

DIVERSITY GAP BETWEEN STUDENTS AND FACULTY

***Dr. Esin Gulari**, Division Director, NSF/ENG Division of Chemical and Transport Systems introduced panelists and moderated public discussion following panel presentations.*



Dr. Evelyn Hu-Dehart, Director of the Center for the Study of Race and Ethnicity in America at Brown University addressed the deficiency of minority faculty at Research One universities. Dr. Hu-Dehart attributed this problem to a cultural bias in the system. Namely, that top universities fail to look outside their ranks for qualified candidates. Because minorities are often educated in community colleges and state universities, they are overlooked, even though they are as capable as those coming from Research One universities, at fulfilling the role of a successful and productive faculty member.



Looking at the total number of faculty in science and engineering by race and ethnicity, blacks and Hispanics are not changing significantly. The largest number of Ph.D.s in the African American and Hispanic population is in education, then social sciences and humanities. The reverse is true for Asian Americans. Asian Americans receive a very disproportionately large number of higher degrees in engineering and in all science fields. Most of the space taken up by so-called minority scholars or scholars of color in the last decade or so have therefore been taken up by Asian Americans. If you take out the Asian American numbers, then the progress really is not impressive at all: it has basically been at a standstill for the last ten years.

Now I want to very quickly explain why it is that Asian Americans have made the progress. Looking at numbers in the back issues of *The Chronicle on Higher Education*³⁶ July issue, notice the institutions that Asian Americans have received their doctorates: they are very predominantly Research One universities. Every single major Association of American Universities, AAU, Research One institution is represented in this list. That to me in a nutshell explains why so many of them have moved on to the faculty positions at top-rated universities. These universities tend to hire their faculty from similar universities and it is in these institutions that they find a large Asian American pool.

In contrast, consider what happens with African Americans, Latinos and Native Americans. If you look at the African American list, you will be hard pressed to find the Research One institutions. This list is very different from the Asian American list. We can clearly see that Asian Americans are in the right kind of pipeline and in significant enough numbers so as to be recruited

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into the professorate of these Research One institutions. These numbers are just not there for the other major ethnic minority groupings.

Now what is the problem? The problem comes down to the faculty culture at the department level, at the search committee level, at the hiring level. I am not even talking about retention because before you can even tackle retention, you have got to talk about recruitment.

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The good news is that we are producing black or Latino or Native American scholars in the science and engineering fields; however, they are being produced at institutions that are generally not on the radar screen of the big Research One universities. There is an incredible coalition called the Southern Regional Education Board,³⁷ SREB. The SREB represents Ph.D. granting institutions primarily in the southern region of the United States and they have organized themselves into a coalition called the Compact for Faculty Diversity³⁸ to promote doctoral education for all students of color but primarily black and Latino with a smattering of Native Americans and a very small number of Asian Americans. The amazing thing about the SREB is that they meet every year and conduct an institute called the Institute on Teaching and Mentoring and it is specifically aimed at Ph.D. candidates. While there is production of graduate students of color, when I go and work with these students every year, I do not see the major Research One institutions represented.

I want to tell you about this because I find it quite disturbing that so many of the Research One institutes are not involved with this Compact for Faculty Diversity but I know why. It is because the institutes that are part of the compact are not on the right list. They are not the pedigree institutions but they are producing a significant number of students of color, particularly the underrepresented.

The other amazing thing is the fields that participants in this compact represent. If you look at the list, there is tremendous representation of science and engineering. The social sciences and humanities are also represented but the emphasis of this particular group, the Compact for Faculty Diversity, is in the sciences and engineering. They are producing graduate students of color in science and engineering but when I go and work with these students every year, I just do not see the major Research One institutions represented there recruiting from these institutions. To increase visibility, what the Compact has now done is network

the Bridges to the Future Program of the NIH,³⁹ The McNair Program⁴⁰ and the Alfred P. Sloan Foundation Minority Ph.D. Program.⁴¹ But still I ask, where are these students and why are they not being recruited? Based on my experiences, I know why. I know where committees start looking for candidates and should a candidate from these non-Research One institutions accidentally end up in the pool, they are very quickly eliminated simply on the basis of the fact that their pedigree is wrong. In other words, most search committees do not actively go out and identify all candidates and then bring them on campus and give them a chance or look them over seriously. That is a serious problem that I have and that I think all of us should begin to examine our practices. It is admittedly hard to examine though, because it is hardened in our culture. It is not something that is verbalized but there is a general consensus in a lot of search committees that this happens all too often.

