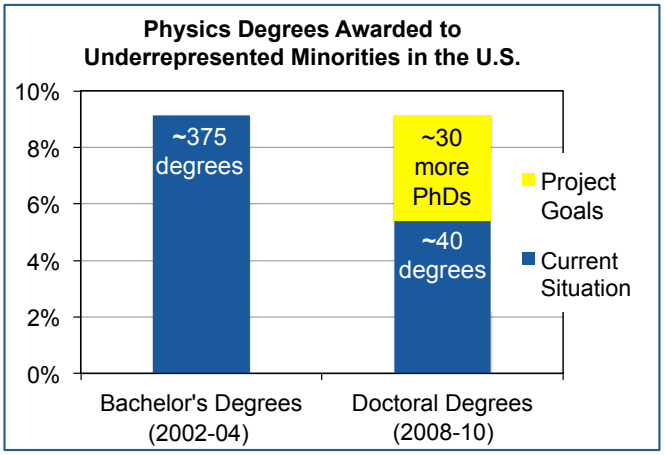
1. INTRODUCTION

In an era of phenomenal discoveries in physics and related fields, our nation is faced with the challenge of producing a generation of diverse scientific leaders who can tackle 21st century challenges. Underrepresented minority[1] (URM) students now make up a third of the college-age U.S. citizens, yet they earn less than 10% of U.S. physics Bachelor's degrees and less than 6% of physics PhDs. Graduation data show that the current paradigm of moving students from undergraduate to graduate education fails to include many.

The American Physical Society Bridge Program (APS-BP) is an effort to increase the number of physics PhDs awarded to URM students. APS-BP will do this by creating sustainable transition (bridge) programs and a national network of doctoral granting institutions that provide substantial mentoring for students to successfully complete PhD programs. The project incorporates practices from programs that have strong evidence of success in supporting URM students. The APS-BP will also establish links between minority-serving and doctoral-granting institutions through research activities, collaboration, and personal contacts. Since many of today's doctoral students will become tomorrow's academic, industrial and government leaders, educating more URM PhDs will have a multiplicative effect in educating and inspiring students at all stages in the system and will help address persistent disparities.

The APS-BP mission is to strengthen physics in the United States by increasing the number of underrepresented minority students who receive doctoral degrees in physics. The project has the following goals:

1. Increase, within a decade, the fraction of physics PhDs awarded to *underrepresented minority* students to match the fraction of physics Bachelor's degrees granted to these groups
2. Develop, evaluate, and document sustainable model bridging experiences that improve the access to and culture of graduate education for *all* students, with emphasis on those underrepresented in doctoral programs in physics
3. Promote and disseminate successful program components to the physics community



Source: IPEDS Completion Survey By Race

[1] The project defines underrepresented minorities as African American, Hispanic American and Native American

The APS Bridge Program is supported in part by the National Science Foundation (NSF-1143070) and the American Physical Society.

2. PROGRAM DESCRIPTION

To accomplish the goals of the program we will, over the course of the project, fund a set of *Bridge Sites*. These bridge sites will host students (*APS Bridge Fellows*), who are unlikely to gain admission to a physics doctoral program without further preparation. The bridge fellows spend a period of 1-2 years after their undergraduate studies enhancing their academic and research skills. This request for proposals (RFP) document provides guidelines by which institutions can apply to become bridge sites, and criteria we will use to select these institutions.

Bridge sites will provide research experiences, advanced coursework, mentoring, progress monitoring, and coaching to help students prepare a competitive application for a doctoral program. Bridge sites must devise a program that prepares students to apply to and be competitive for a physics doctoral program. Two approaches that have been implemented include a *post-Baccalaureate* model[2] where students spend 1-2 years engaging in graduate level research, taking advanced undergraduate or entry-level graduate courses and preparing their application for graduate school but do not receive a degree, and a *Transitional Master's* model where students receive a Master's degree after completion of specified requirements as well as activities similar to the post-Baccalaureate model. Any program should be tailored to fit the institutional context and must have a plan for sustainability beyond APS funding. Success and future funding will be contingent upon the acceptance rate of bridge fellows into doctoral programs, and a documented increase in the number of URM students who achieve this goal. Examples of existing bridge programs can be found on the APS-BP website.[3]

