

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

**FISCAL YEAR 2000
ANNUAL PLAN TO ASSIST
HISTORICALLY BLACK COLLEGES
AND UNIVERSITIES (HBCU)**

**Office of Equal Opportunity Programs
February 1999**

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TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
SUMMARY OF PLANNED AGENCY AWARDS BY CATEGORY - FY 2000	2
SUMMARY OF NASA AWARDS TO HBCU's	3
NASA FY 2000 MEASURABLE OBJECTIVES	4
SUMMARY OF AWARDS TO HBCU's BY NASA HEADQUARTERS PROGRAM OFFICE, CENTER, AND JET PROPULSION LABORATORY - FY 2000	5
PLANNED AGENCY AWARDS TO INSTITUTIONS BY STATE - FY 2000	6
AWARDS AND NARRATIVE INFORMATION	
• Research and Development (R&D)	8
• Program Evaluation 16	
• Training	17
• Facilities and Equipment	20
• Fellowships, Internships, Traineeships, Recruitment, and Intergovernmental Personnel Act (IPA)	21
• Student Tuition Assistance, Scholarships, and Other Aid	23
• Direct Institutional Subsidies	25
• Third-Party Awardees	26
• Private-Sector Involvement	27
• Administrative Infrastructure	28
• Other Activities	29
• Center Activities	31

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) 2000 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 2000 Annual Plan continues its strong links with the Agency's key Strategic Enterprises-- Aerospace Technology, Human Exploration and Development of Space, Space Science, and Earth Science. 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. 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 2000 investment in HBCU's includes planned outlays of \$52.9 million in support of the Agency's research and education objectives. In spite of budget reductions, the \$52.9 million is slightly more than the FY 1999 plan of \$52.1 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 2000 Annual Plan:

FY 1999 Projected Award: \$52,060,433*

FY 2000 Projected Award: \$52,893,857

Amount of projected increase/decrease in awards: +\$833,857
(Compared to FY 1999 awards)

Percent of projected increase/decrease in awards: 1.6%
(Compared to FY 1999 awards)

* Actual awards will not be known until November 1999. The FY 1999 estimated obligations for HBCU's are provided in lieu of actual awards.

NASA FY 2000 MEASURABLE OBJECTIVES

The Office of Equal Opportunity Programs' (OEO) Minority University Research and Education Division (MURED) 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 have been established for the HBCU Program.

1. Increase competitive Faculty Awards for Research by 10 and Mathematics and Science Education awards by five for HBCU's.
2. Continue the University Research Center (URC) Program with the start of the second 5-year award for four HBCU's.
3. Initiate four new Institutional Research Awards at HBCU's.
4. Expand Outreach and Precollege Programs to include four new HBCU's that are not currently funded by NASA.

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.

- **Space Science** - Humans have a profound and distinguishing imperative to understand our origin, our existence, and our fate. For millennia, we have gazed at the sky, observed the motions of the Sun, Moon, planets, and stars, and wondered about the universe and the way we are connected to it. The Space Science Enterprise serves this human quest for knowledge. As it does so, it seeks to inspire our Nation and the world, to open young minds to broader perspectives of the future, and to bring home to every person on Earth the experience of exploring space. The mission of the Space Science Enterprise is 1) to solve mysteries of the universe; 2) explore the solar system; 3) discover planets around other stars; 4) search for life beyond Earth, from origins to destiny; and 5) chart the evolution of the universe and understand its galaxies, stars, planets, and life.

The four long-term goals of the Space Science Enterprise are: 1) establish a virtual presence throughout the solar system, and probe deeper into the mysteries of the universe and life on Earth and beyond; 2) pursue space science programs that enable and are enabled by future human exploration beyond low-Earth orbit; 3) develop and utilize revolutionary technologies for missions impossible in prior years; and 4) contribute measurably to achieving the science, mathematics, and technology education goals of our Nation, and share widely the excitement and inspiration of our missions and discoveries.

