

**FINDINGS FROM THE SURVEY OF PARTICIPANTS OF
THE 15TH ANNUAL
NATIONAL CONFERENCE OF BLACK PHYSICS STUDENTS**



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July 6th, 2001

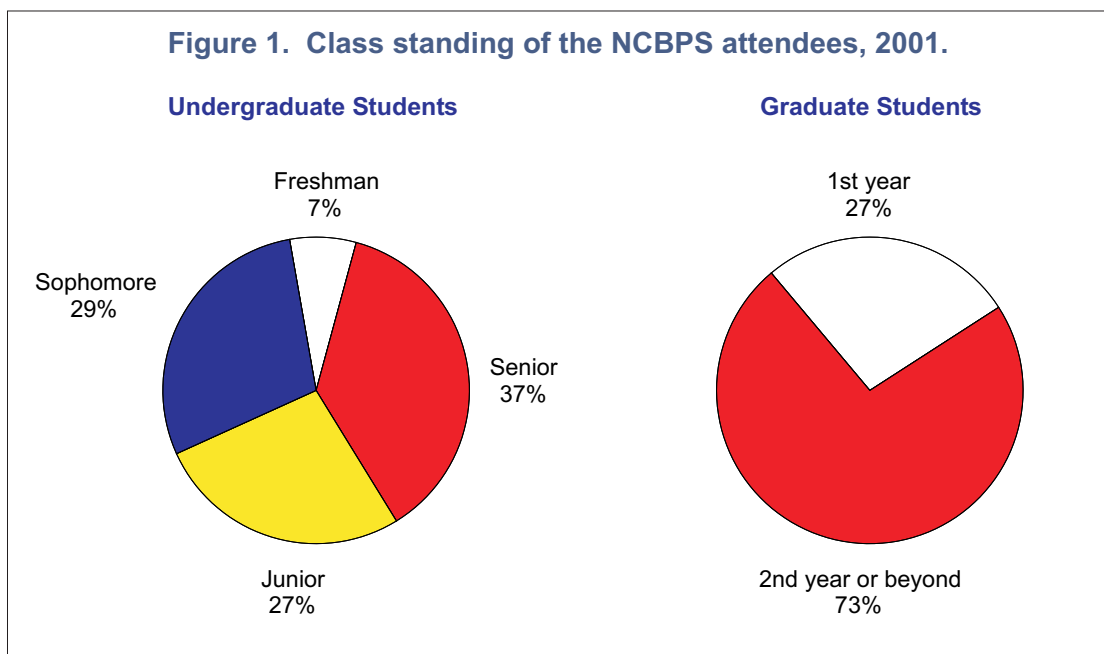
INTRODUCTION

The fifteenth annual National Conference of Black Physics Students (NCBPS) was held this year at Stanford University in Palo Alto, CA, once again in conjunction with the annual meeting of the National Society of Black Physicists (NSBP). The Conference, held March 29th - April 1st 2001, was first staged in 1987 at MIT in Cambridge, MA. It grew quickly from a few dozen attendees to an all time high this year of 317 students, faculty, working professionals, and job recruiters. We estimate that the 160 undergraduate students attending the Conference comprised almost one-quarter of all African American physics undergraduates in the country, while the 100 graduate students made up somewhere between a third and a half of all African American physics graduate students nationwide.

As in years past, the Conference organizers retained the Statistical Research Center of the American Institute of Physics to survey the student participants and conduct an evaluative

study of the meeting. The objectives of this study, as with previous Conference evaluations, are to assess the background and demographic characteristics of the attendees, explore their goals for attending the Conference, and ascertain whether the Conference succeeded in meeting those goals. The survey instrument included questions on participants' backgrounds, experience with physics research, and career goals, in addition to their reasons for attending and their assessment of various aspects of the Conference. Students were also asked for their evaluation of the physics courses and professors that they had encountered during their academic career.

