



Army High Performance Computing Research Center

AHPCCRC Bulletin



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Education and Outreach: Tomorrow's Experts

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The Army High Performance Computing Research Center, a collaboration between the U.S. Army and a consortium of university and industry partners, develops and applies high performance computing capabilities to address the Army's most difficult scientific and engineering challenges.

AHPCCRC also fosters the education of the next generation of scientists and engineers—including those from racially and economically disadvantaged backgrounds—in the fundamental theories and best practices of simulation-based engineering sciences and high performance computing.

AHPCCRC consortium members are: Stanford University, High Performance Technologies Inc., Morgan State University, New Mexico State University at Las Cruces, and the University of Texas at El Paso.

<http://www.ahpcrc.org>

Meeting the Army's scientific and engineering challenges using high-performance computing requires AHPCCRC to develop algorithms, architectures—and people. AHPCCRC's efforts support the Army's objective to "create a steady source of well-trained scientists and engineers" by introducing students to computational science and engineering, with application to high-performance computing. Participation is available to everyone, but special emphasis is given to reaching women and under-represented minorities.

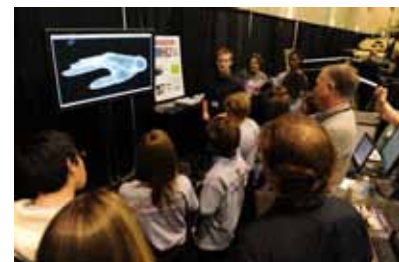


Top to bottom: NMSU PREP4, Summer Institute student, Grad student presenter at Army Science Conference 2010, Postdoc mentor at Summer Institute.



Pre-college level. The pipeline begins with high school seniors, who receive training and encouragement to pursue scientific or engineering courses in college. In 2009, AHPCCRC

partner New Mexico State University expanded its Pre-freshman Engineering Program to include a fourth year (PREP 4) in response to student requests, an expansion that also dovetailed with the Army's desire to prepare students for college science and engineering majors.



Through hands-on projects, field trips, classroom work, and an introduction to college campus life, PREP 4 students receive an introduction to potential careers in science and engineering that they might not have gotten from their schools or homes.

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Undergraduate level. Undergraduate students from AHPCRC partner universities may apply for admission to the annual AHPCRC Summer Institute, held at Stanford University. During this

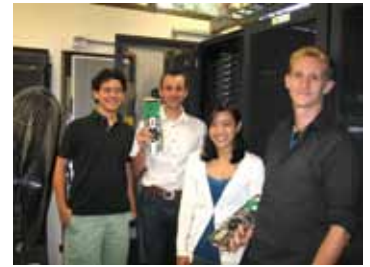
8-week program, 15–20 students interact with an approximately equal number of mentors—Stanford faculty members and their graduate students, postdocs, and staff researchers. The students receive classroom training and hands-on experience working on AHPCRC-related research projects. At the end of the session, each student presents his or her research to an audience composed of fellow students, mentors, and Army researchers and leadership representatives.

Summer Institute graduates bring what they learn back to their home institutions, where they pursue undergraduate research projects and make the decisions that will guide their future educational and career choices. A survey of Summer Institute students shows that the Institute has a strong influence on these students' decision to attend graduate school in engineering or the sciences, often reinforcing or focusing a student's own tentative plans.



Top left: Grad student presenters at the AHPCRC exhibit at Supercomputing 2010. Top right: AHPCRC Summer Institute. Bottom photos: NMSU PREP4.

Summer Institute graduates may be considered for ARL internships, where they develop their skills and experience even further. Interns work side by side with Army researchers at Army laboratory facilities, acquiring knowledge and capabilities that they bring back to their home universities.



Graduate and postdoctoral levels. Graduate students and postdocs working for AHPCRC primary investigators are supported by and contribute to the research projects funded by AHPCRC, and also participate in Army internships. This offers them a potential career path in Army research after graduation. Students participating in these programs benefit their home institutions with their newly acquired knowledge, experience, and professional networks.

AHPCRC also sponsors participation by students and postdocs at professional conferences: this gives them exposure to their colleagues, as well as Army researchers and potential beneficiaries of technology transfer.

Career level. One example of the success of these programs is David Powell (*page 1, bottom photograph, center*), who was sponsored by AHPCRC as a graduate student, postdoc, and Summer Institute mentor. Powell was recently hired as a staff member at ARL. The AHPCRC consortium is working to ensure that this is only the first of many such successes. ★

