

**FINDINGS FROM THE SURVEY OF PARTICIPANTS OF
THE 16TH ANNUAL
NATIONAL CONFERENCE OF BLACK PHYSICS STUDENTS**



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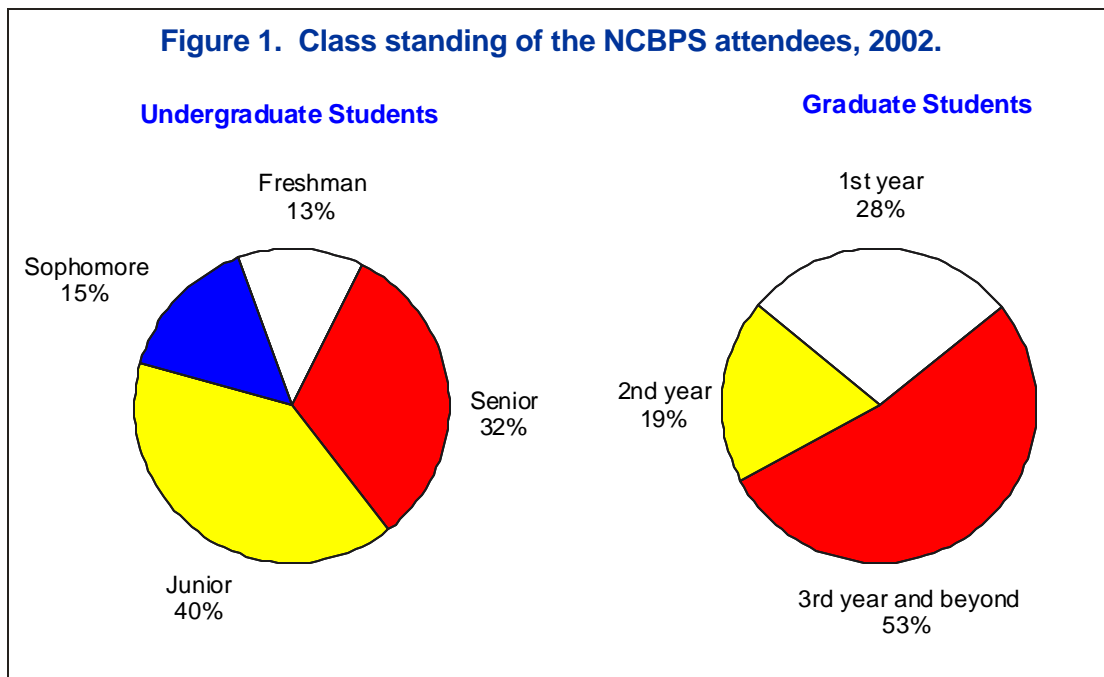
INTRODUCTION

Alabama A&M University in Huntsville was the host site this year of the 16th National Conference of Black Physics Students (NCBPS), held conjointly with the annual meeting of the National Society of Black Physicists (NSBP). The Conference, held March 14-17, 2002, brought together Black physics students to meet Black working physicists, job recruiters, faculty members, and others concerned with increasing the minority representation in the field of physics. Meeting with the professional society members afforded the 206 participating undergraduate and graduate students a unique opportunity to establish contacts with experienced Black physicists, and enjoy an opportunity to learn of the various contributions by Blacks to the field of physics.

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 year's study, as with previous evaluations, were to examine the backgrounds and demographic characteristics of the conference participants, to ascertain their goals in attending, and to assess whether the conference succeeded in meeting these goals. The students were queried on their career aspirations, recent physics research experience, and the factors that helped them persist in their physics studies. Student participants were also asked to evaluate their physics courses and professors that they had encountered during their academic career.

The questionnaire instrument was designed by the Statistical Research Center in consultation with the organizers of the Conference, and structured to allow comparison with the responses of participants from previous 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 meeting. Of the 206 students who attended the conference, 167 (81%) returned a completed questionnaire, a slight increase from last year's 77% response rate.

DEMOGRAPHIC BACKGROUND OF THE ATTENDEES

As was also the case last year, there were significantly more undergraduate participants than graduate participants present at the Conference (61% versus 39%). Almost three-quarters of the undergraduate student attendees, slightly more than last year, were upperclassmen, and almost three-quarters of the graduate student attendees were beyond their first year (**Figure 1**). This is, once again, a

definite indicator of the conference's success in recruiting students across the entire range of the academic pipeline.

