



Association of Universities for Research in Astronomy

WORKFORCE AND DIVERSITY PROGRESS REPORT

Calendar Year 2010

Dear Colleague,

In 2010, AURA continued its commitment to broadening participation, affirmative action, and a proactive development of the future workforce. Although these have been core values for AURA since our founding, we have made a concerted effort over the past several years to become a leader in field. This letter is intended to summarize for AURA employees and governance the actions we have taken and to chart our progress in a transparent way.

The Astro2010 Decadal Survey issued in August 2010 observed that the benefits of broadening participation in science, technology, engineering, and mathematics (STEM) are now well recognized. However, that report also concludes that little progress has been made in increasing the number of minorities in astronomy. National organizations such as AURA need to refocus their efforts on attracting members of underrepresented minorities to the field.

Underrepresented Minorities in
Astronomy

“There are many reasons why improving these abysmal statistics should be a matter of the highest priority. First, failing to tap into such a large fraction of the population is hurting the country through not accessing a large human resource, and this is a statement applicable also to science in general. Second, because of the prominent position of astronomy in the public eye, the absence of minority role models sends a strongly negative message to young people considering careers in science and engineering.”

New Worlds, New Horizons

With regard to women in astronomy, a long-term AURA interest, Astro2010 observed that... “The gender gap in astronomy has diminished significantly, although women still occupy only a small percentage of the most senior positions. Astronomy departments and the community as a whole need to continue work to promote gender equity at all levels.” AURA as a large managing organization has an opportunity to directly contribute to this goal.

The AURA Action Plan for Broadening Participation¹ states our commitment as follows:

- *A Diverse Cross-section of Individuals Employed as AURA Staff:* we will strive to achieve a diverse and inclusive collection of individuals and groups who bring varied human characteristics, backgrounds, interests, and perspectives to enrich the workforce origin, and skill characteristics.
- *Future Workforce:* we will orient our outreach programs to create opportunities for underrepresented minorities, women, and persons with disabilities for the purpose of increasing the flow of undergraduates, graduates and post-docs into STEM fields.
- *Institutions:* we will reach out to institutions that have not had a history of involvement in AURA’s activities, especially smaller institutions and institutions with high percentages of underrepresented groups.
- *Geographic Areas:* we will indentify and establish a greater presence in geographic areas that have not had the opportunity to contribute to AURA’s mission and the overall field of astronomy.

These goals will guide us in achieving the leadership position we desire.

AURA Demographics

Diversity both in the workforce of direct employees and the makeup of the collection of individuals from the community that participate in its governance is an important and directly measurable metric. Related to this, AURA has sought to diversify target audiences for its outreach and educational programs in order to improve the pool of future employment candidates.

¹ see <http://www.aura-astronomy.org/diversity/actionplan.asp>

One standard for demographic comparison for AURA’s workforce is the required reporting by the Equal Employment Opportunity Commission.

