

# SPECTRUM



*A report on underrepresented minorities in astronomy*

## Will Your Diversity Initiative Work?

by Grant Ingle, University of Massachusetts, Amherst

*Good intentions must be matched with careful planning and deliberate follow-through.*

**Y**ou hear from colleagues that your dean is assembling yet another diversity committee. For years, you have strongly advocated addressing diversity issues at the faculty, staff, and student levels, yet you're dreading that call from the dean. In the past, you have dutifully agreed to serve on diversity committees only to see the resulting recommendations end up on a shelf somewhere, never to be examined, discussed, or implemented.

First, a new crisis refocused campus attention elsewhere. Next, leadership changed, and the new leader didn't pursue the diversity initiative begun by his or her predecessor. At other times, it wasn't clear why the recommendations went nowhere. How can you assess the credibility, practicability, and likely success of a diversity initiative? Before joining that committee, make sure it has a chance of success. See if the following conditions apply to your initiative.

1. *The communications about the initiative, on and off campus, are comparable to those for a capital campaign.* A campus-wide diversity initiative is a major campaign, and its communications should reflect that level of importance and seriousness. Its intent is to get you and other members of the campus to contribute your time, expertise, and energy to help build a better campus. The communications should make it clear that you are being asked

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## Contributions from the First Half-Century of African American Solar Astronomers

by Hakeem Oluseyi, University of Alabama, Huntsville

**A**frica's contribution to astronomy extends beyond her shores. The full contributions of the African diaspora to humanity's advancement in the fields of astronomy and astrophysics must take into account those individuals dispossessed of their African homeland in centuries past but not of their African heritage or identity. A particularly prolific group has been the African American astronomers.

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*Hakeem Oluseyi is an assistant professor of physics at the University of Alabama, Huntsville. His research focuses on the development of instrumentation for the study of astrophysical plasmas.*

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### HIGHLIGHTS:

- Learn about the pioneering work of African American solar physicists.
- Find strategies for helping to ensure the success of diversity initiatives at your institution.
- Read about current trends in the repurposing of affirmative action and other diversity-related programs in the wake of legal challenges.
- See the importance of programmatic assessment through the case study of an NIH-funded diversity initiative.

## Will Your Diversity Initiative Work? (cont'd)

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to join a change process, not just a committee. Expect to see a website and other well-crafted communications that describe the effort.

2. *The initiative has an explicit goal or set of goals.* Materials describing the effort should have explicit, preferably measurable goals, such as increasing the recruitment and retention of students of color, or creating a more inclusive and equitable campus community. A statement of goals not only clarifies the intended outcomes of a diversity effort but also manages expectations about what the effort hopes to accomplish. In addition, a statement of goals can help members of the campus to gauge the level of the campus leadership's commitment to the initiative.
3. *The initiative has a realistic time frame.* The first full cycle of an effective diversity initiative will require roughly the same amount of time demanded by a major capital campaign—five to ten years—and this time frame should be evident from the start. A diversity initiative needs a planning phase, an assessment phase, an implementation phase, and then reassessment. Experience shows that it often takes two to three years after implementation to see initial trends in reassessment data and five or six years to demonstrate statistically (and practically) significant differences.
4. *A rationale or "business case" has been put forward explaining why this diversity initiative is critical to the long-term educational mission of the campus.* A campus diversity initiative should not stand by itself but rather have a rationale that is directly integrated into the mission of the campus. For example, the diversity initiative might be framed as a way to increase the social and cultural diversity of a campus so it can provide a competitive education needed by all students

*"A campus-wide diversity initiative is a major campaign, and its communications should reflect that level of importance and seriousness."*

*"Too often, diversity-related change is driven by crises, incidents, or the arrival of a new leader rather than by reliable information..."*

to succeed as citizens in the twenty-first century.

5. *The initiative is driven by a recurring cycle of assessment.* Too often, diversity-related change is driven by crises, incidents, or the arrival of a new leader rather than by reliable information about the status of diversity on the campus.

Credible initiatives are grounded in solid assessment information that clearly identifies the current state of affairs and specific problem areas. These assessments are used to develop and implement needed changes, which are then subject to another assessment cycle three to six years later to see what improvements have occurred and what

still needs to change.

6. *A written plan or process exists to identify, approve, implement, and evaluate the changes for effectiveness.* There should be no doubt about the steps by which proposals for change emerge and then move forward. If proposals are to be forwarded to campus leadership for approval, all parties should agree in advance that every proposal will receive a full response. The plan should also specify that proposals for change be based explicitly on problem areas documented by the assessment results. Although this linkage may seem obvious, diversity initiatives can suffer over time from a disconnection between documented problem areas and plans for improvement. This form of "mission drift" can easily occur as other agendas emerge and times and issues change. Early on, every proposed change must be linked to an assessment result that can easily be reassessed to see if progress has taken place.
7. *Campus leadership is committed to devoting the staff and financial resources necessary to implement recommendations emerging from the*

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## African American Solar Astronomers (cont'd)

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The early history of African American intellectuals in the West is characterized by their struggle to persevere in an environment where they were generally considered to be mentally inferior to whites, regardless of the thoughts they possessed. Moreover, their general station in life subjected them to daily humiliation, emasculation, and abhorrence. There were those who did persevere, however, and were able to achieve intellectually despite

these circumstances.

One of the earliest known exhibitors of Black African mental prowess in the Americas was Thomas Fuller (1710-1790). Fuller was known to be capable of instantaneous unit conversions for any intervals of time or space. He could also calculate in his head the values of a geometric series to the seventh power. Fuller was born in West Africa and sold into slavery at the age of 14. It is suggested that he possessed his calculational abilities prior to arrival in the Americas.

A more well-known early African American intellectual, generally considered to be the first African American with a serious interest in astronomy, is Benjamin Banneker (1731-1806). Banneker was known to have taught himself mathematics and astronomy, and successfully predicted the solar eclipse of April 14, 1789. By 1791 he had created and published an almanac for Pennsylvania, Delaware, and Maryland.

The first African American to achieve the Ph.D. degree was Edward A. Bouchet. Dr. Bouchet was actually the sixth American of any race to earn a Ph.D. He obtained his in the field of Physics from Yale University in 1876. The topic of his dissertation was geometrical optics. Dr. Bouchet also has the distinction of being the first American Ph.D. recipient to NOT receive a faculty position. This did not occur again until 1954.

The first African Americans to become modern, professional astronomical researchers appeared in the second half of the 20th century. Among the early pioneers, these individuals overwhelmingly focused their research activities on the study of the Sun and its influence on the interplanetary environment. Below, we introduce the reader to the African American researchers in the field of solar physics.

The Sun is unique among all stars by being the only one close enough to the Earth for us to observe the details of its surface phenomena. Because of this, it serves as the only existing astrophysical plasma laboratory wherein the resolved observation prevails over speculation. The realm of solar physics involves studies covering four regions of the Sun and its atmosphere: 1) the solar interior, 2) the near-Sun atmosphere, 3) the solar wind and interplanetary environment, and 4) the extension of dis-

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### SPECTRUM

Edited by

Keivan G. Stassun  
Vanderbilt University  
keivan.stassun@vanderbilt.edu  
*and*

Laura A. Lopez  
University of California, Santa Cruz  
lopez@ias.edu

Published by

The American Astronomical Society  
2000 Florida Avenue, NW, Suite 400  
Washington, DC 20009  
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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.