In addition, even though organizers of the Conference limit attendance because of funding constraints and other factors, the participants still comprise a substantial fraction of all black undergraduate and graduate students in the country – maybe as much as 20-25%. Thus, the findings, while not definitive, still offer a valuable window onto the backgrounds, academic experiences, views and aspirations of Black physics students throughout the nation.

The median age for undergraduates was 21 years, while for graduate students it was 28 years (**Figure 2**). Once we controlled for undergraduate/graduate status, we once again found that there was little age difference between male and female undergraduate

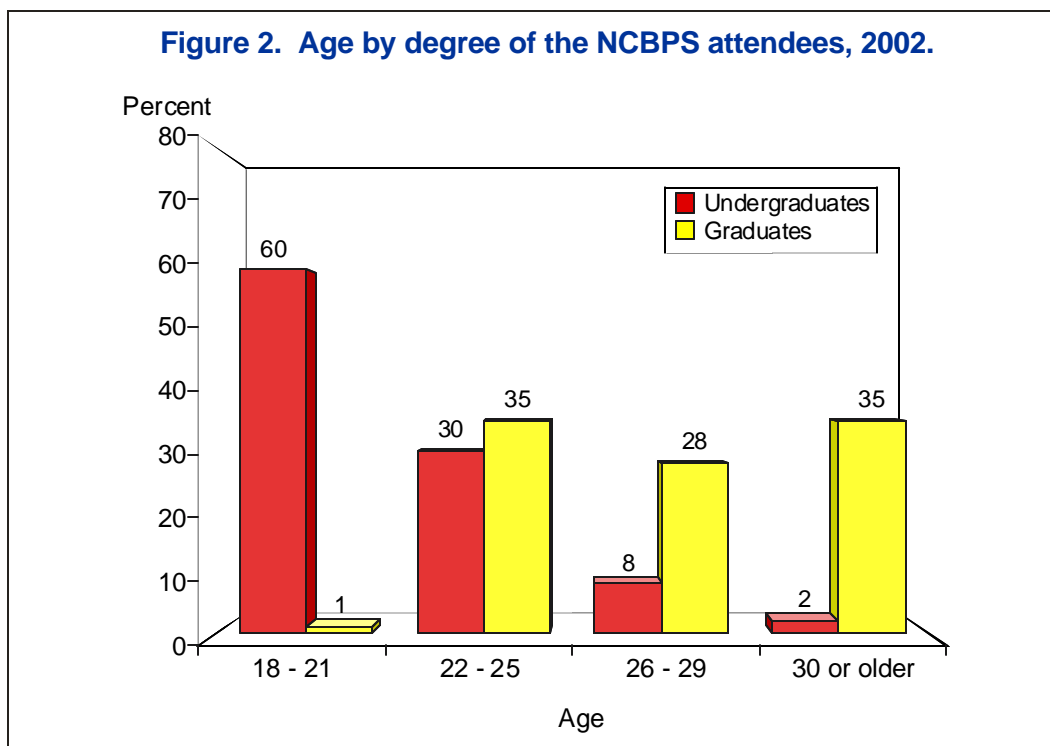
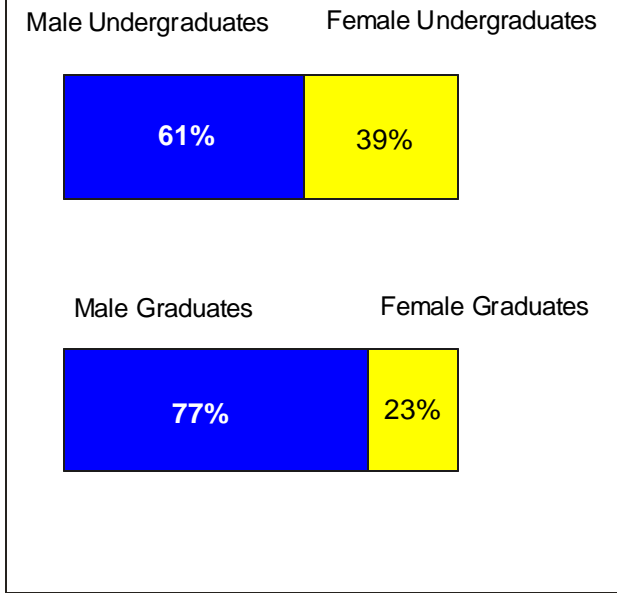


Figure 3. Sex by student status of Conference participants, 2002.