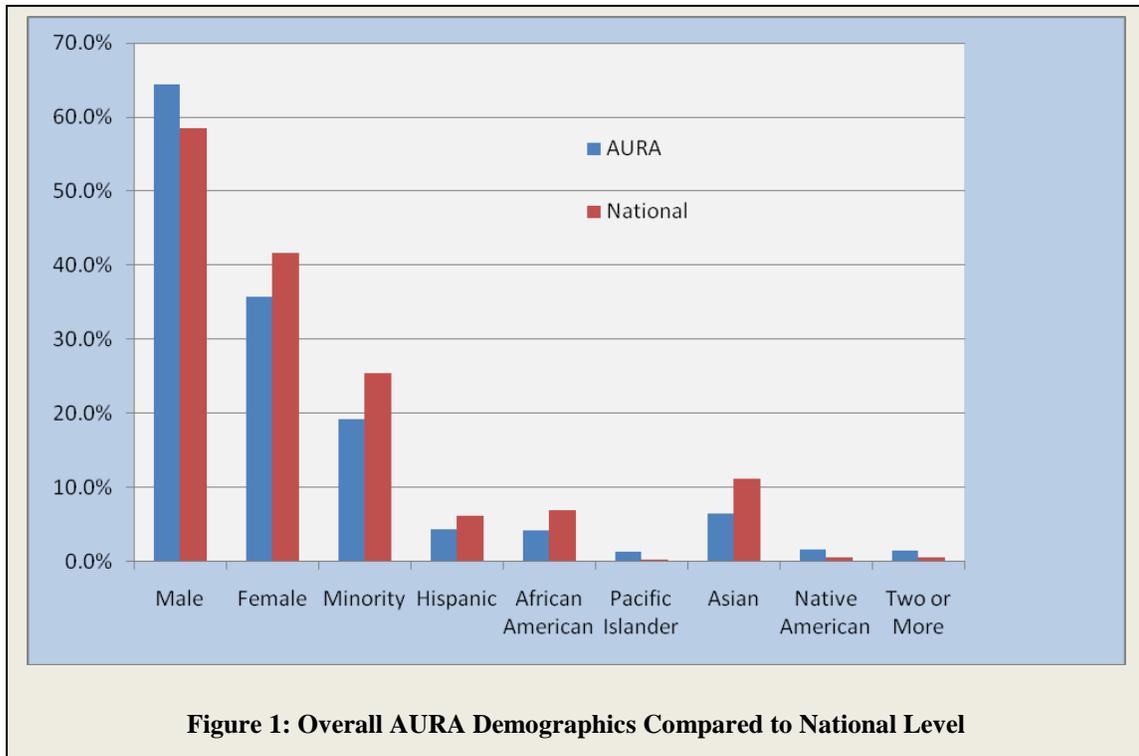
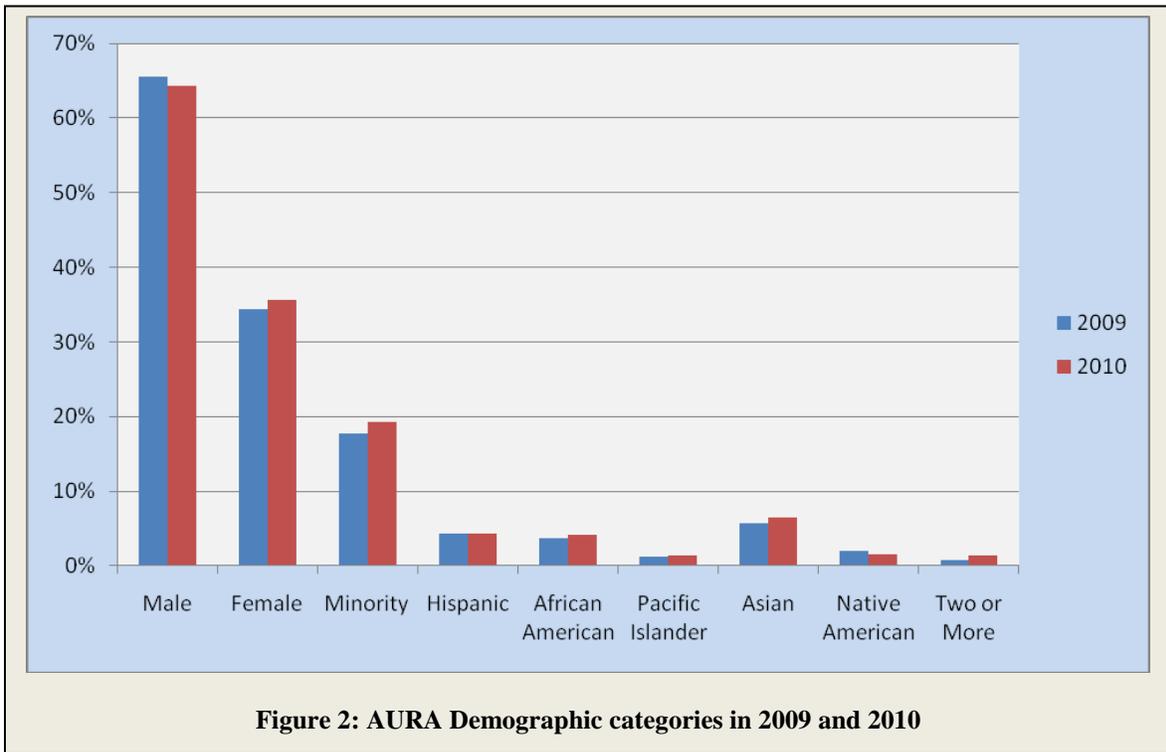