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## As Colleges Open Race-Exclusive Programs to All, Some Minority Students May Be Left Out in the Cold

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Francesca P. Rothenbacher hesitates to even discuss the hot-button issue of affirmative action. She says she was not out to prove a point when she sought admission, as a white woman, to an on-campus summer enrichment program previously advertised as reserved for black, Hispanic, or American Indian students.

A biology major, Ms. Rothenbacher says she applied to the research in science and engineering program, jointly operated here each summer by Rutgers University and the University of Medicine and Dentistry of New Jersey, because “I just wanted to further my career. That is the most important thing to me.”

Regardless of her intentions, Ms. Rothenbacher, a senior at Delaware State University, is one of many white or Asian-American students around the nation who are profoundly changing the complexion of college programs that had been established for members of other racial and ethnic groups.

Over the last three years, mainly in response to the two June 2003 landmark U.S. Supreme Court rulings defining the limits of affirmative action, colleges across the country have been concluding that they are in legal jeopardy if they continue to offer some services or benefits solely to minority students. As a result, the institutions have been abandoning the use of race-exclusive eligibility criteria in determining who can be awarded scholarships and fellowships or can participate in recruitment, orientation, and academic-enrichment programs (*The Chronicle*, March 19, 2004).

The State University of New York System’s Board of Trustees has voted unanimously to expand the eligibility criteria for a \$6.2-million fellowship program and a \$649,000 scholarship program that previously had been restricted to black, Hispanic, and American Indian students. And officials of the Southern Illinois University system have sought faculty input on a plan to change the eligibility criteria for three minority fellowship programs in response to the threat of a lawsuit by the U.S. Justice

Department.

Many of the programs have shifted their focus from increasing minority access to education to serving the broader and more abstract goal of promoting campus diversity. Many have taken in sizable numbers of white or Asian-American students without expanding in size over all. As a result, they are serving fewer students from the minority groups that they previously had sought to help—a development that dismays some advocates for minority groups, as well as people engaged in efforts to diversify certain professional fields.

“You have to ask how effective the programs are for anybody at this point,” argues Richard G. DiFeliciano, vice president for enrollment at Ursinus College, which has bucked the trend by choosing not to open a summer orientation program to white or Asian-American students. “I think damage has been done.”

But Roger B. Clegg, general counsel for the Center for Equal Opportunity and the leader of a campaign to press colleges to abandon race-based eligibility criteria, disputes such assessments. He suggests that colleges are finding alternative ways to reach out to minority students, such as putting more money into programs that serve anyone with financial need.

“We are not trying to foreclose opportunities for anybody,” says Mr. Clegg. “We are trying to open them up.”

### Altered, or Ended?

Assessing the full impact of changes in race-exclusive programs is difficult. Many colleges contacted by *The Chronicle* were reluctant to discuss the subject. Some said it is too early to tell how the programs will be affected in the long run. Others refused to provide a numerical breakdown of which racial or ethnic groups are now being served by the programs, saying that doing so would violate students’ privacy.

Virginia Tech officials reported that their institution had discontinued “a few” race-exclusive pro-

“... colleges across the country are concluding that they are in legal jeopardy if they continue to offer some services solely to minority students.”

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grams, including an internship program and a precollege summer program for minority students. It has opened up other such programs to any racial or ethnic group, while embarking on new efforts to reach minority students through programs geared toward the economically disadvantaged.

Neither supporters nor critics of affirmative action could cite other examples of programs that have been discontinued by colleges in recent years. But that does not mean that no other programs have been shut down, argues Daryl E. Chubin, who has worked extensively with colleges' minority programs as director of the Center for Advancing Science and Engineering Capacity at the American Association for the Advancement of Science. "No college that has had a program like this is going to advertise that it has abandoned it," he says.

Mr. Clegg says the Center for Equal Opportunity has not sought such outcomes. "In winning the debate in the court of public opinion, we don't want to be out there trying to end scholarship programs or end summer programs," he says. "We want to be in the position of supporting programs that also support the inclusion of all racial or ethnic backgrounds."

"Bureaucratically," he says, "it is easier to persuade a school to change a program than to end it."

In some cases, colleges have even overhauled their own administrative structures to avoid the appearance of providing certain services solely to minority groups. Officials at Cornell University, for example, reported that their institution had created new positions in its central administration charged with promoting diversity in a broadly defined sense. Meanwhile, the university's undergraduate schools and colleges have been renaming their various "minority" offices as "diversity" or "multicultural" offices to reflect the full range of students served.

Mr. Chubin says that many colleges are responding to fears of litigation by giving their general counsel's office much more say over the administration of programs that serve minority students. He argues that when control of such pro-

grams shifts from educators to lawyers, "essentially, the character is changed," and the programs become much less focused on the goals for which they were established.

Shirley M. Malcom, the head of the program in education and human resources at the American Association for the Advancement of Science, says she fears that such college programs are suffering from "benign neglect" as their administrators become more concerned with avoiding accusations of racial discrimination than with "trying to build the talent pool for the country."

### Redefining 'Underrepresented'

Most colleges that have opened up race-exclusive programs to other groups have done so by expanding the eligibility criteria to include white and Asian-American students who are somehow disadvantaged.

*"... when control of programs shifts from educators to lawyers, essentially, the program's character is changed ..."*

Among them, Tufts University has altered the eligibility criteria for both a summer research program and an internship to essentially define the "economically disadvantaged" as a separate minority group that is underrepresented in the sciences.

The University of Delaware's provost, Daniel Rich, says that his institution has changed a scholarship program so that, rather than being reserved for members of racial or ethnic minority groups, it now is available to students who are part of the first generation of their family to attend college; who have been through "challenging social, economic, educational, cultural, or other life circumstances"; or who are deemed financially needy based on federal financial-aid criteria. Mr. Rich reports that about 30 percent of the students nominated for scholarships last year were white, and says "the new program is better because it attracts more nominations and supports more students from more diverse backgrounds."

Other institutions, such as Saint Louis University, have opened programs to white or Asian-American students who show a commitment to promoting diversity.

In some situations where such programs already had been accepting a few white students, colleges have removed words such as "minority" from their titles, to make it absolutely clear that no one

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## NIH Told to Get Serious About Giving Minorities a Hand

by Jeffrey Mervis, reprinted with permission from *Science* magazine

***A National Academies' report says that these controversial programs can't be assessed without better data—and better management.***

After more than 3 decades of trying to increase the number of minority biomedical researchers, officials at the National Institutes of Health (NIH) have a raft of anecdotal evidence that its training programs are working. One favorite success story is Erich Jarvis, a neuroscientist at Duke University in Durham, North Carolina, who, as an African-American student from Harlem, was supported by some of those programs and who in 2002 was named the nation's top young scientist. The program managers themselves exemplify NIH's goal of diversifying the nation's biomedical research workforce. Clifton Poodry, head of the division of Minority Opportunities in Research at the National Institute of General Medical Sciences (NIGMS), was born on the Tonawanda Seneca Indian Reservation in Buffalo, New York, for example, and spent 2 decades as a successful academic researcher before joining NIH.

