

# SPECTRUM



*A report on underrepresented minorities in astronomy*

## So... What About Diversity?

by **Marcel Agueros**

*Led by a team of graduate students, the University of Washington Astronomy Department has developed a departmental plan for more effectively engaging diversity issues through enhanced coordination of effort and improved leveraging of available resources.*

*Marcel Agueros describes how they went about it and what they learned along the way.*

The meeting was over. For nearly an hour the graduate students and the graduate program advisor had intensively discussed a number of pressing departmental issues. We were wrapping up when a question was casually dropped on the table: “What about diversity?”

What seemed like a simple enough question to ask turned out to be a very difficult question to answer. That meeting took place about a year ago, and we are still working our way to a good answer. However, with the help of some friends—the Graduate Opportunities and Minority Achievement Program and ADVANCE here at the UW, and the AAS Committee on the Status of Minorities in Astronomy (CSMA), in particular—we have taken some major steps.

After a year’s worth of collaborative effort, the fruit of our labors is a departmental diversity plan, “To Feed, To Fix: Diversity and the Astronomy Pipeline at the University of Washington.”



*Marcel Agueros is a 4th-year astronomy graduate student at the University of Washington. His dissertation research is on X-ray selected stars from the RASS and SDSS Surveys under the direction of Scott Anderson.*

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## Professional Organizations Serving Minorities in the Physical Sciences

by **Laura Lopez, Undergraduate, Massachusetts Institute of Technology**

In recent years, professional organizations and committees have been established to serve historically underrepresented minorities in the physical sciences. These groups have a common purpose: they aim to increase participation and to enhance the experiences of African-

Americans, Hispanic-Americans, and Native Americans in science.

In conjunction with the CSMA Special Session “Professional Societies of Minority Scientists”, this article presents background on the initia-

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### HIGHLIGHTS:

- Learn about efforts at the University of Washington to articulate a departmental diversity action plan.
- Adopt strategies for increasing accountability in diversity outcomes at colleges and universities.
- Learn about NASA’s efforts to engage minority colleges and universities.

## So... What About Diversity? (cont'd)

(Continued from page 1)

The plan outlines some of the ways in which our department can use existing resources to recruit and to retain talented women and minority students into astronomy at the K-12, undergraduate, and graduate levels, and we hope it will serve as a guide to departmental efforts in coming years. And, perhaps just as importantly, struggling with the question has made all of us aware of the role we can play in opening our field to underrepresented scientists.

When the question was asked, the situation within our department was not critical. In recent years we have been extremely successful (in relative terms) both at attracting and at graduating women PhDs. We have also had several minority graduate students pass through the department over the years, more than many other comparable programs. In addition, many students and faculty are involved in outreach activities, such as Project AstroBio, that excite K-12 students about science. In short, we have been “doing our part.”

The question was asked because we realized that too often efforts within the department to reach out to, say, young women, were dependent on one or two individuals and therefore waxed and waned. There was clearly an absence of an overall strategy to link together these different efforts, and we felt it was time to articulate a departmental approach.

Soon after that meeting a year ago we initiated a series of informal discussions, sometimes internal, sometimes with outsiders, around the topic of diversity.

One guest, Maresi Nerad of the UW’s Center for Research and Innovation in Graduate Education, presented statistics that highlighted the still small numbers of PhDs awarded to women and minorities in the sciences, and discussed some of the reasons for this problem. She also showed results from her research, based on interviews with PhD recipients, on what makes departments successful

in training graduate students—a topic at the heart of another presentation, by Johnnella Butler, an Associate Dean and the Associate Vice Provost of the UW’s Graduate School. Dean Butler focused on the distinction between advising and mentoring, and generally outlined methods for creating a departmental culture that benefits all students and faculty.

Finally, with the support of the ADVANCE program, we were able to invite the CSMA’s Keivan Stassun to the UW for a week to both give a science colloquium and to work with us, through some intense brainstorming sessions, to outline what eventually became “To Feed, To Fix.”

These discussions also had some unforeseen outcomes. One of the most remarkable was the decision that the new graduate student orientation, held every September, should include a diversity training workshop.

The ADVANCE program helped us once again, and we invited two professional mediators from the National Coalition Building Institute to host 2 two-hour group discussions. Feedback from the 20 or so graduate students who participated indicates that the workshops were a success (I, for one, thought they were incredibly

powerful), and we are exploring ways to make the workshops a regular feature of the orientation.

So, today, “What about diversity?” As a department, we are now working to complete the plan, in particular by adding a section about the recruitment and retention of faculty. We have also pinpointed some actions we can take immediately. For example, we plan to attend the annual meeting of the National Society of Black Physicists this February and to begin connecting with faculty and students at Minority Serving Institutions. There is still obviously much to be done, but I think we’re all much clearer about how we’re going to go about it.

*For a copy of “To Feed, To Fix: Diversity and the Astronomy Pipeline at the University of Washington,” visit the CSMA website at:*

*[www.vanderbilt.edu/csma](http://www.vanderbilt.edu/csma)*

*“These discussions also had unforeseen outcomes. One was the decision that the graduate student orientation should include a diversity training workshop.”*

## Professional Organizations Serving Minorities (cont'd)

(Continued from page 1)

tives and programs of organizations serving minorities in physics, astronomy, and the space sciences.

### National Society of Black Physicists

The National Society of Black Physicists (NSBP) is the largest organization devoted to the promotion and professional enhancement of African-American physicists. Founded in 1977 at Morgan State University, NSBP is a strong force that increases the opportunities, representation, and visibility of black physics students and professional physicists.

NSBP undertakes many initiatives to encourage and support African-American students. These activities include an undergraduate scholarship program funded through the Lawrence Livermore National Laboratory and an annual outstanding graduate student dissertation award. Additionally, the NSBP began the successful Science Ambassador Program. This initiative brings black professionals to local schools to give technical lectures as a means to encourage pursuit of careers in science, technology, and engineering.

Pending the approval of the AAS Council, NSBP and AAS will, beginning this year, jointly offer a new undergraduate scholarship program for students interested in astronomy, astrophysics, and space science.

The largest annual event of the NSBP is the national conference. This meeting provides a mechanism for African-American physicists to network, to discuss current scientific developments, and to support undergraduate and graduate students. The meeting includes scientific sessions in all areas of physics as well as professional development presentations to guide students.

This year, the NSBP annual conference will be held jointly with the National Society of Hispanic Physicists in Washington, D.C. This meeting will bring together over 500 African-American and Hispanic-American students and professionals. In addition to the usual sessions, the NSBP will convene a symposium on the future of the scientific workforce. Invited speakers include representatives from government, academia, advocacy groups, and private corporations. Topics discussed will span a wide range of issues, from hiring and career selection behavior to reliance on foreign scientists in the American science and engineering workforce.

### Society for the Advancement of Chicanos and Native Americans in Science

Founded in 1973, the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) serves to encourage Latino and Native American students to pursue higher education in the sciences as preparation for research and teaching careers.

Headquartered in Santa Cruz, California, the

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## SPECTRUM

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Published by  
The American Astronomical Society  
2000 Florida Avenue, NW, Suite 400  
Washington, DC 20009  
© 2004 AAS  
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SPECTRUM is produced at  
Vanderbilt University  
Department of Physics & Astronomy  
VU Station B 1807  
Nashville, TN 37235

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The SPECTRUM newsletter is distributed to AAS members at the January and June meetings and sent to home institutions of subscribers during the week of the meeting. Contributed articles are encouraged.

For more information on subscribing to SPECTRUM, submitting articles, or obtaining back issues, please visit the CSMA website:  
<http://www.vanderbilt.edu/csma>

## The Accountability Side of Diversity

by Estela Mara Bensimon, Donald Polkinghorne, Georgia Bauman, University of Southern California  
Reprinted with permission from the Summer 2003 issue of *Diversity Digest*, a publication of the Association of American Colleges and Universities

*Even though individuals are likely to agree that equity is a desirable value, equity is not something that is spoken about in relation to educational outcomes for students. Institutions of higher education most often do not produce annual reports on measures of equity nor do they have equity-oriented benchmarks. An institution's success (or failure) in reducing educational inequities that severely restrict opportunity and upward mobility for students of color is not used as a measure of institutional effectiveness, nor are institutions ranked or graded on the basis of equity in educational outcomes.*

**W**ith the exception of historically black institutions and tribal colleges, intra-institutional stratification based on race and ethnicity is a reality within most higher education institutions, regardless of whether they are predominantly white, open-access, or classified as Hispanic Serving Institutions. However, the specificities of this intra-institutional stratification are largely invisible because equity in educational outcomes does not constitute a metric of institutional performance that is continuously tracked.