The questionnaire was designed by the Statistical Research Center in consultation with the organizers of the Conference and structured to allow comparison with participant's reactions from earlier years. The four-page questionnaire was distributed with



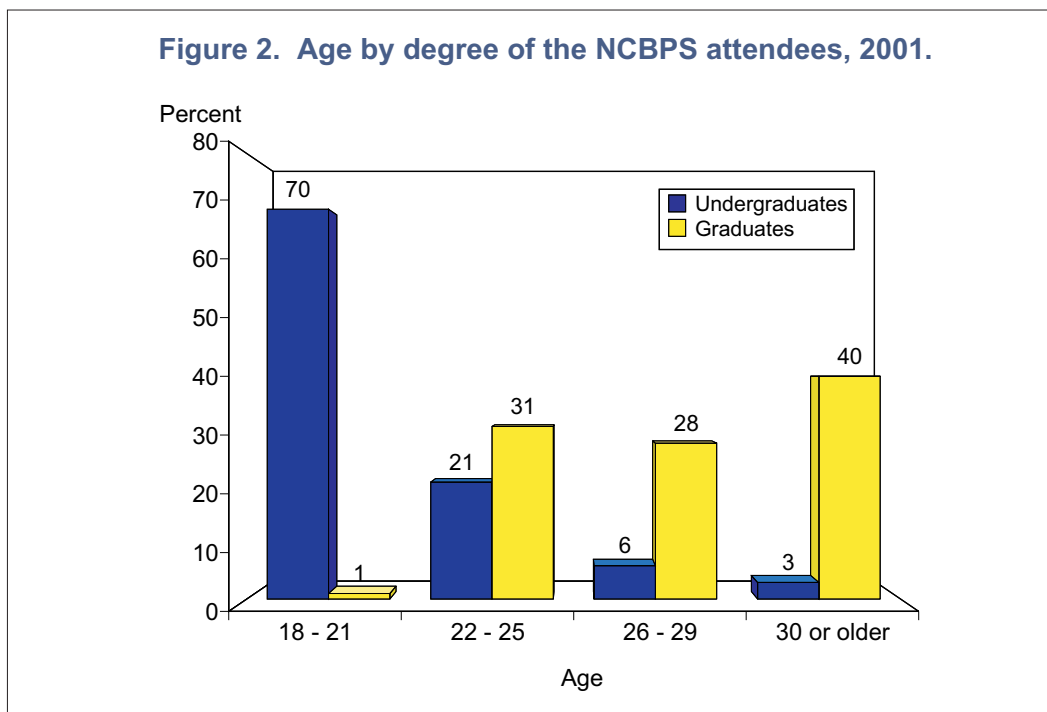
registration materials when the students signed in for the Conference, and then collected on the last day. Of the 260 students who attended the Conference, 200 (77%) returned a completed questionnaire, a modest drop from last year's 86% response rate.

difference between the ages of the male and female undergraduate students. As was also true in previous years, we found a small difference among male and female graduate attendees. The median age among female graduate students was 26, while among male graduates the median age was 29 years.

This year, unlike in previous years where the attendees were fairly evenly distributed, there were significantly more undergraduate participants (62%) than graduate participants (38%). Among the undergraduates, there were few freshmen, not surprising given that many students wait until at least their sophomore year to declare their major. Among the graduate attendees almost three-quarters were beyond their first year (**Figure 1**).

This year we found that the overall proportion of females among NCBPS attendees was 37%, somewhat lower than in previous years. Among undergraduates, the proportion of females this year was 44%, only slightly lower than last year. This is still far higher than the national average, which we know from other studies to be around 20% of the physics bachelors recipients in recent years. Among graduate students, the proportion of Conference participants who were female was 24%, a lot lower than in previous years. Nevertheless, this still exceeds the national average for all physics graduate students of 19% women.