If you consider the data I have presented, you can see why these students are not where we want them to be. Many students of color today are immigrants, have lower income, are first generation, begin their higher education experience in the local community college or maybe a public institution. Hopefully, if they have the right mentoring and the right guidance and the right encouragement, then they may go on to higher education Ph.D. granting institutions. Yet in the end, these students cannot be competitive candidates at Research One institutions and this is why we find ourselves fishing from very limited, small pools.

Clearly this is a cultural problem and it is one that must change. When we do change, we cannot do so in a superficial and cosmetic way simply to placate those who put the pressures on us to advance diversity. We need to take the next critical step and look at these young scholars, young scientists, young faculty and potential faculty, even if they do not have every one of those things we expect them to have. We need to ask the question, “With the right kind of mentoring and the right kind of environment, can they become successful?” I feel that often times, we do hire people but they do not succeed, not because of their own shortcomings or failures or lack of hard work but because we hire them and then we abandon them.

A lot of things have to be in place but let me just conclude by stating that this is a cultural problem. Where the candidates are, where the pools are, and why search committees at Research One universities do not even know about these pools, do not search

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them out, do not identify them is a cultural problem. It is not even that these candidates are missing from higher education. It is just that we lack the practices to find them. I want to pass around a list of those who are Compact for Faculty Diversity graduate students who have completed their degrees.

I want to show you that the pipeline that we are creating is a big and expanding pipeline. Please pick up a copy, look at this list of about 50 or so institutions, and ask yourself, “How many of these would even stand a chance at my institution if we were hiring in that field?”

³⁶ *The Chronicle of Higher Education*, <http://chronicle.com/>

³⁷ The Southern Regional Education Board, <http://www.sreb.org/>

³⁸ Compact for Faculty Diversity, “A Summary of ‘Progress and Promise: An Evaluation of the Compact for Faculty Diversity,’” <http://www.aypf.org/rmaa/pdfs/Compact.pdf>

³⁹ National Institutes of Health. National Institute of General Medical Sciences. Minority Programs: Bridges to the Future Programs, <http://www.nigms.nih.gov/funding/bridges.html>

⁴⁰ The Ronald E. McNair Postbaccalaureate Achievement Program, <http://www-mcnair.berkeley.edu/national/>

⁴¹ The Alfred P. Sloan Foundation. Sloan Ph.D. Program, <http://www.nacme.org/sloan/>

***Dr. Emilio Bruna**, Assistant Professor at the University of Florida, presented on three areas. First, he highlighted the importance of changing the recruiting process for hiring junior faculty. Second, Dr. Bruna advocated increasing the funding opportunities for junior faculty to help secure larger grants. Lastly, Dr. Bruna challenged the NSF to hold grantees accountable for creating impacts through their grants and bringing a diverse body of researchers into the pipeline. By creating opportunities at the undergraduate level, he believes that we ultimately create candidates for junior faculty and faculty positions.*



I have been asked to speak to you today about the experience of junior faculty and the way in which we deal with issues related to diversity. Before I do that, I would like to highlight some of the issues that we have hit upon earlier in today's session and make four very small but concrete suggestions for the National Science Foundation on ways that it can help people like me can get tenure. I hope they will take them in the spirit in which they are intended, since I am a product of the National Science Foundation (I had a NSF International Dissertation Enhancement Grant⁴² as well as a NSF postdoctoral fellowship).

We really cannot ignore the pipeline concept. A number of studies have come out "debunking the pipeline myth." I think it is really important to be critical about looking at the pipeline, and particularly looking at disciplinary boundaries within the broader field of science and engineering.

When it comes time to the pre-recruitment and pre-hiring process, we should really become aware of how we search for the potential candidates. I will give an example from our own department. We are currently doing a search for a junior hire, and the way the search committee asked the faculty to come up with a list of potential underrepresented candidates was to send an email to the faculty (all twelve of us), asking if we knew of any qualified candidates. It was only in coming here that I heard about some of the places where we can go and look at the CV's of potential applicants that might fit our position's profile. I think we need to do more to centralize this information so that search committees in relatively small departments like ours can become aware of the potential candidates who are out there.

This culture has to change. The idea that we cannot contribute to sessions like this - that I have to get up at 6:00 in the morning to work on my manuscript before coming to get donuts over here in the lobby - has to change.

