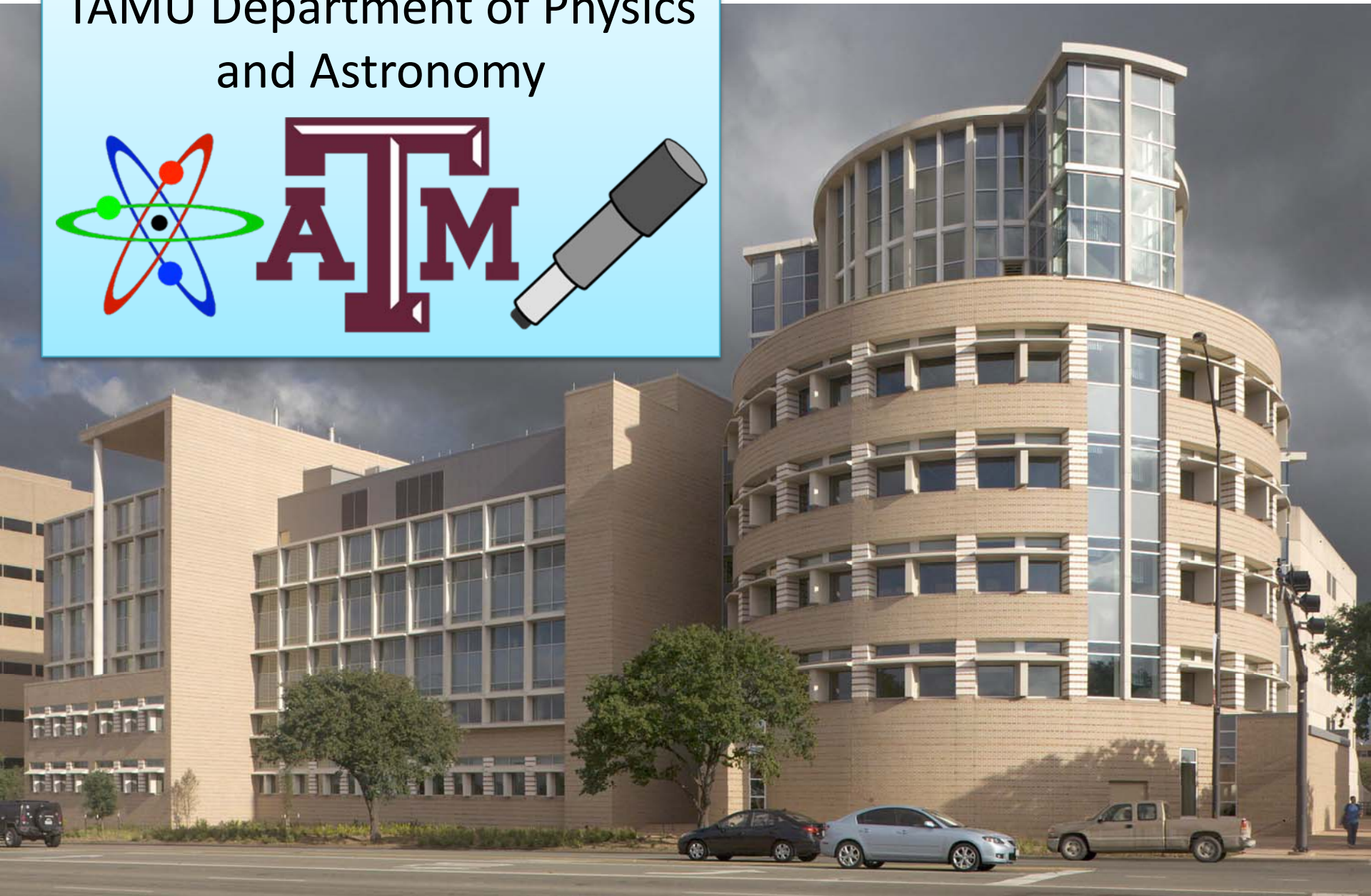


TAMU Department of Physics and Astronomy



Who are we?

TAMU Department of Physics and Astronomy:

63 faculty (25<50 -- 16>70)