But personal success stories aren't the same as hard data. And good data, says a recent report by a National Academies' National Research Council (NRC) panel, don't exist. Asked to assess the programs, the panel threw up its hands. It is devilishly difficult to track participants through their training and into the workforce to find out if they have indeed achieved the gold standard of becoming biomedical researchers, the panel concluded. NIH hasn't invested the time, money, or high-level interest needed for a proper evaluation, it added, nor shared what data do exist.

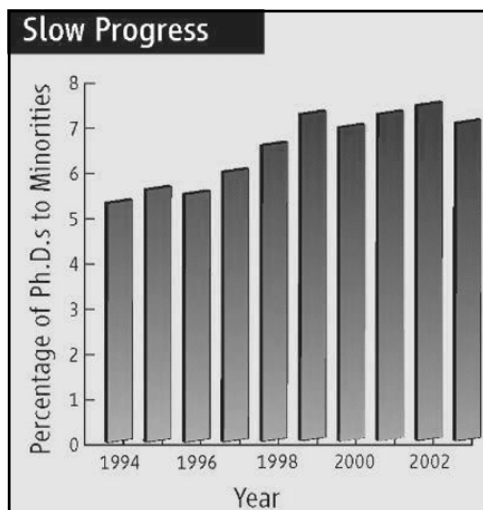
"There's no good way to track the success of these programs," says John Bailar, emeritus University of Chicago statistician and co-chair of the panel, part of NRC's Board on Higher Education

and Workforce. "We were asked to find out what works, and we couldn't do it because of serious problems with the data." NIH can't even say how many participants are actually minorities, it noted, much less how well its programs are doing in churning out minority scientists.

The report's list of flaws is long and damning. Panel members deplored the lack of coordination among the programs, which are run by one or more of NIH's 27 institutes and centers. They questioned NIH's definition of success—the production of Ph.D. biomedical researchers good enough to win NIH funding—given the considerable opportunities open to those with less training and the importance of raising the level of public scientific literacy. They also pointed to a lack of commitment from the top. A meeting of minority-training coordinators convened by the panel, Bailar noted, was the first time all had been together in the same room. And even the report's most basic recommendation—that NIH convene such a group and have it draw up guidelines for a thorough evaluation—has yet to be implemented more than 6 months after NIH officials were briefed on the report.

"The root problem is that these programs have suffered from a lack of sustained high-level interest," Bailar asserts. Despite dedicated administrators such as NIGMS's Poodry and John Ruffin, who heads NIH's National Center on Minority Health and Health Disparities, Bailar says that "a lot of senior managers view these programs as an obligation and don't give them the attention they deserve."

Even so, the paucity of good data didn't prevent the panel from concluding that the programs are essential. Indeed, it recommended that "NIH should commit to the continued funding of minority-targeted research training programs." At a time when programs that favor members of a particular race or gender are under assault (*Science*, 25 July



Source: National Institutes of Health.

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2003, p. 455), supporters worry that the lack of an adequate assessment could be a serious problem.

### Stinging rebuke

NIH has a long history of addressing the serious underrepresentation of African Americans, Hispanics, Native Americans, and Pacific Islanders in biomedical research. Some 79 programs serve populations from community college students to postdoctoral fellows. Despite some gains, the current output is tiny—108 blacks, 175 Hispanics, and 11 Native Americans earned biological science Ph.D.s in 2003, for example—and their 7.3% share of the total number of degrees awarded is a far cry from the group's 25% presence in the general population.

The NRC panel examined 49 programs that ran between 1970 and 1999. After spending more than 4 years and \$1.5 million, the panel delivered a stinging rebuke of NIH management practices.

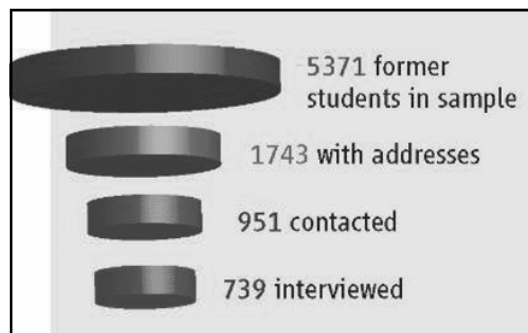
One problem, according to the panel, is NIH's narrow definition of success. What the agency wants, in the words of veteran NIH training administrator Walter Schaffer, is "people who can do research and sit on our review panels and advisory boards." But although few participants make it through the doctorate—nobody has a clue what percentage—many still contribute to the biomedical sciences after earning a lesser degree. "Many of these programs serve quite a different population than the typical NIH training program, so a lower rate of success isn't very surprising," says Bailar. As a result, the panel concluded, NIH should consider a "broader definition of success."

Another sticking point is the inaccessibility of relevant data. Project directors submit annual progress reports, but the data generally do not include longitudinal information on a student's entire academic career. "Once a student leaves, what's the motivation for an institution to track them?" asks Ruffin. And even when grantees dig out that information and submit it to NIH in their annual reports and renewal applications, the agency hasn't found a way to compile it and use it effectively. "We had an electronic database that was also supposed to serve

as a tracking mechanism," says Adolphus Toliver, who runs both the Bridges to the Baccalaureate Degree program and the Minority Access to Research Careers program for upper-level honors students. "But it didn't work, so we stopped using it."

A third problem is that students don't necessarily remain in minority-training programs throughout their education. Even programs that link different types of institutions—such as the Bridges to the Baccalaureate Degree from community colleges to 4-year institutions, and the Bridges to the Doctoral Degree from master's to doctoral programs—don't promise students a slot as they advance. That undermines the program's effectiveness, not to mention making it harder to track students.

One of the biggest complaints from the NRC



**Data deficit.** NIH contractors got information from only one in seven former trainees they had hoped to interview. Source: NIH.

panel is that NIH officials were unwilling or unable to make program data available for a rigorous analysis. NIH shared the data with a private contractor, who surveyed participants and project directors. The response rates were as low as 8%, however. "The NIH data contract achieved a very low response rate," the panel concluded. "As a result, there is a high likelihood of bias among the survey results."

The restriction also prevented the NRC panel from doing its own analyses, Bailar adds.

In the long run, the failure to support claims of success could hurt these programs, which are already under threat from those who disapprove of race-based preferences. In November, for example, the U.S. Justice Department threatened to sue Southern Illinois University for running three such programs, one a "bridges" effort for underrepresented minorities pursuing science degrees, funded by the National Science Foundation (*Science*, 25 November 2005, p. 1263). Even agencies that support minority preference may balk because the evidence for these programs is weak. "When I briefed NIH on the report," says Bailar, "some of the institute directors said: 'You haven't shown any evidence that it produces a lot of Ph.D.s. So why should I bother to fund it?'"

