INTRODUCTION

In the United States, there are more than 27,000 teachers of high school physics who serve students in more than 20,000 public and private high schools. While many of these physics teachers are excellent educators, fewer than half have a major or minor in physics or physics education. Physics consistently rates as a K-12 education field with a “severe shortage” of teachers, in which demand far exceeds supply for open positions. One issue is the low number of new physics teachers prepared each year: over 70% of U.S. secondary education programs failed to graduate even a single teacher with a physics major in a recent three-year period.

PROGRAM DESCRIPTION

To help alleviate the severe national shortage of physics teachers, applications are requested to establish PhysTEC Regional Networks of institutions and faculty who are leading physics teacher education (PTE) programs. By connecting with each other and with support from PhysTEC, these networks will build capacity for addressing regional and local challenges and opportunities to advancing PTE, such as:

- recruiting and retaining students to physics and PTE programs
- navigating state requirements to develop streamlined PTE programs
- collaborating across physics and education departments
- establishing informal pathways or formal articulation agreements among institutions
- coordinating course offerings to address low enrollments
- connecting with regional school districts and physics teachers
- providing professional development for pre-service/in-service teachers
- advocating for supportive policies, e.g. with state education agencies
- pursuing resources to support PTE programs

PhysTEC Regional Networks are intended to help overcome these challenges and support more institutions to develop and institutionalize practices that sustainably increase the numbers of students who become physics teachers and foster a regional reputation for physics teacher education (PTE) with a culture of supporting teachers and teacher preparation. PhysTEC Regional Networks will have some element of commonality among member institutions that motivates sharing of information and coordinated action. Network members may share a geographic region, be part of a state or university system, or share a common goal (one that is better met collectively than individually). For example, campuses in the same university system have shared protocols and governance, and may have system-wide funds or other resources to support multi-campus initiatives. Each network will have one or more network leaders who recruit network members and organize network activities.

Goals

The PhysTEC Regional Network program has the following goals and subgoals:

1. Strengthen the capacity of network faculty to improve PTE
   a. A sustainable network is built that provides peer support and accountability
b. Faculty learn about new ideas and practices related to PTE
c. Faculty identify as PTE champions and members of the PhysTEC community
d. Network leaders gain recognition for leadership in PTE

2. Catalyze network faculty to take action to improve PTE across the network
   a. Faculty act locally to improve their institutions’ PTE program
   b. Faculty act collectively to strengthen PTE in their state or region

Activities
To build and sustain a PhysTEC Regional Network that meets the goals above, network leaders will generally be expected to:
   1. Recruit network participants, which may include physics faculty, education faculty and others engaged in physics or physical science teacher education in the region
   2. Organize a network meeting at least once per year, possibly in conjunction with another related meeting of physicists, science educators, or science teachers
   3. Facilitate virtual interactions between meetings
   4. Engage network members in learning about PhysTEC resources and membership
   5. Lead strategic planning for the network, including identification of shared goals and activities and establishing planning timelines.

Proposals that include additional activities that also help advance the goals of the PhysTEC Regional Networks program are welcome.

PhysTEC Resources
Network leaders will be expected to promote PhysTEC resources shown to be useful for strengthening physics teacher education programs, including the Physics Teacher Education Program Analysis Rubric, Get the Facts Out recruiting resources, and other reports. New resources will be shared with network leaders as they become available, and creative new ideas for improving physics teacher education in a region are also welcome in response to this RFP.

FUNDING
Up to $15,000 is available to build and sustain each selected PhysTEC Regional Network over a two-year period. Up to two PhysTEC Regional Networks will be awarded in this request for proposals.

ELIGIBILITY
We encourage a team of network leaders to apply, and applications must designate one primary network leader who will serve as the PhysTEC contact. The primary network leader should be located at a university or four-year college in the U.S. that is a PhysTEC Member Institution. Additional network leaders or co-applicants may be from any institution of higher education or non-profit entity.
Networks may span a single state, a few states, or a region of a large state. To find institutions that have active physics teacher preparation programs in a given region, it may be useful to consult the National Report Card on Physics Teacher Preparation.

APPLICATIONS

Applications are due July 2, 2020 at 5 p.m. local time. Email applications as an electronic attachment in PDF format to David May at may@aps.org. Late applications will not be accepted. If you intend to submit an application, please inform David May at may@aps.org by June 22. PhysTEC welcomes inquiries and consultation during the application writing process. Please contact David May (email: may@aps.org) or Monica Plisch (email: plisch@aps.org). Review criteria listed below indicate how applications will be evaluated.

Project description

The project description should be a maximum of three pages. Text should be written in Arial 10-point font or larger with at least one-inch margins. Applications must include and clearly identify the following elements in the project description section:

- **Background.** Identify the state or region for your network and describe the regional context. Relevant contexts might include, for example, the state policy environment, the university system context, regional needs for PTE, or synergistic initiatives. Be sure to identify challenges and opportunities that serve as motivation for your network goals.

