



2014 REQUEST FOR PROPOSALS – RECRUITING GRANTS

PHYSICS TEACHER EDUCATION COALITION (PHYSTEC)

INTRODUCTION

In the United States there are over 27,000 teachers of high school physics who serve students in over 20,000 public and private high schools. While many of these high school physics teachers are excellent educators, fewer than half of U.S. physics teachers have a major or minor in physics or physics education. Each year, about 3000 teachers find themselves at the front of a physics classroom for the first time, yet only 1400 have a relevant major or minor. In many states, weak standards for certification or endorsement to teach physics hide the fact that many teachers of physics lack the content knowledge and focused pedagogical preparation necessary to provide an excellent physics education for *all* students. The scarcity of qualified physics teachers is exacerbated by an annual increase in both number and fraction of high school students who take physics.

The Physics Teacher Education Coalition (PhysTEC) has the mission of improving the education of future physics and physical science teachers. The PhysTEC project has the following goals:

- Transform physics departments to engage in preparing physics teachers
- Demonstrate successful models for increasing the number of highly-qualified physics teachers
- Spread best-practice ideas throughout the physics teacher preparation community

To date the project has funded 32 institutions as PhysTEC Supported Sites to build physics and physical science teacher education programs. These Supported Sites have demonstrated significant successes in increasing the number of highly qualified physics teachers (for details, see www.PhysTEC.org). A coalition of over 280 PhysTEC Member Institutions is served by an annual national conference and other opportunities to improve and promote physics teacher education (see www.PhysTEC.org). In addition, transformation of physics departments is addressed by a national advocacy campaign, which includes partnerships with organizations with aligned goals.

PROGRAM DESCRIPTION

The project seeks to explore a new approach for engaging institutions in increasing the number of physics teachers through a Request For Proposals (RFP). *Recruiting grants* will be awarded with a goal of establishing a cohort of institutions focused solely on developing successful recruiting strategies that can be implemented at a wide variety of institutions, including primarily undergraduate institutions. This document describes the call for *recruiting grants*. A separate document available at www.PhysTEC.org/solicitation describes the call for *comprehensive sites*, which are larger awards that establish model programs and address the entire teacher education continuum.

Recruiting strategies

Institutions with *recruiting grants* are expected to embrace the goal of increasing the number of highly qualified secondary physics teachers. In this sense, recruiting¹ can broadly encompass any action designed to increase the number of physics teachers educated at your institution. PhysTEC supported sites have experimented with a wide variety of activities to recruit more teachers,² many of which can be grouped into the following categories:

- **Marketing** – Raising awareness about opportunities in physics teaching among students whom you hope to recruit is a critical first step; this should include considerations of physics majors as well as students in other disciplines that may become physics teachers. Additional considerations include promoting the program outside the university, for example to high school students or potential career changers.
- **Advising** – Students considering or pursuing physics teaching need encouragement and guidance from someone knowledgeable about the profession and ways to explore pathways leading to a teaching career.
- **Pathways** – A variety of flexible and streamlined pathways leading to a physics degree and certification is key to attracting a large number of students to physics teaching, as students may develop an interest in teaching at different points in their academic career. Improving existing pathways or establishing new pathways can substantially increase the number of students pursuing physics teaching.
- **Financial support** – Students who seek certification often take longer to graduate; scholarships, TA support, tuition waivers, or other financial support can make a critical difference in affordability, as can an overall low cost of attendance.
- **Early teaching experiences** – Opportunities for prospective teachers to test the waters and experience physics teaching early in their college career are key to attracting more students to the teaching profession. Experiences working with pre-college students are especially important for prospective teachers to develop and confirm a passion for teaching (or decide it is not for them). A Learning Assistants program can also provide students with a well-structured introduction to physics teaching at the college level.