The median age for undergraduates was 20 years while for graduate students it was 28 years (**Figure 2**). We once again found very little

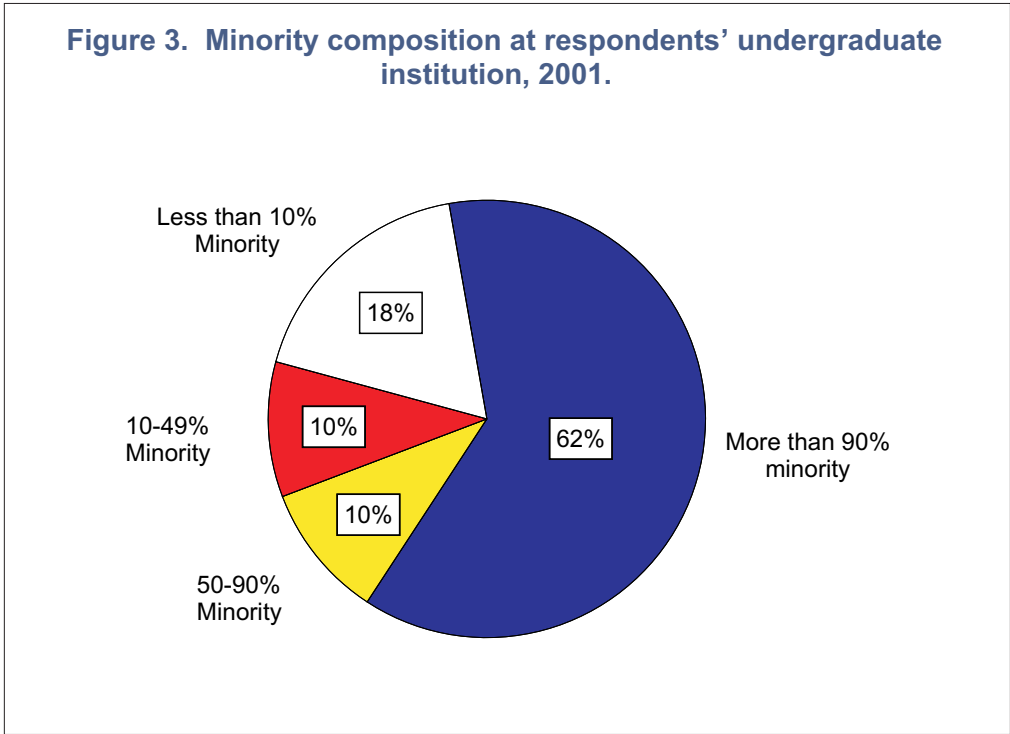


Attendees were again asked about the minority composition at their high school and undergraduate institution (**Figure 3**). As in years past, students from minority-majority schools were again very heavily represented. In terms of high school, 59% of the participants went to minority-majority schools. An even higher proportion (72%) went on to Historically Black Colleges or Universities (**HBCUs**) or minority-majority colleges. In this respect, the Conference fairly closely resembles the national community of Black physics students. According to AIP's most recent Enrollments and Degrees report, 56% of Black physics bachelors recipients and 54% of masters went to HBCUs.

However, there were also some differences, which have been fairly consistent over the years. For one thing, only 31% of the NCBPS' graduate student participants went to HBCUs for their undergraduate work, compared to 84% of current undergraduate participants. This may suggest that African-American physics students who attend white-majority schools are more

likely to continue on to graduate study in physics than students who attend HBCUs. On the other hand, it may simply be that the former are more eager to attend a conference like the NCBPS to compensate for fewer chances to network with other Black physics students during their prior schooling.