A third concern is the tenure process. I am like most people in that I know exactly what I have to do to get tenure and promotion - I have to just publish insanely and bring in copious amounts of grant dollars. But I also know that doing things like this workshop will *not* get me tenure and promotion. This culture has to change. The idea that we cannot contribute to sessions like this - that I have to get up at 6:00 in the morning to work on my manuscript before coming to get donuts over here in the lobby - has to change. This has to change because otherwise, the people who are deciding about diversity for my work environment for the next 20-30 years are people who are maybe halfway through that process themselves, sometimes a little further along. This includes things like search committees. I was shielded, so to speak, from being on search committees in our department because of the fact that I should really be contributing to my research. This means I don't have a forum in which I can voice my opinion regarding these issues.

The final thing I wanted to suggest is that my institution is looking to me to be Richard Tapia, and I think that's an unfair burden to place on people like me. We come from different backgrounds - not incompatible backgrounds and not backgrounds that may not merge on the same end point - but I think it is unfair to assume that I have all the answers for a student who either comes from an elite institution and is Latino, or who comes from the barrio and is Latino, or who is African American, or who is Filipino. We need to think about the apparent blanket assumption that I know exactly what it's like to be "underrepresented" and to face some of these problems.

Now I would like to talk about incentives to diversify and what the NSF can do. These suggestions are based on discussions I have had with some of the other junior faculty in our department on issues that we have had to deal with, so I cannot take all the credit for them myself. Perhaps the NSF or people in this room are already aware of some of these suggestions. If they are and I am repeating them, then it suggests that these are issues that have been recognized for a long time and we potentially still have a long way to go.

The first thing I suggest you do is expand the NSF's fellowship program for minority scholars. I am a product of the NSF and I had a Doctoral Dissertation Improvement Grant. The research starter grant that is associated with my postdoctoral fellowship helped me negotiate a better startup package, helped buy me

more research time and helped buy me more support for graduate students. The NSF needs more of these, and needs them in more disciplines. They work.

It was very interesting to me when I was being interviewed by the University of Florida that everyone introduced me as an NSF postdoctoral fellow. The word “minority” seemed to drop off every time, even though it was prominently displayed on my CV. Another thing that seemed to drop off was that I had a prestigious dissertation year fellowship from the Ford Foundation. The Ford Foundation has a pretty good name; however, I never got introduced as a Ford fellow. The NSF has that name recognition, and I think that this is something that really helps and should be taken advantage of.

Secondly, I think we need to increase funding opportunities that are targeted at junior faculty and those from underrepresented backgrounds. I have just completed my first year at UF and I can tell you right now that the biggest hurdle to overcome as a junior faculty member is getting that first grant. This grant supports graduate students and gets productive postdocs into your lab, and at some institutions getting a grant from the NSF is a good way to buy out of your heavy teaching load. Getting that first grant is really important and can set you on the path to tenure. Despite the importance of these grants for getting people established, new faculty have to compete with labs that are well established, have an army of postdoctoral fellows and graduate students in them, have more preliminary data that they can put into the proposal, and have more experience writing grants.

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The third suggestion is to make REU’s available to faculty that do not have full NSF grants. The Research Experiences for Undergraduates Program¹⁰ is a great opportunity for both undergraduates and the faculty who mentor them. It is an opportunity to get undergraduate students in a faculty member’s lab doing research. As an undergraduate, I volunteered for six months in a lab so that I could get the kind of experience needed to prove myself to the PI before they actually hired me. Students can’t afford to do this anymore.

The REU students that I know have gotten their funding one of two ways. First, they have been in a field station or a site that has an REU program. As a result, researchers who do not have an REU program on their field site cannot take advantage of the opportunity. Second, they come as a supplement to an NSF grant.

Research experiences with undergraduates can lead to very good science and publications.

We need to hold grantees accountable.

So if you do not have an NSF grant, then you cannot get an REU student supplement. The interesting thing is that a lot of times, the undergraduate students are the ones who are doing the kinds of preliminary research that you put into an NSF grant.

Research experiences with undergraduates can lead to very good science and publications. I have three papers with undergraduates and three more on the way. Yet because of the fact that I have now become a faculty member at the University of Florida and I do not have an NSF grant, I can no longer tap into this resource. I think that we need to consider divorcing at least some of those REU funds from these two programs. That way, faculty who have a smaller research project that is done locally, or who are interested in submitting an NSF grant, can call a program officer and show them the benefits to including a well-qualified student in faculty research. I think this would be a really good way of making labs productive.