- **Network goals.** Give a numerical goal for the expected size of the network after two years (institutions and people), and define any other major goals you have for the network during the award period. Briefly describe metrics and other indicators that you will use to determine progress toward achieving your goals.

- **Network members.** Include a list of institutions to be targeted for network membership and describe the types of institutions included (public/private, size, demographics, etc.). Also include a brief description of the faculty to be targeted, including any PTE leaders or other expertise or connections that align with your network goals.

- **Network leader(s).** Describe the relevant expertise and position(s) of each network leader. Also describe the responsibilities of each network leader with respect to recruiting, developing and sustaining the network. Indicate a lead institution for the regional network to manage the contract.

- **Project activities.** Describe specific plans to address each of the five general network activities listed above in the Activities section. You are welcome to include any additional activities that help advance the goals of the PhysTEC Regional Networks program.

- **Sustainability.** Describe how administrators and other stakeholders will be informed of network activities and their support will be cultivated. Indicate plans and any commitments to sustain key activities after the PhysTEC award period ends.

Additional application sections

None of the sections listed below will count toward the page limit for the project description.

- **Project summary.** Include a one-paragraph abstract suitable for the web.

- **Biographical sketches.** Provide a NSF-style, two-page CV for each network leader.

- **Letters of support (optional).** Any letters of support should include specific commitments of resources or other contributions.
- **Budget.** An NSF-style budget and budget justification are required with the application. A budget template (Excel download) may be found [here](#). Include a budget for each project year and a summary budget for the entire project, for up to $15,000.
  - Participant costs, i.e. for meetings, should not incur any indirect costs, in alignment with NSF guidelines.
  - Travel expenses for at least one network leader to attend the 2021 and 2022 PhysTEC Conferences must be included in the budget.
  - A budget for external evaluation is not necessary, as the PhysTEC project has an external evaluator. Expenses related to internal evaluation (e.g. surveys to gather information from network members) are allowable.
- **Budget justification.** The budget justification should include a description of each budget line item.

**APPLICATION 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 applications. Anonymous comments from the panel discussion will be sent to each applicant. Regional Networks will be announced in late July 2020 after the entire process is completed. Funding will begin 1 August 2020.

**Review criteria**

Panels will use the following criteria during review of applications.
- Faculty capacity (Goal 1) – *To what extent does the proposed plan strengthen the capacity of network faculty to improve PTE? How does it address faculty learning, engagement, collaboration in a network, and recognition?*
- Faculty action (Goal 2) – *To what extent does the proposed plan catalyze network faculty to take action to improve PTE across the network? How much support will faculty have to take steps to improve PTE at their home institutions and in the region as a whole?*
- Network leadership – *Are network leaders well positioned to implement proposed activities? What is the knowledge and experience of the PI in physics education?*
- Institutional support – *What institutional resources (at university, system, or state levels) will be leveraged in support of a successful network, including network sustainability? How will appropriate administrators stay informed about and connected to the project?*
- Diversity – *How do the types of institutions and geographic location extend the portfolio of PhysTEC Member Institutions? What is the potential of the project to increase diversity among physics teachers?*

**AWARD ADMINISTRATION**

Applicants chosen to run Regional Networks will be expected to participate in project activities described below.

**Contract**

PhysTEC (via APS) will negotiate a contract with the lead institution for each regional network award. The contract will include a list of activities to be carried out during the project year.
(August 1 to June 30 for the first year, July 1 to June 30 for the second year), and include a budget for each project year. Expenses will be reimbursed on a quarterly basis, in response to invoices generated by the lead institution that include allowable costs.

Communications
The primary network leader will serve as the point of contact with PhysTEC staff, who will communicate with this person on all project matters. Communication will be facilitated by periodic videoconferences, and an online drive will be used to facilitate document exchange. In addition, the primary network leader or their designee will be required to attend the PhysTEC Conferences in 2021 and 2022 to facilitate sharing of network activities with the national PhysTEC community (travel expenses will be reimbursed). Network leaders will also be asked to facilitate communications with the PhysTEC external evaluator and assist with gathering data from network members.

Reports
A brief annual report will be required at the end of each project year, including a description of activities, progress toward achieving goals, and annual data requested by the project. Data will include numbers of physics teachers prepared and program enrollments at each member institution, PTEPA Rubric results, and perceptions survey 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.

To date, the PhysTEC project has funded over 50 institutions as Supported Sites to build model physics teacher education programs. These PhysTEC Supported Sites have demonstrated significant successes in increasing the number of highly-qualified physics teachers. A coalition of over 325 PhysTEC Member Institutions is served by an annual national conference and other opportunities to improve and promote physics teacher education. In addition, the project has conducted research, developed assessment instruments, and published a number of books, reports, and peer-reviewed articles on physics teacher preparation. More information is available on the project website at www.PhysTEC.org.