COMMITTEE ON THE STATUS OF MINORITIES IN ASTRONOMY

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SPECTRUM

A report on underrepresented minorities in astronomy

Significantly Increasing the Numbers of Minorities in Astronomy in the Next 10 Years: A Paper of Recommendations to the Decadal Survey Review

by Dara Norman, NOAO

Every ten years, the National Research Council convenes a committee to survey the astronomy and astrophysics community and identify the most important scientific and technical activities to be pursued over the subsequent ten-year period. This prioritized list of goals is the document often referred to as the "Decadal Review" and is presented to Congressional committees, who have jurisdiction over the priorities of the funding agencies by virtue of budget allocation. That time is currently upon us.

Many in the astronomical community think of the decadal review as being only concerned with the priority science and large technical projects that will take precedent in the coming decade. However, the last decadal survey, "Astronomy and Astrophysics in the New Millennium" (hereafter AANM), included substantial sections on workforce policy and education initiatives needed to effectively advance the scientific goals presented. Attention to policy and education issues was not new to these documents; in fact, the so-called 'Bahcall Report' (1990-2000) included recommendations that universities and national observatories be involved in teacher workshops and that the NSF initiate state-by-state fellowships to recog-

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Strong Astronomy Turnout at the 2009 NSBP/NSHP Annual Conference

by Laura Lopez, University of California Santa Cruz

The joint annual meeting of the National Society of Black Physicists and the National Society of Hispanic Physicists (NSBP/NSHP) was held in Nashville, TN, this February 11-15, 2009. By all measures, the conference this year was one of the most successful ever, drawing over six-hundred participants from all subfields of physics. Since NSBP generously covers the travel costs of all students, the meeting had a dynamic cross-section of individuals from every level of academia and from across the United States. Broadly, the conference was roughly 400 students (half undergraduates, half graduate students) and 200 scientists and faculty. Thus, the meeting is an outstanding venue to network with senior scientists and to recruit younger minds for

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- *Learn about the decadal survey review recommendations to increase minorities in astronomy*
- *See how astronomers increased their presence at the annual NSBP/NSHP meeting*
- *Read about current events and issues relevant to minorities in astronomy*
- *Meet the winners of the new Beth A. Brown Memorial Prize*

Decadal Review Recommendations... (cont'd)

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nize high school students who show interest in astronomy. Even the 1970-1980 report addressed some issues of workforce training, placement and the availability of jobs as linked to funding. However, the considerable increase in breadth and depth of workforce policy and education issues addressed in more recent review documents reflects the growing recognition that science is not done in a vacuum outside important national and societal goals. In fact, discussion of the role of astronomy in the general education of non-astronomy career students and the public was even included in the AANM recommendations section. This is significant because the main decadal report is usually a 200+ page document. It is likely that many, if not most, readers do not get beyond the first 40 or so pages of the executive summary and recommendations sections.

In the last two decadal reviews it has also been acknowledged that the "astronomy enterprise" is expanding beyond more traditionally boundaries. The scientific goals that have been top priority over the last 20 years have required the work, creativity and expertise of professionals with experience in engineering, computer science and instrument building as well as astronomy and physics. The desire to increase ground based telescope aperture sizes to 30 meters and beyond will require engineering and project management expertise perhaps best handled by those experienced and trained in such endeavors. Researchers well versed in aspects of computer science are required to do the theoretical work and simulations that use parallel computing to make predictions about everything from the evolution of the solar system to the universe. Even the act of storing and retrieving all the data that astronomers will collect over the next decade requires the abilities of people who might necessarily have different skill-sets than the traditionally trained astronomer. Therefore, the increased attention in these documents to ensuring a qualified, vibrant workforce in future decades is a result of the recognition that in order to achieve any of our priority scientific objectives, we must pay attention to the recruitment and training of the next generation of scientists.

Unfortunately, while the astronomy enterprise increasingly needs quality professionals in a variety of science, technology, engineering and math (STEM) disciplines, the numbers of US students pursuing careers in these disciplines has been steadily decreasing. Only about 30% of US college students major in any STEM field. Furthermore, less than 20% of students entering high school will even finish in 7-10 years with a college degree. These numbers are projected to only get worse over the next decade unless something is done to curb the trend.

The overall demographics of the US workforce (workers with ages 25-64) are also changing. The numbers of workers who have been traditionally underrepresented in science is the sector that is growing the fastest. Current education gaps among these workers will exacerbate the problems already recognized: the problem of identifying students with the basic STEM skills needed to carry out the science challenges put forth in documents like the decadal review over the coming years.

It is within this context that the AAS's Committee on the Status of Minorities in Astronomy (CSMA) submitted a positional paper to the Astro2010 Decadal Survey's State of the Profession panel on the subject of broadening diversity in astronomy and astrophysics. The submitted paper, entitled "Increasing the Number of Underrepresented Minorities in Astronomy", has been written in 3 parts because the magnitude of the issues to be addressed in rectifying the problem of diversity is large and multifaceted. A single ten page paper can not adequately address all the most important aspects of the difficulties of improving the representation of underrepresented minorities in astronomy and astrophysics. Although issues of workplace equity with respect to minorities can seem daunting because they can encompass intangible and societal problems that have plagued mankind for centuries, the 3 papers submitted make recommendations for specific, concrete goals that can be achieved in the next ten years to increase the number of minority scientists in the field.

Even split into the 3 parts, the document does not address all aspects of the diversity issue. The "Executive Summary" section outlines the scope and parameters of the issues to be addressed in the 2 subsequent papers; the Executive Summary is printed in this issue of SPECTRUM starting on

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Strong Astronomy Turnout at NSBP... (cont'd)

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summer or graduate study.

The conference has two components: a full scientific program and student support tutorials that present professional advice. The science program at NSBP/NSHP covers many subfields of physics, including astronomy and astrophysics. In the past, however, the astronomy turnout at NSBP/NSHP has been fairly weak, with only a handful of related posters and talks. For example, there were only two astronomy-related research posters at the 2008 meeting! Clearly, we needed to step it up a notch to communicate the exciting results in astronomy and to demonstrate our commitment to diversity.

Thanks to the organizational efforts of Dr. Marcel Agüeros (Columbia University), Dr. Kevin Covey (Harvard CfA), and Dr. Andrew West (MIT), astronomy flourished at NSBP/NSHP this year and became possibly the most well represented subfield of the conference. The three solicited their friends and colleagues, who then solicited their friends and colleagues, and so on, until the meeting was widely publicized in the astronomical community. In addition, the three heavily encouraged everyone to submit abstracts for research talks to bolster the scientific program in astronomy and astrophysics. And their efforts were a resounding success. Astronomers from throughout the US converged at the NSBP/NSHP meeting and comprised roughly one sixth of the conference participants. About fifty astronomers gave poster or oral presentations on their research, and about fifty more represented their departments, universities, and laboratories as recruiters and exhibitors. Additionally, this year had a marked increase in astronomy faculty attendance, with professors from MIT, Harvard, Yale, Arizona, UNC Chapel Hill, UC Berkeley, Vanderbilt, Case Western, and elsewhere.