The APS-BP will undertake a significant effort to recruit prospective bridge fellows from across the country. Each bridge site will receive a common set of student applications, and can also recruit students directly. *The bridge site is responsible for admitting students*. To receive APS funding the institution must ensure students meet eligibility requirements outlined in the student selection criteria policy.[4]

3. AWARDS

We will fund one or two bridge sites to begin activities in Summer 2014 with students starting as early as July 2014. Funding includes up a total of $20,000 per student for stipend and benefits while at the bridge site, and $10,000 per year for institutional support to help operate the program. Three-year support of a site for two new students per year could then total $150,000 (6 students x $20,000/student + $10,000 /yr).[5] APS will also support travel for the site leadership and students to APS-BP events, as well as travel for the bridge fellows to attend one scientific conference where they can present their research. Reasonable travel expenses can be included above that requested for student stipend and institutional support. Travel funds cannot be repurposed within the budget. We intend to seek new sites again in 2014 and 2015, with additional sites added beyond that as permitted by funding.

---

[2] For the post-Baccalaureate model, it is typical that the student is hired as a university staff member (research assistant) and may therefore take classes for free, depending on university policies.

[3] See www.APSBridgeProgram.org/institutions/bridge for more information on existing bridge programs.

[4] See www.APSBridgeProgram.org/students/ for more information on the eligibility criteria.

[5] Awards will only encompass the costs for student and institutional support and will include up to $150,000 plus travel for three years.

4. ELIGIBILITY

4.1 Eligible Institutions

The bridge site must be a university or college that offers a Master's or Doctoral degree in physics, and be located and accredited in the United States or Puerto Rico. The institution must have active research programs readily available to bridge fellows throughout the academic year. The institution must also be an APS-BP *Member Institution*[6] prior to receiving support.

4.2 Site Leader Eligibility

The site leader must be a tenured or tenure-track faculty member in the physics department with strong backing from the chair and university administration. The preference is for a site leader who is a tenured faculty member and has significant experience working with students from diverse backgrounds. We have found that successful programs typical have at least 15% of their tenured or tenure-track faculty involved.

5. PROPOSALS

Institutions that would like to be considered for bridge site support are required to submit an initial proposal, due **October 4, 2013 at 5 p.m. ET.** All who submit an initial proposal can expect a response by mid-December. A small number of selected institutions will be invited to submit a full proposal, due **December 20, 2013 at 5 p.m. ET**.

Text should be single-spaced, written in Times 12-point font or larger, with at least 1-inch margins. Proposals must be sent as a single PDF document (as an email attachment, or for larger files to a "dropbox" folder by prior arrangement) to Bushraa Khatib at bridgeprogram@aps.org. Late proposals will not be accepted.

There will be a webinar describing the project and the RFP process **on September 20, 2013 at 12:00 p.m. ET**. Details will be available on www.APSBridgeProgram.org. Project management encourages inquiries and consultation during the proposal writing process. Inquiries can be directed to Ted Hodapp (301-209-3263 hodapp@aps.org) or Brian Beckford (301-209-3398 beckford@aps.org)

5.1 Initial Proposal

Initial proposals are limited to 3 pages. Proposals that exceed the page limit will not be read beyond the stated page limit. While sustainability and institutional support should be addressed, actual letters of support will not be accepted. The proposal should not contain appendices or attachments.

If your institution would like to be considered for bridge site support, please send a document that includes the following information as appropriate:

- **Project overview.** Describe the program you would develop or modify to prepare students for entry into doctoral programs.

[6] See www.APSBridgeProgram.org/institutions/member for more information on becoming a Member Institution.

