



Association of Universities for Research in Astronomy

WORKFORCE AND DIVERSITY PROGRESS REPORT

Calendar Year 2014

Dear Colleague,

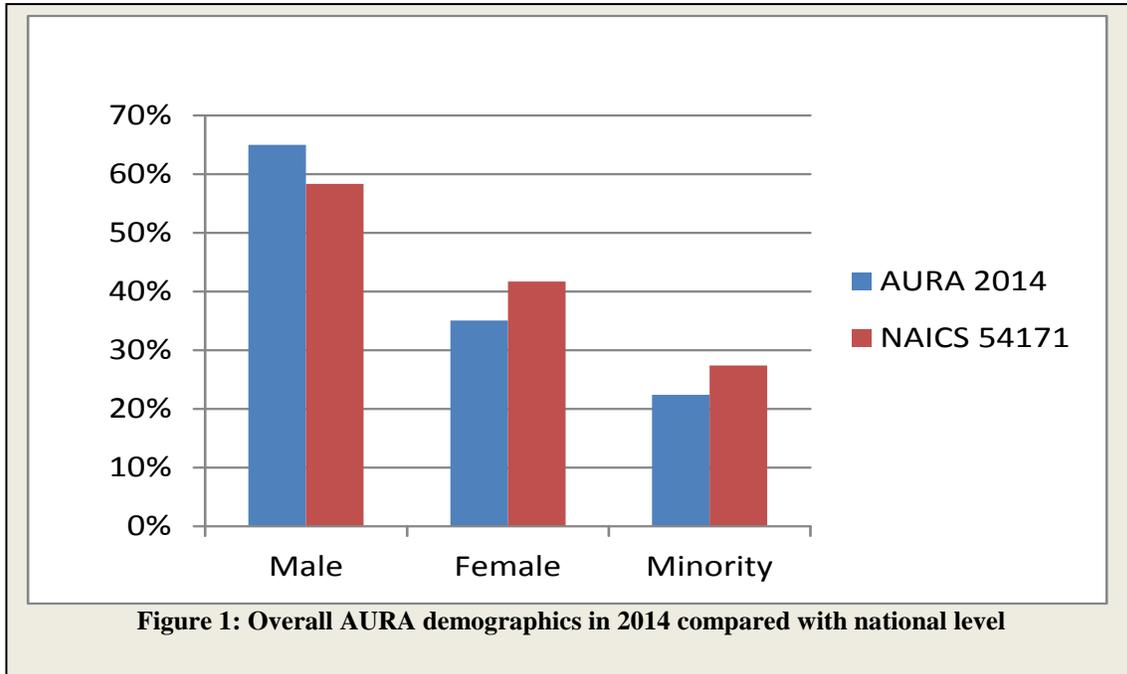
This letter summarizes for AURA employees and governance the actions we have taken in 2014 to broaden participation in AURA activities and to work towards the development of a diverse future workforce. This report marks the five-year mark since AURA undertook a focused commitment to achieve and strengthen the following.

- *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 such as origins, backgrounds, interests, skill characteristics, and perspectives to enrich the workforce.
- *A Future Workforce:* we will orient our outreach programs and partnerships 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 the fields of astronomy and related technologies.
- *A More Diverse Institutional Participation:* 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.
- *A More Diverse Geographic Participation:* we will identify 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.

AURA Demographics

AURA Employees

AURA compares its demographic makeup to the set of organizations that are required by the Equal Employment Opportunity Commission to report under the classification NAIC 54171, Private Sector Physical, Engineering, and Life Sciences¹. There are over 300

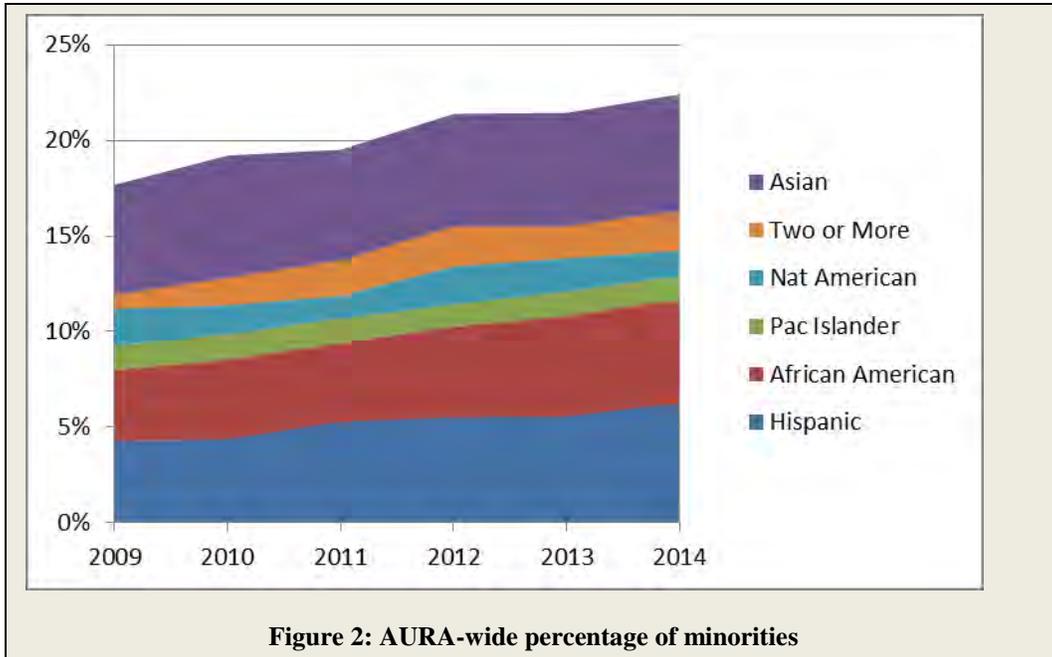


thousand workers in this category, of whom AURA employs about a thousand.

As seen in Figure 1, in 2014 women and minorities in AURA lag slightly compared with the national percentages for organizations in our category. However AURA has shown improving trends in important categories over the past five years; for example, the 2014 data show a slight (0.8%) increase in women compared with 2013.

Figure 2, similarly, illustrates the positive trend over the past six years in the percentage of AURA employees who are categorized as minorities. As seen, the subset that has traditionally been considered underrepresented in STEM fields (Hispanic, African American, Pacific Islander, and American Indian), have shown positive growth. Also the per cent employees who identify two or more ethnicities have also grown.

¹ See <http://www1.eeoc.gov/eeoc/statistics/employment/jobpat-eeo1/2009/index.cfm#centercol>. EEOC data generally track NSF Science and Engineering Indicators where data can be compared.



Over the past five years, AURA focused on recruiting and retention of women and minorities in its top management ranks. Figure 3 shows the 2014 gender demographics for the highest employment classification, *Executive and Senior Management*. AURA outperforms the national average for percentage of women.

