



Report on the
HBCU/BSI Physics Chairs Summit
Convened by the APS Committee on Minorities



The Ellis Hotel, Atlanta, GA
28 September 2017

Over the last two decades, the percentage of physics bachelor's degrees earned by African Americans has decreased substantially. In an alarming trend, the numbers of physics majors at Historically Black Colleges and Universities (HBCUs) and Black Serving Institutions (BSIs), which used to educate over half of all African Americans with physics bachelor's degrees, have declined significantly. The APS Committee on Minorities (COM) felt a sense of urgency to understand the decline and identify actions that could be taken to reverse it. COM decided to organize a one-day summit of HBCU/BSI physics chairs to discuss these issues and develop recommendations. In preparation, a COM member called all 38 HBCU/BSI physics chairs to ask about challenges affecting their departments and inform topic areas for discussion. The calls were also used to personally invite chairs to attend the summit.

The HBCU/BSI Physics Chairs Summit was held in downtown Atlanta on September 28, 2017. The 31 attendees included 16 HBCU/BSI physics chairs or their delegates, 8 COM members, 5 APS staff, and 2 AIP staff. The agenda minimized presentation time to hold a series of focused discussions with specific objectives. Discussions generated many recommendations, which were evaluated by COM as to whether they were actionable, feasible and relevant.

Recommendations for APS fell into four categories:

1. Strengthen relationships with HBCU/BSI physics chairs
2. Convene HBCU/BSI physics chairs periodically and build a network to foster discussion
3. Disseminate effective practices for recruitment and retention of physics majors
4. Support threatened HBCU/BSI departments through advocacy

Recommendations for HBCU/BSI physics chairs fell into seven categories:

1. Actively recruit physics majors
2. Implement a curriculum that supports recruitment and retention
3. Foster student community
4. Form a committee or committees to focus on recruitment and retention of majors
5. Seek opportunities for partnering and fundraising to bring in resources
6. Be proactive and advocate for your program
7. Be in contact with APS

COM intends to oversee implementation of recommendations for APS and will work with APS staff to fulfill as many recommendations as possible.

Motivation

Over the last two decades, the percentage of physics bachelor's degrees earned by African Americans has decreased substantially. In contrast to sharp increases in the numbers of white Americans, Asian Americans, and Hispanic Americans, the numbers of African Americans have remained essentially constant. Moreover, the numbers of physics majors at Historically Black Colleges and Universities (HBCUs) and Black Serving Institutions (BSIs), which used to educate over half of all African Americans with physics bachelor's degrees, have declined precipitously. The APS Committee on Minorities (COM) felt a sense of urgency to understand the decline and identify actions that could be taken to reverse it, and decided to hold a one-day summit of physics chairs at HBCUs and BSIs.

Preparations

A member of COM, Charles McGruder, called the chairs of all 38 HBCU and BSI physics departments in the U.S. multiple times in an attempt to reach as many as possible. Each physics chair was asked the same questions: What are the key challenges that are affecting your department, and what are possible solutions to these challenges? The responses were compiled and presented to COM to inform topic areas for discussion at the summit. COM also used these phone calls as an opportunity to personally invite and encourage chairs to attend the summit. In addition, APS staff analyzed data from IPEDs to get a better quantitative understanding of national trends to inform Summit discussions (see Appendix A).

Summit

The HBCU/BSI Physics Chairs Summit was held at the Ellis Hotel in Downtown Atlanta, Georgia on September 28, 2017. Of the 31 attendees, 16 were physics department chairs or their designees, 5 were APS Staff, 2 were AIP Staff, and 8 were COM members. The agenda minimized presentation time in order to hold a series of focused discussions on key topics identified by COM. Specific outcomes were identified for each topic area, including recommended actions for APS and HBCU/BSI physics chairs. This report summarizes the discussions and recommendations of the summit.

Acknowledgements

The APS is grateful for the support from the National Science Foundation (award #1738311), which provided travel support for physics chairs at HBCUs and BSIs to attend the Summit. Heather Styer took the photograph on the report cover. APS staff members Miranda Bard, Arlene Modeste Knowles, Christine Lenihan and Heather Styer provided key logistical support. Erika Brown (APS Bridge Program Manager) took comprehensive notes during the Summit, and she and Monica Plisch (APS Director of Education and Diversity) edited the report. An organizing committee including Edmundo Garcia-Solis (COM chair), Charles McGruder (COM member), Monica Plisch and Ted Hodapp (APS Director of Project Development) planned the agenda and edited the recommendations.

A member of the APS Committee on Minorities, Charles McGruder, called all of the physics department chairs at Historically Black Colleges and Universities and Black Serving Institutions in the nation, ultimately reaching 20 of the 38 HBCUs/BSIs with active physics degree programs. During the call, physics chairs were asked about the key challenges that are affecting their departments, as well as potential solutions to those challenges.

One of the most commonly reported challenges was a lack of students interested in majoring in physics. In particular, department chairs highlighted issues with recruiting students due to hesitancy on the part of their family members. Many students at these institutions are first-generation college students, and often do not get mentoring that guides them towards physics. In addition, many parents do not see the practicality of a physics degree as leading to a career. As a result, they are more likely to encourage their students to go into other fields, like biology, engineering, and computer science. It would seem that convincing these groups of the importance and practicality of physics careers would be essential for reducing barriers in recruiting African American students.

Another commonly cited barrier to recruiting more students into physics was that many students are “financially disabled.” Given the overall lack of resources at HBCUs, these physics departments are often unable to provide sufficient opportunities for undergraduate employment that could support their students with financial need, making it difficult to retain these students. Also, the teaching load at HBCUs and BSIs is typically higher than other institutions due to small numbers of faculty members, stretching them thin and leaving no time to do research and obtain grants to support students financially.

Department chairs mentioned competition with majority institutions, which typically have more resources to recruit and retain students, was affecting the size and quality of the student body they were able to attract. There was also an issue with low retention due to poor student performance in college-level physics courses, which may be due in part to lack of quality physics courses in high school. Department chairs also acknowledged a lack of effective recruiting practices to attract more physics majors was likely an issue, as well as a dearth of diversity in physics faculty, specifically very few African Americans and women.

