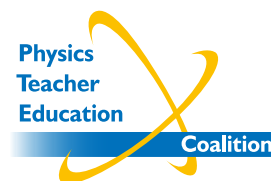


PHYSICS TEACHER EDUCATION COALITION

PROJECT SYNOPSIS



PROJECT OVERVIEW

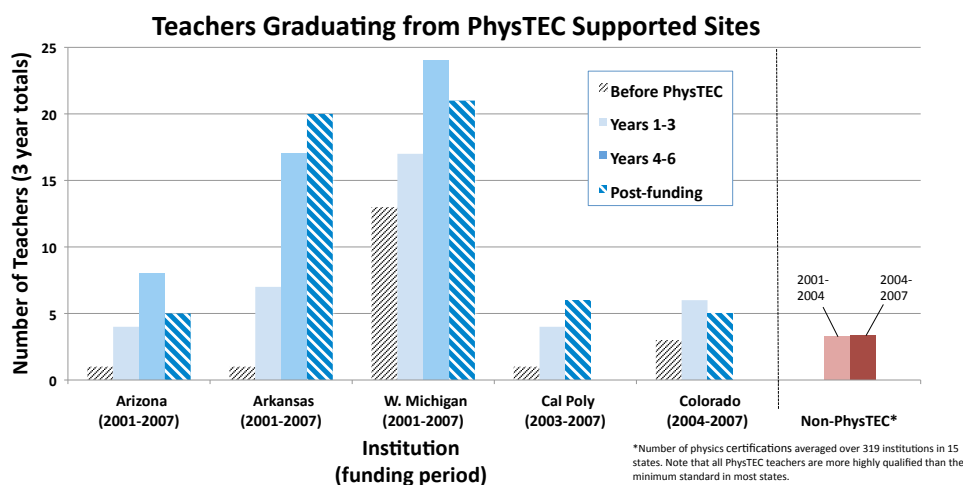
The mission of the Physics Teacher Education Coalition (PhysTEC) is *to improve and promote the education of future physics teachers*. Specifically, the project aims to:

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

PhysTEC is a partnership between the American Physical Society (APS) and the American Association of Physics Teachers (AAPT). The project is funded primarily by the National Science Foundation, and has also received significant funds from individual and corporate donors through the APS's 21st Century Campaign, as well as direct and in-kind support from each of its partner institutions.

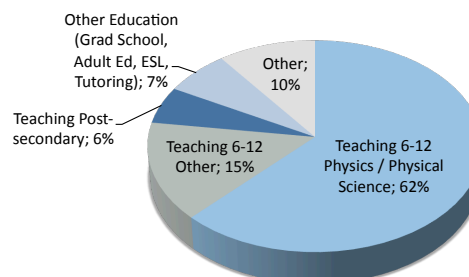
KEY PROJECT SUCCESSES

The PhysTEC project can report significant findings and results. The number of teachers graduating each year from PhysTEC-funded institutions has greatly increased since the project began in 2001. The project has current employment information for nearly 80% of these teachers, of whom over three-quarters are teaching in a K-12 school. PhysTEC sites have also improved the preparation of about 500 elementary teachers per year through implementation of research-based curricula in physical science courses that these teachers take.



Funded sites have developed and refined models of recruiting, course transformation, early teaching experiences, induction, and mentoring. Teachers-in-Residence and Teacher Advisory Groups have helped to create authentic collaborations among physics departments, education schools, and local school districts. Most importantly, these sites have found ways to sustain gains beyond the period of external funding. The project is engaged in an effort to study and document sustainability at its funded sites.

Early Careers for PhysTEC Graduates



PHYSTEC SUPPORTED SITES

PhysTEC Supported Sites are selected colleges and universities that develop their physics teacher preparation programs into national models with substantial project support. They are chosen based on their potential to make substantial increases in the number of teachers they graduate, and to develop programs that will serve as national models. To date, the project has supported 22 sites, and expects to fund at least an additional 12 using a combination of NSF and private funding. Sites no longer receiving funding remain in contact with the project, advise currently funded sites, and continue to provide project data.

PhysTEC Supported Sites

Institution	Term
Boston University	2011-2014
California State University, San Marcos	2011-2014
State University of New York at Geneseo	2011-2014
Virginia Polytechnic Institute and State University	2011-2014
California State University, Long Beach*	2010-2013
Chicago State University*	2010-2013
Middle Tennessee State University	2010-2013
Towson University†	2010-2013
Cornell University	2007-2010
Florida International University*	2007-2010
University of Minnesota	2007-2010

Institution	Term
University of North Carolina	2007-2010
Seattle Pacific University	2006-2009
Towson University†	2004-2008
University of Colorado	2004-2008
Cal Poly, San Luis Obispo	2003-2007
Ball State University	2001-2008
Oregon State University§	2001-2004
University of Arizona	2001-2008
University of Arkansas	2001-2008
Western Michigan University	2001-2008
Xavier University*§	2001-2005

* Minority-Serving Institution.