Figure 1 shows the overall demographics for the AURA workforce² for calendar year 2010 compared to the national levels for those employed in the private sector for physical, engineering, and life sciences³. This shows the representation for women and minorities, and a further breakdown of specific minorities. Relative to 2009, this comparison shows a slight loss in AURA demographic diversity, primarily because the national picture has become more diverse over the intervening year.

As an internal comparison, AURA as an organization showed improvement in its diversity since 2009. Figure 2 shows the broad EEOC categories for AURA for 2009 and 2010. This improvement is consistent with the attention AURA has paid to this issue over the past year. However, such trends are dominated by small numbers and somewhat fragile on a year to year basis. Nevertheless, the picture for 2010 is positive and encouraging.

² AURA employs about 1000 US hires. EEOC submissions do not include Chilean nationals.

³ Aggregate 54171 EEOC Statistics, <http://www.eeoc.gov/eeoc/statistics/employment/jobpat-eeo1/2008/nac5/index.html>.



In tracking demographic trends for underrepresented minorities, it is important to distinguish gender factors as well. Figure 3 shows the gender makeup for underrepresented minorities in 2010. Again, small numbers pose a difficulty in drawing statistically significant conclusions.

Achieving an ethnically diverse workforce at AURA is challenged by the pool of applicants available. In commenting on this issue, Astro2010 observed--

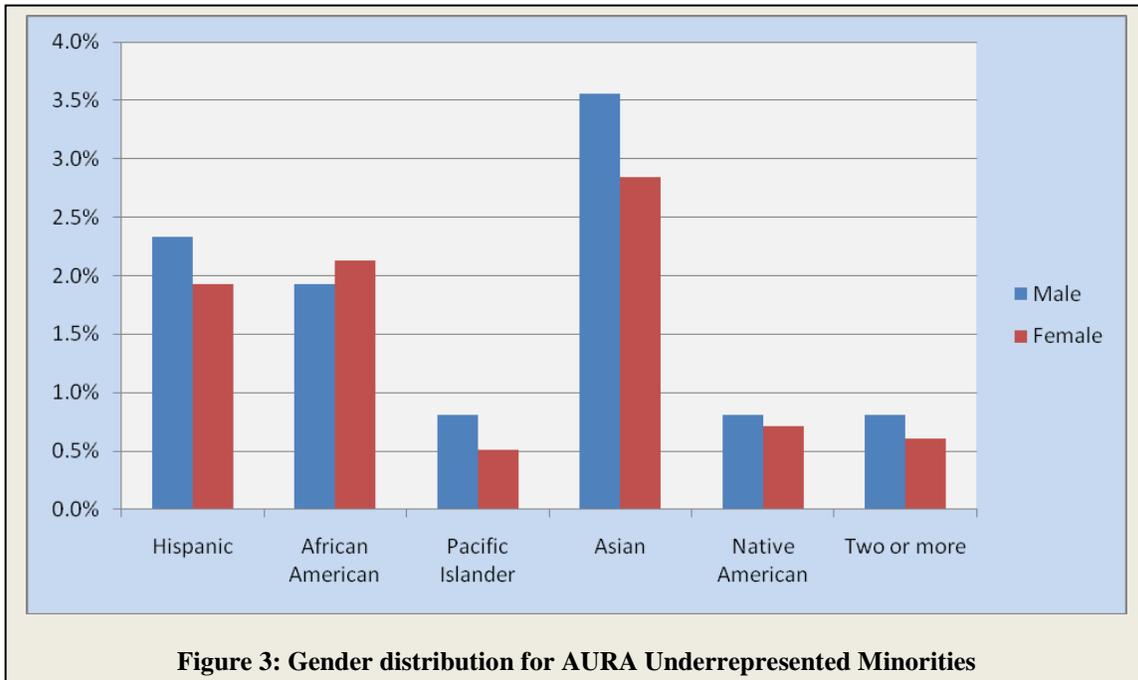
“Black Americans, Hispanic Americans and Native Americans constitute 27 percent of the U.S. population. By all measures they are seriously under-represented among professional astronomers. For example, this cohort accounts for only four percent of astronomy PhDs awarded in the U.S. and three percent of faculty members, and yet these small fractions represent growth. To achieve parity would require increasing the annual rate of minority PhDs in astronomy from around five to a sustained value of about forty over a period of thirty years.”