- **Earth Science** - NASA's Earth Science (ES) Enterprise is dedicated to understanding the total Earth system and the effects of natural and human-induced changes on the global environment. The ES Enterprise is pioneering the new discipline of Earth systems science, with a near-term emphasis on global climate change. Space-based and in situ capabilities presently being used or developed yield new scientific understanding and practical benefits to the Nation. To preserve and improve Earth's environment for future generations, governments around the world need policies based on the strongest possible scientific understanding. Commercial firms, natural resources managers, and educators rely on a dependable stream of this same new knowledge. The unique vantage point of space provides information about Earth's land, atmosphere, ice, oceans, and biota that is obtainable in no other way. In concert with the global research community, including the National Oceanic and Atmospheric Administration and the other agencies participating in the U.S. Global Change Research Program, the ES Enterprise is developing the understanding needed to support the complex environmental policy and economic investment decisions that lie ahead.

The goals of the ES Enterprise are: 1) expand scientific knowledge of the Earth system using NASA's unique vantage points of space, aircraft, and in situ platforms, creating an international capability to forecast and assess the health of the Earth system; 2) disseminate information about the Earth system; and 3) enable the productive use of ES science and technology in the public and private sectors.

- **Human Exploration and Development of Space** - The Human Exploration and Development of Space (HEDS) Enterprise pursues the answers to myriad research and engineering questions that must be answered as we learn to live and work in space. HEDS plays an important role in pursuing answers to the questions: What is the fundamental role of gravity and cosmic radiation in vital biological, physical, and chemical systems in space, on other planetary bodies, and on Earth, and how do we apply this fundamental knowledge to the establishment of permanent human presence in space to improve life on Earth? HEDS also plays an important role working with the other NASA Enterprises to pursue answers to other fundamental questions, including: Does life exist elsewhere than on our planet? The goals of the HEDS Enterprise are to: 1) expand the frontier; 2) expand knowledge; 3) enable and establish permanent and productive human presence in earth orbit; 4) expand commercial utilization of space; and 5) share the experience and discovery of human space flight.
- **Aerospace Technology** - The mission of this Enterprise is to pioneer the identification, development, verification, transfer, application, and commercialization of high-payoff aeronautics and space transportation technologies. Through its research and technology accomplishments, it promotes economic growth and national security through a safe, efficient national aviation system and affordable, reliable space transportation. The plans and goals of this Enterprise directly support national policy in both aeronautics and space, documented in "Goals for a National Partnership in Aeronautics Research and Technology" and "National Space Transportation Policy." This Enterprise works in alliance with its aeronautics and space transportation customers, including U.S. industry, the university community, the Department of Defense (DOD), the Federal Aviation Administration (FAA), and the other NASA Enterprises to ensure that national investments in aeronautics and space transportation technology are effectively defined and coordinated and that NASA's technology products and services add value, are timely, and have been developed to the level at which the customer can confidently make decisions regarding the application of those technologies. The Enterprise also has Agency responsibility for technology transfer and commercialization. This function is provided as an Agencywide service to ensure wide, rapid transfer of NASA-developed technologies to U.S. industry for the social and economic benefit of all U.S. citizens.

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 Minority Institutions (MI). 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 2000.

INSTITUTIONS

FY 2000

ALABAMA

Alabama A&M University

Center for Hydrology, Soil Climatology, and Remote Sensing (URC)

\$999,763

Mission Planning and Risk Analysis (FAR)

\$100,000

Nureal Network Analysis of Leaf Multispectral Reflectance for Detection and Discrimination (FAR)

\$100,000

Tuskegee University

Center for Food and Environmental Systems for Human Exploration of Space (URC)

\$1,000,000

Study of Electrical Contacts and Devices in Advanced Semiconductors (FAR)

\$100,000

DELAWARE

Delaware State University

Investigation of Optical Phase Distortion in Solid State Pulsed Laser Amplifiers (FAR)

\$100,000

DISTRICT OF COLUMBIA

Howard University

Center for the Study of Terrestrial and Extraterrestrial Atmospheres (URC)

\$999,539

Structure-Function Relationship of Impact-Modified Cyanate Ester Resins (FAR)

\$100,000

FLORIDA

Bethune Cookman College

Research and Development (KSC)