Jarvis and Poodry harbor no doubts about the

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## As Colleges Open Race-Exclusive Programs... (cont'd)

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will be turned away based on race or ethnicity. Colleges are often now promoting the programs more aggressively to populations that had not been sought out in the past.

In most cases, colleges have not changed the lessons or activities offered by the programs. There are exceptions, however. The Tri-Co Summer Institute, a one-week orientation program for incoming freshmen jointly offered by Bryn Mawr, Haverford, and Swarthmore Colleges, took in its first cohort of white students last summer. It not only expanded from about 65 students to about 85, but also ended up altering the activities related to its focus: discussing issues related to race, gender, and class.

"Definitely, we have to say that the character of the program changed," says Darryl M. Smaw, Swarthmore's associate dean for multicultural affairs.

Just as in past years, the program conducted workshops in which students broke off into small, segregated groups that discussed what their particular racial or ethnic identity meant to them, and then reported back to other participants. For the first time, however, there were white students on hand to break off and share their own experiences before joining the broader discussion.

"It was really interesting to watch the white group this year. A lot of people had never talked about 'whiteness,' or what that term means to them," says Deluwara Ahmed, a Bryn Mawr sophomore of Bangladeshi descent who took part in the program two summers ago and helped run it this last time around.

Ms. Ahmed says that all of the institute's participants benefited from such discussions because "whiteness is a culture that is completely denied, when it is obvious that there are many codes that do exist in the culture that are not talked about."

### Fairness and History

Issues of race were barely discussed by the students participating in the research in science and engineering program that operated here last summer, mainly at the Busch campus of the University of Medicine and Dentistry of New Jersey.

Of the 20 students in the program, 10 were Hispanic, with six coming from colleges in Puerto Rico and another having been born and raised in Peru. Five were black, with two having been born in Africa and two others being the children of Jamaican immigrants. The two Asian-American participants were a young man of Korean ancestry and a young woman who had immigrated from Vietnam. Of the three white participants, one was a young man who routinely identifies himself on applications as "African-American" because his father was raised in Egypt.

Although the students differed in their views of affirmative action, most preferred not to discuss issues of race and seemed much more preoccupied with the mathematics, science, engineering, and laboratory work that the program revolved around.

"Right now, I don't consider myself a minority," said Devin D. Downing, a junior from the University of Maryland-Baltimore County who is black. "I don't want to be defined by the color of my skin."

"I am an intelligent person, a person who exhibits such-and-such characteristics," Mr. Downing said. "I don't just want to be 'a black guy.'"

Samuel C. Dokko, a Korean-American junior from the University of California at Santa Cruz, said his involvement in the program "was not about race, but being part of a program that caters to an undergraduate who wants to get research experience."

The program, established in 2001, had initially billed itself on its Web site and brochures as being for minority populations that are underrepresented in engineering and the sciences, even though it has always accepted some white and Asian-American students who seemed unlikely to get access to such research opportunities at their own colleges. In 2003, the program revised its promotional materials to make clear that it was not race-exclusive. Its overall goal remains diversifying the ranks of people seeking advanced degrees in the fields it covers.

"I have two commitments, and I try to balance them" in deciding who participates, says Jerome A.

*"When colleges have refused to open their programs to any race or ethnicity, advocacy groups have routinely filed complaints ..."*

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Langer, the program's co-director. The first is trying to help remedy the effects of the nation's history of discrimination. The second is maintaining "an element of fairness for the kids living now."

### Change Agents

Many of the colleges that have opened up race-exclusive programs have done so in response to letters of complaint from the Center for Equal Opportunity and a second nonprofit advocacy group, the American Civil Rights Institute. "We are making a real effort to visit the Web site of every college and university in the country over the next year" to look for evidence of race-exclusive programs, says the center's Mr. Clegg.

When colleges have refused to open their programs to any race or ethnicity, the advocacy groups have routinely filed complaints with the U.S. Education Department's Office for Civil Rights. The complaints accuse the colleges of violating Title VI of the Civil Rights Act of 1964, which prohibits discrimination in education. Based on those complaints, as well as similar ones filed by other affirmative-action critics, the civil-rights office has investigated more than a half-dozen colleges, several of which have opened up their programs in response.

The U.S. Justice Department got involved last year, threatening in November to sue the Southern Illinois University system in response to a Center for Equal Opportunity complaint about three fellowship programs on the system's Carbondale campus. The Justice Department sent a letter to the system alleging that it was violating Title VII of the Civil Rights Act, which prohibits employment discrimination, by reserving the fellowships for women or members of minority groups.

Among the colleges investigated by the Education Department's civil-rights office was Washington University in St. Louis, which had been operating two race-exclusive scholarship programs. In a letter sent to that office in October, the university said that both programs had been opened up as of the current academic year, and that, as a result, white students had received 12 of 42 scholarships offered by one, and five of 20 scholarships offered by the other.

Not every college has backed down in response to such investigations. As of last week, both Pepperdine University, in California (*The Chronicle*, January 23, 2004), and the University of Wisconsin System (*The Chronicle*, April 13, 2005) were still in negotiations with the civil-rights office over financial-aid programs reserved exclusively for needy minority students.

Officials at a few other colleges, such as Ursinus, a small college outside Philadelphia, and Kettering University, a technical institution in Flint, Mich., said they were continuing to operate race-exclusive programs unchallenged, probably because their colleges had remained below the advocacy groups' radar screens. Programs that are financed and administered solely by outside entities, such as corporations and philanthropies, also have been left alone.

*"... most colleges have concluded that changing the eligibility criteria for any race-exclusive program is the prudent course."*

Many of the colleges that are opening up such programs say they are doing so in response to the Supreme Court's 2003 rulings in two cases involving the use of race-conscious admissions policies by the University of Michigan at Ann Arbor. Those rulings held that colleges could consider race in admissions, but they must treat applicants as individuals, and may not accept or reject them based solely on race.

In a report issued last June, the NAACP Legal Defense and Educational Fund argued that the Supreme Court's rulings "did not address, much less prohibit, considerations of race outside the admissions context" (*The Chronicle*, June 23, 2005). But most colleges have concluded that changing the eligibility criteria for any race-exclusive program is the prudent course, and some philanthropies, such as the Andrew W. Mellon Foundation, and federal agencies, such as the National Institutes of Health, have decided to cease providing financial support to college programs with race-exclusive eligibility criteria (*The Chronicle*, March 11, 2005).

Mr. Clegg says that well over 100 of the colleges contacted by his organization have voluntarily abandoned race restrictions, and only a handful have refused to do so. He declines to name the colleges that have backed down, however, saying, "It makes it easier to persuade the schools if they know we are not going to do a little victory dance."