11 Distinguished Professors

35 Professors

12 Associate Professors

2 Assistant Professor ← 1 will be considered for T&P

1 Sr. Lecturer

3 Lecturers

Two active faculty searches

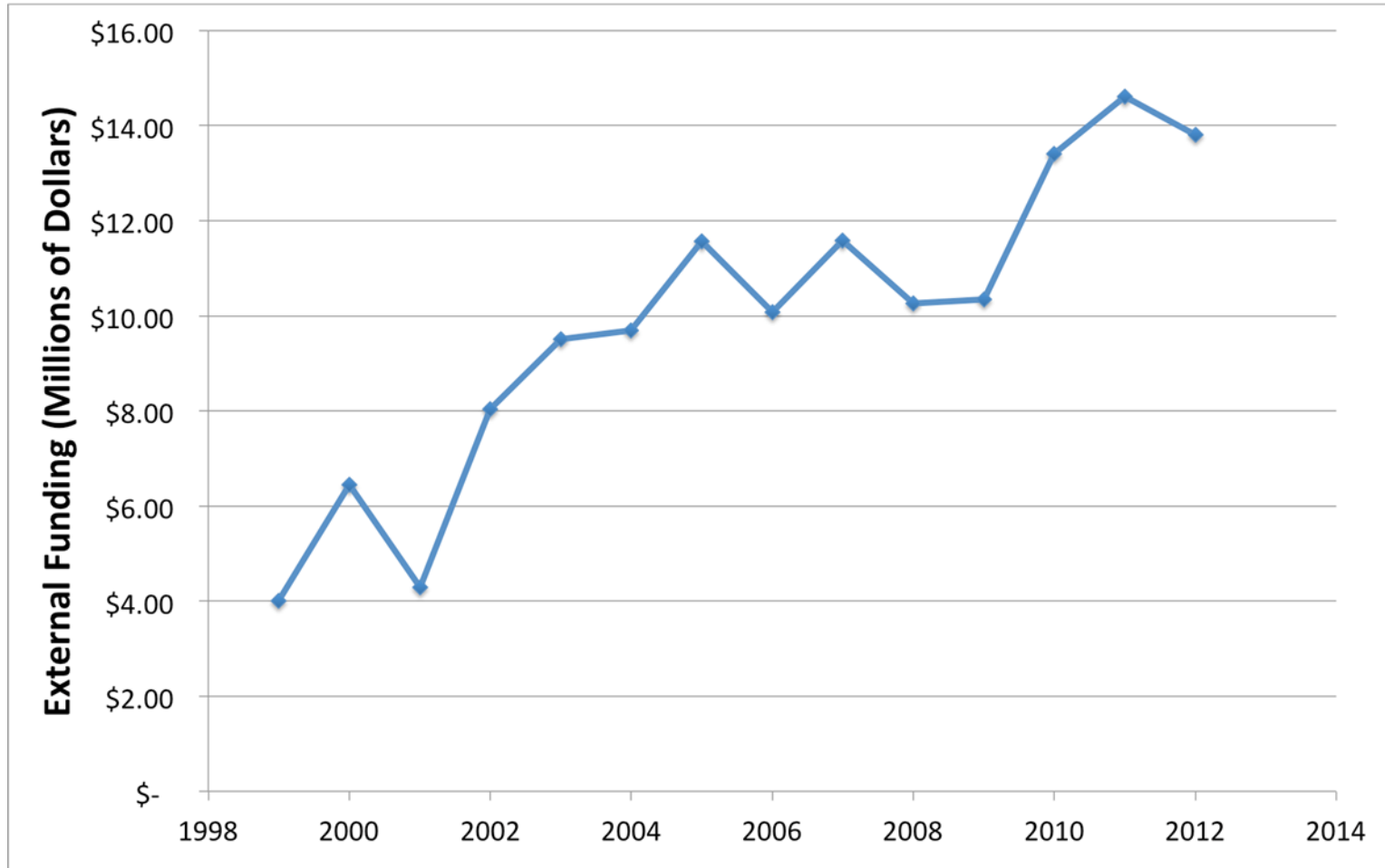
43 Ph.D. research personnel

5 Joint appointments (Fulling, Hyland, Laane, Yang, Harris)

2 Adjunct appointments (Towner, Corkum)

4 Emeritus (Bryan, Church, Hu, Duller)

Research funding

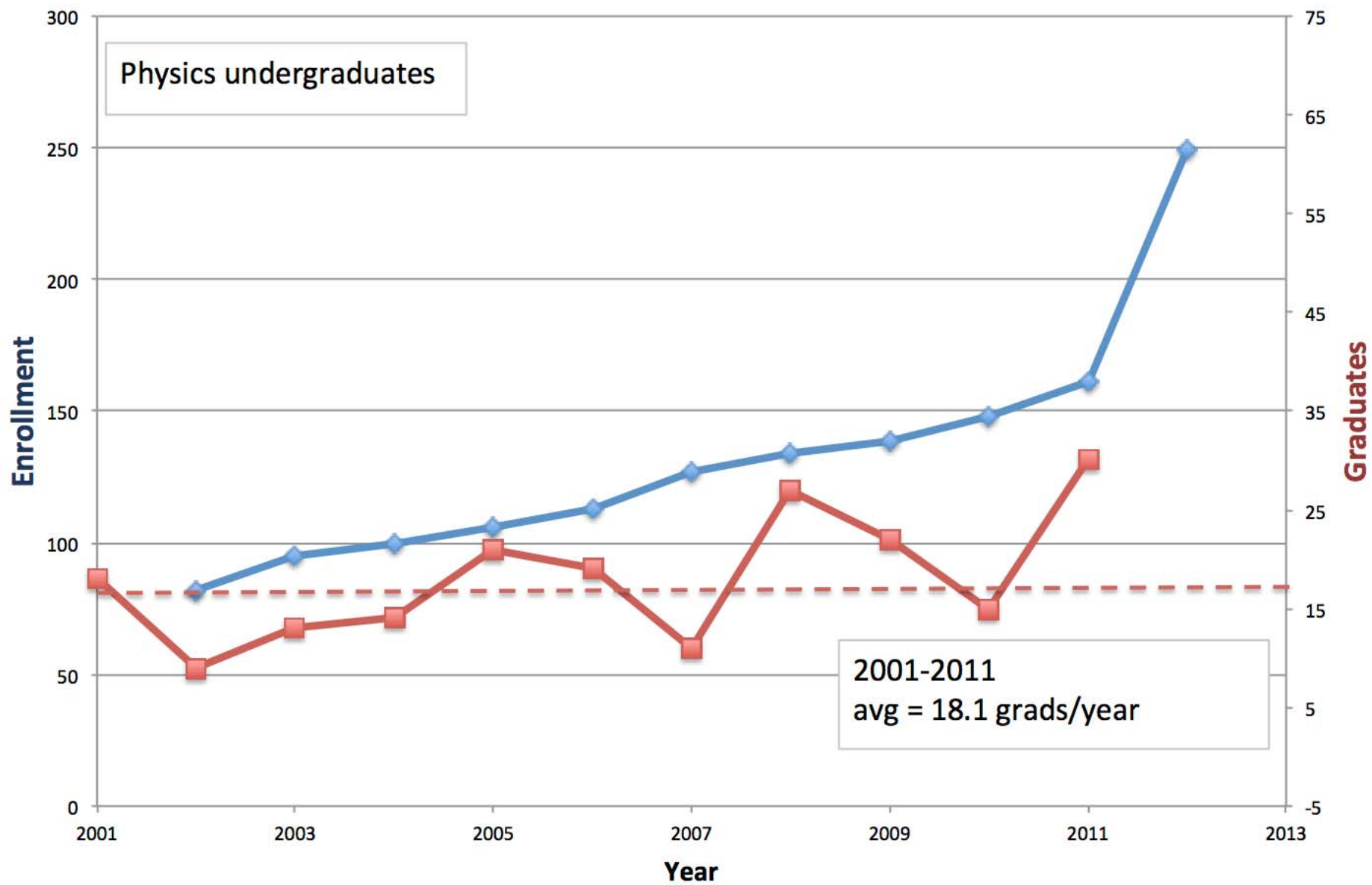


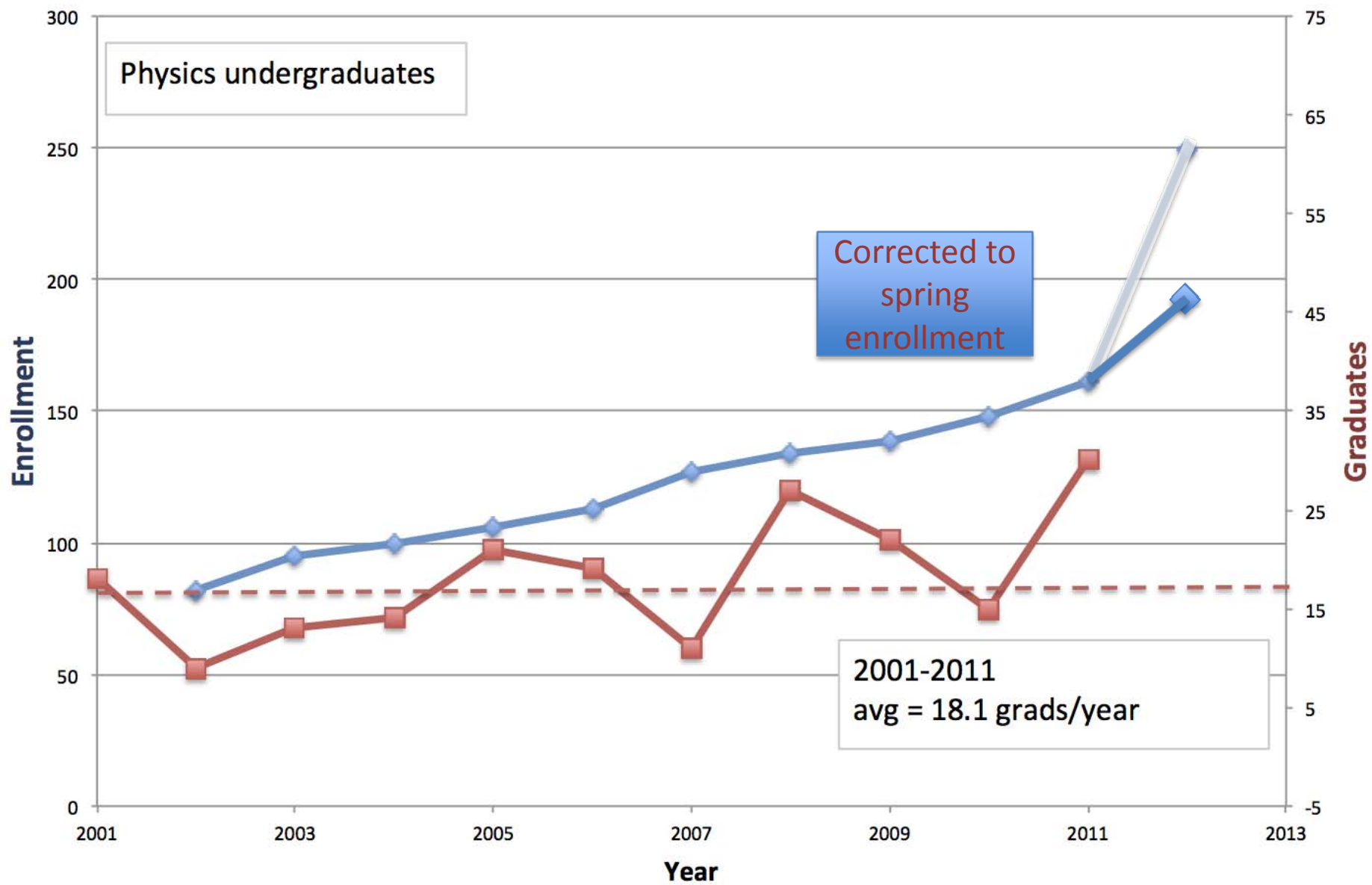
Student Enrollment

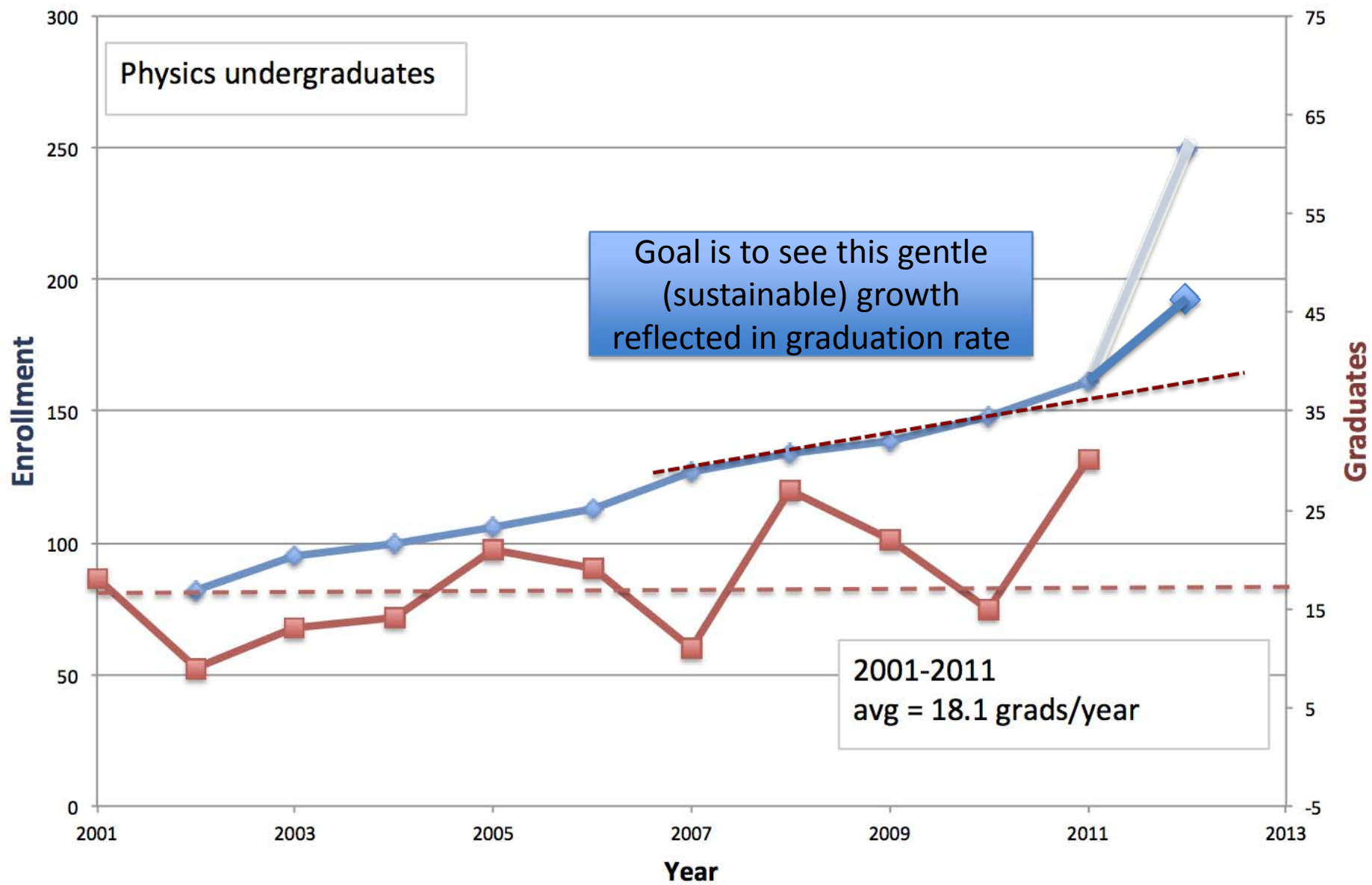
Fall 2012:

248 undergraduates – 144 freshmen!

183 graduate students







What do TAMU graduates do?

What do TAMU graduates do?

We don't fully know

2010:

- HS Physics teacher in Sherman, TX
- Business analyst at Capital One Corporate in Plano
- Graduate School:
 - UT Austin law school
 - UT Houston medical school
 - Rice University
 - UT Austin
 - Washington University
 - Cornell University
 - TAMU
 - U. Colorado
 - Swinburne University (Melbourne)
- (10 unknown)

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 - TAMU
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 - Swinburne University (Melbourne)

- (10 unknown)

