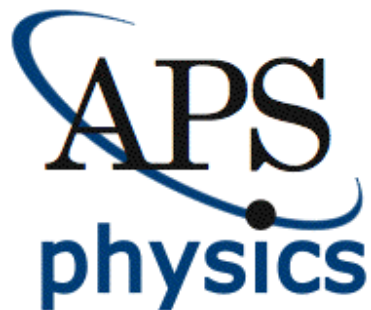




CalTeach / MSTI Meeting

*2 February 2012
Ontario, California*

PhysTEC Project Overview



Theodore Hodapp
Director of Education and Diversity
American Physical Society

Need for High School Physics Teachers

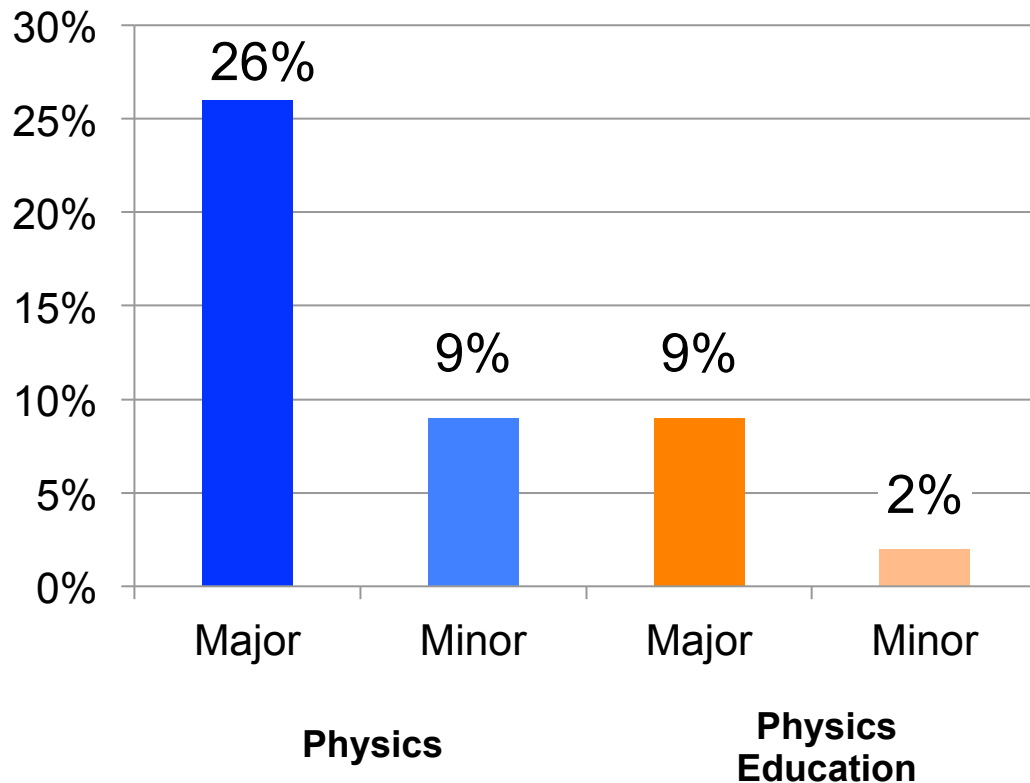
Relative Demand by Field: Top 13 High Demand Fields

Considerable Shortage: 5.00 - 4.21; Some Shortage: 4.20 - 3.41

Mathematics Education	4.21
Physics	4.18
Multicategorical (Spec. Ed.)	4.17
Emotional/Behavioral Disorders (Spec. Ed.)	4.14
Chemistry	4.14
Severe/Profound Disability (Spec. Ed.)	4.13
Mild/Moderate Disability	4.06
Mental Retardation (Spec. Ed.)	4.05
Dual Certification (Gen./Spec. Ed.)	3.95
Learning Disability (Spec. Ed.)	3.95
Bilingual Education	3.94
Hearing Impaired	3.93
Speech Pathology	3.91

2009 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

For comparison,
secondary teachers with a
major in the field (2004):

