APPROVED BY THE BOARD OF DIRECTORS; NSGA, FEB 7TH, 2003

THE NATIONAL SPACE GRANT ALLIANCE (NSGA)

FIVE-YEAR IMPLEMENTATION PLAN

This plan reflects the position of the NSGA, and as such it is administratively confidential and is not intended for distribution beyond the members of the NSGA.

INTRODUCTION/BACKGROUND

The -National Space Grant Alliance has developed this Implementation Plan for the National Space Grant College and Fellowship Program (Space Grant) with the goal of increasing the program's budget to $60 million over the next five years. The proposed plan positions Space Grant to convey the contributions made by Space Grant to the nation and to demonstrate Space Grant's relevance to NASA's emerging "Code N" goals and priorities by highlighting the Space Grant technical mentoring national network, unique among the Federal agencies.

The impetus for this five-year plan is driven by three main forces:

The *first force* is the restructuring of NASA's education portfolio and the creation of Code N education initiatives. In the last year, NASA has undertaken a major review of its education programs and is now in the process of restructuring and reinventing its educational effort to provide a coherent portfolio of initiatives that in the words of Administrator Sean O'Keefe, "inspire the next generation of explorers – as only NASA can." While new initiatives are under development, it is clear that the priorities of the new Administration are to: (1) improve K-12 math and science education, (2) use NASA's unique resources in creative and innovative ways to bring the excitement of inquiry and discovery to many more students from diverse communities nationwide, and (3) create "the next generation of explorers" and NASA workforce. Consequently, the National Space Grant Alliance must work to: (a) ensure that Space Grant remains an integral component of the new NASA education portfolio and that resources flow accordingly, (b) facilitate state and national growth of the Space Grant program in a manner consistent with NASA needs and (c) underscore and promote the importance and utility of Space Grant with NASA administrators.

The *second force* moving on the five-year plan is the value and importance of the Space Grant program to the national education enterprise.

The *third force* working to grow the new five-year plan is the ongoing strategic planning activities initiated by the Space Grant Directors in the spring of 2000.

Strategic planning has been an ongoing priority for the Space Grant Directors. In 1994, after the first five years of the national program, Space Grant was subject to an extensive review. Based on this review, NASA issued a strategic plan to guide Space Grant for the period of 1996-2000.

In the strategic plan for 1996-2000, NASA noted that although pre-college education was receiving a great deal of national attention, the Space Grant network, because of its position within the higher education community and its limited resources, should have its greatest impact at the higher education level. From this platform we are also in position to: (1) extend NASA's efforts in K-12 to assist teachers and conduct activities that would inspire, motivate, and attract students to study science and math and to pursue careers in these areas, particularly those most relevant to NASA, such as aeronautics and aerospace sciences; and (2) support a modest number of faculty research development initiatives primarily for new faculty and for faculty seeking to enhance collaboration with NASA field centers and the enterprises.

CORE ISSUES

Four core issues were determined to be affecting the future of the Space Grant program with respect to the three contemporary forces described in the introduction. This report summarizes the background information and the subsequent recommendations or vision that the Space Grant Alliance holds during these shifting times for the NSGA and its role in NASA education over the next five-year implementation period.

- Existing Program Components
- NASA and Space Grant's Target Populations
- Relevance of Space Grant to Code N Goals
- Proposed Program Components and Funding Targets

EXISTING PROGRAM COMPONENTS

Background

Congress established the National Space Grant College and Fellowship Program under Title II of the NASA Authorization Act of 1988. Space Grant is a national network of colleges and universities working to expand opportunities for Americans to understand and participate in NASA's aeronautics and space programs by supporting and enhancing science and engineering education, research and outreach programs through three major components: *(1) Education and Workforce Development; (2) Public Understanding and Participation in Aerospace Programs; and (3) Research Enhancement Programs.*

- ***Education and Workforce Development***. Space Grant recognizes the importance of a diverse, scientifically literate and prepared workforce. This is as important and relevant at the state level as it is to the nation as a whole. Space Grant programs directly encourage students to enter science, mathematics and engineering careers. Many programs offer "hands-on" training with aerospace technology that enhances classroom learning. Particular attention is given to recruiting and training students from underrepresented groups and women . For example, Space Grant supports: (1) over 1100 college and pre-college programs and (2) 2270 scholarships and fellowships each year, with 20% going to minority underrepresented students and 43% to women. *We are aware of no other mainstream, non-targeted, national education program, which has this level of outreach and involvement of minorities and women.*

- ***Public Understanding and Participation in Aerospace Programs***. An active and informed citizenry helps to galvanize support and enthusiasm for aerospace research and education. Space Grant consortia provide a wide array of public outreach programs that reach citizens of all ages: Space Grant supports more than 400 public outreach programs reaching over 3 million people each year. Space Grant has become a major NASA resource, to which the media and the public turn in every state for informed opinion.

