

SPACE GRANT IN ARIZONA: SUMMARY AND IMPACT

Since its inception in 1989, the Arizona Space Grant Consortium (AZSGC) has worked to develop and expand opportunities for Americans to learn about and participate in NASA's aeronautics and space programs by supporting and enhancing science and engineering education, research, and public programs in space, Earth, and aerospace-related fields. We sponsor a variety of strategically integrated programs that incorporate research with education to help build a diverse, scientifically literate

The Space Grant program is a valuable tool for developing the next generations of technical and charismatic leaders for the U.S. Space Program and for other industries. (Lila Engle, Raytheon; NAU & Goddard Academy Intern)

citizenry and a well-prepared science, engineering and technology workforce. AZSGC has become a

catalyst for synergy between NASA, industry, and Arizona's education/research efforts. Our programs truly extend the arms of NASA – expanding our universities' capacity to conduct research and doing it in a way that educates our next generation of scientists and engineers, all in direct partnership with the military, industry and NASA demanding new talent and the latest innovations.

The Space Grant activities in Arizona are aimed at making a real difference in the quality of science education at all levels, with particular emphasis on support of students from groups historically underrepresented in these fields. We at Lockheed Martin [AZSGC affiliate] are very pleased to play a part in these efforts, and feel that the Arizona Space Grant-funded projects have had a positive effect on Arizona and on our company (Steve Lasswell, Lockheed Martin Management & Data Systems Technical Ops).

Turn the perspective to that of Arizona's educators, employers and even legislators: the marriage of public and private research/development with education benefits society by productively nourishing the workforce development pipeline from those exploring science for the first time, to those traditionally under-represented in these fields, to university students making final career

choices, to members of the general public who want to apply the latest research to real world problems. AZSGC programs have demonstrated that integrating students into the research enterprise greatly enhances student education while benefiting the research enterprise, state/local and tribal government, and the general public. In the past five

Table 1. AZSGC Cumulative Metrics: 1998-2002.

Program Area	Total NASA & Matching Funds	Percent of Total	Additional Proposals	Total Participants	Women (%)	Diversity (%)
Internships/Fellowships*	2,624,975	36%	-	606	41.2%	19.6%
Research	1,686,565	23%	1,808,899	1,439	26.0%	15.0%
Higher Education	589,430	8%	2,202,808	15,591	51.0%	20.0%
Precollege Education†	470,540	6%	-	70,541	50.0%	41.8%
Public Programs**	772,887	10%	624,996	39,849	39.6%	25.2%
Administration‡	1,238,740	17%	-	‡N/A	--	--
Total	\$7,383,137	100%	\$4,636,703	128,026	46.6%	33.6%

* 518 undergraduate research interns, 88 graduate fellows

† 44,805 students, 21,801 educators, 3,936 parents/administrators (diversity on latter estimated)

** Data for diversity systematically collected for Earth Grant, but estimated for other Public Programs

‡ 4 directors, 1 manager, 3 associates, 30 steering committee members, 28 affiliate reps; includes indirect.

years, AZSGC programs have directly impacted a diverse group of **128,026 citizens** and indirectly touched many more, **33.6%** are from underrepresented minority groups while **46.6%** are women (Table 1). This commitment to diversity is a common element of all AZSGC sponsored programs and is a commitment shared throughout our affiliate network. **For every \$1.00 NASA has invested (21% of AZSGC funds), the AZSGC has generated \$4.80 in Arizona matching (32%), other federal cost share (9%) and competitive funding (39%). This amounts to \$20 of NASA funds and \$75 of support funds per participant from 1998 through 2002.**

AZSGC program impacts span our state and are extended beyond its borders by managers who lead important national Space Grant initiatives in Earth Grant and Student Satellite program development. AZSGC member institutions, The University of Arizona (Lead), Arizona State University and Northern Arizona University, work in partnership with 28 affiliates from all sectors to provide cost-effective, creative and truly exceptional educational opportunities. AZSGC Programs benefit our students, our universities, Arizona, NASA and our country.

I would like to take this opportunity to recognize ASU's participation in the Demonstration launch of the Orbital Suborbital Program (OSP) space launch vehicle on 26 Jan 00...Your team developed...ASUSAT... in record time in support of this mission...I commend your students for the superb manner in which they conducted themselves during the difficult payload development and integration process. They were "prime movers" in the development and integration of five major satellites and an important R&D experiment in record time...Congratulations and thank you for a job well done. (Daniel A. Dansro, Col. USAF, Director Rocket Systems Launch Program)



Arizona/NASA Space Grant Programs Launch Talented Graduates

Federal Gov't/Research

Carnegie Institution-1
 Department of Defense-1
 Department of Transportation-1
 Federal Bureau of Invest-1
 Natn'l Radio Astronomy Obs-1
 Natn'l Weather Service-1
 Natn'l Air and Space Museum-1
 Natn'l Institute of Health-2
 Natn'l Optical Astronomy Obs.-1
 Natn'l Science Foundation-1
 Sandia Natn'l Laboratories-1
 Smithsonian Institution-4
 US Air Force-1
 US Army Proving Ground-1
 US Environ Protection Agency-1
 US Geological Service-1
 US missile test: Kwajalien-1
 US Naval Research Lab-1
 US Navy Seals-1
 US Navy-4
 US Patent/Trademark Office-1
 US Senate Intern-1
 USDA-NRCS-1