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## As Colleges Open Race-Exclusive Programs... (cont'd)

### FIVE PROGRAMS THAT OPENED THEIR DOORS TO ALL RACES

Across the nation, higher-education programs restricted to certain minority groups have now opened their doors to students of any race or ethnicity. Following are five colleges or agencies that changed their programs' eligibility criteria, and summaries of the results:

#### California Institute of Technology

Caltech operates a three-day campus-visit program, called GradPreview@Caltech, for college seniors who, because of their backgrounds, have had little opportunity to learn of that institution's graduate offerings. The program had been restricted to black, Hispanic, and American Indian students until 2004, when it was opened to all racial and ethnic groups. Despite the change in eligibility criteria, the number of student participants has remained capped at 30 because Caltech says it cannot afford to cover the travel, hotel, and meal costs of more. Caltech officials will not specify how many white students or how many Asian-American students have participated in recent years, saying that to do so would jeopardize the students' right to privacy. But, officials say, both groups combined accounted for three of the 24 participants in the fall of 2004 and two of last fall's 28 participants. The basic activities offered by the program remain the same, with students meeting professors, touring laboratories, and learning how to navigate the admissions process. "We have not lost the flavor of the program," says Erica N. O'Neal, Caltech's assistant vice president for student affairs.

#### Carnegie Mellon University

Carnegie Mellon had been operating a Summer Academy for Minority Scholars to help black and Hispanic high-school students position themselves to pursue a degree in science or engineering at top colleges. In 2004 Carnegie renamed the program the Summer Academy for Mathematics and Science and opened it to students of any race or ethnicity, while retaining the goal of using it to promote diversity. The program's enrollment remained capped at 100. At last summer's camp, the first to operate under the new criteria, about 15 percent of the students were either white or Asian-American. William F. Elliott, the university's vice president for enrollment, says the program remains committed to diversifying the ranks of those entering science or engineering, but "all kids who need a shot in order to expand this pipeline are not necessarily a racial minority."

#### Harvard University

In an effort to diversify its enrollment, the Harvard Business School operates the Summer Venture in Management Program, which offers about 80 college juniors from populations that are underrepresented in business an opportunity to spend a week working with the school's faculty. As of the summer of 2003, the program was restricted to black, Hispanic, and American Indian students. Since then, its eligibility criteria have been broadened to include students who are the first members of their families to attend college, are from families with little or no business education or experience, or are from colleges whose graduates do not typically attend top-tier urban universities (The Chronicle, February 18, 2004). While the program has not expanded, the list of racial or ethnic groups served by it has. As of last summer, 8 percent of its participants were Asian-Americans, 4 percent were white, and 1 percent were classified as "other." A spokesman for the business school, David R. Lampe, says, "Our feeling is that we have retained the original objective, which is to attract people who would traditionally not attend business schools, and to attract the best students that we can."

#### Saint Louis University

In 2004, under pressure from the U.S. Education Department's Office for Civil Rights, administrators at Saint Louis University disbanded a program that had annually awarded 30 scholarships of \$11,000 a year solely to black students. They replaced it with a larger program that awards scholarships of \$8,000 per year to students of any race or ethnicity who demonstrate leadership potential and show a commitment to promoting the Rev. Martin Luther King Jr.'s vision of a diverse but unified nation. John M. Baworowsky, the university's vice president for enrollment and academic services, says the program's administrators also consider whether applicants will help make the campus more diverse. Of the 77 sophomores who were selected for such scholarships as freshmen, one is American Indian, 16 are Asian-American, 32 are black, 10 are Hispanic, and 18 are white. Of the 159 members of the current freshman class who received scholarships, two are Alaska Natives, 19 are Asian-American, 57 are black, 29 are Hispanic, 45 are white, and seven are classified as "other." Mr. Baworowsky says the new scholarship program "has helped make our student body more national," taking in students from California, Hawaii, Texas, and other states that generally have not been represented in the student body. The share of the university's students coming from the St. Louis metropolitan area has dropped from about 60 percent to about 40 percent. For next year, the university plans to cap the number of new scholarships at 100 but increase the awards to \$13,000 each.

#### Wisconsin Department of Public Instruction

From 1985 to 2004, Wisconsin's Minority Precollege Scholarship Program provided money for minority students in grades six through 12 to attend precollege courses at campuses across the state. Under pressure from the federal Office for Civil Rights, the State Department of Public Instruction altered the eligibility criteria to eliminate any consideration of ethnicity or race, and instead limited participation to students whose low family incomes qualified them for federal school-lunch subsidies. The overall size of the program remained the same. Of the 1,366 students who took part last summer, 65, or just under 5 percent, were white. Kevin Ingram, who directs the state agency's Educational Opportunity Programs, says that as a result of the changed eligibility criteria, the precollege program now serves "more kids who are more needy" and no longer enrolls young people from financially well-off families "who are participating just because they are minority students."

## Will Your Diversity Initiative Work? (cont'd)

(Continued from page 2)

*change process.* No campus leader would be wise to make a blanket commitment for resources to implement yet-to-be-formulated changes, of course. Still, there must be evidence of commitment to make changes, even if they have price tags. Far too many campuses spend much money and staff time transitioning to a new software system but seem unwilling to make similar investments in efforts to improve campus climate regarding diversity issues. Instead of relying on volunteer efforts, a credible diversity effort will

provide staff or students to committees and teams to take minutes and manage communications, such as meeting announcements. If an initiative is a campus-wide effort, the coordinating group for the campus must also have an adequate budget and staff support.

8. *The terminology surrounding the diversity effort is unambiguous.* If terms like “diversity” or “multicultural” are used, they need to be defined explicitly. On many campuses, “diversity” informally translates to race alone, and “multicultural” refers only to people of color. The undefined use of such terms is confusing at best and exclusionary at worst, often leaving women; religious minorities; members of the gay, lesbian, bisexual, and transgendered community; and those with disabilities wondering if their concerns are included. It can be entirely appropriate for a diversity initiative to focus on a single set of issues, such as racial and ethnic inclusion, but the language of the initiative should accurately reflect this focus.

9. *The boundary of the change effort is well defined in terms of who and what parts of the*

*campus are involved.* Credible diversity efforts are explicit about who is involved and how. Students, staff, faculty, governance units, unions, and even alumni and community members can all be legitimate and valuable participants. Similarly,

the effort should specify which parts of the campus are participating. Sometimes it is entirely appropriate to examine a narrow realm, such as student experience in the classroom or the practices of a particular department, school, college, or administrative unit. At other times, larger questions of campus climate appropriately include gathering information from all

members and organizational units of a campus.

10. *The leaders of the diversity initiative will use external expertise to shape and guide it.* Effective diversity efforts benefit from drawing on the experience and advice of external parties who have managed similar change processes. This outside perspective can come from consultants, a team of trusted colleagues from peer institutions, or an educational association. Engaging parties from outside your campus provides not only valuable

information about what has worked and not worked elsewhere, but also a critical independent perspective. External voices will be able to speak with campus leaders in a way that no one from the campus can, especially regarding their leadership of the initiative.