The NSBP/NSHP meeting had a broad scientific program that spanned many areas of physics: e.g., particle and nuclear physics, biophysics, medical physics, atomic physics, condensed matter, plasma physics, and computational physics. This year's schedule boasted an extensive astronomy program as well. In total, five sessions were dedicated to astrophysics topics: cosmology, star-formation and extrasolar planets, nearby galaxies, distant galaxies, and gravitational waves. Talks were given by a range of individuals (graduate students, postdocs, research scientists and professors), and they were presented at a level typical of general scientific astronomy meetings. Aside from these dedicated sessions, Professor Keivan Stassun of Vanderbilt University gave a plenary talk entitled "Astrophysical Frontiers in the Era of 'Big Data' " about the Sloan Digital Sky Survey and the Large

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SPECTRUM

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For more information on subscribing to SPECTRUM or on obtaining back issues, please visit the CSMA website:
http://csma.aas.org

News You Can Use

If you would like to contribute stories to 'News You Can Use', send articles and ideas to the Editor: lopez@astro.ucsc.edu.

AURA Establishes 'Diversity Advocates' at Managed Observatories

The Association of Universities for Research in Astronomy (AURA) has established 'Diversity Advocates' at each of its centers (NOAO, NSO, STScI, and Gemini). These appointees will be involved in Human Relations as well as outreach and educational activities. Additionally, they will encourage the recruitment of women, minorities, and persons of disabilities in candidate/hiring pools.

Howard University Joins the USRA

On April 1, Howard University became the fourth historically-black college and university (HBCU) to join the Universities Space Research Association (USRA). Other HBCU members of the USRA are North Carolina A&T State University, Hampton University, and Alabama A&M University. The USRA is a private, non-profit corporation founded in 1969 under the auspices of the National Academy of Sciences. Its current membership is 104 universities (with 95 in the United States), and its aim is to provide a collaborative organization where universities and research institutes may cooperate toward the development of space-science knowledge and technology.

Las Cumbres Observatory to Fund Talks at Minority-Serving Institutions

Las Cumbres Observatory Global Telescope Network will fund a series of visiting lectures in astronomy at minority-serving institutions. This program will be modeled off the AAS Harlow Shapley lectures, and the AAS CSMA will assist to connect potential speakers to these institutions. More details will become available in the coming months.

Society Publishers Offer Free Journal Access to Minority-Serving Institutions

Following the lead of the American Institute of Physics (AIP) and the American Physical Society (APS), three more scientific society publishers are offering free journal content to historically-black colleges and universities (HBCUs) and other minority-serving institutions.

The American Association of Physicists in Medicine (AAPM), the Acoustical Society of America (ASA), and, as of this month, AVS (formerly, the American Vacuum Society) are contributing their online research journals to the free trial initiated one year ago by the AIP and APS.

The project was initiated by the National Society of Black Physicists (NSBP), the National Society of Hispanic Physicists (NSHP), and the Southeastern Universities Research Association (SURA). AIP and APS established a free trial of their journal content in February 2008 to all HBCUs and other minority-serving academic institutions. Some of these institutions subscribe to a number of AIP and APS journals (and some get none), but none of the institutions currently receives the entire collection of both publishers.

The goal is not only to strengthen science education in the short term, but to find a long-term pricing formula that will allow these institutions to maintain access to this content for the future. AIP and APS originally offered the free trial until the end of 2008 and have since extended the trial through December 31, 2009. Usage data is available to each participating university or college, to help them identify the value of this content for their faculty and students.

For further information or to apply for a free trial in 2009, please contact:

Douglas LaFrenier
Director, Publication Sales & Market Development
American Institute of Physics
(516) 576-2411

NSF Restores Data on Minority PhDs

Each year, the NSF conducts the 'Survey of Earned Doctorates' to track research PhDs from universities in the United States and Puerto Rico. Individuals respond to questionnaires regarding gender, race, field of study, and post-graduation plans (see page 18 for a summary of 1997-2006 results in astronomy and physics).

In 2007, the NSF began to suppress any subcategories that had fewer than six degree recipients, citing that small numbers could identify individuals (for example, one African-American earned a PhD in astronomy in 2006).

Following extensive criticism, the NSF agreed to hold a series of meetings on the importance of reporting this data. Numerous organizations argued that programs need statistical evidence of underrepresentation to prove they are necessary. Following this criticism, the NSF agreed in February 2009 to rescind this policy.

University of California to Cover Tuition and Fees for Low-Income Families

A Regents committee for the University of California preliminarily approved a plan to cover tuition and fees for families that make less than the state's median income, about $60,000 per year. Upon final approval, UC will join a growing number of private universities to waive costs for low-income family. Comparatively, however, UC has a much larger low-income student body: roughly 50,000 students (or 1/3 of its undergraduate population) will meet the income criterion, many who are underrepresented minorities.

New Mailing List for Minorities in Astronomy

The AAS Committee on the Status of Minorities in Astronomy (CSMA) has started a new electronic mailing list called aas_panchromatic. The CSMA created this list as a response to the discussion at the Austin AAS that indicated a growing need for advocacy and support for minorities in astronomy at all levels in their careers. This list is intended to be a resource for astronomy students and professionals of under-represented groups. Its primary purpose is to facilitate networking and mentorship. Additionally, aas_panchromatic is used to inform the community of relevant events and issues. The list is not intended for open forum political discussions or for distribution of job advertisements.

Instructions for subscribing to the aas_panchromatic list are given at the URL: http://www.physics.rutgers.edu/~ajbaker/aas_panchromatic.html

Decadal Review Recommendations… (cont'd)

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page 7. This article directly recommends initiatives to increase the numbers of minority students graduating with PhDs in astronomy, but it does not speak to challenges of retaining minority astronomers in the field beyond the initial postdoctoral level. Also, the Executive Summary explains that the paper does not directly address issues for all minority groups, who may have other cultural concerns that currently prevent full participation in the field

Paper I, "Increasing the Number of Underrepresented Minorities in Astronomy at the Undergraduate, Graduate and Postdoctoral Levels", directly addresses the fact that the numbers of minority students receiving PhDs in Astronomy has been basically flat over the last two decades, with minority PhDs being about 2-5% of all Astronomy PhDs in any given year.

The recommendations put forth in Paper I for improving these numbers in the next decade mainly focus on 1) partnerships between astronomy PhD granting universities and minority serving institutions, 2) expansion of STEM disciplines from which students are recruited to engage in the astronomy enterprise and 3) involving minority students in research early and continually. In addition to a description of the recommended activities and suggestions for how they can be successfully implemented, examples of specific programs already in place to confront some of these concerns are identified. The list of recommended support activities for these programs is broken up into suggestions made directly to 1) PhD granting institutions, 2) funding agencies, 3) national centers, labs and observatories and 4) professional societies.