For example, institutions do not monitor whether minority students are earning GPA's that will enable them to go on to graduate school. The tracking of some measures of institutional performance is a taken-for-granted routine, e.g., the average SAT scores of each freshman class. If an institution's leadership were to be asked what percentage of African-American or Latino students graduate with a 3.5 GPA, most would need to run the numbers before being able to answer. Institutions are not in the habit of tracking whether the educational outcomes for African-American and Latino students, such as GPA, are improving or declining. As an institutional researcher pointed out to us, "When people ask me for data, they do not ask me about the high GPA minority students."

In this article we describe the Diversity Scorecard project, a process of developing awareness of

inequities in educational outcomes that we developed in partnership with fourteen urban colleges in Southern California and with the support of The James Irvine Foundation.

### Diversity Scorecard Project

The Diversity Scorecard was developed as a response to the fact that the "diversity agenda" has been primarily about access to predominantly white institutions. Yet in California, as in many other states, urban colleges, private and public, two- and four-year, have served as the main entry point into higher education for students of color. For institutions like California State University at Los Angeles, Whittier College, and Los Angeles City College—all institutions that are part of our project—the challenge is not how to become more diverse.

The challenge for these colleges is how to translate diversity in the student body into equity in educational outcomes. The core principle of the Diversity Scorecard is that evidence (i.e., factual data) about the state of equity in educational outcomes for African Americans and Latinos can have a powerful effect on increasing the recognition by faculty members, administrators, counselors, and others about the existence of inequities as well as their motivation to resolve them. That is, in order to bring about institutional change, individuals have to see, on their own, as clearly as possible, the magnitude of inequities, rather than having researchers, like us, tell them that they exist.

To start the project, we invited the presidents of the fourteen colleges<sup>1</sup> to appoint a team of individuals to work with us on the development of their institution's scorecard. The task of each team was to examine data disaggregated by race and ethnicity that would reflect educational outcomes in four general areas: access, retention, excellence, and institutional receptivity.

Each team decided what types of data they would examine, and, based on their analyses, each team identified unequal outcomes for particular groups of students. The next step was to create the actual scorecard, which entailed selecting goals,

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measures, and benchmarks where unequal outcomes had been uncovered in each of the four general areas. The last step was presenting the completed scorecard in a report to the president.

Initially, some of the participants were skeptical about the project. However, after two years, the majority of participants feel that the process has been fruitful. One participant shared:

*At first I was very skeptical about this project. However I have found the approaches to data very useful. This push to look at data is spilling over to other areas such as curricular issues. Doing this project I've found many ways of thinking about data.*

Breaking data down by race and ethnicity has provided many “aha” moments. Upon seeing remediation rates disaggregated by race and ethnicity a member of one institution said:

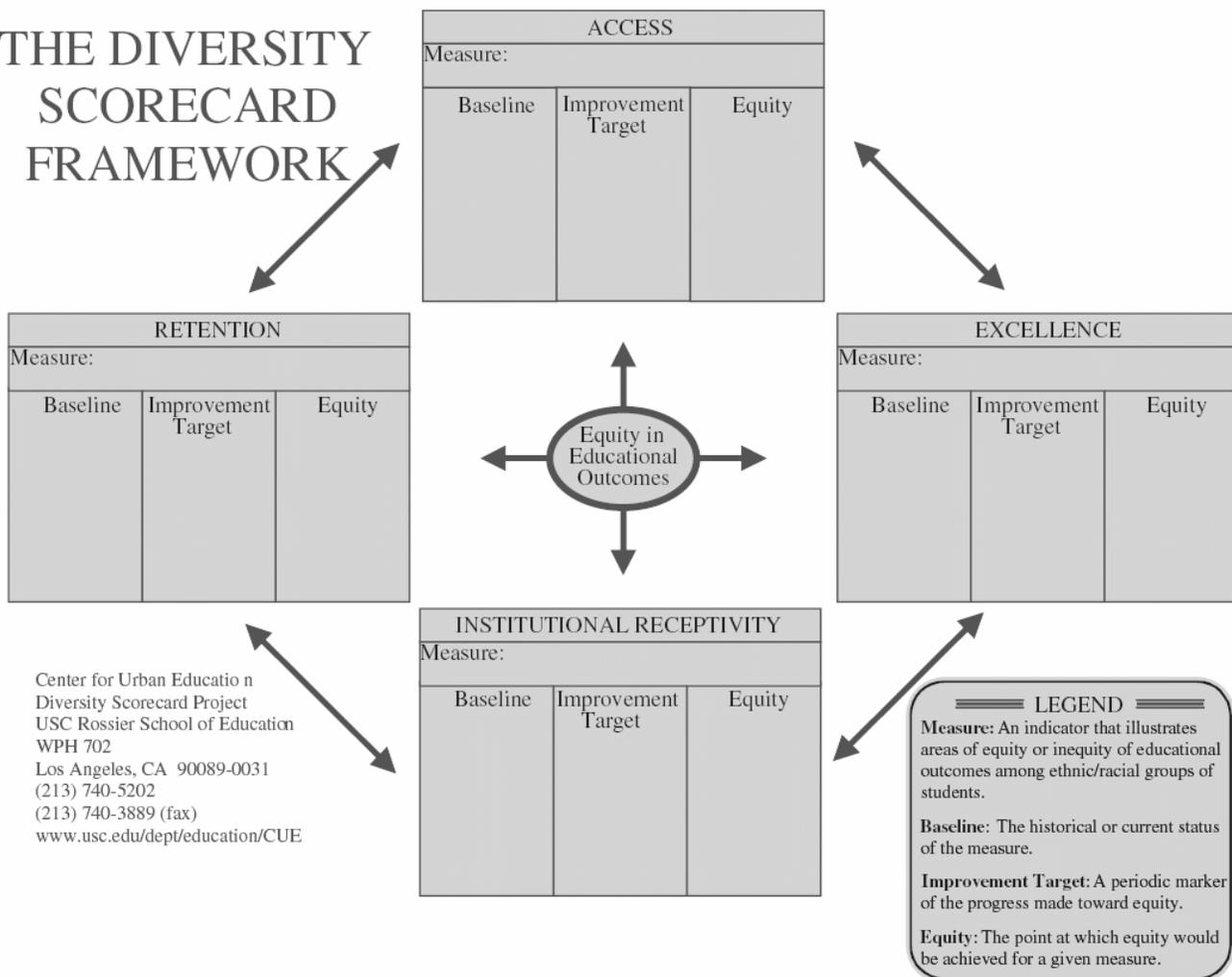
*This is the first time that I'm aware of that anyone is looking at this problem by ethnicity and to this level of detail. [Now that it has been disaggregated] we can look more deeply and systematically at remediation rather than just the split between English and math. This is central on everyone's mind. We can really raise conversation around this.*

**Scorecard Measures**

Thus, through simply disaggregating existing data on basic indicators of student outcomes, our partner institutions have been able to locate very specifically the most critical gaps in the academic performance of African American and Latino students. The combined effort of the institutions resulted in the development of fifty-eight fine-grained measures (available at [www.usc.edu/dept/education/CUE/projects/ds/diversityscorecard.html](http://www.usc.edu/dept/education/CUE/projects/ds/diversityscorecard.html)). The fol-

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**THE DIVERSITY SCORECARD FRAMEWORK**



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## What's in a Name?

By Kendra Hamilton—Reprinted with permission from the June 19, 2003 issue of *Black Issues in Higher Education*, [www.blackissues.com](http://www.blackissues.com)

*Study shows that workplace discrimination begins long before the job seeker shows up for an interview.*

Thinking of naming your child Keisha or Aisha? How about Rasheed or Tremayne? African American parents across the nation may have to think again, as a recent study has shown that workplace discrimination begins long before the job seeker shows up for an interview.

Indeed, it seems to be in play from the moment the résumé hits the human resource manager's desk.

Dr. Marianne Bertrand, a professor of economics at the University of Chicago, and Dr. Sendhil Mullainathan, MacArthur-winning associate professor of economics at the Massachusetts Institute of Technology, have made a significant contribution to the research literature with their new study, "Are Emily and Brendan More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination."

With names chosen from birth records in Chicago and Boston, the researchers crafted sets of résumés—some of higher quality, some of lower—labeled them with either "White-sounding" or "Black-sounding" names and sent nearly 5,000 of them out in response to 1,300 jobs advertised in the Chicago and Boston papers.

The response from colleagues as they designed their deceptively simple study was, "'Oh, yes, you'll find a discrimination effect, a reverse discrimination effect,'" Bertrand says.

Instead, they found that résumés with "White-sounding" names—like Jay, Brad, Carrie and Kristen—were 50 percent more likely than those with "Black-sounding" names to receive a callback. The results were striking, holding both for jobs at the lower end of the spectrum—cashier and mailroom clerk positions—and for those at the executive level. Put another way, a White job seeker would

have to send out at least 10 résumés to receive a single contact from a potential employer. A Black candidate, meanwhile, would have to send out 15—and this in a "soft" economy with a relatively low rate of new job creation.

