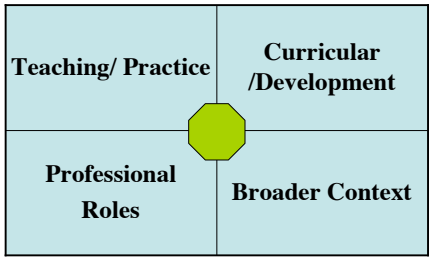
Preparing Future Physics Faculty



What do Faculty do?

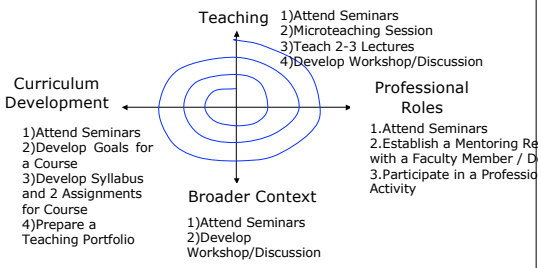
- Research
- Teaching
- Service

- Grant writing
- Management
- Talks

What do grads do

- Research

PFPF structure



Why's education important?

The [National] Commission [on Mathematics and Science Teaching for the 21st Century] is convinced that ***the future well-being of our nation and people depends*** *not just on how well we educate our children generally, but* ***on how well we educate them in mathematics and science*** *specifically"*

-- Before It's Too Late – pg. 4 - Sept 2000

From both sides of the aisle

In March 2001, the U.S. Commission on National Security/21st Century …. on which I served warned that the crisis in scientific research and education is the second greatest threat facing American national security. In fact, the 14 bipartisan members unanimously agreed that the 'inadequacies of our systems of research and education pose a greater threat to U.S. national security over the next quarter century than any potential conventional war that we might imagine.' The Commission went on to assert that only a nuclear or biological weapon released in an American city [is] a greater threat

-Newt Gingrich, AEI
open letter to Congress, May 2005

How are we doing: TIMSS

AVERAGE PHYSICS PERFORMANCE OF ADVANCED SCIENCE STUDENTS IN ALL COUNTRIES

NATIONS WITH AVERAGE SCORES SIGNIFICANTLY HIGHER THAN THE U.S.	
NATION	AVERAGE
NORWAY	581
SWEDEN	573
(RUSSIAN FEDERATION)	545
(DENMARK)	534
(SLOVENIA)	523
(GERMANY)	522
(AUSTRALIA)	518
(CYPRUS)	494
(LATVIA)	488
SWITZERLAND	488
GREECE	486
(CANADA)	485
FRANCE	466
CZECH REPUBLIC	451

NATIONS WITH AVERAGE SCORES NOT SIGNIFICANTLY DIFFERENT FROM THE U.S.	
NATION	AVERAGE
(AUSTRIA)	435
(UNITED STATES)	**423**

NATIONS WITH AVERAGE SCORES SIGNIFICANTLY LOWER THAN THE U.S.	
NATION	AVERAGE
NONE	

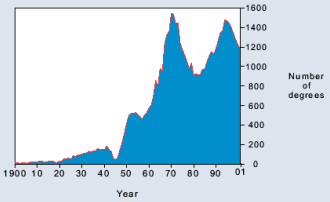
INTERNATIONAL AVERAGE = 501

http://timss.bc.edu

The Context of Grad School

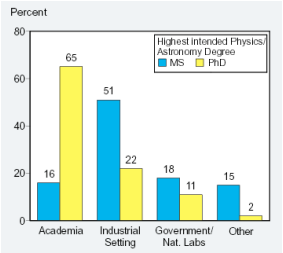
What do PhD's in physics do?
Where do they go?

Number of physics PhDs conferred in the United States, 1900 to 2001.



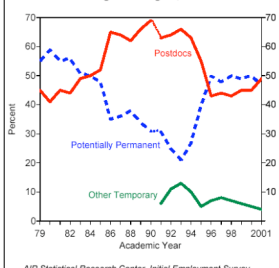
Sources: ACE (1900-1919), NAS (1920-1961), AIP (1962-2001)
AIP Statistical Research Center, Enrollments and Degrees Report.

Career goals by intended highest degree
1st year US physics & astronomy grads students, 1997-98.



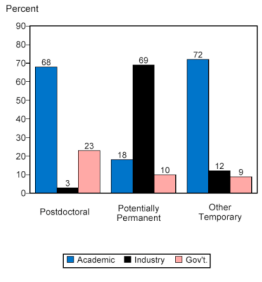
Source: AIP 1998 Graduate Student Report.

Trend Data on the Type of US Employment Secured by Physics PhDs in the Winter Following Their Degree, 1979-2001



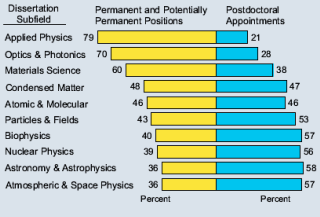
AIP Statistical Research Center, Initial Employment Survey

Employment Sector for Physics PhDs, Classes of 2000 & 2001.



AIP Statistical Research Center, Initial Employment Survey

Figure 3. Initial employment of physics PhDs by subfield of dissertation, classes of 2000 & 2001.



Rows do not add to 100% since they do not include PhDs who accepted other temporary positions.

AIP Statistical Research Center, Initial Employment Report.

Table 1. Departments by highest physics degree offered, academic year 2000-2001.

	Number of Depts.	Percent of Depts.
Bachelor's-granting	514	67
Master's-granting	72	9
PhD-granting	182	24
Total	768	100%

AIP Statistical Research Center, Enrollments and Degrees Report.

Table 4. Estimated Number of Physics Faculty Hired, 2002

	Type of Department						
	PhD		Master's		Bachelor's		Total
All Faculty	274	40%	71	10%	342	50%	687
Tenured and Tenure-Track	197	56%	32	9%	124	35%	353
Percent of Depts. Hiring any Faculty	72		59		45		53
Percent of Depts. Hiring Tenured and Tenure-Track	60		34		20		31

AIP Statistical Research Center: 2002 AWF Survey

Table 13. Previous Positions of New Physics Faculty, 2002*

Type of Department			
PhD (%)		Bachelor's (%)	
Postdoc	47	Postdoc	23
Research Scientist	29	Tenured or Tenure-Track Prof.	23
Tenured or Tenure-Track Prof.	20	Visiting Prof.	15

AIP Statistical Research Center: 2002 AWF Survey

*Includes permanent non-tenured faculty at schools without tenure, and tenured and tenure-track faculty at other schools.

Table 14. Backgrounds of New Physics Faculty, 2002*

	Type of Department	
	PhD (%)	Bach (%)
Earned PhD in US within last 5 years	34	55
Earned PhD outside US, any year	30	13
Earned PhD in US > 5 years ago		
Previous Employer		
US Academic Institution	29	29
Industry, National Lab, Other	7	3

AIP Statistical Research Center: 2002 AWF Survey

*Includes permanent non-tenured faculty at schools without tenure, and tenured and tenure-track faculty at other schools.