



**New Investigators Program
Grant Year 2010
(July 1, 2010 – June 30, 2012)**

Request for Proposals

Online Proposal Submissions Due: Thursday, February 25, 2010 (5:00 PM)

Original Hardcopy Submission Due: Monday, March 1, 2010

Anticipated Award Date: April 15, 2009

<http://www.ncspacegrant.org/nip/>

North Carolina Space Grant New Investigators Program - Request for Proposals

I. Summary

The New Investigators Program is designed to strengthen North Carolina's aerospace-related research infrastructure by providing startup funding to early career university faculty who are conducting research that is directly aligned with NASA's Strategic Framework (Appendix A).

II. Background

The National Space Grant College and Fellowship Program was established by Congress under Title II of the National Aeronautics and Space Administration Authorization Act of 1988. Today the 52 Space Grant Consortia include over 850 affiliates from universities, colleges, industry, museums, science centers, and state and local government agencies.

NC Space Grant, established in 1991, is an active member of the National Space Grant College and Fellowship Program. NC Space Grant currently has 11 university member institutions (Appalachian State University, Duke University, Elizabeth City State University, NC A&T State University, NC Central University, NC State University, UNC-Asheville, UNC-Chapel Hill, UNC-Charlotte, UNC-Pembroke, Winston-Salem State University), 4 industry/government/non-profit partners and has managed and provided nearly \$14 million in support to North Carolina citizens.

NC Space Grant conducts programs in areas of fellowships, scholarships, education, research, and public service to promote, develop and support aeronautics and space-related science, engineering and technology training and programs. A common focus is to involve women, underrepresented minorities, and persons with disabilities, and to reach more citizens of North Carolina.

III. Project Overview and Guidelines

A. Award Range and Performance Period

NC Space Grant anticipates making 4 to 6 awards of up to \$25,000 with a period of performance of 24 months (July 1, 2010 to June 30, 2012). Awards require a 50% cost-match of non-federal funds to awarded funds. In other words, if \$25,000 is requested from the NC Space Grant, then \$12,500 must be provided as cost-match. Facilities and Administrative (F&A, or overhead) costs are not allowed.

B. Eligibility

Competition is open to individuals at active NC Space Grant university member institutions. Individuals must be qualified to serve as a principal investigator at their respective institution and be U.S. citizens. Permanent residents, foreign nationals and resident aliens may apply for funding but with budget restrictions (see Section IV.E.).

NC Space Grant encourages proposals from females, members of underrepresented minority groups, and persons with disabilities. Submission is limited to one proposal per investigator; an investigator may receive only one NC Space New Investigations program award.

IV. Proposal Content

A. Title Page (1 page)

The cover page must include the following items: Project title; period of performance (July 1, 2010 – June 30, 2012 or less); PI name, institution, address, phone, fax, and email; concurrence signatures from the Principal Investigator and the Authorizing Official of the proposing institution; and the program name (New Investigations Program).

B. Project Description (5 pages maximum)

The PI is expected to use these discretionary funds to further establish his/her professional career through research. Examples of things to consider include: support for graduate or undergraduate students; publication costs; travel funds to establish collaborative relationships with NASA/industry researchers; regional/national travel costs to conferences and meetings; summer salary support; disposable research materials; and research related equipment (not an all-inclusive list). This section should include the following (refer to Section VII for evaluation rubric):

- Detailed description of the proposed research;
- Relevance of proposed research to NASA's Strategic Framework (and Mission Directorates and NC Space Grant Strategic goals for research (refer to Appendices A-D));
- Number of students supported through research efforts;
- Description of how funding will impact investigator's career; and
- Description of past projects supported by NC Space Grant (if applicable).

C. Vita (2 pages)

The PI must include a biographical sketch (not to exceed two pages) that includes his/her professional experiences and positions and a bibliography of recent publications, especially those relevant to the proposed investigation. Those participants who will play critical management or technical roles in the proposed investigation should demonstrate that their qualifications, capabilities, and experience are appropriate to provide confidence that the proposed objectives will be achieved (no more than one page each).

D. Support Letters (2 letters)

Include a letter of support and commitment from each of the following:

- Research colleague - this letter should emphasize the importance of the proposed research to the field, as well as the ability of the PI to conduct research.
- Department Head or Research center/laboratory Director – this letter should outline the importance of the proposed research to the department and the direction of the university.

E. Budget and Budget Narrative (2 pages)

Provide a detailed budget using the format outlined in Appendix E (New Investigators – Proposed Budget for Grant Year 2010), along with a budget narrative. Each format should include expense summaries as well as the 50% non-federal cost match requirement.