2011:

- Graduate School
 - UT Dallas (Applied Math)
 - TAMU (NUEN)
 - TAMU (NUEN)
 - UT Austin
 - RPI (Materials Engineering)
 - Caltech
 - University of Arizona (MATH)
- (9 unknown)

What do TAMU graduates do?

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- HS Physics teacher in S
- Business analyst at Cap
- Graduate School:
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 - UT Houston medical
 - Rice University
 - UT Austin
 - Washington University
 - Cornell University
 - TAMU
 - U. Colorado
 - Swinburne University
- (10 unknown)

2012

- Boeing: Phantom Works
- Cyclotron Institute
- PTC, Technical Consulting
- USAF officer training
- Graduate School
 - GA Tech (NUEN)
 - Rice University
 - UC Berkeley (PHYS and CHEM)
 - TAMU (NUEN) **X 3**
 - UCLA (Astrophysics)
 - TAMU
 - TAMU (Geophysics)
 - Rice
 - Ohio State
 - UT Austin
 - UC Boulder
 - Ohio State (ASTR)
- (12 unknown)

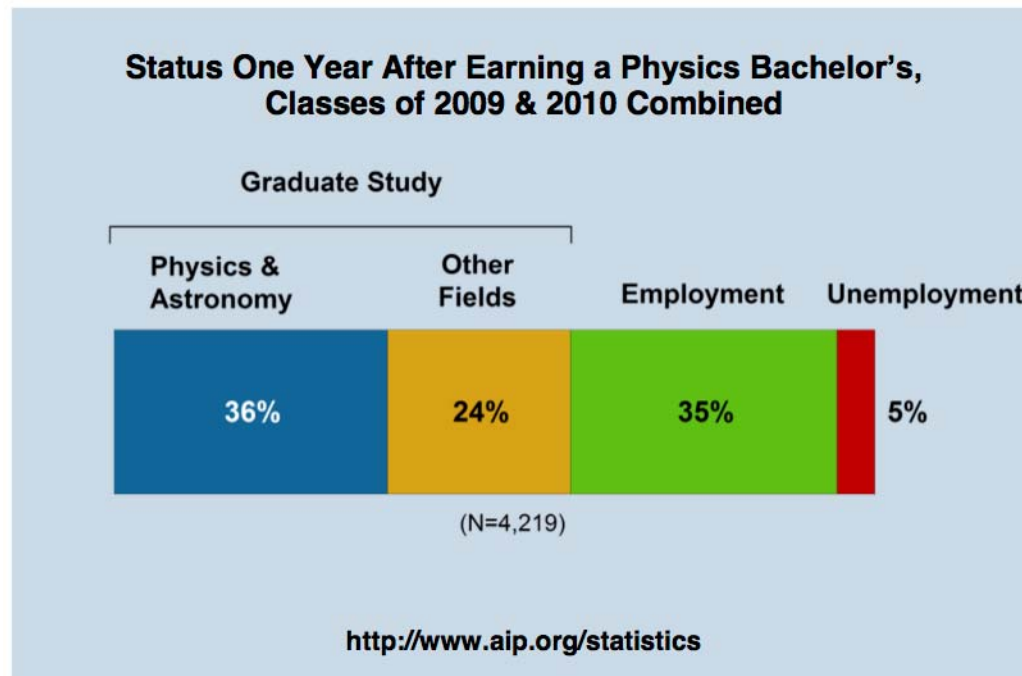
2011:

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 - UT Dallas (Applied Math)
 - TAMU (NUEN)
 - TAMU (NUEN)
 - UT Austin
 - RPI (Materials Engineering)
 - Caltech
 - University of Arizona (M)
- (9 unknown)

Nationally, What do physics graduates do?