Physics chairs suggested some possible solutions to these recruiting and retention challenges. A common theme was improving the quality of the coursework and research experiences available to their students, and many chairs expressed the curriculum must prepare their students for what they are going to do after graduation, whether they are going on to graduate school or entering the workforce. Some suggested adding computational courses into the curriculum, which is a highly sought-after skill in a number of fields that students are very interested in learning. Another suggestion was combining the physics degree program with other disciplines, for example, offering degree programs in biophysics, health physics or engineering physics. Some chairs felt that making research experiences more pertinent to workforce experiences would better prepare students who do not go on to graduate school. Another idea was developing an HBCU physics teaching network in which a faculty member at one institution could make a course available to students other HBCUs/BSIs via the internet. This would enable students to connect and work with students from other institutions, and a suggestion was to engage with National Society of Black Physicists (NSBP) to help bring students into this network.

A few chairs proposed ensuring that freshman physics classes are taught by a female or an African American faculty member to make the physics department more welcoming to students, and to have physicists from these underrepresented groups give invited talks within the department. Some chairs also recommended creating an active student physics society chapter within their department, in hopes

CALLS TO HBCU/BSI PHYSICS CHAIRS

that it would help with recruiting, as students can bring in other students. Another suggestion was that faculty members should make personal contact with new students in their department, with the goal of getting to know them and their unique interests and needs. Also, the physics faculty should also make an effort to let students know they are entering a physics family, and that the program is not intended to weed them out. Finally, it was noted that a strong NSBP is important for supporting physics programs at HBCUs/BSIs.

7:00 – 8:15	Working breakfast: Welcome and introductions , COM programs and activities (Edmundo Garcia-Solis, 15 minutes), Framing of the day (Charles McGruder, 30 minutes) (Chair: Angie Little)
8:15 – 8:45	Critical role of HBCUs/BSIs in educating African American physics majors (Presenter: Willie Rockward; Chair: William Ratcliff)
8:45 – 9:45	Statistics on BS physics degrees granted by HBCUs/BSIs (Chair: Casey Miller) <ul style="list-style-type: none"> ● Mini presentation: IPEDS data trends (Presenter: Monica Plisch, 10 minutes) ● Small groups: What are key issues contributing to the overall decline of physics BS degrees granted by HBCUs/BSIs? ● <u>Outcome</u>: An understanding of where declines in African American BS degrees in physics are occurring and possible underlying issues, to inform COM actions as well as the AIP Diversity Task Force
9:45 – 10:00	Break
10:00 – 11:15	Effective practices for recruiting and retaining physics majors (Chair: Garfield Warren) <ul style="list-style-type: none"> ● Mini presentation: Key recommendations from HBCU SPIN-UP workshop report on building thriving undergraduate physics programs (Presenter: Quinton Williams, 15 minutes) ● Small groups: What has worked for recruiting/retaining majors? What are opportunities/barriers for engaging faculty to implement recommendations? ● <u>Outcome</u>: Recommendations for APS to address the institutional context of HBCUs/BSIs at the Building Thriving Programs workshop (10-11 February)
11:15 – 12:15	Public funding of HBCUs/BSIs (Presenter: Ted Hodapp) <ul style="list-style-type: none"> ● Small groups: Describe your funding situation (e.g. federal grants, state funding, etc.) and the impact on building thriving physics programs. What are specific advocacy issues for publicly funded HBCUs/BSIs? ● <u>Outcome</u>: Recommendations for APS advocacy of public funding for HBCUs/BSIs
12:15 – 1:30	Working lunch: Obstacles to existence of physics departments at HBCUs/BSIs (Chair: Marie Lopez del Puerto) <ul style="list-style-type: none"> ● Mini presentation: Status of efforts to fight closure of physics departments at HBCUs/BSIs (Presenter: Ted Hodapp, 15 minutes) ● Small groups: What are threats to maintaining strong physics departments at HBCUs/BSIs? What could APS do to assist HBCUs/BSIs facing such threats? ● <u>Outcome</u>: Recommendations for APS to help physics departments at HBCUs/BSIs ward off threats of closure

<p>1:30 – 2:30</p>	<p>Communications between HBCUs/BSIs and APS (Chair: Jesús Pando)</p> <ul style="list-style-type: none"> ● Small groups: What would you like to see in terms of communications between HBCUs/BSIs and APS? Where have communications been effective? Where have communications been lacking? What are possible ways to improve communication? ● <u>Outcome</u>: Recommendations for HBCUs/BSIs and APS to maintain good communications
<p>2:30 – 2:45</p>	<p>Group Photo, Survey and Break</p>
<p>2:45 – 3:00</p>	<p>AIP Diversity Task Force (Presenter: Arlene Modeste Knowles)</p>
<p>3:00 – 4:00</p>	<p>Recommendations and Next Steps (Chair: Charles McGruder)</p> <ul style="list-style-type: none"> ● Review list of recommendations gathered during the day (project on screen) ● Small groups: What are the top priorities? What is missing from the list of recommendations? ● <u>Outcome</u>: Prioritized list of actionable recommendations to be implemented by APS and/or physics chairs at HBCUs/BSIs

Critical role of HBCUs/BSIs in educating African American physics majors

Presenter: Willie Rockward, Chair of Physics, Morehouse College

Discussion:

HBCUs and BSIs play a critical role in educating African American physicists. Community members at these schools actively work together to create an optimal environment for African American students to study. There is an emphasis on creating a culture that reflects the student body--students see someone that looks like them, being successful and doing what they love. There is also a strong focus on keeping students in school, even if faculty must go above and beyond traditional expectations to do it. This is manifested in smaller class sizes, and the relationships faculty at these institutions strive to build with their students.

HBCUs and BSIs set expectations for their faculty to make their subject engaging for students. Students must see physics at work inside and outside of the classroom. In order to engage students, faculty must demonstrate engagement with the discipline in their personal lives as well. Faculty members are charged with showing students what makes physics so exciting and encouraging students to get excited about physics themselves.