\$330,000

<u>Florida A&M University</u> Center for Nonlinear and Nonequilibrium Aeroscience (URC)	\$1,000,000
Robust Fault Detection and Isolation for NASA Launch Vehicles (FAR)	\$100,000
Research and Development (Ames)	\$473,000
GEORGIA	
<u>Clark Atlanta University</u> High Performance Polymers and Ceramics (URC)	\$999,729
Formation and Characterization of Metal-Diamond Interfaces (FAR)	\$100,000
<u>Morehouse School of Medicine</u> Space Medicine and Life Sciences Research Center (URC)	\$915,268
LOUISIANA	
<u>Southern University</u> A Study of the Relationships Between Structure and Magnetic and Electron Transport Properties in R1-xAxMnO3 Alloys (FAR)	\$100,000
Modeling and Analysis of Heat-Activated Thermal Coupling for Joining Composite to Composite/Alloy Structures (FAR)	\$100,000
Noise Removal Deconvolution, and Vibration Relaxation Studies to Enhance Exhaust Plume Diagnostic Technology (FAR)	\$100,000
Development of a Balloon-Borne X-ray/Gamma-Ray Detector for Studies of High-Energy Astrophysical Sources and Related Space- and Ground-Based Multiwavelength Observations (FAR)	\$100,000
<u>Xavier University</u>	
Seeing the Earth: Using Remote Sensing Technologies to Stir the Imagination of Science Students (FAR)	\$100,000
Education and University Affairs Research and Development (SSC)	\$10,000

MARYLAND

Morgan State University

Characterization and Simulation of Gallium Nitride
Ultraviolet Photodetectors (FAR) \$100,000

Smart-Sensor Design Incorporating Signal Processing for
Data-Compression and Feature Enhancement (FAR) \$100,000

Network Resources and Training Site (IRA) \$600,000

Forging a Partnership (GSFC) \$850,000

MISSISSIPPI

Alcorn State University

Thermal Hydraulics and Material Pre-Construction Analysis
of the Second Generation of the Space Shuttle Engine Test
Diffusor at NASA SSC (FAR) \$100,000

Jackson State University

Commercial Remote Sensing Program (SSC) \$150,000

Education and University Affairs Research and
Development (SSC) \$20,000

Commercial Integrated Technology Program (JSC) \$25,000

Mississippi Valley State University

Response of Leaf and Canopy Spectral Reflectance to
Drought Stress in Soybean (FAR) \$100,000

NORTH CAROLINA

Elizabeth City State University

Regional Network Resources and
Training Site at ECSU (IRA) \$550,000

Controlling Chaos in Josephson Junction (FAR) \$100,000

North Carolina A&T State University

Center for Aerospace Research (URC) \$1,000,000

Investigation of Aero-Servo-Structural Interactions
in Aerospace Applications (FAR) \$100,000

Self-Timed Synchronous Digital System Design (FAR) \$100,000

Hydrogen Production and Separation in a \$100,000

Novel Membrane-Reactor-Separator for Use in
Fuel Cell System (FAR)

SOUTH CAROLINA

South Carolina State College
Network Resources and Training Site (IRA) \$650,000

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

TEXAS

Prairie View A&M University
Center for Applied Radiation Research (URC) \$982,643

Network Resources and Training Site (IRA) \$600,000

Radiation Effects on Electronic Materials and
Devices at High Atmosphere and Low Earth
Orbital Altitudes (FAR) \$100,000

Software Engineering Initiative (JSC) \$224,000

VIRGINIA

Hampton University
Research Center for Optical Physics (URC) \$1,000,000

Principal Investigators Services to Support SAGE II (LaRC) \$532,192

Investigations of Tropical Atmospheric
Radiative Energy Balance (LaRC) \$369,269

Norfolk State University
Feasibility Study of Piezoelectric Actuators Driven by a Microwave (FAR) \$100,000

RESEARCH AND DEVELOPMENT SUMMARY:

SUBTOTAL OF COMPETITIVE AWARDS	\$19,080,403
SUBTOTAL OF AWARDS TO BE DETERMINED	\$13,603,707
TOTAL RESEARCH AND DEVELOPMENT AWARDS	\$32,684,110

Program Evaluation

Annual evaluation and assessment of all HBCU-funded awards remain high priorities 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 Office of Equal Opportunity Programs (OEOP) Minority University Research and Education Division Electronic Management System by FY 2000.

The total for program evaluation is projected to be \$750,000 in FY 2000.

PROGRAM EVALUATION SUMMARY:

SUBTOTAL OF COMPETITIVE AWARDS	\$
SUBTOTAL OF AWARDS TO BE DETERMINED	\$750,000
TOTAL PROGRAM EVALUATION AWARDS	\$750,000

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.

