

USRP – Undergraduate Student Research Project

Administered via Cooperative Agreement between NASA and Virginia Space Grant Consortium

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PROGRAM DESCRIPTION

First implemented in 2001, USRP provides degree-related internships mentored by NASA scientists and engineers to talented undergraduate students pursuing academic degrees that align with NASA's critical workforce competency needs. USRP internships are stipend-paid, full-time, fully immersive research and engineering experiences available in spring, summer, and fall at 12 NASA centers and research facilities. USRP internships are open to U.S. Citizens with a cumulative GPA of 3.0 or above (rounded off to 0.1), currently enrolled full-time in an undergraduate engineering and/or hard-science degree program and classified as a sophomore or above by the start of the internship. Fall and spring USRP internship sessions are 15 weeks long while the summer session is 10 weeks. Interns work side-by-side with NASA engineers and scientists performing activities ranging from basic research and development to mission operations. Interns complete a technical report documenting their work at the conclusion of the experience. Following are the USRP stated goals:

- a. Provide an academic and career nexus, through internships that facilitate the pursuit of graduate study in STEM, and/or employment in the aerospace and aeronautics workforce.
- b. Attract undergraduate students from the widest array of backgrounds, who are fully representative of U. S. undergraduate students enrolled in STEM majors; and provide them with hands-on, challenging technical experiences that enhance their academic
- c. Build a national STEM pipeline from existing NASA Pre-College Education activities to other NASA Higher Education options; to encourage and facilitate student interest in future professional opportunities with NASA and its partner organizations.
- d. Extend and strengthen NASA's commitment to educational excellence and university research; and to highlight the critical need to increase the nation's undergraduate and graduate STEM skill base.

PROGRAM RELEVANCE TO NASA

USRP directly addresses outcome 1 and supports outcome 2 of the NASA educational strategic plan. These outcomes commit the education office to fund programs which (1) contribute to the development of the STEM workforce and (2) attract and retain students in STEM disciplines needed to achieve NASA strategic goals. Put simply, USRP is an important contributor in developing NASA's future workforce as well as increasing the size and quality of the overall future aerospace workforce to which NASA contractors depend. USRP is NASA's largest fully-immersive experiential program for undergraduate STEM students and the only purely undergraduate internship project with an agency-wide scope. Research shows that incorporating experiential opportunities into higher education programs provides several benefits over traditional "lecture and lab" curricula - including improved retention through graduation and into degree-related employment at NASA and its contractor partners.

In addition to the workforce development benefits of USRP internships, NASA also benefits through the immediate productivity gained by hosting hundreds of the nations top engineering and science students and putting them to work on current research, analysis, operations, and planning activities crucial to the agencies mission.

Additionally, research has shown that the earlier students gain this experience and the greater the amount of experience the better – both terms of improved retention and in increased competence at graduation. For example, a data set recently presented covering a 10 year period indicates that undergraduate aerospace engineering students who participated in co-op or internship were retained within the aerospace field at rate 30% higher than students who did not. (85% vs 55%)

PROGRAM BENEFITS TO SOCIETY

The need for increased STEM graduates in the U.S. is well documented. This need is dramatically magnified in the aerospace field. Documentation from the National Aerospace Initiative (2004) shows the average age of the US aerospace workforce at 49. As many reports and studies affirm, the health of the aerospace workforce is directly connected to America's long-term security interests - both economic and defense.

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, GPA at graduation, increased capability at graduation, pursuit of advanced degrees, and retention within the career field are well documented. Additionally, research has shown that the earlier students gain this experience and the greater the amount of experience the better – both terms of improved retention and in increased competence at graduation.

In 2004, a study commissioned by ABET, the accrediting agency for higher education engineering programs nationwide, found that despite a much greater awareness of the value of experiential learning, “the hours spent in cooperative or internship experiences” have actually decreased for the average undergraduate student. USRP internships are an important piece of the puzzle in growing the next generation of STEM researchers and expanding the pool of well-qualified aerospace engineers and scientists.

PROGRAM GOALS

USRP goals for 2007 are to provide internship experiences to:

- a. Provide internship experiences for a minimum of 100 STEM students.
- b. Select a geographically and institutionally diverse group of interns from a wide array of backgrounds, who are fully representative of U. S. undergraduate students enrolled in STEM majors.
- c. Generate a large and appropriately diverse pool of candidates for the first-ever USRP spring internship session in 2008.

PROGRAM ACCOMPLISHMENTS

For 2007, 139 undergraduate students were selected for internship positions representing 99 separate institutions, 111 congressional districts, and 35 states plus Puerto Rico. Of the placements, 35% were female and 22% were underrepresented minorities. Thirty of the students participated in the 15-week fall session while 109 students participated in the 10 week summer session. In 2007, USRP interns were hosted at all NASA centers (including the Jet Propulsion Laboratory), NASA's Wallops and White Sands facilities, and at Los Alamos National Laboratory.

The applicant pool for selection of these students was 723 for summer and 82 for fall.
The applicant pool generated for the 2008 USRP spring session was 118.