One of the most important contributions to student development is honest and open mentorship. Mentors must be willing to share the ups and downs of their career path, particularly if the path is not a traditional one. Being candid with students about a mentor's strengths and their struggles can inspire the mentee to persevere through their difficult situations.

HBCUs and BSIs often face more complicated funding situations than other institutions, and infrastructure can be lacking at times. However, faculty should not allow funding to prevent them from reaching their teaching goals and aspirations. In addition, many HBCU students are first-generation college students, who need funding in the form of scholarships and work-study programs. HBCU/BSI faculty acknowledge that finding ways to support their students in this way is also critical to their success in school and beyond.

A question from the audience was how mentors who may not have much in common with their mentees could be effective. Chairs were advised to let students see that they have a genuine interest in them and they are invested in their mentee's success. There also needs to be understanding that African American students have a societal backdrop that often works against them. Being successful within that backdrop can take extra effort and require additional support from mentors. Even though students may not always make the right decisions, it should be remembered that professors can have a profound impact on their students. Sometimes all it takes is an encouraging word to change a student's mindset and trajectory.

Other questions involved supporting underprepared students. Faculty members must consider that some high schools do not even offer physics class or the physics preparation may not be strong. In other cases, factors like having to work to support family members or health issues may negatively impact a student's performance. There are ways that faculty mentors can support students facing such challenges to be successful. One such method is the encouragement of effective peer mentoring. Some of the biggest career decisions are often made because of peer input, so it is important to make sure mentees are getting solid advice. Students should be encouraged to pursue all of their interests, and also to master effective time management skills. A mentor should also use their networks to connect mentees with other mentors and opportunities that will guide them along their career path.

Statistics on BS physics degrees granted by HBCUs/BSIs (see Appendix A for slides)

Presenter: Monica Plisch, Director of Education and Diversity, American Physical Society

Guiding Questions:

- What are key issues contributing to the overall decline of physics BS degrees granted by HBCUs/BSIs?

Discussion: An analysis of college degree data from IPEDS showed the percentage of physics bachelor's degrees awarded to African Americans had dropped significantly in the last 15 years, from about 4-5% in the late 1990's down to 2-3% in the early 2010's. In contrast, the percentage of physics bachelor's degrees awarded to Hispanic Americans has increased rapidly over the same period, approximately doubling. The decline in participation for African Americans is a result of their overall numbers holding approximately steady (6% increase over the last 15 years) while the numbers of students of all races earning a physics bachelor's degree approximately doubled (94% increase over the last 15 years). Breaking this out by type of institution, numbers of African Americans graduating from HBCUs/BSIs declined 28% in the last 15 years while numbers graduating from all other institutions increased 47% over the same time period. The decline at HBCUs/BSIs is of particular concern since these institutions are traditional powerhouses for educating African American physics majors.

The decline in enrollment at HBCU/BSI physics programs may be informed by broader institutional factors. In the last 15 years, the number of STEM degrees awarded at HBCUs has fallen 11% while nationwide the number of STEM degrees increased 53% in the same period. In addition, average faculty salaries at HBCUs are 15% lower than the average across all U.S. institutions, and this facet of a larger resource gap has an impact on physics programs along with other departments at these institutions. Again, data from IPEDS was used to generate these results.

The vast majority of HBCUs/BSIs average less than 5 physics bachelor's degrees per year and are well below national averages in comparison with other BS- and MS-granting physics departments. These low numbers of degrees are a serious concern given the recent trend of eliminating programs that average fewer than five degrees per year in response to financial pressures.

At the high school level, data from the AIP Statistical Research Center shows that percentages of African American students taking physics have increased dramatically in the last couple of decades, from 10% in 1990 up to 26% in 2013. This substantial increase in pre-college numbers points to an opportunity to recruit more African Americans into physics at the college level. However, among all HBCUs, Title II data indicated only one teacher with a physics major was certified in a recent three year period. Educating greater numbers of high school teachers can help with recruitment, since these teachers can send their best physics students to their alma mater.

Attendees emphasized the importance of developing a more comprehensive statistical description of the current state of HBCU/BSI physics departments, and sharing this information on a regular basis within the HBCU/BSI community. APS was also asked to publish case studies of thriving programs and the characteristics that make them successful. Discussions highlighted the importance of understanding the unique characteristics of HBCUs and BSIs, to develop effective interventions for problems they face. Also, finding ways to support students financially was highlighted as an important and challenging task for chairs. Attendees also suggested offering dual degree programs with engineering and biology as a way to attract more students to physics programs.

Effective practices for recruiting and retaining physics majors

Presenter: Quinton Williams, Chair Physics and Engineering Physics, Howard University

Guiding Questions:

- What has worked for recruiting/retaining majors?
- What are opportunities/barriers for engaging faculty to implement recommendations?

Discussion: The presentation featured two reports relevant to recruiting and retaining physics majors, including *Strategic Programs for Innovations in Undergraduate Physics (SPIN-UP)* and *Phys21: Preparing Physics Students for 21st Century Careers*. Overall, both reports emphasized the fundamental importance of understanding students and their needs, and the ability to adapt an undergraduate program in order to optimize its effectiveness. They also noted that meaningful change does not necessarily require a large sum of money, but it does require creativity, dedication, and willingness to adapt to changing times. Both reports are freely available on the APS website.

The SPIN-UP report identified key elements of thriving undergraduate physics programs, defined as those that increased their numbers of majors during a period of overall national decline. Strong and sustained departmental leadership is a key element, as well as a willingness to engage in continual self-evaluation and improvement. A well-defined sense of departmental mission is also important, as is a large fraction of faculty engaged in achieving the departmental mission. The report also revealed that a challenging but supportive program is necessary for growth, and establishing support structures to help students achieve goals is key. This includes, among other things, implementing research-based instructional strategies that are effective in fostering student learning, and focusing particularly on high quality instruction in introductory courses. Finally, opportunities for meaningful student-faculty interactions and fostering student community are critical to attracting more majors.