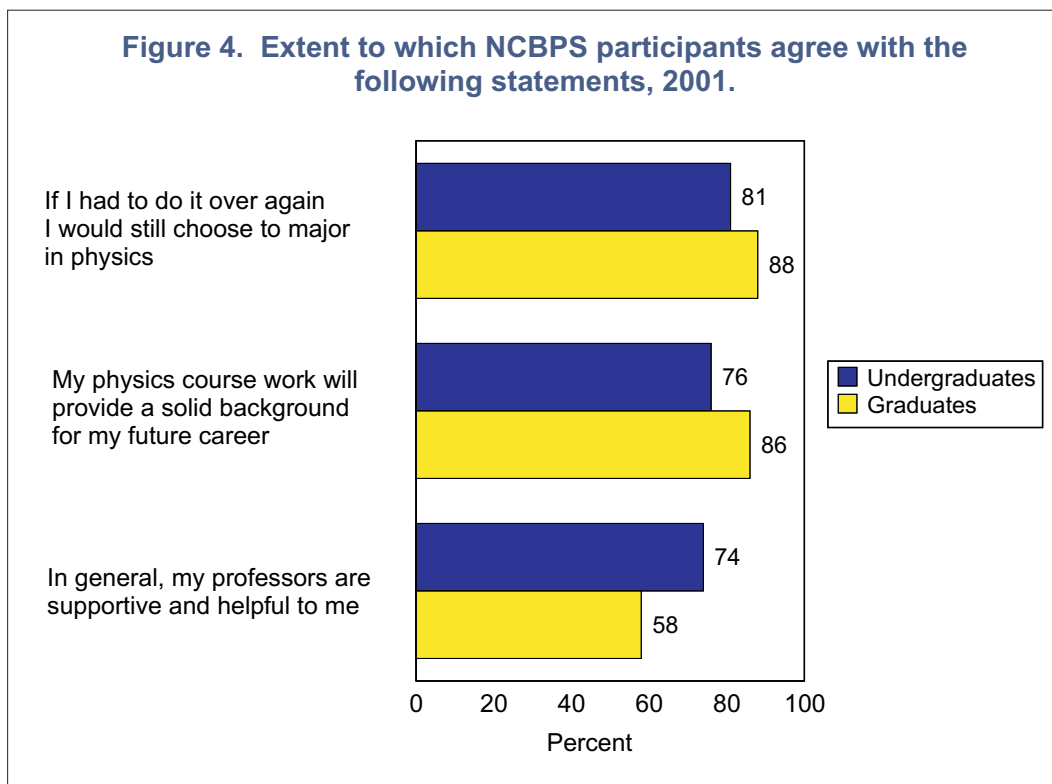
There are a number of indicators that Conference organizers have been broadening their recruiting efforts lately. For instance, even though many of the Conference participants had attended previous NCBPS meetings, almost three quarters of the undergraduate students and about one quarter of the graduate students this year were new to the Conference. And while in previous years there was a very high proportion of students coming from a relatively small set of schools concentrated in the South, this year that percentage was somewhat lower (60% vs 80% last year). Finally, there were also students from a number of schools that had not been previously represented.



PHYSICS & SCIENCE BACKGROUND

Participants were asked to provide information on their current academic situation, including their evaluation of the courses and professors they had encountered during their academic careers. As in the past, the Conference drew only a sprinkling of students (11%) who weren't majoring in physics, and half of these were in engineering. The high level of satisfaction with their choice of field was again reflected in the proportion of respondents (83%) who indicated that they would major in physics again if they had to do it over. Eighty percent of the respondents (versus 76% last year) felt that their course work would provide a solid background for their future careers, and 68% of them felt that in general the professors they had encountered were supportive or helpful.

