

# SPECTRUM



*A report on underrepresented minorities in astronomy*

## The Road to Racial Equality: Looking Back on *Brown v. Board*, Moving Forward After Michigan

by Beverly Daniel Tatum

**Editor's Note:** In this issue of *SPECTRUM* we commemorate the 50th anniversary of the landmark Supreme Court ruling in *Brown v. Board of Education of Topeka*, and we examine the recent Supreme Court rulings on affirmative action at the University of Michigan. This essay reflecting on the legacy of *Brown* is accompanied by several articles clarifying the recent rulings and presenting practical strategies for enhancing diversity in science and engineering.



Dr. Beverly Daniel Tatum is president of Spelman College in Atlanta, Ga.

I was born in 1954 just four months after the *Brown v. Board of Education* Supreme Court decision outlawed the “separate but equal” doctrine of school segregation. That one fact has shaped my life immeasurably. Howard University, Morris College, Spelman College and what was then called Atlanta University and Tuskegee Institute are all part of my family genealogy, historically Black institutions where my parents, grandparents and great grandparents were educated. But I am an “integration baby,” and the struggle to desegregate has shaped my life since birth.

I entered the world in Tallahassee, Fla., where my father taught in the art department at Florida A&M University. Eager to obtain a doctorate in art education, my father desired a degree from nearby Florida State University, but the

*(Continued on page 2)*

## Special CSMA Presentation on Affirmative Action at January 2005 AAS Meeting

by Keivan Guadalupe Stassun

The AAS Committee on the Status of Minorities in Astronomy (CSMA) will host a special lunch-time presentation on affirmative action at the January 2005 AAS meeting in San Diego.

Ann Springer, associate legal

counsel for the American Association of University Professors (AAUP), will give a presentation entitled “Michigan and Beyond: Affirmative Action and the Future of Student and Faculty Diversity.”

*(Continued on page 2)*

### INSIDE THIS ISSUE:

The Road to Racial Equality	1
Special CSMA Presentation on Affirmative Action	1
Feature Article: Affirming Diversity at Michigan	4
Research on Increasing Faculty of Color in Science and Engineering	6
Standing Our Ground: A Guidebook for STEM Educators in the Post-Michigan Era	8

### HIGHLIGHTS:

- Learn about the recent Supreme Court rulings on affirmative action and about how efforts to enhance diversity in the sciences may proceed in the wake of these rulings.
- Learn about a new “guidebook” with practical suggestions for implementing affirmative action programs in science and engineering.
- Access a useful, online compendium of research on strategies to increase diversity among science and engineering faculty.

## The Road to Racial Equality (cont'd)

(Continued from page 1)

state of Florida preferred to pay his tuition at Pennsylvania State University rather than open the doors of FSU to an African American graduate student. In 1957 he completed his degree at Penn State, and in 1958 he became the first African American professor at Bridgewater State College in Massachusetts, where I grew up. There the ideal of integration was more often the reality of tokenism as I was frequently the only Black student in my class. Given this history, it is not surprising that I am now known as a "race relations expert." I have been observing racial dynamics all of my life, and I have seen positive change. Today Bridgewater State College has its first president of color, and in 2004, I, a Black woman, will deliver a keynote speech at Florida State. Neither was even imaginable in 1954.

Now serving as the ninth president of Spelman College, the oldest historically Black college for women, I have a new lens through which to understand the meaning of *Brown*. Though it was not instant, the decision opened new doors of educational opportunity for Black students that initially challenged and ultimately strengthened Spelman College. Like many HBCUs, Spelman faced new competition for its students from those predominantly White institutions that had previously excluded them. However, increased competition

spurred important improvements at Spelman, including enhanced faculty development, new resources for scholarships and expanded facilities — creating an environment that now attracts more than 4,400 talented young women competing for 525 spaces in our first-year class.

Fifty years after *Brown*, why are historically Black colleges like Spelman not only still relevant but the preferred choice for many talented Black students? As a psychologist whose scholarly focus has been racial identity development, I recognize that college choice is a reflection of identity — a statement about how you see yourself, who you are now and who you hope to become. Students are drawn to an environment where they see themselves reflected in the environment in powerful ways, places where they see themselves as central to the educational enterprise.

The importance of affirmation of identity in college choice cannot be underestimated. But indeed it often is. Though most college campuses are considerably more diverse today than they were in 1954, historically White institutions are still struggling to understand the ABCs of creating truly inclusive environments that will maximize the intellectual and leadership potential of all of their stu-

(Continued on page 3)

## CSMA Lunch Talk at January 2005 AAS Meeting (cont'd)

(Continued from page 1)

This presentation will examine the Supreme Court's recent affirmative action decisions in the University of Michigan cases, their legal framework, and the current legal landscape for affirmative action. It will then address the practical implications of the decisions and their current and future effects on diversity in student admissions and faculty recruitment.

The primary purpose of this special session is to provide AAS members with an update on the legal landscape of affirmative action. In the wake of the recent Supreme Court rulings on affirmative action policies at the University of Michigan, many college and university faculty are wondering whether their own programs may be affected, and in what ways, if so. While many affirmative action

related issues play out at the institutional level (e.g., undergraduate admissions), many other issues play out at the department level (e.g., graduate admissions, faculty hiring, recruitment practices, outreach efforts), and still others play out at the individual level (e.g., postdoc hiring).

Ms. Springer has conducted numerous presentations on behalf of the AAUP, and has authored several AAUP reports and position papers. She was a co-author of an *amicus* brief filed by AAUP in the recent University of Michigan cases before the U.S. Supreme Court.

Ms. Springer's presentation will be followed by a short time for questions and answers. Reference materials will also be provided to AAS members who attend.

## The Road to Racial Equality (cont'd)

(Continued from page 2)

dents. Those ABCs as I describe them are affirming identity, building community and cultivating leadership, three critical dimensions of effective learning environments.

Affirming identity refers to the idea that students need to see themselves reflected in the environment around them — in the curriculum, in the faculty and staff, and in the faces of their classmates — to avoid feelings of invisibility or marginality that can undermine student success. Building community highlights the importance of creating a sense of belonging to a larger, shared campus com-

munity. The goals of affirming identity and building community are often perceived as being in tension, but they are in fact complementary. Students who feel that their own needs for affirmation have been met are more willing and able to engage with others across lines of difference. Cultivating leadership refers to the fact that leadership in the 21st century requires not only the ability to think critically, and speak and write effectively but also demands the ability to interact effectively with others in a pluralistic context. The development of each of these abilities requires opportunities to practice.

Whether at an HBCU or predominantly White institution, we all must ask ourselves, “How do we create and sustain educational environments that affirm identity, build community, and cultivate leadership in a way that supports the learning of all students?” The young people we are educating will graduate on the edge of a new frontier, a society more diverse than ever before and one in which the need for high-level skills is the rule, rather than the exception. Though we are naturally inclined to teach the way we were taught, relying on the lessons of the past will not necessarily take us where we want to go. How will we get there? A few years ago I had a dream that illuminated for me the difficulty of the task we are undertaking. In the dream I was driving a car along a road, and all of a sudden the car went off the road and was on top of a pile of rocks. I said in surprise, “What happened to the road?” A voice answered, “There is no road.” When I awakened, it occurred to me that my dream held the perfect metaphor for what we as a society are trying to do.

Fifty years after *Brown*, our “road” is still under construction. Though some progress has been made, the road to racial equality is not complete. Supreme Court Justice Sandra Day O’Connor suggested in her judicial opinion in the Michigan case that perhaps in 25 years affirmative action programs would no longer be needed or allowed. We will all have to intensify our building efforts if we expect to meet that construction deadline.

*This article reprinted by permission from Black Issues in Higher Education, www.blackissues.com. The article is excerpted from a longer version entitled “The Road to Racial Equality.”*

### SPECTRUM

Edited by  
Keivan G. Stassun  
Vanderbilt University  
keivan.stassun@vanderbilt.edu

Published by  
The American Astronomical Society  
2000 Florida Avenue, NW, Suite 400  
Washington, DC 20009  
© 2005 AAS  
All rights reserved.

SPECTRUM is produced at  
Vanderbilt University  
Department of Physics & Astronomy  
VU Station B 1807  
Nashville, TN 37235

Copyrights for contributed or reproduced material may rest with the author. These articles reflect the opinions of the authors, which are not necessarily those of the editor, Vanderbilt University, or the AAS. SPECTRUM is published for the personal use of AAS members.

