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SOARS - The apprenticeship model in the atmospheric sciences

Significant Opportunities in Atmospheric and Research Sciences (SOARS) is positioned to complement our partnering academic institutions' efforts in preparing students for careers in academia and research, particularly in the atmospheric sciences. Hosted at the National Center for Atmospheric Research (NCAR), SOARS combines a summer internship, which includes an authentic research experience guided by scientific mentors, a weekly communication workshop, seminars about graduate school and career choices, and end-of-summer poster and oral presentations by the students, with year-round mentoring, conference travel and publishing support. SOARS protégés work at NCAR and partnering laboratories and universities in Colorado to gain experience with what a career in academia and research could look like for them. Topics of research span the broad field of climate and weather, including computing and engineering in support of the atmospheric sciences.

Mentor Julie Caron, protégé Manuel Hernandez and mentor Joseph Tribbia (left to right).

The SOARS program builds on the apprenticeship model common in academia, expanding it through an individualized team of mentors who teach essential research, communication and networking skills through a summer internship. Students join the SOARS program as undergraduates from a number of fields, including meteorology, atmospheric sciences, chemistry, physics, computing, engineering and environmental science. During their first summer they complete an authentic research project, which they present in written, oral and poster forms by the end of the 10 week experience. While their research is guided by a team of scientist/engineer mentors, SOARS also provides a comprehensive communication workshop to develop the skills needed to effectively communicate their research. By the end of the summer, protégés have the ability to 'think and work like a scientist' and have been exposed to a wide

range of career possibilities within the atmospheric and related sciences. In addition, they have become part of a strong peer-mentoring network. For up to four summers, protégés are able to return to SOARS, gaining additional independence in subsequent years to select, focus, and direct their research, with many using the opportunity to expand their graduate research through contacts and facilities available at a national laboratory. The multi-year nature of the program additionally gives returning protégés the opportunity to share their knowledge through informal teaching and formal mentoring.


Research mentors Cécile Penland (left) and Leslie M. Hartten (right) with protégé Ma'Ko'Quah Jones.

By the time SOARS protégés move onto graduate school, they are well prepared to be successful in graduate research. They have not only gained hands-on research experience and strengthened their scientific writing and computing skills, they have also developed a professional network. This network of supportive peers and mentors has proven to be one of the key benefits for our protégés as they move forward in their careers. Many of our students come from smaller colleges without established research programs who may not automatically be linked in with faculty mentors, collaborators and future co-authors. Matching SOARS protégés with NCAR scientists has allowed them to enter existing networks and establish new ones between SOARS alumni and current protégés.

For faculty involved with SOARS protégés, advantages come not only from working with well-trained, connected students, but also from the network and contacts that come with them. Many students and their advisors continue to collaborate with mentors from their SOARS research experiences, leading to ongoing collaboration and publication between university and the national laboratories and partner organizations who contribute to SOARS. In addition, SOARS provides conference and grant-writing support to their protégés and alumni, helping them stay connected with the wider community.

SOARS is proud of their alumni, the vast majority of whom go on to excel in graduate school and move on to careers in atmospheric science or related STEM fields. Many of our alumni have entered academia as post docs, junior faculty, or as researchers at national research labs. Others are employed at federal intuitions such as FEMA, or the EPA. A few alumni serve as K-12 teachers or are employed in the private sector for consulting firms, the re-insurance industry or private weather companies. They remain connected to the SOARS community, committed to the SOARS mission of increasing diversity in the sciences, and play an important role in increasing the strength and diverseness of the STEM workforce.

2011 SOARS Cohort

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