Science (all) 77%

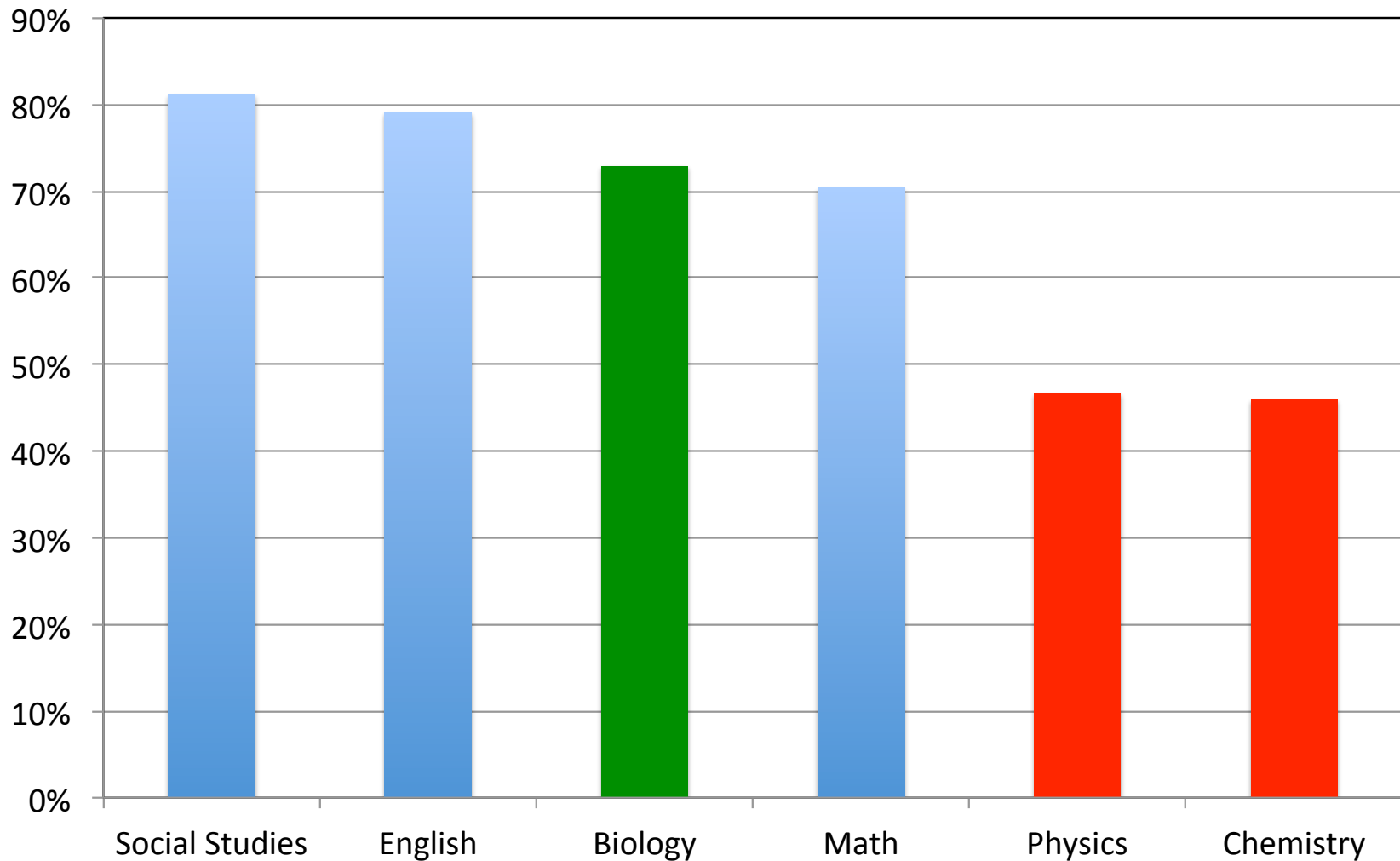
Math 61%

English 76%

Social Studies 79%

Source: Schools and staffing survey,
National Center for Education Statistics

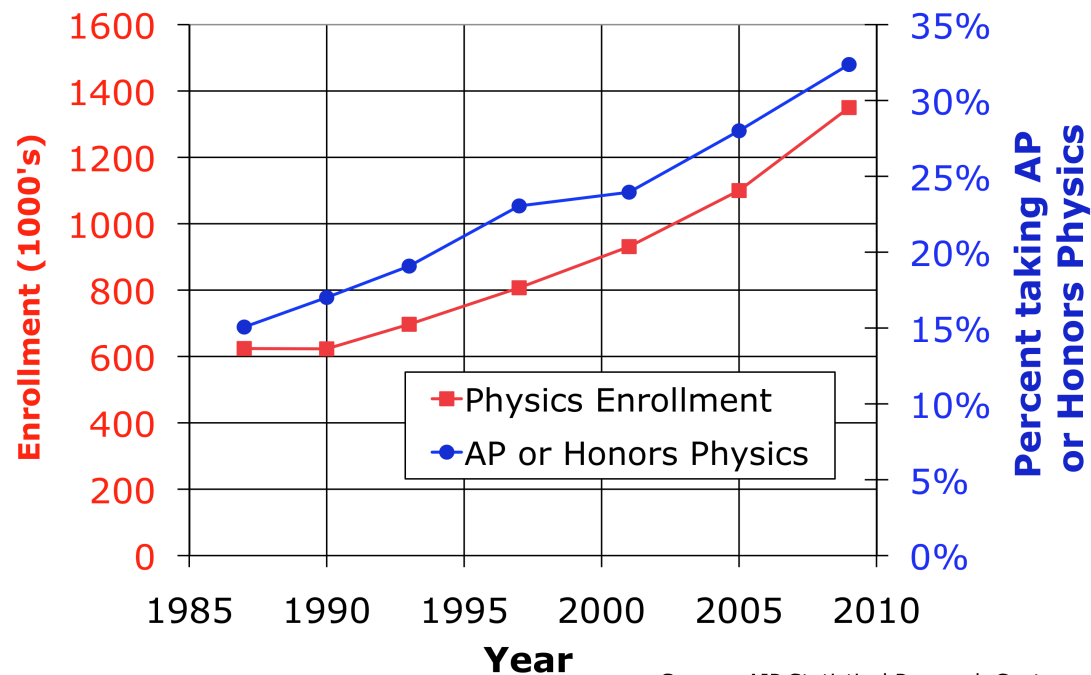
High school classes taught by teacher with degree in the field