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.aas.org/csma>

## FEATURE ARTICLE

## Affirming Diversity at Michigan

by Ann Springer, Reprinted with permission from the American Association of University Professors

*In its much-anticipated review of affirmative action, the Supreme Court upheld the educational importance of diversity. But finding the best means to institute diversity will remain a challenge for higher education.*

Amid great controversy, confusion, and debate, the U.S. Supreme Court in June 2003 issued its much-anticipated decisions in two University of Michigan cases addressing affirmative action in higher education admissions. The Court was faced with deciding (a) whether the educational benefits of diversity, and the need to defer to educators on educational judgments, constituted a sufficiently compelling state interest to justify racial preferences in admissions, and (b) if so, how such admissions plans could be constitutionally structured. It concluded that diversity could be such an interest, and that plans must be individual and not mechanistic. The Court then promptly adjourned for the summer. Many educators did the same, reviewing the decisions and news coverage in a flurry in June, and then mentally setting it all aside in favor of the joys of summer. But now, as we return to our campuses ready to launch into the new academic year, we need to better understand how these decisions will shape our current and future work. We have next year's entering class to fill and admissions policies to review or craft. What do the cases mean for us as educators? What did the Court say and why? And, most important, where do we go from here?

Twenty-five years ago, the Supreme Court addressed the issue of race in higher education admissions in the highly splintered and contentious decision of Regents of the *University of California v. Bakke*.<sup>1</sup> (The AAUP filed a friend-of-the-court brief in the case, just as it did in the Michigan cases, urging the Court to give educators deference

on such essential academic judgments as the educational value of diversity.) Rather than settling the matter, however, the justices' numerous opinions, concurrences, and dissents in *Bakke* turned the case into the opening salvo in a long and raging conflict over affirmative action in admissions.

Justice Lewis Powell's opinion in *Bakke*, issued as the opinion of

the Court, endorses educational diversity as a constitutionally compelling state interest. Since then, however, distinguished judges across the country have come down on all sides of the debate, often issuing diametrically opposed opinions. Judges in the United States courts of appeals, the highest courts in the

land below the Supreme Court, have ruled, alternatively, that diversity is such a compelling state interest (*Smith v. University of Washington*, Ninth Circuit), that diversity is not a compelling state interest (*Hopwood v. University of Texas*, Fifth Circuit), and that it may or may not be (the court couldn't decide in *Johnson v. Georgia*, Eleventh Circuit). It is amid this morass that the Michigan cases first arose.

### Michigan Cases

Brought in fall 1997, the two Michigan class-action lawsuits were filed by the Center for Individual Rights (CIR) on behalf of white students denied admission to the University of Michigan's undergraduate (*Gratz v. Bollinger, et al.*) and law school (*Grutter v. Bollinger, et al.*) programs.<sup>2</sup> The CIR, a public policy law firm that views itself as a conservative version of the American Civil Liberties Un-



Ann Springer is associate legal counsel for the American Association of University Professors.

*“What do the cases mean for us as educators? What did the Court say and why? And, most important, where do we go from here?”*

(Continued from page 4)

ion, had been conducting a nation-wide campaign of lawsuits to dismantle affirmative action and had represented the plaintiffs in the Texas and Washington cases cited above.

The Michigan cases were the first opportunity the Court had taken since *Bakke* to consider squarely whether diversity as an educational goal was a sufficiently compelling interest to support affirmative action in admissions. The Court took both cases, allowing it to analyze both an undergraduate and a graduate admissions program. Moreover, the Court reached beyond constitutional interpretation, which affects only public universities. It made clear that the Michigan decisions apply to every institution that accepts any federal money; in other words, virtually all higher education institutions.

The Michigan cases set a record for the Supreme Court in the number of briefs submitted. Seventy-five distinct briefs were filed on behalf of the university (many with multiple signatories), fifteen were filed on behalf of the student applicants, and five were filed in support of neither party. The briefs supporting the university came from a disparate group: military generals, law students, civil rights and higher education organizations, and major corporations.<sup>3</sup> Yet they all voiced the same general theme: diversity in education is essential to quality education, to society, to democratic governance, and to America's future, and without the ability to create this diversity, we risk all of these.

So what did the Court actually decide? In an opinion written by Justice Sandra Day O'Connor in the 5 to 4 *Grutter* decision, the Court endorsed Justice Powell's decision in *Bakke*, finding diversity to be a compelling state interest and upholding the law school admissions program. Yet, in the 6 to 3 *Gratz* decision, Justice O'Connor joined the opinion's author, Justice William Rehnquist, and four other justices in upholding the concept of affirmative action and diversity as a compelling interest but striking down Michigan's undergraduate admissions process for not being tailored narrowly enough.

*“Briefs supporting the university all voiced the same general theme: diversity in education is essential to quality education and to America’s future.”*

The legal framework of the Michigan decisions is based on interpretation and application of the Fourteenth Amendment to the Constitution, which provides that “[n]o State shall make or enforce any law which shall . . . deny to any person within its jurisdiction the equal protection of the laws.”

In *Bakke* Justice Powell interpreted the Fourteenth Amendment to find that racial and ethnic classifications are inherently “suspect” and therefore call for exacting judicial scrutiny. This “strict scrutiny” requirement means that, as the Court reiterated in *Gratz*, “all racial classifications imposed by government . . . are constitutional only if they are narrowly tailored to further compelling governmental interests.”<sup>4</sup> The Court stated that this careful review is the only way to “determine what classifications are ‘benign’ or ‘remedial’ and what classifications are in fact motivated by illegitimate notions of racial inferiority or simple racial politics.”

As Justice O'Connor further explained in *Grutter*, “We apply strict scrutiny to smoke out illegitimate uses of race by assuring that government is pursuing a goal important enough to warrant use of a highly suspect tool.” Thus the debate in *Gratz* and *Grutter* came down to two questions: (1) Is diversity in higher education a compelling state interest? and, (2) If a compelling state interest exists, are the Michigan undergraduate and law school admissions plans narrowly tailored enough to achieve that interest constitutionally?

### Compelling State Interest

For twenty-five years, courts and legislatures have analyzed and challenged the legal and pedagogical validity of Justice Powell's conclusion in *Bakke* that diversity in higher education is a compelling state interest. The Michigan cases were so important precisely because they brought this challenge to a head. Recognizing these cases for the litmus test they were, the University of Michigan presented reams of evidence on the educational benefits of diversity—so much, in fact, that the student complainants conceded the educational benefits early on, fighting legally on whether such educational benefits could be a constitutionally compelling state interest.<sup>5</sup>

(Continued on page 10)

## Research on Addressing Institutional Challenges in Science and Engineering to Increase Faculty of Color

by Anne J. MacLachlan, Center for Studies in Higher Education, University of California at Berkeley

*Editor's note: This article is a transcript of a presentation at Keeping Our Faculties III, a conference at the University of Minnesota in November 2004, focusing on challenges and strategies for increasing the representation of minorities in science and engineering faculty.*

*It is intended to serve as a primer on, and reference to, recently published research and policy reports on the subject. An accompanying bibliography is maintained on the CSMA website: [www.aas.org/csma](http://www.aas.org/csma).*

Science, technology, engineering and mathematics (STEM) are an integral part of national defense, public health, technological progress and economic development. A large part of the effort to effect institutional change in these disciplines has been the work of government agencies. Formation of national policy therefore can have a substantial impact on individual institutions by determining the kind of research the federal agencies will fund, the way in which funding is provided for minority participation in science careers, or, to take a current example, how "homeland security" affects the participation of international students in STEM departments at American universities.

The key observation here is that politics indeed influences higher education policy at the national and local level. Moreover, there are multiple sources of policy making, so institutions as well as individual scientists can be affected by conflicting information and directives. The most significant for our topic is the condition of Affirmative Action. Its creation came about by a particular political climate which supported a series of executive actions and court decisions which extended the Civil Rights Act of 1964 to higher education with the proviso that institutions should engage in "affirming acts" to overcome past discrimination. In the 1990s as

students of color were beginning to participate in all levels of higher education at a greater rate, the political climate turned and California passed Proposition 209 outlawing affirmative action. Enrollments in undergraduate programs at the University of California declined precipitously. Because of lawsuits and court judgments both before and after Proposition 209 passed in 1996, preferential programs of any kind at colleges and universities have come under sharp legal scrutiny, no less by the institution's own lawyers. Even though affirmative action still is required of all higher education institutions receiving federal monies, federal agencies such as the National Science Foundation (NSF) have not been emphatic that programs they fund for

"minorities" be exclusively populated by minority students. In fact, at the moment the country is at a low point with respect to improving the life chances of children of color through education, higher education and employment.

Yet in 2004 there are more organizations to support underrepresented individuals in STEM education and the workforce than ever before, partially in

response to the current situation, one suspects, partially because as more Ph.D.s have been earned in STEM, various affinities have led to groups like Black Mathematicians of the Diaspora, Society of Black Engineers, etc. Organizations like the National Academies, policy and oversight boards of science sponsoring federal agencies such as the Department of Energy (DOE), Department of Defense (DOD), NASA and many more have also engaged with underrepresented groups' limited participation in science and engineering. However, of all the organizations concerned with equity and workforce issues, The American Association for the Advancement of Science (AAAS) has made a distinctive long-term effort to sustain and support expanded participation of underrepresented groups at all levels of scientific and engineering education and em-

*"As federal contractors, universities are still bound by Executive Order 11246. Not only are universities able to recruit based on diversity, they are required to do so!"*

(Continued from page 6)

ployment. The most recent activity of the Directorate of Education and Human Resources (EHR) Programs under the leadership of Shirley Malcom and Yolanda George is a substantial contribution in the fight against the current inimical climate.

