materials and Devices (URC)	$1,000,000
Tennessee State University	
Center for Automated Space Science (URC)	$1,000,000
Network Resources and Training Site (IRA)	$600,000

INSTITUTIONS	FY 1999
TEXAS	
Prairie View A&M University Center for Applied Radiation Research (URC)	$978,486
Network Resources and Training Site (IRA)	$600,000
Research to Significantly Enhance Composites Survivability at 550 Degrees F. in Oxidative Environments (FAR)	$100,000
VIRGINIA	
Hampton University Research Center for Optical Physics (URC)	$1,000,000
Characterization of Molecular Interactions at Metal Polymer Composite Surfaces and Interphases (FAR)	$100,000
RESEARCH AND DEVELOPMENT SUMMARY:	
SUBTOTAL OF COMPETITIVE AWARDS	**$15,808,094**
SUBTOTAL OF AWARDS TO BE DETERMINED	**$15,033,047**
TOTAL RESEARCH AND DEVELOPMENT AWARDS	**$30,841,141**

Program Evaluation

Annual evaluation and assessment of all HBCU-funded awards remain a high priority and are an integral part of each award requirement. These evaluations and assessments are critical tools that provide valuable information to HBCU's that can be utilized to strengthen their research and program outcomes.

The evaluation of NASA's minority university research and programs will continue through a combination of oversight by NASA technical monitors, collection of data on key metrics, site visits, and reverse site visits. For institutional research programs, technical review committees, comprised of NASA experts in relevant research areas, still conduct at least one site visit per year. Key metrics for monitoring research output and student participation have been developed, along with an implementation and outcomes instrument, for individual Principal Investigator (PI) programs.

Outcome metrics for educational programs that include student data, persistence to graduation trends, and postgraduate placement information on participants are expected to be on the OEOP Minority University Research and Education Division Electronic Management System by FY 1999.

The total for program evaluation is projected to be $410,000 in FY 1999.

Training

Included under this category are NASA awards to HBCU's for the purpose of supporting and stimulating educational activities that capture students' interest and improve their participation and performance in science, mathematics, technology, or related fields at all educational levels. Also included are awards that enhance the skills, knowledge, or ability of preservice and inservice teachers or faculty members in science, mathematics, or technology. These activities are consistent with the National Science and Technology Council Committee on Education and Training's efforts to ensure that all Americans have access to quality education and training; to promote excellence in science, mathematics, and engineering education at all levels; and thereby, contribute to a competent, contemporary, and diverse scientific and technical workforce.

NASA's Minority University Education Program strives to build sustainable, systematic educational programs at HBCU's that increase the number of students prepared to enter college and successfully pursue and complete degrees in NASA-related fields. Awards are made through national announcements of opportunity, peer review, and merit selections. Some specific initiatives are cited below:

Mathematics, Science, and Technology Awards for Teacher and Curriculum Enhancement Program (MASTAP) strengthens preservice teachers' skills and knowledge in mathematics, science, and technology. MASTAP awards are made, based on a competitive peer review process. In FY 1999, at least eight will be selected to replace HBCU MASTAP's that complete the program in 1998.

Model Institutions of Excellence (MIE): NASA, in collaboration with the National Science Foundation (NSF), funded two of the six institutions selected as MIE's-- Bowie State University and Spelman College. These MIE's were selected, based on a competitive peer-review process led by NSF. The primary goal for establishing MIE's is to strengthen the science, engineering, and mathematics (SEM) baccalaureate degree-producing capacity of HBCU's and other minority institutions.

Bowie State University's Science, Engineering, and Mathematics Education (BSEME) Reform: An MIE program that proceeds to develop and institutionalize a strategy for improving educational and research opportunities for minorities in SEM fields. The program focuses on designing and implementing an outreach plan, expanding current linkages with area schools to increase the inflow of students into SEM fields, strengthening its mentoring and advisory programs for undergraduates, and increasing links with Federal entities, industry, and other universities, especially the University of Maryland.

Spelman College's MIE award focuses on the retention of African-American females in SEM disciplines.

The program includes a revitalization of the SEM curriculum, modification of undergraduate research scope and capabilities, increased student development programs, and administrative infrastructure development. Spelman's MIE will complement its successful training project, Women in Science and Engineering (WISE).