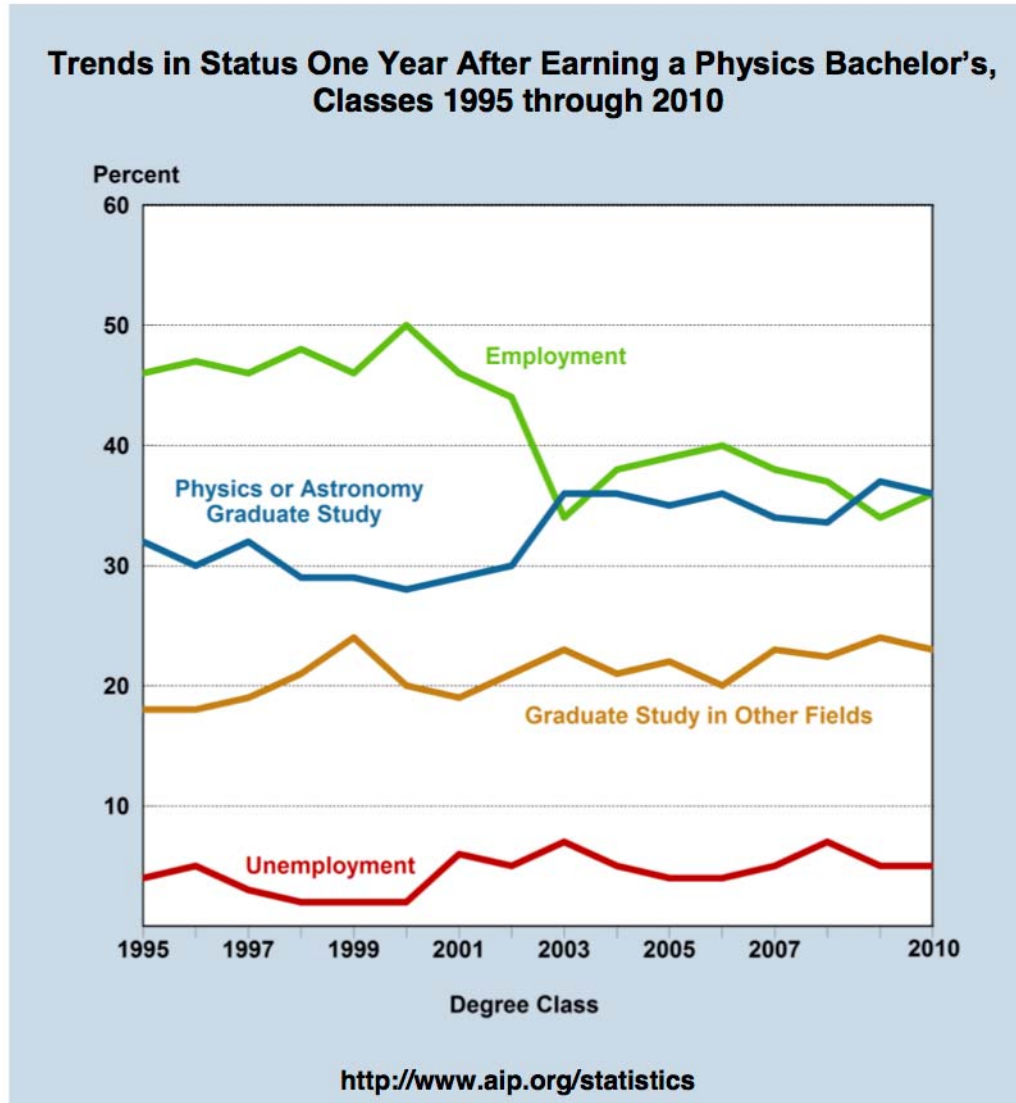
After receiving a bachelor's in physics, most new graduates **either continue on to graduate school or enter the workforce** in the year following their degree.

Sixty percent of the new graduates from the classes of 2009 and 2010 combined **chose to enroll in a graduate program**. Of this group, the majority chose to study physics or astronomy.



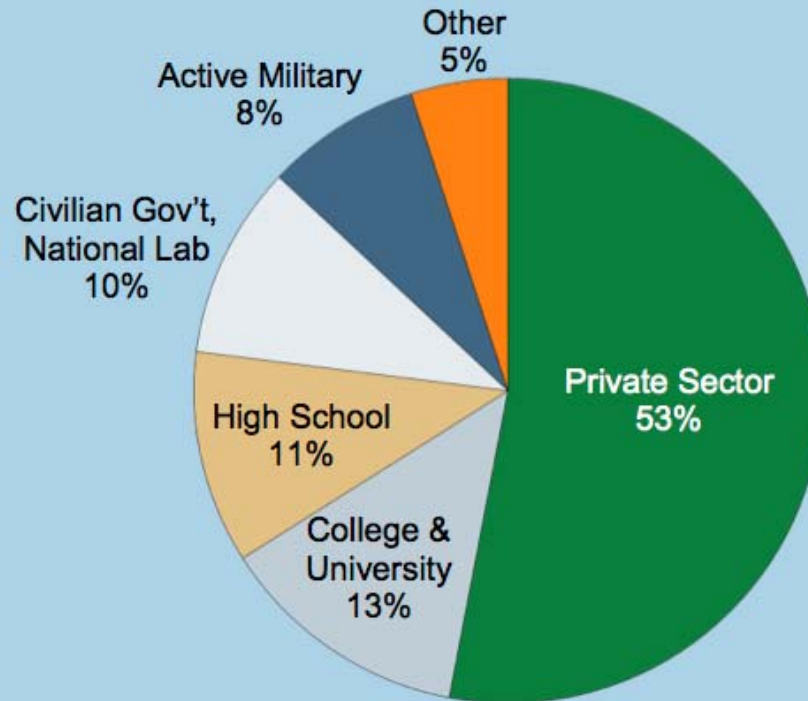
Trend over last 15 years

These proportions have been fairly flat for the last 15 years



Where do physics graduates get jobs?

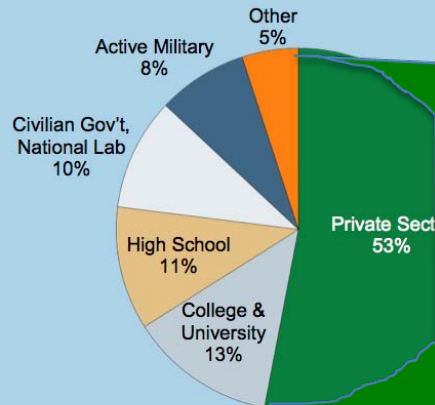
**Initial Employment Sectors of Physics Bachelor's,
Classes of 2009 & 2010 Combined**



<http://www.aip.org/statistics>

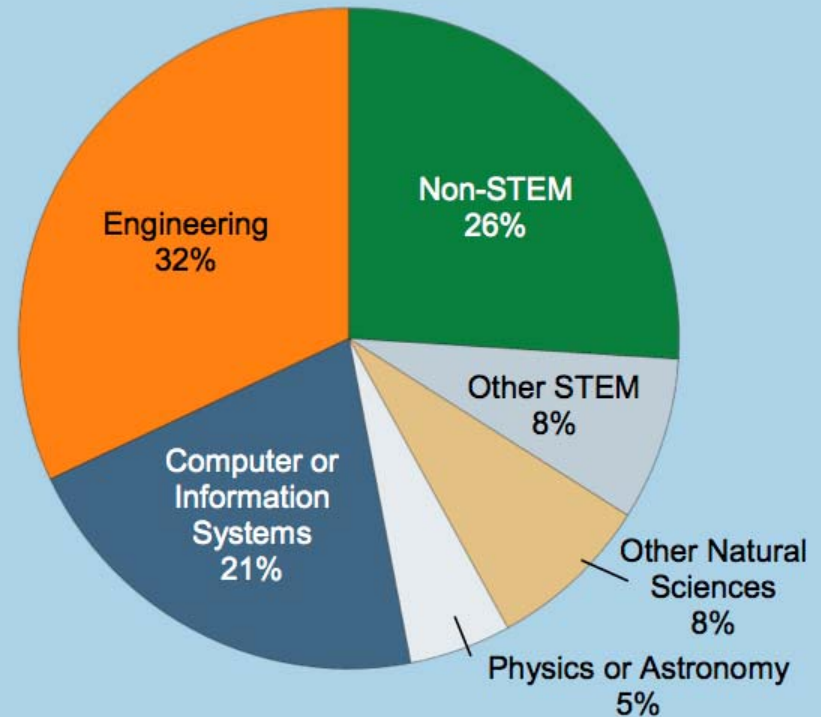
Where do physics graduates get jobs?