The second paper of the series, "Increasing the Number of Underrepresented Minorities in Astronomy Through K-12 Education and Public Outreach (Paper II)", addresses the fact that unless we, as astronomers, are able to encourage students, parents and the public to invest in STEM careers through time, efforts and monetary commitment, the workforce needed to advance our scientific goals will not be available in the future. Those who will be undergraduates in the next ten years, and making choices about becoming tomorrow's research astronomers, are today's middle school students. Furthermore, it is in middle school where many of these students are beginning to either engage positively in science and math disciplines or are beginning to turn away from the possibility of a STEM career.

Again in this section on K-12 and public education, the goal is to directly recommend actions that astronomers can and should take to involve younger minority students, their teachers and their parents in scientific inquiry and discovery through the science of astronomy. Paper II focuses on how astronomers can be directly involved in engaging 1) minority K-12 students, 2) teachers who work in underserved communities and 3) the underserved minority public. Again, the section points out examples of already successful programs in which astronomers are already participating and recommends that these activities be expanded to specifically include minority students and the public. Specific recommendations on successfully engaging the minority community are made for 1) astronomers at colleges, universities and national centers, 2) funding agencies and 3) for professional, astronomical societies.

The main objectives of all three sections of this paper on increasing the numbers of underrepresented minorities in astronomy are to 1) demonstrate to astronomers that broadening diversity is in the best interest of the field and will insure that the best science is produced, 2) provide suggestions to actively and effectively increase minority diversity over the next ten years, 3) demonstrate with examples where and how suggestions for increasing diversity can be put into practice, and 4) to recommend how funding and support of these practices and programs can improve their chances of success.

All 3 sections of the paper have been made available with their full appendices through the CSMA webpage at: http://csma.aas.org/events.html . The shortened version, without appendices, is also available through the Astro2010 Decadal Survey's positional papers website at: html://www7.nationalacademies.org/bpa/Astro2010_Position_Papers_byTitle.html, paper numbers 38, 39 and 40.

All 3 full sections are also available on astro-ph preprint archive (http://arxiv.org/find/astro-ph) as numbers arXiv:0903.4505 (Executive Summary), arXiv:0903.4506 (Paper I), and arXiv:0903.4507 (Paper II).

Increasing the Number of Underrepresented Minorities in Astronomy: Executive Summary

An Astro2010 State of the Profession Position Paper

Authored by: the AAS Committee on the Status of Minorities in Astronomy (CSMA)
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National Society of Hispanics in Physics - David J. Ernst, Pres. (Vanderbilt University), Marcel Agueros (Columbia University), Scott F. Anderson (University of Washington), Andrew Baker (Rutgers University), Adam Burgasser, (Massachusetts Institute of Technology), Kelle Cruz (Caltech), Eric Gawiser (Rutgers University), Anita Krishnamurthi (University of Maryland, College Park), Hyun-chul Lee (Washington State University), Kenneth Mighell (NOAO), Charles McGruder (Western Kentucky University), Dara Norman (NOAO), Philip J. Sakimoto (University of Notre Dame), Kartik Sheth (Spitzer Science Center), Dave Soderblom (STScI), Michael Strauss (Princeton University), Donald Walter (South Carolina State University), Andrew West (MIT)
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Promoting racial and ethnic diversity is critically important to the future success and growth of the field of astronomy. The raw ability, drive and interest required to excel in the field is distributed without regard to race, gender, or socioeconomic background. By not actively promoting diversity in our field we risk losing talented people to other professions (or losing them entirely), which means that there will be astronomical discoveries that simply won't get made. There is demonstrated evidence that STEM fields benefit from diverse perspectives on problems that require more complex thought processes.[1] This is especially relevant to a field like astronomy where more and more work is being done collaboratively.

The lack of notable growth in African American, Hispanic, and Native American representation in astronomy indicates that the "pipeline" for these individuals is systemically leaky at critical junctures. Substantially more effort must be directed toward improving the educational and career development of minorities to insure that these potential colleagues are supported through the process. However, simply recognizing that the pipeline is faulty is woefully inadequate. There must be very specific, targeted solutions to help improve the situation. With this in mind, we offer two position papers addressing specific areas of improvement that we identify as (a) essential for any foreseeable progress in the field, and (b) attainable in the 2010-2020 decade. These position papers focus primarily on African Americans, Hispanics, and Native Americans. Although we do not directly address issues of Asian Americans, Pacific Islanders, and other groups, many of the recommendations made here can be adapted to address issues faced by these groups as well. We summarize the discussion of these papers as follows:

Undergraduate, Graduate, & Postdoctoral Levels (Paper I)

A clear means to improvement is in tending to the educational transitions in which potential minority PhDs are lost. This includes the transition for minority physics and astronomy undergraduates into astronomy and astrophysics PhD programs, or similar careers beneficial to the astronomy enterprise[2]. Partnerships with minority-serving institutions (MSIs) can provide an effective and immediately attainable solution, as they not only provide critical stepping stones to the PhD, but also because the strength of these undergraduates in physics, engineering, and computer science offer promising avenues for en-

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1 Chubin, D.E. and Malcolm, S.M., "Making a Case for Diversity in STEM Fields", Inside Higher Education, October, 6, 2008 and references within. See www.insidehighered.com/views/2008/10/06/chubin
2 By "astronomy enterprise" we mean Astronomy and related fields that include Physics, engineering and computer science. See the section on "Enhance recruitment through physics and engineering".

Astro2010 Diversity Executive Summary… (cont'd)

(Continued from page 7)

gagement in instrumentation development, support, and large scale computing/data-mining. Early and continuous research engagement is critical to this vision, in which the federally funded undergraduate research internship programs (e.g., NSF REU), and national centers and observatories (e.g., NOAO) play a vital role.

K-12 Education and Public Outreach (Paper II)

To keep our technological workforce strong in the next decade and beyond, we must proactively increase opportunities for minority students in STEM areas well before they reach the undergraduate level. The astronomical community can and should play a critical role in supporting these opportunities because of Astronomy's wide spread appeal and inspirational nature. Our community must improve its efforts to develop and sustain education opportunities for today's minority elementary, middle, and high schools students, in order to attract, recruit, and retain them in astronomy and related disciplines, and insure that there continues to be a well qualified pool of undergraduate and graduate students from which to recruit. Only by actively engaging these communities can the U.S hope to continue its leadership in astronomical discovery and knowledge.

These position papers were prepared with the intent that several study groups for the State of the Profession will take interest in them, with specific attention to the study groups on Demographics (DEM) and Education and Public Outreach (EPO). These submitted papers do not include their appendices, which can be found on the AAS CSMA's website at: http://csma.aas.org/events.html

1. Statement of the Problem:

The vast under-representation of minorities in astronomy remains a staggering challenge despite at least two decades[KGS1] of awareness of the issue. Let us briefly examine the challenge quantitatively.

Over the past 20 years, the absolute number of PhDs awarded annually to underrepresented minorities in the field has grown slightly, from approximately 3±1 in 1988 to approximately 5±1 per year in recent years. The corresponding proportion of minority PhDs has been roughly flat at 2-4% of the total (see Paper I). During this same time period, the proportion of underrepresented minorities in the U.S. population grew by 33%, from 20.9% in 1988 to 27.0% in 2009 (data from US Census). Consequently the relative underrepresentation of these groups in astronomy and astrophysics has been steadily worsening.