The most intriguing—and troubling—aspect of the study was that the discrimination effect held even for candidates with stronger credentials: those who had gone to better schools, or won awards, or had fewer résumé "gaps," periods of at least six months without employment.

"We really thought a higher quality résumé would help the African American candidate—that the employer would put less weight on the names," Bertrand says.

And indeed, improving the résumé quality

*"Among 5000 résumés, those with 'white-sounding' names were 50% more likely than those with 'black-sounding' names to receive a callback."*

helped candidates with White-sounding names significantly—their chances of receiving a callback rose 30 percent. But for candidates with Black-sounding names, "we found none of that. If anything, we found the opposite," Bertrand says.

"It was very counterintuitive," she adds. "One imagined employers looking at the names and kind of screening at that stage, not going any further, not even

reading the résumé. People in HR (human resources) call that a 'deselection process,' where you see a pile of résumés that you have to get through and do a kind of rapid screen" in order to separate the wheat from the chaff.

"That's exactly how we used to do it," notes Kimberly Wilson, who held a human resources position in a mid-sized social policy research firm in the Washington, D.C., area. It was Wilson's job to cull the stack of résumés—"perhaps around 300" for every position, she says—down to about 20 that would then be brought before a committee.

"And every time, the committee would be more critical of résumés with Black-sounding or foreign-sounding names. 'Oh, yes, she did a research in-

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ternship, but it wasn't in health and that's what we're really looking for," Wilson says. When the names didn't provide a clue to race, the committee members would often zero in on other data—professional organizations, for example.

"Oh, he belonged to the Hispanic fellowship group in college," she adds, explaining, "I don't even think it was conscious, certainly not in most cases."

Conscious or not, the MIT-UChicago study demonstrates that employers actively discriminate among job candidates on the basis of race. And attempts by African Americans to improve their chances with more education and more skills don't appear to help at all.

In addition, the study showed that adjusting for gender greatly increased the discrimination effect. There was a difference of 3.35 percentage points—

or 50 percent—between the callback rates for all Whites (10.1 percent) and all Blacks (6.7 percent). But the callback rate for the lowest scoring Black female name, Aisha (2.2 percent) was 6.1 percentage points below that of the lowest scoring White female name, Emily (8.3 percent) and 11.4 percentage points below that of the highest scoring White female name.

Indeed, five of the nine Black female names—Aisha, Keisha, Tamika, Lakisha and Tanisha—scored lower than the lowest scoring White female name. By contrast, the racial gap between male names was not nearly so pronounced. The lowest scoring White and Black male names—Neil and Rasheed—were only 3.6 percentage points apart.

Applicants who lived in "better" neighborhoods—"Whiter," more educated, higher income—received more callbacks than those who did not. But again, Whites benefited so much more than Blacks, it was not clear that Blacks benefited at all, suggesting that, despite a widespread societal belief in the stigmatizing effect of a "ghetto" address, a good address doesn't help African Americans overcome discrimination either.

The racial gap in callbacks varied greatly by occupation and industry, but not necessarily in ex-

pected ways. The gap between Whites and Blacks for the highest occupational category, the managerial and executive category, was the lowest measured: 33 percent. The highest racial gap was seen in the rung below the top level—administrative supervisors, who saw a racial gap of 64 percent. And near the bottom of the ladder, secretaries had the second highest racial gap in callbacks.

The extent of the discrimination is "remarkably uniform" across all occupations and industries. Neither federal contractors—bound by affirmative action rules—nor companies who call themselves "Equal Opportunity Employers" discriminate less than any others, suggesting that the designation may be more or less meaningless. The only exceptions were companies located in Black neighborhoods in Chicago—these discriminated less than other firms.

Placed in the national context—the fact that African Americans are twice as likely to be unemployed as White Americans and that, when employed, they earn 25 percent less—the study seems both an explanation and a reiteration of very bad tidings.

It was certainly greeted as such in Boston and Chicago when the results were released earlier this year. They sparked a blizzard of newspaper coverage, not to mention spirited discussions on radio call-in shows.

Bertrand says she has been virtually inundated with phone calls and e-mails—particularly, from "people who in their own lives are carrying out the experiment," she explains. "I've heard from people who were African American and had a very distinct African American name who changed the name on their résumés to a less race-salient name, dumbed down their education and did much better...."

"Of course, that was not our point."

Though many media accounts have seized on the name-changing aspect as a possible solution, Bertrand is quite clear that "it seems like an easy way out. The burden should be on the companies, not on the person looking for a job. And to give up your name—when names are such an important part of personal identity?—No."

*"The extent of the discrimination is remarkably uniform across all occupations and industries."*

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## The Accountability Side of Diversity (cont'd)

(Continued from page 5)

lowing provides one example from each of the four perspectives.

- Access Perspective

*Example:* The percentage of African Americans and Latino students who succeed in “gateway” courses. Gateway courses are those courses that serve as points of entry for particular majors (e.g., particular math courses serve as pre-requisites for engineering and business majors).

- Retention Perspective

*Example:* The percentage of target group students who complete courses in which they enroll within a term.

- Excellence Perspective

*Example:* The average grade point average of Latino and African-American students, by college/major at the point of graduation.

- Institutional Receptivity Perspective

*Example:* The percentage of African-American, Latino, and Asian-American faculty in each college/department compared with the percentage of students from these ethnic/racial groups in each college/department (i.e., the percentage of African-American faculty in the College of Arts and Sciences compared to the percentage of African-American students in that college).

We believe that the disaggregation of data on educational outcomes by race and ethnicity and the determination of equity standards are evidence-based practices that will make individuals more

conscious of the state of educational outcomes for historically underserved students and will enable them to act purposefully. Our partners suspected that there were problems, but many relied heavily on anecdotal data, both to describe the problem and, in some cases, to justify why it is practically unsolvable. With very few exceptions, most institutions in the project lacked a disciplined and evidence-based approach to understanding educational outcomes and the dimensions and the extent of the equity gap.

We are continuing our work with the fourteen Diversity Scorecard institutions and have two overarching goals. First, we hope to raise awareness at each institution more broadly around the issues identified on each team’s scorecard in order bring about change. Second, we will work to institutionalize the use of data disaggregated by race and ethnicity so it becomes a routine practice and disparities in outcomes by race and ethnicity become more readily recognized. Of course, we also hope that our partners will continue to analyze and discuss institutional data in a way that will continue to bring about new awareness.

<sup>1</sup>*The fourteen Diversity Scorecard project institutions include: California State University Los Angeles, California State University-Dominguez Hills, California State University-Fullerton, Los Angeles City College, Los Angeles Valley College, Cerritos College, Santa Monica College, Riverside Community College, Whittier College, University of Redlands, University of La Verne, Occidental College, Loyola Marymount University, and Mount St. Mary’s College.*

*Questions may be directed to [diversityweb@acu.org](mailto:diversityweb@acu.org).*

## What’s in a Name? (cont’d)

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Nor should the study’s findings deter African American job seekers who want to sharpen their skills, says Dr. William Harvey, vice president of the American Council on Education and director of ACE’s Office of Minorities in Higher Education.

“Unfortunately, there’s nothing in the study that contradicts what we already anecdotally know to be true of the experience of African Americans in the job market. There’s nothing surprising here,” he says. “This should not deter those of us being discriminated against from getting as many weap-

ons as possible to add to our arsenals—and one of the most respected weapons is still higher education.”

Bertrand adds that she is quite encouraged by the fact that “there’s been a huge amount of interest, much more than we expected, from people in training and resource management.” She hopes in the future “to use the study as a training device, to kind of illustrate to the HR people that these kinds of biases might be at play, whether they’re conscious or subconscious,” adding, “What we’re hearing from the people in HR who have contacted us is that they want to de-bias the selection process, too.”

## Astronomy Faculty Diversity Survey: Preliminary Results

by Laura Lopez, Undergraduate, Massachusetts Institute of Technology

This Fall, Professor Donna Nelson of the University of Oklahoma and I conducted a survey on the demographics of faculty in U.S. departments which grant PhDs in astronomy and/or astrophysics. This survey is similar in nature to the others conducted by Professor Nelson in various science and engineering fields (the Nelson Surveys are available online at: <http://cheminfo.chem.ou.edu/faculty/djn/diversity/top50.html>).

Under the auspices of the Massachusetts Institute of Technology, we polled all 53 departments offering the PhD degree in astronomy or astrophysics to obtain disaggregated data by race/ethnicity, gender, and rank of all tenure-track and tenured professors. This method enables us to assess the status of groups typically overlooked by other studies (such as minority females).

Presently, 45 of the 53 departments have responded (an eighty-five percent reply rate).