Specific budget details are noted below:

- Direct salary expenses for PI and students should be separated by titles or disciplines with hours, rates, and total amounts for each position.
- Proposed travel should include the number of trips, destination, duration, etc. International travel is not allowed.

- *NOTE: Permanent residents, foreign nationals and resident aliens may not charge salary or travel expenses to the grant; unrecovered salary and travel can be used to meet the cost-match requirement.*
- All students (graduate and/or undergraduate) supported must be permanent U.S. citizens.
- Requests for equipment are limited to equipment that has a direct impact on the research (computers, however, are not allowed). Any requested equipment purchase to be made as a direct charge under this award must include the equipment description, an explanation of how it will be used in the conduct of the research proposed, and a written certification that the equipment will be used exclusively for the proposed research activities and not for general business or administrative purposes. *Please note that NASA training grant funds cannot be used to purchase equipment. As a result, state funds will be used to support any equipment requests. The budget format (Appendix E) contains a column for state funds; this is where equipment expenses should be shown.*
- The NC State University/NASA National Space Grant College and Fellowship Program grant does not cover facilities and administrative costs. Unrecovered facilities and administrative costs may be used for required cost-matching. The detailed budget must include a description of the required 0.5:1 (50%) non-federal matching funds.
- The NASA Grants and Cooperative Agreements Handbook, Sections A and B, located at <http://ec.msfc.nasa.gov/hq/grcover.htm>, provides additional information on uniform administrative requirements for grants and cooperative agreements with institutions of higher education.

F. Current and Pending Support

Identify current and pending support of the Principal Investigator including: source of support; project title; amount of award; period covered by award; months or percent of time committed by the investigator during the award period; and location of research. Do not include the current proposal on the list of pending proposals unless it has been submitted to another possible sponsor.

V. Proposal Format

The following guidelines and restrictions apply to all proposals. Proposals not meeting these requirements may not be considered.

- Proposals must be submitted in PDF format.
- Proposals should be one-sided, single-spaced on standard 8 ½ x 11 paper, no smaller than 12 point font and with no less than one inch margins throughout. Text restrictions are inclusive of all illustrations, tables, charts, exhibits, etc.
- All pages must be numbered sequentially.
- Proposals should contain only appendices and attachments specifically called for.
- All information you wish for reviewers to consider should be included in your proposal. It is not acceptable to refer reviewers to websites or other external sources for additional information or as evidence for your narrative. Additional appendices and attachments are not allowed.

VI. Proposal Submission

Proposal submission will be conducted via the NC Space Grant website at https://secure.spacegrant.org/proposals/submit/?sponsor_id=1 by February 25, 2010 at 5:00 PM. One complete single electronic file in PDF format is required by the on-line system. Electronically submitted proposal **must** contain all required signatures. Questions concerning the on-line proposal submission system should be directed to proposals@ncspacegrant.org.

The original proposal with all required signatures must arrive at NC Space Grant by March 1, 2010. Late or incomplete submissions may not be considered. Hard copy submissions should be sent via express mail, commercial delivery, or courier to:

Dr. Chris Brown, Director
North Carolina Space Grant
NCSU - Research Building II
1009 Capability Drive, Suite 210
Raleigh, NC 27606

VII. Proposal Review and Evaluation

Proposals will be reviewed by a panel of individuals who are scientifically literate, but not necessarily experts in the proposed field of research. Proposals will be grouped into 'research areas' based on information provided by the PI during proposal submission. Similarly, review panel members will be grouped into research areas of interest. The following areas will be considered in the evaluation of the proposal:

Research Plan (35%)

- Degree to which proposed project demonstrates responsiveness to NASA Mission Directorate research and development areas of interest and emphasis;
- Degree to which proposed project advances space and aerospace-related research in North Carolina and beyond;
- Degree to which proposed project offers innovative methods, approaches, and concepts;
- Degree to which proposed project incorporates collaboration and/or cooperation of two or more disciplines or fields of study;
- Degree to which proposed effort builds on past research activities undertaken by the PI or other investigators;
- Feasibility and clarity of goals and objectives; and
- Degree to which the proposed effort provides opportunities for students to engage in STEM research.