Gender diversity is also somewhat constrained by the pool. Over the recent past, about twenty-five percent of astronomy PhD's have been awarded to women. AURA Centers have attempted to meet or exceed this pool average. For Gemini, for example, 33% of the PhD science staff are women⁴. At NSO, 27% of the science staff are women. For STScI, 10% of the 67 science staff are female. At NOAO, 11 of the 48 (or 23%) science staff are female.

Although the overall demographics are difficult to change over the short term, a key measure of future success for AURA centers is recruitment, hiring, and promotions.

- For STScI for 2010, there were 75 new hires, of which 28 were female and 26 were underrepresented minorities. There were also 40 promotions of which 24 were female and 6 were underrepresented minorities.
- For NOAO for 2010 there were 28 new hires, of which 16 were female and 7 were underrepresented minorities (included overlapping categories) There were also 17 promotions of which 5 were female and 5 were underrepresented minorities.
- For Gemini for 2010, there were 26 new hires, of which 5 were female and 16 were from underrepresented groups. There were also 12 promotions of which 4 were female and 5 were from underrepresented groups.
- For NSO, there were 30 new hires, of which 13 were females and 3 were from underrepresented groups. There were 19 promotions of which 7 were female.

⁴ Gemini faces the added difficulty of luring engineers to areas that are geographically remote (Hilo and La Serena), where spouses or unmarried partners have difficulty finding employment (or may be forbidden to work, if on a visa), and families with children may have schooling issues.



Within its governance, AURA has also sought greater diversity. AURA’s standing committees are listed on the AURA website at <http://www.aura-astronomy.org/>. AURA has sought to maintain at least 30% women and minorities in its governance, above what would be the pool for academic candidates. In addition to diversity goals, governance choices are sharply constrained by a variety of management, scientific, and other factors. Figure 4 shows the trend over the past decade in achieving greater percentages of women.

Gender balance has also been a goal in constituting various AURA level *ad hoc* committees for major position searches, appointment reviews, visiting committees, etc. AURA Centers have reflected this goal in constituting internal administrative committees such as tenure review panels, search committees etc.