Preliminary results indicate 12.9% of all astron-

omy faculty are female, roughly double the 6.6% female faculty representation in physics. 91% of all astronomy professors are Caucasian, and 80% are Caucasian males. 1.3% of all astronomy professors are black, 1.3% are Hispanic, 6.5% are Asian, and 0% are Native American.

These numbers are comparable to those of physics faculty except for the Asian faculty representation: Asian astronomy faculty representation is approximately half of that for physics faculty (6.5% in astronomy versus 11.2% in physics).

As we receive the final eight responses, these numbers may shift slightly. However, we do not anticipate much change as the response rate is a statistically significant sample. The full results, disaggregated by race/ethnicity, gender, and rank for each department will be published in the June issue of SPECTRUM.

We gratefully acknowledge the support of the Ford Foundation, the Guggenheim Foundation, and the National Science Foundation.

**Physics-Astronomy Faculty Representation Comparison: Preliminary**

	<i>Physics (%)</i>	<i>Astronomy (%)</i>
All Female	6.6	12.9
Caucasian	86.3	91.0
Caucasian Male	81.2	80.0
Black	0.6	1.3
Hispanic	1.9	1.3
Asian	11.2	6.5
Native American	0.5	0.0

## A Small First Step

by Jesús Pando, Phillip Cervantes, Ruth Howes

Reprinted with permission from the American Physical Society's Forum on Education newsletter [www.aps.org/units/fed/newsletters/summer2003/index.html](http://www.aps.org/units/fed/newsletters/summer2003/index.html)

Even with the slight upturn in enrollment of the last two years, undergraduate physics enrollments have dropped 20% during the past decade. Physics departments have offset a similar decline in US students entering graduate school by recruiting foreign students who now make up more than half of all entering grad students in physics.

In many physics departments, the low number of graduate students has forced them to rely more on undergraduate teaching assistants while at the same time faculty lines are not being replaced as faculty retire. In light of these developments, it is perhaps time for physicists to consider changing the way we conduct business in order to attract new people and new ideas to the field.

Ironically, just at the time the physics departments most need students, historically under-represented groups that form a large and increasing pool of students are not being drawn to the field. Only 5% and 3% of Bachelor's degrees earned in the year 2000 went to US citizens who are African-Americans and Hispanics, respectively. At the graduate level, the numbers are even more disappointing. In 2000, only 17 Ph.D.s (3%) in physics were granted to African-Americans and 14 to Hispanic-Americans. These proportions are well below those that characterize the general population of U.S. college students. Clearly, it is enlightened self-interest for physics departments to discover how to increase the numbers of Hispanic-American and African-American students who major in physics.

Recently, the National Task Force on Undergraduate Physics completed SPIN-UP (Strategic Programs for Innovation in Undergraduate Physics). SPIN-UP surveyed all bachelor degree granting physics departments in the country and did twenty-one site visits to "thriving" (primarily in terms of majors) physics departments. These departments proved excellent models for building

supportive environments for majors.

However, even among these thriving departments, none was successful in attracting majors from under-represented groups. Perhaps the nurturing environments that attract majors to these physics departments are nurturing primarily to those students that have historically populated physics. It may be that these environments are necessary to retain these students, but it is clear from the SPIN-UP results that they are not sufficient to attract minorities to the discipline.

Under these circumstances, it is in the interest of physics departments to create a culture to which talented minority students will be attracted. A critical component of such a culture is

physics faculty who work at attracting and retaining physics majors from underrepresented groups.

These faculty members need not themselves be from under-represented groups, but they should have an understanding of the unique issues minority students face. For example, the very great importance of the family in Hispanic-American culture may

cause students from that culture to appear less than dedicated to physics than their majority colleagues. Similarly, African-American students may feel pressure from their peers to pursue academic areas such as law or medicine with a direct relationship to their home communities.

All physics departments need at least one faculty member who is familiar with these cultures and can educate other faculty members as well as act as an advisor and mentor to minority students. Departments with no faculty of color probably face a harder time trying to achieve this than those departments that do have faculty from under-represented groups. These efforts take substantial time and effort and should be recognized as a meritorious part of faculty work. Departments must take responsibility for recruiting and hiring faculty able and willing to fill this role.

*"To facilitate the hiring of faculty that can affect cultural change, we propose two simple and definite actions..."*

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Typically, physics departments seek new faculty by forming a search committee charged with finding the best candidate for the position based on a set of perceived objective criteria. The reality is that setting these criteria is frequently highly political so that 1) the criteria are not actually objective, and 2) the criteria strongly reflect the makeup of the existing department. The SPIN-UP site visits found that departments tend to recruit individuals like those already in the department. If new faculty members continue to be hired in this way, the historically under-represented groups in physics will remain so because the culture of physics will not have changed.

To facilitate the hiring of faculty that can affect cultural change, we propose two simple and definite actions:

First, the criteria for any new hire in a physics department should include a phrase like: "The candidate should have a demonstrated ability and commitment to the success of students of diverse backgrounds."

Second, when a new faculty member has been hired, the criteria on which the new department member is evaluated must include similar language. Efforts to increase diversity require time that can only be taken from research and teaching. These

efforts must be recognized as attributes toward tenure and promotion.

Physics has historically thrived in times when new ideas clash with established ones. It is our belief that physics can also thrive on the kinds of creative ideas that are generated at the interface of diverse cultures. (S.J. Gates, *Physics and Society*, 25, July 1996)

Furthermore, we live in an age of global competition, and the United States must cultivate the scientific talent of *all* its citizens if it is to remain competitive. When all of this is combined with the decreasing enrollments in physics departments, it becomes essential for physics departments to diversify by hiring faculty who can attract and retain students from underrepresented groups. We cannot emphasize enough that this imperative is no longer based solely on ethical reasons, as was affirmative action, but also on the pragmatic realities that physics departments must face in order to thrive.

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## Professional Organizations Serving Minorities in the Physical Sciences (cont'd)

(Continued from page 3)

SACNAS Board of Directors comprises scientists, teachers, and students across the United States. To improve and to expand opportunities available for minorities in the scientific workforce, SACNAS emphasizes the improvement of pre-college science education and the mentorship of undergraduate and graduate students.

The largest SACNAS event is the SACNAS Annual National Conference. This meeting receives financial support from numerous federal agencies, including the National Institutes of Health, the National Science Foundation, and the Department of Energy. The conference focuses on scientific presentations, career guidance, graduate school application advising, and advice on choosing a scientific

field. SACNAS also holds K-12 Teacher Workshops to support teacher professional development.

SACNAS directs other efforts to improve K-12 education as well. The SACNAS Biography Project highlights the contributions of Native American and Chicano scientists, mathematicians, and engineers. Intended as middle- and high-school class material, this initiative discusses the accomplishments of these individuals so "the students... see themselves reflected in the lives that are presented here". Another effort, the SACNAS Teacher-Scientist Partnerships Initiative, facilitates communication between minority-serving K-12 educators and research scientists via an E-mentoring program. Each year, SACNAS recognizes an outstanding

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## Two Historically Black Colleges Show Greater Ph.D. Productivity Than 95% of All Colleges and Universities

*Reprinted with permission from the Winter 2001/2002 issue of Journal of Blacks in Higher Education*

*Several historically black colleges and universities produce a greater percentage of graduates who go on to earn doctoral degrees than do many of the nation's highest-ranked colleges and universities. But when we look at Ph.D. productivity in the sciences, black colleges do not fare as well. Overall, among the black colleges, Fisk University is the leader in Ph.D. productivity.*

**T**wo historically black colleges—Fisk University (Nashville, TN) and Spelman College (Atlanta, GA)—send a greater percentage of their graduates on the path to the completion of a doctoral degree than more than 95% of all predominantly white four-year colleges and universities.

In fact, Fisk and Spelman have a greater percentage of graduates who go on to earn doctorates than do elite institutions such as Dartmouth College, Emory, the University of Michigan, Wake Forest, Middlebury, Colgate, Colby, UCLA, Tufts, Hamilton, Vanderbilt, Wesleyan, the University of Virginia, and the University of Notre Dame.

This journal has obtained statistics that enable our editors to rank black colleges and universities according to the percentage of a particular college's graduates who go on to earn a doctorate. Obviously, these particular statistics tend to show whether or not a particular college or university is producing a high percentage of graduates who have the desire and ability to pursue graduate study at the highest level. The figures show too whether a given college or university is doing a good job in providing its graduates with the skills and preparation necessary to succeed in graduate school.

In compiling these data we looked at the total number of graduates produced by a college or university in the 10-year period 1978 to 1987. We then examined how many of these graduates earned a Ph.D. in the period between 1986 and 1995, or eight years after the doctoral students earned their bachelor's degrees. This eight-year doctoral window was chosen because the median lag time na-

tionwide between a bachelor's degree and a doctorate for those who have earned a Ph.D. is eight years. Black students who earn a doctoral degree usually take a bit longer to earn a Ph.D. than do white students. By comparing the number of doctoral degrees earned by graduates of a given institution to the total number of bachelor's degrees awarded by that institution, we arrived at a ratio for doctoral productivity.