The following identifies training awards that have resulted from competitive review and merit selections for which NASA anticipates funding in FY 1999:

INSTITUTIONS	**FY 1999**
GEORGIA	
Spelman	
Model Institutions for Excellence (MIE)	$1,736,225
MARYLAND	
Bowie State University	
Science, Engineering, and Mathematics Education Reform (MIE)	$1,649,786

TRAINING AWARDS SUMMARY:

SUBTOTAL OF COMPETITIVE AWARDS	**$ 3,296,011**
SUBTOTAL OF AWARDS TO BE DETERMINED	**$ 1,295,000**
TOTAL TRAINING AWARDS	**$ 4,591,011**

Facilities and Equipment

There are no competitively awarded grants specifically for Facilities and Equipment. A small portion of funding is normally permitted under a research or education grant to fund equipment required to support research or education activities. In addition, to the degree that it is available from the NASA Centers, HBCU's may be able to acquire excess or loaned equipment to support research efforts or scientific teaching.

Executive Order 12999, Educational Technology: Ensuring Opportunity for All Children in the Next Century, signed April 17, 1996, by President Clinton, streamlines the transfer of excess and surplus Federal computer equipment to our Nation's classrooms and encourages Federal agencies to assist teachers and to connect classrooms. Federal employees are encouraged to help connect America's classrooms to the National Information Infrastructure, assist teachers in learning to use computers to teach, and provide ongoing maintenance of and technical support for the educationally useful Federal equipment transferred pursuant to this Order.

Research grants approved under OEOP promote making computer technology an integral part of classrooms, providing teachers with the professional development opportunities they need to use new technologies effectively.

Fellowships, Internships, Traineeships, Recruitment, and Intergovernmental Personnel Act (IPA)

During FY 1999, NASA will continue to promote the involvement of HBCU faculty in the NASA Summer Faculty Fellowship Program to work on research projects with scientists and engineers at NASA Centers. NASA will also continue to encourage the utilization of the IPA Mobility Program to enable NASA scientists and engineers to teach or administer programs at HBCU's.

In compliance with the U.S. House Resolution 4624, NASA will develop and increase Ph.D. graduate fellowship programs at HBCU's, offering Ph.D.'s in NASA-related discipline areas, as well as increase fellowship opportunities for socially and economically disadvantaged and disabled students through nationwide programs. All students receiving support must be U.S. citizens and enrolled on a full-time basis.

The total fellowships, internships, traineeships, recruitment, and IPA awards are projected to be $5,583,035 in FY 1999.

Student Tuition Assistance, Scholarships, and Other Aid

Precollege Awards for Excellence in Mathematics, Science, Engineering and Technology (PACE) provide opportunities for HBCU's to expand their partnerships with public middle and high schools and for industry partners to advance the success rates of disadvantaged students in college preparatory courses.

Undergraduate researcher programs support students pursuing undergraduate science, engineering, mathematics, and computer science at HBCU's. These programs support the national goals of strengthening technical education and increasing the participation of socially and economically disadvantaged and disabled persons in technical pursuits. NASA plans to continue funding these programs. In FY 1997, NASA supported over 450 students through undergraduate researcher awards at approximately 12 HBCU's.

The total student tuition assistance, scholarships, support for research based experiences, and other student support services with middle and high schools are projected to be $7,414,189 in FY 1999. The Agency is moving towards a competitive peer review and merit selection process for programs supporting educational outreach projects at HBCU's that increase the number of students with the knowledge, skills, and ability to pursue graduate-level education in mathematics, science, and engineering.

The following identifies precollege awards which have resulted from competitive review and merit selections that NASA anticipates funding in FY 1999:

INSTITUTIONS	**FY 1999**
FLORIDA	
Saint Augustine's College	
Saint Augustine's College Summer Science Camp (PACE)	$100,000
NORTH CAROLINA	
Fayetteville State University	
Fayetteville State University, NASA PACE/MSET Project (PACE)	$100,000
Elizabeth City State College	
Dr. C. D. Turnage PACE/MSET Program (PACE)	$100,000
VIRGINIA	
Hampton University	
Mathematics, Science, Engineering & Technology (PACE)	$100,000

STUDENT TUITION ASSISTANCE, SCHOLARSHIPS, AND OTHER AID SUMMARY:

SUBTOTAL OF COMPETITIVE AWARDS	**$400,000**
SUBTOTAL AWARDS TO BE DETERMINED	**$6,614,189**
TOTAL TRAINING AWARDS	**$7,014,189**

Direct Institutional Subsidies

NASA does not have any direct institutional subsidies.

Third-Party Awardees

NASA continues to support selected nonprofit organizations that have as part of their mission outreach to HBCU's. The following are representative programs that provide direct services, support, and technical assistance to HBCU's through grants from NASA: the National Association for Equal Opportunity in Higher Education (NAFEO), and the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. (GEM).

