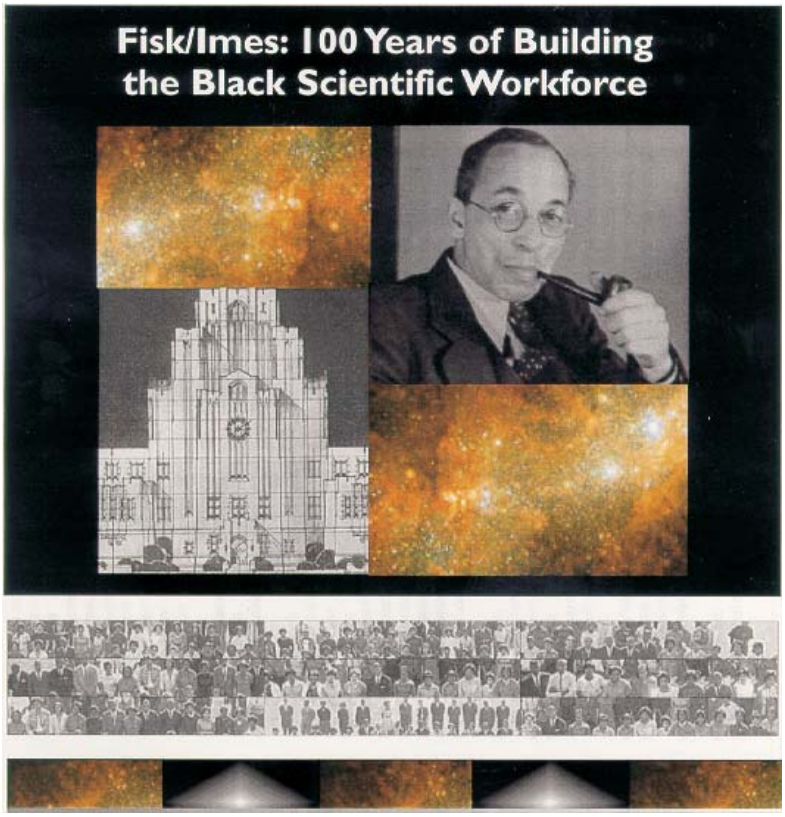
FINDINGS FROM THE SURVEY OF PARTICIPANTS OF THE 18TH ANNUAL NATIONAL CONFERENCE OF BLACK PHYSICS STUDENTS



Report prepared by:
Julius Dollison
and
Michael Neuschatz

Statistical Research Center
American Institute of Physics
College Park, MD
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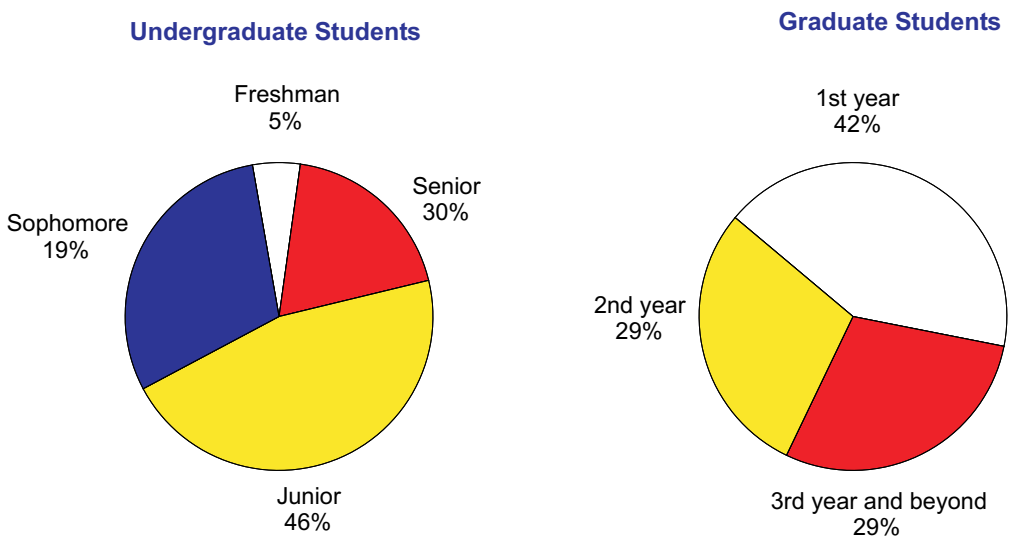
INTRODUCTION

The eighteenth annual National Conference of Black Physics Students (**NCBPS**) was held this year at Fisk University in Nashville, Tennessee. The Conference, held on the weekend of February 5th - 8th, once again brought together Black students interested in physics to meet and network with Black working physicists, corporate as well as graduate school recruiters, faculty members, administrators, various professional society representatives, and others concerned with the lack of representation of minorities in the physics field.