Recruiting grants may be used to enhance these types of activities and/or other activities directly aimed at increasing the number of physics teachers.³

¹ For more information on recruiting as a key component of a PhysTEC program, visit www.PhysTEC.org/keycomponents/recruitment

² To learn about specific recruiting activities at PhysTEC supported sites, go to www.PhysTEC.org/institutions and select a supported site to access its annual report. The section labeled “Recruitment” has a summary of activities, and additional report sections including “Early Teaching Experience,” “Collaboration,” “Teacher in Residence,” and others may have relevant information.

³ PhysTEC funds may not be used directly for scholarships since funding is limited. In addition, PhysTEC support may not be used for Learning Assistant (LA) stipends. While the project encourages the establishment of LA programs and sees them as beneficial to physics teacher education, many institutions have funded LA programs internally and the project seeks to explore additional types of reforms to improve recruiting of physics teachers.

Part-time Teacher in Residence

The Teacher in Residence (TIR)⁴ has proven to be an invaluable component of many PhysTEC programs, and has contributed strongly to increasing the numbers of physics teachers at supported sites. Their first-hand knowledge of the teaching profession, connections to local schools, and expertise in pre-college physics teaching typically brings much needed skills and expertise to a physics teacher preparation program. TIRs have led or contributed to many of the recruiting activities listed above, and their presence as an ambassador for physics teaching in the physics department has been effective in shifting attitudes and presenting teaching as an attractive career option. In addition, TIRs have helped to foster student community around teaching, which can enhance efforts to recruit more physics teachers. Recently, a number of PhysTEC institutions have experimented with a part-time TIR due to limited resources. The project seeks to further explore this model for engaging part-time TIRs by supporting selected institutions with *recruiting grants*.

Part-time TIRs typically keep their pre-college teaching job and spend a few hours per week at a university supporting the physics teacher education program. TIRs often teach physics courses, which can help to supplement their stipend and promote contact with students. PhysTEC supported sites with part-time TIRs (sometimes known as Visiting Master Teachers or VMTs) include Seattle Pacific University, State University of New York (SUNY) at Geneseo, and California State University (CSU) at Long Beach.⁵

Additional considerations for *recruiting grants*

Recruiting is an increased emphasis in the 2014 solicitation as PhysTEC seeks to build models for institutions that substantially increase the number of physics teachers. At the same time, institutions should realistically assess their potential to recruit more physics teachers. The most accessible pool for recruiting future teachers is physics majors. Note that data we have collected from institutions around the country indicate it is unusual for more than about 10-15% of physics majors to become teachers. Beyond the physics department, students in closely allied disciplines offer further opportunities for recruiting physics teachers.⁶ These disciplines can include, for example, applied physics, astronomy, materials science, math, chemistry, and some branches of engineering. Education majors, physics graduate students, and career changers have also contributed to the ranks of PhysTEC teachers at sites that recruit for and have workable pathways for these students.

The PhysTEC project will offer financial and intellectual support to selected institutions to achieve project goals. This will include networking with the best programs throughout the country; helping your institution raise other local, state or federal funds; and making available the expertise of dedicated individuals who are working toward similar goals. It should also be kept in mind that PhysTEC funding is limited, and we see a PhysTEC award as support for

⁴ For more information on TIRs, visit www.PhysTEC.org/keycomponents/tir

⁵ To learn about specific TIR activities at PhysTEC supported sites, go to www.PhysTEC.org/institutions and select a supported site to access its annual report. Activities of full-time TIRs at supported sites may also help to inform plans for a part-time TIR.

⁶ Any student who has a physics major, minor or equivalent coursework and who completes a program of teacher education can be counted as a PhysTEC graduate.

bootstrapping a nascent physics teacher education program rather than long-term funding of these efforts.

The PhysTEC project is focused on pre-service teacher education, which is an often neglected and critical part of teacher education. Proposals that are primarily or exclusively focused on in-service teachers will not be accepted as there are many existing models of in-service programs as well as other funding streams to support teacher professional development.

AWARDS

We will fund up to 10 *recruiting grants*, with about half engaging part-time TIRs, to begin in September 2014. Institutions with *recruiting grants* can request funding of up to \$10,000 per year for three years, for a maximum total of \$30,000.