The Phys21 report focused on the skills and knowledge the next generation of undergraduate physics degree holders should possess to be well prepared for a diverse set of careers. The report noted the vast majority of physics bachelor's degree recipients are employed outside of academia, with only 5% pursuing careers as physics professors. Traditional physics curricula need modification in order to foster development of the knowledge and skills that translate to career readiness. Recommended learning goals include some expected items, such as physics-specific knowledge and scientific and technical skills, as well as communication skills, such as technical writing, and professional and workplace skills, like management and working in teams. Another recommendation was to redesign the physics degree program to better prepare students for specific types of career paths. In addition, chairs were advised to educate their career office about the benefits of a physics degree and the career options available, and encourage them to send promising students to the physics department.

The discussion of barriers facing faculty revolved around finding students and selling the major to family members who may not be aware of what physicists do. Attendees asked about ways to market a physics major to students, their parents and the wider community. They were advised to think about physics as a platform to a wide variety of careers in medicine, technology, finance and law. Presenting physics degree programs as having broad career options will be attractive to students who may not be clear on what career they want, as well as to their parents who have hopes of their child working in prestigious and high-salaried areas. Infusing special activities and exercises into coursework, so that the competencies needed for these career options are covered, was also noted. A suggestion that addressed both the problem of recruiting and student financial concerns was to pay work-study students to recruit in their communities.

Public funding of HBCUs/BSIs

Presenter: Theodore Hodapp, Director of Project Development, American Physical Society

Guiding Questions:

- How would you describe your funding situation (e.g. federal grants, state funding, etc.) and the impact on building thriving physics programs?
- What are specific advocacy issues for publicly funded HBCUs/BSIs?

Discussion: Funding of HBCUs and BSIs varies by state, as determined by the value placed on education, state-level politics and other factors. As a result, APS is now focusing on state-level advocacy in order to address the particular situations that institutions face. A number of advocacy successes have been achieved through conversations with state representatives and boards of education by framing issues in terms of serving constituents' needs. In addition, advocacy tools such as writing op-eds and sending letters to law-makers can help sway critical decision makers.

Many chairs indicated they were looking for tools to help them advocate for financial support at the institutional and state level. In particular, attendees requested that APS help departments craft statements or letters for institutional administrators. These letters would advise institutions against using single numbers as productivity measures of physics departments, and communicate the value of a physics degree, such as sharing the low unemployment rate of physics majors as compared to other disciplines (4% one year after graduation), and information on job titles of program graduates. An existing tool is the "How Does Your Institution Compare?" webpage on APS.org that reports statistics on physics degree programs in comparison with national averages, which can help physics departments benchmark their achievements appropriately and illustrate the effectiveness of their programs.

In addition, many attendees indicated a workshop on development of a physics major retention program would be helpful in adapting and improving their department. Such programs can support students to mediate deficiencies in coursework and skills early in their undergraduate career and introduce students to the physics major as well as faculty and students in the department. Retention programs are attractive to university administrators, and can be a source of poignant illustrations of the department's effectiveness.

Obstacles to the existence of physics departments at HBCUs/BSIs

Presenter: Theodore Hodapp, Director of Project Development, American Physical Society

Guiding Questions:

- What are threats to maintaining strong physics departments at HBCUs/BSIs?
- What could APS do to assist HBCUs/BSIs facing such threats?

Discussion: Physics programs at public regional institutions (i.e. state-funded schools that are not flagship institutions) are the most vulnerable to threats of closure by their local administration or state government. Threats of program elimination can be a shot across the bow, encouraging departments to increase their productivity, or they can be a serious threat of imminent closure. Such threats can be precipitated by the arrival of a new president or provost, new members on a state education board, budgetary changes at the institutional or state level, or a combination of the above. In many cases, a criterion of graduating a minimum number majors per year is used to select programs for elimination.

Threats of closure are a particular concern at regional publics that are HBCUs or BSIs, as the number of physics majors at these institutions continues to decline. There are national implications of closing physics programs based on arbitrary cutoffs for productivity. If all programs that graduate fewer than 5 majors per year were eliminated, the nation would lose nearly all HBCU physics programs and a large fraction of the African American students majoring in physics.

Once an administrative decision to eliminate a program has been made, departments typically react in one of two ways: either allowing the closure to proceed, or implementing strategic measures to try to stay open. Strategic measures can include restructuring the department so as to increase the numbers of majors, finding other ways to meet the institution's demands, or enlisting help from alumni and APS to fight the decision. APS can assist in this fight, but departments also must be proactive about their own survival in order to have the most impact. Departments under threat must first assess what is being done to increase enrollment and retention in their degree program. An ability to articulate the value the physics department brings to the institution, and a plan to improve in identified areas of deficiency, can go a long way toward developing a successful course of resistance.

Attendees emphasized the helpfulness of letters from APS to university administrators in defense of threatened physics programs. Chairs also noted that APS could assist significantly by continuing to provide spaces for faculty to gather and talk about these issues. The development of a network of HBCU/BSI faculty was a recurring request throughout the day. Attendees also discussed the importance of training faculty how to talk to recruiters and community members, in order to enlist them in their student recruitment efforts. Several attendees shared stories of building relationships with area churches and community centers, places where many African American students spend time. A low-cost workshop on how to implement effective recruitment practices would be especially helpful to resource-strapped institutions. In addition, attendees indicated that assessment tools would be helpful, such as documentation of effective practices for evaluating their own programs, or an institutional scorecard for demonstrating their departmental impact.

Communications between HBCUs/BSIs and APS

Chair: Jesús Pando, Chair of Physics, DePaul University; President of NSHP

Guiding Questions:

- What would you like to see in terms of communications between HBCUs/BSIs and APS?
- Where have communications been effective? Where have they been lacking?
- What are possible ways to improve communication?