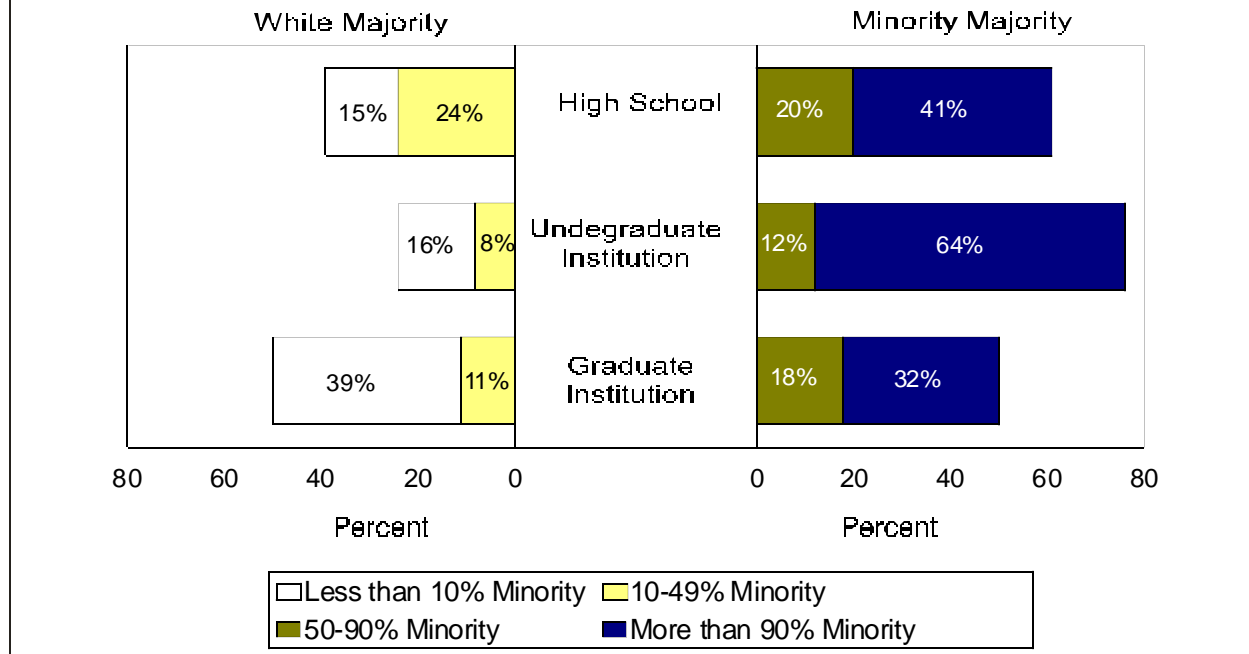
female graduate students. The median age among female graduate students was 24 years, while among male graduate students the median age was 28 years.

This year we found that the overall proportion of females among NCBPS attendees was 33%, slightly lower than in previous years. Among undergraduates, the proportion of females this year was 39%, a somewhat larger drop from last year's 44%. Among graduate students, the proportion of conference attendees who were female was 23%, virtually the same as last year (Figure 3).

Conference participants were again asked about the minority composition at their high school, undergraduate institution, and, where applicable, their graduate institution (Figure 4). As has been the case at prior conferences, most students came from minority-majority schools. In terms of high school, 60% of the participants went to minority-majority

students. The median age for both groups was 21 years. As was also true in previous years, we found a substantial difference among male and

Figure 4. Minority composition at respondents' high school, undergraduate, and graduate institution, 2002.



schools, and the number coming from essentially all-minority high schools has been rising in recent years.

Curiously, we found that female graduate respondents were more likely to come from integrated high schools and colleges, but less likely to be attending integrated graduate schools. As **Table 1** shows, more than half of the female graduate participants indicated that they had attended a white majority high school, and almost half indicated that they had attended a white majority college. However, only 39% (versus 53% of the male graduate respondents) said that they were attending white majority graduate schools.

This year we found that 52% (versus 31% last year) of the NCBPS' graduate student participants went to HBCUs for their undergraduate work, compared to 81% of current undergraduate participants. Interestingly, here too we found a similar "crossing-over pattern" as was described above for female graduate students. Non-HBCU students, both

undergraduates and graduates, were more likely to have come from minority-majority high schools than their HBCU counterparts (73% versus 56%). This may be because students from one high school environment find themselves eager to explore something different in college. On the other hand, we found that graduate HBCU students were more likely to have attended minority-majority colleges than graduate non-HBCU students (76% versus 57%).

Fifty-two percent of this year's Conference participants reported that they had attended previous NCBPS meetings with about three-quarter of that group attending last year's conference at Stanford University. Although this is a high rate of repeat attendance, reflecting the great popularity of the Conference, it is worth noting that more than half of the undergraduate students and about one-third of the graduate students this year were new to the conference. Not surprisingly, given that the conference was held in the South, we found that there was a higher proportion of attendees from the Southern region of the country. The

Table 1. Minority composition at respondents' highschool and college, 2002.				
	Undergrad Males	Undergrad Females	Grad Males	Grad Females
	%	%	%	%
White majority high school	37	38	38	53
Minority majority high school	63	62	62	47
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White majority college	23	11	29	47
Minority majority college	77	89	71	53

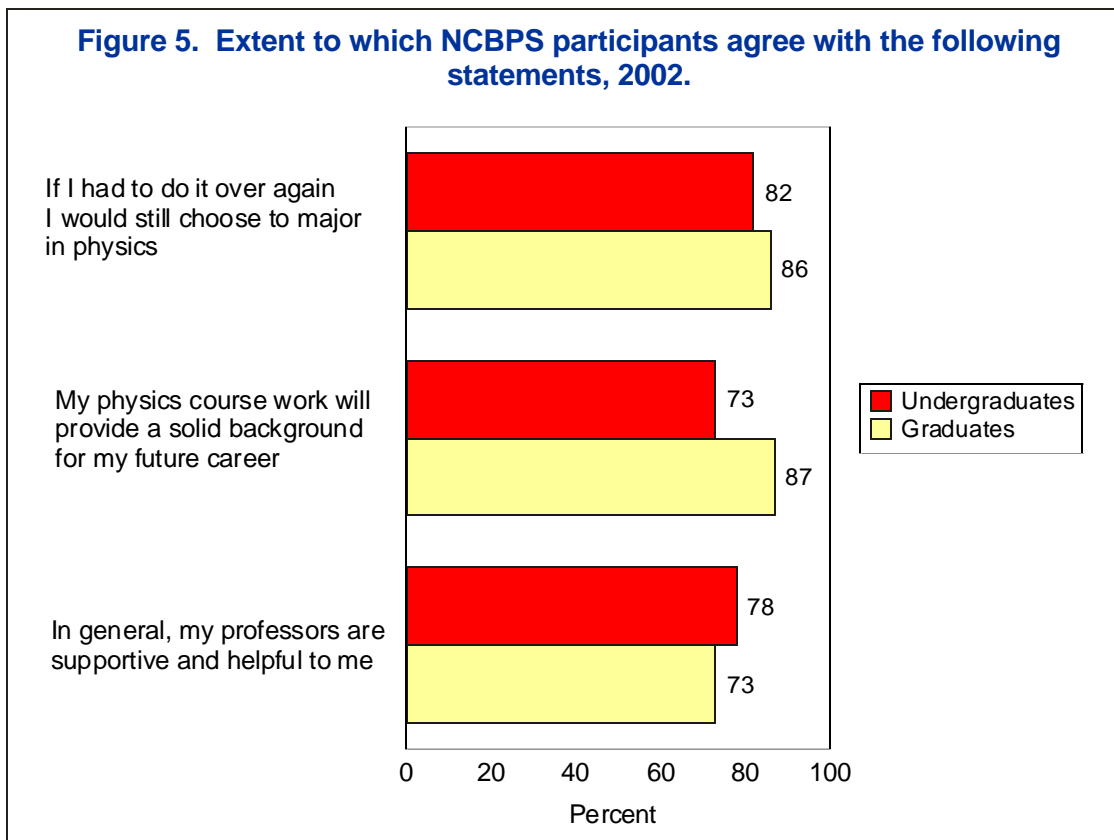
proportion from the South rises whenever the meeting is held in the South. Even though, there was a substantial proportion of students coming from a relatively small set of schools concentrated in the South, there were also students from a handful of schools that had not been previously represented.

of respondents (83%) who indicated that they would major in physics again if they had to do it over. Over three-quarters of the respondents felt that their physics course work would provide a solid background for their future careers, and 76% (versus 68% last year) of the respondents felt that in general the professors they had encountered were supportive and helpful.

PHYSICS & SCIENCE BACKGROUND

Conference attendees were asked about their current academic experiences, including their evaluation of the courses and professors they had encountered during their academic careers. The overwhelming majority (92%) of the students indicated that physics was their major subject, with another 6% majoring in engineering. The high level of satisfaction with their choice of field was once again reflected in the percentage

As we found previously, there were a number of small differences in the attitudes by level of study and by gender (**Figure 5**). Undergraduate respondents were less likely than their graduate counterparts to feel that their physics course work would provide a solid background for their future careers (73% versus 87%). This was further emphasized by the fact that all of the female graduate students

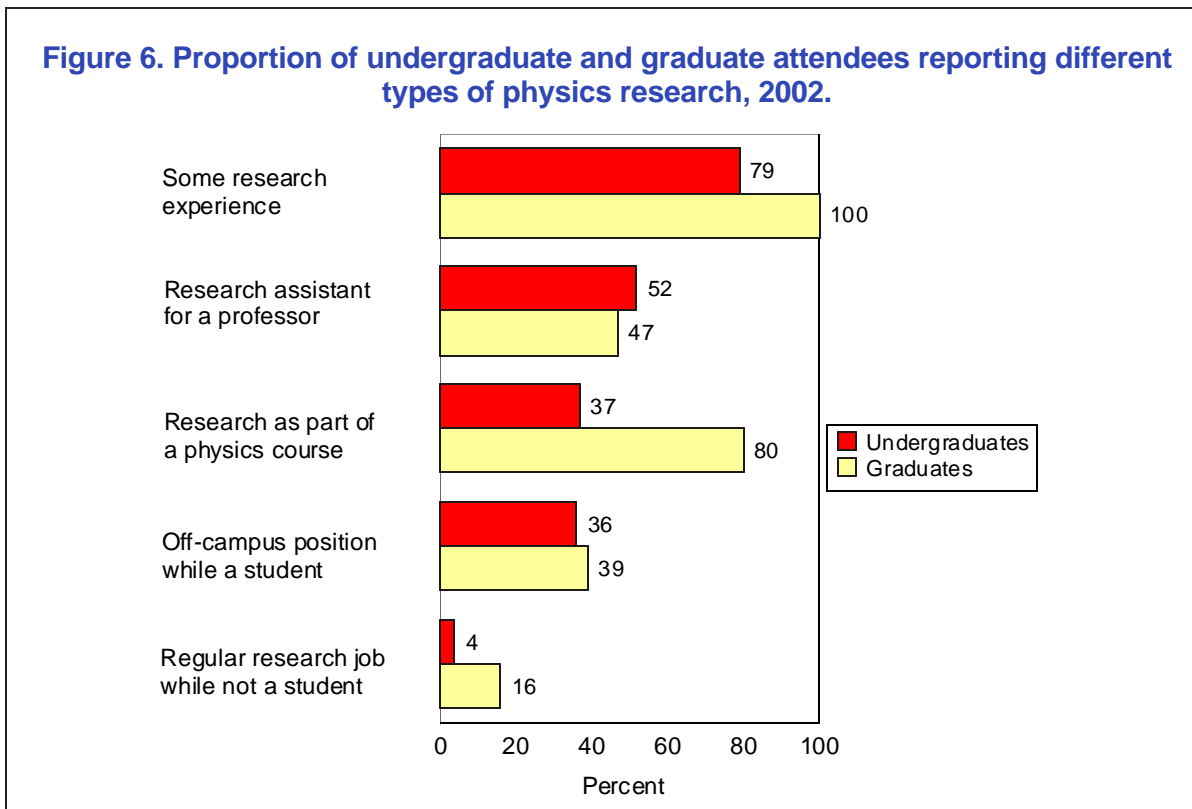


(100%) felt that their physics course work would provide a solid background for their future careers. However, like last year, female graduate students were the least likely to feel that the professors they had encountered were supportive or helpful (60% versus 75% for male graduate students and 78% undergraduate students). Finally, undergraduate students at HBCUs were more likely to feel that their physics course work would provide a solid background for their future careers than their non-HBCU counterparts (86% versus 68%).

The vast majority of participants, both undergrads and graduate students, reported having already had some type of research experience in physics. While a high percentage among graduate students is to be expected, that 79% of undergraduates reported having physics research experience of some sort is gratifying

(**Figure 6**). Unlike previous years, where graduate students were more likely to have been a research assistant for a professor, this year we found that 52% of the undergraduate students (versus 47% of the graduate students) indicated that they had been a research assistant to a professor. Thirty-nine percent of this year's grad students and 36% of the undergrads reported that they had an off-campus position or internship that included a physics research component.

Interestingly, female undergraduates were more likely to have been a research assistant for a professor (62% versus around 45% for the other 3 groups). Along similar lines, female graduate students were more likely to have had an off-campus position (60% versus around 35% for the other 3 groups). Not surprisingly, given the predominance of



African-American faculty members and the generally smaller size of the schools, a greater proportion of students at HBCUs reported that they had worked as a research assistant for a professor (53% versus 41% for students at non-HBCUs). As to be expected, graduate students were more likely to have engaged in research as part of a physics course than their undergraduate counterparts. Finally, more students at non-HBCUs reported having had research experience as part of a physics course than did students at HBCUs (65% versus 50%).

ACADEMIC GOALS AND CAREER ASPIRATIONS

Conference attendees were also asked in detail about their future academic objectives and career aspirations. Regardless of their current level of study, an overwhelming majority of the students indicated that a graduate degree was their ultimate goal, with about 78% of the participants aspiring to a PhD. Once again it is worth mentioning that in reality only a very small fraction are likely to realize this goal. For

instance, in recent years, only 1 in 7 Black physics Bachelors recipient actually earned a Masters Degree in physics, and only 1 in 20 went on to a PhD in physics. So while encouraging academic aspirations is desirable, it is of utmost importance to put realistic information in the students' hands, including information on what is expected of graduate students, on the typical length of the course of study, and other similar aspects of graduate study in physics. The twin goals of encouraging students to pursue physics and at the same time informing them about the realities of that pursuit comprise the mission that the NCBPS Conference has undertaken to fulfill.

More than half of the students reported that they definitely wanted to pursue careers in physics, with another 33% indicating that they were considering going in that direction. Eleven percent indicated a desire to do something outside of the field of physics. An idea of the types of physics careers students aspired to can be seen in **Table 2**. Controlling for student level, we found that graduate students were more likely to gravitate towards

Table 2. NCBPS participants' anticipated career goals, 2002.	
	Percent
Academic teaching or research in physics	25
Non-academic physics research in industry	18
Non-academic physics research in government / national labs	12
Physics research in unspecified employment sector	21
Other types of physics-related positions	12
Careers in other sciences	11
Careers outside of physics altogether	2

a career in academe (41% vs 15%). Interestingly, undergraduates were more open to careers in other, albeit, related fields. Undergraduates at non-HBCUs were more likely to favor a career in industry than their undergraduate counterparts. On the flip side, undergraduate students at HBCUs were more likely to aim for a physics career in a government agency or at a national lab (13% versus 5%).

Conference participants were further asked to indicate the motivation underlying their choice of career goals (**Table 3**). As in previous years we found that the most common reason, ranked number one by around half of all respondents, was the intrinsic challenge of the work. The chance to give something back to the community came in second, while only 10% indicated that salary and benefits were the most important factors for them. This year, students at HBCUs were far more concerned with giving something back to the community than students at non-HBCUs (37% vs 22%). Similarly, female graduate students were, more so than any other

group at the Conference, more focused on giving something back to the community than any other group at the conference. None of the groups pointed to the salary and benefits as the main reason for choosing their career goals.

Participants were asked to name the most important factor that helped them to persist in their physics studies (**Table 4**). As in prior years, love of the subject matter was ranked the number one reason. Support from African-American faculty, third last year, came in second, and career prospects came in third. But these feelings were not evenly distributed among participants. In general, both undergraduate and graduate women stressed external support from family, other Black students, and Black professors, while their male counterparts were much more likely to focus on internal factors (i.e. love of the subject, and career prospects). And surprisingly, undergraduate respondents were much more likely to focus on the career prospects than their graduate counterparts (16% versus 5%).

	Undergrad Males %	Undergrad Females %	Grad Males %	Grad Females %	Overall %
Challenging or interesting work	44	50	53	40	48
Chance to give something back to the community	32	30	29	53	32
Salary and benefits	13	10	8	0	10
Respect people have for this type of work	8	8	0	0	5
Other	2	3	8	7	4

Table 4. Factors that have helped NCBPS participants persist in their studies, 2002.		
	Top Factor %	Among Top 3 %
Love of subject matter	37	71
Family support	16	53
Support from Black faculty members	13	34
Career prospects	11	44
Support from other Black students	9	39
Support from non-Black faculty members	3	25
Support from other non-Black students	1	9
Other	5	9

Other significant differences were observed as well. As we found last year, students at non-HBCUs were more likely to stress love of the subject matter, while, not surprisingly, students at HBCUs cited peer support from other African-American students (12% versus 0% for those at non-HBCUs) and to a somewhat lesser degree, support from African-American faculty members. Getting this support might explain why they decided to go to HBCUs in the first place. Undergraduates at HBCUs were also more likely to emphasize family support than undergraduates at non-HBCUs (15% versus 5%).

ASSESSMENT OF THE CONFERENCE

The purpose of this report is twofold: to present a profile of the conference participants and their objectives for attending, as presented above; and to obtain their assessment of the conference and evaluate how well it met their needs. As part of

the latter, participants were queried about their specific objectives for attending the conference, and whether the Conference was effective in meeting those objectives.

As in previous years, networking with other Black physics students was the most important reason, cited as primary by more than a third of the respondents (**Table 5**). Networking with Black professionals came in second with almost a third of the participants reporting this as their main reason for attending. Learning about further study in physics was once again a distant third, with less than one-fifth of the students indicating this as their primary motivation.

Upon closer inspection, we discovered that male students and female graduate students were much more interested in networking with other Black physics students than were female undergraduate students (40% and 47% versus 23%). Not surprisingly, we found that

students at non-HBCUs were more eager to network with Black professionals and, to a lesser degree, other Black physics students than were students from HBCUs.

Besides helping the students develop a networking base, the conference had other major objectives as well, such as offering the students tools to help them persevere in their chosen career path and giving them an opportunity to hear about recent research topics. As we found in previous years, very few participants (10%) indicated that meeting with school and job recruiters was their main reason for attending NCBPS. Whereas 17% of the undergraduates at HBCUs cited this as their main objective for attending, none of the undergraduates at non-HBCUs did like-wise. Hearing research talks was even less a focus for participants, mentioned by only 4% as their main objective for attending the conference.

The evaluation of the conference and its various aspects gives the strongest and most direct evidence of the experience of the participants

(**Figure 7**). The sessions on career strategies, getting into grad school, and making it through grad school were all given positive ratings by more than half of the respondents. Not surprisingly, undergraduate participants found the sessions on the undergraduate experience and getting into grad school especially helpful. More than half of the graduate students felt that the research talks were presented in a clear and interesting manner, while less than a third of the undergraduate students felt this way. On the other hand, only around a third of the participants felt that the contents of the talks were directly relevant to the physics they were studying, and around half of all respondents reported that they had been unfamiliar with the topics covered during the research talks.

Female graduate students felt that the content of the talks was more directly relevant to the physics they had been studying than any other group. Male respondents were more positive about the sessions on making it through graduate school than were female respondents (69% versus 58%). However, more than half of them indicated that the research talks

Table 5. Goals in attending NCBPS conference, 2002.

	Top Goal %	Among Top 3 %
Networking with other Black students	37	84
Networking with Black professionals	31	83
Learning about further physics study	16	52
Meeting with recruiters	10	51
Hearing research talks	4	21
Other	1	4

covered parts of physics they had been unfamiliar with. Undergraduates at HBCUs were more positive about the sessions on the undergraduate experience than undergraduates at non-HBCUs (63% versus 32%). Undergrads at HBCUs also felt that the sessions on career strategies were useful (76% versus 58% for undergraduates at non-HBCUs). Graduate students at HBCUs found the sessions on making it through graduate school more helpful than did graduate students at non-HBCUs.

As has been the case with all previous reports, the most highly rated aspect of the conference was the opportunity to network, both with other Black physics students and with Black professionals (Table 6). The vast majority rated the opportunity to network with other Black physics students as good or excellent. Learning about further study in physics and meeting with recruiters were also given high marks, even higher than the ratings they received last year.

And once again, even though the goal of hearing research talks was not uppermost in the minds of most participants, the actual experience of attending these talks also got high ratings.

Participants attendees were again asked to rate the practical arrangements (i.e. travel arrangements, housing, length of sessions, geographical location, and the overall length of the Conference) of this year's NCBPS meeting (Table 7). Ratings for the housing facilities was up this year. Travel arrangements, length of the individual sessions, and overall length of the conference were also rated very favorably, even though slightly below the high ratings of the previous years. This year, we asked students to rate the geographical location of the Conference, and almost three-quarters rated it good or excellent.

Figure 7. Extent to which NCBPS participants agree with the following statements, 2002.

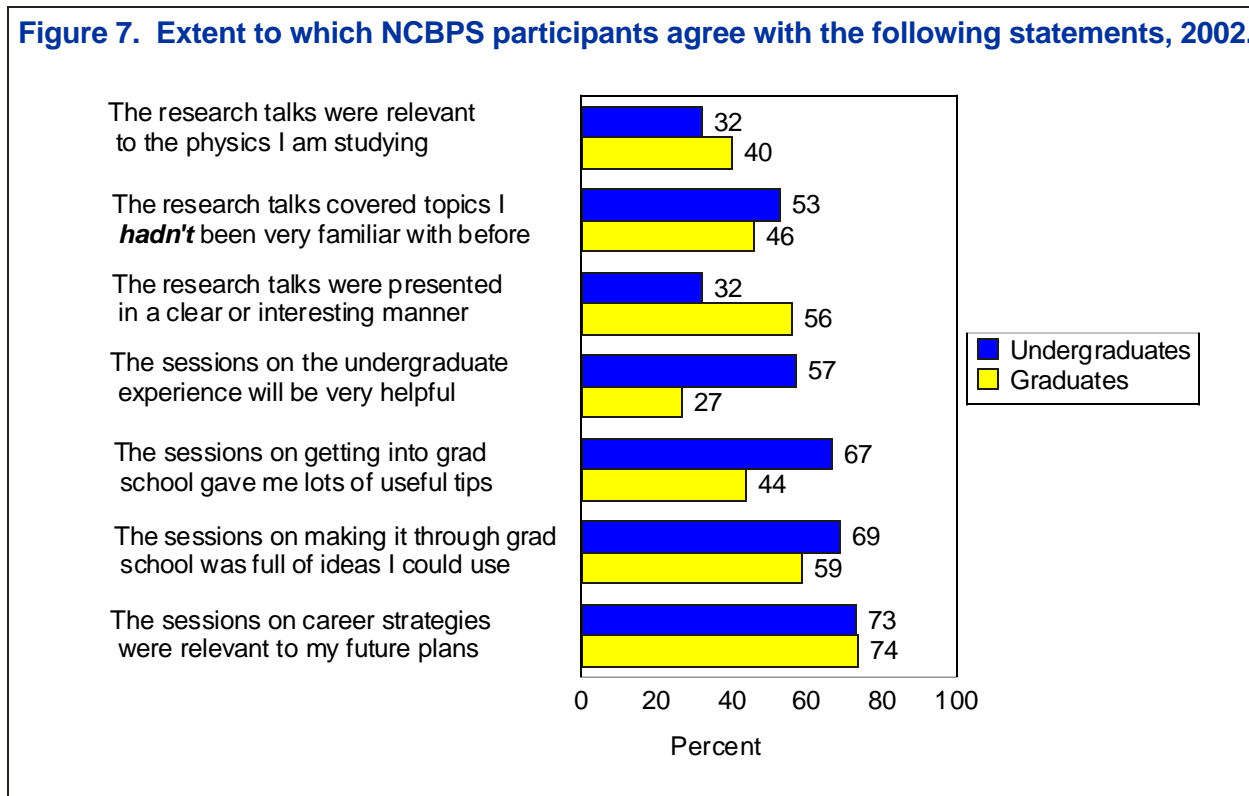


Table 6. Performance of the Conference in meeting goals, 2001.				
	Excellent	Good	Fair	Poor
	%	%	%	%
Networking with other Black students	70	25	5	0
Networking with Black professionals	71	21	7	1
Learning about further physics study	58	34	7	0
Meeting with recruiters	51	37	10	2
Hearing research talks	41	39	20	0

CONCLUSION

Even though the students have an array of different goals and objectives for attending this year's NCBPS meeting, the findings definitely attest to the fact that in most ways the Conference was quite successful in meeting the expectations and fulfilling those goals. The various aspects of the sessions and the practical arrangements of the Conference itself all received unusually high ratings. Even where we attempted to reword questions to provide more

differentiation in responses, the ratings still tended to cluster at the upper end of the scale.

As an addendum, we've included the verbatim comments that many of the student participants added to the questionnaire. We feel that these comments generally speak for themselves, filling out and adding depth to the quantitative findings in providing a picture of the role the conference plays in the academic and social lives of its participants.

Table 7. Ratings of the practical arrangements at the Conference, 2001.				
	Excellent	Good	Fair	Poor
	%	%	%	%
Travel arrangements	72	22	5	1
Housing facilities	76	19	4	1
Length of sessions	35	40	21	4
Length of the Conference	52	38	8	2
Geographic location of the Conference	41	31	22	6