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 evaluation, as with previous conference evaluations, were to examine the backgrounds and demographic characteristics of the Conference participants, to ascertain their goals in attending the Conference, and to assess the level of success the Conference had in meeting those goals. Attendees were asked about their career goal choices, recent physics research experiences, their participation in various national internship programs, and the factors that helped them persist towards their goals. The survey also asked student participants to rate various aspects of the Conference as well their evaluation of physics courses and the professors they had encountered during their academic careers.

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 at the beginning of the conference, and then collected on the last night. Of the 117 students who

Figure 1. Class standing of the NCBPS attendees, 2004.



attended the Conference, 57 (49%) returned a completed questionnaire, a decrease from previous years. The lower response rate at this year's conference compared to previous years can be largely attributed to the fact that the office where the forms were to be returned was situated in an obscure area of the hotel where the Conference was held.

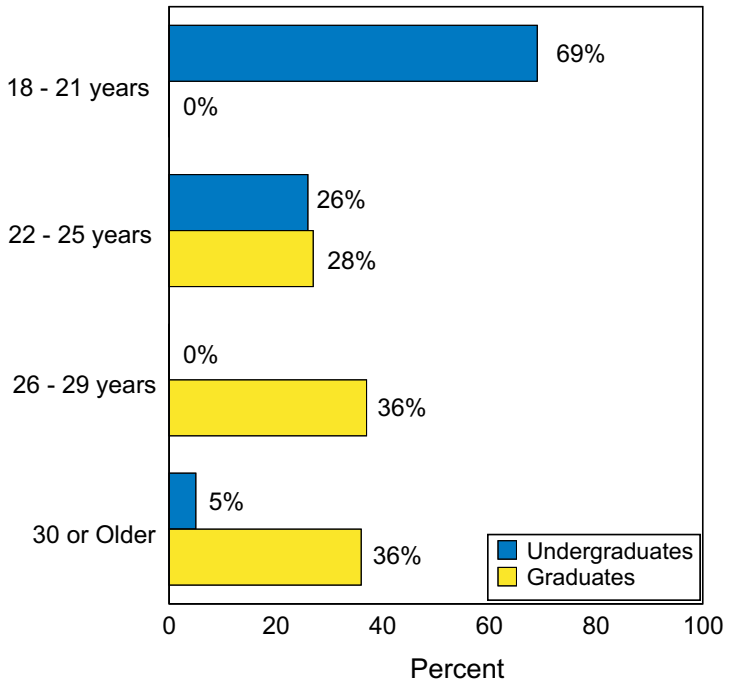
DEMOGRAPHIC BACKGROUND OF ATTENDEES

This year, as was also the case in previous years, there were significantly more undergraduate participants than graduate participants present at the meeting (75% versus 25%). More than three-quarters of the undergraduate student attendees, up from two-thirds last year, were upperclassmen, and more than half of the graduate student attendees were beyond their first year (**Figure 1**).

Consistent with earlier **NCBPS** Meetings, we found the median age for undergraduate student attendees was 21 years, and for graduate student attendees it was 28 years (**Figure 2**).

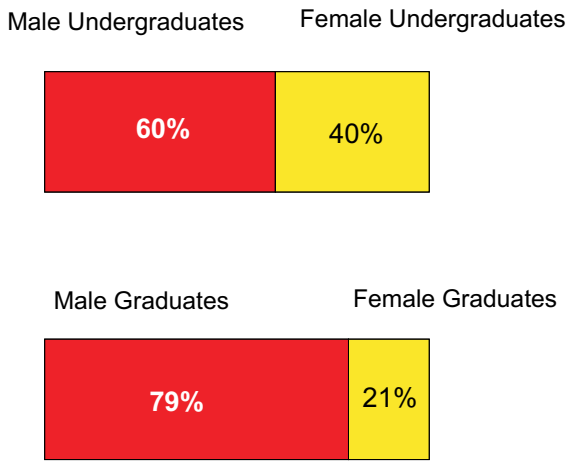
Controlling for undergraduate/graduate status, we once again found that there was little age difference among the male and female undergraduate students. The median age for male undergraduates was 21 years, while for female undergraduates it was 20 years. On the other hand, as in previous years, there was a marked difference in the ages of male and female graduate students. The median age among female graduate students was 23 years, while among male graduate students the median age was 28 years.