In January 2004 AAAS EHR working with the National Action Council for Minorities in Engineering (NACME), convened a national meeting chaired by Shirley Malcom and Daryl Chubin of NACME. The result is the most valuable document in recent years to sustain and improve the participation of underrepresented groups in STEM fields. Called *Standing Our Ground: A Guidebook for STEM Educators in the Post-Michigan Era* [Editor's note: See p. 8], put together by the two chairs and Jolene Jesse, it is a true guide for understanding the legal parameters of institutional action. It provides an overview of programs still legally able to focus on members of underrepresented groups. In the context of this Keeping Our Faculties Conference, with reference to faculty recruitment and retention it states:

*"If there is one area where universities are on solid legal ground in promoting diversity efforts, it may be faculty recruitment and hiring. As federal contractors, universities are still bound by Executive Order 11246, which carries a requirement to develop an Affirmative Action Plan that includes an analysis of the utilization and underutilization of minorities and women (see Legal Primer). It also requires that contractors reach out to a diverse pool of candidates, although the actual selection of an employee should be done regardless of race or ethnicity. In other words, not only are universities able to recruit based on diversity, they are required to do so!"*

Large questions remain about why institutions have not diversified their faculty and why, despite national improvements in the participation of underrepresented students in STEM fields, the numbers of diverse faculty members at predominantly white institutions do not seem to increase.

There are many reasons why this has not happened which all emphasize the enormous complex-

ity of bringing more diverse faculty into STEM departments. The issue too is whether change will be eventually fostered by external agencies, from within, or a combination of the two. At the moment graduate departments exist in their current form largely because of the pattern of funding available to support faculty research and student research assistants which grew exponentially after the launching of Sputnik. Calls for proposals made by federal funding agencies, largely by the National Institutes of Health (NIH) and the NSF have stimulated departments since the 1980s to create a broad range of student support programs for under-served and underrepresented students; changing once again how departments function, although to a limited degree.

Changes are important but are more of an addition to department operations than a fundamental change in approach. At the institutional level, after Proposition 209, centrally funded grants for minority graduate students ceased, and the pool of money is now available to all. Real change needs to be supported by individual faculty, backed up by institutional commitment manifest by strong local academic leadership and a willingness to be remorseless both in implementing policies supporting diversity and in not rewarding the recalcitrant. It also requires budget and staffing to maintain.

*"What research do faculty need to be acquainted with that might induce them to be more active in insisting on real diversity among their students and colleagues?"*

What research do faculty need to be acquainted with that might induce them to be more active in insisting on real diversity among their students and colleagues? Possible sources are: Awareness of the situation through data and trend analysis, an understanding that the practice of science is imbedded in a socio-cultural system which brings many of the same prejudices from society at large to the workbench, much more knowledge about the professional lives and experience of minority professionals, knowledge of "best practices" in developing the next generation of underrepresented faculty, and a willingness to experiment. Without strong departmental and institutional leadership, however, all of this will not be much more than reinforcing the commitment of those already en-

(Continued on page 15)

## Standing Our Ground: A Guidebook for STEM Educators in the Post-Michigan Era

*Excerpted from the same-titled report by the American Association for the Advancement of Science (AAAS) and the National Action Council of Minorities in Engineering (NACME)*

**Editor's note:** *This new report from the AAAS and NACME attempts to clear up some of the confusion created by the Supreme Court's dual rulings in the University of Michigan affirmative action cases. To clarify legally defensible options for protecting diversity in science and engineering programs, the report features a "legal primer" to help in interpreting the Grutter and Gratz rulings. It also describes eight "design principles" that may serve as a checklist for faculty and administrators alike. Excerpts from the report are provided here to encourage AAAS members to take advantage of this superb—and free—resource.*

### **From the press release:**

“Universities have been subjected to a campaign of intimidation so that a bunker mentality now prevails, despite the fact that targeted recruitment is still perfectly legal,” said report co-author Shirley M. Malcom, director of Education & Human Resources at AAAS. Since the Michigan rulings, two advocacy groups — the Center for Equal Opportunities and the American Civil Rights Institute — have questioned an array of minority recruitment and other intervention programs. According to *The Chronicle of Higher Education* (19 March 2004), these two groups have sent some 1000 letters to colleges threatening to file complaints with the U.S. Office for Civil Rights.

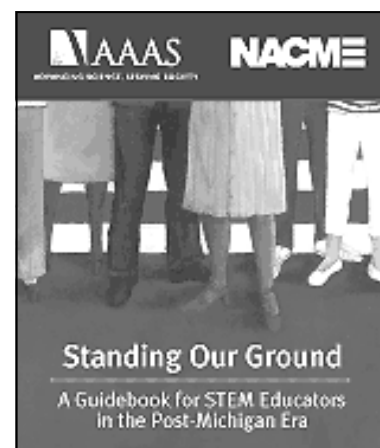
How can program administrators protect diversity goals in the post-Michigan era? In summary, the report notes, “there is no cookie-cutter approach” that will work in all settings. Instead, explains report co-author Daryl E. Chubin, director of the AAAS Center for Advancing Science & Engineering Capacity, “We propose that universities take a program-by-program approach, and be mindful that ‘race-neutral alternatives’ are not required; they simply must be considered.”

“Universities need to take on a strong leadership role that unambiguously states a commitment to diversity in their mission statements,” the

AAAS-NACME report concludes. Planners also are urged, for example, to specify program goals and target populations; to define the program's character so that any consideration of race is “not mechanical, but flexible;” to conduct evaluation and research on outcomes; and to pursue diverse faculty recruitment and retention. Campus leaders must be “willing to take risks in order to realize the rewards inherent in a more diverse campus or organization,” the report notes.

### **From the report's "legal primer":**

In the final section of this primer we summarize ongoing federal affirmative efforts to broaden participation in STEM fields. It is critical that STEM program implementers understand that avenues to increase diversity in these fields still exist, and that these programs can continue as long as they are designed and implemented in a constitutionally permissible manner. The potential for new paradigms remains, though such new approaches will necessarily have to employ creative and innovative strategies compliant with the legal principles set forth above. AAAS and NACME maintain that inroads to solving the intractable problem of underrepresentation in STEM fields will only be made by institutionalizing or “mainstreaming” concern for these issues. We therefore encourage more widespread utilization of the broad language contained in the Science and Engineering Equal Opportunities Act, increased federal enforcement of Title VI, Title IX and 504 compliance in STEM fields, and the



*Standing Our Ground is available free of charge by email request to [ehr@aaas.org](mailto:ehr@aaas.org) or by download from [www.aaas.org/standingourground](http://www.aaas.org/standingourground)*

*(Continued on page 9)*



*(Continued from page 8)*

development of new models like NSF's "Criterion II" by institutions that fund STEM education and human resource development, including federal agencies, private corporations and foundations.

### **The Science and Engineering Equal Opportunities Act of 1980, 42 U.S.C. §1885, et seq. (as amended, December 2002) (the "SEEOA")**

This often-overlooked law was the first of its kind with its mission to create equal opportunity in STEM fields. The SEEOA includes strong and broad language about the United States' interest in promoting the full use of human resources in STEM fields that could be relied upon more broadly by proponents of equal opportunity programs in STEM fields. It is important to note that the Congressional findings and statement of policy set forth in the SEEOA is broadly applicable to STEM fields, even though the specific authorization language in the statute refers to the National Science Foundation. NSF relies upon this mandate to authorize its comprehensive science and engineering education program to increase the participation of underrepresented groups in STEM fields, and to support activities to initiate research at minority-serving institutions. The SEEOA remains in effect today. It was amended as recently as one and a half years ago as part of the NSF Authorization Act, P.L. 107-368 where Congress specifically added "persons with disabilities" to its "Congressional statement of findings and declaration of policy" set forth in §1885 of the SEEOA, and also explicitly listed implementing the goals of the SEEOA as a priority area for NSF. The Grutter and Gratz cases should inform the implementation of the mandates of the SEEOA by universities and other institutions engaging in STEM human resource development, whether or not those institutions receive NSF funding.