NASA has expanded its partnership with GEM to strengthen outreach to HBCU's with a graduate bridge program designed to prepare graduate students from HBCU's for success in NASA's competitive Graduate Student Researchers Program. Additionally, the NAFEO collaborative agreement has been augmented for FY 1999 to support a component that builds the pool of graduate students at HBCU's who are pursuing degrees in NASA-related fields.

The NASA Education Division continues to promote excellence in America's educational system by providing access and engagement in the Agency's exciting missions. During FY 1999, the Education Division will invest $1,467,917 in outreach to HBCU's. The Education Division's activities in which HBCU's will be involved include the NASA Space Grant and Experimental Program to Stimulate Competitive Research Awards, Project NOVA, Teacher Education Workshop, SHARP PLUS Summer Program for Precollege Students, and the Summer Faculty Program.

The Third-Party Awardees total is projected to be $3,275,917 for FY 1999.

Private-Sector Involvement

NASA's Office of Small and Disadvantaged Business (SDB) Utilization has a strong role in policy and advocacy. The following special initiatives and programs facilitate the involvement of HBCU's in private-sector activities.

NASA Minority Business Resources Advisory Committee
Two representatives from HBCU's have been included on this Committee for the sole purpose of providing recommendations on ways NASA can increase contracting dollars to HBCU's.

Outreach
HBCU's are included in NASA's data base for receiving notification of contract solicitations, subcontract opportunities, and other important notifications.

HBCU Capabilities Manual
A directory is being developed for use by NASA managers and prime contractors to assist in identifying HBCU's for prime and subcontracting opportunities and for R&D and related technical opportunities.

Public Law 101-144/507
HBCU's are included in all of the SDB initiatives sponsored by NASA. Examples of special programs designed to facilitate SDB/HBCU participation in NASA contracts and subcontracts include the following:

Quarterly Aeronautics SDB Forum: SDB/HBCU's make presentations to senior-level technical managers to create awareness of high-tech capability. The forums are held four times a year in one of each of NASA's four research centers (Ames Research Center, Dryden Flight Research Center, Langley Research Center, and Lewis Research Center).

The NASA Mentor-Protégé Program: Protégés, which include eligible SDB's or HBCU's, enter into a relationship with NASA prime contractors to receive developmental assistance that will increase their high-tech capability. Incentives are provided to prime contractors for successful relationships with their NASA protege.

Training Course: SDB's/HBCU's receive training in critical areas of business management such as marketing, financial management, and proposal development.

During FY 1999, the Office of Small and Disadvantaged Business Utilization will hold one separate training course specifically designed for HBCU's. The course will accommodate 50 HBCU representatives (limited to 2 representatives per institution). The curriculum focus will be on proposal writing, marketing strategies, and financial management and control techniques. In addition, a minimum of four HBCU's will be included as participants in the Quarterly Aeronautics SDB Forum. NASA will also continue to encourage its prime contractors to enter into Mentor-Protégé relationships with HBCU's.

Administrative Infrastructure

There are no specific funds allocated for support of the administrative infrastructure of HBCU's. NASA assumes that all of the activities, support, and initiatives referenced in other parts of this plan will contribute indirectly to this important area. This certainly is anticipated through all of NASA's minority university institutional research and education awards such as Research Centers, Institutional Research Awards, and Mathematics and Science Awards for Teacher and Curriculum Enhancement Programs.

Other Activities

Specific activities undertaken by NASA Centers and JPL are summarized below, along with the measurable objectives which these Centers will seek to achieve during FY 1999 under Executive Order 12876.

Ames Research Center (ARC)

ARC will pursue the following measurable objectives in FY 1999:

1. Increase the number of site visits by HBCU scientists and engineers with their ARC counterparts.

2. The quality of interactions shall be facilitated by improving the awareness of ARC's program activities and research arenas by HBCU's. ARC will develop Internet-based communication tools, including automated E-mail lists and Web pages.

3. Increase the number of ARC HBCU summer students. ARC also seeks to improve the quality of the summer students' experiences.

Dryden Flight Research Center (DFRC)

DFRC will increase its support for HBCU's. Working in partnership with HBCU's will help DFRC in its goal of becoming a premier flight research organization and will enable HBCU's to be a part of the cutting-edge of technology in aeronautics.

The FY 1999 Annual Plan for HBCU's projects a goal of $300,000. This represents a 67-percent increase from the award levels achieved in FY 1997. The schools with which DFRC is currently working include the following HBCU's: Tuskegee University, North Carolina A&T State University, Clark Atlanta University, Hampton University, and Prairie View A&M University. DFRC is also identifying and establishing working partnerships with other HBCU's. The Center will continue to recruit HBCU students for the Student Career Experience Program (Coops) and hire from this source when opportunities become available. DFRC's principal, measurable objectives include the following:

1. Recruit HBCU students for DFRC's Cooperative Education Programs to enhance their research experience and possible conversion to employment.