Figure 2. Age by degree of the NCBPS attendees, 2004.



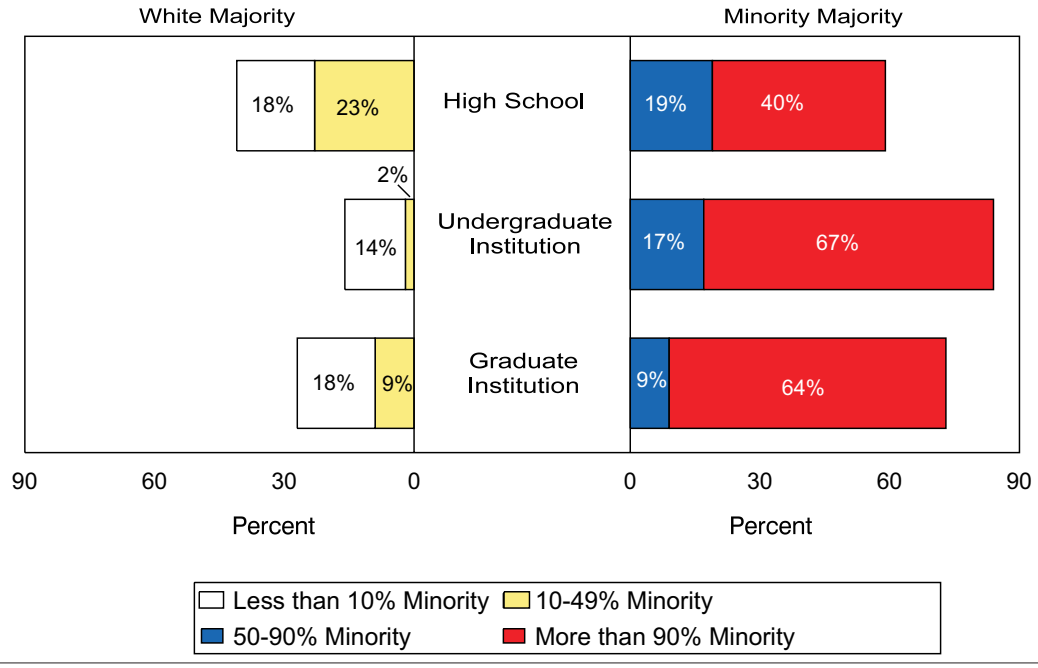
The overall proportion of women among this year's **NCBPS** attendees was 35%, slightly lower than last year's 41%. The proportion of females among undergraduates was 40% (**Figure 3**). Among graduate students, the proportion of Conference participants who were female was 21%, about equal to the national average for all physics graduate students.

Figure 3. Sex by student status of the NCBPS attendees, 2004.



Conference participants were 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 **NCBPS** meetings, most of the students came from minority-majority schools. We found that 59% of the participants went to minority-majority high schools, and most of these came from essentially all majority high schools. And like last year, an even higher percentage (91% of all attendees) reported that they had attended or

Figure 4. Minority composition at respondents' high school, undergraduate, and graduate institution, 2004.



were attending an Historically Black College or University (**HBCU**) or minority-majority college.

One curious, but consistent, finding over the years has been that an even higher proportion of undergraduate female than male participants at the **NCBPS** tended to gravitate towards minority-majority colleges and universities regardless of whether they attended an integrated or minority-majority high school (**Table 1**). We also found that graduate male students were the least likely, compared to the other groups at the Conference, to have attended a minority-majority undergraduate institution. However, many more then chose to attend a minority-majority school for graduate studies. Similarly, we found that 49% (versus 48% last year) of the conference graduate attendees went to HBCUs for their undergraduate work, compared to virtually all of the current undergraduate participants.

The recruiting efforts of the Conference organizers is once again worth noting given the relatively small number of black physics students in the academic pipeline. Although many of the Conference participants had attended previous **NCBPS** meetings, around half of both the undergraduate and graduate students this year were new to the Conference. And even though there was a high proportion of students coming from a relatively small set of schools concentrated in the South, there were also students from a few colleges that had not been previously represented.