CalTech is, by a large margin, the predominantly white university with the greatest doctoral productivity among its graduates. Nearly 38 percent of all CalTech graduates go on to earn a doctoral degree. Harvey Mudd College in Claremont, California, ranks second. More than 22 percent of all graduates of Harvey Mudd College go on to earn a doctorate. Princeton University has the highest Ph.D. productivity among the Ivy League colleges. During the 1978 to 1987 period, Princeton awarded bachelor's degrees to 10,775 students. Of these, 1,329, or 12.3 percent, went on to earn a doctoral degree within the ensuing eight-year period.

Among the high-ranking liberal arts colleges, Swarthmore College in Pennsylvania ranked second to Harvey Mudd College. More than 19 percent of all Swarthmore College graduates go on to earn a doctorate.

Spelman College ranks first among the nation's black colleges in Ph.D. productivity. During the 1978 to 1987 period, 2,463 black women earned bachelor's degrees at Spelman. Of these, 157, or 6.37 percent, went on to earn a doctoral degree. This places Spelman in 80th place nationally in Ph.D. productivity. This puts Spelman among the top 6 percent of colleges and universities nationally in Ph.D. productivity.

Following directly behind Spelman in 81st place nationally is Fisk University. Some 6.28 percent of all Fisk graduates go on to earn a doctorate. Both Spelman and Fisk have higher Ph.D. productivity than Dartmouth College, the University of Michigan, Wake Forest University, Colby College, Vanderbilt University, Tufts University, and Emory University.

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In somewhat of a surprise, Tougaloo College in Mississippi ranks third among black colleges and universities in Ph.D. productivity. Of the college's 1,055 graduates during the 1978 to 1987 period, 58 Tougaloo graduates, or 5.5 percent, went on to earn a doctorate. Other black colleges finishing in the top 10 percent of colleges and universities nationally in Ph.D. productivity are Bennett College of North Carolina and Knoxville College in Tennessee. Both of these schools have more than 5 percent of their graduates go on to earn a Ph.D.

Further down on the list is Howard University. Ranking 259th nationally, 375 of Howard's 10,461 graduates earned a Ph.D. This is a rate of 3.58%. In the 1978 to 1987 period, Arkansas Baptist College and Selma University did not produce a single graduate who went on to earn a doctoral degree.

Readers may be surprised to see the relatively strong rankings in doctoral productivity achieved by some of the nation's historically black colleges and universities. But one must remember that in these rankings all categories of doctoral degrees are included. Thus, a black college that produces many graduates who go on to earn doctorates in education will achieve a high rank. And it must be remembered too that more than two fifths of all doctorates awarded to African Americans are in the field of education.

Similarly, a small black college with a religious affiliation may produce a large number of graduates who go on to earn a doctorate of divinity. This may explain the relatively high doctoral productivity rating of colleges such as the predominantly black Allen University in South Carolina, which is affiliated with the African Methodist Episcopal Church.

### **Ph.D. Productivity in the Sciences and Mathematics**

The picture changes for the black colleges and universities when we examine Ph.D. productivity for graduates who go on to earn doctorates in the sciences and mathematics. In this ranking, most black colleges and universities are far down on the list of all four-year colleges and universities in the United

States. In fact, there are only 10 black schools in the top half of the national rankings. Twelve of the black colleges did not produce a single graduate who went on to earn a Ph.D. in the sciences or mathematics during the 1986 to 1995 period.

Before proceeding further, let's review the ranking procedures. As we did before in the doctoral productivity rankings for all disciplines, we examined the total number of graduates at a given college or university in the 1978 to 1987 period. We then looked at how many doctorates were earned by graduates of these schools in the sciences and mathematics during the ensuing eight years after they completed their bachelor's degrees. Dividing the doctoral degrees by the bachelor's degrees, we come out with a Ph.D. productivity ratio.

As was the case with doctoral degrees in general, CalTech had the highest Ph.D. productivity ratio in the nation when we restricted the analysis to Ph.D.s earned in the sciences and mathematics.

Nearly 23 percent of all bachelor's degree recipients at CalTech go on to earn a Ph.D. in the sciences. Harvey Mudd College again ranks second. Of the 1,074 graduates of Harvey Mudd College in the 1978 to 1987 period, 185, or 17.2 percent, went on to earn doctorates in the sciences. Reed College, Carleton College, and the University of Chicago also placed in the top five nationally in

Ph.D. productivity in the sciences and mathematics.

Princeton University ranked highest in this measure among the Ivy League schools. Many of the nation's high-ranking liberal arts colleges fared very well in scientific Ph.D. productivity. Swarthmore, Haverford, Grinnell, Pomona, Bryn Mawr, and Oberlin all finished among the top 25 nationally in Ph.D. productivity in the sciences.

Among the nation's historically black colleges and universities, Fisk University has the highest ranking in Ph.D. productivity in the sciences and mathematics. Of Fisk's 1,482 bachelor's degree recipients in the 1978 to 1987 period, 21, or 1.42 percent, went on to earn a Ph.D. in the sciences or in mathematics. Fisk is the only black college or university at which more than 1 percent of its

*“Among the nation's historically black colleges and universities, Fisk University has the highest ranking in PhD productivity in the sciences.”*

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## The NASA Saturday Academy for Space Science: Cultivating the Next Generation of Astronomers

by *Dara Norman and Vivian Hoette*

**W**e have seen in this newsletter and elsewhere the dismal statistics on the numbers of minority students who receive doctorate degrees in Physics and Astronomy each year. Furthermore, many of us look around our own universities and labs and recognize the lack of diversity. So the question remains, how do we encourage the younger generation of minority students to consider careers in physics, astronomy and space science?

This is the very goal of the NASA Saturday Academy for Space Science (SASS, [www.csu.edu/sass](http://www.csu.edu/sass)) at Chicago State University, a program that began in September of 2002, with a plan to continue through spring of 2006. SASS is open to sophomores, juniors and graduating seniors of Chicago Public Schools (CPS) who are interested in exploring the fields of space science and technology. The broad objectives of the program are to increase student's knowledge, interest and abilities in science and in scientific careers, to enhance student's oral and written communication skills, and to develop their collaborative learning skills.

These objectives are being accomplished by having students participate in a series of structured learning modules that re NASA themes for science education. Each module has a number of common elements which include: hands-on physics laboratory activities; an integrated mathematical component; a field trip or other enriching activity; presen-

tations by active scientists on issues and careers related to the module theme and/or their own research interests.

In the highly successful first year of the program, students studied themes as diverse as optics, expansion of the universe, solar phenomena, and the exploration of Mars. Astronomers and Space Scientists join students as guest speakers last year and are looking forward to this years sessions. Dara Norman (CTIO) explained how images of galaxies taken with 4m telescopes in Chile can be used to study gravitational lensing. Jim Swietzer of the DePaul NASA Center, modeled time since the Big Bang with a history of the Universe scaled on adding machine tape. Bernhard Beck-Winchatz (DePaul NASA Center) set the tone of exploration with his talk on NASA missions which was presented at the orientation. Al Harper, Univ. of Chicago and P.I. of the High-resolution Airborne Wideband Camera (HAWC) infrared imaging camera for the Stratopsheric Observatory for Infrared Astronomy (SOFIA), described the adventures of his career doing astronomy from an airplane; he worked with students as they learned by doing labs to investigate light, visible and invisible using Active Astronomy, classroom activities developed by the SOFIA EPO team.

Students are highly self-motivated to attend. During the first year of the program nearly half completed at least 15 of the 16 Saturday classes. The participants seemed to enjoy the activities and other methods employed in the program to enable them to learn new concepts and skills. Early in last year's program Elizabeth, who is now a senior at South Shore High School, explained, "The program has been really great and I've learned a lot of things that I didn't know just from the two sections I've participated in. So, I'm guessing that by the end of this program I should be an Einstein!"

Students use real data from the Yerkes Rooftop Telescope (a 10 inch Meade) and other data provided through Hands-On Universe ([www.handsonuniverse.org](http://www.handsonuniverse.org)) to complete labs and projects. Of one of these lab sessions, another stu-



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dent commented that this was “My first time looking at outer space [pictures]... I had never dreamed that I would actually be seeing these beautiful images up close and personal on a computer. This image was something that I had only seen in science books and science fiction movies: This experience is great and I will continue to enjoy it!”

Over the final five weeks of the SASS Year One, students worked in school teams to build 7 telescopes. They drilled, sanded, painted, used power screw drivers, measured focal lengths of their mirrors, planned where to put everything in the telescope tubes, and finally learned to collimate their scopes. This year, they are venturing out to Univ. of Chicagos Yerkes Observatory in Williams Bay, Wisconsin, to use their telescopes on skies where the Milky Way is visible! (This is certainly not the case within the city of Chicago.) While at Yerkes they will work with Andy Puckett, Univ. of Chicago, to build a scale model of the Solar System that will help them to know in which direction to point their telescopes in order to observe solar system objects in the night sky.