What must be done to achieve parity in the production of underrepresented minorities in the field? As of 2004, the 50 PhD-granting institutions in astronomy and astrophysics counted 652 permanent (i.e. tenure-stream) faculty (Nelson & Lopez 2004). Multiply this number by a factor of ~4 to account for permanent jobs at non-PhD institutions and national centers, and we have that there are roughly 2600 permanent astronomy and astrophysics positions in the U.S. If an individual holding one of these positions occupies it for typically 30-35 years, then approximately 3% of the permanent jobs turn over every year, or about 75 positions. This is consistent with the recent estimate from the AAS Employment Committee, which found that on average 75±15 permanent jobs open up in the U.S. every year. Thus to achieve parity in the number of minorities entering the stream of permanent astronomy and astrophysics positions, the community must in the coming decade increase the number of minority PhDs from 5 per year to 20. And if the same attrition rates apply to these individuals as in the field overall (the AAS Employment Committee estimates that roughly 40% of astronomy and astrophysics PhDs end up in permanent jobs), then this number becomes 50. *In other words, the absolute number of minority PhDs produced annually must increase by a factor of at least 5-10 in the coming decade.* At this aggressive pace, the field can achieve parity overall in 30-35 years.

It is moreover essential to realize the scale of PhD production problem. Currently there are fewer than 20 minority faculty at astronomy and astrophysics PhD-granting institutions (Nelson & Lopez 2004). If only these individuals are actively involved in increasing minority PhD numbers, each would need to produce 2-3 minority PhDs per year to achieve these target goals. Vastly increasing the

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number of minority PhDs in the coming decade will have to be the purview of the entire astronomy and astrophysics community.

At the same time, the issue of underrepresentation in any STEM field, including astronomy, is not merely about achieving target demographics. At its heart, it concerns the tremendous social issues related to the perpetual educational and economic inequity in our nation. Its solution should address the flat (if not declining) scientific and technical ability of the general workforce (see Paper II), upon which our nation's economic strength and global leadership will depend on in the next decade and beyond. Astronomy will not be immune to these deficiencies, and is especially dependent in areas of instrumentation development and the computational challenges associated with mining and serving vast datasets. Improving minority participation will help meet these challenges by providing a sufficient domestic, technically-trained workforce to complete, support, and lead the advancement of astronomy.

2. The primary recommendations of these papers are:

For Colleges, Universities, and National Centers/ Observatories:

- Commit to engaging local under-served minority communities, to encourage interest in and appreciation of math and science, and retain their interest in astronomy.
- Develop "horizontal" and "vertical" partnerships with MSIs. Form equal-stakes partnerships in research, funding, and development that reflect the mutual synergies of intellectual contribution.
- Develop internship programs that connect minority students to mentored research engagement with scientific and/or engineering staff.

For Funding Agencies:

- Substantially expand funding for programs that specifically forge linkages between MSIs
- and research universities.
- Provide funding incentives for broadening participation of underrepresented minorities in mission critical ways by including this in the funding criteria (e.g., NSF's "broader impacts" criterion).
- Provide opportunities for continuity of funding for astronomy education programs by establishing Federal funding cycles in the same way that research is funded.

For Professional Societies:

- Play a lead role in aggressively identifying exceptionally effective K-12 outreach programs and work to see them adopted widely, particularly in under-served communities.
- Create a professional network to better link potential candidates (at all levels) with potential employers and programs.

3. Other Issues of Importance

The targeted solutions presented in these position papers are in no way meant to be the "silver bullets" that fix the numerous challenges related to diversity and racial equity, even within our field. Indeed, there are several other areas of critical importance that must be addressed in the coming decade, which for the sake of brevity and focus, are not presented in our papers. Efforts must be made on several fronts to ensure a more comprehensive growth in minority representation. These include, but are not limited to,

- Advocating a greater investment in middle and high school science education, specifically those in dense minority centers. This includes encouraging strong undergraduates to pursue teaching careers, developing stronger science preparation for certification, and strongly supporting better teacher salaries.
- Pre- and post-PhD mentorship for career development, to insure that the careers of minority investigators remain "on track" for faculty and research positions, and to provide "off-ramp" career options at important junctures (after graduation, after postdocs, etc.).
- A greater awareness of cultural issues that amount to professional obstacles for minorities in the traditional pipeline. These include the very realistic importance for many to stay in their home regions, for schooling and ultimately for their careers.

Mentoring New Generations of Minority Astronomers: Discussions at the CSMA Luncheon in Long Beach

By Dara Norman, NOAO

At the AAS January 2009 meeting in Long Beach, CA, the Committee on the Status of Minorities in Astronomy (CSMA) hosted its first luncheon focused on discussing issues of recruiting, retaining, and mentoring underrepresented minorities in Astronomy careers. The luncheon, entitled "Mentoring New Generations of Minority Astronomers", attracted nearly 80 participants who engaged in frank discussion of the triumphs and frustrations of, and potential solutions to, growing the numbers of minority astronomers and astrophysicists. Participants included department chairs, faculty, postdocs, graduate and undergraduate students. Scientists from universities, national observatories, and science centers as well as representatives from AURA, AUI and NSF were in attendance.

The planned portion of the program featured three panelists, each involved in specific programs at their universities, to begin the discussion by reflecting on their work to help increase the numbers of minority students pursuing careers in astronomy. Panelists were also asked to reflect on activities and plans that have or have not worked in their own programs. They were encouraged to talk about any issues they felt needed to be addressed regarding the expansion of diversity in the field.

Professor Kelley Holley-Bockelmann of Vanderbilt University began the discussion by pointing out the dearth of minority students receiving PhDs in astronomy covering the period from 1985-2004. Over those nearly 2 decades the numbers of Black, Hispanic and Native American PhD recipients has remained small and flat at about 2-5% of all PhDs awarded per year (see the article on page 18 of this newsletter). That means for a given U.S. Astronomy PhD granting institution, these statistics amount to about 1 minority student receiving a PhD every 13 years! "The fact that we can name individual people on that plot is pretty sad," Dr. Holley-Bockelmann commented. She then discussed the Fisk-Vanderbilt Masters to PhD Bridge Program (www.vanderbilt.edu/gradschool/bridge/index.htm) that partners an historically Black university with a PhD granting astronomy department with the goal of drastically improving these numbers. Students in the program are bridged from a master's degree program at Fisk to the PhD program at Vanderbilt. While the program includes several different disciplines, it was pointed out that the potential of this program is to graduate more minority astronomy PhD students from this single program in one year than will graduate in all the rest of US astronomy PhD granting institutions combined, in the same year, if the current trends continue.

Dara Norman, the co-organizer of the event, welcomes everyone and opens the CSMA luncheon.

Dr. Holley-Bockelmann then presented the critical components to the success of the Bridge program. These key components touched on nearly all of the major themes discussed by the panelists and others during the luncheon. Below each of the four key components is presented along with a summary of how the larger discussion evolved around each theme.