Total-30

Local Government

City of Chandler-1
 District of Columbia Gov-1
 LA County Coroner Dept.-1
 Maricopa Co. Medical Exam-1
 Phoenix Police Department-1

Total-5

Journalism

Arizona Daily Star-6
 Associated Press-2
 Casa Grande Dispatch-1
 East Valley Tribune-1
 Salt Lake City Tribune-1
 San Antonio Express News-1
 Space.Com-1
 Time Magazine-1
 Tucson Citizen-1

Total-15

Other Professional

Arkane Arts-1
 CBIZ Gordon, Zucarelli, ... -1
 EditMax-1
 Hometown Mortgage-1
 Micro Age-1
 MJS Design-1
 Other Institution-14

Total-20

NASA

JPL-6
 NASA AMES-1
 NASA Dryden-1
 NASA Goddard-3
 NASA JSC-2
 Space Telescope Inst-2

Total-14

Aerospace/NASA Contractors

Adam Aircraft Industries-1
 Analox NASA Contract-1
 Andrews Space & Technology-1
 Arete Associates-2
 Arizona Flightworks-1
 Ball Aerospace-1
 Boeing/McDonnell Douglas-18
 Continental Express Airlines-1
 DeCrane Aircraft-1
 Honeywell-9
 Hughes Aircraft-2
 Jacobs Sverdrup Technology-1
 Kaman Aerospace-1
 Lockheed Martin
 Microcosm-1
 Motorola-8
 NAVAIR-5
 Northrop Grumman-3
 Orbital Sciences-10
 Raytheon-20
 Rockwell Collins-2
 Smiths Aerospace Corp-1
 Space Adventures-1
 Space Works, Inc.-2
 Spectrum Astro-1
 Titan Corporation-1
 TRW-2
 United Space Alliance-1
 Wolfsberg Electronics-1

Total-106

Not-For-Profit

Int'l Institute of Physics-1
 Nature Conservancy-1
 Planetary Science Institute-3

Total-5

Consulting

Accenture-1
 DFI International-1
 Dunn and Crutcher-1
 Gammage and Burnham-1
 Lehman Brothers-1
 Other Institution-1

Total-6

Precollege K-6 Teachers

Corona Norco Unified-2
 Miami-Dade School District-1
 Rockville Center School-1
 Yuma Schools-1
 Other Institution-3

Total-8

Precollege (7-12) Science

Baltimore High Schools-1
 Gallup, NM High School-1
 Marana School District-1
 Muir Middle School-1
 Other Institution-6
 Payson Junior High-1
 Pinnacle High School-1
 Tempe Union High School-1
 Tucson High School-1
 Xavier College Preparatory-1

Total-15

High Ed Administration

Arizona State University-1
 University of Arizona-2

Total-3

High Ed Faculty/Research

Arizona State University-10
 Cal Tech Astronomy Dept-1
 Columbia University-1
 Duke University-1
 Grand Canyon University-1
 Keck Observatory-1
 Lab for Atmo/Space Physics-1
 Lowell Observatory-1
 Mesa Community College-1
 MIT Center Space Research-1
 Nat'l Astrobiology Inst, CO-1
 Northwestern University-1
 Pima Community College-2
 Prairie View A&M University-1
 Scottsdale CC-1
 Scripps Research Institute-1
 Stanford University-1
 University of Arizona (UA)-4
 UA, Lunar & Planetary Lab-4
 UA, Steward Observatory-4
 UC Berkeley-1
 University of Illinois, Urbana-1

Total-42

Industry

Advanced Acoustic Concepts-1
 Advanced Micro Devices-1
 AGM Container Controls-1
 Amgin Biotech-1
 Applied Materials-1
 Arizona Cancer Center-1
 Biomedical Communication-1
 BOS Gasses-1
 Brown and Caldwell-1
 Center Bionutrition-1
 Compucom-1
 DaVita Dialysis Center-1
 Dell-1
 Exxon-Mobile-2
 General Atomics-1
 General Clinical Research-1
 GM Proving Grounds-1
 Harris Corporation-1
 Hoag Hospital-1
 Hologic Inc-1
 HP Laboratories-1
 I.C.E. Corp.-1
 IBM-6
 ICU Ventures-1
 Intel-7
 Invitrogen Corp-1
 Johnson and Johnson-1
 Microsoft Corporation-1
 Nautilus Systems-1
 Netmedia-1
 Novellus Systems Inc-1
 Oasis Instrumentation-1
 OHSU Children's Hospital-1
 Other Institution-5
 Phoenix Memorial Hospital-1
 Pretium Corp-1
 Procter & Gamble-1
 Rincon Research-2
 Silicon Graphics Inc SGI-1
 Stormfront Studios-1
 The Trane Co.-1
 Thiokol
 Tidel Engineering-1
 Toyota Technical Center-1
 Valero Oil Corporation-1
 Vencor Hospital-1
 Xerox-1
 Yuma Reg. Medical Center-1

Total-65

Data represents 335 (1990-2002) AZSGC Fellowships students from 2003-04 tracking survey.
 Key: -# Number Employed, Current AZSGC Affiliate, Past AZSGC Affiliate

Into America's Science, Engineering and Technical Workforce