Source: Schools and Staffing Survey

Demographics of High School Physics Teachers

- 27,000 Physics Teachers Nationwide
- 1,400 new physics teachers each year
- ~450 of these have a physics major or minor

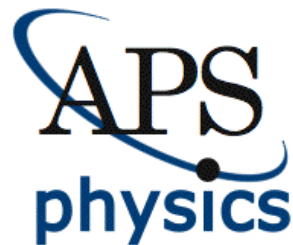


Source: AIP Statistical Research Center

- *Fraction* of students taking physics growing by 8% per decade

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





National Coalition

- National conference
- Community leaders
- Topical workshops
- Sharing innovative ideas
- Broad dissemination
- 255 member institutions



Demonstration Projects

- Comprehensive (< \$300k)
 - All key elements
 - Teacher in Residence
- Targeted sites (< \$75k)
 - Innovative ideas, smaller sites
- National models
- Institutional support
- Now 20 supported sites

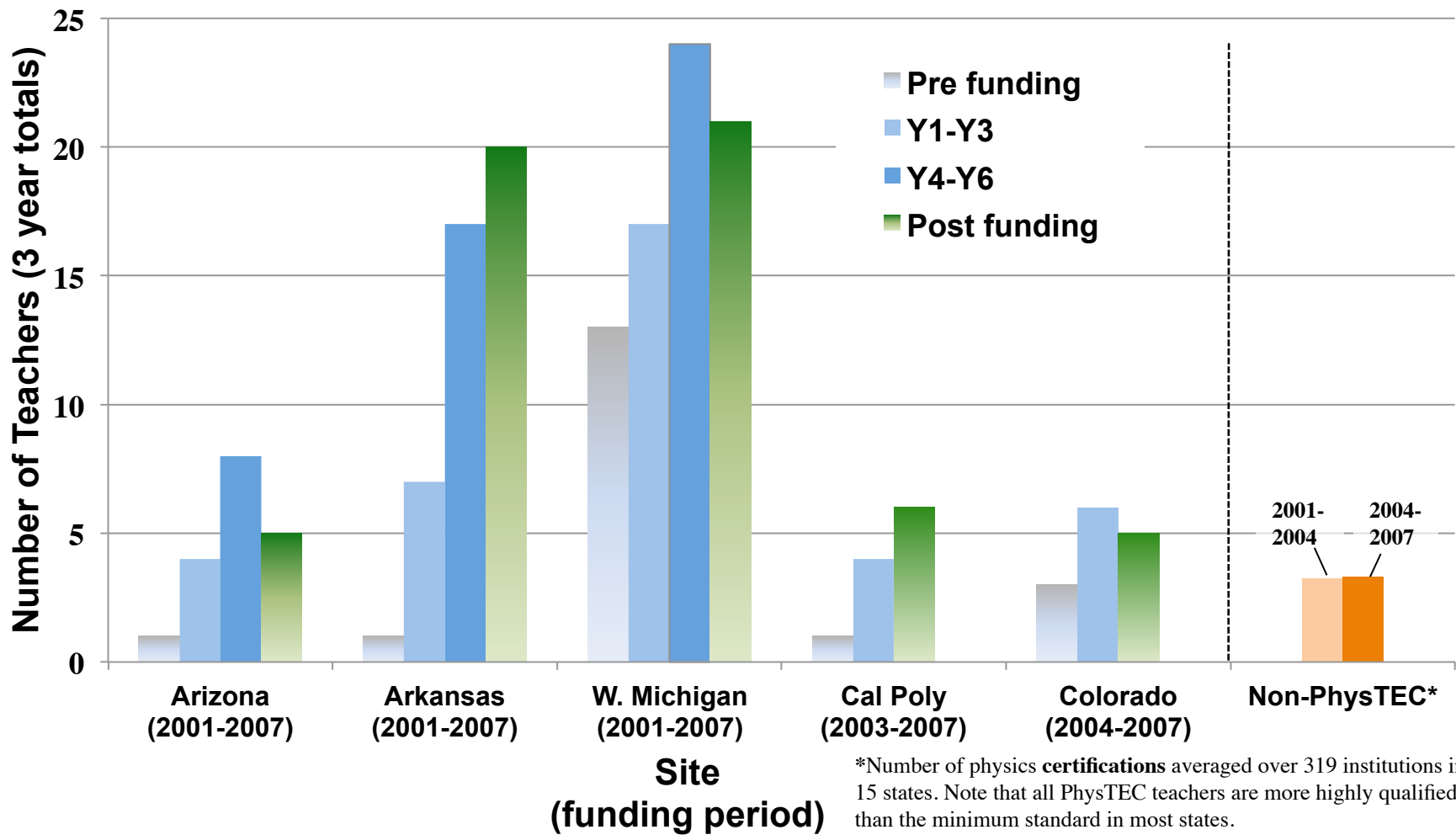


PhysTEC Key Components

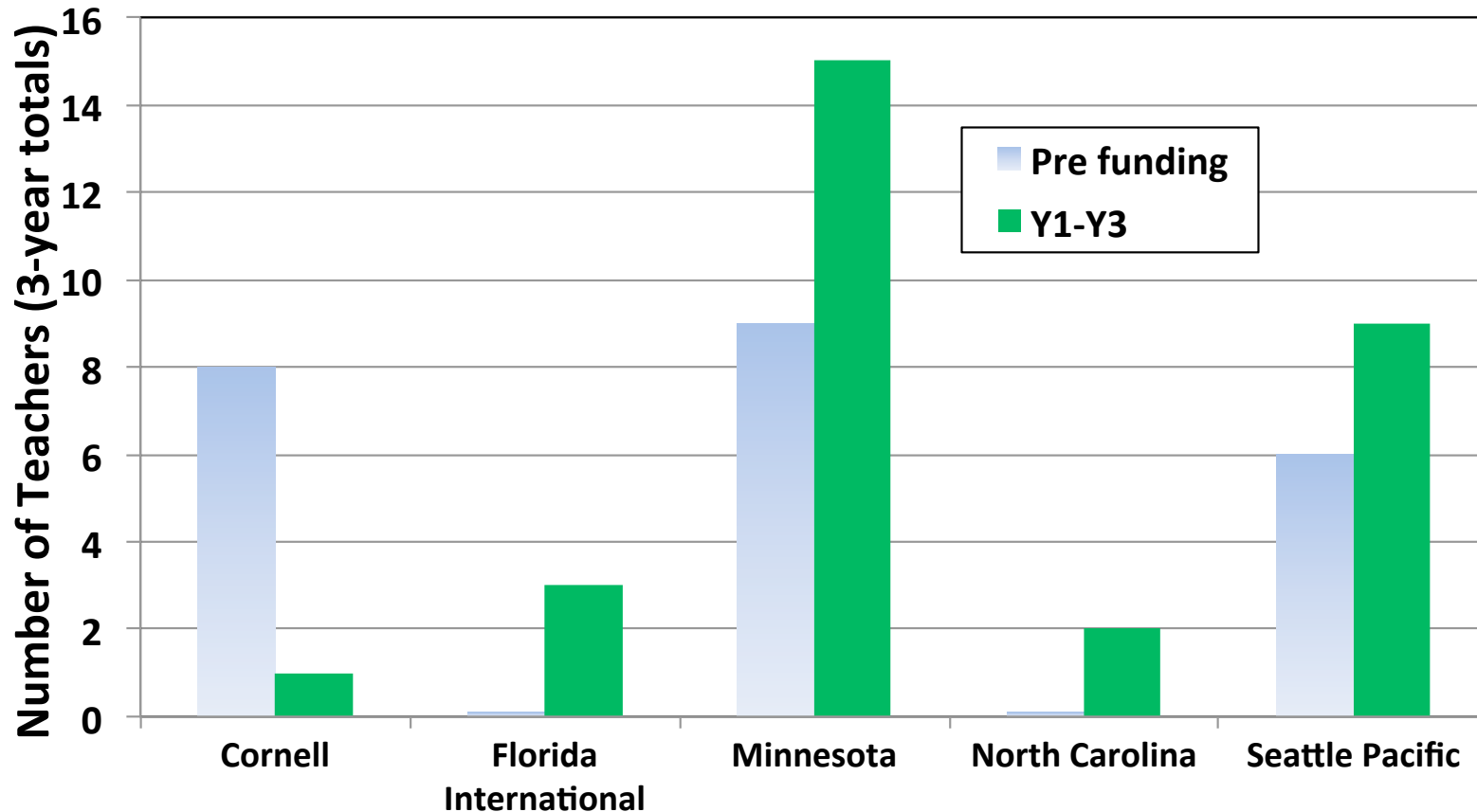
- Recruitment
- Teacher-in-Residence
- Course Reform
- Learning Assistants (exposure to teaching)
- Collaboration
- Teacher Advisory Groups
- Induction / Mentoring
- Sustainability

Its not rocket science...

PhysTEC Project Outcomes



PhysTEC Project Outcomes



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.

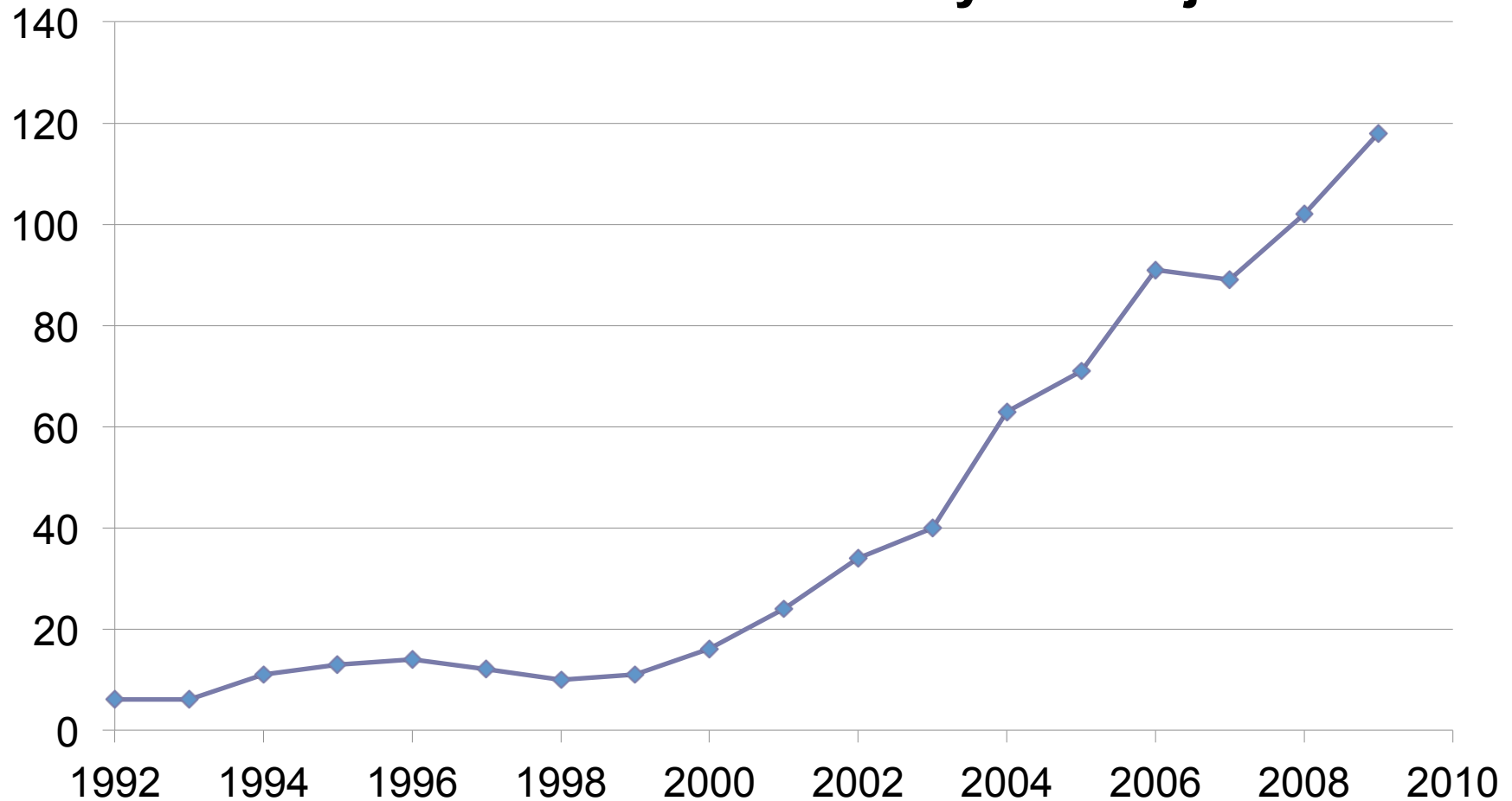
PhysTEC Member Institutions



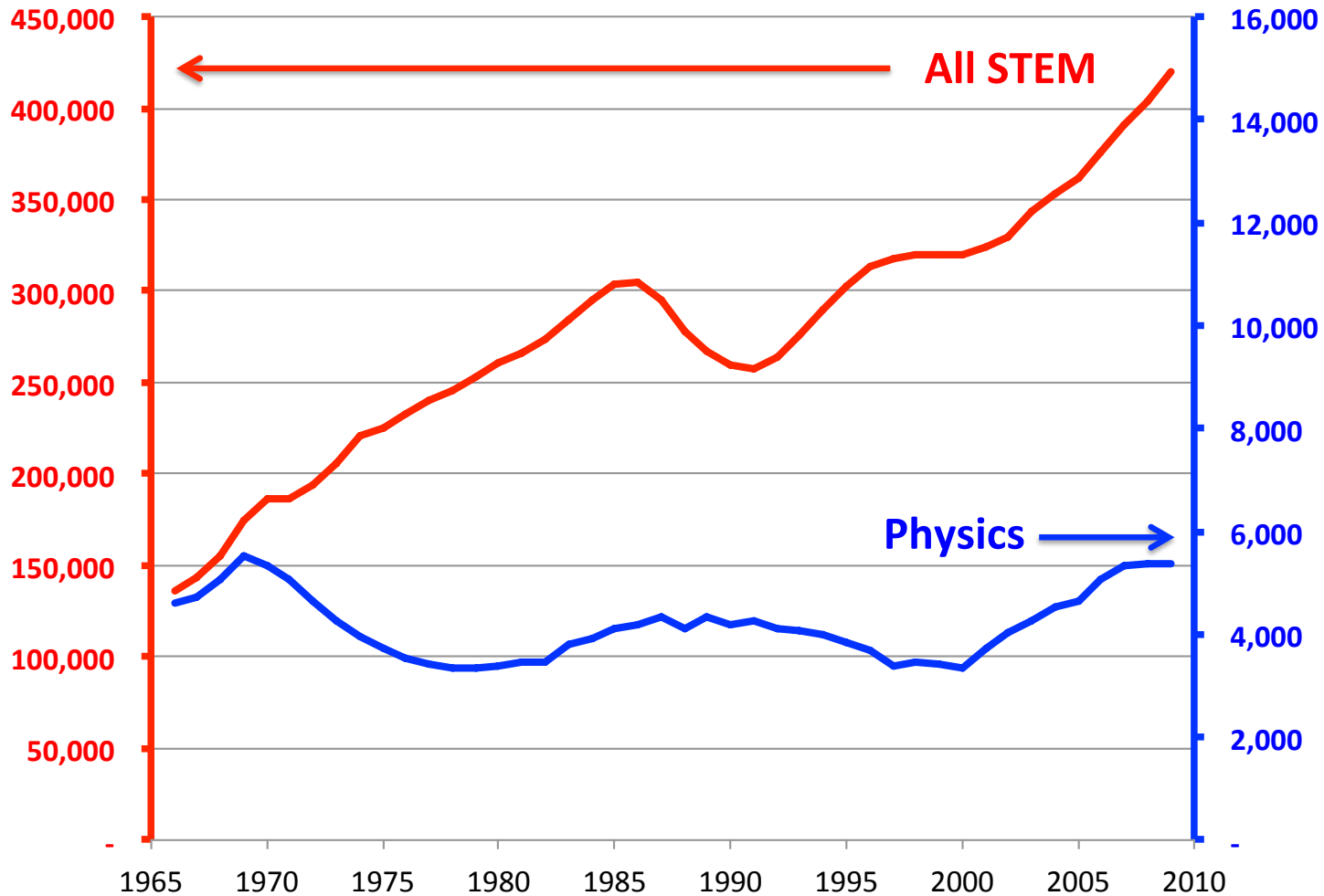
Key Element: Champion

- Promote/lead program at institution
- Contact with administration to build long-term support
- Faculty advocate
- Student advocate
- Obtain funding
- Bridge between Physics/Education/K-12 schools
- Knowledge of issues/literature
- Recruiting lead

Intended and Declared Physics Majors

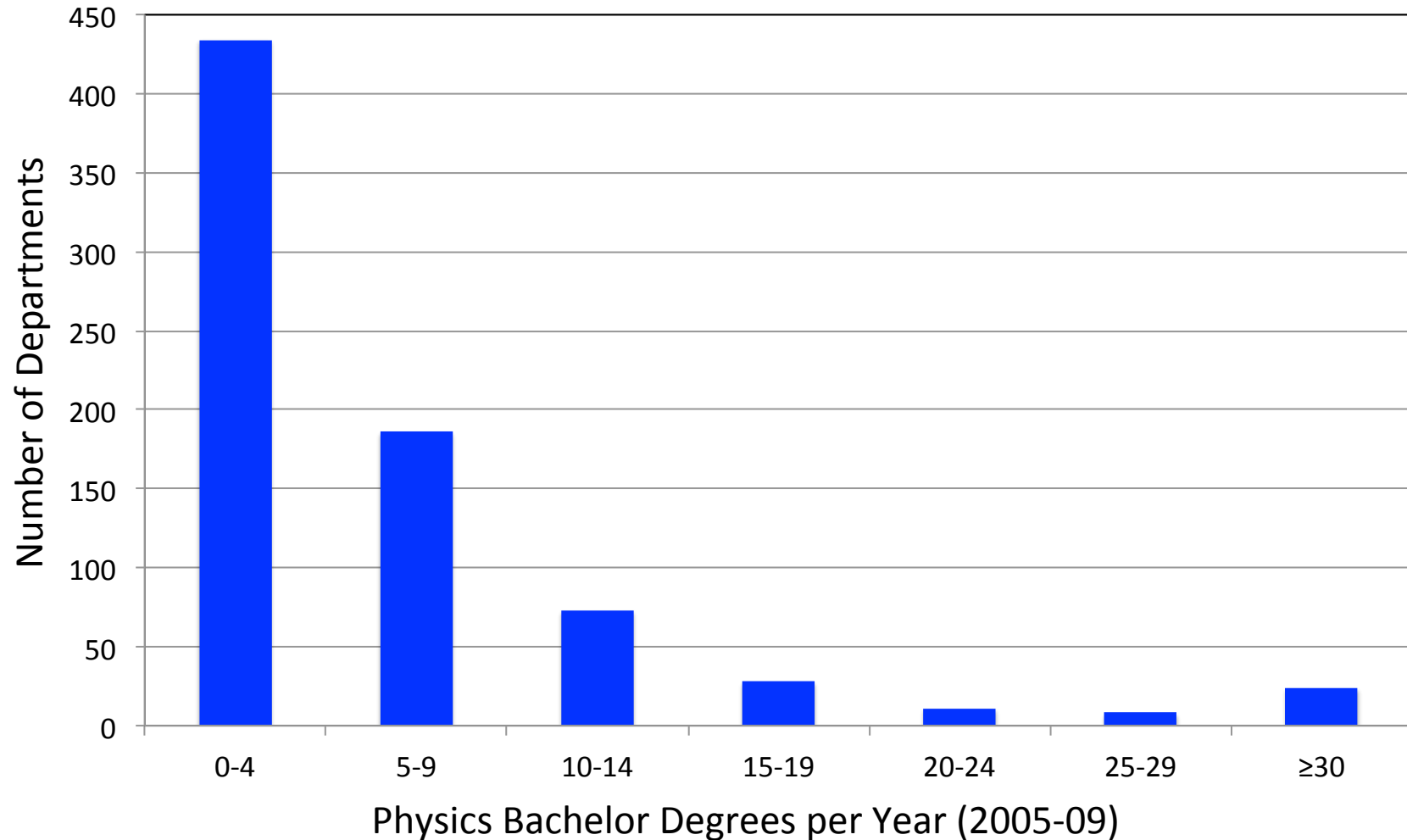


Undergraduate Physics and STEM majors



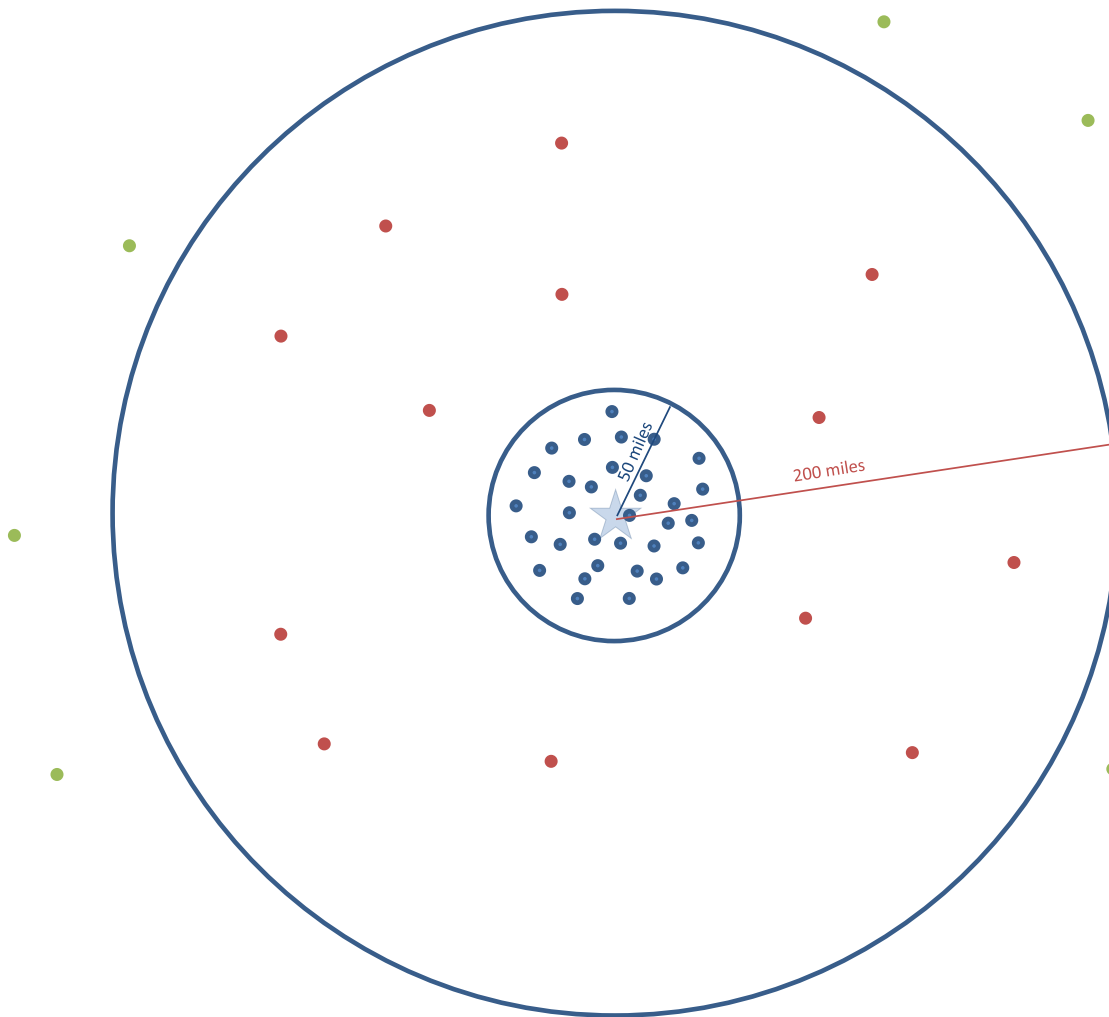
Source: NCES

Why Biology Doesn't Have Our Problem



Source: NCES

Teacher Education is a Local Issue

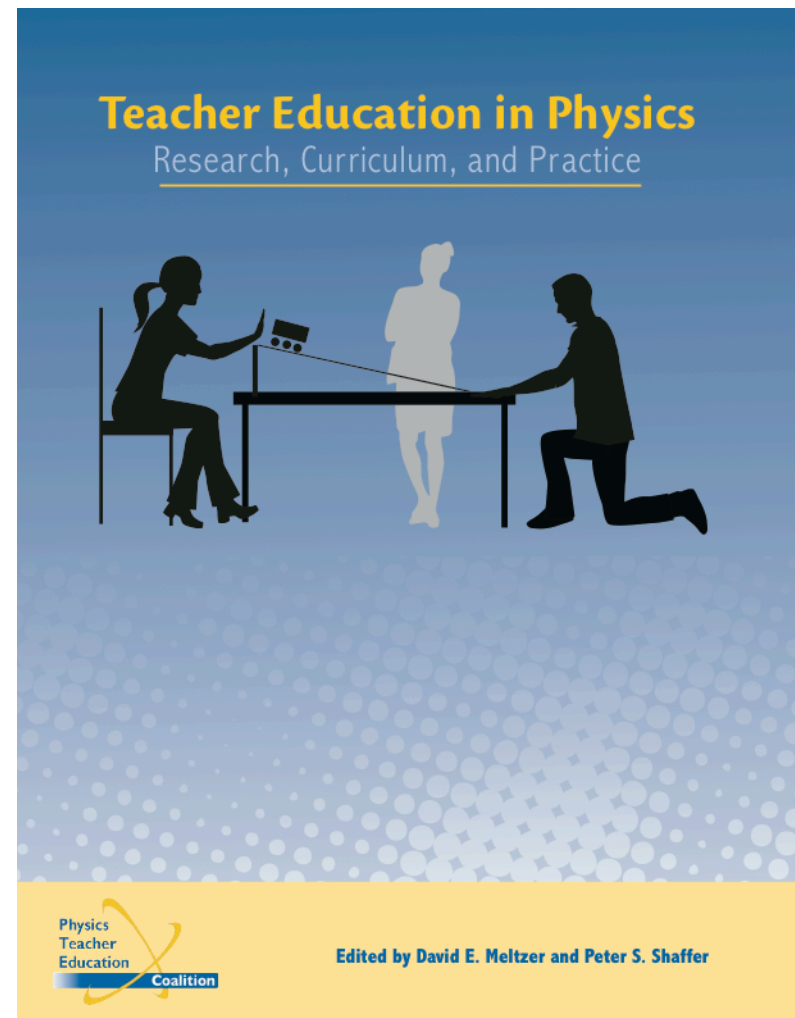


Teach within X miles of their institution

- 60% 50 miles
- 25% 50-200 miles
- 15% >200 miles

PhysTEC Teachers: 54 respondents

- Collection of scholarly articles on teacher education in physics
- All articles published in peer-reviewed journals
- Review article on research in physics teacher education
- Hardcopy sent to all physics departments



- 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)
- Physics Teacher Education Digital Library www.PTEC.org
- National workshops of exemplar programs (RTOP, LAs, PCK, Increasing majors)
- Regional workshops
- Book: Scholarship of Physics Teacher Education
- Sponsoring: National taskforce on teacher education
- Collaborative Associations (ACS, APLU, NMSI)