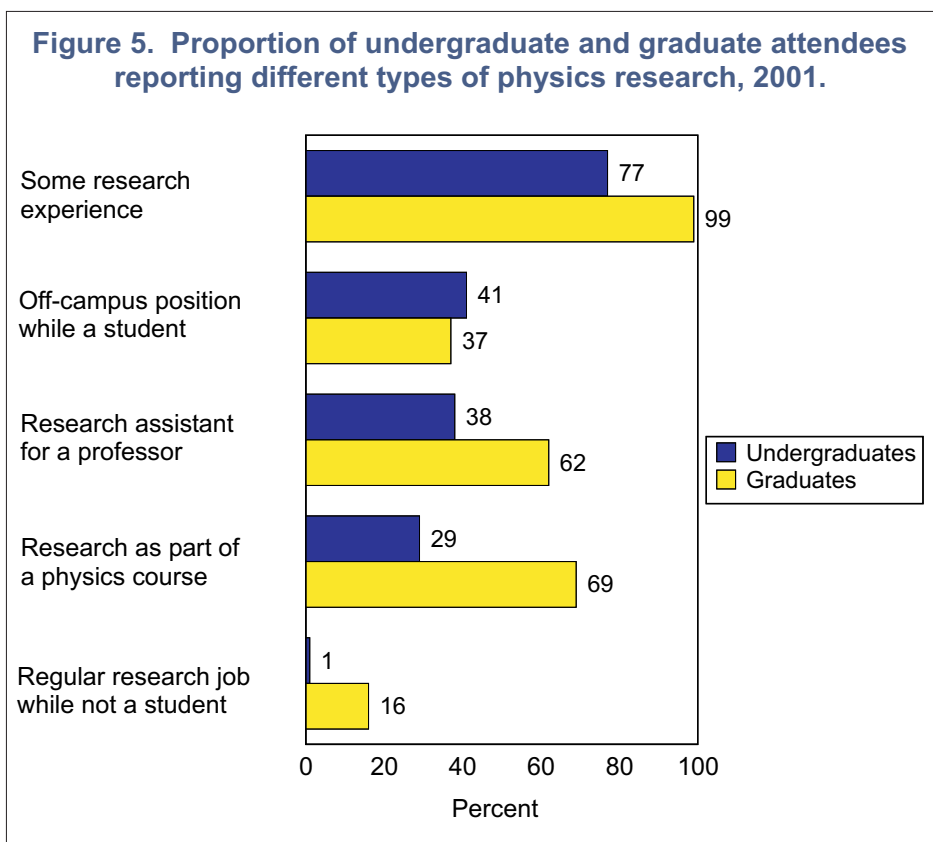
As in previous years, there were some differences in the attitudes by gender and level of study (**Figure 4**). Men, for example, were more likely to say they would major in physics if they had it to do over again (87% versus 77%). They were more likely than their female counterparts to feel that their physics course work would provide a solid background for their future careers. However, a greater proportion of female than male participants reported that the professors they had encountered had been helpful or supportive (74% versus 65%). Interestingly, female undergraduate students were the least likely to feel that physics would provide a solid background for their future careers (69% versus 83% for male undergraduate students, 86% for male graduate students and 89% for female graduate students). It is also worth noting that graduate students in general were somewhat less positive about the professors



they had encountered than were undergraduates (58% versus 74%). Along similar lines, undergraduate students at HBCUs also reported that the professors they had encountered were more helpful or supportive (77% versus 60%).

As we found in previous years, the overwhelming majority of attendees indicated that they already had some type of research experience in physics (**Figure 5**). Over one-third of the undergraduates and almost two-thirds of the graduate students reported they had been a research assistant for a professor. Unlike previous years, where graduate students were more likely to have held an off-campus position, this year we found that 41% of the undergraduates (versus 37% of the graduate students) indicated that they had an off-campus position while attending school. More females than males (49% versus 34%) reported having an off-campus position while attending school.

Not surprisingly, graduate students were more likely to have engaged in research as part of a physics course than their undergraduate counterparts. Interestingly though, graduate female students were more likely to have engaged in research as part of a physics course than graduate male students (83% versus 64%), while graduate males were much more likely to have had a regular research job while not a student than any other group of students that attended the Conference. And undergraduate female students were also more likely to have engaged in research as part of physics course than their undergraduate male counterparts (35% versus 23%). Finally a greater proportion of graduate participants from HBCUs reported having had a regular research job while not a student than participants from non-HBCUs (30% versus 10%).



ACADEMIC AND CAREER GOALS

Participants were queried in detail about their future aspirations and career objectives. Regardless of their current level of study, virtually all of the respondents indicated a desire to obtain a graduate degree, with around 79% aspiring to a PhD, about half definitely in physics and most of the rest with physics as one of the options. It is once again worth mentioning that in spite of the great number of participants who want to earn a PhD, the data on actual degree recipients indicate that far fewer achieve this goal. In recent years, only 1 in 7 black physics bachelors recipient earned a Masters in physics and only 1 in 20 earned a physics PhD. Thus, we see it is vitally important that a strategy be found, and implemented, to not only motivate, but also retain, black students who indicate a desire to pursue graduate studies in physics. This Conference is a part of that strategy -- with its focus on not just getting into, but also getting through, graduate school.