Table 1. Minority composition at respondents' high school, college and graduate institution, 2004.

	Undergrad Males %	Undergrad Females %	Grad Males %	Grad Females %
White majority high school	35	48	36	67
Minority majority high school	65	52	64	33
White majority college	8	-	55	33
Minority majority college	92	100	45	67
White majority graduate school	-	-	33	-
Minority majority graduate school	-	-	67	100

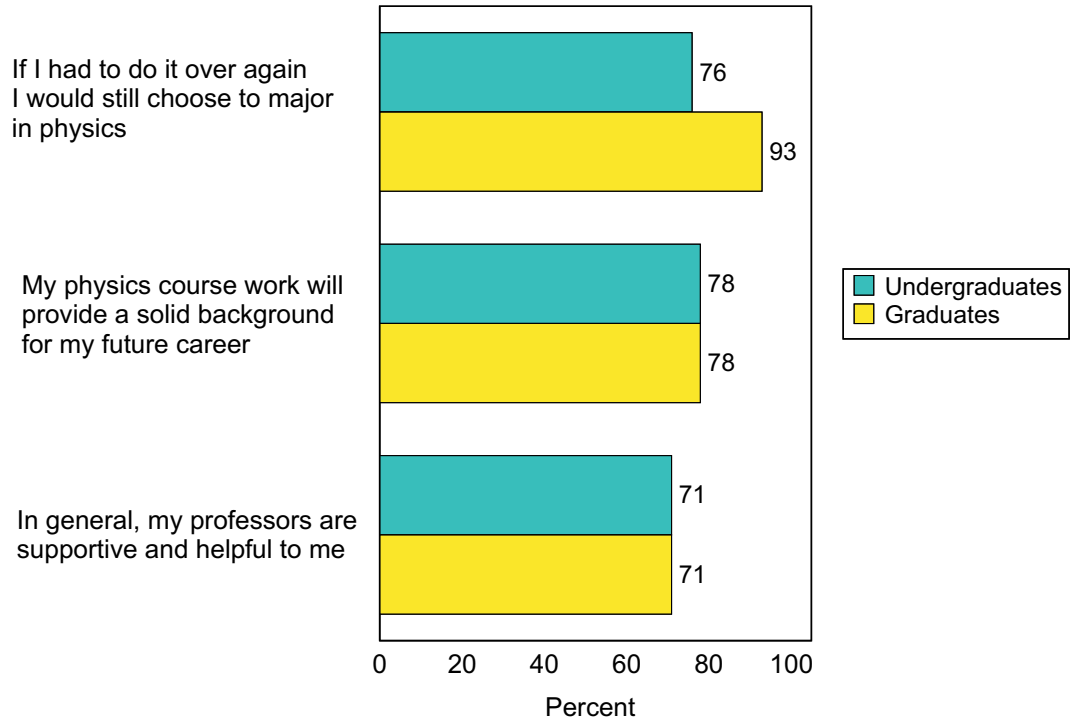
PHYSICS & SCIENCE BACKGROUND

Participants were asked about their current academic experiences so far, including an evaluation of the courses and professors they had encountered during their academic careers. The overwhelming majority (90%) of the students reported that physics was their major subject, with another 4% indicating engineering as their major.

The high degree of academic satisfaction was once again reflected in the proportion of respondents (80%) who reported that they would major in physics if they had it to do over again. Along similar lines we found that more than three-quarters of the respondents felt that their physics course work would provide a solid background for their future careers, and 71% of them reported that in general the professors they had encountered had been supportive and helpful.

As we found in previous years, there were a number of significant differences in the attitudes when we controlled for gender and level of study (**Figure 5**). Male participants were far more likely to say they would major in physics if they had it to do over again (95% versus 53% for female participants). They were also somewhat more likely than their female counterparts to feel that their physics course work would provide a solid background for their future careers (81% males versus 73% for females). Less surprisingly, we also found that graduate student attendees of both genders were more likely than undergraduates to say they would major in physics again if they had it to do over (93% versus 76% for undergraduate attendees).

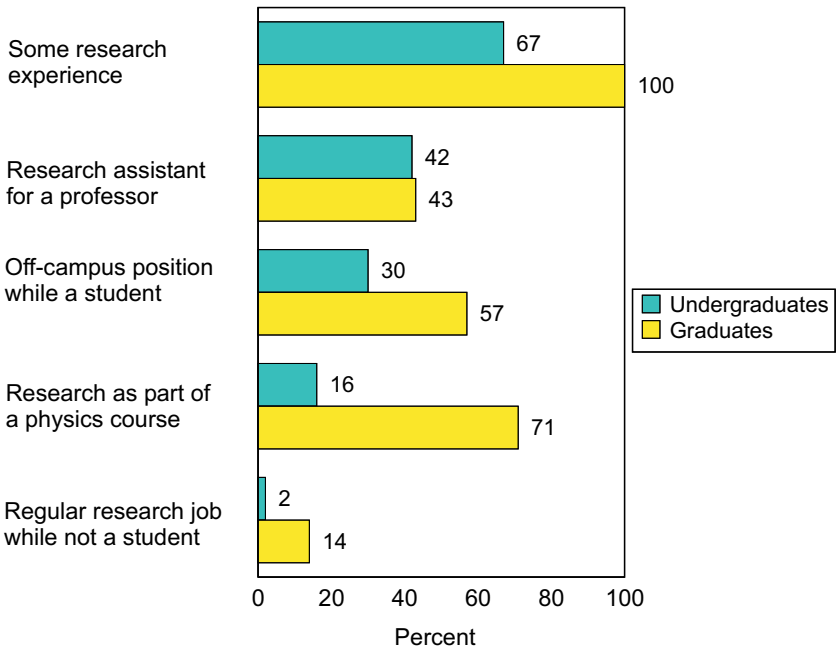
Figure 5. Extent to which NCBPS participants agree with the following statements, 2004.



As was also true in prior years, the majority of participants indicated that they already had some type of research experience in physics. As expected, this was true for virtually all of the graduate students (**Figure 6**). But it was also true, surprisingly, for more than two-thirds of the undergraduate participants. Moreover this was not just confined to on-campus activities. We also found that half of this year's graduate students and 30% of the undergraduates reported that they had an off-campus position or internship that included a physics research component. Graduate students, not surprisingly, were more likely than undergraduates to have engaged in research as part of a physics course. And male participants were somewhat more likely than their female counterparts to report that they had been a research assistant to a professor (46% males versus 36% females).

For the first time this year Conference participants were asked to provide us with information concerning their participation in nationally-sponsored internship programs. The most popular program, chosen by almost one-third of the student participants, was with NSF - Research Experiences for Undergraduates (REU). The next most popular program chosen was the DOE summer internship program. The third popular program was with NASA - Undergraduate Student Research Program (USRP), and the last was with NSF - Louis Stokes Alliance for Minority Participants. None of the respondents reported any involvement with the DOD summer internship program. We also asked the attendees if they were planning on participating this summer with any of the aforementioned programs, and around one-fifth of them

Figure 6. Proportion of undergraduate and graduate attendees reporting different types of physics research, 2004.



indicated that they were scheduled to participate with one of these programs in the summer of 2004.

ACADEMIC GOALS & CAREER ASPIRATIONS

Participants at this year's NCBPS meeting were also asked in detail about their future academic objectives and career aspirations. We discovered that regardless of their current level of study, an overwhelming majority of them indicated that a graduate degree was their ultimate goals, with about 81% of the participants aspiring to a PhD. About two-thirds of the students hoped to make their careers in physics research or teaching, including 17% who indicated an interest in physics research but were unsure what employment sector they preferred (**Table 2**).

Interestingly, undergraduate female attendees seemed more likely than their male counterparts to gravitate towards careers in other sciences. Not surprisingly, graduate students were more likely to favor a career in academe (36% versus 9% for undergraduates). Undergraduates, on the other hand, seemed to indicate an interest in physics research but were unsure what employment sector they preferred (21% versus 7% for graduate students). Students at HBCUs were once again definitely more focused on physics research in industry (21% versus 0% for Non-HBCU students).

Participants were asked to indicate the motivation underlying their career goal choices (**Table 3**). As has been the case in previous years as well, the most common reason, ranked by half of the respondents, was the intrinsic challenge of the work. Salary and benefits, normally in third or fourth place, came in second this year, while the chance to give something back to the community came in a distant third. We found that undergraduate students were far more concerned with salary and benefits (26% versus 7% for graduate students). This sentiment was also shared by students from

Table 2. NCBPS participants' anticipated career goals, 2004.

	Percent
Academic teaching or research in physics	16
Non-academic physics research in industry	19
Non-academic physics research in government / national labs	14
Physics research in unspecified employment sector	18
Other types of physics-related positions	18
Careers in other sciences	15
Careers outside of physics altogether	-
Total	100

Table 3. Main factor that led NCBPS participants to their choice of career goal, 2004.					
	Undergrad Males %	Undergrad Females %	Grad Males %	Grad Females %	Overall %
Challenging or interesting work	50	41	64	67	51
Salary and benefits	23	29	9	0	21
Chance to give something back to the community	15	18	18	33	18
Respect people have for this type of work	0	6	9	0	4
Other	12	6	0	0	7
Total	100	100	100	100	100

HBCUs, (23% versus 0% for Non-HBCU students) who in times past were more likely to stress the chance to give something back to the community.

Students were again asked to name the most important factor that helped them to persist in their physics studies (**Table 4**). As in previous years, love of the subject matter was ranked the number one reason. Support from family members, third last year, came in second. Support from African American faculty and support from other African American physics students tied for third place this year.

However, these feelings were not evenly distributed among Conference participants. Interestingly, none of the graduate male students choose support from family members as a motivating factor. However, they were more likely to stress love of the subject matter (46% for graduate male students, 23% for undergraduate male students, 18% for undergraduate female students, and 0% for graduate female students). Students at HBCUs were more likely than their Non-HBCU counterparts to cite family support, love of the subject matter, and surprisingly, to a somewhat lesser degree, support from other African American students as their motivating factor.

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 asked their specific objectives for attending the Conference and whether the Conference was effective in meeting those objectives.

Networking with other Black physics students was the most important reason, cited as their primary motivation by more than a third of the

Table 4. Factors that have helped NCBPS participants persist in their studies, 2004.		
	Top Factor %	**Among Top 3 %**
Love of subject matter	25	51
Family support	23	65
Support from Black faculty members	14	51
Support from other Black students	14	49
Career prospects	12	51
Support from non-Black faculty members	4	17
Support from other non-Black students	2	6
Other	6	15
Total	100	

respondents (**Table 5**). Networking with Black professionals came in second with around a quarter of the participants reporting this as their main reason for coming. Learning about further study in physics was once again a distant third, with around one-fifth of the students indicating this as their primary motivation.

Needless to say, these motivations varied greatly depending on where students were in their academic career. Undergraduate students were far more interested in learning about further study in physics and meeting with school or job recruiters than their graduate counterparts. Similarly, we found that students

Table 5. Goals in attending NCBPS conference, 2004.		
	Top Goal %	**Among Top 3 %**
Learning about further physics study	21	35
Networking with Black professionals	25	83
Networking with other Black students	35	88
Meeting with recruiters	14	68
Hearing research talks	4	18
Other	-	4
Total	100	

Table 6. Overall assessment of key aspects of the conference, 2004.					
	Proportion rated exceptional				
	All %	Most %	Half %	Few/None %	Total %
Content of research talks	37	52	9	2	100
Quality of speakers	30	54	14	2	100

at HBCUs were also more intent on meeting with school or job recruiters than students at Non-HBCU schools (15% versus 0%). Networking with other Black physics students was more frequently cited by male participants than their female counterparts (38% versus 30% for female participants).

The evaluation of the Conference and its various aspects gives the strongest and most direct evidence of the experience of the participants. Although research was not uppermost in the minds of the student attendees, the overwhelming majority (90%) viewed all or most of the research talks as exceptional, and 84% gave a similar rating to the quality of the speakers (**Table 6**).

The sessions on career strategies and the keynote addresses were all given positive ratings by around half of the Conference participants. Fifty-six percent of all respondents felt that almost all of the research talks were presented in a clear and interesting manner

Figure 7. Extent to which NCBPS participants agree with the following statements, 2004.

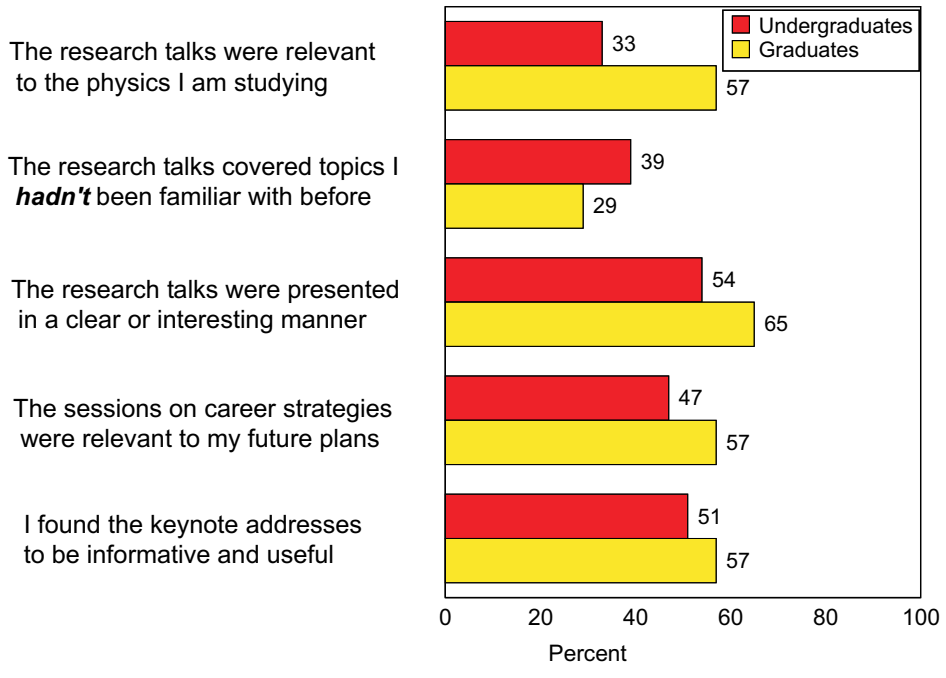


Table 7. Performance of the Conference in meeting goals, 2004.				
	Excellent %	Good %	Fair %	Poor %
Learning about further physics study	37	54	9	0
Networking with other Black students	63	25	12	0
Networking with Black professionals	54	33	11	2
Meeting with recruiters	35	46	17	2
Hearing research talks	40	44	16	0

(**Figure 7**). Like last year, around a third of the respondents felt that the contents of the talks were directly relevant to the physics they were studying. And around a third of the students reported that many of the topics addressed during the research talks covered new ground for them.

Predictable, a greater proportion of the graduate students felt that the contents of the research talks were directly relevant to the physics they were studying (57% versus 32% for undergraduates). Among the undergraduates, we found that female respondents were more likely to say that they were unfamiliar with the topics covered in the research talks (46% versus 34% for undergraduate male students, and 28% for graduate students). Similarly, students at HBCUs reported that many of the topics covered during the research talks were new ground for them (39% versus 20% for Non-HBCU students). Perhaps because of their lack of familiarity with the topics covered, students at HBCU schools reported less positive feelings about the research talks than their Non-HBCU counterparts.

Conference participants consistently rated the Conference a success on all of the goals the Conference set for itself. Overall, every goal received an excellent or good rating from over 80% of the respondents. Like last year, the most highly rated aspect of the Conference was the opportunity to learn about further study in physics (**Table 7**). Networking, both with other Black physics students and Black professionals, tied for second place, while hearing about research talks came in third.

Virtually all undergraduate respondents valued the opportunity to learn about further study in physics, but a surprising 79% of the graduate students expressed the same view. A high proportion of both groups gave high ratings to hearing research talks. Students at Non-HBCUs, not surprisingly, gave very high marks to the opportunity of networking with other Black physics students, while students at HBCUs were more positive about the opportunity to learn about further study in physics.

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 8**). All of the students rated the housing facilities as good or excellent. Travel arrangement, length of the individual session, and overall length of the

Conference were also given very high marks. And almost three-quarters of the students rated the geographic location of this year's meeting as good or excellent.

CONCLUSION

Although students may have had an array of different goals and objectives for attending this year's Conference, the findings reported here definitely attest to the fact that the Conference was generally successful in meeting those expectations and fulfilling those goals. The various aspects of the sessions and the practical arrangements of the Conference all received very high ratings. However, many of the students expressed regret that they weren't able to meet with the broader conference of professional black physicists as they had done in the past.

Table 8. Ratings of the practical arrangements at the Conference, 2004.

	Excellent %	Good %	Fair %	Poor %
Travel arrangements	66	29	5	0
Housing facilities	90	10	0	0
Length of sessions	37	47	16	0
Length of the Conference	47	49	4	0
Geographic location of the Conference	42	30	25	3