2. Increase the amount of grants to HBCU's by working with DFRC engineers to identify needs in research and visiting HBCU's to encourage a collaborative effort between DFRC and HBCU's.

3. Initiate workshops/seminars to include HBCU Principal Investigators, administration, and grant personnel. Provide technical assistance and integrate efforts to reach goals and objectives.

4. Continue working with Spelman College and Morehouse College scholars to increase the overall pool of minorities graduating in the science and engineering field.

Goddard Space Flight Center (GSFC)

GSFC recognizes the importance of strengthening its HBCU programs and will continue to develop greater involvement of more of the Center's technical staff in the overall HBCU program components. The projected FY 1999 awards to HBCU's are expected to increase by 21 percent over the FY 1998 projected awards. GSFC's four principal measurable objectives are as follows:

1. Provide a technical assistance workshop on financial management procedures required to properly administer research grants and cooperative agreements.

2. Establish a capability to facilitate partnerships between HBCU's and major academic research institutions for the purpose of competing for flight mission opportunities advertised by NASA.

3. Provide technical assistance to enhance current electronic networking capability used to access research data at HBCU's.

4. Provide opportunities for students at HBCU's to participate in projects designed to build scientific payloads suitable for suborbital launches.

Jet Propulsion Laboratory (JPL)

JPL performs research, development, and related activities for NASA. JPL's primary mission is to explore the solar system with automated spacecraft. In addition, JPL undertakes other scientific, technological, and educational projects to meet the national needs. JPL is fully committed to Executive Order 12876 and NASA's efforts in support of HBCU's.

During FY 1999, JPL will continue to develop virtual organizations that are focused on technical themes and core competencies, consistent with its Strategic Plan. An integral part to implementation of this plan is the development of the following JPL Centers of Excellence:

Space Microelectronics Technology

Space Interferometry

Insitu Exploration and Sample Return

Integrated Space Microsystems

Deep Space Communications and Navigation Systems

Space Mission Architectures and Design

The overall goal of JPL is to enhance the research competitiveness of a selected number of HBCU's through various mechanisms, and to assist these institutions in aligning their educational

and research activities with JPL's long-term vision. The Minority Science and Engineering Initiatives Office is developing a strategy to inform these universities of the JPL Strategic Plan for the Centers of Excellence and the research and educational opportunities for faculty and students for the next 7 to 10 years. It is expected that representatives from JPL will visit with the deans and faculty from the engineering and science departments of these universities to solicit their interest in long-term partnerships with JPL.

JPL is re-engineering many of the existing research, educational, and outreach programs to align these activities with the Centers of Excellence focus. This will provide opportunities to acquire first-hand knowledge of state-of-the-art research technology which is comprised of entirely new and developing technology.

The following are measurable objectives that JPL will seek to achieve under Executive Order 12876 during FY 1999:

1. Increase the number of faculty members from HBCU's participating in the American Society for Engineering and Education (ASEE) Summer Faculty Program.

2. Increase the number of graduate researchers from HBCU's participating in the Graduate Researcher Program.

3. Expand the number of HBCU Research Projects conducted in collaboration with JPL.

4. Increase the number of students from HBCU's participating in the Minority Summer Intern Program.

Johnson Space Center (JSC)

JSC has developed a successful and vital link with HBCU's and plans to aggressively seek new relationships and strengthen existing ones during FY 1999. JSC will continue to provide technical oversight and administration of three University Research Centers (URC) (Tuskegee University, Prairie View A&M University, and the Morehouse School of Medicine) which become increasingly more critical as NASA prepares for long-duration space flights on the International Space Station. These URC's are funded at approximately $1 million per Center. For FY 1999, a limited and reduced Center budget will restrict JSC's ability to fund many worthwhile ongoing and new HBCU proposals. However, JSC will seek to identify additional sources such as competitive, peer-reviewed, announcements of opportunity. A major goal is to promote the joint participation of NASA JSC contractors, the community, and private organizations in the funding pool.

The following are four principal, measurable objectives that JSC will seek to achieve during FY 1999:

1. Continue developmental activities to assist the three URC's transferred to JSC by OEOP. Their research is critical to NASA's requirements to effectively know more about the effects of long-duration space flight on humans, food, and environmental systems. Their research also has significant impacts on space medicine and life sciences and the effects of radiation on humans and materials.