- ***Research Enhancement Programs***. The development of a strong research base and infrastructure is critical to securing U.S. world leadership in science and technology. In addition to improving the quality of education provided to all citizens, Space Grant is dedicated to strengthening research capability. Integrating this research with education and human resource development builds a highly skilled scientific and technical workforce that is complementary to NASA's research programs and which contributes to economic development in the states. For example, (1) Space Grant offers over 500 research programs annually to support the development of a diverse workforce of future scientists, engineers, technology professionals and educators; and (2) Space Grant sponsors programs in which students design space experiments and construct satellites such as Citizen Explorer-1 and CubeSat.

Recommendations

- Space Grant, while continuing to remain a predominantly higher education and workforce development program, will expand to include a K-12 component oriented primarily toward contributing to: (1) the success of Code N new K-12 initiatives, and (2) bringing NASA Space Grant resources to the new NSF Math and Science Partnership (MSP) program and other related federal programs. In this way, NASA Space Grant is and would expand its efforts to be an integral part of the Nation's "no child left behind" initiative.
- Space Grant should encourage science and math faculty to engage in K-12 initiatives being developed by NASA's Code N. Space Grant has many STEM experts distributed in every state and an extensive national network of partners, which represent an available pool of resources that compliment and can assist in implementing Code N initiatives.
- Space Grant's R&D initiatives should continue to be focused on student research and experiences and seed grants for promising research ideas and faculty and on infusing research themes into the curriculum, rather than research per se.
- Space Grant has many excellent state-based programs undertaken with state partners that effectively support the education goals of NASA and the nation. Space Grant consortia should be encouraged to continue these outstanding efforts while serving as a NASA outreach presence in each state.

TARGET POPULATIONS

Background

w Space Grant has always been primarily an undergraduate and graduate program. However, we have also worked in the following arenas: K-12, public outreach, graduate education, and faculty development. *Space Grant is the only NASA Education Program that reaches across all these target populations, and naturally integrates education and research.* About half of Space Grant funds are focused on inspiring and motivating students (including community college students) by supporting research experiences, scholarships and stipends. In these activities, we have contributed to building the pipeline of students entering college as well as those pursuing MST careers. We have created an effective national network partnership of programs in 50 states, plus the District of Columbia and Puerto Rico. *No other Federal R&D agency has a similar network.*

w In the last two years, the national Space Grant organization with the encouragement of Congress has strengthened its undergraduate efforts with the addition of new initiatives aimed at building the NASA workforce. Also, the program is involving more students in direct hands-on and telepresence experiences through the Space Grant National Student Satellite program, which engages students in designing, developing and launching data-collection satellites.

w In summary, the information emanating from NASA about the new education enterprise (Code N) indicates that the primary target of NASA's educational mission would be K-12 math and science improvement through a set of yet to be defined programs.

w The new NASA educational organization would be comprised of a core group assigned to Code N and supplemented by a set of educational leaders physically located within the Enterprises and reporting to the new Code N Associate Administrator for Education**.**

Recommendations

For the next year, we recommend that Space Grant continue its current focus on higher education while continuing to assist K-12 math and science improvement through the Space Grant outreach and public service programs. Space Grant has leveraged NASA funding $3:$1 through State government funding, various university-match, other government agencies (such as NSF, DoD and DoE Labs and DoEd), and the private sector. Furthermore, in the last two years, Congress has added $5 million to the NASA request, realizing the contributions of the program to undergraduate math and science education and workforce development. The House of Representatives has also provided very strong language noting the benefit of the Space Grant program.

The Congress has consistently supported increases in funding over NASA's annual budget request to the nation.

RELEVANCE OF SPACE GRANT TO CODE N GOALS

Background

Current Space Grant goals and objectives are closely aligned with the proposed goals of the new Code N. Furthermore, Space Grant is the only national program operated by NASA that currently addresses all of the new Code N goals.