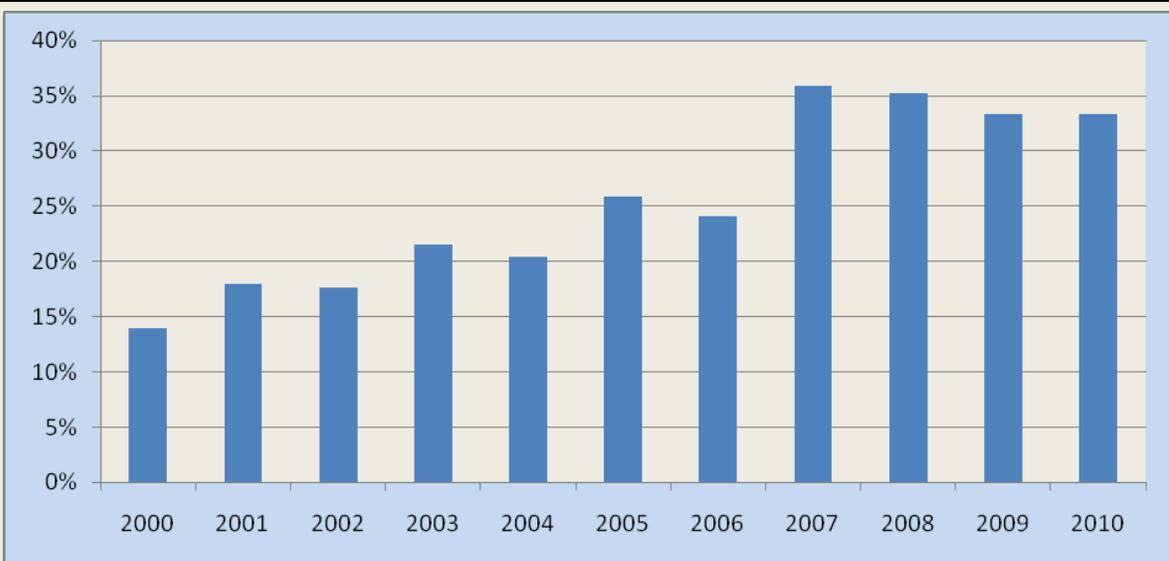


Figure 3: Women in AURA Governance

Growing a Future Diverse Workforce

AURA has continued to target its outreach and education programs to engage underrepresented populations, underserved geographic areas and institutions, and women. At the K-12 level, AURA has sought to provide the seeds of interest in science in general and future STEM related careers. At the advanced student level, AURA institutions offer a valuable research experience that complements academic and career development at all levels and also provides to a growing number of students a familiarity with the operating environment for major public observatories.

K-12 And Teacher Training Activities

NOAO has worked to achieve a sustained outreach effort with the Tohono O’odham nation in Arizona. NOAO held a Star Party at San Xavier recreation center in February and sponsored an Astronomy week in June at the Sells recreation center. NOAO set up a booth at Schuk Toak District day in April, and supported a Tohono O’odham student scholarship at University of Arizona astronomy camp.

As an International institution, the Gemini Observatory has primarily focused on the local communities in Hilo and La Serena. For over 5 years, Gemini South has trained teachers thanks to the Family ASTRO program, which has benefited hundreds of students and their families. Family ASTRO is part of a series of public education programs of the Astronomical Society of the Pacific (<http://www.astrosociety.org/education/family.html>).

This program involves training educators in several basic areas of astronomy and physics by means of workshops aimed at “learning by doing” in which each participant learns according to their own skills. In middle of March, Gemini South invited 8 institutions to be part of this annual training. The training was held in the Colegio Inglés Católico de La Serena and was attended by around twenty teachers.

Gemini took the lead on the Journey through the Universe 2010 program. In Hilo, Hawaii, 35 astronomy educators (55 Journey science educators in total) visited over 5,600 children in 270 classrooms during Journey through the Universe week, February 25 – March 4, 2010. Over 3,000 members of the public attended two Family science events held at Imiloa Astronomy Education Center. This year’s Journey theme, Human Presence in Space, gave teachers the tools and training to conduct lessons in the classroom that are deeply relevant to the Hawaii State Science Standards curriculum. Each participating teacher received a Galileoscope.

At STScI, 2010 showed continuing and increasing involvement in key initiatives and partnerships with respect to broadening participation and outreach. The STScI Office of Public Outreach (OPO) spearheaded multiple projects such as our Visions of the Universe exhibit tour and the Hubble ERO Student Pilot Project targeted at bringing the science of Hubble to underserved communities and students from underrepresented groups. Both programs underwent significant expansion in 2010.