Initial Employment Sectors of Physics Bachelor's,
Classes of 2009 & 2010 Combined



<http://www.aip.org>

Field of Employment for Physics Bachelor's in the Private
Sector, Classes of 2009 & 2010 Combined



STEM refers to natural Science, Technology, Engineering, and Mathematics.

<http://www.aip.org/statistics>

What companies in TEXAS hire physics grads?

Accenture

Ad Astra Rocket Company

Apex HiPoint

Applied Nanotech Holdings, Inc.

ATC Logistics & Electronics

Atco Rubber Products, Inc.

Capgemini Energy

Centinel Financial Corporation

CGGVeritas

Circular Energy

Dimensional Fund Advisors

Education Testing Service

Farwest Corrosion Control Company

FWT, LLC

GeoMark Research

Geos Communications, Inc.

Honeywell International

JM Assets, LP

L3 Communications

Luminant Power

MicroPower Global, Ltd

National Instruments Corporation

National Oilwell Varco

NexRev, Inc.

One Technologies

Peterbilt Motors Company

Rackspace

Raytheon

Reynolds and Reynolds

Samsung Austin Semiconductor

Schlumberger

Southwest Research Institute

Superconductor Technologies, Inc.

TASC

Texas House of Representatives

Texas Instruments

Towers Watson

United Space Alliance

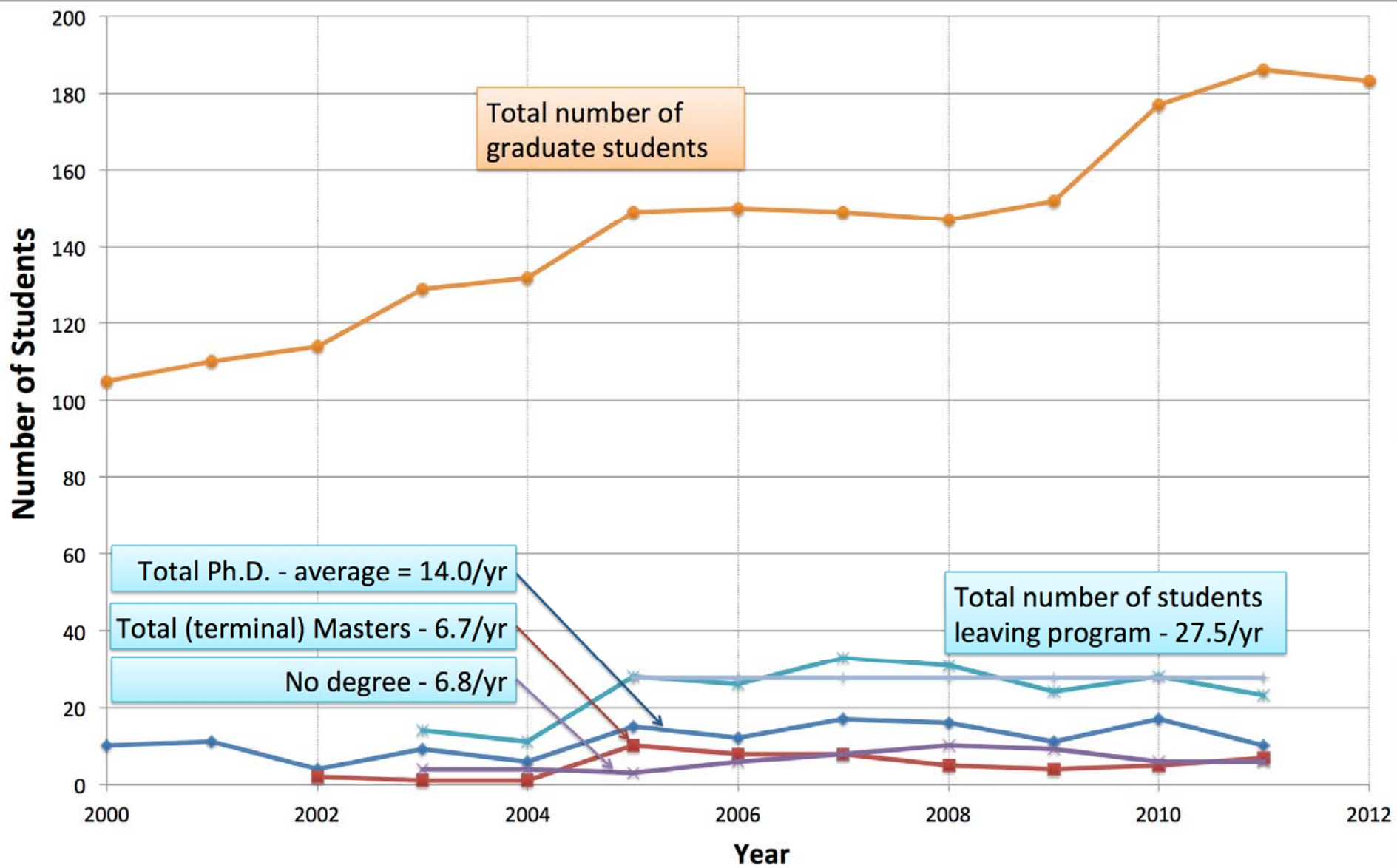
Univ. of Texas M. D. Anderson Cancer Center