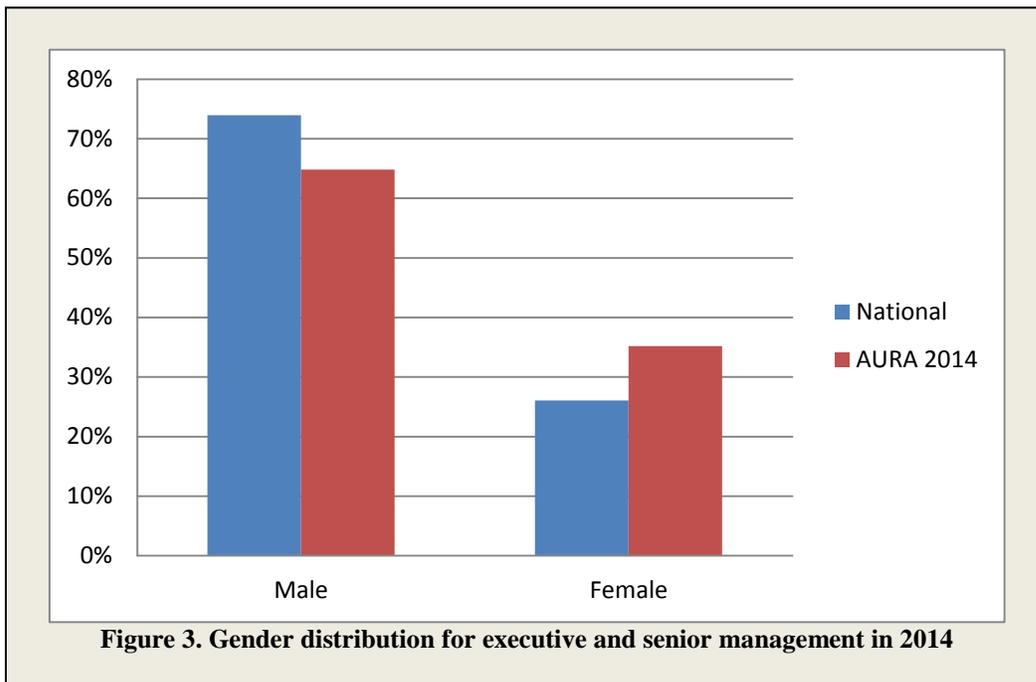
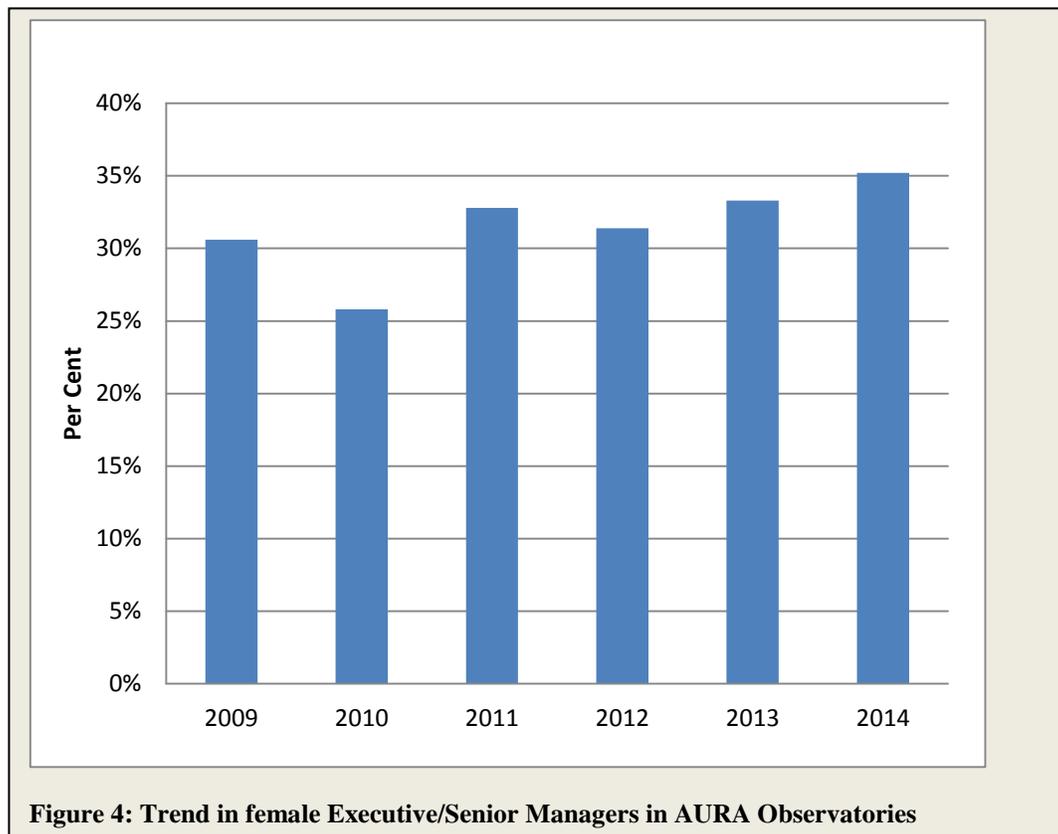


Figure 4 further shows that the percentage of women in this category has increased steadily during the past three years.



To maintain this trend, AURA puts special attention on its search and recruitment processes. It is increasingly recognized that the diversity of search committees is not always sufficient to achieve a more diverse workforce due to unconscious bias held by both men and women. Consequently, AURA created a Recruitment Guide for search committees², and instituted a policy of introducing search committees to current findings on unconscious bias. AURA also put focused effort into ensuring the diversity of applicant pools and “short lists.”

In 2014 AURA conducted a search for the AURA President. The Search Committee was briefed on unconscious bias and was provided the AURA Recruitment Guide. Two of the eight Search Committee members were women. The final list of interviewed candidates included one woman.