Alignment of research to NASA's Vision for Space Exploration (20%)

- Degree to which proposed effort is aligned with one or more of the NASA Office of Education outcomes;
- Degree to which proposed effort is aligned with one or more of the NC Space Grant Strategic Goals for higher education and research;
- Degree to which proposed effort cultivates diversity and extends access to NASA facilities and capabilities; and
- Likelihood that the proposed effort will be sustained beyond the initial funding period

Management (25%)

- Qualifications, capabilities, and experiences of the principal investigator;

- Realistic schedule/timeline or other description of how project goals, objectives and major milestones will be met;
- Degree to which the proposed project will further the investigator's research career;
- Level of collaboration with and support from the investigator's university and other projects, institutions, professional societies, and/or other appropriate partners;
- Degree to which the proposed project results will be disseminated.

Budget (20%)

- Clarity and reasonableness of the funding request;
- Degree of alignment between proposal narrative and budget;
- Degree to which proposed effort demonstrates effective use of funds; and
- Degree to which proposed outcomes justify total costs.

VIII. Reporting Requirements

A. Financial Progress Report

A financial progress report must be submitted by December 31, 2010. This report must contain a breakdown of project expenditures to date and summarize how remaining funds will be spent. Format will be provided.

B. Final Report

A final report is due within 90 days of the completion of the award. This report must contain the following (format will be provided):

1. Executive summary of the project that is suitable for publication. The executive summary should no more than 250 words.
2. Statement on how funding assisted investigator.
3. List of papers submitted for publication during the period of this award. Include title, publication, date of publication, author list, and a copy of the paper.
4. List of all presentations delivered during the period of this award. Include presentation title, location, date, and a copy of the presentation.
5. List of all conferences attended during the period of this award. Include conference title, location, dates, and if investigator presented.
6. List of all proposals submitted during the period of this award. Include proposal title, announcement of opportunity title, name of sponsor, proposal due date, role of investigator, and funding status.
7. List of all patents that were applied for and/ or approved during the period of this award.
8. List of pending and actual support for investigator. Include source, PI, % time, and role of investigator.
9. Budget summary that details all project expenditures and includes a comparison of the proposed budget to actual expenditures for all budgeted categories.
10. Signed statement of cost sharing from PI's Office of Sponsored Programs.

IX. Other Requirements

A. Acknowledgment of Support

An acknowledgment of NC Space Grant support (logo and/or written) must appear in all publications of any material based on this funding in the following terms: "Supported by the North Carolina Space Grant." The NC Space Grant logo can be downloaded at www.ncspacegrant.org.

B. Post Award Reporting Requirements

The Principal Investigator agrees to submit a current vita to NC Space Grant once per year for at least 5 years after the completion of this award. This allows NC Space Grant to assess the impact of this program on the career of the investigator.

C. Audit and Records

Financial records, supporting documents, statistical records, and other material pertinent to this grant shall be retained by the grantee for a period of at least three years following submission of the final project report and shall be made available to NC Space Grant upon request.

D. Payments

Contingent upon NC Space Grant's receipt of NASA funds, a sub-agreement will be established between the grantee's institution and NC State University. The grantee institution shall receive payments under this grant through that institution's Office of Sponsored Projects. Invoices must be submitted no later than 30 days after the last day of the month in which the expense was incurred. Late invoices may not be honored.

E. Notification of Absence

NC Space Grant shall be notified prior to the Principal Investigator’s absence from campus for a period of four months or more. Prolonged absences from the campus for non-project related purposes are subject to NC Space Grant review.

F. Transfer of Awards

If the principal investigator leaves the grantee institution or otherwise relinquishes active direction of the project, the institution must notify NC Space Grant as soon as possible and the award will be terminated. Awards may not be transferred if the PI leaves the grantee institution to another institution that is not an active academic member of the NC Space Grant.

G. Suspension or Termination

This grant may be suspended or terminated if the grantee fails to comply with all the terms and conditions of the grant.

H. Nondiscrimination

No person shall be excluded from participation in, be denied benefits of, or be otherwise subjected to discrimination under this grant on grounds of race, color, national origin, religious affiliation, physical disability, gender, or sexual orientation.

I. Compliance with Regulations

The investigator must abide by all state and federal regulations related to research.

X. Point of Contact

Questions regarding this announcement should be directed to:

Dr. Chris Brown, NC Space Grant Director, cbrown@ncsu.edu, (919) 513-2457; or

Jobi Cook, NC Space Grant Associate Director, jobi_cook@ncsu.edu, (919) 515-5933.