WesternGeco

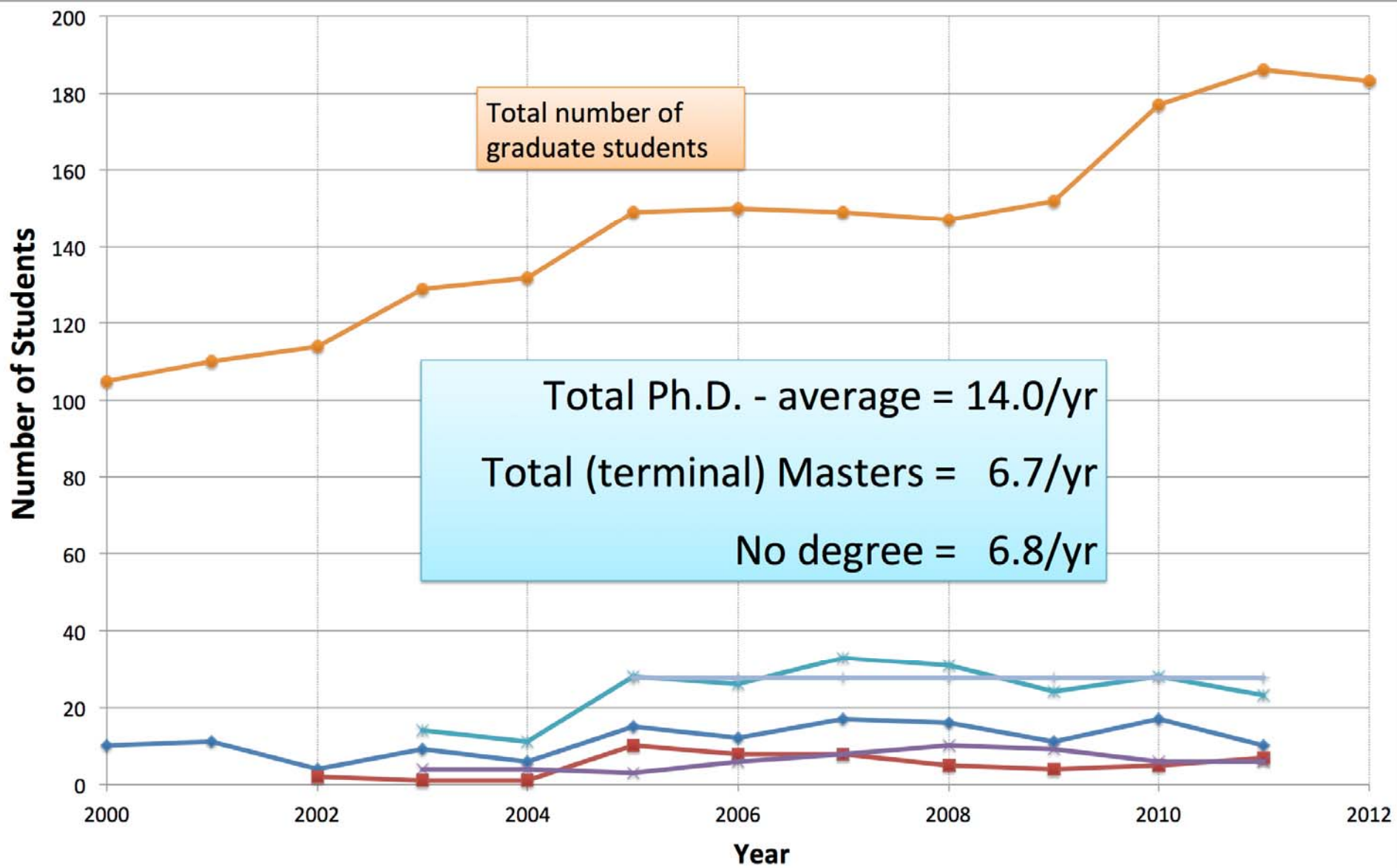
Whataburger, LP

We have no reason to think that our unreported graduates do not match the national averages.

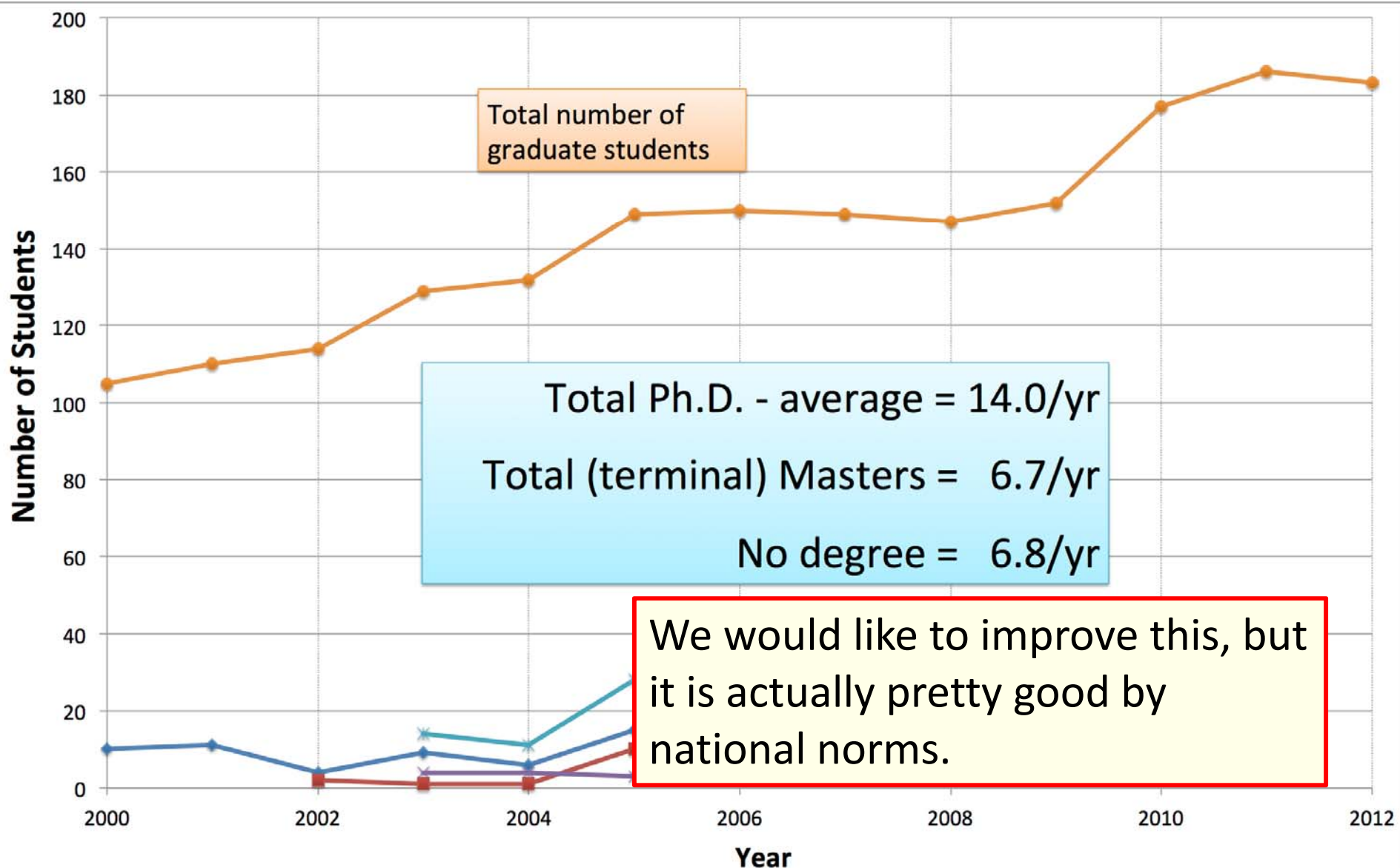
Let's look at Physics and Astr. Graduate Students



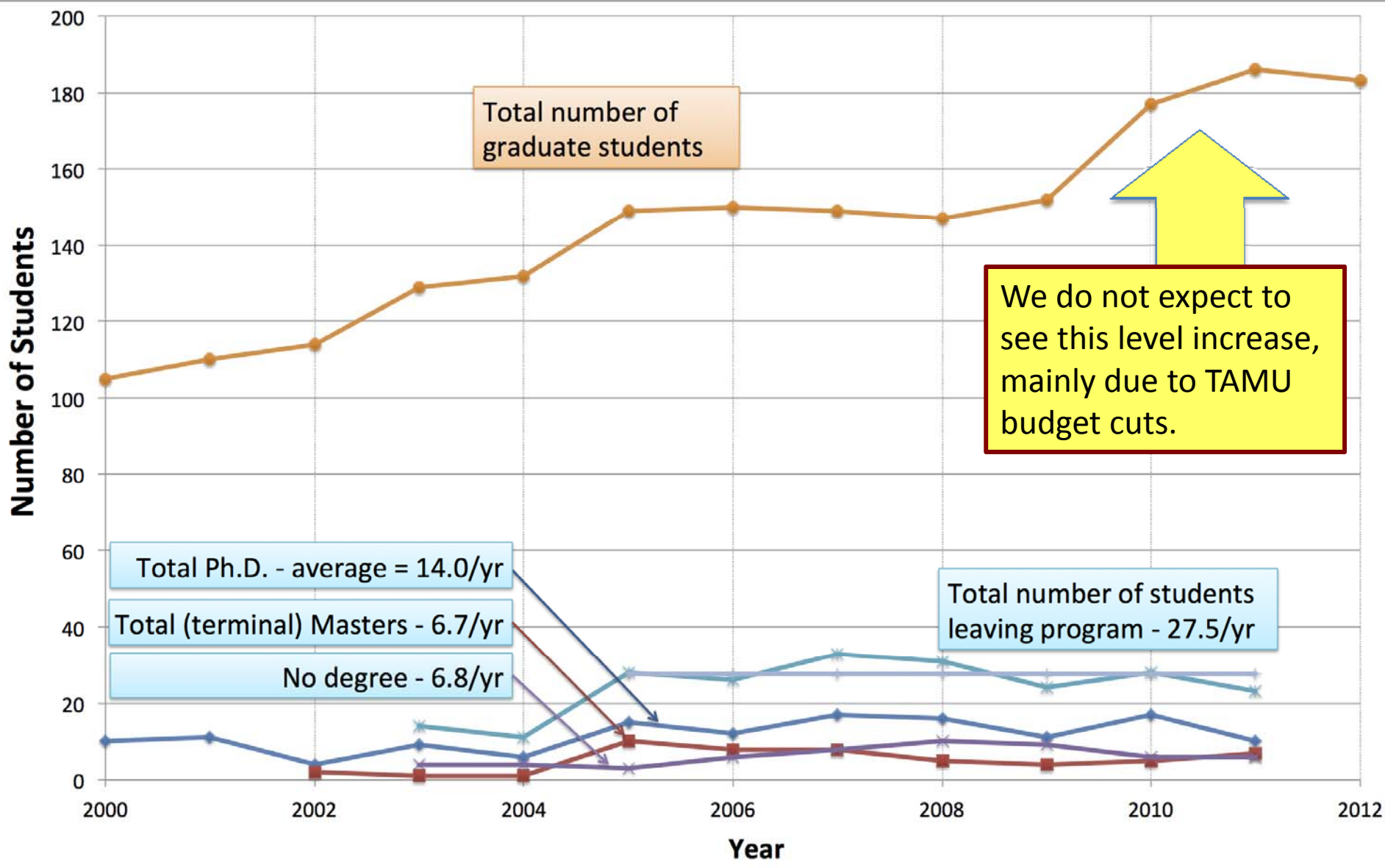
Let's look at Physics and Astr. Graduate Students