- **Project goals.** Include the number of students you intend to admit into the program on an annual basis, the time they will spend in the program, and your rationale for why they will be successful in transitioning into doctoral programs (at any institution, including your own, if you have a PhD)
- **Infrastructure elements.** Briefly describe each of the points below as it relates to your department:
    - **Setting.** Briefly describe the institution, the physics department (including highest degree awarded), and the student population.
    - **Data table.** Provide a data table with the following:
        - Number of graduates with Bachelor's, Master's, and PhD (if applicable) for at least each of the last 3 years
        - Number of URM graduates with Bachelor's, Master's, and PhD (if applicable) for at least each of the last 3 years
    - **Racial/Ethnic Diversity.** List existing programs/efforts in place (at the university and departmental levels). Describe policies in place or under consideration that might impact the racial/ethnic diversity in your department, and the department's expressed concern for improving racial/ethnic diversity at various levels.
    - **Project team.** List key faculty and staff who will help implement the project and their primary responsibilities.
- **Key components.** Broadly outline a plan of action for achieving the stated goals, addressing APS-BP key program components:[7]
    - Recruitment (beyond students recommended by APS)
    - Admission decisions (how you will decide which students to invite to become bridge fellows)
    - Financial support (stipend and health benefits)
    - Mentoring (regular interaction with students to ensure their success, communication between various mentors and advisors)
    - Community (initial induction into the program, activities for socialization or acclimating to the local culture)
    - Coursework (advising to select appropriate physics/math courses, other courses including ESL classes if needed)
    - Research (research areas, capacity for incorporating students into existing groups, matching of students with advisors)
    - Progress monitoring (regular inquiries with instructors on how students are progressing in coursework and research, along with plans for providing tutoring or other interventions as needed)
    - Application coaching (GRE preparation, improving application writing, choosing schools)
    - Sustainability (how will the programs be sustained beyond the period of APS funding)
- **Budget.** Provide a brief budget summary.

[7] See www.APSBridgeProgram.org/bridge/components.cfm for more information on the APS Bridge Program key components

5.2 Full Proposal

The full proposal format is similar to a standard NSF proposal. Review criteria listed below indicate how the proposals will be reviewed.

5.2.1 Project Summary

Include a one-page project summary stating the goals and summarizing the project, suitable for the web.

5.2.2 Project Description

The project narrative should be a maximum of 15 pages. The following elements must be included and clearly identified in the Project Description section. If your project will not explicitly implement a key component, provide a rationale or explain how its underlying goals are addressed in other ways. Clearly describe the following in the narrative:

- **Project overview.** Describe in detail the type of program you would develop or modify to prepare students, for example, post-Baccalaureate or transitional Master's
- **Project goals.** Describe in detail the project goals during the APS-BP funding period and beyond
    - Number of students your department intends to admit into the program annually (if your department already has a Master's program, include a description of how you will demonstrate an increase through program funding)
    - Time that students would spend in the program including when the students would begin at your institution
    - Rationale for why the students will be successful in transitioning into a doctoral program (at any institution, including your own, if you have a PhD)
    - Description of how you will demonstrate an increase of URM students transitioning into doctoral programs, beyond any that you already educate
- **Infrastructure elements.** Describe in detail each of the points below as it relates to your department.
    - **Institution profile.** Include size, type of institution, student demographics and the institution setting
    - **Physics department profile.** Provide the following information:
        - Number of graduates with Bachelor's, Master's and PhD (if applicable) for at least each of the last 3 years
        - Number of URM graduates with Bachelor's, Master's and PhD (if applicable) for at least each of the last 3 years
        - A description of diversity among the faculty members
    - **Project team.** List key faculty and staff who will implement the project and their roles and responsibilities.
    - **Diversity programs.** Describe existing program(s) to increase diversity implemented at the department level, graduate school level and institution wide.
    - **Graduate student organizations.** Describe the activities of graduate students groups, their involvement in department committees and how these organizations will assist in incorporating Bridge fellows into the graduate student population

- **Synergistic activities.** Describe existing programs or initiatives that will have a significant interaction with APS Bridge Program efforts. Outline the nature of the interactions. Examples of such programs that could exist at your institution may include the Alliance for Graduate Education and the Professorate, minority student organizations, etc.
- **Sustainability.** Describe how program changes brought by the bridge program will become standard practice and how support for program efforts will be continued after funding ends. How will university administration be kept informed about the project?
- **Assessment.** How will your institution measure success with respect to stated goals, and use results to improve diversity?