ELIGIBILITY

Eligible organizations

The lead organization must be a university or four-year college that offers a physics degree and teacher certification program, and be located and accredited in the U.S. A consortium of institutions may also include two-year colleges or non-profit entities.

PI eligibility

The principal investigator (PI) must be a tenure-track or tenured faculty member in the physics department. As appropriate, programs may have collaborative arrangements with the School of Education or other unit housing the teacher certification program, which may include a co-PI in Education.

PROPOSALS

If you plan to apply for a PhysTEC *recruiting grant*, please email Monica Plisch (plisch@aps.org) by May 1 to indicate your intent. An email of intent is not required but is much appreciated as this will help us with planning the review process. Full proposals are due 5 June 2014 at 5 p.m. local time. Email proposals as an electronic attachment in PDF format to Monica Plisch at plisch@aps.org. Late proposals will not be accepted.

There will be a webinar on the PhysTEC RFP on 22 April 2014 at 3 p.m. EDT. Details will be available on www.PhysTEC.org/solicitation. Project management encourages inquiries and consultation during the proposal writing process. Please contact Monica Plisch (phone: 301-209-3273, email: plisch@aps.org) or Ted Hodapp (phone: 301-209-3263, email: hodapp@aps.org).

The proposal format is similar in format to a standard NSF proposal, but substantially simplified. Review criteria listed below indicate how proposals will be evaluated. Please keep in mind that while a brief description of existing efforts can be useful to provide context, the emphasis of the proposal should be on the types of actions to be undertaken as a result of PhysTEC funding, and how these efforts will result in a substantial increase in physics teachers.

Project description

The project description should be a maximum of 5 pages for *recruiting grants*. Text should be single-spaced, written in Times 12-point font or larger, with at least 1 inch margins. Also include a half-page project summary suitable for the web, which will not be included in the page count for the project description. Proposals must include and clearly identify the following elements in the project description section:

- **Project goal.** Give a numerical goal for increasing physics teachers during the period of PhysTEC funding and beyond. Give an explanation for how you arrived at the goal and justify why you think the number is feasible.
- **Institution profile.** Include a brief description of the institution, including how teacher education fits with the mission, and whether it is a minority-serving institution.
- **Physics department profile.** Include a brief description of the physics department, and provide the number of students who received bachelor degrees in physics for at least each of the last 3 years, as well as an overview of the undergraduate program.
- **Physics teacher education program.** Describe existing program(s) to educate physics teachers and the number of graduates from each program for the last 3 years.
- **Recruitment plan.** Describe specific strategies that you will implement to increase the number of physics teachers. This may include discussions of the recruiting strategies outlined above and/or other activities that are targeted specifically at increasing the numbers of teachers. Be sure to differentiate between existing activities and those that will be new or enhanced as a result of PhysTEC efforts.
- **Teacher in Residence.** If a Teacher in Residence (TIR) will be part of your project, describe specific roles and responsibilities of the TIR. You are encouraged to name a potential candidate for TIR.
- **Dissemination.** An intended outcome of *recruiting grants* is the development of effective materials, strategies and resources for recruiting future physics teachers. Describe plans to make recruiting materials and resources developed as part of the project readily available for use by other institutions.
- **Champion(s).** Name the champion(s) who will lead the project, and describe how they are positioned to have influence in the physics department and with key administrators. In addition, name any other faculty and staff on the leadership team, and describe their roles and responsibilities.
- **Institutional commitment.** Describe how program activities will be sustained by the institution and program changes will become standard practice after PhysTEC funding ends. Also, provide a plan for keeping your local administration informed about the project.

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 description.