As already noted, around half of the students reported that they definitely wanted to pursue careers in physics, with another 38% indicating they were considering going in that direction. Only 13% indicated definite plans to shift into another field. Almost three-quarters of the participants hoped to make their careers in physics research or teaching, including 18% who indicated an interest in physics research but were unsure of the employment sector they preferred (**Table 1**). Male students were more likely to gravitate towards a career in academe (34% vs 24%). Women, on the other hand, indicated a desire to have a career outside of physics (26% vs 15%). Students at non-HBCUs were also more likely to favor a career in academe. On the flip side, students at HBCUs were more likely to choose a career in physics in a government agency or at a national lab (12% vs 4%). Graduate students were more focused in on physics, while undergraduates were more open to careers in other, albeit related, fields. Of all the students at the Conference, graduate males were the least likely to want a career outside of physics.

Table 1. NCBPS participants' anticipated career goals, 2001.	
	Percent
Academic teaching or research in physics	30
Non-academic physics research in industry	16
Non-academic physics research in government / national labs	9
Physics research in unspecified employment sector	18
Other types of physics-related positions	8
Careers in other sciences	15
Careers outside of physics altogether	4

Attendees were also asked to indicate the motivation underlying their career goal choices. As we found in previous years, the most common reason, ranked first by more than half of all respondents, was the intrinsic challenge of the work. The chance to give something back to the community came in a distant second, while only 10% indicated that salary and benefits were the most important factors for them. However, this latter percentage was substantially higher among students at HBCUs than at non-HBCUs (15% vs 3%). Students at HBCUs were also far less concerned with the intrinsic challenge of the work than their counterparts (40% versus 76%). As was also true in prior years, we found that graduate students were somewhat more likely than undergraduates (62% versus 48%) to stress the desire for challenging work as their main reason for choosing their career goals.

Students were again asked to name the most important factor that helped them to persist in their physics studies (**Table 2**). Once again, love of the subject matter was ranked the number one

reason, and by an even greater proportion of respondents than last year. And like last year, family support came in second. While career prospects was the third choice last year, this year, support from African-American faculty came in third. However, these feelings were not evenly distributed among participants. Female graduate students were much more likely to cite support from African-American faculty members than any other group that attended the Conference, while a greater proportion of female undergraduates mentioned the support of white faculty members. Graduate male students, on the other hand, were much more likely to stress love of the subject matter as their number one reason.

Other significant differences emerged as well. Students at non-HBCUs were more focused on love of the subject matter (59% versus 32%), while, not surprisingly, students at HBCUs stressed peer support from other African American students (13% versus 1% for those

Table 2. Factors that have helped NCBPS participants persist in their studies, 2001.

	Top Factor %	Among Top 3 %
Love of subject matter	42	71
Family support	19	55
Support from Black faculty members	13	39
Peer support from other Black students	9	47
Support from non-Black faculty members	7	17
Career prospects	6	44
Support from other non-Black students	1	5
Other	3	13

at non-HBCUs), and, to a somewhat lesser extent, from African-American faculty members (not necessarily only in physics). One point worth noting was that undergraduate students were twice as likely to mention the support from non-African American faculty members than graduate students (9% versus 4%).

ASSESSMENT OF THE CONFERENCE

Besides getting background information on the Conference attendees, we were also interested in obtaining their reasons for attending the Conference, their assessment of the Conference, and their evaluation of how well the Conference met their needs. We therefore asked the participants about their specific objectives for attending the Conference, and whether they found the Conference useful in terms of meeting those objectives.

One of the key objectives of the Conference was to help the students develop a networking base. As shown in **Table 3**, networking was foremost in the students' minds as well. The most

important reason they gave for attending the Conference this year was networking with other Black physics students, with more than a third of them selecting this option. While last year networking with Black professionals had been the number one reason, this year it came in second with more than a quarter of the students reporting this as their main objective for attending. Learning about further study in physics was a distant third again this year, with less than one-fifth of the students indicating this as their primary reason for attending the Conference.

On closer inspection of the data, we found that graduate students (45%) were once again more focused on networking with Black professionals than were the undergraduate students (29%). Interestingly, we discovered that networking with Black professionals was actually foremost in the minds of graduate male students, while graduate female students were more interested in networking with other Black physics students. Once again, not surprisingly given where they came from, we found that students at non-HBCUs were more concerned with networking with Black professionals than were their counterparts at HBCUs.

Table 3. Goals in attending NCBPS conference, 2001.