Discussion: A few years ago, the National Society for Hispanic Physicists (NSHP) highlighted the lack of communication between NSHP and APS. COM has since identified ways to foster communication links between APS and other identity-based organizations. How can we foster a productive continuing dialogue between HBCUs/BSIs and APS/COM?

In response to these questions, attendees noted several ways that communication could be improved. Several attendees reported feeling isolated and generally unaware of what goes on at other HBCU/BSIs. They emphasized the importance of face-to-face meetings with other HBCU/BSI faculty and APS, and there was widespread support for sharing information about activities and events happening at HBCUs/BSIs among the members of this community. Attendees requested that APS provide more opportunities to gather to discuss solutions to common issues, and to get regular updates on current status of physics programs at HBCUs/BSIs. Some commented that supporting regional faculty workshops could serve this need, while also offering professional development to faculty in their own communities. Other suggestions involved making sure that all HBCUs/BSIs have access to professional development activities through discounted or free memberships to APS and other professional societies.

Recommendations for APS

1. Strengthen relationships with HBCU/BSI physics chairs
 - a. Establish a Committee on Minorities liaison to HBCU/BSI chairs who maintains regular contact.
 - b. Ensure HBCU/BSI physics chairs are on the APS chairs contact list and receive information on what is happening in the physics community. (For combined administrative units, designate the primary contact person for physics faculty.)
 - c. Encourage HBCU/BSI physics chairs to become APS members, and consider ways to make membership more accessible (e.g., through free or reduced price membership, or reciprocity agreements with AAS or AAPT).
2. Convene HBCU/BSI physics chairs periodically and build a network to foster discussion
 - a. Bring HBCU/BSI chairs together for face-to-face discussions of critical issues every 2-3 years. Seek external funding for these events.
 - b. Create an email list of current and future attendees of such gatherings, similar to a listserv used by the “Midwest Chairs” gathering, for these individuals to exchange ideas and strategies.
 - c. Hold workshops at regional meetings that bring HBCU/BSI faculty together in their communities.
3. Disseminate effective practices for recruitment and retention of physics majors
 - a. Organize training on effective practices for recruitment and retention of physics majors (e.g. research-based instruction, curriculum modification), provided at low cost to resource-strapped institutions. Seek external funding for these events.
 - b. Serve as a clearinghouse for effective practices specific to maintaining strong physics programs at HBCUs/BSIs (e.g. a gateway to physics course for retaining first-year majors, or strategies for creating collaborative agreements among small departments).
 - c. Gather resources that help HBCU/BSI faculty communicate strong job prospects for their physics majors (i.e. videos of African American physics majors in exciting jobs, job titles and descriptions, low unemployment figures compared with other majors).
 - d. Reach out to senior physics faculty at HBCUs/BSIs to help them understand the landscape is changing, that they need to adapt, and how to adapt.
4. Support threatened HBCU/BSI departments through advocacy
 - a. Develop statistics to show the current state of affairs in HBCU/BSI physics departments so that chairs can put their programs in a national context and argue for their importance.
 - b. Craft arguments that chairs can use with institutional and state leaders to advise against using a single number (i.e. number of physics bachelor’s degrees) as a productivity measure to determine whether to maintain or close a program.
 - c. Offer consultation to physics chairs concerned about threats of program closure.
 - d. At the request of a physics chair, send a letter from the APS president to top-level administrators to advocate for the physics program (e.g. lauding strengths and contributions, explaining the national context, and advocating for resources).

Recommendations for HBCU/BSI Physics Chairs

1. Actively recruit physics majors
 - a. Meet the recruitment officers at your institution, and explain your needs and the benefits of a physics degree for students. Many are unaware of the wide range of career options.
 - b. Develop a meaningful relationship with community organizations who will have access to the students you want to recruit, e.g. churches, high schools, community organizations. Tailor your messaging based on their unique contexts.
 - c. Encourage some of your majors to become high school physics teachers, who can serve as recruiters for your department.
 - d. Share with your students the culture of physics (e.g. evidence based learning), as well as the obstacles you have faced and overcome.
2. Implement a curriculum that supports recruitment and retention
 - a. Add an engineering concentration and other tracks to the physics degree program to attract a larger body of students with a wide range of career interests.
 - b. Use interactive research-based curricula that promote student learning, particularly in introductory courses.
 - c. Start underprepared students in algebra-based physics courses, and accept these courses toward the physics major.
 - d. Develop a retention course for new physics majors (see the Gateway to Physics course at Georgia State) where students can meet peers and faculty and get oriented to the department, career options, research, etc.
3. Foster student community
 - a. Develop student organizations to support physics majors and/or black students, engaging student leaders to take initiative.
 - b. Foster a sense of community among new students in the entering class, engaging student organizations to help.
 - c. Engage students in peer instruction and tutoring in the department (e.g. see the [Learning Assistant program](#)).
4. Form a committee or committees to focus on recruitment and retention of majors
 - a. Form a “Doubling Committee” that has a goal of doubling the number of physics majors.
 - b. Form a committee to focus on department recruiting initiatives.
 - c. Have a strategic plan for the department that includes growth of the physics majors and selling physics to community members.
5. Seek opportunities for partnering and fundraising to bring in resources
 - a. Foster a culture in your department that important things continue with or without funding.
 - b. Talk with university development officers about how alumni dollars get filtered to departments. Help them understand the importance and value of the physics department, e.g. the skills imparted to students in physics courses.
 - c. Look for industry and state partners.
 - d. Consider resource sharing with nearby universities, for example to offer upper division courses or access to research facilities.
 - e. Encourage students to participate in summer research experiences at other institutions.
 - f. Look for opportunities to support students financially.

6. Be proactive and advocate for your program
 - a. Talk to the registrar and make sure they are accurately counting physics majors.
 - b. Seek to understand the dean's and provost's perspectives of the changing economic reality. Align discussions with their priorities and goals.
 - c. Market your physics program to the university administration and to the community.
 - d. Reach out to APS if you need advocacy at your institution. Ask for help immediately. Contact Ted Hodapp (hodapp@aps.org) or Monica Plisch (plisch@aps.org).
 - e. Talk to people who have faced similar challenges, such as threats to physics degree programs.