Applicants are encouraged to contact their local NC Space Grant Campus Director, listed below:

University	Campus Director	Email
Appalachian State University	Dr. Anthony Calamai	calamaiag@appstate.edu
Duke University	Dr. Josiah Knight	jknight@duke.edu
Elizabeth City State University	Dr. Thomas Rossbach	tjrossbach@mail.ecsu.edu
North Carolina A&T State University	Dr. Fred Ferguson	fferguso@ncat.edu
North Carolina Central University	Dr. Shawn Sendlinger	ssendlinger@nccu.edu
North Carolina State University	Dr. Fred DeJarnette	dejar@ncsu.edu
University of North Carolina at Asheville	Dr. Brian Dennison	dennison@unca.edu
University of North Carolina at Charlotte	Dr. Bharat Yoshi	bsjoshi@unc.edu
University of North Carolina at Chapel Hill	Dr. Gerald Cecil	cecil@physics.unc.edu
University of North Carolina at Pembroke	Dr. Jose D'Arruda	jose.darruda@uncp.edu
Winston-Salem State University	Dr. Elva Jones	jonese@wssu.edu

APPENDIX A: Strategic Framework for NASA

NASA Mission Directorates

NASA's Mission to *pioneer the future in space exploration, scientific discovery, and aeronautics research*, draws support from four Mission Directorates, each with a specific responsibility.

- The Aeronautics Research Mission Directorate (ARMD) conducts vital research to make air travel more efficient, safe, green, and to uncover leading-edge solutions for the Next Generation Air Transportation System (NextGen) in the United States. ARMD's fundamental research in traditional aeronautical disciplines and emerging disciplines helps address substantial noise, emissions, efficiency, performance and safety challenges that must be met in order to design vehicles that can operate in the NextGen. (<http://www.aeronautics.nasa.gov>)
- The Exploration Systems Mission Directorate (ESMD) Agency role is to develop a sustained human presence on the moon; to promote exploration, commerce, and U.S. preeminence in space; and to serve as a stepping-stone for the future exploration of Mars and other destinations. ESMD establishes the NASA exploration research and technology development agenda. Specifically, ESMD develops capabilities and supporting research and technology that will enable sustained and affordable human and robotic exploration. It also works to ensure the health and performance of crews during long-duration space exploration. In the near-term, ESMD does this by developing robotic precursor missions, human transportation elements, and life-support systems. (<http://www.exploration.nasa.gov>)
- The Science Mission Directorate (SMD) leads the Agency in four areas of research: Earth Science, Heliophysics, Planetary Science, and Astrophysics. SMD works closely with the broader scientific community, considers national initiatives, and uses the results of National Research Council studies to define a set of "Big Questions" in each of these four research areas. These questions, in turn, fuel mission priorities and the SMD research agenda. The SMD also sponsors research that both enables, and is enabled by, NASA's exploration activities. SMD has a portfolio of Education and Public Outreach projects that are connected to its research efforts. (<http://nasascience.nasa.gov>)
- The Space Operations Mission Directorate (SOMD) provides the Agency with leadership and management of NASA space operations related to human exploration in and beyond low-Earth orbit. SOMD enables current space exploration in low earth orbit through its Space Shuttle and International Space Station Programs. SOMD is also responsible for Agency leadership and management of NASA space operations related to Launch Services, Space Transportation, and Space Communications in support of both human and robotic exploration programs. (<http://www.spaceoperations.nasa.gov>)

II. NASA Research Areas of Interest

Research priorities for each of the Mission Directorates can be found at the following locations:

Aeronautics Research Mission Directorate (ARMD)

Researchers responding to the ARMD should propose research that is aligned with one or more of the ARMD programs. Proposers are directed to the following:

- ARMD Programs: <http://www.aeronautics.nasa.gov/programs.htm>
- Research Opportunities in Aeronautics (ROA) <http://nspires.nasaprs.com> (select "Solicitations" and then "Open Solicitations")

Exploration Systems Mission Directorate (ESMD)

General priorities of ESMD can be found at <http://www.nasa.gov/directorates/esmd>.

ESMD - Science Research Interests:

- Research and Technology Development to Support Crew Health and Performance in Space Exploration Missions, NASA Human Research Program and The National Space Biomedical Research Institute <http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=154870/NNJ08ZSA00.pdf>
- Ground-Based Studies in Space Radiobiology, NASA Space Radiation Program Element <http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=179575/NNJ09ZSA001N.pdf>

ESMD - Engineering Research Interests:

- **Spacecraft:** Guidance, navigation and control; thermal; electrical; structures; software; avionics; displays; high speed re-entry; modeling; power systems; interoperability/commonality; advanced spacecraft materials; crew/vehicle health monitoring; life support.
- **Propulsion:** Propulsion methods that will utilize materials found on the moon or Mars, “green” propellants, on-orbit propellant storage, motors, testing, fuels, manufacturing, soft landing, throttle-able propellants, high performance, and descent.
- **Lunar and Planetary Surface Systems:** Precision landing hardware, software, in-situ resource utilization (ISRU), navigation systems, extended surface operations, robotics, (specifically environmental scouting prior to human arrival, outpost maintenance with and without humans present, and assist astronaut with geologic exploration) environmental analysis, radiation protection, spacesuits, life support, power systems. ESMD also has an extensive program to develop and test models of lunar surface systems in realistic analog environments on Earth. Information on the Analog Tests is available on the Web by visiting: <http://www.nasa.gov/exploration/home/analogs.html>.
- **Ground Operations:** Pre-launch, launch, mission operations, command and control software systems, communications, landing and recovery.

Science Mission Directorate (SMD)

Detailed information on SMD research priorities is available at the following URLs:

- NASA Science Plan 2007: <http://science.hq.nasa.gov/strategy/> and http://nasascience.nasa.gov/about-us/science-strategy/Science_Plan_07.pdf.
- Research Opportunities in Space and Earth Science (ROSES): <http://nspires.nasaprs.com/external/>. Select “Solicitations”, “Open Solicitations”, and then “Research Opportunities in Space and Earth Sciences (ROSES) – 2009”.
- In addition, proposer can visit the following URL: <http://nasascience.nasa.gov/bigquestions> which summarizes the research questions across all four SMD divisions and links to their respective 2007-2016 science strategy.

Space Operations Mission Directorate (SOMD)

The primary research and technology development areas in SOMD support launch vehicles, space communications, and the International Space Station. Examples of research and technology development areas (and the associated lead NASA Center) with great potential include:

- Space Communications and Navigation
 - Coding, Modulation, and Compression (Goddard Spaceflight Center (GSFC))
 - Precision Spacecraft and Lunar/Planetary Surface Navigation and Tracking (GSFC)
 - Communication for Space-Based Range (GSFC)
 - Antenna Technology (Glenn Research Center (GRC))
 - Reconfigurable/Reprogrammable Communication Systems (GRC)
 - Miniaturized Digital EVA Radio (Johnson Space Center (JSC))
 - Transformational Communications Technology (GRC)
 - Long Range Optical Telecommunications (Jet Propulsion Laboratory (JPL))
 - Long Range Space RF Telecommunications (JPL)
 - Surface Networks and Orbit Access Links (GRC)
 - Software for Space Communications Infrastructure Operations (JPL)
 - TDRS transponders for launch vehicle applications that support space communication and launch services (GRC)
- Space Transportation
 - Optical Tracking and Image Analysis (Kennedy Space Center (KSC))
 - Space Transportation Propulsion System and Test Facility Requirements and Instrumentation (Stennis Space Center (SSC))
 - Automated Collection and Transfer of Launch Range Surveillance/Intrusion Data (KSC)
 - Technology tools to assess secondary payload capability with launch vehicles (KSC)
 - Spacecraft Charging/Plasma Interactions (Environment definition & arcing mitigation) ((Marshall Space Flight Center (MSFC))

- Processing and Operations
 - Crew Health and Safety Including Medical Operations (JSC)
 - In-helmet Speech Audio Systems and Technologies (GRC)
 - Vehicle Integration and Ground Processing (KSC)
 - Mission Operations (Ames Research Center (ARC))
 - Portable Life Support Systems (JSC)
 - Pressure Garments and Gloves (JSC)
 - Air Revitalization Technologies (ARC)
 - In-Space Waste Processing Technologies (JSC)
 - Cryogenic Fluids Management Systems (GRC)

APPENDIX B: NASA Education Strategic Coordination Framework

I. Overview

As identified in the 2006 NASA Strategic Plan, education is one of the Agency's cross-cutting management strategies. High achievement in STEM education is essential to the accomplishment of NASA's mission. NASA contributes to national efforts for achieving excellence in STEM education through a comprehensive education portfolio implemented by the Office of Education, the Mission Directorates, and the NASA Centers. NASA will continue the Agency's tradition of investing in the Nation's education programs and supporting the country's educators who play a key role in preparing, inspiring, exciting, encouraging, and nurturing the young minds of today that will manage and lead the Nation's laboratories and research centers of tomorrow. The **NASA Education Strategic Coordination Framework: A Portfolio Approach** describes the alignment of NASA's education portfolio with the 2006 NASA Strategic Plan and creates an agency-wide strategic planning, implementation and evaluation framework for NASA's investments in education. This Framework establishes three educational outcomes:

- **Outcome 1 – Higher Education:** Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goal through a portfolio of investments.
- **Outcome 2 – Elementary and Secondary Education:** Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.
- **Outcome 3 – Informal Education:** Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission.