Institutional support

It was acknowledged that institutional support from the larger university/institute/center is required for the success of any program that seeks to broaden minority participation in astronomy. There are a number of ways in which the larger institution can and should sponsor such programs in order to increase a program's chance of success. Financial support is usually the first thing that comes to mind, but alone this is not sufficient to ensure success. Moral support of programs by reducing or eliminating barriers to their implementation is extremely

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The three panelists, Prof. Kelly Holley-Bockelmann (left), Prof. Eric Wilcots (middle), and Prof.. Caty Pilachowski (right) discuss strategies to increase minorities in astronomy.

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important and demonstrates the commitment of the larger institution.

Another essential component of institutional involvement is support for faculty and staff that devote effort to these programs. "There is a role for institutions setting priorities or at least acknowledging effort," suggested Mike Meyers of the University of Arizona. "It's a good thing if the institution values that individual activity." The larger institution must not only acknowledge that this work is beneficial to the entire institution but they need to compensate individuals appropriately for their service to increasing diversity.

Institutional and departmental support must also be made available to students/faculty who seek to broaden diversity by participating in outreach to younger students and the public. Several times during the meeting it was noted that the visibility of current minority astronomers (whether students or faculty) is very important to promoting the field as a career goal for the next generation. Students and young people who see someone like themselves are more inclined to believe that they can succeed as well. However, while this work is important, it often disproportionately adds to the service requirements of minority faculty and students for which they get little recognition in return. One suggestion was made that more departments should provide funding support through teaching assistantships for students who wish to engage in these kinds of activities.

It was pointed out by another panelist, Eric Wilcots (University of Wisconsin) that, at the institutional level, many universities have grand ideas about increasing the numbers of minority students in advanced degree programs and faculty school wide. However, these efforts usually don't succeed because decisions on graduate student acceptance and faculty hiring are made at the department level where this is done on a case-by-case basis. "I don't think we have figured out how to make that translation from a strategic plan that the university [envisions] down to a departmental level", said Dr. Wilcots. This difficulty of having institution-wide initiatives implemented at the department level underscores the need for the time investment of committed faculty in any efforts to increase minority representation.

Dedicated Faculty

Another of the keys to success cited as crucial was the involvement of dedicated faculty. For partnerships like the Bridge program, faculty dedication and investment is important to have at both partnering institutions. To emphasize this point, the third panelist, Caty Pilachowski (Indiana University) stressed the importance of participation by each individual as we seek to broadening diversity in astronomy. "It is that taking of personal responsibility that will lead us to success," Dr. Pilachowski said. In several contexts the importance of promoting one-on-one connections between faculty at minority serving institutions (MSIs) with faculty at PhD granting and large research institutions was discussed as a basis for promoting change and growth in the field.

Dr. Pilachowski used her own work with Dr. Orville Bignall at Tennessee State University (an HBCU) as an example of a partnership that began as a proposal to the NSF to fund students from TSU to participate in the REU program at Indiana University. These students were then funded to continue their summer project with faculty at their home institution. The result has been more scientific collaborations between faculty at both universities. "The outcome of the program is of mixed suc-

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Mentoring Discussion at Long Beach… (cont'd)

Luncheon attendees during the panelists' discussion. Turnout at the event was high, with about 80 astronomers

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cess," admits Dr. Pilachowski, "The biggest success was not the production of one student, but the development of a partnership; a collaboration between institutions that continues."

"The take away message is to build those connections both one-on-one with advisors of students, but also at the institutional level," Dr. Wilcots pointed out. "That's something we need to work on."

It was also pointed out that MSI institutions also include community and city colleges where many minority students initiate their college careers. "UC Berkeley had a program where they would go to community colleges and recruit students," said Kristen Howley, a graduate student at UC Santa Cruz reflecting on her own successful story, "…in my second year, I transferred to UC Berkeley." From these non-traditional paths, minority students interested in science and technology careers can be recruited to continue studies in astronomy.

Generous Grant support

Of course, continuous, sustained, long term financial support is important to any program that seeks to make a significant contribution to increasing the numbers of minority PhDs in astronomy. For example, students in the Bridge program are fully funded while pursuing their Master's degree. "Frankly we would not be able to do this if we couldn't provide our students with full support," acknowledged Dr. Holley-Bockelmann, "otherwise many of them would not be there."

Attendees discussed issues of funding priorities for programs dedicated to broadening diversity. It was suggested that care should be taken by funding agencies to include panelists who have expertise in understanding the multifaceted nature of

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supporting programs designed to increase diversity when reviewing these funding requests. There was also a suggestion that funding agencies should vigorously support programs at MSIs since, although these institutions do not educate the majority of minority students, they are very successful at producing graduates in Science, Technology, Engineering and Mathematical (STEM) disciplines.

One-on-one, tailored mentoring

"The thing that is the most successful is really talking [with] and mentoring each student," Dr. Holley-Bockelmann pointed out, "…understanding what they need to succeed." This type of mentoring was cited by many participants as being crucial to recruiting, retaining and advancing students through their careers. Tailored mentoring is reflected in sensitivity to cultural issues, for instance, respecting the desire for some students to continue their education/career path locally.

Mentors also need to be aware of the difficulties that many minority and first generation college graduates may have in seeing research astronomy as a career goal. "You could change the numbers overnight if somehow the option of being an astronomer could be made more real to those otherwise majoring in engineering," suggested Dr. Neil deGrasse Tyson (American Museum of Natural History). For these students, there is a need for our community to point out that the benefits of a career in astronomy can be more than monetary. "What if we rolled in with the recruiting packet and told them the benefits of playing for our team; playing for astronomy," suggested Dr. John Johnson (University of Hawaii), comparing the recruitment of astronomy students to that of student athletes. "Couldn't we do that for the best [minority] students coming out of high school or college I don't think it should cost a lot of money but it takes a lot of personal investment.."

A critical aspect of individualized mentoring is also recognizing a student's potential for success in the field despite education or course gaps in some areas. "We try to remove as many barriers as possible towards getting [their] PhD," remarked Dr. Holley-Bockelmann. Helping a student to fill those gaps and continue moving forward on their career path was considered by the group to be an important step to improving diversity in the field.

The discussion also touched on the importance of good mentoring for helping students and postdocs deal with negative attitudes towards minorities that still exist in many scientific fields including astronomy. "Even if there's only one person at an institution who is hostile towards you," commented Dr. Hakeem Oluseyi, of the Florida Institute of Technology, "it can make a big negative difference in what you think you can do and where you're going."

It was pointed out that, although the numbers of minority astronomy PhD recipients per year is very small, these statistics avoid an equally important discussion of how many of these PhD recipients are able to continue on in astronomy careers after the receiving their degree. While the discussion at this event focused primarily on promoting students through graduate school, it was recognized that continued mentoring of minority researchers even after receiving degrees must be included in any solution if the ultimate goal is truly to increase diversity throughout the field of astronomy at all career levels.