7. Be in contact with APS
 - a. Join the APS physics chairs email list at go.aps.org/aps-chairs.
 - b. For physics departments that are administratively combined with other departments, make sure AIP has the lead physics representative on their physics chairs list (contact Judith Mulvey at jmulvey@aip.org).
 - c. Join the Physics Teacher Education Coalition for resources to improve teacher preparation. Go to www.phystec.org/join to join and for more information.
 - d. Partner with the APS Bridge Program to provide another pathway to graduate school. Go to www.apsbridgeprogram.org for more information.

Name	Title	Department	Institution
HBCU/BSI Physics Department Chairs and Delegates			
Santanu Banerjee	Professor of Physics	Physics and Chemistry	Tougaloo College
Oscar Criner	Acting Chair	Department of Physics	Texas Southern University
Wendy Hinton	Associate Professor and Department Chair	Physics	Norfolk State University
Caesar Jackson	Professor	Mathematics & Physics	North Carolina Central University
Floyd James	Interim Chair	Physics	North Carolina A&T State University
John Kelly	Associate Professor	Mathematical Sciences	Tennessee State University
Marta Dark McNeese	Associate Professor	Physics	Spelman College
Chris De Pree	Charles A. Dana Professor of Astronomy	Physics & Astronomy	Agnes Scott College
Willie Rockward	Associate Professor and Chair	Physics & Dual Degree Engineering Program	Morehouse College
Judith Salley-Guydon	Professor and Chairperson	Biological and Physical Sciences	South Carolina State University
Swaraj Tayal	Professor and Interim Chair	Physics	Clark Atlanta University
Brian Thoms	Associate Chair	Physics & Astronomy	Georgia State University
Donald Walter	Professor	Biological and Physical Sciences	South Carolina State University
Michael Williams	Professor/Director	Physics	Clark Atlanta University
Quinton Williams	Chair and Professor of Physics	Physics and Engineering Physics	Howard University
Nicholas Wolff	Assistant Professor, Department Chair	Physics	Lane College
APS Committee on Minorities			
Edmundo Garcia-Solis	Professor of Physics	Chemistry, Physics and Engineering Studies	Chicago State University
Angie Little	Visiting Assistant Research Scientist	Physics	Michigan State University, University of Maryland
Charles McGruder	Professor	Physics and Astronomy	Western Kentucky University

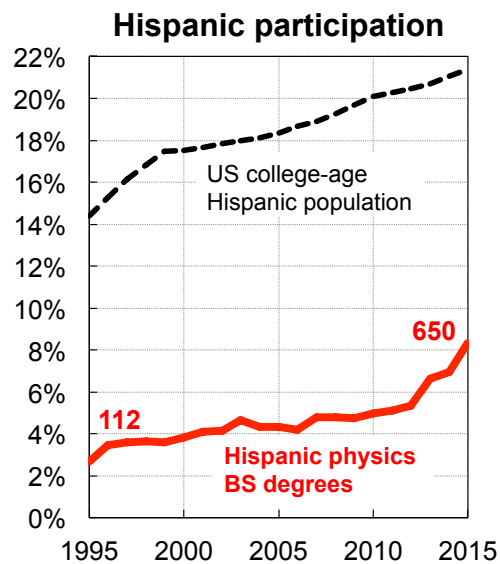
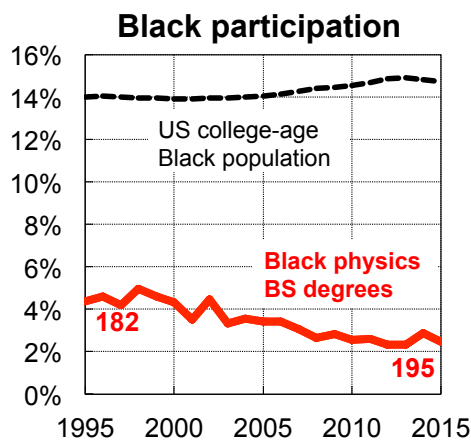
Casey Miller	Associate Professor	Chemistry and Materials Science	Rochester Institute of Technology
Jesús Pando	Professor	Physics	DePaul University
Marie Lopez del Puerto	Associate Professor of Physics	Physics	University of St. Thomas
William Ratcliff	Physicist	National Center for Neutron Research	National Institute of Standards and Technology
Garfield Warren	Professor	Physics Department	Indiana University
Professional Society Staff			
Miranda Bard	Women and Education Programs Coordinator	Education and Diversity	American Physical Society
Erika Brown	Bridge Program Manager	Education and Diversity	American Physical Society
Bo Hammer	Senior Director	Member Society Services	American Institute of Physics
Ted Hodapp	Director of Project Development	Education and Diversity	American Physical Society
Arlene Modeste Knowles	Diversity Task Force Program Manager	Member Society Services	American Institute of Physics
Monica Plisch	Director of Education and Diversity	Education and Diversity	American Physical Society
Heather Styer	Diversity Programs Coordinator	Education and Diversity	American Physical Society