2. Strengthen the ability of HBCU's to conduct advanced scientific research related to NASA disciplines.

3. Continue to improve the reporting process to include the timely obligation and costing of grant funds to HBCU's.

4. Continue to encourage and support HBCU's to increase the number of highly skilled disadvantaged minorities with degrees at the Masters and Ph.D. levels in NASA-related fields through the Intergovernmental Personnel Act and onsite work opportunities for university faculty.

Kennedy Space Center (KSC)

KSC will continue to reach out to HBCU's and will focus on the involvement of academia in the Center's technology transfer and commercialization and outreach processes. KSC will continue to give high priority to the funding of projects led by HBCU's.

The four principal, measurable KSC objectives are as follows:

1. Encourage students at HBCU's to use their talents, interests, and training for scientific research.

2. Encourage HBCU's to submit innovative projects for Mars initiatives.

3. Encourage partnerships with other universities in order to form strong teams for the purpose of being more competitive in the R&D community.

4. Provide assistance to focus HBCU efforts for aerospace applied science applications.

Langley Research Center (LaRC)

LaRC initiatives to assist HBCU's during FY 1999 are in support of NASA's Strategic Enterprises. LaRC will support NASA's efforts to increase the number of HBCU students trained as interns and fellows through grants, cooperative agreements, and contracts. LaRC officials will inform HBCU Principal Investigators and other university officials of the costing requirements for NASA grants, cooperative agreements, and contracts on a regular basis; utilize a variety of intervention mechanisms to inform HBCU administrators, students, and faculty of NASA outreach programs; and exchange visitations among HBCU students and faculty and LaRC scientists, engineers, and administrative personnel.

The following are four principal, measurable objectives that LaRC's Office of Education will seek to achieve under Executive Order 12876 during FY 1999:

1. Continue to increase the number of HBCU students trained as interns and fellows and through grants and cooperative educational programs.

2. Establish a data base and track the effectiveness of students and faculty participating in NASA internships and fellowships through NASA grants, cooperative agreements, and contracts.

3. Continue informing HBCU Principal Investigators, Grant Officers, and business office personnel of costing requirements for NASA grants, cooperative agreements, and contracts on a regular and frequent basis.

4. Utilize teleconferencing and the use of other educational technologies for a variety of intervention mechanisms to inform HBCU students and faculty of NASA outreach programs to include exchanging visitations between HBCU students and faculty and the LaRC scientists, engineers, and administrative personnel.

Lewis Research Center (LeRC)

LeRC's funding plan for FY 1999 is estimated to be approximately $3.3 million which includes $2.8 million in R&D grants and $0.5 million in fellowships, internships, and arrangements under the Intergovernmental Personnel Act. The amount of decrease in awards to HBCU's is due to continuous reductions in the overall core research and technology budget.

LeRC's principal measurable objectives include the following:

1. Increase the number of proposals submitted by HBCU's in response to solicitations for investigations.

2. Improve the laboratory and analytical engineering capabilities at HBCU's through the purchase of new hardware and software under microgravity science, space communications, space power and propulsion, and mission analysis-related grants.

3. Develop an adaptive thermomechanical model and a microstructural evolution dynamics model and integrate the two models.

4. Develop an adjoint algorithm for design sensitivity analyses.

Marshall Space Flight Center (MSFC)

MSFC will aggressively and enthusiastically comply with the White House Initiative to advance the human potential at HBCU's through its science and engineering programs. The objectives of MSFC's HBCU program are to encourage student participation in science and engineering, provide a broad spectrum of research opportunities, develop faculty research opportunities and collaboration, and provide technical assistance in advancing research and scientific capabilities at participating institutions.

The four principal measurable objectives are as follows:

1. Maintain the current level of MSFC institutional funding for HBCU initiatives.

2. Improve the obligations and costing performance of HBCU grants.

3. Work with the institutions to increase the number of students benefiting from MSFC-funded internship programs.

4. Assist MSFC program and project offices in identifying additional areas in which HBCU's can contribute to mission success.

Stennis Space Center (SSC)

The four principal, measurable objectives that SSC will seek to achieve are as follows:

1. To attain HBCU faculty participation at 10 percent or more in the Summer Faculty Resident Research Associateship and Jove programs.

2. To maintain funding of research grants at HBCU's at 10 percent or more of the SSC R&D expenditures and to steer HBCU research activities to be relevant to the SSC mission.

3. To maintain HBCU student participation at 10 percent or more in the SSC fellowship, internship, and traineeship programs.

4. To participate in outreach activities such as career fairs, mathematics/science fairs, Black History Month observances, mentoring programs, and speakers bureaus at HBCU's within the SSC geographical area and at HBCU's with programs related to the SSC mission.