11. *The assessment will use multiple methods.* Although a single climate survey administered to an entire campus

can provide valuable information, the findings will be clearer if they are supplemented by additional sources of information. Well-planned diversity assessments typically involve multiple sources in addition to survey data: demographic data about the racial and gender composition of

*“Many campuses spend money and time transitioning to a new software system but seem unwilling to make investments in efforts to improve campus climate regarding diversity issues.”*

*“It can be entirely appropriate for a diversity initiative to focus on a single set of issues, such as racial and ethnic inclusion, but the language of the initiative should accurately reflect this focus.”*

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## NIH Told to Get Serious About Minorities (cont'd)

(Continued from page 7)

value of the training programs. "I wouldn't be where I am today without these programs," says Jarvis, who this fall won a prestigious NIH Director's Pioneer Award.

Poodry feels likewise. But he also thinks that the NRC panel is right in calling for clear and measurable outcomes. "We need a doubling [of minority Ph.D.s] every 8 years to shift the [participation] curve to where it should be," he says. "If that doesn't happen, then 20 years from now we'll probably be looking at the same results and wondering why things haven't improved."

### Will This Bridge Take Me to the Lab?

The National Institutes of Health's (NIH's) "Bridges to the Baccalaureate Degree" tries to help underrepresented minority students become scientists. But measuring its impact—and, by extension, all of NIH's minority-training programs—may be a bridge too far.

The Bridges program links community colleges with research universities at dozens of sites around the country. Working with students more likely to have grown up on an Indian reservation, in an urban ghetto, or with parents speaking a language other than English than are their undergraduate peers attending research-intensive universities, the Bridges program supplements coursework with academic assistance, career counseling, paid lab jobs, lectures, and other activities.

It's an excellent way to expose them to a life in research. But it's a long way from fulfilling NIH's dream of turning them into biomedical researchers capable of winning federal grants. Even following what happens to the thousands of students who try to cross that bridge has so far proven impractical.

Why are the students so hard to track? The

main reason is their educational peregrinations. Even if students earn their associate's degrees, they may not head to a 4-year school. If they do, they may not win a spot in another NIH-sponsored minority program, if one exists on campus. They may not major in science. Even if they graduate, they may not attend graduate school. And so on.

The available data are both impressive and sobering. California State University, Los Angeles (CSU-LA), has had a Bridges grant since the program's inception, giving project director Linda Tunstad an unusually long perspective on what happens to her students. From a 12-year pool of 148 students, she says, some 76% continued their education at a 4-year school, two-thirds of them at CSU-LA. At least 37%—55 and counting—have earned bachelor's degrees. Of the 75 who attended CSU-LA, 39 have earned bachelor's degrees, mostly in the biological and chemical sciences, and 22 have gone on to graduate programs.



**Hard to calibrate.** NIH's "Bridges" program helps minority students transfer from community colleges to research universities, but there are few data on what happens to them later.

*Credit: Courtesy of Bridges program.*

Even if institutions take the trouble to follow their students, however, the significance of the journey may not be clear. When NIH's Adolphus Toliver told Bridges directors recently that the program has a 23% transfer rate—the share of community college students who advance to a 4-year school—the group's first question was: "Is that good or bad?" recalls biologist Thomas Landefeld of CSU Dominguez Hills, past president of the project directors' group. Toliver's answer? "We don't know."

The group would also like information on how their participants stack up against the general student population in terms of completing a bachelor's degree, entering graduate school, and earning a Ph.D. "We think that our programs are adding value," says Landefeld. "But without comparative data, it's hard to know for sure."

## Will Your Diversity Initiative Work? (cont'd)

(Continued from page 11)

students, staff, and faculty, and thoughtful analysis of existing policies, practices, and communications regarding diversity issues. Focus group data and interviews can be valuable secondary sources of information but should not serve as primary data sources.

12. *The basic assessment methodology of the initiative makes sense.* If the initiative aims to examine the experiences of students of color, it is critical to compare these experiences with those of majority white students. This comparison makes it possible to tease out the issues affecting students generally versus those that affect students differentially by race and ethnicity. Furthermore, examining the experiences of undergraduates of different racial and ethnic

groups in a particular academic department will likely make more sense when compared with the experiences of graduate students, staff, and faculty of color from the same department. Sampling issues are also important to address prior to conducting climate surveys. For example, many predominantly white campuses use random samples of undergraduates to collect climate data, but these samples typically will not generate enough responses from students of color to allow for meaningful analysis by racial or ethnic group. A well-known strategy of “oversampling” students of color can correct this deficiency.

13. *The climate data are useful at the departmental*

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### Communications Checklist

- Develop one or two primary goals for the diversity initiative and state them in language easily understood both on and off the campus.
- Encourage campus leaders to mention the initiative frequently; provide them with written material they can cite in speeches and other presentations. (The material might include updates on the initiative’s progress, compelling stories, data and analyses, a list of issues emerging across administrative divisions and departments, and so on.)
- Bring a team including the chancellor, president, or provost to national and regional conferences to explain the project. Provide the team with talking points.
- Early on, decide on a name for the initiative that incorporates key concepts and lends itself to abbreviation as an acronym.
- Develop a graphic identity for the initiative, and use it on stationery and posters and in presentations about the initiative.
- Develop a Web site about the initiative that clearly ties into the design and format of the “official” campus Web site, and make sure the initiative is frequently mentioned on other campus Web sites.
- Present periodic in-person reports to leaders, governance groups (students, staff, faculty), unions, and other key constituencies.
- Provide periodic updates about the status of the initiative in on-campus media (the student newspaper, e-mail messages to faculty and staff, Web announcements, etc.).
- Issue press releases at key junctures to off-campus media, especially newspapers, such as the Chronicle of Higher Education, likely to cover the initiative in detail.
- Make regular presentations at local, regional, and national conferences about the initiative; post presentation dates and locations on the Web site.
- Include information about the initiative on national diversity sites such as [www.diversityweb.org](http://www.diversityweb.org).
- Write opinion pieces for national higher education audiences based on experiences with the initiative.

## African American Solar Astronomers (cont'd)

*(Continued from page 3)*

coveries made in the solar context to stars.

Of the approximately twenty African Americans who have become astronomical researchers, half have studied solar and stellar physics. Coincidentally, all of the first four fall into this category. In the following sections, we present profiles of three of these African-American astronomy pioneers. We also present brief profiles of two young solar scientists who are blazing a trail of success in their own right.

### Early pioneers

#### Carl A. Rouse

After earning a Ph.D. in Physics from the California Institute of Technology (Caltech) in 1956, Dr. Carl Albert Rouse became the first African American to successfully enter into a career as a professional astronomical researcher. Dr. Rouse's Ph.D. research was in the field of particle physics. After graduate school he took a position as a scientist at Lawrence Livermore National Laboratory (LLNL) where he studied screened Coulomb interactions utilizing quantum mechanics theory.