Although the luncheon was allotted one hour in the AAS meeting program, the discussion lasted nearly an additional hour. In light of the enthusiasm that attendees showed for having this event, the CSMA and organizers plan to host other such events at future AAS meetings. The goal is that through sustained dialog and contact between interested members in the astronomical community, we can put many of the ideas and programs discussed here into practice across more astronomy departments. Furthermore, there is the hope that future gatherings can be a forum to support and encourage the efforts of other individuals taking responsibility in their own regions of influence to increase diversity in the fields of astronomy and astrophysics.

Anyone interested in participating in future CSMA events is encouraged to join the CSMA's listserver, aas_panchromatic, where future announcements and information will be distributed. Instructions for subscribing are given at the URL: http://www.physics.rutgers.edu/~ajbaker/aas_panchromatic.html

In addition to all the participants, the CSMA and organizers would like to thank the AAS, AURA, AUI and NOAO for financial and logistical support in making this luncheon a very successful event.

Strong Astronomy Turnout at NSBP... (cont'd)

Group shot of astronomers at the NSBP/NSHP annual meeting following one of the astronomy/astrophysics sessions.

(Continued from page 3)

Synoptic Survey Telescope. Additionally, the conference had a town-hall style focus session on the decadal review survey of astronomy and astrophysics. All of these activities make the conference feel like a diverse AAS or APS annual meeting.

As the society name NSBP suggests, most of the conference's participants are African-American. Nonetheless, scientists of any race/ethnicity are encouraged to attend and to take part in all events. In 2003, the NSHP merged its annual meeting with the NSBP, and the Hispanic presence has been growing since then. Additionally, each year the non-Black/non-Latino attendance has increased in support of diversity and to recruit students at the meeting. The atmosphere at NSBP/NSHP is very welcoming and inclusive, with many opportunities to converse and to develop friendships and collaborations . Many participants comment that the NSBP/NSHP meeting is an eye-opening and gratifying experience to see so many physicists of color in one place. Aside from the great science, the NSBP/

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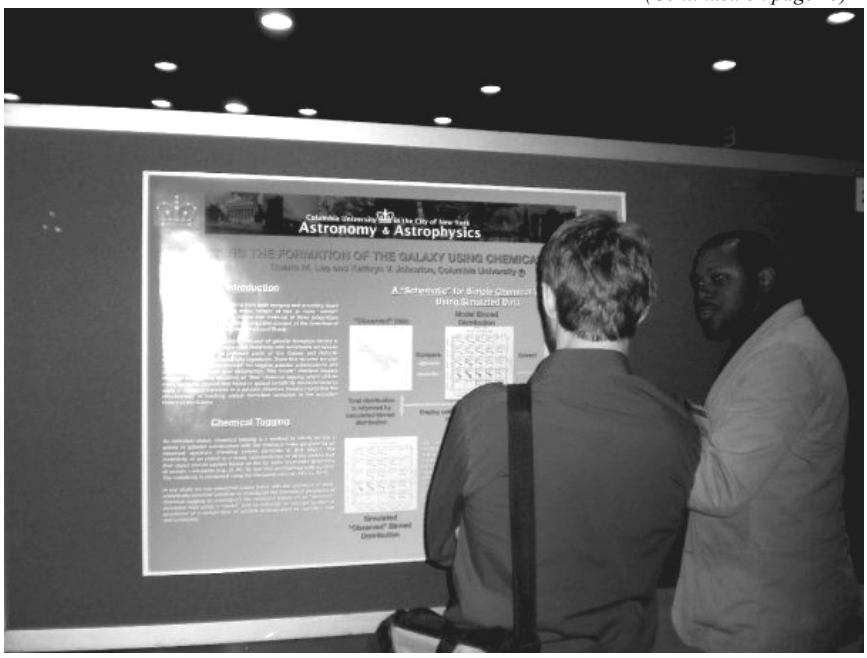

Duane Lee, a graduate student in astronomy at Columbia University, presents his poster entitled, "Tracking the Formation of the Galaxy Using Chemical Tagging" (Photo Credit: Jedidah Isler)

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NSHP meeting is a valuable window to learn about the issues facing underrepresented minorities in physics today.

With the attendance of roughly 400 talented undergraduate and graduate students in physics, the NSBP/NSHP conference puts a strong emphasis on student support, networking, and recruitment. Many sessions offered career and academic guidance, including talks on how to study for the physics GRE, applying to graduate school, and obtaining postdoctoral positions. An astronomy networking dinner one night enabled students to speak with senior scientists in an informal setting. Additionally, many exhibitors advertised their summer, graduate, and postdoctoral opportunities in physics and related fields. In astronomy, recruiters from numerous departments/observatories attended (e.g., MIT, Wisconsin, Indiana, Harvard, Washington, Texas A&M, and the NRAO). This year, MIT, Wisconsin, and Columbia especially dominated attendance-wise. In the case of MIT, they had twenty-five students, postdocs, and faculty, including four physics professors (three of whom do astronomy)! This active presence demonstrates a commitment to their underrepresented students, and participants perceive those schools as welcoming and supportive places.

The astronomy networking dinner at the NSBP/NSHP annual conference (Photo Credit: Chanda Prescod-Weinstein)

In recognition of astronomy student participation this year at NSBP/NSHP, Kevin Marvel and the American Astronomical Society graciously sponsored the creation of the Dr. Beth Brown Memorial Prize. Dr. Brown, an astronomer at NASA's Goddard Space Flight Center, was an active member of AAS and NSBP before her passing in October 2008. Three prizes were given in her honor for the best undergraduate and graduate poster presentations as well as the best student oral presentation. The winners of this prize (Chris Williams of MIT, Greg Mosby of Yale, and Laura Lopez of UCSC) are featured on page 16 of this newsletter.

Generally, a strong presence at NSBP/NSHP identifies departments as serious and committed to all students, and it draws qualified minorities to those institutions now and later in their careers. And one does not have to be African-American or Latino to attend NSBP/NSHP: the presence of a few non-minority scientists or professors still demonstrates that the department has a supportive atmosphere. NSBP/NSHP is a great resource to meet and to connect with physics students of color.

So, reader, you should take advantage of this outstanding opportunity and bring your department to next year's NSBP/NSHP meeting in Washington, DC. I know I will!

Winners of the First Dr. Beth A. Brown Memorial Prize

Dr. Beth Brown

In honor of Dr. Beth A. Brown, an active member of the American Astronomical Society and National Society of Black Physicists, the AAS sponsored the creation of the Dr. Beth A. Brown Memorial Prize. This prize is awarded for the best student poster and oral presentations in astronomy/astrophysics at the National Society of Black Physicists/National Society of Hispanic Physicists annual conference. The award winners receive free membership to the AAS for one year and a waived registration fee for one AAS annual meeting.

Here, we feature the three winners of this year's Dr. Beth A. Brown Memorial Prize: Greg Mosby (Yale University), Laura Lopez (University of California Santa Cruz), and Chris Williams (MIT).