The hope is that SASS will open the minds of participating students to ideas and experiences that they may have not thought possible before entering



the program. Who knows, maybe one of these new possibilities will be a PhD in Physics or Astronomy.

For more information about participating as a contributor, please email [sass@csu.edu](mailto:sass@csu.edu) or [kg-smith@csu.edu](mailto:kg-smith@csu.edu). For an application for the program, go to [www.csu.edu/sass](http://www.csu.edu/sass) or write to:  
NASA - CSU Saturday Academy for Space Science  
Williams Science Center  
Chicago State University  
9500 S. King Dr.  
Chicago, IL

## PhD Productivity of Historically Black Colleges (cont'd)

*(Continued from page 13)*

graduates go on to earn a Ph.D. in the sciences. Fisk ranks 128th in the nation among four-year colleges and universities in Ph.D. productivity in the sciences. This puts Fisk in the top 10 percent of colleges and universities nationally in this measure of academic success. Fisk has a higher Ph.D. productivity ranking in the sciences than that of Vassar College, Emory University, Tufts University, the University of Notre Dame, Vanderbilt University, and Pennsylvania State University.

Next in the rankings among the black colleges is Lincoln University. Lincoln places 244th in the national ranking as 0.9% of its graduates go on to earn a Ph.D. in the sciences. As a measure of its high ranking, Lincoln University ranks just ahead of Purdue in Ph.D. productivity in the sciences.

When we examined Ph.D. productivity in the sciences and mathematics, Spelman College, which ranked first in the overall doctoral productivity

rankings, places third among the black colleges. Eighteen of Spelman's 2,463 graduates earned a Ph.D. in the sciences during the 1986 to 1995 period. Spelman ranks 320th nationally among all four-year colleges and universities in Ph.D. productivity in the sciences. This places Spelman directly ahead of the University of Rhode Island but behind such schools as Rockford College, Adams State College, and Baker University, institutions generally considered among the nation's third- or fourth-tier academic institutions.

Other black colleges ranking among the top 50 percent of four-year colleges and universities in Ph.D. productivity in the sciences are Tougaloo College, Tuskegee University, Howard University, Morehouse College, Talladega College, Bennett College, and Xavier University.

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## NASA Space Science Diversity Initiatives

by Jeffrey D. Rosendhal and Philip J. Sakimoto, Space Science Education and Public Outreach Program, NASA Headquarters

The NASA space science missions currently envisioned span the next several decades, during which time substantial turnover in the scientific workforce and changes in the Nation's demographics will occur. To prepare for this future, the NASA Office of Space Science (OSS) is conducting a targeted effort to engage underrepresented minorities in space science activities.

### Minority Universities

The first thrust in this effort is the NASA Minority University and College Education and Research Partnership Initiative (MUCERPI) in Space Science. This grants program, carried out in collaboration with the NASA Office of Education, offers minority universities opportunities to develop academic and/or research capabilities in space science. The hallmark of this program—and perhaps the most important key to its success—is that OSS plays an active role in providing guidance and in engaging the community of OSS-sponsored researchers to serve as active partners in collaborations with the minority institutions involved in the program.

The first set of MUCERPI grants were awarded to fifteen minority universities 3 years ago. These grantees have recently reported a remarkable set of success stories. They are engaged in research collaborations with 10 NASA space science missions or suborbital projects and in nearly 50 working partnerships with major space science research groups. In academic programs, they have established on their campuses 25 new or redirected space science faculty positions, 12 new or revised space science degree programs for which nearly 100 students have signed up, and 68 new or revised space science courses with a total enrollment to date of nearly 1,800 students. They are also engaged in a wide variety of teacher training, precollege outreach, and public outreach programs.

These successes clearly demonstrate that vibrant academic and research programs in astronomy and space science can be built at minority institutions provided that sponsoring Agencies offer serious opportunities to do so. Further information on these projects may be found in the OSS Educa-

tion and Public Outreach Annual Report at <http://ossim.hq.nasa.gov/ossepo/>.

After a competitive solicitation conducted during 2003, a second round of MUCERPI awards was announced at the Congressional Hispanic Caucus and Congressional Black Caucus meetings in September 2003. These 16 awards were made to eight Historically Black Colleges and Universities (HBCU), five Hispanic-Serving Institutions (HSI), two Tribal Colleges and Universities (TCU), and one Minority-Predominant Institution (MPI):

- Alabama A&M University [HBCU], Dr. Arjun Tan
- California State University at Los Angeles [HSI], Dr. Charles W. Liu
- California State University at San Bernardino [HSI], Dr. Susan Lederer
- Fisk University [HBCU], Dr. Arnold Burger
- Hampton University [HBCU], Dr. Patrick McCormick
- Medgar Evers College [MPI], Dr. Leon P. Johnson
- Norfolk State University [HBCU], Dr. Carlos W. Salgado
- North Carolina A&T St. Univ. [HBCU], Dr. Abebe Kebede
- Salish Kootenai College [TCU], Dr. Timothy S. Olson
- South Carolina State University [HBCU], Dr. Donald K. Walter
- Southern University, Baton Rouge [HBCU], Dr. J. Gregory Stacy
- Southwestern Indian Polytechnic Institute [TCU], Mr. Kirby Gchachu
- Univ. of the District of Columbia [HBCU], Dr. Abiose O. Adebayo
- University of Houston—Downtown [HSI], Dr. Penny Morris-Smith
- University of Puerto Rico at Mayagüez [HSI], Mr. Rafael Fernandez
- University of Texas at El Paso [HSI], Dr. Ramon E. Lopez

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## Meet Dara Norman at CTIO

by Keivan Guadalupe Stassun

*Dara Norman is completing her tenure as an NSF Astronomy and Astrophysics Postdoctoral Fellow at CTIO in Chile. I met up with Dara on a recent observing run at CTIO and asked her about her personal background and her development as an astronomer.*

**D**ara was born near Memphis, Tennessee, on the naval base where both of her parents were stationed. “Yes, there is a naval base in land-locked Tennessee!” Her family relocated twice until moving to the South Side of Chicago when she was six, where Dara considers herself to have grown up.

Dara remembers being interested in space from a young age, and this interest was encouraged by her mother. “She would allow us to be late for school in order to watch early morning Space Shuttle launches.” But when she announced in her 4th grade class that she wanted to be an astronaut, she was told by her male classmates that “girls can’t be astronauts.” This, says Dara, was the beginning of her resolve to pursue her interest in space.

One of the things that Dara enjoyed about growing up in Chicago was the access to cultural events and museums. When she was young, the Museum of Science and Industry on Chicago’s South Side was free to the public. “It was a short bus ride away. It was great that I was able to decide, on my own, to go to a place of learning.”

Dara attended Kenwood Academy, one of Chicago’s public high schools. With interests in both sports and academics, she was on the swim team for 4 years and on the math team for 3 years. While Dara says that physics was not well taught at her school, the resources available at the University of Chicago played an important part in her continuing interest in science. “Every other year, the University hosted open house days. In the astrophysics lab was the first time I got to see liquid nitrogen evaporate as it spilled out onto the floor!”

In her junior year Dara was accepted into the summer pre-college program at Carnegie Mellon University to take college-level classes in calculus and physics. She performed well enough to be one of two students invited to apply for early admis-

sion. “But I was afraid this meant I would miss my senior year and the prom!”

Dara continued to be involved in sports through her undergraduate years at MIT as a member of both the Women’s Crew and Rugby Teams. These activities would peak years later when she ran (“and completed!”) the New York City Marathon.

One of the most important lessons Dara learned in college is the importance of good mentors. She explains with an anecdote: “In a summer preparatory program for minority freshmen students entering MIT, we had physics lab classes and I paired up with a friend to be lab partners since she and I were both interested in being physics majors. But we were told by the professor that we should instead pair up with boys since ‘they know more physics.’ Eventually, I ended up with a very good adviser, Dr. James Elliot, whom I credit with encouraging me to continue on in science. Thanks, Jim.”

Graduating after 4 “grueling” years, Dara says she was not ready to commit to graduate school despite an offer from her mentor to stay on in his lab. So he helped her find a position as user assistant and public affairs officer for the Goddard High Resolution Spectrograph Team for the soon-to-be-launched Hubble Space Telescope. “Besides reducing and archiving HST data, and working with a great group of astronomers, this position allowed me to go to local schools to give talks about astronomy, participate in press conferences, and help prepare scientific material for press releases.” She worked with the team for 3 years, leaving just before COSTAR was scheduled to be installed.

Now Dara felt ready to begin graduate study, at the University of Washington. It was at this time that Dara began to develop the model for her professional career that she maintains to this day. In addition to research and teaching Dara became actively involved in outreach. “I volunteered to give planetarium shows for student groups, lead science day lectures at local schools. I even presented an astronomy slide show at a local jazz festival.”



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## Meet Dara Norman at CTIO (cont'd)

*(Continued from page 17)*

At about the time she started looking for a thesis topic and adviser, Chris Impey (University of Arizona) visited Seattle for a year-long sabbatical. Being very interested in education, Chris taught the introductory astronomy class that first semester and Dara was one of his TAs. She began working on a project with Chris that would turn into her dissertation topic, Magnification Biasing of Quasars.

“Magnification bias arises because of weak gravitational lensing. Gravitational lensing changes the solid angle of a source but conserves its surface brightness. Faint background objects (QSOs in this case) are brightened into a magnitude limited sample while their number density is diluted because of geometrical effects. A statistical association of high- $z$  QSOs and low- $z$  galaxies suggests that some bright QSOs may be beacons signaling the locations of matter concentrations in the local universe. The strength of this correlation is quantified by the angular two-point correlation function between QSOs and foreground galaxies. It has been shown that the shape and amplitude of the correlation function is significantly different for different choices of cosmological parameters.”

After completing her PhD, Dara took a postdoctoral position at the State University of New York working on—of all things—cool stars with Fred Walter and Michal Simon. “Again, I was lucky to find myself with very good mentors.” This experience gave Dara the opportunity to learn new skills and new wavelengths, including the near-IR, which would prove valuable later on. She also continued her outreach, including an invited lecture at the American Museum of Natural History.

While Dara found scientific life at SUNY rewarding, personal reasons would take her to Chile. Personal reasons? “My fine husband (who is also a fine astronomer!),” she explains with a broad smile.

Dara’s tenure at CTIO, which concludes this year, has been under the auspices of a National Science Foundation Astronomy and Astrophysics Postdoctoral Fellowship. This fellowship is right up Dara’s alley. “In addition to pursuing a research program, fellows are also expected to have an outreach/education component to their work.” Fellowships are awarded on the strength of the research

proposal as well as on the strength of the proposed outreach/education project.

Dara’s proposed research included a continuation of the study of quasar magnification bias using data from the Deep Lens Survey (DLS), one of the NOAO Survey Projects headed by Tony Tyson of Bell Labs. “A primary goal of the DLS is to map out regions of dark matter over-densities in 7 four-degree square fields.”

Dara explains that an advantage of DLS for measuring magnification bias is that galaxies do not need to be used as a proxy for mass in this case. “The distribution of mass is measured directly using weak-lensing shear measurement techniques. However there are very few quasars already known in the survey area, so my work has focused on using near-IR photometry to search for quasars in the DLS. This type of near-IR survey has been made possible recently by new wide-field IR detectors.”

At CTIO, the ISPI instrument began regular use on the Blanco 4m in September 2002, and since Dara plans to use this instrument to continue her research, she has become part of the ISPI instrument team, helping with instrument engineering, characterization, and user assistance.

Dara’s outreach/education work has matured as well, becoming ever more multifaceted, including education projects both in Chile and in the US. In 2001, Dara, Malcom Smith, and David Orellana began a new collaboration with NOAO Tucson designed to create a dialog among teachers interested in expanding astronomy education. The collaboration has supported a series of video-linked workshops, dubbed “Astro-Chile”, between Spanish-speaking educators in Tucson and La Serena. The project has had 3 successful workshops involving discussions of astronomical teaching methods, creation of Spanish language materials, and examples of hands-on activities for use with students.

Dara has also continued to give talks to student groups, both in Chile (in Spanish) and in the US, when she can. “Since I am often in Chicago visiting family, I have taken the opportunity to talk with students participating in NASA’s Saturday Academy for Space Science (SASS) program at Chicago State University.” Dara describes the SASS program in an article which appears on page 14.

## Meet Bryan Méndez at UC Berkeley Space Sciences Lab

by Keivan Guadalupe Stassun

*Bryan Méndez, a recent graduate of UC Berkeley, is presently a Space Science Education and Public Outreach Officer at the UC Berkeley Space Sciences Laboratory. I asked Bryan to share his educational and career path with SPECTRUM readers.*

**B**ryan was born and raised in Traverse City, Michigan, at the base of the Grand Traverse Bay. “It’s the body of water separating the pinky from the rest of the mitten of the Lower Peninsula,” explains Bryan.

His mother and maternal grandparents are all from that area. “But my father immigrated to the United States from Mexico when he was a child with my abuelos,” says Bryan, using the Spanish word for grandparents. With a population of 25,000 within the city limits, Traverse City was the largest city in all of Northern Michigan and was quite homogenous. “So I was always the oddball kid in school with the unusual last name.”

But the small town skies were always very dark, and Bryan found them wondrous. “As long as I can remember I was fascinated by the sky. After watching Star Wars, at the impressionable age of four, I was forevermore lying on the lawn at night gazing out at the stars and imagining the amazing adventures to be had up there.”

But Bryan’s interest in astronomy ultimately came from a place considerably more down to Earth. “I became particularly interested in the study of astronomy after a visit to the Adler Planetarium in Chicago. After that, my parents bought me a 5-inch refractor and a sky chart. I was hooked.”

After high school Bryan attended the University of Michigan in Ann Arbor—“just west of Detroit in the lower thumb area.” Bryan was an ambitious college student, and pursued a triple major at U of M. He double majored in physics and astronomy like most of the other astronomy majors, but he also majored in saxophone performance at U of M’s School of Music. “Music was a passion equal to astronomy for me at the time, and it took me 3 years before I decided which way to go with my life.” Bryan graduated with both Bachelor of Science and Bachelor of Musical Arts degrees.

While at U of M, Bryan primarily worked with Patrick Seitzer in the astronomy department studying the proper motion of Galactic globular clusters with 10-year-old CCD images as well as HST data. He also spent two summers away for internships: the first was at the Space Telescope Science Institute studying the aging of Sun-like stars in the solar neighborhood with David Soderblom, and the second was at the Goddard Space Flight Center studying Galactic giant HII regions in the near infrared with Dr. David Leisawitz.



At U of M, Bryan was also a member of physics and astronomy student groups. And it was while participating in education and public outreach activities with these groups that he developed a strong interest in teaching.

After five years at Michigan Bryan went straight into graduate school at UC Berkeley, where he found the opportunity to continue his interests in both research and teaching simultaneously. “During the first year, I was a graduate student instructor for introductory astronomy classes and discovered that I had knack and passion for teaching.” Bryan indeed loves to teach, so much so that he went on to teach every year he was at Berkeley, including designing his own courses. He also volunteered in local classrooms through Project ASTRO, was the public liaison for the astronomy department, and was a volunteer scientist for MadSci.org, where people come to have their questions on science answered by experts.

At the end of his first year Bryan began working with Dr. Marc Davis of UC Berkeley’s Physics and Astronomy departments. “He had a ‘little summer project’ for me that would tide me over until the DEEP project was underway. It turned out to be ‘the little summer project that could.’ It blossomed and grew into my dissertation project, which was lucky since the DEEP project did not see first light until my final year.”

The project involved probing the peculiar ve-

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## Professional Organizations Serving Minorities in the Physical Sciences (cont'd)

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teacher at the SACNAS Annual National Conference with its Distinguished K-12 Educator Award, presented to an individual who best inspires the next generation of minority scientists.

Numerous SACNAS activities also aim to enhance experiences of minorities pursuing advanced degrees in technical fields. SACNAS is involved with numerous summer programs, including the Mathematical Theoretical Biology Institute-Cornell-SACNAS Mathematical Sciences Program and the Summer Institute in Mathematics for Undergraduates at the University of Puerto Rico, Humacao. Additionally, SACNAS participates in the SACNAS/NINDS Neuroscience Scholars Fellowship Program which gives students the opportunity to conduct neurology-related research.

Through its efforts to improve K-12 education and enhance student experiences, SACNAS aims to increase the numbers of Chicanos and Native Americans in the highest levels of academia and research.

### National Society of Hispanic Physicists

Similar to the NSBP, the National Society of Hispanic Physicists (NSHP) serves to support and develop the careers of Hispanic physicists and students. Through a grant from the Sloan Foundation and coordination of the Pan-American Association of Physics, the first NSHP meeting was held in 1996 in Austin, Texas. Since its founding, the NSHP has held joint annual meetings with other professional organizations like SACNAS, the American Physical Society, and the American Association of Physics Teachers. Particularly, NSHP has held numerous special sessions at SACNAS National Conferences to promote interest in physical sciences. These efforts have generated a sizeable physics presence in the SACNAS community.