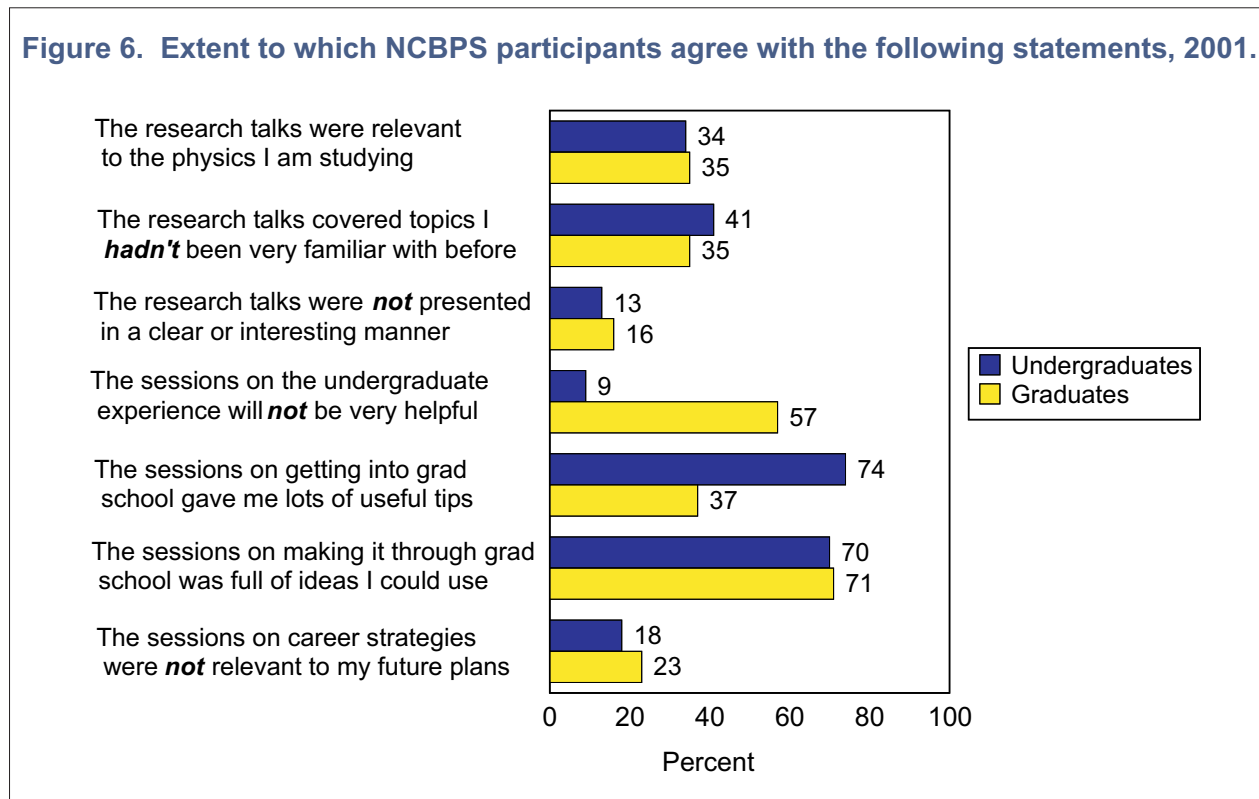
	Top Goal %	Among Top 3 %
Networking with other Black students	35	87
Networking with Black professionals	29	83
Learning about further physics study	18	51
Meeting with recruiters	13	49
Hearing research talks	3	24
Other	2	6

Giving students an opportunity to hear about recent research and general topics of interest in physics, and offering the students tools to help them persevere in their chosen career path were also other objectives of the Conference. As in previous years, very few students (13%) reported that meeting school and job recruiters was their main objective for attending the Conference. Once again however, we noticed that students at HBCUs were more likely to stress meeting with school and job recruiters as their main objective than students at non-HBCUs (19% versus 5%). As was also true in the past, hearing research talks was mentioned by only 3% of the attendees as their main objective for coming to the Conference. This lower priority given to the research talks is further underlined by the fact that this year the fraction attending 5 or more research talks was about the same as the fraction attending 2 or fewer. Last year, four times as many participants attended 5 or more talks as attended 2 or fewer (48% versus 12%).

The assessment of the various aspects of the Conference gives evidence of the positive experiences of the attendees. **Figure 6** shows that the sessions on making it through graduate school were useful to the majority of the students. Not surprisingly, undergraduates found the sessions on getting into graduate school especially helpful. More than half of the participants felt that many of the research talks were presented in a clear and interesting manner. However, only a third of the attendees felt that the contents of the talks were directly relevant to the physics they were studying. Also surprising was the fact that more than a third of even the graduate students reported that they had been unfamiliar with the topics covered during the research talks.

Graduate students felt that the content of the talks was more directly relevant to the physics they had been studying than did undergraduate

Figure 6. Extent to which NCBPS participants agree with the following statements, 2001.



students. We also found that more than half of the female respondents reported that they had not been familiar with the topics covered in the research talks, while less than a third of the male respondents had felt that way. Male respondents were also more positive about the sessions on making it through graduate school than were their female counterparts (78% versus 58%). They also felt that the sessions on career strategies were more relevant to their future plans than did the female respondents (56% versus 39%).

Although slightly lower than in previous years, the most highly rated aspect of the Conference was the opportunity for networking, both with other black physics students and with Black professionals. The overwhelming majority (91%) rated the opportunity to network as good or excellent (**Table 4**). The slightly lower rating this year might be due in part to the larger number of attendees, which made it impossible for all of them to be housed in one central location. They were ultimately split across three separate hotels, making it a bit more difficult to

interact with each other. Learning about further study in physics and meeting with recruiters were also given high marks, although slightly below the even higher ratings of the previous years. And even though the goal of hearing research talks was given far less weight by Conference participants, the actual experience of attending these talks also came out with a relatively strong favorable rating.

Conference participants were also asked to rate the practical arrangements (i.e travel arrangements, housing, length of the sessions, and the overall length of the Conference) of this year's Conference (**Table 5**). Not surprisingly, ratings for travel were down from last year, because students had to be rerouted to different flights at the last minute when one of the major air carriers went on strike. Ratings for the housing facilities, the length of the sessions, and the overall length of the Conference were also very favorable, as was the case in previous years.

Table 4. Performance of the Conference in meeting goals, 2001.

	Excellent	Good	Fair	Poor
	%	%	%	%
Networking with other Black students	66	28	6	-
Networking with Black professionals	48	39	11	2
Learning about further physics study	43	42	15	-
Meeting with recruiters	43	34	23	-
Hearing research talks	30	45	22	3

Table 5. Ratings of the practical arrangements at the Conference, 2001.				
	Excellent	Good	Fair	Poor
	%	%	%	%
Travel arrangements	63	25	10	2
Housing facilities	73	18	7	2
Length of sessions	34	49	15	2
Length of the Conference	40	45	14	1

CONCLUSION

The findings in this report definitely show that the Conference continued its success in fulfilling the goals and meeting the expectations of those attending. The various aspects of the sessions and the practical arrangements of the Conference all received glowing ratings. The only negative comments that surfaced with any frequency was that a few of the students would have preferred if they hadn't been split across different hotels, and like every other year, they would have preferred more time off to do some sightseeing. Other than that, all indications were that the Conference contributed significantly to the goal of nurturing an ongoing community of Black physicists.

Based on an analysis of the data from the survey, we see that the Conference organizers seem to have been successful in broadening their recruiting efforts. In years past there were a lot more repeat attendees and a greater number of students coming from a small set of schools

concentrated primarily in the South. This year, the participant list was not only larger but more diverse.

Another point worth mentioning again is the issue of retention of graduate students. Although the increased presence of undergraduate and graduate school recruiters helps to fulfill the goal of encouraging more Black physics students to pursue graduate study in the field, it still does not address the problem of helping graduate students stay in school and achieve their degree objectives. The data shows that the majority of students aim to earn a graduate degree, with around 80% aspiring to a PhD. However, when we look at figures on Black degree recipients, we notice that far fewer actually reach this goal. Perhaps this problem could be more effectively addressed as part of a meeting or retreat geared specifically to graduate students.