- **Key components.** Describe in detail a plan of action to achieve the stated goals, addressing the APS-BP key program components:[8]
  - **Recruitment.** Describe recruiting strategies you will implement beyond that provided by the APS-BP.
  - **Admissions.** Describe how your department will undertake admissions of bridge fellows and the policies in place. This could be a brief explanation on how students can take undergraduate level classes, if they are considered special-status students or registered in a degree program, and any other procedures you would follow in admitting the students.
  - **Financial support.** Describe how you will support the students financially. Include stipends and any other benefits they will receive. How will tuition be paid?
  - **Mentoring.** Students in successful bridge programs have several mentors (research advisor, program lead, peer mentors, etc.). Describe the roles that each person will play in mentoring, and how they will communicate with each other to provide appropriate interventions if needed.
  - **Induction.** How will you support students at the beginning of the program? What steps will you take to ensure students fit into the department? Where will the student have an office, and how will this impact the way in which students are included in the department's academic and social student circles? This could also include a description of how you will match students with different mentors. What steps will be taken to assist students in relocating and acquiring housing? Will students be provided on-campus housing if available?
  - **Coursework / Advising.** How will you advise students on coursework they should take to progress toward a competitive admissions package into a doctoral program? This may include physics, math, or other courses relevant to improving the student's chances of admission.
  - **Research.** Describe how students will be immersed into research and how the paring between student and research mentor will occur. How will the research advisor interact with the student's other mentors?
  - **Monitoring.** How will you track student progress and ensure they successfully transition into a doctoral program? What interventions will you be able to provide and how will decisions be made to do this?

[8] See www.APSBridgeProgram.org/bridge/components.cfm for more information on the APS Bridge Program key components

- **Graduate school application.** How will you help students prepare an admission package for a doctoral program? How will you advise the student in selecting appropriate schools in which to apply? Include activities such as GRE preparation, writing a personal or research statement, preparing a CV, etc.

5.2.3 Additional Proposal Sections

There is no page limit for the additional sections listed below, and none of the sections will count toward the page limit for the project narrative.

- **References.** References should be included in a separate section from the project description.
- **Biographical sketches.** Provide an NSF-style, two-page CV for senior members of your project team listed in the project narrative.
- **Current and pending support.** If the proposed budget includes salary offsets, provide an NSF-style document listing current and pending support for anyone receiving support.
- **Letters of support.** Letters of support should include specific commitments of resources or other contributions. Letters that offer only endorsement rather than actual support are discouraged.

5.2.4 Budget

An NSF-style budget and budget justification is required with the full proposal. Include a budget for each project year and a summary budget for the entire project.

- **Fringe.** The fringe rate on salaries is limited to the institutional fringe rate or 33%, whichever is smaller.
- **Travel.** APS will support travel for the site leadership and students to APS-BP annual meeting, as well as travel for the bridge fellows to attend one scientific conference where they can present their research. Reasonable travel expenses can be requested in addition to the amount requested for student stipend and institutional support. Travel funds cannot be repurposed within the budget.
- **Indirect cost limitations.** No indirect costs are allowed on the bridge student stipends or participant support. Indirect costs on other budgetary items are limited to the APS negotiated rate of 36.69%.
- **Cost sharing.** Cost sharing is not required, however, we anticipate successful proposals will indicate significant matching funds and in-kind contributions. Reviewers typically interpret these resources as demonstrating commitment by the institution to a sustainable program. We ask that you estimate and summarize the value of these funds in a paragraph, but it is not required in the budget calculations.

