

Undergraduate Student Research Project (USRP)

FY 2012 Annual Report (9/1/11 – 9/1/12)

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PROJECT DESCRIPTION

The NASA Undergraduate Student Research Project (USRP) offers undergraduate students across the United States immersive research and engineering internship experiences at all ten NASA Field Centers and two NASA Research Facilities.

USRP interns work side-by-side with NASA engineers and scientists performing activities ranging from basic research and development to mission operations. At the completion of the internship session, students must submit a 10-page technical paper on their NASA-USRP internship experience and complete an exit survey. Students may also be asked to discuss their research in public forums and/or participate in NASA-sponsored colloquia, workshops and technology demonstrations.

USRP internships are open to U.S. Citizens with a cumulative GPA of 3.0, currently enrolled full-time in an undergraduate STEM degree program and classified as a sophomore or above by the start of the internship. In some cases, recently graduated students (less than 9 months) pursuing a STEM graduate degree are also eligible. Applicants must also be pursuing a STEM degree that aligns with NASA's critical core competency needs. Eligible fields of study are academic majors or demonstrated coursework concentration in engineering, mathematics, computer science or physical/life sciences.

USRP internships occur in three sessions. Participants receive a \$6,500 (10-week summer session) or \$9,500 (15-week spring or fall session) stipend for the research experience. A location allowance may be provided for USRP students at specific high cost NASA Centers.

PROJECT GOALS

The purpose of USRP is three fold:

- 1) To extend and strengthen NASA's commitment to educational excellence and university research, highlighting the critical need to increase the Nation's undergraduate and graduate science, engineering, mathematics, and technology (STEM) skill base
- 2) To build a national NASA STEM education pipeline - from existing NASA K-12 STEM education program activities to NASA Higher Education Program options — that encourage and facilitate student interest in future professional opportunities with NASA and its partner organizations

3) To attract STEM undergraduate students from the widest array of backgrounds, who are fully representative of America's racial, ethnic, and cultural diversity and to provide them with hands-on, challenging research experiences that stimulate continued student interest in the fields/disciplines aligned with NASA's research and development mission.

PROJECT BENEFIT TO OUTCOMES 1 AND 2

USRP directly addresses NASA Higher Education Outcome 1 and supports NASA Higher Education Outcome 2 of the NASA Education Strategic Plan. These outcomes commit the education office to fund programs which (1) *"contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals through a portfolio of investments"* and (2) *"attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty."* USRP most directly contributes to NASA Higher Education Outcome 1.2 defined as —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.

USRP is a fully-immersive experiential program for higher education STEM students providing experiences spring, summer, and fall. Research shows that one of the best methods of maximizing retention within a field of study is to incorporate experiential opportunities into the traditional course of study. Benefits in terms of retention to graduation, increased capability at graduation, pursuit of advanced degrees, and retention within the career field are well documented.

Based on longitudinal data collected from 2008-2011, 100% of USRP participants achieve their STEM Bachelor Degree, 52% choose to pursue a graduate STEM degree after graduation, and 95% of the rest successfully entered the STEM workforce.

PROJECT ACCOMPLISHMENTS

USRP funding was reduced by \$2.8M in FY12. This cut resulted from the reorganization and consolidation of NASA educational portfolio of projects and caused a significant decrease in the number of internships offered in 2012. However, USRP personnel partnered with center technical mentors and were still able to obtain USRP internships on a limited basis. Technical mentors provided the funding required to process and pay the student stipends for all the spring and summer interns listed in the table below.

In addition, former USRP intern Kody Ensley was named Intern Student of the Year by the American Society of Engineering Educators Cooperative and Experiential Education Division. Kody accepted the award at the ASEE Conference for Industry and Educational Collaboration.

USRP Participants FY 2012				
NASA Center	Fall 2011	Spring 2012	Summer 2012	Total
Ames	11			11
Dryden	3	2	2	7
Glenn	13	5	4	22
Goddard	11			11
Headquarters			1	1
JPL	11	7	9	27
JSC	17	5	9	31
Langley	8			8
Marshall	8	5		13
Stennis	1		2	3
Wallops	4			4
White Sands Test Facility	2	1		3
Total	89	25	27	141

PROJECT CONTRIBUTIONS TO APG MEASURES

APG 5.1.2.1: ED-12-1 - *Achieve 40 percent participation of underserved and underrepresented (in race and/or ethnicity) in NASA higher education projects.*
 In FY 2012, 28 USRP interns represented an underserved and under-represented race or ethnicity – 23 Fall, 3 Spring, and 2 Summer.

APG 5.1.2.1: ED-12-2 - *Achieve 45 percent participation of women in NASA higher education projects.*
 In FY 2012, 46 USRP interns were female – 30 Fall, 8 Spring, and 8 Summer.

APG 6.1.2.1: ED-12-4 - *20,000 undergraduate and graduate students participate in NASA education opportunities.*
 USRP provided 141 experiences for higher education students.

IMPROVEMENTS MADE IN THE PAST YEAR

USRP was able to streamline the administrative elements to reduce cost as funding for the program was zero'd out. These measures included eliminating the partial travel reimbursement process, which was highly manpower intensive, and replacing it with a fixed \$500 travel stipend given to all interns. USRP also improved its assistance to mentors in transferring funds for the "purchase" of USRP internships generating all 52 internships in the spring and summer sessions.

As a result of these efforts, USRP was able to maintain operation during the spring and summer sessions and be a viable option for administering education internships in FY13.

PROJECT PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Universities Space Research Association (USRA) provides program management, implementation and administration of the NASA Undergraduate Student Research Project (USRP) for NASA Johnson Space Center (JSC).

In FY12, USRP continued its partnerships with University of Texas Pan American (UTPA and HESTEC), American Association of Community Colleges, NASA Space Grant and Universities Space Research Association Council of 104 Space-related Institutions. USRP expanded its partnerships to include the Tribal Working Group and American Society of Engineering Educators (ASEE). USRP also continued working with the NASA OSSI Broker Facilitator organizations in their efforts to recruit potential STEM intern applicants. The goal of these targeted partnerships (and others to follow) is to widen the USRP opportunity dissemination points resulting in a larger, more diverse pool of highly qualified participants.

References:

B. E. Dansberry, Examining Outcomes Data From an Undergraduate Internship Program, ASEE Annual Conference Proceedings (AC 2012-4594), June, 2012.

H. Ogletree; A. Zippay, Employing Strategic Communications to Accomplish Outreach Goals For Experiential Programs, ASEE Annual Conference Proceedings (AC 2012-4752), June, 2012