Let's look at Physics and Astr. Graduate Students



Let's look at Physics and Astr. Graduate Students



What do TAMU Ph.D. graduates do?

2010

MS:

- Seismic Data Processing Engineer at Western GECO / Schlumberger
- Samsung Semiconductor in Austin, TX in engineering
- TAMU grad school in MATH

PhD:

- Houston geo-services company as technical staff
- CGGVeritas, Houston technical staff
- CGGVeritas, Houston technical staff
- Working in automotive lighting for company in Germany
- TAMU Physics and Astronomy postdoc
- TAMU Physics and Astronomy postdoc
- Max Planck Institute for Gravitational Physics postdoc
- Iowa State University postdoc
- Louisiana State University postdoc
- Univ. of Penn postdoc in Medical School Radiology Dept.
- Univ. of Colorado-JILA postdoc

What do TAMU Ph.D. graduates do?

2011

MS:

- Working at an observatory in Hawaii

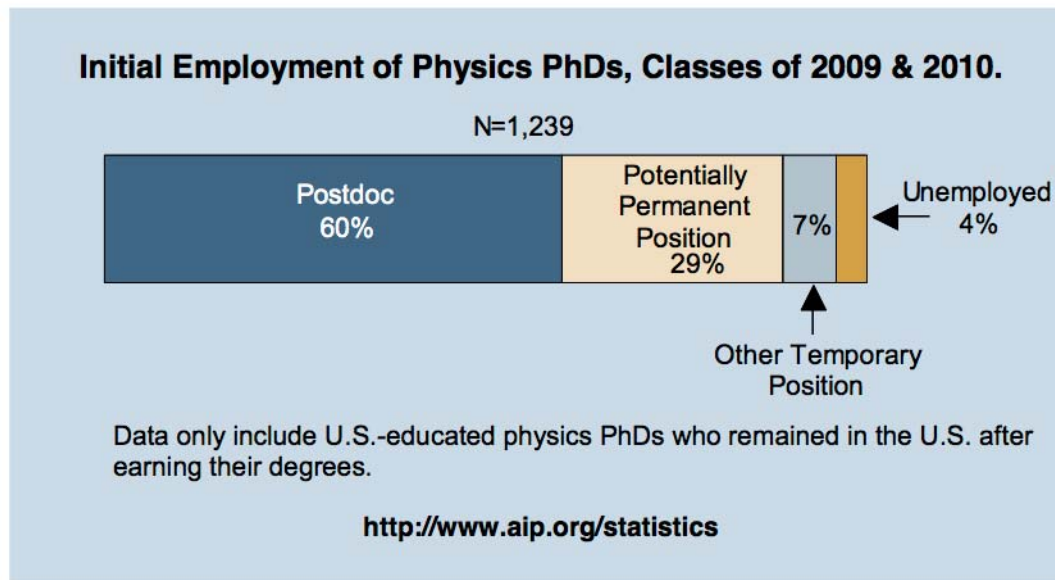
PhD:

- Samsung R&D Lab (Samsung Advanced Institute of Technology) in Korea research staff
- Intel fabrication facility in Albuquerque, NM position

- TAMU postdoc in Atmospheric Sciences
- IPMU in Japan postdoc
- Univ. of Arizona postdoc
- Methodist Hospital Research Institute postdoc
- Mathematical Sciences Center, Tsinghua University, China postdoc
- Stockholm University postdoc
- University of Kaiserslautern in Germany

What do physics Ph.D. grads do?

The market of potentially permanent jobs available to new physics PhDs in the U.S. constricted in the aftermath of the recent global recession. Consequently, more PhDs from the classes of 2009 and 2010 accepted postdocs than in preceding years.

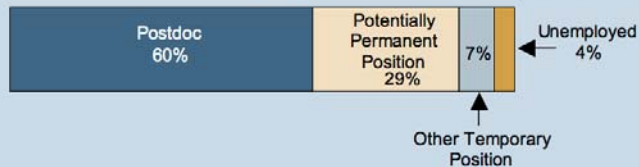


What do physics Ph.D. grads do?

The market of potentially permanent jobs available to new physics PhDs in the U.S. constricted in the aftermath of the recent global recession. Consequently, more PhDs from the classes of 2009 and 2010 accepted postdocs than in preceding years.

Initial Employment of Physics PhDs, Classes of 2009 & 2010.

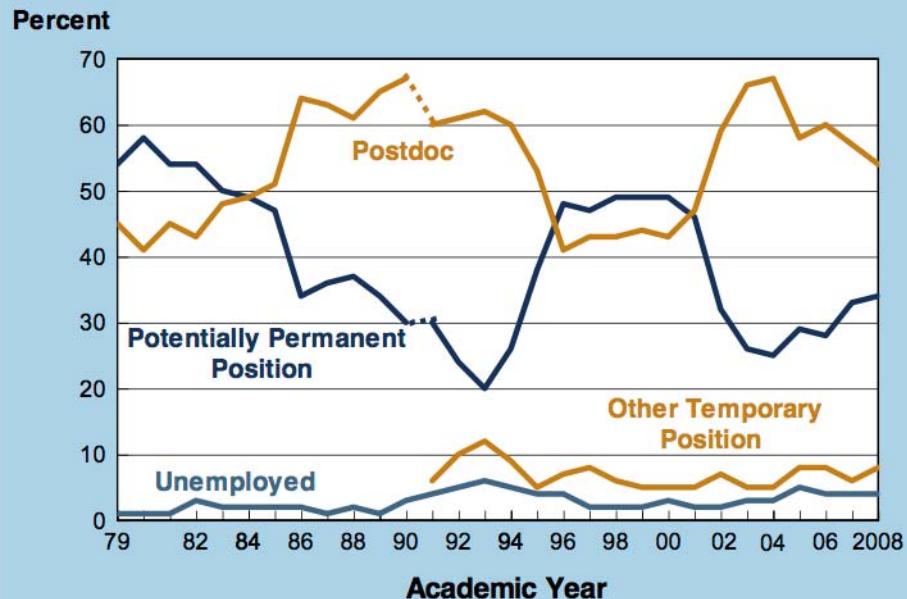
N=1,239



Data only include U.S.-educated physics PhDs who remained in the U.S. after earning their degrees.

<http://www.aip.org/statistics>

Initial employment of physics PhDs, 1979 through 2008.