6. PROPOSAL REVIEW

A panel with members both external and internal to the project will review proposals shortly after they are submitted. Project management may elect to visit potential sites prior to committing funds. The review panel will consider the RFP and APS-BP project goals when reviewing proposals. Initial three page proposals will not receive a written review. Feedback on the initial proposal may be obtained by contacting project leadership. Written reviews will be returned for each submitted full proposal. Proposals are not required to specifically address the

NSF criteria of Intellectual Merit and Broader Impacts,[9] but reviewers will treat proposals in much the same way they evaluate typical NSF proposals.

7. AWARD ADMINISTRATION

Institutions will be expected to participate in project activities described below:

7.1 Communication

Each institution will be asked to designate one person as the primary point of contact, and the project management group will communicate with this person on all project matters. In addition, communication will be facilitated by an email list and project wiki.

7.2 Memorandum of understanding

The project will negotiate an institution-specific memorandum of understanding (MOU) with each supported bridge site for every project year. The MOU will include a detailed list of activities to be carried out by faculty and staff during the project year (August 1 to July 31). The MOU will also include a budget for the project year.

7.3 Site visits

The project management group will conduct site visits once each year. The visit will last 1 to 1.5 days and will include discussions with faculty, students, administrators and staff. The project management will write up a synopsis of the visit that will be sent to the site but will not be published by the project, and is intended to provide feedback to the site on project activities and suggestions for synergistic activities. The site will be given an opportunity to comment on the validity and accuracy of the report before it is finalized. Site visits may include members from other bridge sites, APS Committee on Minorities or from the larger coalition of APS Bridge Program member institutions committed to increasing diversity in physics graduate education. Individuals from your institution may also be asked to take part in site visits to other institutions where there seems to be a mutual benefit to such a visit.

7.4 Site leadership

The faculty leader from each site is expected to participate in the APS Bridge Program Summer project meeting. The site leaders will meet monthly via videoconference and in person once a year at the annual APS Bridge Program summer meeting. The site leader is expected to attend this meeting annually during project funding. The purpose of this group is to ensure smooth operation of the project, provide input on project policies, share ideas, and help spread knowledge of activities that encourage participation of underrepresented minorities in physics graduate education.

7.5 Annual reports

We ask each site to compile an annual report that we will place on the APS Bridge Program website to inform the broader community of your progress and activities. We have constructed a template for this report and will assist each site in making reports web-compatible.

[9] See http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf for more information on NSF criteria of intellectual merit and broader impacts

7.6 Assessment

We collect data from every site annually to help with local assessment of progress and to characterize the project's success as a whole. The project will expect the following from each institution:

- Tracking of all bridge fellows throughout their time from admission in the bridge program through receiving their PhD. Data gathered while at the bridge site should include demographics, contact information (temporary and permanent), complete transcripts, complete bridge site admission package, and other academic progress indicators (passing various entrance or progress requirements, publications, presentations, etc.). Data gathered after the student completes the program at the bridge site should include graduate program status, and contact information.
- Participation in project data gathering including on-line and telephone surveys of lead faculty (site leader, student's mentors and research advisor).
- Participation in the project's characterization of doctoral admissions process (if applicable). This will entail an on-line survey completed by the chair or members of the graduate admissions committee, and possible phone interview with our assessment team.
- Student agreement: We require a signed agreement with every student supported by the APS-BP. This covers their agreement for us to gather data from and about them, a statement of their intention to complete the program, and their agreement to comply with our assessment efforts. APS-BP will be responsible for collecting the agreements directly from the students. If you are able to support students beyond the ones funded by the project, we would appreciate gathering similar data from these students.

7.7 Publications

We expect each site to author at least one written publication beyond the annual report for dissemination to a broader audience based on their experiences and/or program elements for publication. Sites should consider how they structure data gathering and documentation efforts in such a way as to make this a project outcome.

8. About APS Bridge Program

The APS Bridge Program has support from the National Science Foundation through grant NSF-1143070 and through individual and corporate gifts to the American Physical Society. More information about the program is available at www.APSBridgeProgram.org.