The STScI/OPO group was extensively involved in providing professional development experiences for Baltimore City science educators and attendees of the Project ASTRO professional development workshop at the Maryland Science Center. STScI maintained significant support of partnerships in STEM education and career development initiatives with Maryland Mathematics, Engineering and Science Achievement, the Maryland Business Roundtable for Education and the Maryland Space Grant Consortium

The STScI Youth for Astronomy and Engineering (YAE) program, a local community youth outreach program, offered day and evening programs for underrepresented youth and their families. Through a partnership with OPO, YAE sponsored a day long professional development workshop entitled for local middle school educators.

Advanced Student Activities

Student intern programs directly expose future potential hires to the observatory working environment. Although not formally a Broadening Participation program, the NSF Research Experience for Undergraduates (REU) has been one of the most effective tools used by AURA as well as other qualifying institutions. For STScI and Gemini which are unable to participate in the REU program, comparable active intern programs have been established.

- For NOAO, the REU program in summer 2010 totaled 6 students: 3 women and one minority.
- At NSO, 2010 saw a class of 10 REU summer students, of which 5 were female. Four of these presented papers at the Seattle AAS meeting.
- The NSO also actively participates in the NSF's International Research Experience for U.S. Graduate Students. Of the four students in 2010, two were female.
- For Gemini, during 2010 there have been 20 Interns who have gained experience in STEM occupations in the Gemini workplace, of which 9 were female and 10 were from underrepresented groups.
- For the Space Telescope Science Institute, 16 summer interns were selected, of which 10 were female. 7 of the 16 identified themselves as being from underrepresented groups. Additionally, during the summer of 2010, STScI initiated the HST Summer STEM Internship program in partnership with the Maryland Space Grant Consortium. This is a pilot internship program that provides an opportunity for an underrepresented undergraduate student to participate in STEM activities related to HST computer science applications.

AURA Centers have also reached out in other ways. On November 12, 13, the NSO sponsored a special Akamai Remote Sensing Workshop in Maui. This was intended to stimulate interest among alumni of the Akamai

Internship Program in engineering careers. 71% of the participants were from underrepresented groups. Following the workshop, 82% of the participants reported that they "Definitely will" or "Probably will" apply for jobs at the NSO.

All AURA Centers have benefitted from the NSF's Partnership for Astronomy and Astrophysics Education Program. Although not directly eligible to submit proposals, AURA Centers have acted as partners in the overall bridge program by providing valuable research experience.

- During 2010 Gemini hosted in La Serena Chile its first student from the Fisk – Vanderbilt Bridge Program
- During 2010, a Fisk Vanderbilt student at NSO successfully defended his Masters thesis based on data from the Global Oscillation Network (GONG) program. He was subsequently admitted to the PhD program.
- In summer 2010 NOAO hosted two underrepresented minority student from the PAARE program at South Carolina State University. These students were seamlessly included in the existing REU program.
- At STScI, a recent Fisk Vanderbilt graduate participated in the summer research program and, due to her interest in exploring a career in science education outreach, was retained for an extended term position in the Office of Public Outreach. STScI also worked with the Fisk Vanderbilt program to explore local PhD study and joint mentoring opportunities for the graduate.

Organizational Initiatives

AURA's Workforce and Diversity Committee has continued to explore ways for AURA to enhance its programs to broaden participation, improve the workplace climate, and attract a diverse workforce. The Committee met twice in 2010 in Tucson and Hilo. Each meeting focused on the unique features of the AURA workplace in these locations and also on the issues related to outreach and broadening participation within the local communities. In addition, the Committee addressed two specific issues for further work.