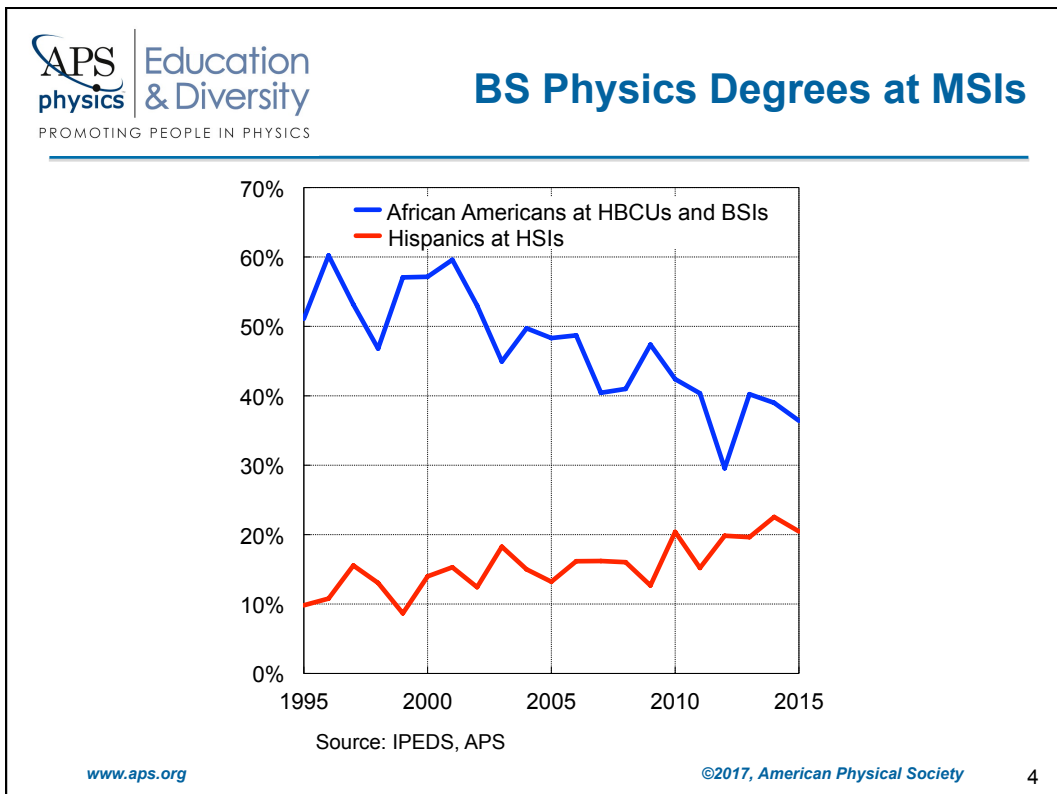
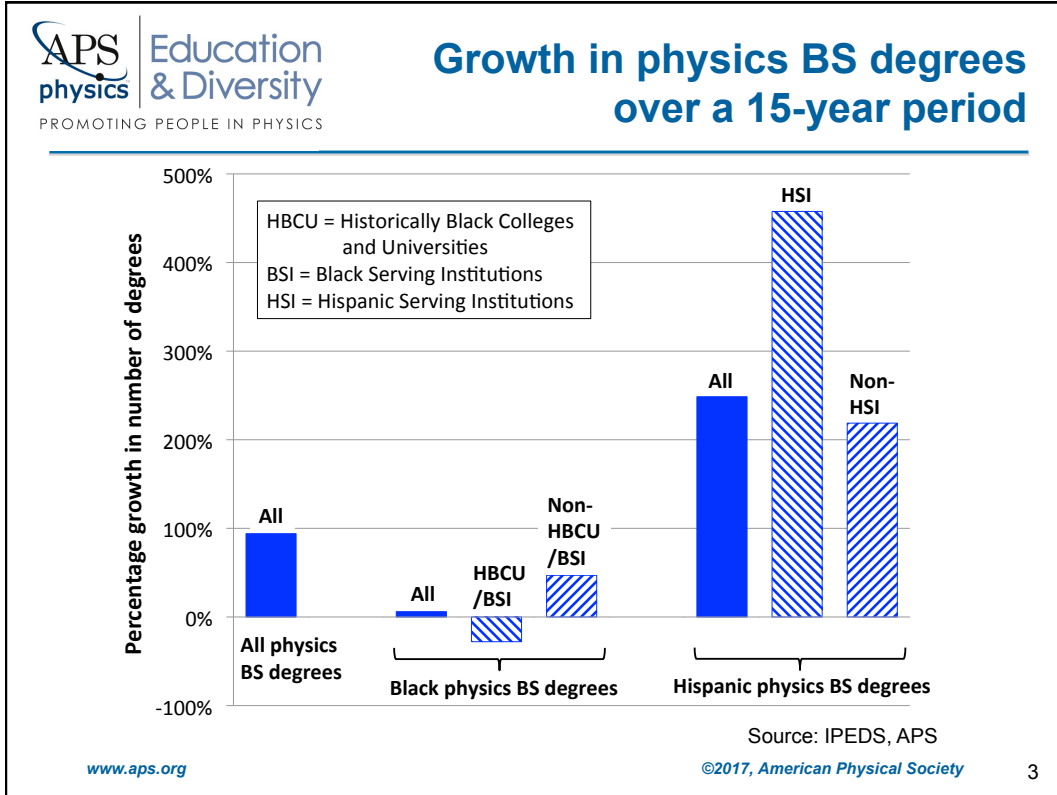
Statistics on BS Physics Degrees Granted by HBCUs and BSIs

Monica Plisch, Director of Education and Diversity
Ted Hodapp, Director of Project Development
Sam Montgomery, APS Intern
Megan McRae, APS Intern

Participation of US minorities in physics

Sources: IPEDS, US Census, APS.