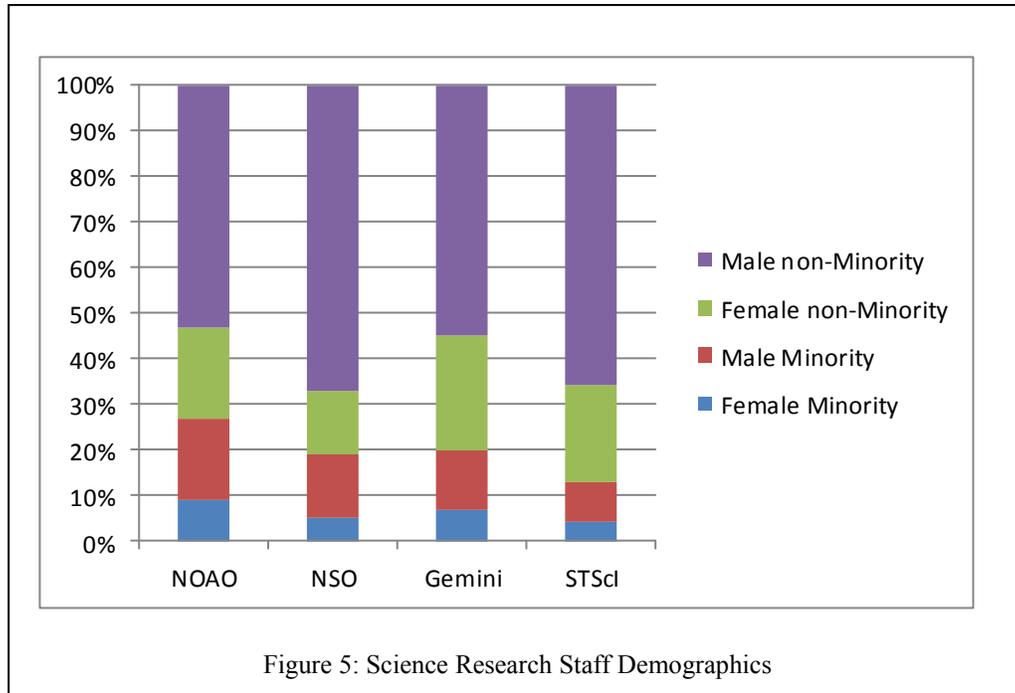
Also in 2014, NOAO conducted a search for the Director of NOAO South. The applicant pool included 13 individuals, 11 male and 2 female. Of these 4 were minority. The pool

² [http://www.aura-astronomy.org/diversity/documents/AURA Recruitment Guide - Final.pdf](http://www.aura-astronomy.org/diversity/documents/AURA%20Recruitment%20Guide%20-%20Final.pdf)

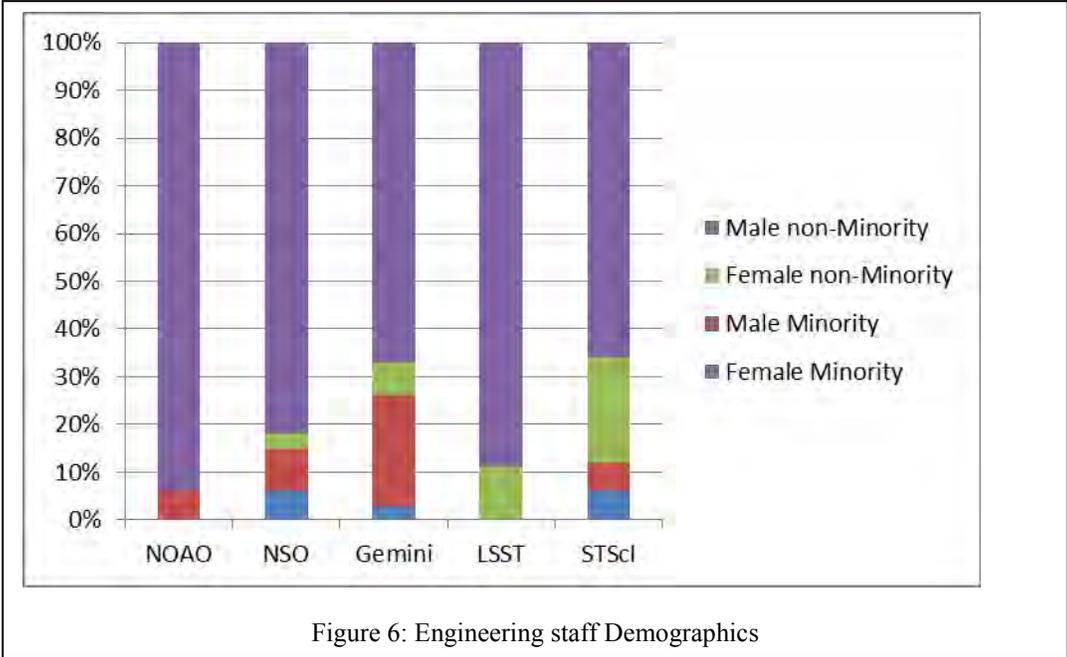
selected for interview included 6 males, and one female. One of these interviewees was a minority. The process resulted in the selection of a male.

STEM Staff

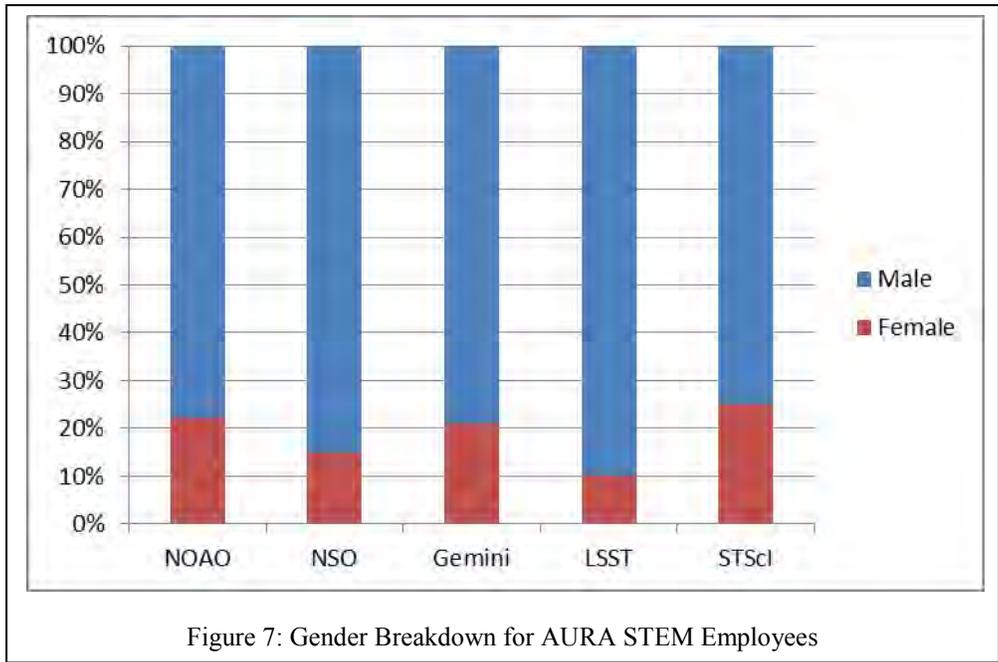
Science and engineering staff represent a special category of employee relevant to NSF and NASA diversity goals. Figure 5 shows the gender/ethnicity breakdown for science research staff for AURA observatories.



Engineering staff tend to reflect local pools to a greater extent than science staff, but other factors such as engineering discipline (e.g. software engineers, mechanical engineers) also affect the demographics. Figure 6 shows the breakdown for AURA engineering staffs.