Finally, we need to hold grantees accountable. When I was getting ready to submit my first NSF grant just a couple of months ago, I collected copies of successful proposals from colleagues and looked at their “broader impact statements.” I know there was a sincere effort on the part of a lot of people I worked with to fulfill the impact statement, but I am curious as to how many people who put certain goals in their proposal then went on and achieved them. Were they successful? If they were, how did they do it? If they were not successful, why not? We need to reward those faculty who go ahead and achieve these impacts - who actually beyond lip service to actually do something right and get people into the pipeline.

⁴² National science Foundation. International Opportunities for Scientists and Engineers, <http://www.nsf.gov/pubs/2003/nsf03559/nsf03559.htm>

⁴³ National Science Foundation. Research Opportunities for Undergraduates program, <http://www.nsf.gov/home/crssprgm/reu/>

***Dr. Lilian Shiao-Yen Wu**, Program Executive, University Relations, IBM Corporate Technology, drew on her experiences at IBM and as a member of committees for the National Research Council and the National Science Foundation to recommend how to bring diversity to faculty in universities and colleges. Dr. Wu discussed the progress that has been made over the past two decades and pointed to strategies used at IBM to promote this progress. Dr. Wu stressed that while diversity in the workplace has evolved, it does not do so naturally, and thus we must continue to press the issue by applying outside pressure and undertaking studies to evaluate the current status and what works.*



My remarks this afternoon will come from three perspectives. The first will be from my work at International Business Machines, IBM. The other two will be from two committees that I serve on: the National Research Council's Committee on Women in Science and Engineering⁴⁴ and the more recent committee that I have joined, the National Science Foundation's Committee on Equal Opportunities in Science and Engineering.⁴⁵

First, I will start with my experiences with IBM. In the last five years, I have seen tremendous progress in IBM and some of the reasons for this may be useful for our discussion today. There is no question that in IBM we have made progress in whom we hire and whom we advance. The first reason for this goes back to the mid-1990s when we changed our thinking from treating diversity as a moral imperative to treating diversity as a business imperative.

To give you some idea, back in the mid-1990s, when you thought about the employees of IBM, you typically thought about a white male in a white shirt. This was out of sync with the increasing diversity in the US labor force and the increasing buying power of minorities and women. So it was really important for IBM to think about this and have discussions on what to do.

The second reason was that once it was recognized that diversity was a business imperative, we at IBM took this very seriously, and have tried a number of things. For example, we hosted regular conferences of women with technical backgrounds from around the world. We would get together and discuss the situation, how we can change and what actions we have to make in order to create change. We had conferences of multicultural technical people,

getting together to talk about barriers, how we can hire more people and how to nurture young people and foster their success. I have personally participated in these conferences and they work.

Mentoring is very effective if it is really a part of the culture. It really does work.

Another strategy that I have seen at IBM is mentoring. If you have mentoring that is of the form where women are expected to mentor young women, you are immediately asked questions, such as, how many women are you mentoring? Who are they? What has worked? How many people are mentored? This is something that we discuss often in our meetings at IBM and we take very seriously. Mentoring is very effective if it is really a part of the culture. It really does work.

Another effort began back in 1950 when we established eight executive level taskforces. These are groups of executives of different races, genders, sexual orientations, persons with disabilities, and so on. If you get groups of executives together, they are very competitive and if you put them on a problem, they will come up with answers. The result is executives are now personally involved in diversity and from this is significant increase in diversity of our management and leaders.

A third reason that we work so hard to solve these situations is because there is an outside push. *Working Mother* annually ranks its 100 Best Companies for Working Mothers.⁴⁶ Catalyst,⁴⁷ an important non-profit organization that studies women in industry, also does an annual report on women on Corporate Boards. This kind of reporting is very similar to the push from the US News and World Report on Colleges and Universities. They put us in the spotlight. You routinely see articles on how diverse a particular company is in major news media. Also, many professional societies like the Society of Hispanic Professional Engineers⁴⁸ give awards to companies on diversity. As a result, companies brag on their website about what programs they have. IBM, for example, has on its website the numbers of employees in different areas by race and by gender and other information on company diversity. We also report over the years what changes there are in these numbers so you can see what kind of progress IBM is making. In 2002, one third of IBM's professionals, who are mostly technical, were women, eight percent were black, four percent were Hispanic and half a percent are Native American. These numbers are out there for everyone to see and judge. There are also statistics comparing diversity statistics in the managerial and office ranks.