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 2000:

INSTITUTIONS

FY 2000

ALABAMA

Coahoma Community College (SSC)

Training	\$65,000
FLORIDA	
<u>Florida A&M University</u> MASTAP	\$199,999
Graduate Fellowship Program (LeRC)	\$300,509
GEORGIA	
<u>Clark Atlanta University</u> MASTAP	\$200,000
<u>Spelman</u> Model Institutions for Excellence (MIE)	\$2,164,995
LOUISIANA	
<u>Southern University (LeRC)</u> Aerospace Research & Education Program	\$1,000,000
<u>Xavier University (SSC)</u> Training	\$20,000
MARYLAND	
<u>Bowie State University</u> Model Institutions for Excellence (MIE)	\$1,554,100

MISSISSIPPI

Alcorn State University
MASTAP \$200,000

Jackson State University
Commercial Remote Sensing Program \$100,000

TENNESSEE

Tennessee State University
Increasing Pool of Minority Engineers \$84,660

VIRGINIA

Hampton University
Aerospace Research Summer Scholars (LaRC) \$200,000

TRAINING AWARDS SUMMARY:

SUBTOTAL OF COMPETITIVE AWARDS	\$6,089,263	
SUBTOTAL OF AWARDS TO BE DETERMINED	\$826,897	
TOTAL TRAINING AWARDS		\$6,916,160

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 2000, 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 \$1,212,387 in FY 2000.

Listed below are competitively selected fellowship awards projected to be funded in FY 2000:

<u>INSTITUTIONS/ACTIVITIES</u>	<u>FY 2000</u>
ALABAMA	
<u>Tuskegee University (KSC)</u> Traineeships	\$15,333
FLORIDA	
<u>Florida A&M University (KSC)</u>	\$15,333
Internships (LeRC)	\$3,960
GEORGIA	
<u>Atlanta University Center</u> College Recruiting (JPL)	\$15,950
MARYLAND	
<u>Bowie State University</u> Summer Institute in Engineering and Computer Science (GSFC)	\$185,000
NORTH CAROLINA	
<u>North Carolina A&T State University</u> College Recruiting (JPL)	\$17,200
TENNESSEE	

Tennessee State University (KSC)

Traineeships \$15,334

Internships (LeRC) \$22,712

**FELLOWSHIPS, INTERNSHIPS, TRAINEESHIPS, RECRUITMENT,
AND INTERGOVERNMENTAL PERSONNEL ACT (IPA) SUMMARY:**

SUBTOTAL OF COMPETITIVE AWARDS		\$290,822
SUBTOTAL OF AWARDS TO BE DETERMINED	\$921,565	
TOTAL FELLOWSHIPS, INTERNSHIPS, TRAINEESHIPS, RECRUITMENT, AND INTERGOVERNMENTAL PERSONNEL ACT (IPA) AWARDS		\$1,212,387

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.

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 \$7,212,000 in FY 2000. 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 2000:

<u>INSTITUTIONS</u>	<u>FY 2000</u>
FLORIDA	
<u>Florida A&M University</u> PACE	\$100,000
GEORGIA	
<u>Clark-Atlanta University</u> PACE	\$100,000
<u>Morehouse College</u> PACE	\$100,000
LOUISIANA	
<u>Southern University A&M College University System</u> PACE	\$100,000

MISSISSIPPI

Jackson State University
Student Tuition Assistance \$99,970

**STUDENT TUITION ASSISTANCE, SCHOLARSHIPS,
AND OTHER AID SUMMARY:**

SUBTOTAL OF COMPETITIVE AWARDS	\$499,970
SUBTOTAL OF AWARDS TO BE DETERMINED	\$6,712,030
TOTAL STUDENT TUITION ASSISTANCE, SCHOLARSHIPS, AND OTHER AID AWARDS	\$7,212,000

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 2000 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 2000, the Education Division will invest \$1,500,000 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 \$3,325,000 for FY 2000.

Private-Sector Involvement

Allied Technology Group, Inc.

The competitive peer review processes are supported by a contract to the Allied Technology Group, Inc. This involves solicitation development, proposal review and selection, and post-award documentation and reporting. The annual cost of this contract for HBCU's is \$750,000.

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

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 awarded 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 protégé.

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

During FY 2000, 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.

