

Arkansas Space Grant Consortium
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PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia one each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Arkansas Space Grant Consortium is a Capability Enhancement Consortium funded at a level of \$535,000 for fiscal year 2008.

PROGRAM GOALS

Educational Outcome 1 Goals (Metrics in parentheses)

1. Fund Research Infrastructure Grants to affiliate institutions (42).
2. Fund Student Fellowship/Scholarship Grants (60).
3. Fund Workforce Development Fellowships of \$6,500 (6).
4. Continue five (5) existing Collaborative Research Programs
5. Fund a "Pilot" program for Aeronautic two-year certificate students (10).
6. Fund a "Pilot" Program with Henderson State University, the only four-year institution in Arkansas that offers a degree in aviation (1-2).
7. Continue to collaborate with the National Space Grant Foundation's program for longitudinal tracking of awardees, and participate fully in reporting results to NASA.

Educational Outcome 2 Goals

1. Fund Mini-Grants to K-12 educators in Arkansas to promote their ability to teach aerospace related science in their classrooms, and Outreach Grants to K-12 educators in Arkansas who are affiliated with NASA Explorer Schools, in order to enhance their ability to participate in NES programs. Continue to support the 2 *Arkansas BalloonSat* teams and the *Arkansas Academy of Space Science for Educators*. (Mini 30, Outreach 5)
2. Offer applications and funding for students to be accepted to a NASA Academy, a Summer Internship at a NASA Center, Graduate Student Research Program, or summer employment positions with NASA affiliated contractors in or out of the state. (as needed)

Educational Outcome 3 Goals

1. Fund Guest Lecturers from STEM disciplines to make presentations for the General Public at affiliate campuses. (1)
2. Hold the 17th Annual Symposium so students and faculty can present their research to their peers and other members of the community.
3. Maintain the ASGC website as needed.
4. Continue active involvement with University Affairs Offices at all the NASA centers.

PROGRAM/PROJECT BENEFIT TO OUTCOME (1, 2, OR 3) :

Outcome 1:

Mr. Benjamin Newton, received the First Place Award in the nano-science category and Mr. Stephen Broughton received the Third Place Award physics in Atlanta Georgia at the national award at the HBCU-UP conference held in Atlanta, Georgia. Both of these students received ASGC student funds for their research at the University of Arkansas at Pine Bluff.

Ashley Ramsey and Shuneize Lowe both worked on the Functionalized Cotton project with Dr. Martha Baskett at the University of Arkansas at Monticello. Both are graduating in May, 2009, and have already been accepted to one or more graduate programs in Chemistry. Shuneize is entering the Ph.D. program at the University of Mississippi, while Ashley is entering the Ph.D. program at the University of Arkansas in August, 2009. Contacts with the graduate programs for which these students applied stated that the fact they have worked in an undergraduate research lab made them rank higher in the admissions process. They might not have been able to work on projects at this level without the NASA/ASGC funding.

A team from University of the Ozarks was selected for NASA's Reduced Gravity Student Flight Opportunities Program. The team was able to conduct a experiment on the C-9 aka the Weightless Wonder. This experiment was based on the ASGC funded project titled "Effects of Microgravity on Polyelectrolyte Water Absorption"

Outcome 2:

The ASGC Outreach Coordinator was able to enhance contact with several of the Math and Science Centers located statewide; therefore further networking with localized K-12 STEM related programs and science focused programs. ASGC presented four programs on the K-12 Mini-Grant application process, encouraging teachers to apply for funding for professional development activities. Response has been positive, as reported below.

Increasing interest is noted in the increased number of emails and telephone calls coming into the Program Office containing inquiries about how to participate.

Members of the ASGC program office also visited with each Workforce Development Fellow and Mentor(s), and with recipients of other undergraduate NASA internships, on their respective campuses, in order to conduct a Q&A session and coordinate internship positions at NASA Centers, research facilities, or with NASA contractors.

Outcome 3:

The 17th ASGC Symposium was held at the Winthrop Rockefeller Institute at Petit Jean Mountain. Attendance was 114. Dr. Christopher McKay was our Keynote speaker. His presentation about searching for life on Mars, Europa, and Enceladus was well received. In the early morning announcement time, Dr. Warfield Teague was presented a plaque honoring his retirement, and recognizing his dedication to Arkansas Space Grant/Arkansas NASA EPSCoR.

PROGRAM ACCOMPLISHMENTS

Outcome 1:

With our FY08 funding ASGC was able to exceed our goals in most of our Outcome 1 areas. ASGC funded 46 Research Infrastructure awards, 69 Student Scholarship/ Fellowships, and 5 Workforce Development Fellowships. Our goals for these programs were 42, 60 and 6 respectively. Our Workforce Development (WFD) was short by one, but ASGC was able to fund two unexpected summer internships with the unused funds. Overall, we were able to fund a total of 80 students.

ASGC implemented two new “Pilot” Programs. One was to fund an aeronautics project with Henderson State University, the only four-year institution in Arkansas that offers a degree in Aviation. This was successful, in that we were able to fund one student project. Our second program, mentioned in Educational Outcome 1 Goal #5, was not successful. We had planned to fund about 10 A&P mechanics students at Arkansas 2-year program schools, something the State of Arkansas has identified as a growth sector. However, we have trouble getting to the right persons at 2-year schools in our state. ASGC plans to re-evaluate this program and try to again implement it in a revised format at a later date, funding permitting.

In FY08 ASGC added two new four-year campuses to our membership. The University of Arkansas at Fort Smith with Dr. Jill Guerra, Campus Representative; and Southern Arkansas University, at Magnolia, with Dr. Joe Winstead, Campus Representative, became active participants. Both campuses had requested joining our consortium several years ago, but with funding limitations in past years, an invitation was not possible until this year.

Outcome 2:

Our K-12 programs have gained popularity this year. We awarded 13 Outreach Grants, thru which 36 teachers received funding for professional development. 14 Mini-Grants were funded, of which 2 went support our partnership with the Civil Air Patrol. Total teachers and youth-leaders funded: 50

ASGC took unused funds from our WFD program to partially fund two unexpected summer internships. We were also able to use some funds from our Administration pool to sponsor the “Flying Bison” Rocket team to go to Huntsville, AL, for the USLI. This team was the only one to use a hybrid fuel source.

Outcome 3:

ASGC funded one guest lecturer this year. Dr. Christopher McKay from JPL attended our Year 17 Symposium. Twenty-nine presentations were made by a combination of faculty and students. There were 20 poster presentations.

Our Year 18 symposium will be at the University of Arkansas at Pine Bluff, our only HBCU in Arkansas. We have selected David James, a former ASGC funded student, who is a Graduate Assistant at Laboratory for Atmospheric and Space Physics (LASP) who has worked on projects such as the Student Dust Counter (SDC) on the New Horizons spacecraft to Pluto and the Cosmic Dust Experiment (CDE) on the Aeronomy of Ice in the Mesosphere(AIM) mission to study Polar Mesospheric Clouds.

Our website is currently functioning. It was hacked into in the summer of 2008, and it has taken some time to restore it. We have increased our security, but that makes updating and changing the site difficult. The Program Office is currently looking at our options for a permanent fix.

Further involvement with the NASA Centers will aid in the placement of students in summer internships. Contact will be pursued through emails, telephone conversations, networking at regional and national Space Grant meetings, and invitations to UAOs to visit Arkansas, in order to explore the possibilities that exist at each center, and to place as many ASGC students in these excellent internship positions as possible.

PROGRAM CONTRIBUTIONS TO PART MEASURES

- **Longitudinal Tracking:** For those students who were significantly supported from FY 08 funds, all 54 of them are still enrolled in the degree program they were pursuing while the receiving their Space Grant award. For all students who were significantly supported in the period spanning FY06-FY08, 5 students graduated and are pursuing advanced STEM degrees, 2 students accepted STEM positions in industry, and 1 is working in a STEM position at a non-K-12 academic institution. The remaining students have not yet received the degree they were pursuing while receiving their Space Grant award.
- **Course Development:** Lyon College has been able to enhance their Earth Systems Interactions (BIO349) class from research performed by Dr. David Thomas on microorganisms found in extreme environments.
- **Matching Funds:** ASGC received a little over 1:1 matching funds. Total matching funds were \$579,640.
- **Minority-Serving Institutions:** Arkansas has only one HBCU, the University of Arkansas at Pine Bluff. UABP has become more competitive over the past few years in NASA related research, thus involving more under-served minority students.

IMPROVEMENTS MADE IN THE PAST YEAR

The greatest improvement in FY08 is involving more under-represented minority students. Arkansas's minority percentage enrolled in a four-year higher education institution is $\approx 22\%$.

Last year ASGC's longitudinal tracking reported 14%. In FY08 we are proud to report an increase of 4.5% to 18.5% under-represented minority participation.

ASGC was successful in implementing our "Pilot" Program at Henderson State University.

ASGC combined some funds with some state matching funds, and was able to send 36 K-12 teachers to professional development workshops in other Space Grant states, including: "LiftOff 2008", "Flood & Flows: Exploring Mars Geology on Earth", NSTA in Portland, OR, "Northrop-Grumman Weightless Flight of Discovery," and the "15th Annual Space Exploration Educators Conference" in Houston, Texas.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Four-Year Higher Education Institutions (Affiliates)

Arkansas State University - Jonesboro†
Arkansas Tech University - Russellville
Harding University – Searcy*
Henderson State University - Arkadelphia
Hendrix College – Conway*
Lyon College – Batesville*
Ouachita Baptist University – Arkadelphia*
Southern Arkansas University - Magnolia
University of Arkansas, Fayetteville†
University of Arkansas at Ft. Smith
University of Arkansas at Little Rock†
University of Arkansas for Medical Sciences – Little Rock†
University of Arkansas at Monticello
University of Arkansas at Pine Bluff ‡
University of Central Arkansas - Conway
University of the Ozarks – Clarksville*

Partners in Aerospace

Arkansas Department of Aeronautics – updates on aeronautics development in Arkansas
Aerospace Education Center – meeting place and input on aerospace programs
Arkansas Department of Education – input and K-12 standards
Arkansas Department of Higher Education – input and higher education standards for the state
Arkansas Science and Technology Authority – cash matching and state Science & Technology standards
BEI Systems & Space Division – industry contact and input
Civil Air Patrol – Arkansas Wing – aerospace education, teacher/flight program cooperation

*Private Institutions

†Research/PhD Granting Institutions

‡HBCU