From my experience at IBM, it is possible to make significant progress on diversity in five years, but not by natural evolution. It will take real push from the leaders of an organization to make diversity a part of what everyone does day-to-day. Also pushing from the outside and requiring more transparency on the performance of an organization can make a big difference.

This leads me to the next two perspectives, which are efforts to increase faculty diversity by pushing from the outside. The first is a major piece of work that we are starting at the Committee on Women in Science and Engineering.⁴⁴ This work focuses on women and has been mandated by Congress to assess the gender difference in careers of science, engineering and math faculty. It focuses on four-year institutions and is built on a report that we published in 2001 on gender differences in career outcomes.⁴⁹ The study was based on a survey of doctoral recipients from 1973 to 1995.

I want to summarize some of the results, none of which were terribly surprising. The first finding was that there has been progress over time on any measure you look at in women's participation. Second, there are sizable differences by field, with the physical sciences, math and engineering being the worst. Third, women are less likely to be in tenure positions and hold senior faculty ranks even if you make all the adjustments for age. The fourth finding was that the top research institutes have fewer women overall.

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For this mandated study we are undertaking, it will be in three parts. Part one will be to see how much progress we have made since the first statistical study ended, in 1995. Part two will be a synthesis of many of the major studies that have been done by universities looking at themselves. For example, people have cited studies by the University of California system,⁵⁰ University of Wisconsin-Madison,⁵¹ Georgia Institute of Technology,⁵² Massachusetts Institute of Technology,⁵³ the National Science Foundation's ADVANCE program,⁵⁴ so we will be synthesizing what has been found in those major studies. Part three will be a small survey in five disciplines of the top 20 departments and we will report on the status of those departments and survey the climate there.

Before I go on I would like to recognize the contribution of Jong-on Hahn to the congressionally mandated study and Charlotte Kuh to the Career Outcomes Report.

Now I want to draw on my experience with the National Science Foundation's Committee on Equal Opportunities in Science and Engineering.⁵⁵ I want to show you some statements from the National Science Foundation Science and Technology Center⁵⁶ proposals that have been awarded. These are major National Science Foundation grants, about \$1½ million to \$4 million per year for five years. In year four, these projects are reassessed for funding for years six through ten. The objectives of the STCs are very broad: they include technology transfer, education, and diversity.

Here are some of the statements: "Our program will focus on inner city youth in the Oakland Unified School District, one of the most ethnically diverse in the country." Another, "the center will address this problem by recruiting women and minorities for faculty and postdoctoral positions. This proposal will expand research and educational programs to serve the needs of the Atlanta University Center with more than 95 percent minority students." Another one, "a significant fraction of these teachers will reach minority students with particular emphasis on Native Americans in Arizona and New Mexico." I can share with you others but you can see the general theme.

These statements are really in the right direction. These are the right kinds of things to think about and the next step planned will be to review what they consider to be a success on these issues. These are great goals to set but what are the plans to achieve those goals? If we come back for site visits year after year and especially in year four, what has been accomplished that is demonstrable? I will be taking a look at whether we can get more tangible, describable statements of success and understanding of how to achieve these goals. There are reasons to be very hopeful that these are places in which change can happen. These are very important ways in which the NSF is investing in the future. If we keep an eye on what they can accomplish, ask them to tell us what they are planning to do, and see how they go about doing it, this may be a good opportunity to apply some push.

Changing the mindset from this being a moral imperative, meaning that this only is the right thing to do, to being an education and research imperative, that this is about the business of the university, is a must.

In closing I want to say that from what I have seen at IBM, I believe that meaningful progress in diversity can happen in a reasonable period of time. In five years I saw real change happen. This change will probably have to come from the inside however. Changing the mindset from this being a moral imperative, meaning that this only is the right thing to do, to being an education and research imperative, that this is about the business of the university,

is a must. And from the 2 committees which I am serving on I believe that there really are ways in which we can push effectively from the outside as well.