INSTITUTIONS

FY 2000

DISTRICT OF COLUMBIA

Howard University (GSFC)
Public Service Internship

\$70,000

Morgan State University
Engineering Enrichment Program

\$60,000

OTHER ACTIVITIES SUMMARY:

SUBTOTAL OF COMPETITIVE AWARDS	\$
SUBTOTAL OF AWARDS TO BE DETERMINED	\$792,200
TOTAL OTHER ACTIVITIES AWARDS	\$792,200

Center Activities

Specific activities undertaken by NASA Centers and the Jet Propulsion Laboratory (JPL) are summarized below, along with the measurable objectives which these Centers will seek to achieve during FY 2000 under Executive Order 12876.

Ames Research Center (ARC)

Ames will pursue the following measurable objectives in FY 2000:

1. Increase the number of site visits by HBCU scientists and engineers with their Ames counterparts.
2. Increase the number of ARC HBCU summer students. ARC also seeks to improve the quality of the summer students' experiences.
3. Assure compliance with projected awards and increase the amount of discretionary R&D funding through an aggressive new system of internal quarterly monitoring and reporting.

Dryden Flight Research Center (DFRC)

DFRC will continue to move forward in its plan and commitment to increase involvement with HBCU's. DFRC's vision is to be recognized as a leader in establishing effective partnerships with HBCU's by promoting academic excellence, strengthening and expanding the capacity to conduct research and development, and diversifying and developing an effective technical workforce to meet the critical technology needs of our Nation.

DFRC's objectives affecting HBCU's during FY 2000 include:

1. Generate increase of grant amounts to HBCU's. Identify HBCU research and development programs for which DFRC can supply scientific and technical information and services.
2. Increase site visits by program staff. Allocate time and resources to this objective. This will provide feedback that will be enhanced with program updates.
3. Increase DFRC contributions funding for HBCU awards.

4. Implement, assess and evaluate specific strategies designed to increase the recruitment and retention of HBCU students and graduates. Continue to promote and support DFRC's internship and cooperative education opportunities and emphasize the importance of outreach efforts to target new HBCU students.

Goddard Space Flight Center (GSFC)

GSFC will pursue the following measurable objectives affecting HBCU's during FY 2000:

1. Provide a forum for researchers at HBCU's to present findings to the scientific community at GSFC.
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 capabilities 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)

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 following are measurable objectives that JPL will seek to achieve under Executive Order 12876 during FY 2000:

1. Align the Research Projects performed by HBCU faculty and students with the current and future technology focus at JPL.
2. Increase the number of faculty members from HBCU's participating in the American Society for Engineering and Education (ASEE) Summer Faculty Program.
3. Increase the number of graduate researchers from HBCU's participating in the Graduate Researcher Program.
4. Ensure participation by JPL engineers and scientists on the thesis committees of JPL-sponsored students pursuing graduate degrees.
5. Ensure that the position assignments for Summer Intern students are aligned with their chosen disciplines of study.

Johnson Space Center (JSC)

The accomplishment of the Minority University Research and Education Program (MUREP) at JSC is noteworthy. JSC has developed a successful and vital link with HBCU's in implementing Executive Order 12876. JSC will continue to provide assistance and to seek opportunities to strengthen technology and education outreach partnerships with existing HBCU's, as well as to aggressively seek new relationships with HBCU's during FY 2000. JSC will continue to promote the development of

competitive aerospace research and capability in HBCU's. JSC managers continue to support the Agency's goal and mission to assist HBCU's; and together with JSC's Director of Equal Opportunity Programs and the MUREP Manager, will continue to seek additional funding sources from respective organizations. During the formulation of the FY 2000 budget, the Office of Space Flight and JSC targeted an additional \$900,000 per year of institutional funding for HBCU and Other Minority Universities (OMU) contracts and grants, despite decreasing budgets.

Kennedy Space Center (KSC)

KSC will pursue the following measurable objectives in FY 2000:

1. Encourage students at HBCU's to use their talents, interests, and training for scientific research.
2. Encourage HBCU's to submit innovative ideas for enabling technologies to support long-term space travel.
3. Encourage partnerships with other universities and local community business ventures in order to form strong teams for the purpose of being more competitive in the applied R&D community.
4. Improve overall program management of HBCU grants to include timely obligation and costing of grants.