- **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 description.
- **Letters of support.** Any letters of support should include specific commitments of resources or other contributions. Letters that offer only endorsement rather than actual support are discouraged.
- **Budget.** A NSF-style budget and budget justification are required with the proposal. Include a budget for each project year and a summary budget for the entire project. The budget justification should include a description of each budget item. No support for scholarships or Learning Assistant stipends is allowed, although we encourage in-kind support for such activities as a component of cost sharing.
 - **Fringe benefits.** The fringe benefit rate on salaries is limited to the institutional fringe rate or 33%, whichever is smaller.
 - **Travel.** Do not include travel for the PI or TIR to the PhysTEC conference, as this will be reimbursed separately by the project.
 - **Indirect cost limitations.** No indirect costs are allowed on TIR salary or participant support, if applicable. Indirect costs are limited to 24.73% on other budgetary items.
 - **Cost sharing.** Although cost sharing is not required, reviewers may interpret these resources as demonstrating commitment by the institution to a successful and sustainable effort.

PROPOSAL REVIEW

All applications will go through an NSF-style review process. A panel composed of external reviewers and the PhysTEC project management team will evaluate proposals. Anonymous comments from individual reviewers and the panel discussion will be sent to all Principal Investigators. New sites will be announced in July 2014, with funding to begin 1 September 2014.⁷

Review criteria

Panels will use the following criteria during review of initial letters and full proposals.

- Potential to increase the number of physics teacher graduates – *What is the potential to substantially increase the number of well qualified physics teachers? How large is the pool of potential physics teachers including physics majors and others? How well conceived is the plan to recruit future teachers, and retain them to successful graduation?*
- Potential to develop recruiting resources – *What is the potential to develop and document effective materials, strategies, and resources for recruiting future physics teachers that can be disseminated nationally?*
- Qualifications of team to carry out project – *Is the team well positioned to implement proposed changes in the physics department and school of education, as applicable? What is the knowledge and experience of the team in physics education?*

⁷ There will be an option to defer the start of funding to 1 January 2015 if, for example, it is difficult to find a TIR by 1 September 2014.

- Evidence of institutional support – *What matching funds and other support will the institution provide? What resources will the institution commit to sustaining the project after PhysTEC funding?*
- Extent to which the institution adds diversity – *What is the potential of the project to increase diversity of PhysTEC graduates? How does the type of institution and geographic location extend the portfolio of PhysTEC institutions?*

AWARD ADMINISTRATION

Institutions with *recruiting grants* will be expected to participate in project activities described below.

Memorandum of Understanding

The project will negotiate an institution-specific Memorandum of Understanding (MOU) with each institution awarded a *recruiting grant* for the entire term of project. The MOU will include a detailed list of activities to be carried out by faculty and staff during the project term, and will also include a budget.

Communication

The Principal Investigator will be assumed to serve as the primary point of contact, and the PhysTEC project management team will communicate with this person on all project matters. In addition, communication will be facilitated by a listserv, videoconferences, and project wiki.

Meetings

The Principal Investigator from each site is expected to participate in a number of videoconferences during the academic year and meet in person once each year at the annual PhysTEC conference (travel will be reimbursed). The purpose of these meetings is to promote good communication and sharing of ideas among PIs and project management.

Annual reports

We ask each institution to compile an annual report that we will place on the PhysTEC website to inform the broader community of its progress and activities. There will be a template for this report and assistance will be provided in making reports web-compatible. As part of the annual report, each institution will be asked to submit recruiting materials and resources developed as part of the project in a form that can be disseminated to other institutions.

Assessment

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

- Data and a clear description of methods used to count teachers for each year of the project as well as the three years prior to PhysTEC funding (to provide a baseline). These numbers will be used, in part, to measure your success. This should include

separate categories for the number who graduate from your physics teacher education program and the number who are in the pipeline as future physics teachers.

- Updated contact information for all program graduates. We send a brief survey to all PhysTEC graduates each year to ask about employment outcomes. We ask each site to maintain contact with *all* graduates during the project and for a period of five years following funding, to assist with gathering employment and retention data.

ABOUT PHYSTEC

The PhysTEC project has support from the National Science Foundation and through individual and corporate gifts to the American Physical Society's (APS) Campaign for the 21st Century. The project is led by APS in partnership with the American Association of Physics Teachers. More information about PhysTEC is available at www.PhysTEC.org