Space Grant has coherent successful systemic partnerships already in place within each state and across the nation. NASA has not yet fully realized the relevance of Space Grant and its value to the new Code N priorities. For example, in response to NASA's Code N priorities, specifically dealing with "return on taxpayers investment," it should be noted that Space Grant has leveraged national organizations into consortium membership that has grown to over 800 affiliates in 2001, of which 530 are colleges and universities. All consortia are required to match its NASA funding with non-federal sources of support. *In 2000, for every dollar that NASA provided to the Space Grant program, almost $3 dollars were provided by state and local governments, universities, industry, and other consortia members. This level of investment is a clear measure of the value that states and local entities find in this NASA program.*

Recommendations

- w Aggressively market Space Grant to NASA's highest levels.
- w Prepare for the NASA reauthorization so that Space Grant has a high priority.
- w Clearly articulate the relevance of the Space Grant organization to the new NASA educational priorities in mathematics and science.
- w Examine each state and develop a brief analysis of their current programs and their relevance to the new Code N priorities. Compile the info into a report?
- w Align state programs to contribute more efficiently and effectively to the new NASA mathematics and science education goals.

PROPOSED PROGRAM COMPONENTS AND FUNDING TARGETS

Background

Currently, Space Grant states are divided into 28 "designated" and 24 "non-designated" states. This two-tier system is based on the amount of NASA and R&D funds received by each state and on historical precedent.

- Designated states are provided up to $475,000 per year.
- Non-designated states may receive up to $250,000

Space Grant competitions are conducted every five years. Funds are obligated in annual increments pending satisfactory reviews and availability of program funds.

Two major problems exist. First, there are more states eligible for designated status than funds available. Of the 24 non-designated states, 20 are eligible for upgrades to designated status. Second, the program provides no consideration for a state's population, or rather the size of the demand for educational service. Thus, Montana (population 900,000; 17 universities and colleges) receives the same amount of annual funding as New York (population 19 million; 312 universities and colleges). Given the considerable national network of scientists and engineers (S&E) and universities and colleges that Space Grant provides to NASA education and opportunities that the National Space Grant is bringing to students across America, the annual level of funding for each state must be increased and a more adequate distribution mechanism developed to support the goals of the Space Grant program.

In FY 2003, Space Grant anticipates receiving $24.1 million (as was actually appropriated in FY02) from Congress. This is $5 million above the President's FY03 request, despite the fact that many programs are being lowered or funded

at the President's request. In this climate, Space Grant must present a realistic growth scenario for the next five years. Space Grant is in a unique position in space science and engineering education inspiring and educating our young people, and enriching the future of America. Accordingly, we propose to triple the Space Grant budget over the next five years from the President's FY03 request of $19.1 million.

We propose that the NASA budget for Space Grant be tripled to $60 million by FY 2008. This funding should be used to support: (1) a growing Core Program Grant; (2) continuation of the workforce supplements for one more year (FY 2004) with incorporation of the supplements into the Core Program Grant in FY 2005; and (3) creation of an Extension Award fund.

Over a five-year period (FY 2003-FY 2008) we propose that NASA:

1. Eliminate the two-tiered funding system, based on status of state as "designated" and "non-designated" and equalize funding for all states by FY 2008.
2. Implement a uniform Core Program Grant award of $675,000 (per year) by FY 2008.
3. Grow gradually both the size and scope of the Core Program Grant award over the next five-year period as well as the number of states eligible to receive the increased funding level without diminishing existing state programs.
4. Introduce an Extension Award component within Space Grant. This award would allow states to compete for additional funds based on: (a) population; (b) involvement in prototype programs such as student satellite programs; (c) formation of new linkages to the evolving Code N priorities; and (d) other federal agency education and training partnerships.
5. Limit the "NASA Administration" budget line (for management of the Space Grant program) the lesser of three (3%) percent of the total budget, or $1.8 million.

Funds appropriated to NASA for the Space Grant program should be competitively awarded in two distinct ways: Core Program Grants and Extension Awards.

PROPOSED PROGRAM PLAN: CORE PROGRAM GRANTS AND EXTENSION AWARDS

1. **Two-tiered funding system, based on status as a "designated" and "non-designated" state, should be eliminated.**

   Equalizing core funding, pending satisfactory merit review, for all states provides all states with a greater opportunity to advance the goals of the Space Grant program.

2. **A uniform Core Program Grant would be implemented, which would increase both in size and scope over the next five-years, to achieve a value of $675,000 by FY 2008.**

   Grants should be awarded for five years with annual funding increments based on a rigorous review of the previous 5 years' performance and the submission of competitive proposals. These Core Program Grants are intended to be used for steady year-to-year support of state Space Grant programs.

   Each consortium would be eligible to receive a maximum of $675,000 in Core Program Grant support by FY 2008. These awards based on a merit review competition would be used to support and enhance science and engineering education, research and outreach programs, including: (1) undergraduate scholarships and graduate fellowships; (2) STEM course enhancements and curriculum modifications; (3) research experiences for students and faculty; (4) after-school academies, summer programs and other educational initiatives in STEM for K-12 students; (5) support for elementary and secondary school teachers; (6) state, regional and national network and partnership development; and (7) public outreach.

   The growth plan entails:

- eliminating reference to states as “designated” and “non-designated.”
- utilizing Core Program Grant A and Core Program Grant B to classify level of support provided to Space Grant consortia, until all states are eligible to receive the $675,000 in funding.
- phasing in two funding tracks, with increases in Core Program Grant support at least every other year.
- increasing the number of states receiving a higher threshold of core grant support each year, until parity in the Core Program Grant is achieved.
- incorporating approximately $3.6 million in workforce supplements into the Core Program Grant support beginning in FY 2005.

	CORE PROGRAM GRANT A		*CORE PROGRAM GRANT B*	
FY	# of States	Level of Funding	# of States	Level of Funding
2003	28	$475,000	24	$250,000
2004	35	$475,000	17	$300,000
2005	40	$575,000	12	$350,000
2006	44	$575,000	8	$350,000
2007	48	$625,000	4	$350,000
2008	52	$675,000	0	$0

Five-year core grant renewal proposals judged inadequate by NASA for funding at the nominal level should be given four months to respond to NASA and reviewer concerns and then be resubmitted for consideration. Proposals that are still not considered competitive must wait for the next annual assessment to be considered for funding, all remaining funds being reallocated to the Extension Award, (see below).

3. **Add an Extension Award component to Space Grant that would allow states to supplement their Core Program Grant on a competitive basis, beginning in FY 2004.**

   This “Extension award” would allow states to compete for additional funding based on innovative pilot proposals from state Consortia to accelerate linkages to Code N new initiatives and also support State needs as well as advance programs that:

   - recognize states with larger populations in order to address and involve larger numbers of students and/or educational institutions;
   - support more students in designing, developing, and flying student built satellites and placing student experiments on NASA launches (e.g. National Student Satellite Program);
   - support other education and training partnerships or prototype projects.

   Extension Awards may be up to $500,000 per year and may extend for multiple years. Extension Award competitions should be held every other year. Funds not used for Core Program Grants shall be transferred to the Extension Awards fund.

Extension Awards

FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
n/a	$3,500,000	$8,000,000	$12,000,000	$15,000,000	$22,000,000

4. **Limit the annual Space Grant appropriation for NASA management of Space Grant to the lesser of three (3%) percent or $1.8 million, of the total budget.**

   NASA may use up to three percent of the annual Space Grant appropriation or $1.8 million, for management purposes, i.e. staffing, proposal review, Space Grant fellows, other administrative functions.

NASA Administration

FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008

$1,800,000 $1,000,000 $1,000,000 $1,500,000 $1,500,000 $1.800,000

SPACE GRANT FUNDING PLAN
FY 2003 – FY 2008

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
re Program Grant of states * funding el)	$13,300,000 (28 *.475)	$16,600,000 (35*.475)	$23,000,000 (40*.575)	$25,300,000 (44*.575)	$30,000,000 (48*.625)	$35,100,000 (52*.675)
re Program Grant B of states * funding el)	$6,000 (24*.250)	$5,100,000 (17*.300)	$4,200,000 (12*.350)	$2,800,000 (8*.350)	$1,400,000 (4*.350)	
rkforce pplements	$3,600,000	$3,600,000				
SA dministration"	$1,200,000	$1,000,000	$1,000,000	$1,500,000	$1,500,000	$2,000,000
tension Awards		$3,500,000+	$8,000,000	$12,000,000	$15,000,000	$22,000,000
tal	$24,100,000	$29,800,000	$36,200,000	$41,600,000	$47,600,000	$59,100,000