Langley Research Center (LaRC)

The following are four principal, measurable objectives that the LaRC Office of Education will seek to achieve under Executive Order 12876 during FY 2000:

1. Continue to increase the number of HBCU students trained as interns and fellows through grants and cooperative education programs.
2. Establish a data base to be used in conjunction with the MURED data base to track the effectiveness of the students and faculty participating in NASA internships and fellowships through NASA grants and cooperative agreements, and contracts.
3. Continue to inform HBCU Principal Investigators, Grant Officers, and Business Office personnel on procurement requirements for NASA grants, cooperative agreements, and contracts on a regular basis.
4. Utilize Distance Learning and other educational technologies for a variety of intervention mechanisms to inform HBCU students and faculty of NASA outreach programs including the exchange visitation between the HBCU students and faculty and the LaRC scientists, engineers, and administrative professionals.

Lewis Research Center (LeRC)

LeRC's funding plan for FY 2000 is estimated to be approximately \$3.1 million.

LeRC's principal measurable objectives include the following:

1. To increase the number of proposals submitted by HBCU's in response to solicitations for investigations (NRA's).

2. To 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, Mission Analysis and related grants.
3. Develop an Adaptive Thermomechanical FEM Model and Microstructural Evolution Dynamics Model, and integrate the two models.
4. Develop an Adjoint Algorithm for Design Sensitivity Analyses.

Marshall Space Flight Center (MSFC)

MSFC's measurable objectives for FY 2000 are to:

1. Maintain the current level of MSFC institutional funding for HBCU initiatives.
2. Improve the obligations and costing performance on HBCU grants.
3. Work with the institutions to increase the number of students benefiting from MSFC-funded internship programs.
4. Assist Center program and project offices in identifying additional areas where HBCU's can contribute to mission success.

These objectives are consistent with the Agency goals which are to:

1. Increase competitive Faculty Awards for Research by 10 and Mathematics and Science Education awards by five for HBCU's.
2. Continue the URC Program with the start of the second 5-year award for four HBCU's.
3. Initiate four new Institutional Research Awards at HBCU's.
4. Expand Outreach and Precollege Programs to include four new HBCU's that are not currently funded by NASA.

MSFC is committed to supporting NASA in helping HBCU's "to increase opportunities to participate in and benefit from Federal programs" and to assure that HBCU institutions continue to play a vital role in carrying out MSFC roles and missions.

Stennis Space Center (SSC)

SSC will pursue the following measurable goals in FY 2000:

1. To attain HBCU faculty participation in the Summer Faculty, Resident Research Associateship, and JOVE programs at 10 percent or more.
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 and faculty participation in SSC fellowship, internship, and traineeship programs at 10 percent or more.

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

<p>SUMMARY OF PLANNED AGENCY AWARDS BY CATEGORY FY 1999</p>

1. AGENCY: NATIONAL
AERONAUTICS AND SPACE
ADMINISTRATION

2. AGENCY REPRESENTATIVE:
George E. Reese

Associate Administrator for Equal
Opportunity Programs

(Signature)

AWARDS* (dollars
in thousands)

CATEGORY	AWARDS TO IHE's	AWARDS TO HBCU's	AWARDS TO HBCU's AS % OF TOTAL AWARDS TO IHE's
Research & Development	\$718,922	\$32,684	4.5%
Program Evaluation		\$750	
Training	\$41,296	\$6,916	16.7%
Facilities and Equipment	\$719		
Fellowships, Internships, Traineeships, Recruitment, and IPA's	\$10,765	\$1,213	11.3%
Student Tuition Assistance, Scholarships, and Other Aid	\$3,915	\$7,212	184.2%
Direct Institutional Subsidies			
Third-Party Awardees		\$3,325	
Private-Sector Involvement		\$2	
Administrative Infrastructure			
Other	\$35,682	\$792	2.2%
TOTAL	\$811,552	\$52,894	6.5%

Daniel S. Goldin

Administrator

(Signature)

+ Institutions of Higher Education
awards are based on FY 1997 actual
obligations

* HBCU Awards are based on FY
1999 budget estimates

	R & D	PE	TRAINING	F & E	FELLOWS
OFFICE OF AERONAUTICS & SPACE TRANSPORTATION TECHNOLOGY (OASTT)	4,500,000				
AMES RESEARCH CENTER	473,000				
DRYDEN FLIGHT RESEARCH CENTER	107,500				27,3
LANGLEY RESEARCH CENTER	901,461				200,0
LEWIS RESEARCH CENTER **	2,193,000		834,660		26,6
OFFICE OF EQUAL OPPORTUNITY PROGRAMS (OEOP)*	12,415,000	750,000	6,035,000		
OFFICE OF HUMAN RESOURCES AND EDUCATION (HR&E)					
OFFICE OF LIFE AND MICROGRAVITY SCIENCES AND APPLICATIONS (OLMSA)	1,000,000				
OFFICE OF MISSION TO PLANET EARTH (OMTPE) ??	4,200,000				
GODDARD SPACE FLIGHT CENTER	172,884		25,000		
OFFICE OF SPACE FLIGHT (OSF)	1,800,000				
JOHNSON SPACE CENTER	624,000		1,500		60,0
KENNEDY SPACE CENTER	480,000				63,2
MARSHALL SPACE FLIGHT CENTER	587,265				1,0
STENNIS SPACE CENTER	30,000		20,000		
OFFICE OF SPACE SCIENCE (OSS)	3,200,000				
JET PROPULSION LABORATORY					834,1
TOTAL	32,684,110	750,000	6,916,160		1,212,3

* PROJECTED APPROPRIATED FUNDS FOR HBCU'S

** INCLUDES \$500K OF DOE FUNDING TO SOUTHERN U.

					FY 2000		
STATE/INSTITUTION	R & D	PE	TRAINING	& E	FELLOWS	STA	DIS
ALABAMA							
ALABAMA A&M UNIVERSITY	\$1,199,763						
TUSKEGEE UNIVERSITY	\$1,100,000				\$15,333		
COAHOMA COMMUNITY COLLEGE			\$65,000				
DELAWARE							
DELAWARE STATE UNIVERSITY	\$100,000						
DISTRICT OF COLUMBIA							
HOWARD UNIVERSITY	\$1,099,539						
UNIVERSITY OF THE DISTRICT OF COLUMBIA							
FLORIDA							
BETHUNE COOKMAN COLLEGE	\$330,000						
FLORIDA A&M UNIVERSITY	\$1,573,000		\$500,508		\$19,293	\$100,000	
GEORGIA							
CLARK ATLANTA UNIVERSITY	\$1,099,729		\$200,000			\$100,000	
MOREHOUSE SCHOOL OF MEDICINE	\$915,268						
SPELMAN COLLEGE			\$2,164,995				
MOREHOUSE COLLEGE						\$100,000	
LOUISIANA							
SOUTHERN UNIVERSITY - A&M COLLEGE	\$400,000		\$1,000,000			\$100,000	
XAVIER UNIVERSITY	\$110,000		\$20,000				
MARYLAND							
BOWIE STATE UNIVERSITY			\$1,554,100		\$185,000		
MORGAN STATE UNIVERSITY	\$1,650,000						
MISSISSIPPI							
ALCORN STATE UNIVERSITY	\$100,000		\$200,000				
JACKSON STATE UNIVERSITY	\$195,000		\$100,000			\$99,970	
MISSISSIPPI VALLEY UNIVERSITY	\$100,000						
NORTH CAROLINA							
ELIZABETH CITY STATE UNIVERSITY	\$650,000						
NORTH CAROLINA A&T STATE UNIVERSITY	\$1,300,000				\$17,200		
SOUTH CAROLINA							
SOUTH CAROLINA STATE UNIVERSITY	\$650,000						
TENNESSEE							
FISK UNIVERSITY	\$1,000,000						
TENNESSEE STATE UNIVERSITY	\$1,600,000		\$84,660		\$38,046		
TEXAS							
PRAIRIE VIEW A&M UNIVERSITY	\$1,906,643						
VIRGINIA							
HAMPTON UNIVERSITY	\$1,901,461		\$200,000				
NORFOLK STATE UNIVERSITY	\$100,000						
SUB-TOTAL							
ALLIED TECHNOLOGY GROUP, INC.							
OTHER (PROJECTED AWARDS)							
MASTAP - 5 AWARDS							
PACE - 5 AWARDS							
UNDERGRADUATE/GRADUATE RESEARCHERS							
AWARDS TO BE DETERMINED							
	\$13,203,707	\$750,000	\$326,897		921,565	\$500,000	\$6,212,030
GRAND TOTAL	\$32,284,110	\$750,000	\$6,916,160		\$1,212,387		\$7,212,000