† Towson University's first PhysTEC project focused on elementary teacher education. Its second project is focused on secondary teacher education.

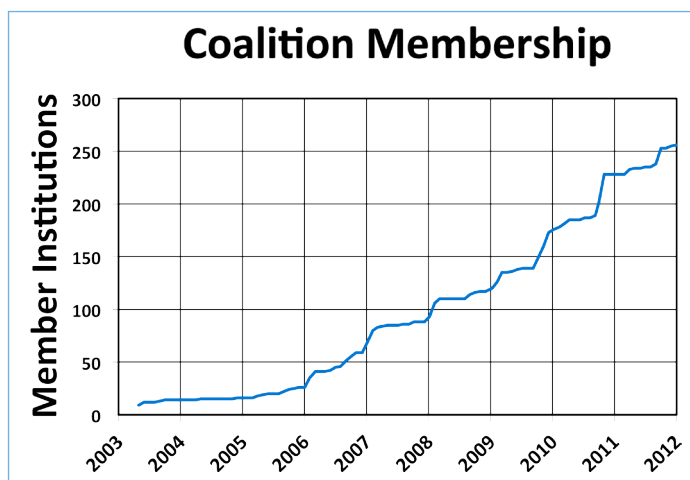
§ Did not complete funding period.

COALITION MEMBER INSTITUTIONS

In addition to the PhysTEC Supported Sites, the project has built a broad Coalition of institutions committed to improving physics and physical science teacher education. The goals of the Coalition are to:

- Build a network of institutions engaged in reforming physics teacher education
- Promote and disseminate successful programs, methods, and ideas
- Advocate nationally for improving science teacher education.

Coalition membership is free. Coalition institutions do not receive direct funding, but are invited to participate in project conferences and workshops at a reduced rate.



PHYSTEC KEY COMPONENTS

The PhysTEC project has identified a set of interrelated key components shared by successful programs. These include institutional components that provide the context for teacher education efforts, and specific programmatic elements that form the structure of a preservice teacher's educational experience.

Structural Elements

- **Champion**—A change agent at the university who ensures program success.
- **Teacher-in-Residence**—An experienced master teacher who applies classroom wisdom to the tasks of recruiting, educating, and supporting new teachers.
- **Collaboration**—Involves physics departments, education schools, and local school districts working together to create a coherent and supportive path to becoming a teacher.
- **Institutional Commitment**—Internal financial support to sustain program elements, and intellectual and cultural support for those who choose to go into teaching.
- **Assessment**—Ongoing formative and summative assessments are crucial to measuring program success, and ensure project activities support project goals.

Program Elements

- **Recruitment**—A highly visible and multifaceted effort is necessary to attract undergraduates to physics teaching careers.
- **Early Teaching Experiences**—Provide students, early in their studies, with an authentic teaching experience can give them a low-pressure taste of the rewards and challenges of teaching.
- **Pedagogical Content Knowledge**—Subject-specific knowledge about teaching that includes student difficulties and prior conceptions, and content-specific instructional and assessment strategies.
- **Learning Assistants**—Talented undergraduates who help faculty members make large-enrollment courses more interactive by teaching and mentoring their peers.
- **Induction & Mentoring**—Critical support during for new physics teachers during the first few years in the classroom, when they often experience isolation and a lack of support from their schools.

CONFERENCES AND WORKSHOPS

PhysTEC conferences and workshops disseminate successful programs, provide opportunities for networking, and build widespread support for physics teacher education reform.

PhysTEC Conferences

Year	Location	Attendance
2013	Baltimore, MD	
2012	Ontario, CA	124
2011	Austin, TX	120
2010	Washington, DC	100
2009	Pittsburgh, PA	108
2008	Austin, TX	117
2007	Boulder, CO	112
2006	Fayetteville, AR	85
2005	Muncie, IN	82

PhysTEC Workshops & Regional Conferences

Year	Location	Topic/Region
2012	Ontario, CA	California
2011	Boulder, CO	Learning Assistants
2010	Boulder, CO	Learning Assistants
2010	New Brunswick, NJ	Pedagogical Content Knowledge
2009	Pittsburgh, PA	APLU Leadership
2008	Seattle, WA	Northwest US
2007	Boulder, CO	Learning Assistants
2007	Chapel Hill, NC	North Carolina
2006	College Park, MD	Reformed Teacher Observation Protocol



MAJOR INITIATIVES AND PRODUCTS

PhysTEC Noyce Project

The PhysTEC Noyce Project awards NSF-funded scholarships of up to \$15,000 per year to future teachers from six previously funded PhysTEC institutions. Four scholarships were awarded in 2012, ten were awarded in 2011, thirteen were awarded in 2010, and nine were awarded in 2009.