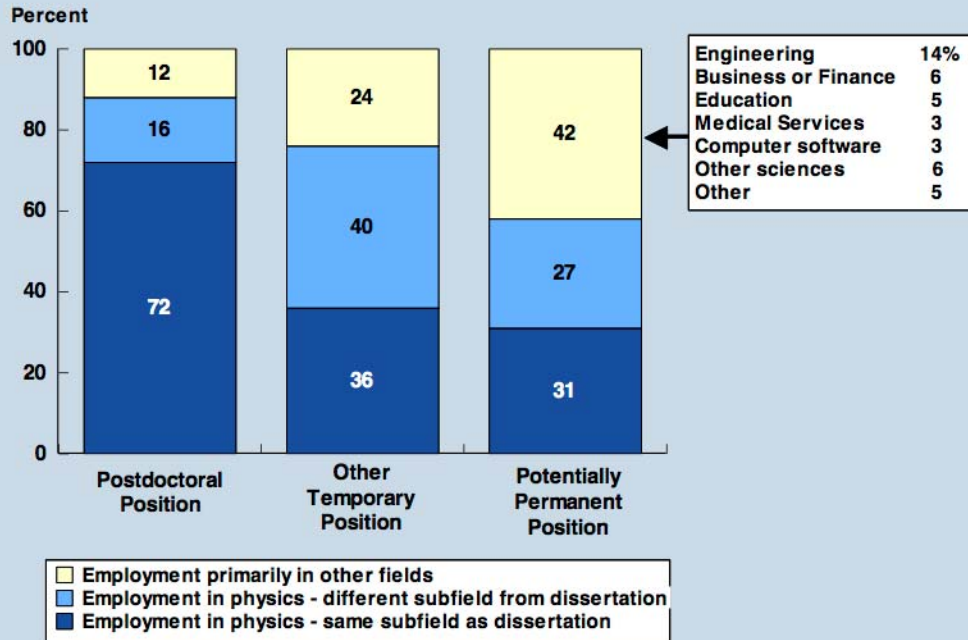


In 1991, the survey questionnaire was changed to measure "other temporary" employment as a separate category.

<http://www.aip.org/statistics>

What kind of positions do Physics Ph.D.s get?

Initial Employment of Physics PhDs, Classes of 2009 & 2010.



Employment in physics means an individual's primary or secondary employment field was in physics or astronomy. Data only include U.S.-educated physics PhDs who remained in the U.S. after earning their degrees.

<http://www.aip.org/statistics>

Most new physics PhDs work in physics and nearly all work in STEM fields.

There are viable ways for new PhDs to change subfields or to move into non-physics fields, should they desire.

Again, we have no reason to think that our unreported graduates do not match the national averages.

What does it take to get a Ph.D. at TAMU?

- Classes.
- Research!

What does it take to get a Ph.D. at TAMU?

- Classes.

Core curriculum: (B or better)

- Mechanics
- E&M 1 and E&M 2
- Quantum 1 and 2
- Stat. Mech.
- Math Methods

2 distribution electives

AMO/CM

Particles/Nuclear

several from astro

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Core curriculum: (B or be

- Mechanics
- E&M 1 and E&M 2
- Quantum 1 and 2
- Stat. Mech.
- Math Methods

2 distribution electives

AMO/CM

Particles/Nuclear

several from astro

Astronomy track:

Core curriculum

- Radiative Transfer
- General Relativity and Cosmology
- Stellar Interior and Atmospheres
- Galactic Astronomy
- Extragalactic Astronomy
- Astronomical Instr. and Statistics

Physics classes:

- E&M 1
- QM 1
- Stat Mech
- Math Methods

What does it take to get a Ph.D. at TAMU?

- Class

Core d

- M
- E
- Q
- S
- M

We expect to offer a Ph.D. in **Astronomy** in the near future

We currently offer a Ph.D. in **Applied Physics** with a slightly different course load, but I expect this to go away in the future.

and Cosmology
Atmospheres
/nomy
and Statistics

2 distribution electives

AMO/CM

Particles/Nuclear

several from astro

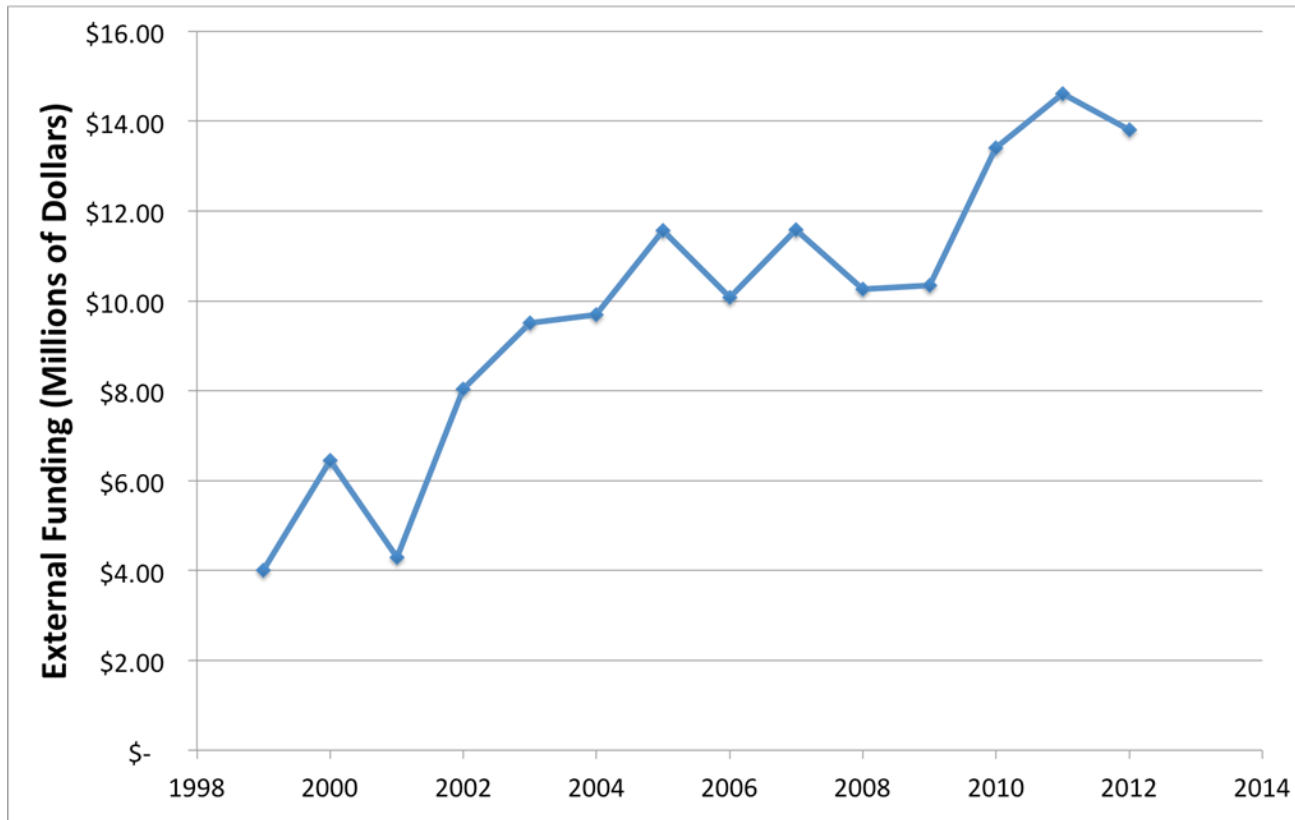
Physics classes:

- E&M 1
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- Math Methods

What does it take to get a Ph.D. at TAMU?

- Research!

Active groups in AMO, CM, HEP, Nuclear, and Astronomy



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- Research!

Active groups in **AMO**, CM, HEP, Nuclear, and Astronomy

AMO experiment:

Attoseconds, Nonlinear optics, Laser Physics, “Bio-Agri-Photonics”, etc.

Fry, Schuessler, Sokolov, Scully, Zheltikov

AMO theory:

THz and semiconductor devices, Atomic/molecular coherence, many-body theory, Fundamentals of QM, Quantum information theory

Belyanin, Kocharovskaya, Kocharovsky, Scully, Zubairy

What does it take to get a Ph.D. at TAMU?

- Research!

Active groups in AMO, **CM**, HEP, Nuclear, and Astronomy

CM experiment:

Novel and nano-magnetism, nano-features, STM,
superfluidity

Lee, Lyuksyutov, Naugle, Roshchin, Ross, Teizer, Weimer,
Wu

CM theory:

Spintronics, