

Arkansas Space Grant Consortium
University of Arkansas at Little Rock
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PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in 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 Consortium is a Capability Enhancement Consortium funded at a level of \$430,000 for fiscal year 2012.

PROGRAM GOALS

Educational Outcome 1 Goals (Metrics in parentheses)

1. Fund Research Infrastructure Grants to affiliate institutions (20).
2. Fund Student Fellowship/Scholarship Grants (32).
3. Fund STEM/MSI Scholarship/Fellowships (10)
4. Fund Workforce Development Fellowships of \$6,500 (6).
5. Fund Collaborative Research Programs (5)
6. Fund Aeronautic Enhancement Program two-year certificate student awards (6).
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 (Mini 20, Outreach 5)
2. Fund an Outreach Rocket Program (1)
3. 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 21th 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, & 3)

Provide concise, meaningful highlights or anecdotes (no more than three) that are directly related to work completed in 2012, highlighting student and/or project accomplishments. Specify alignment to an Outcome.

Outcome 1:

- Undergraduates from the University of Arkansas at Fort Smith, Chris Arnold, Kevin Tran, Joseph Heinrichs, and Kirk Kimery completed construction of an electric vehicle that is powered by a lithium battery. This vehicle can carry up to 5 passengers. Also, Theva Chanthaseny and Andrew Binder have designed a motor control circuit for a Mars rover; the rover and circuit have been tested for different payload weights and hill climb inclination. Theva has also programmed the rover to guide itself autonomously.
- The Flying Bison team from Harding University attended the RockSat-C program at Wallops Island and had great success with their spectrometer payload.

Outcome 2:

- A two day summer science camp last summer for under privileged 3rd -7th grade students in conjunction with the Faulkner County, Arkansas Boys and Girls Club. One hundred students participated in one of the four sessions. A large majority of these students are on free lunch programs.

Publication:

R. W. Dunn, W. V. Slaton, and L. M. Kendall, "Detection of Hurricane emissions using a ring laser interferometer," J. Appl. Phys.112073110 (2012).

- ASGC funded 39 Arkansas teachers to join the Civil Air Patrol as an Aerospace Educations Member (AEM). This program provides teachers many free aerospace educational opportunities ranging from receiving lesson plans to participating in a teacher orientations flight aboard one of CAP's Cessna aircrafts.

Outcome 3:

- The 21th ASGC Symposium will be held at the Winthrop Rockefeller Institute at Petit Jean Mountain. Mr. Edwin Faughn will be our guest lecturer. Mr. Faughn is an artist and lecturer specializing in space sciences and has presented hundreds of presentations to diverse audiences including but not limited to universities, museums, science centers, schools, aviation firms, churches and various civic organizations. His original artwork has been featured in and on the covers of

numerous international space science and other magazines, exhibitions and planetarium productions. A few of his credits include Scientific American, Astronomy, The Planetary Report, Sky and Telescope, Science News, IAAA World Tour Space Art Exhibition: "The Artist's Universe", Federal Express World Headquarters and the world premiere of Titanic: The Exhibition. His work is now featured on the main KEPLER website of NASA's Ames Research Center.

- ASGC is in the works of a redesign of our website. This should be achieved by December 2013. We are working with a student worker, Benjamin Pearson, who is majoring in computer science with emphasis of web design and gaming. Benjamin has done some special projects for us in recent months and we have been very satisfied with his work. We look forward to seeing the end result.

PROGRAM ACCOMPLISHMENTS

Refer directly to the consortium goals and SMART objectives in your 2010 base proposal when describing your accomplishments.

Outcome 1:

With our FY12 base funding ASGC was able to exceed our goals in most of our Outcome 1 areas. ASGC funded **34** Research Infrastructure awards, **71** Student Fellowships/Scholarship and **6** Workforce Development Scholarships. Five Collaborative Research Projects were funded, in which **10** faculty, **5** graduate students and **6** undergraduate students were funded. Our goals for these programs were 27, 39 and 6 respectively.

ASGC funded **7** Aeronautic Enhancement Program two-year certificate student awards this year. Though funding was only available for six, Arkansas Aerospace Training Consortium added another campus to their membership. ASGC was able to fund the additional scholarship with the use of state matching funds. The Partnering with the AATC, ASGC has been able to provide scholarships to the most qualified students in this program.

The STEM/MSI program implemented a few years ago has proven to be beneficial to our program. This year there were **21** awards made. This has doubled our participation from last year of 11. This program specifically helps our underrepresented minority groups and female participation outreach.

In FY10 ASGC added John Brown University (JBU) as a non-voting member to our affiliation. JBU is the only traditional 4-year college/university in Arkansas that is not a fully funded, voting member. Due to budget constraints the ASGC program office is not able to bring them to that level at this time. This campus has participated in some ASGC's statewide funding opportunities and has been awarded two STEM/MIS awards. They have also received funding from the ESMD NASA Lunabotics Mining Competition.

Collaboration with the National Space Grant Foundation's program for longitudinal tracking of awardees has proven to be a great investment. The ASGC program office

receives monthly reports from past awardees on their current standing in education or employment.

Outcome 2:

Our K-12 programs have continued their popularity this year. Four Outreach Grants were funded, of which 2 went support our partnership with the Civil Air Patrol. The other two supported 12 teachers for professional development. Seventeen Mini-Grants were funded across the state and 81 CAP-Aerospace Educators Memberships were funded to K-12 teachers.

The Civil Air Patrol has been a very active member in our Outreach program. Maj. Carmack with the 83rd Squadron in Fort Smith has started an afterschool program teaching grades 6-12 cadets to study, GPS, aerodynamic and orientation flights with a flight simulator and virtual reality programs.

Outcome 3:

The 21th ASGC Symposium will be held at the Winthrop Rockefeller Institute at Petit Jean Mountain. Mr. Edwin Faughn will be our guest lecturer. Mr. Faughn is an artist and lecturer specializing in space sciences and has presented hundreds of presentations to diverse audiences including but not limited to universities, museums, science centers, schools, aviation firms, churches and various civic organizations.

ASGC updates the program website as needed. A computer specialist in the Graduate Institute of Technology at the University of Arkansas at Little Rock provides this service. We are also started working on a redesign on our website to make it more user friendly.

PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE MEASURES

- **Student Data and Longitudinal Tracking:** Total awards= **94**; Fellowship/Scholarship= **83**, Higher Education/Research Infrastructure= **11**; **21** of the total awards are underrepresented minority F/S funding and **45** of the total awards are female students. During the FY12 program year 14 students are pursuing advanced degrees in STEM disciplines, 2 accepted STEM position at NASA contractors, 1 accepted a position at NASA, 24 accepted STEM positions in industry, 1 accepted a STEM position in K-12 academia, 2 accepted STEM positions in academia and 20 went on to spoitions in non-STEM disciplines. The remaining students have not yet received the degree that they were pursuing while they received their Space Grant award.
- **Minority-Serving Institution Collaborations:** 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. Currently, Dr. Mansour Mortizavi from UAPB, is working on a Collaborative Research Project with Dr. Jinbiao Cui from UALR. This team has

recently joined with a faculty member at UAF and has been selected to submit a research project to the NASA EPSCoR Research Competition.

- **NASA Education Priorities:**

- Diversity of institutions, faculty, and student participants (gender, underrepresented, underserved). The Arkansas Space Grant Consortium is working to becoming a more diverse group. Two years ago ASGC reported only 1 female researcher. This year there are six faculty researchers. Our underrepresented minority student and female student participation is just at our state standard of 22.3% at 47.9% respectively.
- Community Colleges – ASGC funds the Aeronautic Enhancement Program for two-year certificate students. Through partnering with the Arkansas Aerospace Training Consortium, ASGC has been able to provide scholarships to the most qualified students in this program.
- Environmental Science and Global Climate Change – Angie Marchany Rivera, one of our underrepresented minority students, from the University of Arkansas at Little Rock, is conducting research in Combining Emission and Trajectory Models for Wildfire Environmental Impact Assessment

IMPROVEMENTS MADE IN THE PAST YEAR

Succinctly describe improvements and/or adjustments made last year that demonstrate significant change(s) within the consortium. The improvements and/or adjustments that brought about change may have been in management, resource allocation, project design, project evaluation, etc.

A major impact for ASGC was the retirement of our Outreach Coordinator, Ms. Sue Hawkins. She worked year to establish a personal relationship with hundreds of teachers throughout Arkansas. Her hard work over the years has made it easier on the remaining Program Office to pick up her responsibilities. With her unused salary, ASGC was able to funds John Brown University to attend the NASA Lunabotics Mining Competition and Harding University to attend the National Student Solar Spectrograph Competition.

Our underrepresented minority participation has continued to maintain at our state's standards. The program office has promoted these underserved groups to our campus representative and they have provided excellent candidates for funding.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

ASGC consist of 17 colleges and universities. A campus representative from each campus sits on our board and has a vote on all proposals funded through ASGC. To aid in this process, several state agency, non-profit organizations, and industry are allowed a voice in the voting processes. The Arkansas Aerospace Training Consortium aids ASGC in awarding the Aerospace Enhancement funds. Arkansas Science and Technology Authority provide state matching funds, and then paired with Arkansas Economic

Development Commission; ASGC is able to keep our NASA project in line with state's R&D priorities.

Four-Year Higher Education Institutions (Affiliates) – Voting members

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 - Non-voting members

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

The National Space Grant Office requires two annual reports, this Annual Performance Data Report (APD) and the Office of Education Performance Measurement System (OEPM) report. The former is primarily narrative and the latter data intensive. Because the reporting timeline cycles are different, data in the two reports may not necessarily agree at the time of report submission. OEPM data are used for official reporting.