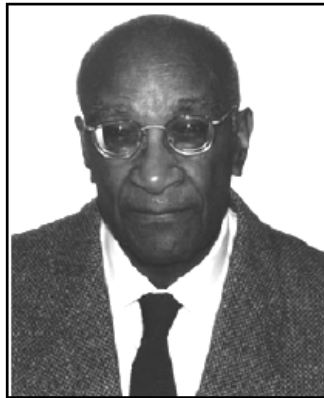
Dr. Rouse's interest in astrophysics was initially aroused from an interest in variable stars. He wondered how a star's internal structure depended upon the details of ionization and excitation within its interior. While it is easy to ask this question, finding the answer is extremely difficult. Modeling the interior of a star is no simple task. The supercomputer resources of the U.S. government laboratories had been previously utilized to model a computationally intense astrophysical situation of great interest, the collapse of a massive star and its subsequent explosion as a supernova. Dr. Rouse realized that supercomputers could possibly allow him to calculate the equation of state of the solar core. Utilizing the supercomputer resources at LLNL, Dr. Rouse created detailed models of the solar interior and was the first person

to solve the Saha Equation for the solar interior.

In a burst of scholarly productivity between 1961 and 1969, Dr. Rouse published nine single author scholarly articles on the theoretical physics of screened Coulomb interactions and six single author articles developing his models of the solar interior. This early solar work culminated in a 1969 article in the prestigious journal *Nature*. One of his most interesting ideas regarding the solar interior was that the Sun's core was not composed primarily of hydrogen or helium as commonly accepted, but that it was composed of a high-Z element with Iron being the likely candidate.

*"Of the approximately twenty African Americans who have become astronomy researchers, half have studied solar and stellar physics."*

Since this early work, Dr. Rouse has continued to develop models of the solar interior utilizing new supercomputer resources as they become available. In the 1980's he considered the solar neutrino deficit with his models. He has also incorporated the latest data from helioseismology observing instruments into his models. Over his career, Dr. Rouse has published a total of 43 single author scholarly articles in refereed journals. Born in 1926, Dr. Rouse turns 80 years old this year and enthusiastically continues his work.



*Dr. Carl A. Rouse, the first African-American to successfully enter into a career as an astronomical researcher. Dr. Rouse created detailed theoretical models of the solar interior and was the first person to solve the Saha Equation for the solar interior.*

#### Arthur B. C. Walker, II

Dr. Arthur Bertram Cuthbert Walker, II received a Ph.D. in Physics from the University of Illinois in 1962. Like Dr. Rouse before him, Dr. Walker's Ph.D. research was in the area of particle physics. He carried out research in nuclear physics and meson physics; particularly, the photoproduction of mesons. Immediately after graduate school he entered the United State Air Force with the rank of 1st Lieutenant. His interest in space physics was initiated there when he utilized his ample talents as a detailed experimentalist to build instruments for rocket probes and for a satellite experiment to measure protons and electrons trapped in Earth's magnetosphere.

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Dr. Walker's interest in solar physics began at the Aerospace Corporation where he accepted a position in 1965 upon completion of his military obligation. With collaborator Dr. H. R. Rugge, Dr. Walker developed the first satellite borne x-ray spectrometer and carried out a series of pioneering studies of the x-ray spectrum of the sun. Dr. Walker's innovative Bragg crystal spectrometers were flown on the Air Force OV1-10 and OV1-17 satellites and resulted in the first astronomical identification of x-ray dielectronic recombination lines and established the importance of radiative decay of metastable levels and of autoionizing levels respectively in high temperature astrophysical plasmas. These studies also helped establish the temperature, composition, and dynamic nature of the sun's corona, and provided basic insights into the interaction of matter and radiation in diffuse million degree plasmas.

In 1974 Dr. Walker accepted a position as a member of the Physics faculty at Stanford University. Dr. Walker continued to perform pioneering research and blossomed as a mentor. He and his student Sally Ride (America's first female in space), performed a comprehensive analysis of the role of dust and of ionization state on the interstellar medium absorption of x-rays. The two developed the first comprehensive model of the interaction of x-rays and the interstellar gas resolving several controversies over the composition of this fundamental component of the galaxy. Later, realizing the potential of a new technology developed by his Stanford colleague, T. W. Barbee, that permitted the fabrication of synthetic mirrors that selectively reflect x-rays of a specific

wavelength, Dr. Walker and his student Joakim Lindblom with their collaborator Richard Hoover of Marshall Space Flight Center (MSFC) pioneered the application of these "multilayer mirrors" to astronomical observations. In 1987 they obtained the first high-resolution thermally differentiated images of the solar atmosphere. This technology has now become the standard in solar EUV imaging.

Dr. Walker stands out among African-American astronomical researchers by being the only one to have produced a successful African-American astronomical researcher. As well, Dr. Walker was the Ph.D. mentor for 5 current solar physics researchers. Four of these are experimentalists and one is primarily a computational physicist. Five of Dr. Walker's former students now serve as professors in American colleges and universities. Dr. Walker passed away on April 29, 2001, but his contributions to astronomy continue through the work of his students and the impact of the technologies and spectroscopic techniques he pioneered, which are still in use today.



*Dr. Arthur B. C. Walker, II, one of two African-Americans to successfully enter into a career as an astronomical researcher in 1962. Dr. Walker was the most accomplished among African American astronomers. He pioneered key technologies to astronomical observation, was a pioneer of x-ray spectroscopy, was the mentor of America's first woman in space, was the mentor of 5 current solar physicists, and was the mentor of two current African American astrophysicists.*



*Dr. George R. Carruthers, the fourth African American to successfully enter a career as an astronomical researcher. Dr. Carruthers is best known for inventing an instrument which was placed on the moon in 1972 and observed the earth and the cosmos.*

### **George R. Carruthers**

Dr. George R. Carruthers received a Ph.D. in Physics from the University of Illinois in 1964, becoming the 4th African American astronomical researcher. Dr. Carruthers is best known for being the Principal inventor of the Lunar Surface Far Ultraviolet Camera/Spectrograph that accompanied the Apollo 16 mission to the moon in April 1972. Positioned on the moon's surface, the camera allowed researchers for the first time to examine the Earth's extended atmosphere in the ultraviolet. The scientific results from this camera also included the first cos-

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## African American Solar Astronomers (cont'd)

*(Continued from page 15)*

mic detection of molecular hydrogen. Dr. Carruthers' camera also represented the first observatory to be placed on a celestial body other than the earth.

Dr. Carruthers began building instruments for space missions in 1966 and has since instrumented numerous sounding rocket missions, space shuttle missions, placed an instrument on Skylab, and as recently as 1999 provided an instrument for the ARGOS satellite. Today Dr. Carruthers is concerned with Sun-Earth connection science. He holds two patents for his astronomical ultraviolet imaging technologies.

*"The pioneering African American solar physicists have been among the most accomplished of African American scientists. The current generation appears well poised to continue this legacy."*

*Dr. Hakeem M. Oluseyi is assistant professor of physics at the University of Alabama, Huntsville. He is an astrophysicist with research interests in the fields of solar physics, observational cosmology, and technology development. He received B.S. degrees in Physics & Mathematics from Tougaloo College, an Historically Black College in Mississippi. He received his Ph.D. in Physics at Stanford University in 1999. His dissertation, "Development of a*

*Global Model of the Solar Atmosphere with an Emphasis on the Solar Transition Region" was conducted with Arthur B. C. Walker, II, who is profiled in this piece. Dr. Oluseyi is the author of over 45 publications, holds 8 technology patents, and was selected in 2003 as a Gordon & Betty Moore Foundation Astrophysics Research Fellow.*

*This article appears in the 2006 issue of "African Skies/Cieux Africains". Reprinted with permission of the author.*

### Young pioneers

Following in the wake of the great African American solar astronomers mentioned above, are two young solar physicists who are developing outstanding careers in their own right. Like the three pioneering scientists profiled above, this group consists of one scientist who is primarily a theorist and one who is primarily an experimentalist; however, both utilize observations and data analysis in their science.

The first is Dr. Alphonse Sterling. He received his Ph.D. in Physics from the University of New Hampshire in 1988. His research has focused on the study of spicules, the primary discrete structures comprising the solar chromosphere. More recently he has begun to study giant explosions at the Sun's surface known as "coronal mass ejections." Dr. Sterling is the author or co-author of over 100 scientific publications.

Next is Dr. Leonard Strachan. He received his Ph.D. in Astronomy from Harvard University in 1990. His research has focused on developing techniques for extreme ultraviolet spectroscopic study of solar plasma outflows. He has been a co-investigator of the Spartan Ultraviolet Coronal Spectrometer (UVCS/Spartan) team. Dr. Strachan is also the author or co-author of over 100 scientific publications.



*(Left) Dr. Alphonse Sterling of NASA's Marshall Space Flight Center. (Right) Dr. Leonard Strachan of the Smithsonian Astrophysical Observatory.*



## Will Your Diversity Initiative Work? (cont'd)

(Continued from page 13)

level. Although a small random sample of undergraduates can give an accurate overall picture of the climate of a campus, providing valid data at the departmental level may require surveying the entire student body in a way that also ensures high rates of survey participation. For example, a campus might learn from oversampling students of color that a significant percentage of them are encountering faculty who express racial stereotypes. But the sample may not be large enough to provide valid information about which departments are the source of these complaints. In such cases, departments wanting to improve their performance regarding diversity issues may be truly concerned about the issues at hand but lack adequate data for making local changes.

14. *The initiative has unambiguous support from campus leaders but is not dependent on any one of them.* Higher education leadership is turning over at an increasing rate. On large public campuses, for example, the average half-life of a chancellor or president now seems to be three years or less. Given that a diversity initiative will probably need to outlast one or more of the leaders, ownership of the initiative needs to reside at levels below that of the president or chancellor, perhaps even below the level of vice presidents or vice chancellors. If the initiative is identified solely with the chancellor, president, or provost, it will probably not be supported by a successor who will find no advantage in continuing the initiatives of the previous leader. Unambiguous support includes a multiyear commitment of funds and staff support; clear authori-

zation of the initiative by leadership; integration of the initiative with other important areas, such as fundraising; assurance that those who participate in the initiative will receive frequent communications and acknowledgement from leadership; and so on.

*“If the initiative aims to examine the experiences of students of color, it is critical to compare these experiences with those of majority white students.”*

The diversity effort you are asked to join will probably not pass muster on all the items above, but someone needs to be thinking about all of them if the initiative is to succeed. Before taking that call from the dean, it might make sense to query some of your colleagues and others about the initiative and do a quick search on the campus Web

site. If it is a campus-wide effort, your dean may not have a full picture of the larger effort and won't be able to answer some of the questions cited above. Nonetheless, it's important to push back by asking probing questions. You may end up improving the next diversity initiative on your campus. Or, perhaps, when you become the dean, you can use this set of questions to better shape a diversity initiative from the start.

*“If the initiative is identified solely with the chancellor, it will probably not be supported by a successor who will find no advantage in continuing the initiative of the previous leader.”*

*Grant Ingle served as director of the Office of Human Relations at the University of Massachusetts Amherst for sixteen years and for seven years was a member of the campus-wide team that coordinates the Community, Diversity, and Social Justice Initiative. The initiative aims to make the university a more inclusive and equitable teaching, learning, working, and living community; see [www.umass.edu/ohr/cdsj](http://www.umass.edu/ohr/cdsj) for details. He currently operates a private practice offering consultation and coaching to higher education institutions on issues of community, diversity, and social justice. He can be contacted at [grant@ingle.ws](mailto:grant@ingle.ws).*

*This article is reprinted by permission from the from the September/October 2005 issue of *Academe*, the magazine of the American Association of University Professors.*

## Science Learning Rises from the Northern Plains

by Christopher Wanjek, NASA's Goddard Space Flight Center, reprinted with permission

When Ted Gull walked in the center of the grand entry procession at the Black Hills powwow in October, he wished he had some type of invention far better than his feeble camera that could truly capture the sights and sounds swirling around him.

The drums and chants and colors of ornate feathered costumes collided as hundreds of Native American dancers from several tribes across the northern plains officially opened this three-day celebration of Lakota, Dakota and Nakota culture.

To have this perspective from the heart of the procession was an honor rarely given to a non-Native American. For Ted, this was a high point in his fifteen years of fostering science and engineering education on Indian reservations in South Dakota. He and the recently retired Fritz Hasler of NASA Goddard, also part of the procession, would speak to the crowd that morning and again in the evening about astronomy and earth science.

Since 1991, Ted has worked with the South Dakota School of Mines and Technology and Oglala Lakota College to inspire Native American students to pursue advanced degrees. As with minority students in other regions of the nation, the odds are stacked against these young people. Reservation life, while often spiritually rewarding, can be rife with poverty, poor health, depression and despair. Unemployment hovers around 90 percent. The western part of the state is among the poorest

in the nation, with many rural areas lacking public funds to support more than four days of school a week.

With support from the NASA Scientific Knowledge for Indian Learning and Leadership (SKILL) program and on his own initiative, Ted has visited South Dakota reservations dozens of times. He has worked directly with teachers, local politicians and tribal elders in creating summer education programs and school curriculum. When Ted started, colleges were graduating about 50 Native American students per year with advanced degrees nationally. Today that number is 100. The 28 tribal colleges (five of which are in South Dakota) have also excelled in providing more science, math and engineering opportunities, particularly through two-year certificate programs.

"That to me shows progress,"

Ted said. "If you treat a person as a person and not a lower-level student, they are going to perform well."

Ted draws a comparison to the historically Black colleges in America after the Civil War. It took decades, but these institutions forever changed the lives of young African Americans, and the nation as a whole reaped the benefits. Similarly, with long-term commitment and patience, Ted says we can see grand improvements in Native American education in our lifetime.

*Ted Gull is a member of the AAS Committee on the Status of Minorities in Astronomy.*

*"Ted draws a comparison to the historically Black colleges in America after the Civil War. It took decades, but these institutions forever changed the lives of young African Americans."*



*Grand entry processional at the Black Hills powwow. Photo courtesy Fritz Hasler.*

Committee on the Status of Minorities in  
Astronomy

American Astronomical Society  
2000 Florida Avenue, NW  
Suite 400  
Washington, DC 20009-1231

Phone: 202-328-2010  
Fax: 202-234-2560  
Email: [csma-info@vanderbilt.edu](mailto:csma-info@vanderbilt.edu)



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[www.aas.edu/csma](http://www.aas.edu/csma)

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*'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.*