Best Graduate Student Oral Presentation

Chris Williams

Chris Williams is a graduate student in physics at MIT, and he won the award for best graduate student oral presentation. At NSBP, Chris gave a talk entitled "Early Results from 32 Tiles of the Murchison Widefield Array". The MWA is a new low-frequency (80-300 MHz) radio telescope under construction in Western Australia and operated by MIT, Havard CfA, and a consortium of Australian institutions. The MWA offers exciting prospects to study the epoch of reionization, solar phenomena, and transient radio sources. The array will consist of 512 antenna tiles, and the telescope is expected to be fully operational by mid-2010. Currently, 32 tiles have been deployed in a prototype array. Chris has worked on early tests to characterize the hardware, and he is involved in the analysis of the first sky images with MWA.

Originally from Potomac, Maryland, Chris graduated from Montgomery Blair High School in 2001. Chris then went to Stanford University, majoring in physics and in political science and graduating in 2005. In his free time, Chris enjoys reading, camping, playing squash, and volunteering with the MIT Emergency Medical Services.

Best Undergraduate Poster Presentation

Greg Mosby at Fenway

The award for best undergraduate poster presentation went to Greg Mosby. Greg is a senior at Yale University majoring in astronomy and physics. At NSBP, Greg presented a poster entitled "Properties and Evolution of Young Stellar Clusters in Orion" based on research he conducted with Dr. Lori Allen and Dr. Kevin Covey at the NSF REU program at the Harvard Center for Astrophysics. For this project, Greg examined spectra from 1422 objects in the Lynds 1641 cloud of the Orion giant molecular cloud. Greg identified stars, spectral typed them, and made an HR diagram to estimate ages and masses of the stars. Ultimately, Greg hopes to obtain more data on stars in this cloud to probe the star formation history.

Greg is originally from Memphis, Tennessee, where he graduated from Memphis Central High School. Greg plans to attend graduate school in the Astronomy Department at the University of Wisconsin, Madison, to study instrumentation. In his free time, Greg plays saxophone, learns foreign languages, and writes short stories and poetry.

Best Graduate Student Poster Presentation

Laura Lopez is a graduate student in astronomy/astrophysics at University of California, Santa Cruz, and she won the award for the best graduate student poster presentation. At NSBP, Laura presented a poster entitled "Dissecting Supernova Remnants Observed with the Chandra X-ray Telescope". For this project, Laura developed three quantitative methods to measure the X-ray morphologies of supernova remnants for comparison between sources. Application of these techniques to one complex remnant, W49B, demonstrated that it arose from a bipolar or hypernova explosion. Currently, Laura is working to apply the methods to study particle-acceleration sites, heating and cooling of supernova ejecta, and interactions of pulsars with their environments.

Laura Lopez

Laura is originally from Barrington, Illinois, where she graduated from Barrington High School in 2000. Laura then went to MIT, where she graduated in 2004 with a bachelors in physics and minors in astronomy and in political science. In her free time, Laura enjoys reading, photography, playing violin, and traveling.

Minority and Female PhD Attainment in Astronomy

By Laura Lopez, University of California Santa Cruz

Each year, the NSF conducts the 'Survey of Earned Doctorates' to track research PhDs from universities in the United States and Puerto Rico. Individuals respond to questionnaires regarding gender, race, field of study, and post-graduation plans; the survey has about a 91-93% response rate.

The NSF Division of Science Resources Statistics recently released the detailed tables for the 2006-2007 academic year. The full results from 1997-2006 for astronomy, physics, and earth, atmospheric, ocean sciences are shown in Table 1 to the right. The numbers reflect the total number of PhDs earned that academic year of US citizens and permanent residents, and the values in the parentheses give the number of females within that group.

Figure 1 plots the fraction of minorities earning PhDs in astronomy (Fig 1, left) and in physics (Fig. 1, right). The lines are jagged because of small number statistics. Broadly, the numbers appear to have remained constant over the last decade (with some fluctuations). Comparison between astronomy and physics reveals that physics draws fractionally around double the Asian and African Americans of astronomy, while Hispanic Americans and Native Americans are equally represented in both. As African Americans and Latinos comprise roughly 13% of the US population each, both groups are earning much less astronomy and physics PhDs than their societal representation.

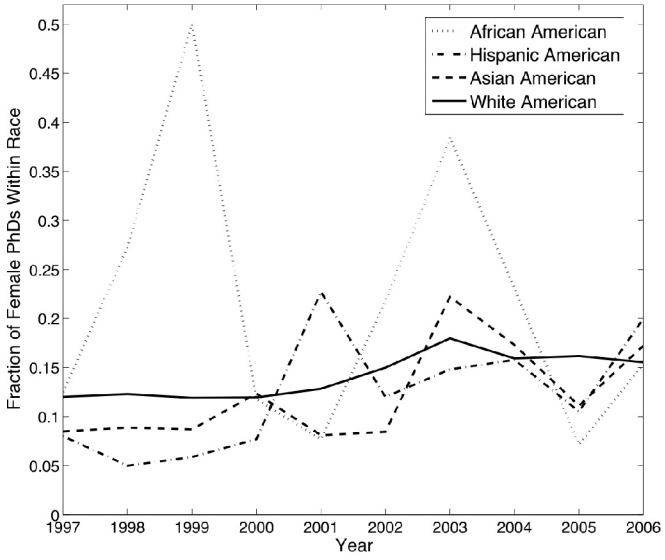

Figure 2: Fraction of PhDs attained by women in astronomy and physics (summed together) by race from 1997-2006.

Figure 2 plots gives the fraction of females earning PhDs in both physics and astronomy by race. Physics and astronomy were added together for each year to avoid small-number statistics; Native Americans are not plotted because of small-number statistics as well. Generally, all races have similar female representation (~15%), except African Americans have large fluctuations with some years (1998, 1999, 2002) >25%. A small upward trend in female representation is apparent, from about 10% in 1997 to ~15% in 2006.

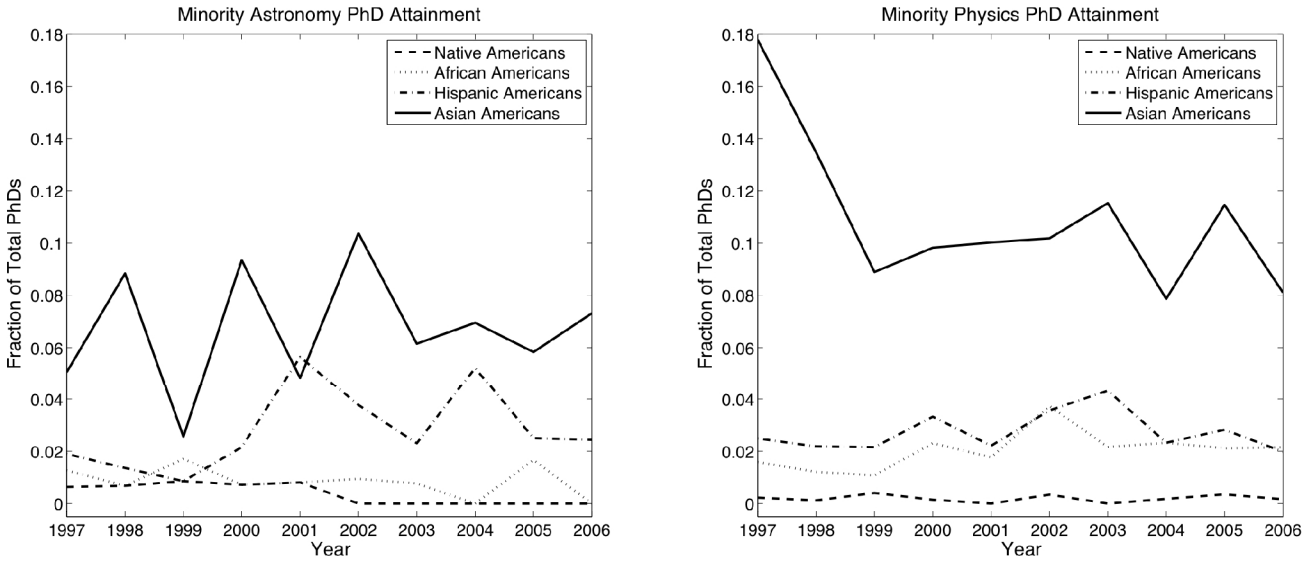

Figure 1: Fraction of PhDs in astronomy (left) and in physics (right) earned by minorities from 1997-2006.

Table 1: Number of PhDs awarded in astronomy, physics, and earth, atmospheric, ocean sciences, listed by race and gender (number of females in each group is given in parentheses) from 1997-2006.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006
Native Americans											
Astronomy	1 (0)	1 (0)	1 (1)	1 (1)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5 (2)
Physics	2 (0)	1 (0)	3 (0)	1 (0)	0 (0)	2 (0)	0 (0)	1 (1)	2 (0)	1 (0)	13 (1)
Earth, Atm, Ocean Sci	3 (1)	3 (1)	6 (3)	4 (1)	0 (0)	0 (0)	2 (1)	4 (0)	4 (3)	1 (0)	27 (10)
All Three Fields	6 (1)	5 (1)	10 (4)	6 (2)	1 (0)	2 (0)	2 (1)	5 (1)	6 (3)	2 (0)	45 (13)
African Americans											
Astronomy	2 (1)	1 (0)	2 (2)	1 (1)	1 (0)	1 (1)	1 (0)	0 (0)	2 (0)	0 (0)	11 (5)
Physics	14 (1)	10 (3)	8 (3)	16 (1)	12 (1)	22 (4)	12 (5)	13 (3)	12 (1)	13 (2)	132 (24)
Earth, Atm, Ocean Sci	6 (1)	5 (1)	11 (4)	4 (1)	5 (2)	5 (0)	13 (6)	7 (1)	6 (1)	5 (2)	67 (19)
All Three Fields	22 (3)	16 (4)	21 (9)	21 (3)	18 (3)	28 (5)	26 (11)	20 (4)	20 (2)	18 (4)	210 (48)
Hispanic Americans											
Astronomy	3 (1)	2 (0)	1 (0)	3 (0)	7 (1)	4 (1)	3 (1)	6 (2)	3 (2)	3 (1)	35 (9)
Physics	22 (1)	18 (1)	16 (1)	23 (2)	15 (4)	21 (2)	24 (3)	13 (1)	16 (0)	12 (2)	180 (17)
Earth, Atm, Ocean Sci	15 (5)	17 (5)	20 (4)	16 (3)	9 (2)	14 (0)	15 (4)	11 (5)	18 (7)	21 (10)	156 (45)
All Three Fields	40 (7)	37 (6)	37 (5)	42 (5)	31 (7)	39 (3)	42 (8)	30 (8)	37 (9)	36 (13)	371 (71)
Asian Americans											
Astronomy	8 (0)	13 (1)	3 (0)	13 (2)	6 (0)	11 (0)	8 (3)	8 (3)	7 (2)	9 (3)	86 (14)
Physics	157 (14)	111 (10)	66 (6)	68 (8)	68 (6)	60 (6)	64 (13)	44 (6)	65 (6)	49 (7)	752 (82)
Earth, Atm, Ocean Sci	61 (3)	45 (1)	35 (4)	23 (4)	27 (3)	24 (4)	22 (3)	11 (2)	18 (4)	24 (8)	290 (36)
All Three Fields	226 (17)	169 (12)	104 (10)	104 (14)	101 (9)	95 (10)	94 (19)	63 (11)	90 (12)	82 (18)	1128 (132)
White Americans											
Astronomy	132 (22)	120 (22)	109 (21)	115 (26)	104 (25)	86 (18)	104 (22)	93 (25)	100 (28)	107 (28)	1070 (237)
Physics	659 (73)	652 (73)	630 (67)	571 (56)	558 (60)	461 (64)	430 (74)	453 (62)	444 (60)	511 (68)	5369 (657)
Earth, Atm, Ocean Sci	449 (114)	443 (127)	387 (101)	411 (120)	354 (119)	374 (136)	379 (121)	379 (143)	384 (134)	406 (141)	3966 (1256)
All Three Fields	1240 (209)	1215 (222)	1126 (189)	1097 (202)	1016 (204)	921 (218)	913 (217)	925 (230)	928 (222)	1024 (237)	10405 (2150)
Other/Unknown											
Astronomy	12 (1)	10 (0)	1 (0)	6 (2)	5 (1)	4 (1)	14 (2)	8(2)	8 (2)	4 (1)	72 (12)
Physics	29 (3)	32 (2)	19 (2)	13 (2)	25 (2)	23 (1)	25 (4)	35 (2)	28 (3)	18 (3)	247 (24)
Earth, Atm, Ocean Sci	21 (7)	20 (3)	12 (4)	16 (6)	16 (2)	16 (11)	20 (8)	26 (12)	12 (5)	16 (2)	175 (60)
All Three Fields	62 (11)	62 (5)	32 (6)	35 (10)	46 (5)	43 (13)	59 (14)	69 (16)	48 (10)	38 (6)	494 (96)
All Races											
Astronomy	158 (25)	147 (23)	117 (24)	139 (32)	124 (27)	106 (21)	130 (28)	115 (32)	120 (34)	123 (33)	1279 (279)
Physics	883 (92)	824 (89)	742 (79)	692 (69)	678 (73)	589 (77)	555 (99)	559 (75)	567 (70)	604 (82)	6693 (805)
Earth, Atm, Ocean Sci	555 (131)	533 (138)	471 (120)	474 (135)	411 (128)	433 (151)	451 (143)	438 (163)	442 (154)	473 (163)	4681 (1426)
All Three Fields	1596 (248)	1504 (250)	1330 (223)	1305 (236)	1213 (228)	1128 (249)	1136 (270)	1112 (270)	1129 (258)	1200 (278)	12653 (2510)

Source: NSF, Division of Science Resources Statistics, 2008. *Science and Engineering Doctorate Awards: 2006.* Detailed Statistical Tables NSF 09-311. Arlington, VA. Available at: http://www.nsf.gov/statistics/nsf09311

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The Committee on the Status of Minorities in Astronomy (CSMA) is a Standing Committee of the American Astronomical Society.

'SPECTRUM' is a semi-annual publication describing the activities of the CSMA, highlighting resources, and providing a forum for discussion of issues relevant to the representation of minorities in the astronomy profession.