### **NSF Criterion II**

NSF Criterion II is another model for success. Since 1997, proposals submitted to the National Science Foundation have been evaluated through use of two merit review criteria. The first review criterion relates to the intellectual merit of the proposal, the second relates to the broader impacts of the proposed activity. Historically, most proposers

## **The SEEOA**

- ◆ The Congress finds that it is in the national interest to promote the full use of human resources in science and engineering and to insure the full development and use of the scientific and engineering talents and skills of men and women, equally, of all ethnic, racial, and economic backgrounds, including persons with disabilities.
- ◆ The Congress declares it is the policy of the United States to encourage men and women, equally, of all ethnic, racial, and economic backgrounds, including persons with disabilities, to acquire skills in science, engineering, and mathematics, to have equal opportunity in education, training, and employment in scientific and engineering fields, and thereby to promote scientific and engineering literacy and the full use of the human resources of the Nation in science and engineering. To this end, the Congress declares that the highest quality science and engineering over the long-term requires substantial support, from currently available research and educational funds, for increased participation in science and engineering by women, minorities, and persons with disabilities. The Congress further declares that the impact on women, minorities, and persons with disabilities which is produced by advances in science and engineering must be included as essential factors in national and international science, engineering, and economic policies.

have had more difficulty responding to criterion II than criterion I. Accordingly, as of October 1, 2002, NSF implemented a policy of returning, without review, proposals that do not separately address both merit review criteria within the Project Summary. NSF implemented this change to more clearly articulate the importance of broader impacts to NSF-funded projects. NSF implements this policy in an even-handed manner that treats all proposers identically. AAAS and NACME maintain that use of a "Criterion II like" factor by more federal

*(Continued on page 20)*

## FEATURE ARTICLE

# Affirming Diversity at Michigan (cont'd)

(Continued from page 5)

Proving the constitutional validity of this argument was essential, because no other tenable legal argument for affirmative action existed on which the university could rely. While the courts have recognized the need to remedy past discrimination as an acceptable justification for affirmative action, that claim is difficult to prove and is ill suited to higher education. It requires proof of direct effects of specific institutional discrimination, rather than just general societal discrimination. Few institutions can afford, logistically or financially, to establish sufficiently strong evidence of their own past extensive racial discrimination, and few want to spend time and money to prove exactly how terrible they were in the past. Some Michigan students and civil rights groups did intervene in the case to argue that past discrimination necessitated Michigan's policies, but the Court summarily dismissed their arguments.

Fortunately, Michigan's efforts paid off. Not only did the Court uphold educational diversity as a justification for affirmative action, but it recognized the need for deference to educators to determine the best educational environment. In fact, the Court made such a strong statement on this issue that the *Grutter* "affirmative action" decision is also an exceptionally strong academic freedom decision.

### Deference to Educators

In an endorsement of Justice Powell's academic freedom argument in *Bakke*, the *Grutter* majority opinion affirmed that "given the important purpose of public education and the expansive freedoms of speech and thought associated with the university environment, universities occupy a special niche in our constitutional tradition." Recognizing the Court's "tradition of giving a degree of deference to a university's academic decisions," Justice O'Connor went on to conclude that "good faith on the part of a university is presumed absent a showing to the contrary."

*"The opinion is a victory for the freedom of faculty to make the important decisions they are most qualified to make by virtue of their training and expertise."*

Justice O'Connor noted specifically in discussing the facts of the case that a faculty committee crafted the admissions policy the Court was upholding, that it became the official policy upon unanimous adoption by the entire law school faculty, and that the policy was focused on evaluating applicants with an eye toward their "potential to contribute to the learning of those around them." Having recognized the deference that such academic decisions should receive, she especially acknowledged that the question of the educational benefits of diversity involves "complex educational judgments in an area that lies primarily within the expertise of the university."

Justice O'Connor and the majority did not have to go so far to answer the question at hand. The opinion's strong endorsement of this deference is a clear victory for the freedom of educators, including faculty members, to make the important decisions they are most qualified to make by virtue of their training and expertise, and to do so without undue judicial interference.

### Beyond Diversity

The question of diversity as a compelling state interest was the most critical element of the Michigan cases, and the result was certainly a victory for academia. Some feared, however, that the Court would endorse diversity but make the standard for tailoring any admissions process so narrow that it would become a practical impossibility to implement it. Alternatively, others worried that the Court's decision on narrow tailoring might be so unclear that it would be impossible to follow. Although the Court did strike down some of Michigan's admissions policies, neither of these fears came to pass. Considerable room remains for affirmative action in admissions, and the Court's guidance, though a bit murky, is not nearly as vague as some predicted.

To determine what kind of race-conscious ad-

(Continued on page 11)

(Continued from page 10)

missions plan, exactly, the Court considers to be tailored narrowly enough, it is necessary to read Justice O'Connor's *Grutter* decision and Justice Rehnquist's *Gratz* decision together, comparing and contrasting to find the nuggets of consensus. Both rulings purport to follow Justice Powell's *Bakke* decision closely, quote from it liberally, and seem to concur on the general legal principles. So at least apparent agreement exists on the law. Tension remains, however, on exactly how that agreed-upon legal standard will be implemented when put into practical use.

### Individual Consideration

Justice O'Connor and the majority in *Grutter* found the law school program to be tailored narrowly enough to pass strict scrutiny. Justice Rehnquist and the majority in *Gratz* (which included Justice O'Connor) found the university's undergraduate admissions policy, which awarded 20 points out of 150 to underrepresented minority applicants solely because of race, to be insufficiently "narrowly tailored to achieve the interest in educational diversity that respondents claim justifies their program." Both authors agreed, however, that race can be considered as a "plus" factor in admissions if that factor, as Justice O'Connor explained, is considered in the context of a "highly individualized, holistic review of each applicant's file, giving serious consideration to all the ways an applicant might contribute to a diverse educational environment."

Although Justice Rehnquist also spoke at some length generally supporting individualized consideration, he did not provide many details on his exact meaning. Justice O'Connor was slightly clearer, noting that the law school policy "does not restrict the types of diversity contributions eligible for substantial weight in the admissions process, but instead recognizes many possible bases for diversity admissions." She found the law school's admissions policy acceptable because of these "many possible bases for diversity."

She further credited the law school for giving

substantial weight to diversity factors besides race and noted that it frequently accepts non-minority applicants with grades and test scores lower than underrepresented minority applicants. Yet in this discussion, she also accepted that the policy expresses "longstanding commitment to 'one particular type of diversity,' that is, 'racial and ethnic diversity with special reference to the inclusion of students from groups which have been historically discriminated against.'" "Finally, she was comfortable with the idea that "[b]y enrolling a critical mass of underrepresented minority students, the Law School seeks to ensure their ability to make unique contributions to the character of the Law School."

### Critical Mass

The Court accepted in *Grutter* the university's argument that it was necessary to enroll a "critical mass" of minority students to achieve the educational benefits of diversity and to ensure that a few minority students didn't end up being token representatives of their race. The CIR argued that this claim was simply an excuse for a quota. Justice O'Connor, however, defined quotas as "impos[ing] a fixed number or percentage which must be attained, or which cannot be exceeded, . . . and insulat[ing] the individual from comparison with all other candidates for the available seats." In contrast, she saw critical mass as a permissible goal, not a quota, because it requires only a "good

faith effort . . . to come within a range demarcated by the goal itself," not "a fixed number or percentage which must be attained." Thus Justice O'Connor flatly rejected the argument that an affirmative action program is the same as a quota simply because it gives "some 'plus' for race, or [gives] greater 'weight' to race than some other factors."

### Bottom Line?

So where do the decisions leave us? First, it is our province, privilege, and responsibility as educators to take diversity into account in ways that create the best possible educational environment. When we do so in admissions, however, we must avoid mechani-

*"It is our province, privilege, and responsibility as educators to take diversity into account in ways that create the best possible educational environment."*

(Continued on page 12)

## FEATURE ARTICLE

# Affirming Diversity at Michigan (cont'd)

(Continued from page 11)

cal point systems, especially ones that give more points to race than to most or all other factors. Both Court decisions emphasize the value of individualistic, holistic, non-mechanical review, and both criticize the point system used in Michigan's undergraduate admissions.

Yet the ultimate conclusion about what type of plan will work and also pass constitutional muster remains up in the air. How does one take race into account in a way that can achieve a critical mass and a diverse student body without overtly quantifying exactly how much weight race is given? Doing so will demand subtle balancing. Perhaps, as Justice Ginsberg mentioned in dissent, it comes down not just to a question of avoiding obvious point systems, but also to an institution's success at increasing the overall stealth level of its process.

### The Narrow Misses

Before moving on, it is also worth pausing to note what wasn't required by the Court, which is often as important as what was. First, many feared that the Court would require institutions to consider and exhaust every conceivable "race-neutral alternative" to racial preferences. A requirement to rule out all such alternatives would have made implementation of any policy exceedingly difficult. Among other things, schools would have had to show why every possible race-neutral alternative would not work—a prohibitively expensive and time-consuming proposition.

The Bush administration argued that Michigan's plan was not narrowly tailored because it could and should rely on alternatives such as "percentage plans," (which offer automatic admission to state schools to students in a certain top percentage of their high school classes); lottery systems; extensive minority recruiting; and so on. Addressing this issue, Justice O'Connor noted that narrow tailoring requires serious, good-faith consideration of race-neutral alternatives that can

achieve the diversity the university seeks, but does not mandate reliance on such programs. Indeed, Justice O'Connor expressed some doubt about percentage plans, suggesting indirectly that they may not actually be race neutral, that the administration does not explain how they could work for graduate schools, and that they do not allow for individualized considerations.

Fortunately, too, Justice O'Connor clarified that narrow tailoring does not "require a university to choose between maintaining a reputation for excellence [and] fulfilling a commitment to provide educational opportunities to members of all racial groups." Some had argued that Michigan's only interest was in "maintaining a 'prestige' law school whose normal admissions standards disproportionately exclude blacks and other minorities," but Justice O'Connor soundly rejected any requirement of a choice between prestige and diversity.

A second, more subtle omission worth noting is the limited nature of Justices O'Connor's and Rehnquist's approach to the Fourteenth Amendment. In focusing on individualized consideration of different elements of diversity and condemning a system that awards points solely for race, they endorsed the presumption that the best way to "equally protect" all individuals is to treat all as similarly as possible. They allowed for narrow consideration of race as one of many factors because they found a compelling state interest in educational diversity. But their focus was on how similarly applicants can be treated while still having some narrow consideration for diversity.

Equally valid, however, is the argument that admissions policies without affirmative consideration of race have such a negative impact on minority admissions that the failure to affirmatively consider race is itself a denial of equal protection under the law. Justice Ruth Bader Ginsburg, joined by

*"Narrow tailoring does not 'require a university to choose between a reputation for excellence [and] a commitment to provide educational opportunities to members of all racial groups.'"*

(Continued on page 13)

(Continued from page 12)

Justices David Souter and Stephen Breyer, alluded to this point in her dissent in *Gratz*, noting that “[t]he Constitution instructs all who act for the government that they may not ‘deny to any person . . . the equal protection of the laws’[;] . . . [i]n implementing this equality instruction, as I see it, government decision makers may properly distinguish between policies of exclusion and inclusion.”

As she eloquently stated, “Actions designed to burden groups long denied full citizenship stature are not sensibly ranked with measures taken to hasten the day when entrenched discrimination and its aftereffects have been extirpated.” Yet the majority opinion in *Grutter* accepts a reading of the Fourteenth Amendment emphasizing that considerations of race should be as similar as possible for equal protection to exist.

This narrow approach affects the way people will view the Court’s decisions and affirmative action in general. It reflects, too, the schism that divides the Court and the nation, and gives credence to terms like “reverse discrimination”—language that presumes that giving preference to minorities actually “discriminates” against members of the majority, even though members of the majority remain dramatically more privileged than the minority population.

Activist Tim Wise has equated discussing privilege in our society to asking a fish how it feels about water. Privilege is so ubiquitous that members of the majority are often not aware that it exists, just as a fish cannot conceive of a world without water. It will be a great challenge to move forward under these new decisions while keeping the “water” in the public eye. Thus while the Court’s decision is a decided victory for diversity, it also fails to truly recognize systemic disparities and the purpose of the Fourteenth Amendment. In this way, it is a loss for America’s greater social conscience.

## The Future

This academic year is the first under the “new” order. Admissions offices nationwide will be evaluat-

ing their policies and practices and determining how best to meet their institutional commitment to diversity within the confines of the Constitution. The greatest change will be at highly selective and large schools—schools that have the luxury of choosing from many qualified candidates, and those whose large applicant pools have necessitated admissions point systems similar to Michigan’s. A move to the individualized review envisioned by the Court may present significant costs—burdens that may fall disproportionately on public institutions, which, in current economic times, may have difficulty absorbing them.

Other institutions, however, may see little or no change. Many schools have open, or virtually open, admissions. Others already conduct individualized reviews or focus on religion, geography, or other issues more specific to their particular mission. And still others are already forbidden from considering race in their admissions process by state laws, which can be narrower and more restrictive than the rulings of the Supreme Court. (For example, California and Washington now have laws banning consideration of race in admissions).

Although the Supreme Court has spoken, the role of race in student admissions in higher education will probably not be laid to rest any time soon. Justice O’Connor hinted at an end to affirmative action, stating that the majority “expect[s] that twenty-five years from now, the use of racial preferences will no longer be necessary.” This statement does not establish an absolutely firm limit, but the dissenting justices did as much as possible to ensure that it would be interpreted that way. They called it a “self-destruct mechanism” and a specific holding that racial preferences in admissions “will be illegal in twenty-five years.” So if we still use affirmative action twenty-five years from now, a new challenge will undoubtedly arise to end it. The Court will either have to eliminate it or find some way to reconcile its use as a no-longer-temporary option.

In the meantime, we should not expect challenges to affirmative action to abate, because these

*“Actions designed to burden groups long denied full citizenship stature are not sensibly ranked with measures taken to hasten the day when entrenched discrimination and its aftereffects have been extirpated.”*

(Continued on page 14)

## FEATURE ARTICLE

# Affirming Diversity at Michigan (cont'd)

(Continued from page 13)

challenges are not really about specific legal arguments or rights. They are about attitudes toward race, entitlement, and access to education. As legal scholar Goodwin Liu pointed out in 2002 in the *Michigan Law Review*, the greatest challenge to white students in gaining admission to elite colleges is actually other white students. Studies have shown that eliminating racial preferences at selective schools increases the likelihood of admission for white applicants by only 1.5 percent. White students who do not get admitted are losing their seats to other, probably wealthier, members of the majority. (After all, white students were admitted to Michigan with scores lower than all of the plaintiffs in the two cases.)

But the nation's current racial climate still permits applicants to blame race rather than other factors, or their own deficiencies, when they aren't admitted to the school of their choice. This tendency will likely fuel continued efforts to ban affirmative action, and will require colleges and universities to continue to defend their programs. The CIR and other groups opposed to affirmative action in admissions have already stated their intention to shift their focus to the political arena and other higher education programs (scholarship programs, financial aid programs, summer camps, and recruitment programs, for example). Legislative efforts in individual states to enact bans similar to those already in place in California and Washington State have already begun.

Faculty can also expect increasing and unique challenges. Affirmative action will continue to engender heated discussion, and faculty members can guide that discussion toward constructive and enlightening debate. Faculty continue to develop ingenious and creative ways to enhance and take advantage of that challenge. Many have developed innovative teaching methods in diverse classrooms, and programs in multicultural learning are now widespread. Moreover, faculty will be needed to

conduct the research required to assess the effects and efficacy of affirmative action programs and race-neutral alternatives. The Court has demanded frequent evaluation and reassessment, and this research requirement creates yet another important role for faculty.

Other faculty members have become involved in recruiting and mentoring students and making sure that they feel comfortable and supported. Many minority students still report feeling isolated, marginalized, and misunderstood on their college campuses, and faculty can help to improve this situation. The Supreme Court has deferred to educators—faculty and administrators—to create the

best educational environment possible. As we move forward toward what Justice Ginsberg calls the “next generation’s span . . . toward nondiscrimination and genuinely equal opportunity,” we must continue to earn that respect and deference in how we admit students and in how we evaluate, mentor, guide, and educate them.

*“Affirmative action will continue to engender heated discussion, and faculty members can guide that discussion toward constructive and enlightening debate.”*

1. *Regents of the University of California v. Bakke*, 438 U.S.

265 (1978).

2. *Gratz v. Bollinger, et al.*, 71 U.S.L.W. 4480 (June 23, 2003), and *Grutter v. Bollinger, et al.*, 71 U.S.L.W. 4498 (June 23, 2003).

3. Copies of briefs, amicus briefs, and other information in the cases are available at <[www.umich.edu/~urel/admissions/](http://www.umich.edu/~urel/admissions/)>.

4. All internal citations and quotations are omitted in quotations from the Gratz and Grutter opinions.

5. For a summary of the extensive social science research and literature on the educational benefits of diversity, see the Diversity and Affirmative Action section of the AAUP's Web site.

*Ann Springer is associate legal counsel for the American Association of University Professors (AAUP). This article originally appeared in the Sept/Oct 2003 issue of Academe, the magazine of the AAUP. Visit the AAUP website: [www.aaup.org](http://www.aaup.org).*

## Research on Addressing Institutional Challenges to Increase Faculty of Color (cont'd)

(Continued from page 7)

gaged in promoting diversity.

The following discussion of the areas listed here is intended to give an idea of the character of the literature available and its apparent readership. It is far from exhaustive. Who reads what is a matter of pure speculation, but anecdotal evidence in the form of many recent conversations with scientists suggest that the areas listed above usually have discrete audiences. In fact, a substantial problem in addressing developing a STEM faculty of color is that, if anything, much of the research and publication in all these areas is simply not read by STEM faculty, nor does information circulate which would be helpful in their teaching and administrative work to make diversity a reality. This is not surprising. Tony Becher did an ethnography of several departments in both the United States and Great Britain and produced a very valuable book, *Academic Tribes and Territories* (2001). In a simplification of his analysis, academic tribes are created and sustained by forms of knowledge and distinct forms of communication about this knowledge belonging to a particular discipline—the territory. Disciplinary specific departments are communities distinguished from others by the type of knowledge they possess. Induction into the “tribe” requires learning a distinct way of thinking about problems, and the specific language which communicates this pattern of thought. Scientists and engineers form their own communities. In the current situation in which academic life is much more demanding than in the past faculty find that more is demanded of them by their departments, by their students, by administrators, and by their disciplines. Literature which could assist them, possibly written by social scientists, is alien. STEM faculty usually have not been trained to understand it, may not be interested, and just don’t have the time. If there are to be significant changes, ALL future faculty should experience new approaches to their training as graduate students so

*“A substantial problem in addressing the problem of developing a STEM faculty of color is that much of the research in all these areas is simply not read by STEM faculty.”*

that there is at least some acquaintance with issues of diversity and practices which support it as well as knowledge of the kinds of literature which can assist them.

### Data Sources:

There are a large number of data compendia and analyses at the national, state, and institutional level. Nonetheless, most faculty in any department have only a superficial acquaintance with data even on their own department’s students unless they are on an admissions or some other kind of committee for which data is necessary. This is far from enough. Accurate and easily accessible data on underrepresented participation in STEM at all levels should be available to all present STEM faculty in their own discipline. Basic statistics and other information help to make the nature of the problem of underrepresentation easily comprehensible. At the micro level departments usually circulate information on students among its faculty on how many students applied, enrolled, graduated; usually by gender and ethnicity. At the macro level agencies such as

(NSF), the National Center for Educational Statistics (NCES) and many other agencies and organizations collect national data on students, teachers, faculty and much more. NSF and NCES fulfill various responsibilities to Congress and federal agencies in terms of providing these data to policy makers. There are numerous reports produced annually or bi-annually which provide the basic trend analysis. NSF is mandated by Congress to produce what are called “comprehensive and special analytic reports” which include *Science and Engineering Degrees, and Women, Minorities, and Persons with Disabilities in Science and Engineering*, and *Data Briefs: Graduate Students and Postdoctorates in Science and Engineering*—among hundreds of others.

Despite the basic data tables agencies make

(Continued on page 16)

## Research on Addressing Institutional Challenges to Increase Faculty of Color (cont'd)

(Continued from page 15)

available, fundamental information on participation in STEM degree programs and graduation by gender and ethnicity is not all that easy to obtain. The extensive publications that are based on these sources tend to aggregate data in ways which do not easily promote understanding of the condition of underrepresented students and faculty. There are several reasons for this: 1. the changing classification of ethnicity: 2. reporting data for both citizens and green card holders. 3. not disaggregating by gender. 4. lumping social science in with natural and physical science and engineering. These criticisms also apply to the NCES data base; there the problem for understanding faculty employment is

the use of “four year institutions” and/or “degree granting institutions” instead of the Carnegie Classification system in the accessible tables. Since there is an extreme difference between a Research I institution and a community college, classifying them under the same heading leads to misleading judgments of significant measures of faculty productivity. It is no surprise that publication output of faculty of color who teach at predominantly comprehensives and liberal arts colleges is less, if they are in the same comparison model with faculty at Research I institutions. This in turn becomes established wisdom about all faculty of color in a prejudicial way.

The real issue here is that there is very little research at all on the experience of faculty of color in STEM fields. Not only is it not clear where they do or do not teach, the Nelson Surveys only establishes that they are not teaching much at the top 50 National Research Council (NRC) rated departments in chemistry, physics and mathematics. The hard work put into the American Council of Education (ACE)'s William Harvey on the *20th Anniversary Minorities in Higher Education: Annual Status Report, 2002-2003*, is very useful because it brings together data from a variety of sources to discuss the situation of minorities from high school through academic employment. What it cannot do, because

*“The real issue here is that there is very little research at all on the experience of faculty of color in STEM fields.”*

the primary source for information on faculty—the Equal Employment Opportunity Commission—does not, is break down the numbers of minority faculty employed by institution type. In 2001 the American Institute of Physics reported on the tiny number of African American faculty in physics (150), two-thirds of whom teach at a Historically Black College or University (HBCU). On questioning one of the authors, Rachel Ivie, it turned out that these data had been collected by the staff of *The Journal of Blacks in Higher Education*.

State data can be more explicit about faculty, at least for faculty employed in public institutions since that is a matter of public record. It still does not make it easy to find by rank, by ethnicity and gender. The state with the largest number of post-secondary institutions (400+), California, has been under legislative and public scrutiny in terms of faculty hiring at its public institutions. Requested by a group of women faculty from the University of California (UC) of State Senator Jackie Speier, an Audit was conducted for three successive years between 2001-2003, of

the hiring, retention and promotion of ladder women faculty. Another State Senator, Richard Alarcón, had the research service of the State Library conduct a review of the situation of faculty at the three public tiers in California particularly with respect to the hiring, retention and promotion of faculty of color. Reports are completed on the Community College System (107), the California State University System (23), and the University of California System (10). With these data Alarcón is requesting an Audit of practices in hiring, retention and promotion of faculty of color. State data is also collected by the Commission of the States and published as a *Annual Report on the Condition of Education in the States*.

With all of this activity it is still not possible to easily answer a question such as how many assistant professors of color were hired in academic year 2002 at Research Universities in microbiology.

(Continued on page 17)



(Continued from page 16)

Certainly, while many professional societies track employment of its members and member institutions, coverage for all scientific fields is inconsistent. Among the better organized are the American Chemical Society, and the American Institute of Physics. Ethnicity and gender is not regularly given in their annual reports, however.

Data on graduate students is available on *Web-Caspar*, a web service of NSF which enables the user to produce tables which include ethnicity and gender which can be ordered by institution, institution type, and broad field. Information on enrollment and degree attainment are available. It is very hard to refine the output. The most useful source is the *Doctorate Recipients from United States Universities: Summary Report*. Sponsored by six federal agencies, it gives detailed trend data. Every volume takes up a special topic, the most recent is on first generation college graduates earning research doctorates. The most recent edition for 2002 reports that first generation college graduates earning Ph.D.s fell from around 60% in 1977 to 37% in 2002. For African Americans the comparable figures for is 78% to 56.3% for all fields, both genders and all citizenship statuses. This is a very important trend with implications about access and the ever narrowing pipeline. But still it is an aggregate. The only place to find U.S. citizen Ph.D. attainment by clear ethnic group AND gender is *Science and Engineering Degrees*.

All of this takes any researcher a number of years to figure out, and usually only to the extent that he or she is able to find the data required for the project at hand. For it to be helpful to scientists requires the kind of summary which the *Committee on Professionals in Science and Technology* puts out on many aspects of training and employment in science for each broad field. Although *Science Magazine* and its corresponding website occasionally have articles on data of particular sciences, it is not consistent. All of this really makes clear why scientists generally do not consult these sources.

### Social System of Science:

This is one of the most difficult concepts to transmit to scientists and engineers who have a low tolerance for the looser conceptual world and the fluidity of borders of the social scientist. An engineer who finally understood a NSF ADVANCE grant application, cried, "it's a 7 vector problem." As mentioned, disciplines really have different languages. Yet for change to occur it has ultimately to occur at the level of individual understanding so that white faculty become comfortable around faculty and students of color and no longer manifest symptoms of prejudice. Robert Merton famously postulated the "universalism of science," suggesting that scientists are neutral observers of phenomena so their work is value free. But such research as there is on the practice of science suggests that it is as heavily laden with culture as any other human activity. Willie Pearson, in his study on Black Chemists in the early 1980s, made it perfectly clear that scientists are particularly biased in the distribution of the rewards from science, so that African Americans generally do not get much recognition for their scientific work, are paid less than whites, and usually not promoted as their achievements would dictate. Larger studies of Black Professionals of several kinds demonstrate this occurring regularly.

*"It has been suggested that scientists are neutral observers so their work is value free. But research on the practice of science suggests that it is as laden with culture as any other human activity."*

In creating institutional change to facilitate a more inclusive environment for "outsiders" it seems that members of underrepresented groups follow the path of women. Once again the impetus arises from federal policy and follows a national investigation of the situation of women and girls in STEM called the Morella Commission Report or the CAWMSET Report. One response was an NSF created national program, ADVANCE, to increase women on STEM faculties and to change the culture of the individual university. The 17 universities who were awarded ADVANCE grants committed themselves to changing their institutions to make them more supportive of women faculty, to increase their number at senior levels, and to develop women to become campus leaders. External and

(Continued on page 18)

## Research on Addressing Institutional Challenges to Increase Faculty of Color (cont'd)

(Continued from page 17)

self-evaluation is taking place, so the results are not fully available, but the record of change described on the ADVANCE website of each of these campuses is impressive.

Faculty of color do not have a parallel program (although women of color were targeted in the 2nd RFP for ADVANCE). There are other programs funded by NSF, particularly the Alliance for Graduate Education and the Professoriate (AGEP) which is intended to create a future faculty of color in STEM. A very worthwhile program, it nonetheless remains an add-on to campus life and will likely disappear when the funding does. Institutional change requires that STEM faculty understand the character of discriminatory behavior and its effects on individuals of color at every level. Unfortunately there is so very little in print about the character of faculty life as experienced by scientists and engineers of color. Willie Pearson has probably done the most, Caroline Turner and Daryl Smith just touch on the experience of scientists in their respective work, but provide a great deal of clear evidence about the discriminatory and sometimes hostile behavior directed at faculty of color and the resistance of university faculty to increasing diversity. There is also a literature, much of it autobiographical, of faculty of color in social science and the humanities, but usually in volumes dedicated to just one group: African Americans or Hispanics. There is hardly a "literature" on the experience of Native Americans.

Currently websites devoted to promoting the interests of scientists have filled the void to some extent by providing information to students and faculty on minority issues and featuring stories on the lives of faculty of color, and the history of underrepresented individuals in science, technology and engineering. Among these are *Science Magazine's MiSciNet*; *Just Garcia Hill*, *A Virtual Com-*

*munity for Minority Scientists*; and *The Diversity-web* with extensive resources for combating discrimination through course syllabi, research reports and assessment tools.

Knowing more about the history and contributions of scientists of color and about their current experience working within colleges and universities might assist white faculty to appreciate individual and historical achievement more. Whether it would actually promote understanding of the impact of racism, and stimulate thought about cultural values remains to be seen. However, in the last two years both NIH and NSF have realized that for all of the billions of dollars they have spent on programs for students, next to nothing is known about the long-term impact of those programs on the careers of participants—and indeed whether they even graduated. Several grants from both agencies targeting students of color now require serious program evaluation. This is a serious challenge to STEM faculty to evaluate the effectiveness of a program in which student learning of a specific kind needs to be measured along with development of graduate school and leadership potential. Even if a social scientist with the requisite training is included in the grant proposal, the faculty member running the program needs to understand the language and conceptual world of the evaluator. This may be useful in many ways. But once again it is an external agent compelling individual scientists to conceive of their work differently. It might assist in promoting learning more about science as a social system.

Another area connected to using "best practices" to ensure equity at every step of the academic hiring, retention and promotion process, is information on the complex world of faculty today. Faculty of color may be disenchanted with a particular academic position, but all faculty are under great pressure to work long hours so that disenchantment can be widespread among faculty generally. There is an

*"Institutional change requires that STEM faculty understand the character of discriminatory behavior and its effects on individuals of color at every level."*

(Continued on page 19)

(Continued from page 18)

extensive literature on faculty working conditions which intersects with the specific concerns of faculty of color. It would be helpful to bring the work on teaching, publishing, service, and other activities into the understanding of the specific condition of faculty of color. Service, for instance is generally thought to be a drag on academic careers for faculty of color since there are so few that students of color tend to flock to them for advising and mentorship. Research institutions generally do not honor such work by seriously including it in the mix of criteria for tenure and promotion.

Institutions which have developed and implemented best practices in hiring, developing, mentoring and supporting faculty in many respects promote a sense of comfort and well being for all in a department. Although several national organizations attempt to promote the incorporation of practice deemed equitable, in the end the effort is local and usually promoted by an activist dean. Examples: Denise Denton, Dean of the College of Engineering at the University of Washington was determined to increase the number of women and faculty of color in her college. Her initial efforts to draw up guidelines for Engineering spread to the campus at large which put substantial effort into the guidelines and made them mandatory for all departments. In a different arena, but one having a great impact on women and students of color was the effort of the Associate Dean of Undergraduate Education in the School of Computer Science at Carnegie Mellon University, Alan Fischer, to change the computer science program so that more women could apply and pass the introductory courses. His efforts were so successful that the participation of women in the college went from 7% to 42%. Yet another Dean, Earl Lewis of the Rackham Graduate School at the University of Michigan, is developing activities to make students of color more successful in graduate school while at the same time promoting the hiring of more faculty of color.

Knowledge of programs to develop institu-

tional diversity by now is reasonably extensive. The Association of Colleges and Universities (AAC&U) created *Diversityweb* with the University of Maryland, and has taken the lead in publishing information about issues of faculty of color and guidelines for creating a more diverse and welcoming institution. The American Council on Education (ACE) also actively works on diversity and publicizes the experience of faculty of color. So too do many of the STEM disciplinary organizations like ACS, AMS, AIP and others. Unless actively interested in promoting diversity, it is highly unlikely that many STEM faculty would read this material.

While far from extensive and with some notable holes, literature, agencies and activities which promote the hiring of faculty of color in STEM and promote their retention are pretty much in place.

But institutional change will not occur until existing faculty are prepared to truly value diversity and adapt behaviors which support it. For that reason, the secondary route to achieving majority faculty support for diversity is to train current graduate students in thinking about diversity and how to support it through teaching, service and professional relationships. The real route to durable institutional change is at the level of individual understanding. There remain, however, serious barriers to promoting

this. These include sustained widespread social inequities—think of driving while Black—efforts among major national agencies which are not coordinated, the lack of widespread distribution of effective practice and revealing research as it is the product of many different disciplines and has no centralized home. Indeed, much of it is published in local reports and never circulates widely. Finally disciplinary language restrictions ensure that audiences are similarly restricted.

*Dr. Anne MacLachlan is with the Center for Studies in Higher Education at the U.C. Berkeley. This article, presented at the Keeping Our Faculties III conference in Nov 2004, is reprinted here with permission from the author. An accompanying bibliography of all sources cited is at [www.aas.org/csma](http://www.aas.org/csma).*

*“Although several national organizations attempt to promote equitable hiring and retention practices, in the end the effort is local and usually promoted by an activist dean.”*

## Standing Our Ground: A Guidebook for STEM Educators in the Post-Michigan Era (cont'd)

(Continued from page 9)

agencies and other institutions funding the STEM enterprise, will lead to collapsing the distinction between research and education, compelling universities and research institutions to examine the impact of their activities on the human resource development needs of the STEM enterprise, and consequently on the economic and national security interests of the nation.

### Equal Employment Opportunity Standards Imposed On Federal Contractors

It is essential that program implementers and their university counsel remember that federal equal employment opportunity standards remain in place. For decades, the federal government has not only banned discrimination by its contractors and subcontractors, but has also required both to take affirmative action steps to ensure that all persons have an equal opportunity for employment, without regard to race, color, religion, sex, national origin, disability or status as a Vietnam era or special disabled veteran. Most all universities are, of course, federal contractors. Therefore, university-wide plans to take steps to ensure equal employment opportunity for all—faculty, administrators, and students—is not only still allowed post-*Grutter*, but it is *required*.

The laws setting forth the federal standards in this regard are: Executive Order 11246, as amended; Section 503 of the Rehabilitation Act of 1973, as amended and the affirmative action provisions of (Section 4212) of the Vietnam Era Veterans' Readjustment Assistance Act, as amended.

Under E.O. 11246, government contractors with 50 or more employees must include a standard "equal opportunity clause" in each of their contracts exceeding \$50,000. If a contractor is found to have violated E.O. 11246, he may be debarred from future government contracts. Additionally, each of these contractors must develop an Affirmative Action Plan that includes an analysis as to the utilization or underutilization of minorities and women. The actual selection decision, however, is made without regard to race. The Department of Labor (DOL) enforces these affirmative action laws. DOL

### NSF Broader Impacts

The components of the broader impacts criterion as defined by the National Science Board are as follows:

- ◆ How well does the activity advance discovery and understanding while promoting teaching, training and learning?
- ◆ How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)?
- ◆ To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks and partnerships?
- ◆ Will the results be disseminated broadly to enhance scientific and technological understanding?
- ◆ What may be the benefits of the proposed activity to society?

also sets numerical goals for contractors to use, not as quotas, but to help to measure the effectiveness of affirmative action efforts to prevent discrimination. DOL also gives annual awards to contractors with outstanding affirmative action programs.

Just as in the case of Title VI, Title IX, and §504 compliance, AAAS and NACME strongly recommend increased and more effective monitoring of these equal employment opportunity requirements by the Department of Labor, as well as by STEM funding agencies, particularly as it relates to STEM faculty hiring and student assistants.

New approaches to broadening participation in STEM will necessarily have to employ creative strategies. These efforts will require collective thought and collaborative relationships among STEM program implementers free to share their ideas and past successes and failures. AAAS and NACME are committed to protecting and maintaining the kinds of open forums where these discus-

(Continued on page 21)

(Continued from page 20)

sions and modeling activities can occur. The intimidation and fear used by conservative groups purportedly concerned about “equal opportunity” are unproductive and unfortunate tactics that are, in our estimation, threats to STEM human resource development and consequently to the future economic and national security of this country. The stakes are high. If those of us in the STEM education and research community truly believe that diversity is critical to our educational missions, we must commit to making this conviction a reality. Understanding the legal principles set forth in this primer is the first step to standing our ground.

***From the report’s “eight design principles”:***

**T**he design principles are grounded in the discussion contained in the Legal Primer, so that program managers may draw on legal precedent to bolster their efforts. Taken together, these principles represent strategies for coping on campus rather than back-pedaling from “what works” in response to allegations and criticisms that may be unfounded, distorted, or without legal precedent.

Finally, we should remain mindful that STEM fields represent pathways to 21st century careers, not only in the U.S. but world-wide. Preparing as many students who are both interested in, and of demonstrated capability to pursue such careers is an imperative, especially if viewed against a backdrop of heightened national security here and challenged economic vitality abroad. STEM can either be an equalizer through access—to information, networks, and other global resources—or a wedge that widens the gap between those with “knowledge” and those in perpetual “ignorance.” The opportunity to acquire and use STEM skills underpins a robust workforce and particularly emboldens its leaders in government, industry, education, and the media.

What’s different about STEM is that: (1) participation in science and engineering vis-à-vis other fields is a national priority and should be treated as such; and (2) the *underparticipation* of women, minorities, and persons with disabilities in STEM—regardless of employment sector—continues as a structural problem, almost 40 years of policy and practice notwithstanding.

The eight design principles presented here en-

## **Eight Design Principles**

1. **Mission:** How do diversity efforts fit into the larger institutional mission?
2. **Intent of the program:** How does the program address overall university or organizational goals? What need does the program meet? What evidence led to the creation of the program?
3. **Target population:** What is the population to be served? How is this population linked to the intent of the program?
4. **Character of the program:** What does the program do? Where is it located?
5. **Program Context:** Context matters. One size does not fit all. Any program to promote diversity in STEM fields is located in myriad contexts. It is first and foremost located in a particular institution that has a history that should be taken into account throughout the design and implementation of the program. At the institutional level, establishing context should involve collecting data from throughout the institution, as well as in the STEM discipline(s) in which you are working.
6. **Evaluation and Research:** Prove that you are making a difference so that you can continue to make a difference until there is no need because there is no difference.
7. **Faculty Recruitment and Retention:** If there is one area where universities are on solid legal ground in promoting diversity efforts, it may be faculty recruitment and hiring. [See text below for more from this section of the report.]
8. **Leadership:** Everything we have discussed in these design principles is predicated on the need for a leadership willing to take risks in order to realize the rewards inherent in a more diverse campus or organization.

compass both theory and practice. They are offered as reinforcement for institutions of higher education committed to building STEM capacity as a human and technical resource to stand their ground.

(Continued on page 22)

## Standing Our Ground: A Guidebook for STEM Educators in the Post-Michigan Era (cont'd)

*(Continued from page 21)*

### Design Principle 7: Faculty Recruitment and Retention

**Theory:** If there is one area where universities are on solid legal ground in promoting diversity efforts, it may be faculty recruitment and hiring. As federal contractors, universities are still bound by Executive Order 11246, which carries a requirement to develop an Affirmative Action Plan that includes an analysis of the utilization and underutilization of minorities and women (see Legal Primer). It also requires that contractors reach out to a diverse pool of candidates, although the actual selection of an employee should be done regardless of race or ethnicity. In other words, not only are universities able to recruit based on diversity, they are required to do so!

**Practice:** Recruitment is the first step in the process of producing a diverse faculty. Single position searches differ from cluster recruitment, and specifying subdisciplinary areas of specialization further delimits the pool of eligibles. Retention efforts are also needed, especially when your “diversity hire” is the only one in a department or college. Once a new faculty member is hired, keeping track of her/him as s/he moves through the tenure process is of critical importance, especially so for women and minorities. Faculty searches are expensive and represent a net drain on ever dwindling resources for colleges and universities.

Those funds would be better spent trying to retain faculty by successfully moving them through the tenure process and then providing necessary resources to keep them. Retention efforts, however, may challenge current university cultures by setting up different reward structures and changing the expectations of faculty and administrators. Experimenting with support measures such as making the tenure clock more flexible, and increasing the family-friendliness of university support structures, for example, may challenge existing notions of acceptable workloads and time commitments. Such efforts, however, have proven beneficial to both female and male faculty members.

The concept of “critical mass” at the faculty-level is also important, though this may be of a dif-

### Diversifying the STEM Faculty

The need for a more diverse population of STEM faculty is compelling. According to NSF data, women Ph.D. scientists and engineers employed in educational institutions were less likely than men to hold the rank of full professor or to be tenured, even after adjusting for age or years since the doctorate (Characteristics of Doctoral Scientists and Engineers in the United States: 2001, Detailed Statistical Tables, National Science Foundation, 2003).

Doctoral faculty who are minority are barely visible regardless of field—less represented at the highest ranks and less likely to be tenured. African Americans and Latinos comprise about 3 percent of the engineering faculty, with even less representation at the full and associate professor levels (see the 2003 faculty surveys of the American Society for Engineering Education, [www.asee.org](http://www.asee.org) ).

Some strategies for building and maintaining a diverse STEM faculty include increasing the number of women and persons of color who are tenured and in upper level administrative positions. After all, tenured professors and department heads control resources, change values, promote excellence, and reward performance. Moreover, they wield influence by modeling faculty behavior. There is now research recognition of this, but solutions to making more of it happen—for the good of both the candidate faculty and the institution—remain elusive.

ferent magnitude than “critical mass” in the student body. Hiring one faculty member from an underrepresented group may not be sufficient, and the likelihood of retention is greatly reduced. Building a community that includes professionals from all backgrounds and that is supportive is more likely to maintain successful faculty diversity efforts.

*(Continued on page 23)*

(Continued from page 22)

**From the report's Appendices:**

**Appendix A: Select Data Compendium**

**African American Top 15 Baccalaureate Awarding Institutions in the Physical Sciences**

- |                      |   |
|----------------------|---|
| 1. Xavier University | 9. Florida A&M                          |
| 2. Howard University | 10. North Carolina State                |
| 3. Tennessee State   | 11. Southern University and A&M College |
| 4. Lincoln Univ      | 12. Morehouse College                   |
| 5. Jackson State     | 13. Georgia Southern U                  |
| 6. CUNY City College | 14. Fisk Univ                           |
| 7. Spelman College   | 15. Georgia State                       |
| 8. Dillard Univ      |   |

Source: CPST, data derived from NSF Web CASPAR

**African American Top 15 Baccalaureate Origin Institutions of Science and Engineering Doctorate Recipients, 1997–2001**

- |                                   |                          |
|-----------------------------------|--------------------------|
| 1. Howard University              | 9. UC-Berkeley           |
| 2. Spelman College                | 10. Univ of Maryland     |
| 3. Hampton University             | 11. Univ of Michigan     |
| 4. Morehouse College              | 12. Stanford Univ        |
| 5. MIT                            | 13. Xavier University    |
| 6. Harvard Univ                   | 14. Jackson State Univ   |
| 7. North Carolina A&T State Univ. | 15. North Carolina State |
| 8. Southern Univ                  |                          |

Source: CPST, data derived from NSF Web CASPAR

**Hispanic American Top 15 Baccalaureate Origin Institutions of Science and Engineering Doctorate Recipients, 1997–2001**

- |                              |                          |
|------------------------------|--------------------------|
| 1. University of PR Piedras  | 9. University of Florida |
| 2. University of PR Mayaguez | 10. Cornell University   |
| 3. Univ of Texas Austin      | 11. Stanford University  |
| 4. UC-Berkeley               | 12. Univ of TX El Paso   |
| 5. MIT                       | 13. UC-Irvine            |
| 6. UCLA                      | 14. University of Miami  |
| 7. Florida International     | 15. UC-Davis             |
| 8. Texas A&M                 |                          |

Source: CPST, data derived from NSF Web CASPAR

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)



First Class  
Postage Paid  
Washington, DC  
Permit #1725

**We're on the web!**  
**[www.aas.org/csma](http://www.aas.org/csma)**

*The Committee on the Status of Minorities in Astronomy*

*(CSMA) is a Standing Committee of the*

*American Astronomical Society.*

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