The plan encompasses all education efforts undertaken by NASA and guides the Agency's relationships with external education partners. Proposers are strongly encouraged to become familiar with this document. It may be found at: <http://education.nasa.gov/about/strategy>

II. NASA Education Outcomes and Objectives

Outcome 1 Objectives

- **Objective 1.1 – Faculty and Research Support:** Provide NASA competency-building education and research opportunities for faculty, researchers, and post-doctoral fellows.
- **Objective 1.2 --Student Support:** Provide NASA competency-building education and research opportunities to individuals to develop qualified undergraduate and graduate students who are prepared for employment in STEM disciplines at NASA, industry, and higher education.
- **Objective 1.3 --Student Involvement, Higher Education:** Provide opportunities for groups of post-secondary students to engage in authentic NASA-related mission-based research and development activities.
- **Objective 1.4 --Course Development:** Develop NASA-related course resources for integration into STEM disciplines.
- **Objective 1.5 --Targeted Institution Research and Academic Infrastructure:** Improve the ability of targeted institutions to compete for NASA research and development work.

Outcome 2 Objectives

- **Objective 2.1 Educator Professional Development—Short Duration:** Provide short duration professional development training opportunities to educators, equipping them with the skills and knowledge to attract and retain students in STEM disciplines.
- **Objective 2.2 Educator Professional Development—Long Duration:** Provide long-duration and/or sustained professional development and training opportunities to educators that result in deeper content understanding and/or competence and confidence in teaching STEM disciplines.
- **Objective 2.3 Curricular Support Resources:** Provide curricular support resources that use NASA themes and content to a) enhance student skills and proficiency in STEM disciplines; and/or b) inform students about STEM career opportunities; and/or c) communicate information about NASA's mission activities.
- **Objective 2.4 Student Involvement K-12:** Provide K-12 students with authentic, firsthand opportunities to participate in NASA mission activities, thus inspiring interest in STEM disciplines and careers; and/or provide opportunities for family involvement in K-12 student learning in STEM areas.

Outcome 3 Objectives

- **Objective 3.1 Resources**

- Provide informal education support resources that use NASA themes and content to 1) enhance participant skills and proficiency in STEM disciplines; 2) inform participants about STEM career opportunities; 3) communicate information about NASA's mission activities
- Develop a significant pool of qualified presenters of NASA aerospace content interacting with a large number of participants.

- **Objective 3.2 Professional Development for Informal Education Providers:** Provide opportunities to improve the competency and qualifications of STEM informal educators, enabling informal educators to effectively and accurately communicate information about NASA activities and access NASA data for programs and exhibits.

- **Objective 3.3 Informal Education Provider Involvement Opportunities**

- Develop a national pool of qualified informal educators with experience in NASA-mission and related activities
- Engage informal educators using NASA themes to enable them to 1) enhance participant skills and proficiency in STEM disciplines; 2) inform participants about STEM career opportunities; 3) communication information about NASA's mission activities.
- Establish and maintain a single informal education network for accessing NASA materials that has the flexibility for Special Interest Groups to function as a subset of the larger network.

APPENDIX C: NC Space Grant Strategic Plan, 2005-2010

INTRODUCTION

North Carolina Space Grant (NC Space Grant), established in 1991, is an active member in a national network of university-based consortia. Established by Congress and implemented by NASA, the National Space Grant College and Fellowship Program contributes to the nation's science enterprise by funding research, education, and public service projects through a national network of 52 Space Grant consortia. NC Space Grant has eleven university member institutions, 4 industry/government/non-profit partners and has managed and provided nearly \$14 million in support to North Carolina citizens.

VISION FOR THE NC SPACE GRANT

To expand the opportunity to participate in NC Space Grant programs to all citizens of North Carolina.

MISSION

To promote, develop and support aeronautics and space-related science, engineering and technology training and programs in North Carolina.

FUNDING

NC Space Grant program funding is provided through an annual base grant from NASA, annual recurring funding from the NC General Assembly, supplemental competitive grants from NASA, private contributions, and annual matching funds from the consortium members.

