



PhysTEC: Physics Teacher Education Coalition

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www.PTEC.org

www.PhysTEC.org

Project Funding

- National Science Foundation
- Department of Education
- APS Campaign for the 21st Century



21st Century Campaign
A SCIENCE EDUCATION INITIATIVE

APS
physics

Teacher Shortages

U.S. Department of Education estimates that an **additional 2.2 million teachers** will be needed over the next decade, exceeding the annual production rate of new teachers.

More specifically, “hard-to-staff” schools in **high-poverty urban and rural districts will require more than 700,000 new teachers** in the next 10 years.

Many states also have identified specific subject-area shortages that exist across their schools in topics such as **math and science**.

Education Commission of the States
<http://www.ecs.org/clearinghouse/61/61/6161.htm>

Need for High School Physics Teachers

Relative Demand by Field

Fields with Considerable Shortage (5.00 - 4.21)

Emotional/Behavior Disorders	4.42
Severe/Profound Disabilities	4.35
Mathematics Education	4.28
Physics	4.26
Mental Retardation	4.26
Mild/Moderate Disabilities	4.23
Learning Disability	4.21

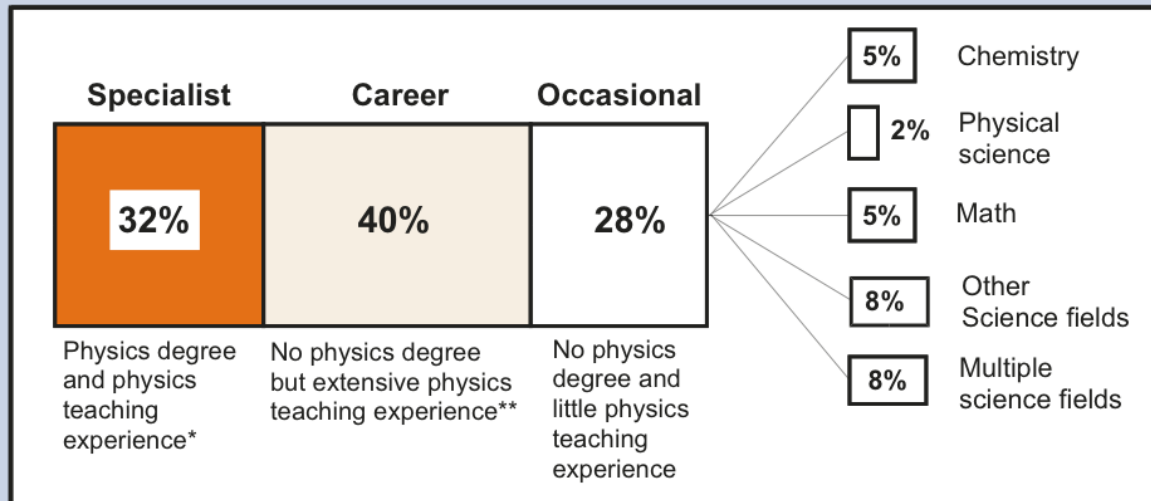
Fields with Some Shortage (4.20 - 3.41)

Chemistry	4.20
Multicategorical	4.20
Visually Impaired	4.19
Hearing Impaired	4.17
Bilingual Education	4.10
Technology Education	4.02

