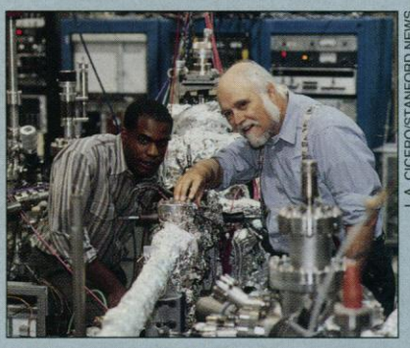
What Works

Reaching Critical Mass in Graduate School

Most U.S. physics departments have exactly the same number of black graduate students: zero. In fact, most universities in this country have never graduated a single black physics Ph.D., although almost every school says it is eager to do so.

But for a short time in the 1980s, during a remarkable episode at Stanford University, the school became a mecca for black physics students. As of this year, 19 black students will have earned Ph.D.s since 1984—more than any other major university. In 1987, graduate student Albert Green arrived from the University of Chicago to find about a half-dozen other black students, out of a total of about 150 in the graduate program. "It was a critical mass," says Green. How did Stanford pull it off?



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Multiplying the numbers. Five black Ph.D.s came out of Bill Spicer's lab.

The original formula included a handful of pioneering black students, several committed white faculty, and, eventually, an informal network of support and advice among the students themselves. It began with a few senior professors, notably the head of graduate admissions, Walter Meyerhof, and a sympathetic department head, Alexander Fetter. The graduate program really got rolling in the mid-1980s, when Meyerhof convinced two of the first black graduate students to tour the South to recruit other blacks. And as more blacks came to Stanford, Meyerhof asked several students to form an advisory committee to help him recruit minorities and to review their applications—reviews that included calling students and their professors.

Once the students were on campus, they got support from older students, and several key professors. One of the first bits of inside information the students shared was which labs to avoid—and which to seek out. Early on, Green was told to take a look at the lab of renowned physicist Bill Spicer. "It's not like he's recruiting black students, but when you visit a lab and see three other black students, you notice," says Green, who became the fifth black to earn his Ph.D. with Spicer.

Spicer tended to judge students more on their potential than on whether they had the right academic background. Occasionally, he took students who lacked top grades, or who didn't graduate from one of the best schools. He says: "You have to ask yourself, what's the potential of this guy in 10 to 20 years?"

But to unlock that potential, Spicer sometimes had to invest a good deal of time in these students. In one case, he spent hours advising a master's student how to make up for her poor training. Although she had earned a degree at an Ivy League university, the physics department there was more interested in pushing her through the program than finding out what she needed to be a successful physicist, says Spicer. Finally, he arranged for her to take undergraduate physics at Stanford.

In most cases, Spicer says he took the time to get to know students well enough that they could confide in him about their problems in the lab. Green, for one, recalls feeling isolated after a postdoc he'd worked with left. It wasn't until Spicer recommended that he work with a visiting researcher that he finally formed a collaborative research project, working on a condensed matter physics problem that became his dissertation. Today Green is considering offers from industry research labs.

But the mix of faculty interest and student support proved a fragile one. Spicer and Meyerhof have retired. Fetter's replacement as department chair, as well as a new group of younger faculty, didn't make it a priority to recruit and retain blacks or Hispanics, say Green and Spicer.

"Times are leaner, and it's harder to take care of these students," says Doug Osheroff, who just took over the chairmanship in September. Osheroff plans to reapply for a James Irvine Foundation grant that expires this year to recruit minorities. But as of now, black students have been setting their sights elsewhere. The word on the grapevine at the National Conference of Black Physics Students, according to Green, is that "The places to go now are Michigan State University and Georgia Tech. The chairmen of those physics departments have picked up the ball."

–Ann Gibbons

know what it's like to be considered 'the other,' and I don't always want to say, 'No, I can't talk you,'" says Williams. She says she wants the same thing most researchers do: an environment where she can focus on research and teaching.

While feeling crowded by extra demands, many also say they long for the camaraderie of other minority scholars. Sometimes minority professors feel that they are outside the mostly white social circles of their new departments. "There is just a comfort or discomfort level some people feel," says Marc Walters, a black chemist who just won tenure at New York University after a protracted battle. "If they haven't had much contact with blacks, it's harder to relax, harder to converse about a variety of topics—among them science.... Having contacts just doesn't happen as readily as for whites."

Of course, at many major research universities, all new faculty—white or minority—are left to sink or swim. "It's pretty Darwinian out there," says black chemist William Leicester of the University of California, Berkeley. But minorities or women are likely to have a particularly tough time dealing with such cold cultures. "Black [and other minority] faculty do feel they come and get isolated, that's why we need a larger mass of them," says Duke provost Langford. "Everywhere I go, to campuses around the country, I hear that."

The point of collegial contacts is not just for friendship, but because they may lead to scientific collaborations. Many minority faculty told *Science* they worried about their lack of scientific contacts in their departments. "People stop by and say, Sandra, what about this situation in South Africa?" says cell biologist Sandra Murray of the University of Pittsburgh, who is black. "But especially at first, no one seemed to want to talk about what I wanted to talk about—my *work*, my area of expertise."

Then there's the issue of graduate students—the lab labor force that gets the research done. Minority students may be more likely to seek out a minority professor—but whites or foreigners are not. And since most