University Member Institutions

Appalachian State University
Elizabeth City State University
Duke University
NC A&T State University

NC Central University
NC State University
UNC-Asheville
UNC-Chapel Hill

UNC-Charlotte
UNC-Pembroke
Winston Salem State University

Partners

Kenan Institute for Engineering, Tech. & Science
Lord Corporation
North Carolina Department of Public Instruction
Pisgah Astronomical Research Institute

Advisory Council

NASA Langley Research Center
Virginia Space Grant Consortium
Lord Corporation
UNC Office of the President
NC DOT, Aviation Division
NC Museum of Life and Science
NC Community College System
Pisgah Astronomical Research Institute

Goals for the NC Space Grant are established in the areas of: Fellowships and Scholarships; Higher Education; Research Infrastructure; K-12 Professional Development; Informal Education and Public Outreach; and Expansion and Growth. A common focus is to expand programs to more citizens of North Carolina, and involve women, underrepresented minorities, and persons with disabilities. These goals and desired outcomes are specific and measurable and have the acceptance of all NC Space Grant participants. While aggressive, they are realistic, can be achieved in the time frame suggested and are aligned with NASA guiding documents and North Carolina's needs in education and training.

Fellowships and Scholarships

Better equip the future STEM workforce.

- Engage 15-25 students per year in hands-on, aero/space-related research projects with an emphasis on networked collaborations within the consortium, NASA laboratories and shared facilities such as Pisgah Astronomical Research Institute.
- Engage 10-20 students per year in aero/space-related study projects.
- Facilitate positive mentor relationships between 25-45 students and faculty members per year.
- Provide venues for 25-45 students to conduct research presentations annually.

Actively pursue the participation of women, underrepresented minorities, and persons with disabilities.

- Increase the participation of women to 50%, and maintain this percentage participation through 2010.
- Maintain the participation of underrepresented minorities at or above 27.1% through 2010.

Desired Outcomes

- 75% of undergraduates who participate will pursue aero/space-related graduate studies or employment.
- 75% of graduate students who participate will obtain aero/space-related employment.
- Increase the number of yearly awards granted by 100%.
- Significantly improve engineering and science students' training in hardware design and development.

Higher Education

Better equip the future STEM workforce.

- Provide 10-15 extramural, aero/space-related work/study experiences to students per year.
- Facilitate positive mentor relationships between 10-15 students and faculty members per year.
- Provide venues for 10-15 students to conduct research presentations annually.
- Increase the number of extramural, aero/space-related work/study experiences by 50%.
- Participate in the International Masters Program in Aerospace Engineering.
- Develop 4 sustainable interdisciplinary and/or distance learning courses which engage 10-20 students each and are focused on enriching students understanding of complex aero/space issues.
- Coordinate with Space Grant Consortia from other states to generate support for education programs of mutual interest.
- Enhance Pre-College Educators' knowledge of aero/space issues.
- Provide professional development training for 25 pre-college educators per year.
- Engage 100 pre-college educators annually at the NC Space Grant NASA Educator Resource Center Satellite Center.
- Partner, as appropriate, with other organizations to provide pre- and in-service teacher development workshops and training opportunities.

Actively pursue the participation of women, underrepresented minorities, and persons with disabilities.

- Increase the participation of women to 50%.
- Maintain the participation of underrepresented minorities at or above 27.1%.

Desired Outcomes

- 75% of undergraduates who participate will pursue aero/space-related graduate studies or employment.
- 75% of graduate students who participate will obtain aero/space-related employment.
- 75% of training participants will report that their knowledge of aero/space issues has been enhanced. 75% of training participants will report that they will use provided training in their classroom.

Leverage funds with other sources to provide additional support for Higher Education programs.

Research Infrastructure

Enhance the research infrastructure of the educational institutions of the state.

- Provide 5 seed grants per year to new or transitioning faculty members to facilitate their professional development.
- Provide information to consortium institutions on NASA research programs and grants.
- Facilitate research collaborations between NC Space Grant member universities and NASA Field Centers.
- Establish a database of aero/space-related projects and principal investigators in North Carolina.
- Coordinate with Space Grant Consortia from other states to generate support for research programs of mutual interest.

Actively pursue the participation of women, underrepresented minorities, and persons with disabilities.

- Increase the participation of females to 50% of all participants.
- Maintain the participation of underrepresented minorities at or above 27.1%.

Desired Outcomes

- 75% of faculty awarded seed grants will receive promotions within 5 years.
- 75% of faculty receiving seed grants will serve as Principal Investigators on aero/space-related research projects within 5 years.

Leverage funds with other sources to provide additional research development projects.

Informal Education and Public Outreach

Enhance informal educator knowledge of aero/space issues.

- Provide professional development training for 25 informal educators per year.
- Partner, as appropriate, with other organizations to provide informal educator development workshops and training opportunities.

Inform and educate the public on the importance of NASA programs to the United States.

- Provide 5 competitive grants targeted to increasing the public's knowledge of and appreciation of NASA sponsored programs per year.
- Participate in 20 speaking engagements annually.
- Recruit and equip university faculty to inform and educate the public.
- Serve as a resource for the news media on up-to-date aero/space information.
- Serve as a resource for officials in state government on current programs and future trends in aerospace and space science with potential impact to North Carolina.
- Coordinate with Space Grant Consortia from other states to generate support for public service programs of mutual interest.
- Engage 1,000 high school and university students each year by co-hosting annual Space Day and Astronomy Day events.
- Engage 1,000 members of the general public each year by participating in annual Space Day and Astronomy Day events.

Actively pursue the participation of women, underrepresented minorities, and persons with disabilities.

- Increase the participation of females to 50% of all participants.
- Maintain the participation of underrepresented minorities at or above 27.1%.

Desired Outcomes

- 75% of training participants will report that their knowledge of aero/space issues has been enhanced.
- 75% of training participants will report that they will use provided training in an informal education setting (such as museums, science centers, and community organizations).

Leverage funds with other sources to provide additional support for public service projects.

Expansion & Growth

Expand NC Space Grant Membership.

- Increase the geographic footprint of NC Space Grant in North Carolina.
- Add 2 academic members.
- Add 2 industrial members.
- Add 2 non-profit members.
- Add 2 government agency members.

Increase Funding for NC Space Grant.

- Attain "Designated" status.
- Work through the NC General Assembly to obtain annual recurring funds to support the expansion of programs and accessibility throughout the state.
- Pursue supplemental competitive funding opportunities as they arise from NASA and other sources.

APPENDIX D: Reference Documents and Useful Web Sites

NASA Links

NASA

<http://www.nasa.gov>

2006 NASA Strategic Plan

http://www.nasa.gov/pdf/142302main_2006_NASA_Strategic_Plan.pdf

NASA Education Strategic Coordination Framework

<http://education.nasa.gov/about/strategy>

http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Strategic_Coordination_Framework.html

Grant and Administrative Links

NASA Grant and Cooperative Agreement Handbook

http://prod.nais.nasa.gov/pub/pub_library/grcover.htm

National, Congressional, and Agency Focus on Education Links

NASA Authorization Act of 2008 (H.R. 6063)

<http://thomas.loc.gov>

NASA and The Future of the Aerospace Workforce – Remarks By Nasa Administrator Charlie Bolden

http://www.nasa.gov/pdf/386965main_NASA_Bolden_AIA_Breakfast_Final.pdf

Memorandum to Heads of Executive Agencies and Offices – Office of Science and Technology Policy priorities

http://www.ostp.gov/galleries/press_release_files/Final%20Signed%20OMBOSTP%20Memo%20-%20ST%20Priorities.pdf

APPENDIX E:
New Investigators Program – Proposed budget for Grant Year 2010
(July 1, 2010 – June 30, 2012)

Institution: _____

PI: _____

AWARD AMOUNT: \$ _____ ; COST SHARE COMMITMENT: \$ _____

(The award amount and cost-share commitment should match what is reported below)

Budget Category	NASA Funding	State Funding**	Cost-Share	TOTAL
Salaries	\$ _____	\$ _____XXX_____	\$ _____	\$ _____
Travel	\$ _____	\$ _____XXX_____	\$ _____	\$ _____
Supplies	\$ _____	\$ _____XXX_____	\$ _____	\$ _____
Services	\$ _____	\$ _____XXX_____	\$ _____	\$ _____
Equipment	\$ _____XXX_____	\$ _____	\$ _____	\$ _____
Student Salaries/Stipend	\$ _____	\$ _____XXX_____	\$ _____	\$ _____
Other (Explain)	\$ _____	\$ _____XXX_____	\$ _____	\$ _____
Indirect Costs*	\$ _____XXX_____	\$ _____XXX_____	\$ _____	\$ _____
TOTALS:	\$ _____	\$ _____	\$ _____	\$ _____

**The NC State University/NASA National Space Grant College and Fellowship Program grant does not cover facilities and administrative costs. Unrecovered facilities and administrative costs may be used for required cost-matching.*

*** NASA training grant funds cannot be used to purchase equipment. As a result, state funds will be used to support any equipment requests, and should be noted in the appropriate column above.*

Budget Narrative: (please attach on a separate sheet)