⁴⁴ The National Academies. Committee on Women in Science and Engineering, <http://www7.nationalacademies.org/cwse/index.html>

⁴⁵ National Science Foundation. Committee on Equal Opportunities in Science and Engineering, <http://www.nsf.gov/od/ceose/start.htm>

⁴⁶ “The 100 Best Companies for Working Mothers, 2003.” *Working Mother*, <http://www.workingmother.com/oct03/100BestList.shtml>

⁴⁷ Catalyst, <http://www.catalystwomen.org/>

⁴⁸ Society of Hispanic Professional Engineers, <http://www.shpe.org/>

⁴⁹ The National Academies, *From Scarcity to Visibility: Gender Differences in the Careers of Doctoral Scientists and Engineers*. 2001, <http://www.nap.edu/books/0309055806/html/>

⁵⁰ The University of California, <http://www.ucop.edu/welcome1.html>

⁵¹ The University of Wisconsin-Madison, <http://www.wisc.edu/>

⁵² Georgia Institute of Technology. The Center for Study of Women, Science, and Technology, <http://www.wst.gatech.edu/>

⁵³ Massachusetts Institute of Technology, <http://web.mit.edu/>

⁵⁴ National Science Foundation. STC: Science and Technology Centers, <http://www.nsf.gov/od/oia/programs/stc/index.htm>

DISCUSSION

The discussion session opened with a focus on the diversity that exists within companies, particularly research portions of companies. These areas often resemble university faculty in that they both lack diversity. Thus, ways to improve diversity in companies and universities were pursued. The point was made that universities often rely on outdated systems of recruiting and university departments often have no incentive to change because department rankings do not take diversity into account. The session concluded by discussing the idea that we can no longer rely on foreign students to fill science and engineering positions, especially teaching positions, as a result of recent security concerns. As a result, to promote diversity in America, we must prepare minorities for successful careers by fostering development as early as grade school and work with organizations that promote career advancement for minorities.

Dr. Richard Tapia

I concede that IBM has done great things in one part of the company; however, I think that there is perhaps a difference between industry and university. Two years ago, Paul Horn asked me to evaluate the T.J. Watson Research Center at IBM in terms of diversity. I found that it was nothing like what you are saying, Lilian. I told them that I was very disappointed at the lack of diversity that I saw and really felt that it was like a university. So while IBM as a company has done great things and I applaud them, T.J. Watson Research Center, looking like a department in a university, was not coming through with flying colors.

Dr. Lilian Shiao-Yen Wu

I think you may be surprised if you go back but I will just give you my perspective. I come from the research community. When I joined IBM, I found that everyone had come from 20 schools: a very short list. Today if you go and look, it is much, much wider. T.J. Watson is not as sterling as the rest of IBM but I think that there is progress there, too. For example, we have women and diversity groups that get together and discuss what it is that really needs to be changed. Recommendations from these groups are taken seriously. I think that change is happening there, just slower.

Dr. Richard Tapia

When I was on the National Science Board, NSF criterion two

for NSF grant applications was a controversial topic. At Rice, we surveyed the faculty. Basically 70-75 percent of the faculty said that criterion two had no bite whatsoever. Essentially their life would be made easier if they could get funding for minority students. But they could not do it without special, additional funding. Criterion two, to them, would just say good things but it didn't have any bite in it.

Dr. Lilian Shiao-Yen Wu

I want to bring up the point that the Science and Technology Centers have done great things and there is no doubt about it. However, it has not changed the culture of the universities because an STC was doing good things.

One of the things that came out was the criticality of the department as a unit on campus where the decisions are made, particularly the first recommendation for the faculty position and recruiting graduate students. I think we still have to handle that one in order to bring about change. The Centers are wonderful. We can pull and push through them our large investment but the Centers depend on the units on campus.

This helps explain the very great difference between the demographics of the undergraduate student body where admission is handled centrally and where policy can be imposed versus what happens when it's done at the level of the departments. Even with the dean of a graduate school, the decisions are largely being made at the level of the department. Therefore, the demographics look very different. So there are good departments and bad departments and we should be able to recognize them.

This is why we hope that our report from the National Research Council will be a first step in looking at five disciplines in the top 20 departments and reporting on the status of those departments. That will be a first start.

Dr. Evelyn Hu-Dehart

I think it is interesting that "women" have done so well. It was mentioned that in biological sciences and engineering, women as a group are doing well, but of course, when we say "women," we are really saying "white women." These terms sometimes are not precise. We separate our women from minorities and I ask, "Where are the women of color?" These women fall between the cracks. When we say "minorities," we generally think of minority men and when we say women, we think of white women. But

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be that as it may, what can we learn from the fact that women, particularly white women, have done very well in my experience in higher education?