As the NSHP is a new organization, it is still developing its strategy to address Hispanic representation in the physical sciences. NSHP leadership has considered numerous projects to establish its identity, including active recruitment of Hispanic-American students for participation in the NSF Research Experience for Undergraduates (REU) Programs. Additionally, the NSHP plans to increase its

involvement and participation with other professional organizations and federal agencies.

### American Physical Society Committee on Minorities

The Committee on Minorities in Physics (COM) is an outreach committee of the American Physical Society. Programs and activities include:

#### *Travel Grants for Minority Speakers*

The APS has compiled the names and talk titles of women and minority physicists who are available to give colloquia. These lists (minority speakers and women speakers) are indexed by field of physics and state, and are available from the APS Education & Outreach Department. Members may enroll in the minority speakers list via the web. APS also provides small travel grants to physics departments to fund visits by minority and women colloquium speakers. Departments can apply by completing the online form at: <http://www.aps.org/educ/com/minority-app.html>

#### *Minority Scholarship*

The award consists of \$2000 per year for new scholars, and \$3000 per year for renewal students to be used for tuition, room & board, and educational materials. In addition, each physics department that hosts one or more APS minority undergraduate scholar and assigns a mentor for their student/s will receive a \$500 award for programs to encourage minority students.

Any African-American, Hispanic American, or Native American U.S. citizen or permanent resident who is majoring or planning to major in physics, and who is a high school senior, college freshman, or sophomore is eligible to apply.

For more information on these organizations and their efforts to increase participation of underrepresented minorities in the physical sciences, please see their respective websites:

NSBP: <http://www.nsbp.org>

SACNAS: <http://www.sacnas.org>

NSHP: <http://physics.utep.edu/nshp/nshp.html>

APS: <http://www.aps.org>

## Meet Laura Lopez at MIT

by Keivan Guadalupe Stassun

Originally from Barrington, Illinois, Laura Lopez is a senior at MIT majoring in physics with minors in astronomy and political science. She is a two-time recipient of the American Physical Society Corporate Minority scholarship, and she has presented posters at the 202nd American Astronomical Society meeting in Nashville and the Women in Astronomy II meeting at Caltech.

Currently, Laura is working with Dr. Herman Marshall of the MIT Center for Space Research to model the X-ray spectrum of SS 433 taken with the Chandra High-Energy Transmission Grating Spectrometer. SS 433 is thought to be a binary consisting of a large blue normal star supplying gas to a compact object and ejects a small portion of the accreted material in twin, oppositely directed jets at 26% of the speed of light.

Observed while the companion eclipsed the receding jet, Laura is using the X-ray spectra model, in conjunction with optical data, to deter-

mine the system's physical properties. This analysis will give new clues regarding the evolutionary state of the binary, the nature of the compact object, and the jet formation process. The work will be published in the *Astrophysical Journal*, and Laura will present the final results in a press conference at the January 2004 AAS meeting in Atlanta. She is writing her undergraduate thesis on similar work, and for her doctoral degree she hopes to continue working as an observational astronomer.

Laura is also actively involved in a number of minority outreach activities, including participation on the AAS CSMA, and has organized an Undergraduate Women in Physics group at MIT.

Laura is applying to astronomy graduate programs this year.



## Meet Bryan Méndez at UC Berkeley SSL (cont'd)

(Continued from page 19)

locity field of the very local Universe, within 10 Mpc, which had previously been observed to be remarkably cool but predicted by quasi-linear models based on IRAS galaxies to be much hotter.

“We required consistent and accurate distances to galaxies within this volume. The regions of most interest were above and below the SuperGalactic plane where a strong quadrupolar flow was predicted to have largely depopulated the regions of galaxies. The galaxies in these regions are primarily early-type dwarfs and dwarf irregulars, which are not good candidates for Cepheid or Surface Brightness Fluctuation studies. Therefore we used the tip of the red giant branch (TRGB) as our distance indicator to galaxies within this local volume. We made use of Keck and HST observations and developed more statistically robust methods for measuring TRGB magnitudes and estimating their uncertainties. In the end, we found that the predictions of

IRAS models, with  $\beta = 0.5$  and  $H_0 = 73$  km/s/Mpc, were statistically consistent with the observed peculiar velocity flow.”

After graduation from Berkeley's astronomy department in December 2002, Bryan started work at the UC Berkeley Space Sciences Laboratory (SSL) as part of the Center Science Education (CSE@SSL), which is under the direction of Dr. Isabel Hawkins.

“I've turned my love for teaching and sharing science with the public into a new career.” Bryan is now a Space Science Education and Public Outreach Specialist. He develops educational materials, conducts teacher training in space science, and develops public programs for several NASA funded missions and projects.

“I find this work extremely rewarding and plan to continue with it for the foreseeable future,” says Bryan.

## NASA Space Science Diversity Initiatives (cont'd)

*(Continued from page 16)*

Eight of these institutions will be developing research capabilities in various areas of space science through partnerships with major space science research institutions. In addition, all 16 of them will be improving their academic capabilities in space science at various levels in the educational system, including 14 who are developing undergraduate courses or degree programs, three who are developing graduate courses or degree programs, 13 who are developing precollege outreach or teacher training programs, and six who are engaging in Public Outreach activities.

Each of the MUCERPI-2003 awards is a three-year grant offering up to \$275,000 per year over the period from January 1, 2004, to December 31, 2006. More than 50 major OSS-sponsored research or educational institutions will be active partners in these projects. Synopses of each project and a full list of the partners may be found at <http://spacescience.nasa.gov/education/news> in the January 2004 issue of the OSS Voyages newsletter.

### Chicago 2004

The second thrust of OSS's diversity efforts is a response to discussions held over the past several years with leaders of various professional societies of minority scientists and also to a strong recommendation of the NASA Space Science Advisory Committee's Task Force on Education and Public Outreach (E/PO) that OSS "expand and intensify" its "pioneering efforts to attract and better integrate minorities into E/PO projects and into the mainstream of OSS science programs."

As a result, OSS is sponsoring Chicago 2004: A Workshop to Foster Broader Participation in NASA Space Science Missions And Research Programs. This workshop is aimed at bringing together NASA personnel, current OSS-funded scientists and educators, and a diverse array of scientists and educators who are interested in participating in future OSS missions and research programs. A specific goal of the workshop is to seed personal contacts among a much more diverse community of investigators than has traditionally been active in NASA space science missions. In addition, all par-

ticipants are expected to gain insights and contacts leading to a better understanding of how the NASA space science program is organized, planned, and conducted; how missions and research programs are conceived; how mission and research teams are formed; and how successful proposals are constructed.

The workshop will be held at the Hilton Chicago on June 28-29, 2004. Participants will engage in two full days of briefings and discussions with ample time for sharing experiences and interests, developing insights, and forming partnerships, culminating in a grand networking picnic supper that all participants are urged to attend.

Strong participation by members of the AAS will be a major key to the success of this workshop. For further information and to sign up for the workshop mailing list, please visit <http://analyzer.depaul.edu/Chicago2004>.

The meeting poster is shown on the facing page.

Additional information on these initiatives may be obtained from the OSS Diversity Coordinating Committee by contacting:

Dr. Philip Sakimoto, Space Science Education and Public Outreach, NASA Headquarters (E-mail: [Philip.J.Sakimoto@nasa.gov](mailto:Philip.J.Sakimoto@nasa.gov)),

Dr. Lynn Narasimhan, NASA/OSS Broker/Facilitator, DePaul University (E-mail: [cnarasim@depaul.edu](mailto:cnarasim@depaul.edu)), or

Dr. Charles McGruder, Western Kentucky University and Past President, National Society of Black Physicists (E-mail: [Charles.McGruder@wku.edu](mailto:Charles.McGruder@wku.edu))



# CHICAGO 2004

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## A Workshop To Foster Broader Participation in NASA Space Science Missions and Research Programs

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*A diverse cadre of scientists, assembled from a broad range of institutions, is essential to the future success of NASA space science missions and research programs.*

—Dr. Edward J. Weiler, NASA Associate Administrator for Space Science

**The NASA Office of Space Science (OSS) invites**

- current and prospective OSS-sponsored investigators;
- minority university faculty and administrators, members of professional societies of minority scientists, and underrepresented minority scientists/educators seeking to work with OSS; and
- scientists, educators, and others interested in supporting the workshop goals

**to participate in briefings and discussions on**

- future OSS mission and research program plans and opportunities,

- how successful mission and research teams and proposals are put together, and
- how plans and solicitations for future OSS missions and research programs are developed and publicized and how proposals are reviewed and selected

**with ample time for**

- sharing experiences and interests,
- developing insights, and
- forming partnerships leading to broader participation in future OSS missions and research programs.

**The Hilton Chicago, June 28–29, 2004**

<http://analyzer.depaul.edu/Chicago2004>

Committee on the Status of Minorities in  
Astronomy

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*(CSMA) is a Standing Committee of the*

*American Astronomical Society.*

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