First, AURA has recognized that, although there are established and successful programs for Science related internships, there is not a

comparable program for engineering interns. Although the observatory workplace offers a rich variety of engineering careers, this is not well known to the academic engineering community nor to those involved with programs aimed at broadening the participation of underrepresented minorities. AURA is committed to engaging a broader segment of the engineering community that includes underrepresented minorities. Ongoing instrumentation efforts and other engineering functions provide important opportunities to mentor students that might enter the future workforce.

In April, AURA participated in the development of a proposal by a group of mid-West academic institutions for a Louis Stokes Alliance for Minority Participation (LSAMP) award. This effort, called INSPIRE (Iowa, Illinois, Nebraska STEM Partnership for Innovation in Research and Education), would reach about 100 minority students per year, many of which are likely to be in engineering majors. AURA will mentor up to three students per year in a manner similar to the REU program. AURA mentors will also participate in the mentor training programs included in the INSPIRE proposal.

Second, the Workforce and Diversity Committee includes experts in enhancing the workplace climate, especially in highlighting unconscious bias. As a part of the December meeting in Hilo, a special session was held including all Gemini staff to review the findings of studies that revealed the sources of unconscious bias. One outcome of this was a heightened awareness of the need to include unconscious bias considerations in such AURA activities as recruitment, personnel searches, promotions, etc. AURA will prepare materials to include in all of these activities AURA wide.

Policy Development

In order to better meet the needs of employees in their child rearing years, AURA has implemented a paid maternity/paternity leave policy in 2010. This policy provides for up to six weeks of paid leave for either parent for the birth or adoption of a child. This paid leave is available to both parents and domestic partners. This benefit is in addition to any vacation, sick leave, and short term disability taken. See [http://www.aura-astronomy.org/about/policies/Section%20B/B8\)%20B-VIII%20Absences.pdf](http://www.aura-astronomy.org/about/policies/Section%20B/B8)%20B-VIII%20Absences.pdf)

Community Engagement

AURA has continued its commitment to establish a greater presence at other national meetings associated with underrepresented minorities. For 2010, AURA participated in:

- In April, NOAO personnel gave a talk at Univ. of Texas at Austin on *Tough Talk: Women Giving Colloquia* (Norman)
- Also in April, STScI staff conducted a hands-on student workshop for high school students at the Southside Academy as part of an ongoing partnership between STScI and the Baltimore City Public School System.
- During the summer of 2010, STScI initiated the HST Summer STEM Internship program in partnership with the Maryland Space Grant Consortium. This is a pilot internship program that provides an opportunity for an underrepresented undergraduate student to participate in STEM activities related to HST computer science applications. This year's intern was a student at Morgan State University.
- In August, NOAO organized a panel discussion held at the annual meeting of the Astronomical Society of the Pacific. The session was entitled "Making Connections with Underserved Communities, Broadening Participation in the STEM Fields". See http://www.aura-astronomy.org/news/2010/ASPpanel_AURAreport.pdf.
- In October AURA, including representatives from the Corporate Office, NSO, Gemini, and NOAO, participated in the National Indian Education Association meeting in San Diego. See <http://www.aura-astronomy.org/diversity/documents/AURA%20Exhibits%20at%20the%20National%20Indian%20Education%20Association%20Convention.pdf>.
- NOAO Diversity Advocates have assumed the role of Editor of the AAS newsletter for Women in Astronomy, *Status*, and will serve on the AAS Demographics Committee as the CSMA (Committee on the Status of Minorities in Astronomy) representative.

Our Future Commitments

In the future, AURA will continue to track its progress in Observatory annual reports, and through visiting committees, and oversight committees. We want to continue to improve our workplace and to refine our mentoring skills for the future workforce.

I thank all of the AURA personnel who have contributed to these activities. I especially thank AURA's Diversity Advocates.

A handwritten signature in black ink that reads "William S. Smith". The signature is written in a cursive style with a large, stylized 'S' and a long, sweeping underline.

Dr. William S. Smith
President
Association of Universities for Research in Astronomy