I think there is some comparability to the relative success of white women to the relative success of Asian Americans as a group. It really comes down to class distinctions as well. Many Asian Americans are what we call middle class in their makeup and their background. These are some of the difficult things for us to crack as institutions of higher education unless we are willing to go way beyond what we are used to thinking of. We are dealing with people who come from very fundamentally different socio-economic backgrounds. How are they going to overcome all of those kinds of barriers in addition to the racial ethnic differences as well as gender?

Dr. Richard Tapia

Your point is well taken. In my talk, I said women as a group are educated in parallel roles. So they do not have that extra baggage along to carry with it. Schools like MIT and Rice are getting closer to parity between admission of men and women. So there are as many women with good educations as there are men but this is not true of minorities.

I do think this was alluded to: there is oftentimes a hidden double standard. The expectations for minority scholars are so high and it starts with where you get your degrees from. If you do not have the right degrees, then they do not even look beyond that. I have found that when it comes to white males, those same high standards are suddenly loosened. Now what is wrong with this picture?

Dr. Pam Ferguson,

Member of the National Science Board

I am on the National Science Board. I want to comment on the issue that faculty are very accustomed to treating one another with deference and courtesy and I think the time for that is over. Our department is aging: a third of it is retiring in the next two years. It became extremely ugly when we wanted to consider hiring a woman from a Research One Institution who met "all the criteria." Comments came out that took your breath away. I think there comes a time when you do not politely sit and listen to that any longer and that has to come from the department. You have to be willing to take on some unpleasantness.

It is certainly the case that I have been in places where the provost fails to search, the pool is not diverse, a good job was not done in recruiting, and the process should really start over. I think we have to have provosts and presidents who are willing to start over. If you are very clear about what your goal is, which is to diversify your faculty, then you can establish a threshold of excellence and consider anybody who meets that threshold. Once you have established your pool, anybody in that pool is considered qualified. It is who is qualified that helps us meet our goal. Obviously the faculty in general has to believe that this is important.

Dr. Beverly Tatum

My experience is that some departments, and I am thinking now about Mount Holyoke – the place where I was for 13 years – clearly did better than others. The departments that were doing well started to shame the ones that were not delivering. Even though there were some disciplinary differences because it was very clear that the departments that were having success were doing things differently than the other departments who were pretty much doing business as usual.

Diversity is about sharing power. It is that part that we have not been able to really significantly change. Departments do not want to change. It is not in their best interests to change.

Dr. Evelyn Hu-Dehart

Whoever is doing the national ranking of departments does not take the kind of values and concerns we have on the table today into consideration. Diversity is not even anywhere near those things. So at Brown, a provost would tell the history department, “you are doing just great; keep doing what you are doing because you are getting good ranking” but in reality, it is the least diverse department on campus.

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Dr. Elizabeth Hoffman,

Member of the National Science Board

Having been a historian, having left history, history has not changed. It is the least diverse field in the humanities. I moved into economics, which was not extremely diverse in 1970’s is now, among the hard social sciences, the most diverse among women. However, these women are primarily white women. I actually did a study of women at AAU institutions and what you observe is that about 40 percent of the assistant professors are women, about 15-20 percent of the associate professors are women, about 10 percent of the full professors are women and ten percent of the presidents

are women. With the passage of the Civil Rights Act, there was a critical mass of white women who had the education, they had been to the right schools but they had not had an opportunity to go to graduate school. They had been barred from the top graduate schools but they had the right undergraduate education.

Between 1968 and 1972 these women went to the right graduate schools in huge numbers. I graduated from college in 1968. You can see that at Smith College, almost everybody in my class had a career like a man. Almost everybody in the class of '64 did not. That is the transition that I am talking about. What happened was we went to graduate school in huge numbers, we had careers very similar to our male counterparts, and we are now in our 50's and we have had a career. We have moved up the ladder just like our male counterparts and there is now a large enough pool of us that in some sense, we can afford to fail.

Some of us can afford to fail without damaging the careers of everybody else because there is a critical mass. I think when we talk about the pipeline coming through high school and whether or not you went to the right college, we are really dealing with two very fundamental pipeline issues. I think the reason why there is a critical mass of white women in certain fields is because these women went to the right schools, then took advantage of the Civil Rights Act, went to the right graduate schools are have now moved up through the pipeline.

Dr. Jaime Oaxaca

Let me give you a perspective from the businessman who is on the National Science Board and spent a lot of time addressing this problem. I was in on the founding of the Mesa Program¹² and many other programs. The thing that I heard today is the kiss of death in business and that is the top-down analysis. We are worried about tenure tracks and we cannot get them to graduate from high school. This is the reality that we are dealing with.

In California we are producing 20,000 science and engineering teachers. We need 34,000. Forty-three percent of our 6 million kids in grades K-12 are Hispanic. The thing that I strongly suggest to the National Science Board is to look at the bottom-up analysis.

America has a serious problem. We can no longer count on folks from Pakistan and Afghanistan and India. Security issues are going to be very strong and you are seeing it now. You are seeing it along the US-Mexico border. You are seeing it along the Korean border. The thing that the National Science Board must do is to

set the policy issues that are going to address the issue. I see two fundamental issues.

One issue is that minority students are coming out of high school ill-prepared. If you add up the population of minorities in the United States, it is about 80 million people. The kids of those 80 million people are graduating ill-equipped to have any kind of a real chance to make it just for the B.S.; forget all the other stuff that has been talked about today.

It is the same thing in every state similar but distinct. California is different from Texas. It is different from New Mexico. It is different from New Hampshire. This issue has to be addressed as target areas and how you solve this problem. First and foremost, you have got to define the problem. I never heard the problem defined once today. The problem is that we are not producing the correct number of people. Northrop Corporation is advertising for 2700 engineers. They cannot get any because there is a requirement in one of the largest industries to have a security clearance.

The next issue that has not been addressed is the fact that if you look at the studies of the California Council on Science and Technology⁵⁶ and all the other studies that have come out along the way, probably no more than 14 percent of the teachers of K-12 that teach math and science are certified to teach math and science. You have to treat this as a total problem with the end result being that we are not producing the right people.

Dr. Keith Jackson

As President of the National Society of Black Physicists,⁵⁷ I have made it my goal to increase our membership from something that was lingering around 120 to numbers now that number like 600. On February 22, 2004, we are going to have our annual meeting in Washington, D.C. and our goal is to have 600 African American physicists and students of physics attend.

I want to share a bit about the struggles I have faced during my membership with this society. Time and time and time again the resource center has set up at historical black colleges and universities and then after eleven years or five years, they say, "Well, this is just seed money and now you are supposed to be independent." I say, "We cannot be independent." This is the market and National Science Foundation is the primary supporters of research in the physical sciences of the United States.

We do not get long-term support. People approach me about the resources required for a Ph.D. program. Does anybody here know about Gravity Probe B? Gravity Probe B⁵⁸ is an idea that started in 1964, first funded in 1969, at an average rate of \$15 million a year for \$600 million. It still has not launched. Maybe it will launch in November, maybe not. Maybe the results will be relevant, maybe not. The point is that they produced 25 Ph.D.s at roughly \$24 million per Ph.D., which is greater than the entire support for all the HBCUs for one year just to produce one student.

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There are people out here. We have talked about the pipeline issue. One of the problems that we have is at the end of the pipeline, there does not seem to be anything. There does not seem to be a job that can lead to a middle class existence. I have a number of members now who have completed Ph.D.s and they are asking me where they can get jobs, where they can get postdocs and unfortunately, they have been unemployed for a long time. Not all of them come from HBCUs either. A lot of them come from places like M.I.T. and the University of Heidelberg and they are unemployed.

I want to know how seriously the National Science Board takes this. When I read the Board's draft paper, it said this was as serious, maybe not as serious, as weapons of mass destruction in Iraq. Well, it is as serious as the weapons of mass destructions here. We need to put some teeth in this and we need to define and we need to work with people who have been successful. One of the people you need to work with is the National Society of Black Physicists.

⁵⁵ Santa Ana College. Mathematics, Engineering, and Science Achievement program, http://www.sac.edu/students/counseling/transfer_center/mesa/mesa.htm

⁵⁶ California Council on Science and Technology, <http://www.ccst.us/>

⁵⁷ National Society of Black Physicists, <http://nsbp.org/cgi-bin/nsbp.cgi?page=home>

⁵⁸ Stanford University. Gravity Probe B, <http://einstein.stanford.edu/>