Investing in the Future of Science

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"The long-term goal is to prepare [underrepresented minorities] to become those critical staff scientists that we need for the future workforce, hopefully here [at ORNL]." –Debbie McCoy, RAMS Program Administrator.

Chris Randall walks through the halls of Huntsville, Alabama's A&M University proudly carrying the souvenir bag he got from being an undergraduate researcher at the Oak Ridge National Laboratory (ORNL), the Department of Energy's (DOE) largest science laboratory, and one of the most prestigious government-run labs in the U.S. The summer he spent in Tennessee at ORNL's Research Alliance in Math and Science (RAMS) Program inspired him to include ORNL into his plans for graduate school in mechanical engineering. "As long as I can do research with them, I'll be happy no matter what university [I get into]," he says.

This is music to the ears of Debbie McCoy, RAMS program administrator, because attracting more underrepresented minorities to careers in science is exactly what she's trying to do. "The long-term goal is to prepare [underrepresented minorities] to become those critical staff scientists that we need for the future workforce, hopefully here [at ORNL]."

The program is having some success already. Many former RAMS students have pursued advanced degrees in computer science, mathematics, information technology, and materials science over the past five years. In the coming years, RAMS hopes to continue and expand its mission of helping Native Americans, Hispanic Americans, African Americans, and women enter science, technology, engineering, and mathematics.

The Set-Up

RAMS provides up to two dozen students with an opportunity to develop research skills by involving them in projects in computer science, math, computational biology, information technology, and materials science. During the 10-12 week program, students choose a research project and attend technical seminars and workshops. At the end of the session, students may share their research results online, at a two-day poster session, or in an oral presentation. But the student's relationship with the lab isn't necessarily over after the program is finished. They may present their summer research in scientific meetings and at their universities. And students

who made significant contributions to ORNL projects--and who also match the needs and research interest of a lab at ORNL--are welcomed to return the following summer as student researchers.

A Positive Outcome

The program's goal is to have students realize that research is something they can do and that going to graduate school and becoming a scientist is attainable, says McCoy. More importantly, ORNL hopes that summer students will return to work for ORNL after they've finished their scientific training.

So far this hasn't happened but that may be because the program is still young. But its growth over the years hints at its future success. McCoy says that every year more applications arrive and more historically black colleges and universities (HBCUs) and minority serving institutions (MSIs) are participating.

While there is no complete record of where former RAMS participants are today, partial data highlight the program's success. About 75% of recent RAMS participants from Fisk University, an HBCU in Nashville, Tennessee, went on to graduate school in computational sciences and engineering related fields, according to Stephen Egarievwe, a computer scientist and nuclear physicist who serves as the main RAMS connection at Fisk.

2004 RAMS participants. Photo courtesy of Oak Ridge National Laboratory.

David Sykes, a computer science professor at Wofford College in Spartanburg, South Carolina, has seen the program's influence on his campus. One of Sykes' students, Ricaye LaShawn Harris, didn't show an interest in a graduate science degree while she was in his class, so he recommended her for RAMS thinking it would introduce her to something new and give her "qualifications to succeed" in her field.

Her first summer away from home turned out to be, in her word, "great." Working at ORNL's Networking and Computing Technologies Division, Harris, an African American, developed a

Web survey to help new employees get acclimated at ORNL. Last fall, Harris presented her ORNL project twice at science meetings at her college. Now, a more confident Harris advises peers to look into RAMS to "get their foot in the door," and she is considering going to graduate school.

She's not alone. RAMS also influenced another computer science major, Sabrina Phillips, who attends Mississippi Valley State University in Itta Bena, Mississippi. While working in the RAMS program, Phillips assisted in the development of a second-generation weigh-in-motion device, an integrated hardware and software automation system that weighs moving vehicles. The system ensures that loaded aircraft have the proper balance and weight for flying. After her first summer with RAMS in 2003, she asked to return to the lab and worked on the same project. Her research experiences strengthened her interest in a graduate degree program in computer engineering. She gives a lot of the credit to her "down-to-earth" mentor, Bob Abercrombie, who she says made her feel welcome.

Overall, these students' time at ORNL has helped them to realize the potential richness of a research career. "A few have been surprised that even us 'old guys' get excited about our work … that you don't have to completely 'geek out ' to reach this level," says Stephen Scott, a senior research scientist in the Computer Science and Mathematics Division at ORNL who has been a RAMS mentor for nearly as long as the program. "Yes, we have families and interests outside of our research interests too."

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The United Negro College Fund Special Programs Corp.: Ensuring Diversity in Science
Lolita Jackmon, 10 January 2003, UNITED STATES