Overall gender balance for AURA STEM related occupations is shown in figure 7.



Staff Hiring

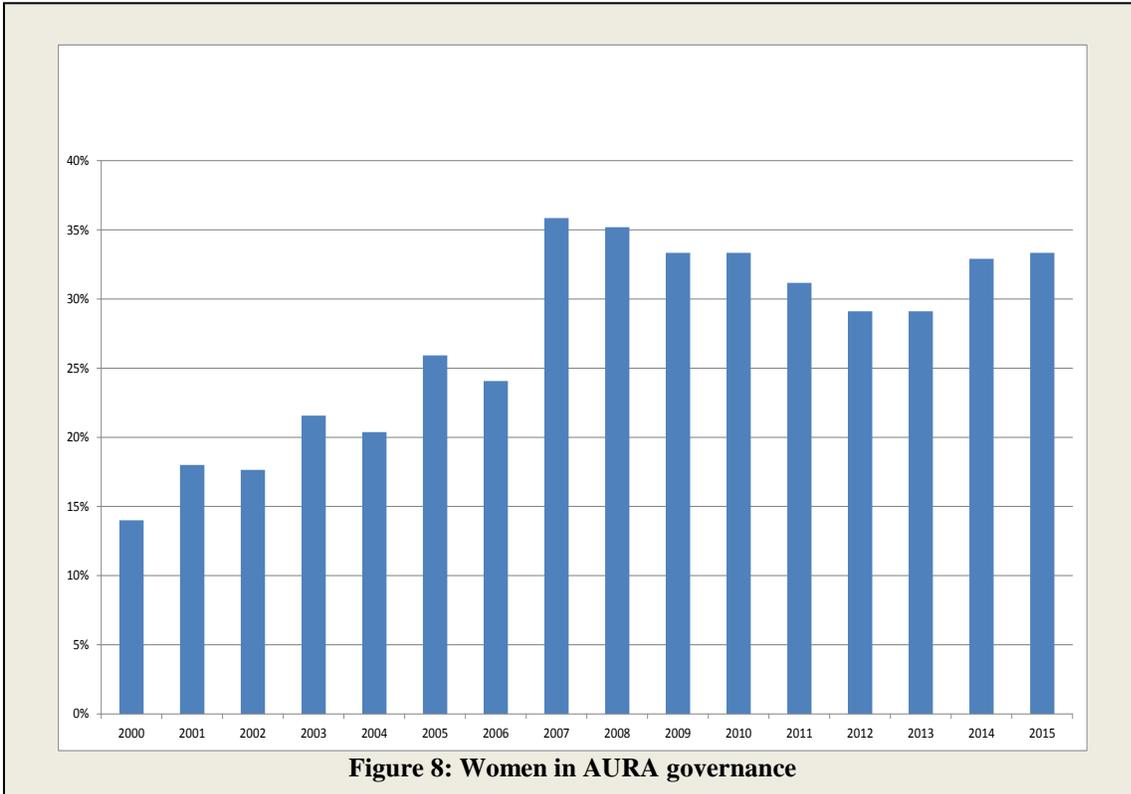
Although overall demographics are difficult to change over the short term, key tools for success in diversification of AURA centers are recruitment, hiring, and promotions.

- For STScI in 2014, there were 56 new hires, of whom 23 were women and 11 were underrepresented minorities. Of 42 promotions, 14 were women and 11 were underrepresented minorities (included overlapping categories).
- For LSST in 2014, the workforce increased from 14 to 36, although 16 of these 22 individuals were direct transfers from NOAO to LSST due to a reorganization of the AURA Centers. Of the 6 new hires, four were women and included three underrepresented minorities. There were no promotions.
- For NSO, there were 12 new hires that were not temporary, of whom 3 were females and 2 were from underrepresented groups. There were three promotions, one of whom was female/minority
- For NOAO there were 17 new hires, of whom 3 were female and 4 were underrepresented minorities. There were also 13 promotions of whom 7 were female and 5 were underrepresented minorities (included overlapping categories.)
- For Gemini for 2014, there were 19 new hires, of whom 5 were female and 7 were from underrepresented groups. There were also 5 promotions of whom 1 was female and 2 were from underrepresented groups.

Turnover in AURA organizations is low. As opportunities to hire and promote women and underrepresented minorities arise, however, AURA strives to improve diversity in the overall composition of AURA's workforce.

AURA Governance

AURA has also sought to increase diversity within its governance: board, councils, and committees (<http://www.aura-astronomy.org/>). In 2008, AURA set an informal goal to maintain at least 30% women and minorities in its governance. This goal was intended to lead the astronomy community in general, where such participation rates historically lag. As seen in Figure 8, over the past several years, this fraction has fluctuated. AURA governance choices are often highly constrained by a variety of factors (e.g., the need to include representatives from certain institutions, the need to include specific international representatives, the need to gain specific scientific and management expertise, etc.). . The AURA goal has been met up through the elected members for 2014-2015.



Growing a Future Workforce

AURA focuses its outreach and education programs to engage underrepresented populations, underserved geographic areas and institutions, and women. At the K-12 level, AURA nurtures the seeds of interest in science and promotes STEM-related career options. 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

NOAO maintains a vigorous outreach effort in Arizona and Región de Coquimbo through a portfolio of programs that serve students directly and that provide professional development for teachers and informal science educators (e.g., museum and afterschool program educators). For example, in Arizona, there are about 140 educational events

(classroom visits, star parties, workshops, etc.) with about 100 educational events per year in Chile. In Arizona, NOAO works across the state with teacher professional development and student-based programs in Sells, Tucson and South Tucson, Yuma, Safford, and Flagstaff that reach a significant Hispanic and Native American student population.

In general, NOAO programs in Arizona are directed towards school districts and areas where the students are from groups underrepresented in science careers. For example, the NOAO Galileoscope program worked with 180 students building Galileoscopes as part of the “Math MovesU” event (in cooperation with Raytheon and the University of Arizona MESA program) including a class of students from Tucson’s Ha:San Preparatory and Leadership School, which has mainly Tohono O’odham students.

In Chile, a major effort is being made to train astronomy guides for observatories run by small municipalities in rural regions. The EPO-South team has an ongoing collaboration with CEAZA (Center for Advanced Studies in Arid Zones) in the joint project “Science, Education and Sustainability for the Touristic Development of the Region of Coquimbo”. The project stresses dark skies education for sustainable tourism in rural coastal towns in northern Chile.

NOAO-North places a very high priority on working with educational organizations on the Tohono O’odham nation and partnering with the Tohono O’odham Community College (TOCC). This year there were 17 events on the Tohono O’odham nation, including visits to the Sells after-school program, tours of Kitt Peak, the Tohono O’odham Truck of Love Summer Camp, science fair judging, a star party at Tohono O’odham High School, and a star party at Tohono O’odham Community College. NOAO staff also attended Indian Day at Sells Elementary School, an annual event before Thanksgiving that features various community groups presenting cultural and educational activities. NOAO staff built kaleidoscopes with over 100 elementary school students. NOAO has been presenting at Indian Day since 2008.

NOAO is working with the American Indian Science and Engineering Society (AISES) chapter at Tohono O’odham Community College. NOAO staff has met with the AISES group over the last several years and does solar and nighttime observing with them. AISES also helps NOAO in outreach programs to schools such as the Indian Day program mentioned earlier. We are currently planning a star party with AISES to be held at the college in early 2015.

Astronomy is being taught by NOAO staff again this fall at Tohono O'odham Community College. The class has 15 students, one of the largest classes at the college. It meets twice a week and carries four credits as a lab class. NOAO staff were also approached by astronomers from the University of Wisconsin who are interested in partnering with a tribal college in their state.

The NOAO-North EPO group is regularly asked to offer both school and after school programs on the Nation, which they carry out as their first priority. While these activities are difficult to assess, independent positive comments about Kitt Peak's educational efforts are becoming very common. Educational partnerships have been formed with Ha:San Preparatory and Leadership School. NOAO worked with the school to organize a school-wide retreat with 70 students and about 20 parents camping at the Kitt Peak picnic area and participating in observing and other programs at Kitt Peak led by NOAO staff from Tucson and from the mountain, including several Tohono O'odham employees. Other programs included a booth at the Tohono O'odham Fair and Rodeo and support for astronomy programs at the Bureau of Indian Education's Tohono O'odham High School west of Sells, Arizona.

NOAO is a partner in Project STEAM: Integrating Art with Science to Build Science Identities among Girls, an NSF-sponsored informal science program (Co-PI Pompea). One aspect of the program is a two-week summer academy held in Tucson and Fairbanks, Alaska for middle school girls interested in art and science. The program strongly encourages Native American involvement in both locations. Our first academy in Tucson in the summer of 2013 had seven girls from the Tohono O'odham Nation (three from Sells and four from the San Xavier District) among the 35 program participants. Other self-identified categories were 1 African American and 4 Hispanic. For the Fairbanks Summer Academy in year one, 14% of the participants were Alaska Native. In Alaska in year two, 2 of the 26 girls were Hispanic and 2 were African American (also self-identified). In Tucson, in year two, there were 7 girls from the Tohono O'odham Nation in the 29 participants, as well as 6 Hispanic and 2 Pacific Islanders girls who self-identified in these categories.

NOAO also continues with an active Project ASTRO program that includes many minority-serving schools in the Tucson area by providing professional development for teachers and educational activities in the classroom facilitated by astronomers... The Project ASTRO professional development workshop took place in May with 28 Project ASTRO teachers and astronomers attending the workshop held at NOAO. The fall ASTRO workshop was held at Kitt Peak National Observatory in September. Sixteen

teachers and thirteen astronomers attended this all day workshop. NOAO will support these new partnerships as well as existing partnerships during the upcoming school year.

Starting in 2006, five to seven undergraduates have been employed each semester in the EPO department in our undergraduate mentoring and outreach program. The students work 10-15 hours per week in astronomy outreach work and are mentored by NOAO staff. Many of these students continue to work at NOAO for several years. The program is designed to assist students in whatever academic direction they are pursuing. Over 30 students have been in the program. The participants have pursued careers or graduate school in astronomy, optical sciences, engineering, geology, engineering management, chemistry, physics teaching, music, and art. The EPO group currently has one Tohono O’odham student employed part-time in this program. A second Tohono O’odham student, not in this program, worked with NOAO EPO staff on a light pollution research project. She was supported by the University of Arizona’s College of Optical Sciences summer REU program while she worked at NOAO alongside the other summer REU students.

Gemini

As an international institution, the Gemini Observatory’s educational programming focuses primarily on its local host communities; Hilo and La Serena. For over 5 years, both Gemini sites have trained teachers to execute 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 a family-based environment in which each participating family group learns according to their own skills. In 2014 the ‘Imiloa Astronomy Center (<http://www.imiloahawaii.org/>) collaborated with Gemini to provide training to teachers (K-12) on activities created by the Astronomical Society of the Pacific.

In addition to Family ASTRO and portable StarLab planetaria at both sites, Gemini’s flagship local outreach program is the extremely successful Journey through the Universe.

Gemini has completed its 10th year and is currently making preparations for the 2015 Journey Through the Universe program. In 2014 *Journey Through the Universe* expanded to Chile under the name Viaje al Universo Chile. Together these two versions of the program, which bring observatory scientists and staff into classrooms for an

intensive week of activities, are impacting thousands of students, parents and educators annually.

The Viaje al Universo program, which engages Chilean students, teachers, and the public, ran for its third year; it featured dozens of classroom visits by scientists and educators. This combined with the annual AstroDay Chile program, which was founded by the Gemini outreach office, provided for some of the most significant outreach programs in Chile

STScI

In 2014, the STScI Office of Public Outreach (OPO) maintained or expanded partnerships to bring both HST and JWST to underserved communities and diverse audiences. One key partnership includes the Dream Academy – a national program that serves at-risk youth in ten cities throughout the United States. For the second year in a row, STScI’s OPO and Youth for Astronomy and Engineering (YAE) programs partnered to provide nighttime observing opportunities accompanied by hands-on STEM activities for Dream Academy youth at Pimlico Elementary/Middle School and their families.

The STScI/OPO group maintained partnerships with local schools; specifically with Baltimore City’s City Neighbors High School. This partnership provided two underserved students with an opportunity to intern in STScI’s OPO and apply STEM processes through mentoring and job shadowing experiences. Additionally, OPO continued its work on the STEM Achievement in Baltimore Elementary Schools (SABES) project in collaboration with both Baltimore City Public Schools and the Johns Hopkins University’s School of Education. The OPO education team provided technical assistance with the development and review of a unit on light and color. This initiative was extended to include a 30-minute video tutorial developed by OPO staff to support Baltimore City educators in covering basic astronomical concepts, the Big Bang, and constellations in the classroom.

OPO supported a pilot initiative developed by the Weinberg Foundation in partnership with the Maryland Out of School Time Network. The initiative was a summer learning program that allowed school libraries to stay open during the summer for local youth to participate in STEM-based literacy workshops. OPO staff provided seven workshops for a total of 423 Baltimore City youth and their families.

In addition to the above, the STScI/OPO group supported existing partnerships with STEM education and career development initiatives such as the Maryland Business Roundtable for Education and the Maryland Space Grant Consortium. OPO also continues to support several local STEM events to bring HST and JWST to young women and Baltimore City youth. (Expanding Your Horizons Career Discovery Day, Girl Power, Girl Scouts STEM Camp, Baltimore’s Project Astro, Morgan State University’s SEMAA Conference, and NASAScience4Girls).

Part of the STScI's OPO, the YAE Program focuses on community youth outreach initiatives. YAE offered workshops and events for underrepresented youth as well as their families. This included the spring *Women's Science Forum*, summer *Family Night at the Institute*, fall *Parent & Daughter/Son Evenings Under the Stars*, and spring/fall monthly *YAE Astronomy Club*, and *YAE Engineering Club* sessions. In addition, the YAE Program held its first *Hispanic Science & Engineering Forum*. The percentage of attendees at these events from Baltimore City is 46%.

The YAE Program maintains an ongoing collaboration with the Mayor's Office's *YouthWorks* program in Baltimore City where the YAE Program was able to provide summer work experience for two youth who actively participated in the YAE Program throughout the year. In addition, the YAE Program, in conjunction with STScI Human Resources, partnered with Maryland's Division of Rehabilitation Services (DORS) in Baltimore City, to provide work experience and STEM engagement for over 20 young adults with physical and mental disabilities .

Jointly with OPO's Education Program, YAE sponsored an Educator's Workshop for middle school teachers. Educators participated in talks on different science topics and hands-on science activities.

The YAE Program, in existence for nine years, has begun to see under-represented students who have routinely participated in YAE Program events enter college, majoring in astronomy or physics. The YAE Program is maintaining contact with these students, connecting them with other opportunities at STScI, such as the Space Astronomy Summer Program, in a effort to foster and sustain their interest in astronomy.

NSO

During 2014, the NSO Research Experience for Teachers (RET) program did not take place. However Matt Peen worked with a senior at Cienega High School in the Vail school district who completed a senior exit project by working with Penn and the East Auxiliary Telescope at the McMath/Pierce solar facility. The student was a participant in the University of Arizona "Space Camp" on Kitt Peak during the summer of 2014, and became interested in the solar telescope. During his Fall 2014 semester, he learned how to remotely operate the East Aux telescope and take data using the NASA/Goddard Space Flight Center two-color Quantum Well Infrared Photodetector . The decay phase of a solar flare was captured during one of his observing sessions. Future work with the East

Auxiliary will continue in collaboration with a high school physics teacher from the Dublin School in New Hampshire, and his students, in 2015.

The partial solar eclipse, on October 23, 2014, was live-cast from the McMath-Pierce Facility and had 2000+ viewers, from 712 US cities, and 34 countries (<https://sites.google.com/site/mcmathpierceeclipse/home>).

NSO has several online projects, CLEA (Contemporary Laboratory Experiences in Astronomy) develops laboratory exercises, as well as RASL and DASL, which can all be accessed through the NSO education and public outreach link at <http://eo.nso.edu/>. NSO will be adding E/PO staff in the near future to revitalize these and other contributions to K-12 and teacher training.

LSST

The LSST Construction project became an AURA Center in October of 2011 and received its federal construction start in August of 2014. However use of the NSF construction funds to implement an E/PO program is specifically disallowed. The NSF construction funding can only be used to build infrastructure to implement EPO during science operations, scheduled to begin in 2022.

Plans for an extensive, embedded program for Education and Public Outreach (EPO) has been part of LSST from the beginning, with shared planning and resources for all users. It is this integrated nature of education and research, coupled with the long lead time for planning and building community, that provide the tremendous opportunity for transformative EPO with LSST.

Since April 2011, the quarterly publication of LSST E-News has been translated into Chilean Spanish (by a volunteer) and posted online at <http://www.lsst.org/lsst/news/enews>. Changing membership of the existing LSST EPO Outreach Advisory Board, and the creation of one or more EPO Science Collaboration Teams, are being explored as possible mechanisms for increasing diverse participation in LSST EPO.

The LSST project maintains a database of activities designed to increase participation of underrepresented groups at the 40 LSST Institutional Members as a possible source of leveraging opportunities for LSST EPO.

LSST is evaluating a range of future projects that are designed to promote awareness of STEM related matters, achieve mastery of some selected STEM skills, and inspire leadership. Pilot projects will be initiated when construction funding becomes available, with full implementation possible only after the LSST survey begins. These projects include:

- EPO Portal: a dynamic web portal that provides entry points for all LSST EPO
- LSST@HOME browsing, adoption, and network participation allow personalized access to portal and sharing
- Providing access to data products and science updates for content developers of planetarium shows, exhibits, and kiosks
- Professional Development Workshops for Content Developers or Classroom Instructors, online and face to face
- Citizen Science – involving non-specialists in the research process such as “alert tagging” through LSST EPO and partners
- Classroom Research Projects – middle school through undergraduate
- Undergraduate Internships (PAARE, IINSPIRE, REU, RET, FaST)

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, in order to contribute to STEM workforce development through research-based training and education. For STScI and Gemini, which are unable to participate in the REU program, comparable active intern programs have been established.

- For KPNO in 2014 there were REU students : 3 women & 3 men (2 URM students in group (NA male, AA female)
- For the Chilean PIA program there were two students: 1 male and 1 female from Universities of Valpariso and La Serena, respectively. CTIO continues to have a larger fraction of Chilean applicants from diverse regions of Chile
- The NSO mentored 5 Summer Research Assistants including 4 undergraduate student SRAs (2 women and two men) and a male graduate student. Working

- with NSO advisors, an Akamai (female) student is about to finish her Ph.D. at the University of Arizona, a male student just finished his Ph.D. at New Mexico State University, an African-American female is continuing her thesis research at Vanderbilt, and a U. Colorado (female) is starting graduate work with NSO,
- For Gemini, during 2014 there have been 19 interns (14 male, 5 female) who have gained experience in STEM occupations in the Gemini workplace. The interns came to Gemini through a variety of programs in Hawai'i and Chile as well as partnerships formed within the Gemini Partner host countries.
 - This year, LSST hosted a student from the *Iowa, Illinois, Nebraska STEM Partnership for Innovation in Research and Education* (IINSPIRE) program. Zachary Reyna, an undergraduate engineering student from Iowa State University, worked with LSST Head of Safety Chuck Gessner to conduct a safety/human factors/ergonomic analysis of the dome and its subsystems. This 2014 10-week summer internship was funded by an AURA/IINSPIRE LSAMP award.
 - For the Space Telescope Science Institute, 15 interns were selected as part of the Space Astronomy Summer Program (SASP), of whom 7 were female; 6 identified themselves as being from underrepresented groups. The f IINSPIRE Program student from the 2013 summer returned in February to continue her research work with her sponsor.
 - STScI hired its third graduate from the Fisk-Vanderbilt Bridge Program.
 - STScI initiated a new student partnership with the National Astronomy Consortium (NAC). This program is led by the National Radio Astronomy Observatory (NRAO)/Associated Universities, Inc, (AUI) and includes the National Society of Black Physicists (NSBP) and minority and majority serving universities. Its purpose is to increase the number of under-represented students in STEM fields and traditional academic pipelines through partnerships for research experiences, etc. STScI hired an individual referred by this program into a research support position and is working to incorporate a cohort of students from this program into our SASP program for summer 2015.

AURA Centers have also reached out in other ways. In the past, NSO sponsored a special Akamai Technical Workshop in Maui, to stimulate interest in engineering careers among alumni of the Akamai Internship Program. For the next three years NSO will support the Akamai Workforce Initiative internships. The long-range goal for the NSO in the Akamai program is to build the local STEM workforce on Maui in order to achieve a stable reservoir of technical talent available to support DKIST operations and on-site instrument development activities. The following institutions currently maintain an interest in the Akamai Program: University of California Santa Cruz (Coordinator), University of Hawaii, Thirty Meter Telescope International Observatory, Air Force Maui

Optical & Supercomputing Site, National Solar Observatory, Mauna Kea Observatories, Hawaii Island Industry, and the University of Colorado-Boulder.

All AURA Centers have benefitted from the NSF's Partnerships in Astronomy and Astrophysics Research and Education Program (PAARE). Although not directly eligible to submit proposals, AURA Centers have acted as partners in the overall bridge program by providing valuable research experience. Since 2009, AURA Centers have hosted 11 PAARE students, 8 from the Fisk–Vanderbilt program alone. Two of these students have subsequently gained employment in AURA centers. This demonstrates what is possible through strategic engagement with specific programs, and the valuable connections that can be made between student programs and workforce development. As discussed next, it is in AURA's interest that programs such as PAARE be further refined and sustained within the NSF portfolio.

Institutional Initiatives

This section addresses a number of other initiatives taken by AURA governance and its centers that relate to workforce issues. Many of these are brought before, and discussed by the Workforce and Diversity Committee.

Standards of Conduct Policy

AURA's Workforce and Diversity Committee (WDC) has been a central organizing element for AURA's overall diversity plan. The Committee's goal is to move the focus from diversity to inclusion to "normal." The Committee has worked towards integrating best processes and practices, improving climate and behavior, enhancing communication, etc. to secure a diverse workplace that will self-sustain and perpetuate. Beyond AURA, the WDC set a goal of helping the field of astronomy improve diversity and inclusion.

In 2014, AURA defined a clear Standards of Conduct Policy. It includes general expectations for the AURA workplace as well as addressing specific issues such as harassment, bullying, consensual relationships, retaliation, and remedies for complaints (see [http://www.aura-astronomy.org/about/policies/Section%20B/B25\)%20B-XXV-Standards%20of%20Workplace%20Conduct.pdf](http://www.aura-astronomy.org/about/policies/Section%20B/B25)%20B-XXV-Standards%20of%20Workplace%20Conduct.pdf))

Diversity Considerations in Chile

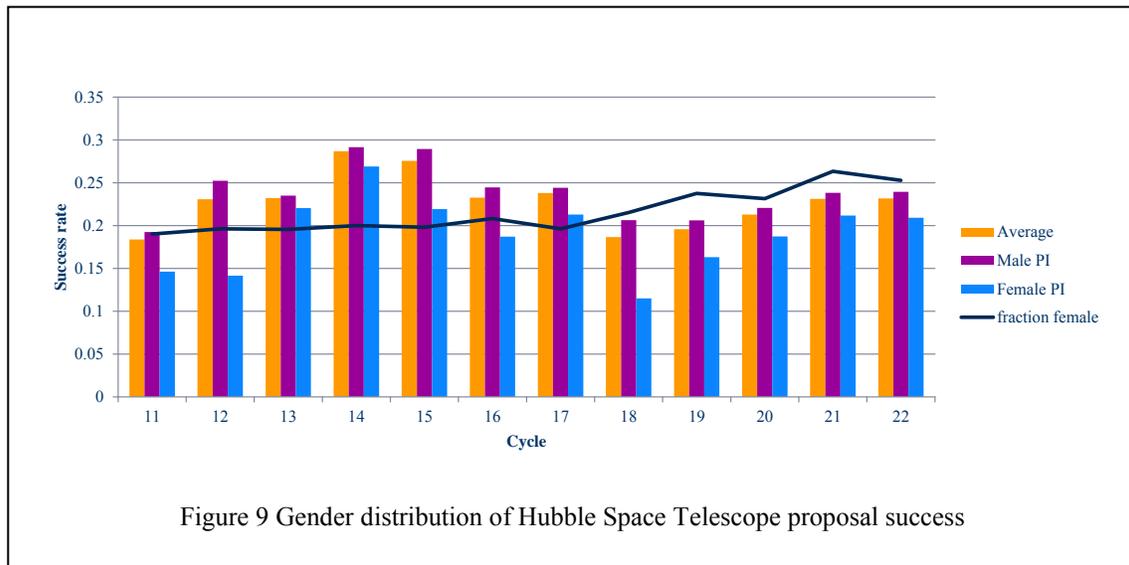
AURA also explored improving its diversity and inclusiveness in its Chilean operations in 2014. The environment in the South is complex in its cultural aspects, its unique

gender-related problems, and the combination of ex-pat and Chilean issues. AURA now has Diversity Advocates from the South to focus specifically on these issues.

Unconscious Bias in Time Allocation

In September 2014, Neill Reid of STScI submitted for publication an analysis of the gender differences in Hubble Space Telescope proposal acceptance rates (<http://arxiv.org/abs/1409.3528>). The analysis showed that the HST Time Allocation Committee process exhibited a small but persistent pattern of underrepresentation in successful proposals from women for cycles 11-21. STScI has undertaken several initiatives to further understand and mitigate any unconscious bias. Beginning with cycle 22, the TAC was exposed to this finding and briefed on unconscious bias. In addition, the proposal form was modified to de-emphasize the name of the PI.

Figure 9 shows that these changes did not have a dramatic effect.



It is likely that other Time Allocation Committees, such as for NOAO, will show similar trends. AURA continues to examine these issues and explore mitigations.

Anticipated Opportunities in Boulder

Recognizing that the relocation of NSO to Boulder represents a unique opportunity to increase diversity at the observatory, NSO is pursuing opportunities to promote diversity in future generations of solar astronomer based on the following pillars:

- Participation in CU SMART (included in the Colorado Diversity Initiative) program, which offers about 25 students per year a ten-week opportunity to conduct research

under the guidance of a faculty mentor. Conversations are on-going to have NSO staff members as mentors in this program.

- Integration of NSO's REU program into the program led by LASP and that includes the REU programs of all of the institutions within the Boulder Solar Alliance (BSA). The gender statistics of the LASP REU program show that about 53% of the participants are female (similar to NSO's REU program) and 16% from minorities (NSO's REU program is 8%). The existing LASP REU program ends in 2015, when they will submit a new proposal to continue the training of undergraduates. NSO has started conversations with the LASP REU coordinator to see how NSO can establish a collaborative framework for NSO's summer activities together with the BSA.
- The Collaborative Graduate Education Program (CGEP) represents a clear venue to achieve NSO's diversity goals. The CGEP is a distant learning education course that included the New Jersey Institute of Technology and the University of Hawaii in the original proposal. More recently, Montana State University and New Mexico State University have established contacts with CU to join the CGEP. This will create a pool of 5 universities that aim to consolidate a graduate curriculum in solar and plasma physics. NSO has already contributed with lecturers for the first phase of the CGEP and plans to continue to do so for the future curriculum currently being discussed. NSO aspires to take ownership of modules such as: Adaptive Optics in Astrophysics, Solar instrumentation, Non-LTE radiative transport and spectro-polarimetric techniques. But the key point here is that through the CGEP, NSO will have access to students not only from CU, but also from four other Universities spread throughout the country. CGEP is currently seen by NSO as a great opportunity to access a diverse audience that includes Hawaii. A workshop is planned this year involving the 5 interested universities to establish a curriculum compatible with existing curricula at those institutions (and that have a much reduced scope). NSO plans to actively participate in this workshop to express the needs we understand the DKIST era will have.
- The Akamai Workforce Initiative (AWI), which was discussed above, also has substantial ties with CU-Boulder.

Community Engagement

AURA's Diversity Advocates are an important means of focusing on "organizational excellence" and connecting diversity to this theme. They are an important presence and voice within community. For 2014, AURA participation included:

- Dr. Dara Norman, as NOAO Diversity Advocate, participated in a number of diversity activities with other groups
 - AAS (demographics, council)
 - Co-planning for CSMA meet and greet with local URM students at the Seattle AAS meeting
 - NSBP (co-chair of ASTRO)
 - Meeting in Baltimore, MD Feb 26-28, 2015
 - Initiated white paper for NRC panel on ‘Maximizing LSST’s Scientific Return: Ensuring Participation from Smaller Institutions’
 - Organizing committee for Inclusive Astronomy Conference to be held at Vanderbilt.
- Other NOAO staff have also actively participated in staff teaching of astronomy at the Tono O’odham Community College. There was a large, initial class: 14 students, only 2 have dropped out. This will likely request for class to be repeated
- Students made 3 trips to Kitt Peak, including observing with research telescope (WIYN/4m, 0.9m, McMath). These students consistently cite trips to KPNO as a highlight of the class.
- STScI continues to expand and stabilize our strong ongoing partnerships with area colleges, universities and city/county organizations in an effort to generate a consistent pipeline of interns, particularly in science, engineering, IT and outreach. Relationships exist with the University of Maryland, Baltimore County (UMBC), Capitol College, Morgan State University, Loyola College, Stevenson University, Johns Hopkins University, the Mayor of Baltimore’s YouthWorks Program, Junior Achievement, Academy of Finance, City Neighbors School and My Sister’s Circle.
- In 2014, HR and faculty at Capital College defined a career pipeline for upcoming engineering graduates. STScI’s Flight Operations Branch leadership met with Capitol College faculty to interview 8 of their brightest and best students within the Astronautical Engineering discipline. Three staff hires for Flight and Test engineering roles resulted from this effort - a Test Engineer, an I&T Engineer and a three semester intern expected to transition to a regular, full-time Flight Operations position upon graduation.
- In 2014, STScI sponsored 13 undergraduate college internships (in addition to SASP) throughout the year, of which 4 were women and 4 identified as being from an under-represented group. One of these internships was provided to a protected veteran as we build new partnerships for veterans and individuals with disabilities.
- STScI increased participation of high school student interns in 2014. Area high school students participated throughout the year working on projects with scientific research, engineering, business and outreach. STScI supported 14 students, 1 of whom was female and 4 identified as under-represented minorities.
- STScI attended veteran career events, in particular, at Stevenson University. Two veterans (who also identified as under-represented minorities), were hired from this

program- a Human Resources Assistant and an Intern for our Help Desk. The Intern will be supported for three semesters until he completes his Information Technology Degree and is then expected to transition into a full-time position.

- Over the past year, STScI expanded its relationship with Maryland's Department of Rehabilitative Services (DORS) and the Veteran's Administration to create opportunities for employment of veterans and individuals with disabilities. Approximately 18 (three groups of 5 or 6) individuals have participated in work readiness activities and internships.
- STScI attended the National Society of Black Engineers Conference in New York. A member of the engineering staff (African-American, Female) was able to partner with Human Resources for this career event. Having staff subject matter experts available has been invaluable at these events. The event resulted in the hire of an individual met at this event.
- SafeZone is an ally support program for the LGBTIQ community. STScI collaborated with Johns Hopkins University to provide SafeZone training to more than 50 staff members.
- NSO continues its participation in the Akamai program in Hawaii, and the University of Hawaii-Maui and local middle and high school teachers to develop a program for Maui,
- NSO is working to increase the strength and breadth of the university community pursuing solar physics in collaboration with our DKIST university partners and other groups to recruit and help diversify the community of scientists doing solar research. This has started in the form of a joint program (Collaborative Graduate Education Program) involving the University of Colorado, New Jersey Institute of Technology, University of Hawaii (CU/NJIT/UH) and NSO. The first phase is to establish remote teaching at all three university sites, then expand once the logistics of the program are well understood.

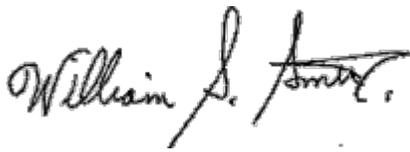
Summary

Over the past six years, AURA's focus on the workplace and its future workforce has resulted in some gains. The impediments are large, however, and dramatic progress in the near term is unlikely.

- AURA demographics have slightly improved, but in some of our Centers still lag the general population of comparable R&D organizations. In some areas, such as women in top management, AURA seems to lead the community.
- Our focus on proactive recruiting program at all levels, coupled with awareness and mitigation of unconscious bias, should lead to even greater gains.

- AURA Governance continues to lag in diversity. Greater attention is needed here.
- AURA's effort to cultivate a more diverse workforce is a high priority for all AURA Centers. Our engagement with students through the REU and PAARE programs, and through new partnerships such as IINSPIRE will expand our interactions with underrepresented minorities, as well as with geographic and institutional sectors that have not traditionally had high participation rates in STEM fields.
- AURA managers continue their proactive engagement at national meetings related to diversity, and participate in other opportunities for community leadership in this area.

I thank the members of the Workforce and Diversity Committee and all of the AURA personnel who have contributed to these activities.

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

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