National Task Force on Teacher Education in Physics

The APS/AAPT/AIP Task Force is composed of physics and education faculty, university administrators, and high school teachers who have been closely involved in national physics education efforts. Its charge is to survey the US physics teacher preparation scene, identify best practices for increasing the number of qualified physics teachers, and establish research, funding, and policy priorities. The task force expects to publish its full report in 2012.

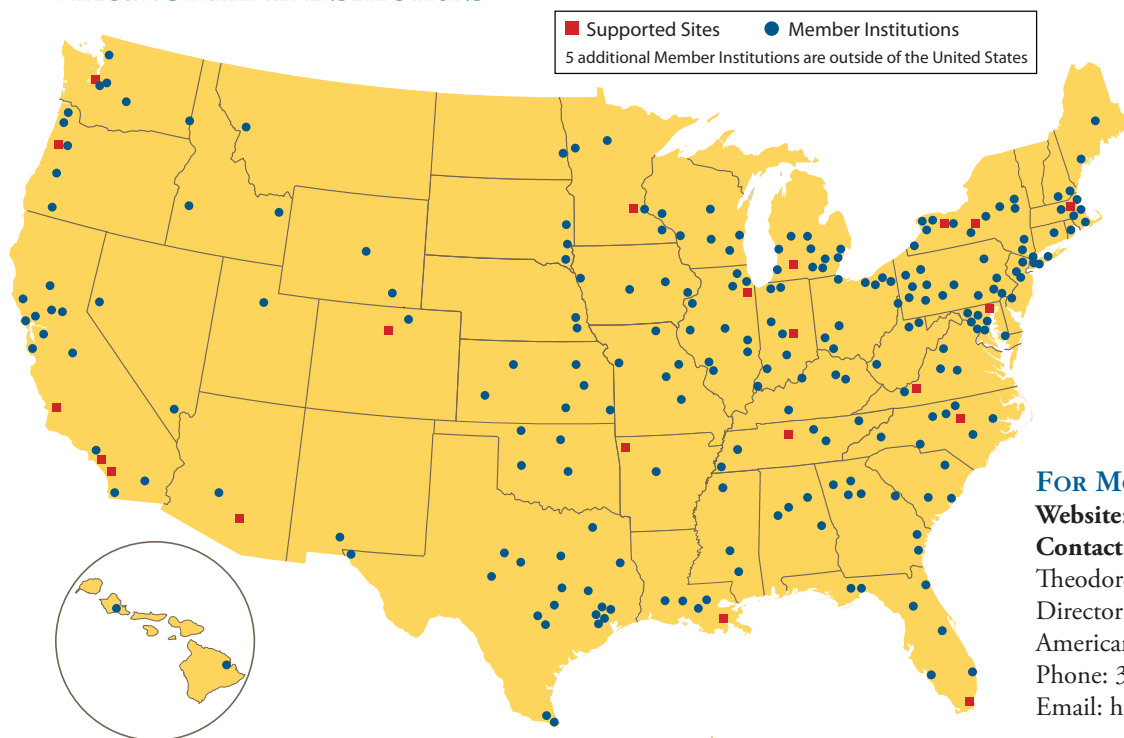
Major Publications

- National Task Force on Teacher Education in Physics Report: expected publication in 2012
- Book: *Teacher Education in Physics: Research, Curriculum, and Practice*, published December 2011
- “Preparing High School Physics Teachers,” *Physics Today*, February 2009
- *PhysTEC News* (project newsletter): Annually beginning 2008
- Articles in *APS News* and *APS Forum on Education Newsletter*: Numerous
- Articles published in peer-reviewed journals: Numerous

COLLABORATIONS

- **American Chemical Society:** Chemistry Teacher Education Coalition
- **Association of Public and Land-grant Universities:** Science and Mathematics Teacher Imperative
- **CompADRE:** PhysTEC Digital Library
- **UTeach Program:** Joint 2011 PhysTEC-UTeach Conference
- **California State University:** Math and Science Teacher Initiative

PHYSTEC MEMBER INSTITUTIONS



FOR MORE INFORMATION

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21st Century Campaign
A SCIENCE EDUCATION INITIATIVE

