2012 Request for Proposals: PhysTEC

Theodore Hodapp
Director of Education and Diversity
American Physical Society
## Need for High School Teachers

### Relative Demand by Field: Highest Demand Fields

#### Considerable Shortage (5.00 - 4.21)

<table>
<thead>
<tr>
<th>Field</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics</td>
<td>4.26</td>
</tr>
</tbody>
</table>

#### Some Shortage (4.20 - 3.41)

<table>
<thead>
<tr>
<th>Field</th>
<th>Score</th>
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<tbody>
<tr>
<td>Spec. Ed. – Multi-categorical</td>
<td>4.15</td>
</tr>
<tr>
<td><strong>Mathematics</strong></td>
<td>4.13</td>
</tr>
<tr>
<td>Chemistry</td>
<td>4.12</td>
</tr>
<tr>
<td>Spec. Ed.</td>
<td>4.06</td>
</tr>
<tr>
<td>Spec. Ed. – Mild/Moderate Disabilities</td>
<td>4.04</td>
</tr>
<tr>
<td>Spec. Ed. – Learning Disability</td>
<td>4.03</td>
</tr>
<tr>
<td>Spec. Ed. – Mental Retardation</td>
<td>4.03</td>
</tr>
</tbody>
</table>

2010 AAEE (*American Association of Employment in Education*)
Educator Supply and Demand in the United States Report
HS Physics Teacher Education

Source: AIP Statistical Research Center

www.PhysTEC.org
High school classes taught by teacher with degree in the field

Source: Schools and Staffing Survey
High School Students Studying Physics

1000's of students

- Honors/AP/2nd Year
- Regular
- Conceptual/Physics First

Source: AIP Statistical Research Center

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Undergraduate Physics and STEM majors

Source: NCES
Physics Departments with Teacher Education Programs (36% of all)

Number of institutions

Number of graduates in 2-year period
PhysTEC Project 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
PhysTEC Project

National Coalition

- National Conference
- Recognized Programs
- Community Leaders
- Sharing Innovative Ideas
- Broad Dissemination
- 240 member institutions

Demonstration Projects

- Comprehensive (<$100k/yr)
  - All key elements
  - Teacher in Residence
- Targeted sites (<$25k/yr)
  - Innovative ideas
  - Possible: TYC, LAs, TIRs
- National models
- Institutional support
Funded Sites

- Arizona State University
- Ball State University
- Boston University
- Cal Poly, Pomona
- Cal Poly, San Luis Obispo
- Cal State, Long Beach
- Cal State, San Marcos
- Chicago State University
- Cornell University
- Florida International University
- James Madison University
- Middle Tennessee State University
- Seattle Pacific University
- SUNY Geneseo
- Towson University
- University of Alabama, Tuscaloosa
- University of Arizona
- University of Arkansas
- University of Colorado, Boulder
- University of Minnesota
- University of Missouri
- University of North Carolina, Chapel Hill
- University of Wisconsin, La Crosse
- Virginia Tech University
- Western Michigan University
PhysTEC Project Outcomes

*Number of physics certifications averaged over 319 institutions in 15 states. Note that all PhysTEC teachers are more highly qualified than the minimum standard in most states.
Seattle Pacific began funding in 2006; all other sites represented began funding in 2007. Florida International and North Carolina graduated no teachers during the pre-funding period.
Teacher Education is a Local Issue

PhysTEC Teachers: 54 respondents

Teach within X miles of their institution
- 60% 50 miles
- 25% 50-200 miles
- 15% >200 miles

*NOTES*

The 54 respondents account for less than one-third of all PhysTEC graduates, so it does not necessarily follow that this distribution pattern holds for all PhysTEC graduates.

In this small sample, there were no statistically significant differences for graduates from schools located in smaller versus larger cities (less than 100,000 versus more than 100,000).

The placement of the dots in this graph is representative only and does not necessarily indicate the actual location of respondents. The PhysTEC institution is indicated by the star.
Project Activities

- National Conference on Physics Teacher Education:
  - **Feb 2010** Theme: *Policy/Diversity* (Washington DC)
  - **May 2011** Theme: *Building Sustainable Programs* (Austin)
  - **Feb 2012** Theme: *New Paradigms* (Ontario, Calif.)
  - **16/17 Mar 2013** Theme: *Preparing the Next Generation* (Baltimore)

- Physics Teacher Education Digital Library [www.PTEC.org](http://www.PTEC.org)

- National workshops of exemplar programs (RTOP, LAs, PCK, Increasing majors); Regional workshops

- Books: Scholarship of Physics Teacher Education; Best practices

- Sponsoring: National taskforce on teacher education in physics

- Collaborative Associations (ACS, APLU, NMSI)
Key Components

• Recruitment
• Early teaching experience
• Learning Assistants
• Course transformation
• Induction and mentoring
• Collaboration (physics, education, schools)
• Teacher-in-Residence (Master Teacher)
• Teacher Advisory Groups
• Sustainability
• Assessment
RFP Elements

• Site Types (*Targeted, Comprehensive*)
• Funding (*up to $25k/yr, $100k/yr for 3 years*)
• National models
• Key components
• Expectations (*reporting, data, meetings*)
• Review process
• Timeline

http://www.phystec.org/solicitation
Comprehensive sites

- Implement all PhysTEC project key components
- Hire a TIR
- Commit to significant departmental and institutional effort
- Agree to provide data during and after project funding
- Sustained at level commensurate with funding
- Significant increase in teachers educated
- Maximum funding $100k/year for 3 years.
Targeted sites

• Do not need to implement all key components
• Commit to increasing number of certified HS physics teachers; provide data during and after project funding
• Must advance project goals, but can be “out of the box”
• TIR not required, but some have had part-time TIRs
• Examples include:
  • Connections to 2-year colleges
  • UTeach emphasis on physics
  • Programs at PUIs
• Maximum funding $25k/year for 3 years.
Proposal Narrative

• Introduction / Summary (state type of proposal)
• Goals of project. What can you realistically do?
• Profile of department / setting
• Existing program (how does this fit into existing efforts)
• Local personnel
• How you will implement PhysTEC key components
• Project budget
• 3 page limit (Comprehensive); 2 page limit (Targeted)
Budgetary Information

• Maximum amount: $25k/year (Targeted) or $100k/year (Comprehensive)
• Choose funding that will be sustainable, appropriate to startup at your institution
• TIR a major expense for Comprehensive Projects
• Overhead rate: 24.73% (no indirect on TIR salary/benefits or Participant Support lines)
• Fringe: 33%
• Matching funds
Evaluation Criteria

• Potential to increase number of pre-service HS physics teachers
• Implement PhysTEC key components
• Become a national model: How will you distinguish yourself from previously funded sites? How will you add to the PhysTEC model?
• Appropriate team, leadership
• Institutional support
• Improve diversity
What we do not fund

• New efforts without advance planning and buy-in
• Unsustainable changes
• Unconnected programs (e.g., LAs without a more complete program)
• *Comprehensive* programs at UTeach sites
• Programs without departmental resources and support
• In-service teacher education
Timeline

- RFP: October
- 2-3 page pre-proposal: **26 October, 5 p.m.** local time
- Responses by 26 November
- Full (8/15 page NSF style) proposal: **11 January 2013**
- Proposal review (late January)
- Funding decision: Spring 2013
- Project Start: August 2013
- PhysTEC 2013 Meeting: 16-17 March 2013 (held in tandem with APS March meeting); Baltimore, MD

[http://www.phystec.org/solicitation](http://www.phystec.org/solicitation)