2002 AAEE
(*American
Association of
Employment in
Education*)
Educator
Supply and
Demand in the
United States
Report

Preparation of High School Physics Teachers

Teacher Specialization: Academic Training and Experience



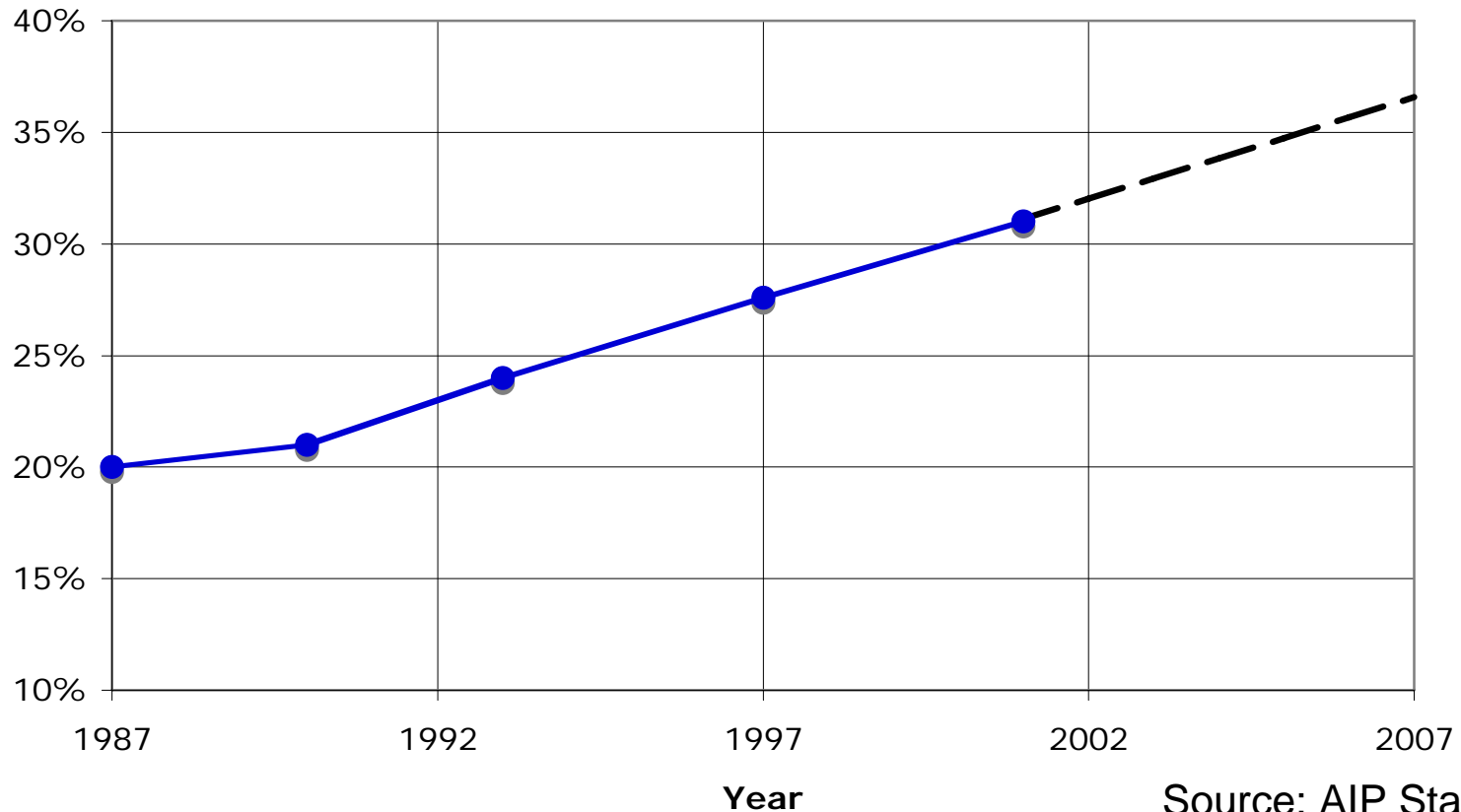
*Teachers with physics degrees but insufficient physics teaching experience are excluded from this figure (3%).

**Career physics teachers include those who have taught physics as much as, or more than, any other subject, or have taught it for ten or more years. The distribution of highest degree earned by career teachers was spread evenly across the sciences, with 29% in math/engineering, 25% chemistry, 22% biology, and 14% in other science fields.

AIP Statistical Research Center: 2000-01 High School Physics Survey

Demographics of High School Physics Students

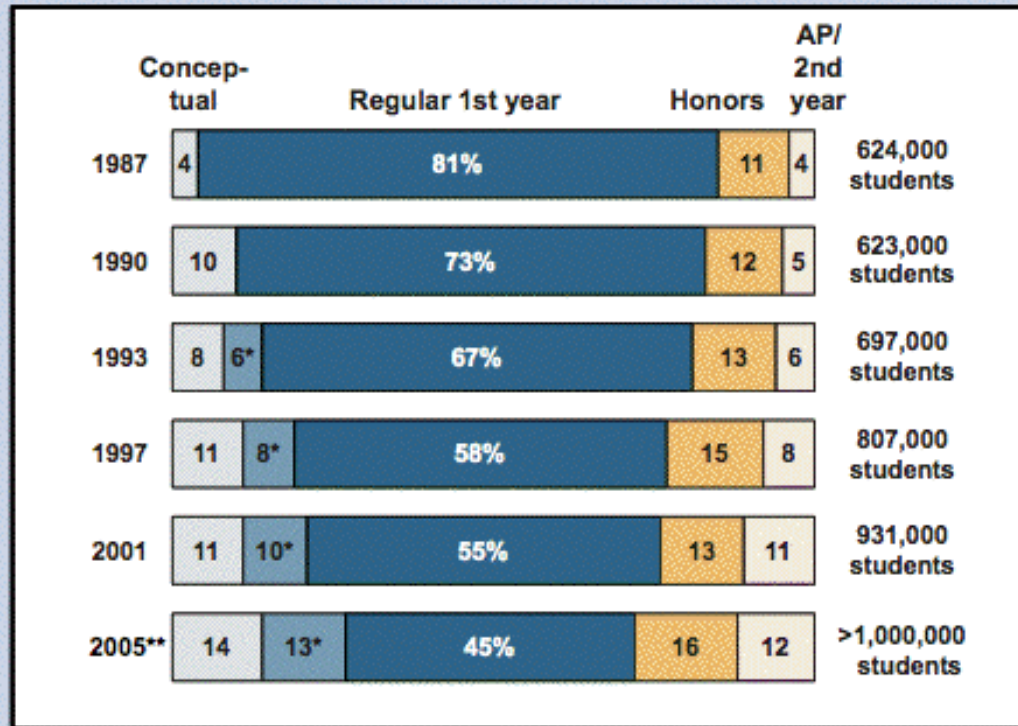
% HS Students Taking Physics



Source: AIP Statistics

Demographics of High School Physics Students

High School Physics: Enrollment Distribution



* Percent of students in regular first-year physics courses that use conceptual physics textbooks.

**Preliminary estimate

AIP Statistical Research Center: 1986-87, 1989-90, 1992-93, 1996-97, 2000-01 & 2004-05 High School Physics Surveys

Demographics of High School Physics Teachers

- 21,300 Physics Teachers Nationwide
- 29% Physics teachers are women
 - 46% of HS physics students are female
 - 25% of those taking Physics AP C are women
- 1,000 new physics teachers each year
- ~300 of these have physics major or minor
- 3.5 M students in each HS class
- 1 M taking physics
- Number taking physics growing by 1% per year
 - Need roughly 1% of 21,000 new teachers each year (~200)

Source: AIP Statistics, College Board

PhysTEC Project

National Coalition (PTEC)

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

Demonstration Project (PhysTEC)

- 13 National Sites
- Comprehensive Program
- Teacher-in-Residence
- Physics, Education Collaboration

PhysTEC Project Goals

- Demonstrate and provide models for:
 - Increasing the number of highly qualified high school physics teachers
 - Improving the quality of K-8 physical science teacher education
- Spread best practice ideas throughout the community
- Work toward transforming physics departments to re-engage in the preparation of physics teachers

PhysTEC Institutions

- **University of Colorado**
- **University of Arkansas**
- **University of Arizona**
- **Cal Poly San Luis Obispo**
- **Ball State University**
- **Western Michigan University**
- **Xavier University of Louisiana**
- **Towson University**
- **Oregon State University**
- **Cornell University**
- **Florida International University**
- **University of Minnesota, Twin Cities**
- **University of North Carolina at Chapel Hill**

UA PhysTEC Project

- **College of Science Teacher Prep Program**
 - 76 science teachers in past 7 years
 - 12 physics teachers
 - 7 women
 - 5 men
 - 9 teaching in AZ, 1 in C•A, 1 in MA, 1 May grad
 - 2 physics teachers next year
 - 4 now in pipeline

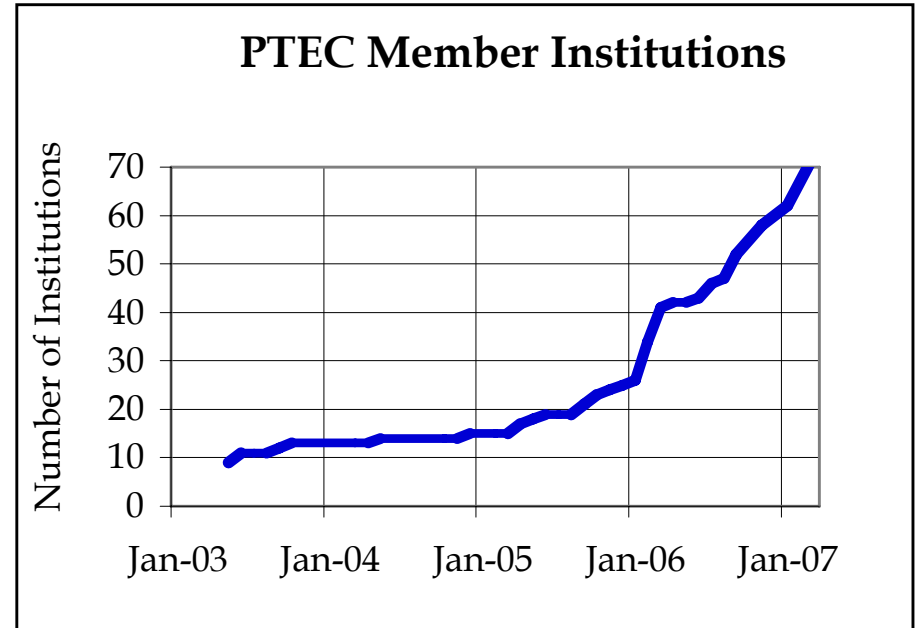
National Coalition Activities

- Now 72 PTEC Institutions
- National Conference on Physics and Physical Science Teacher Education:

3-4 Mar 2007 Theme:
Recruitment (Boulder)

22-23 Feb 2008 Theme:
Master Teachers (Austin)

- Physics Teacher Education Digital Library
www.PTEC.org
- Best-practices book to bring together information on Physics Teacher Education



National Coalition Activities