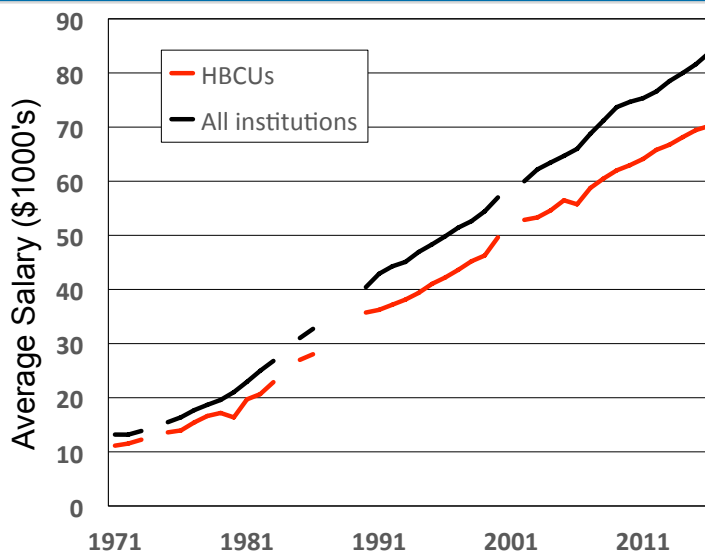


Change in Number of BS degrees at HBCUs Over Last 15 Years

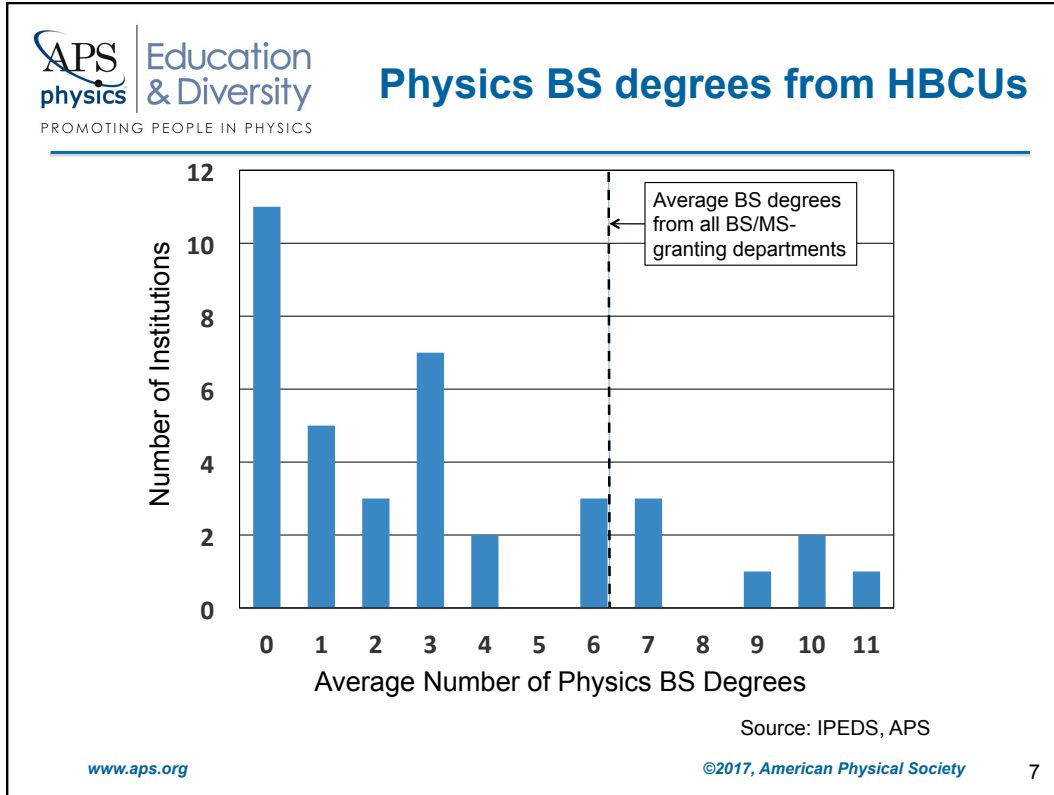
BS degree	All institutions	HBCUs
All degrees	+52%	+7%
STEM degrees	+53%	-11%
Physics degrees	+94%	-25%

Source: IPEDS, APS

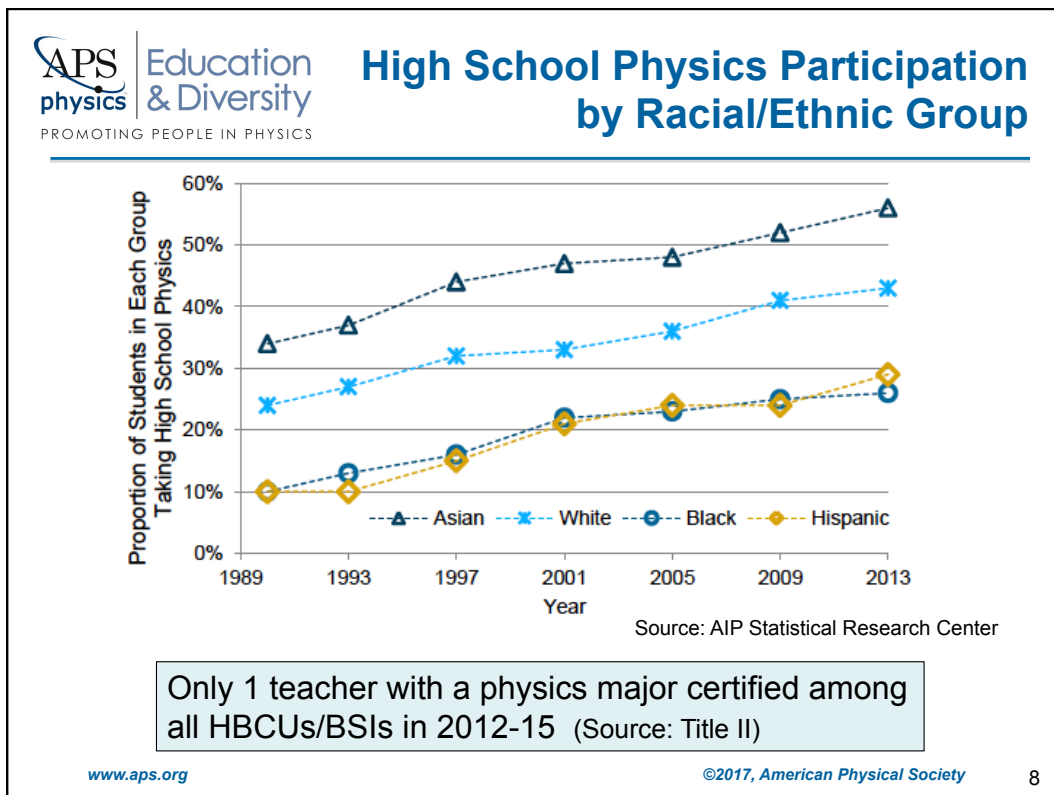
Average Faculty Salaries



Source: IPEDS, APS



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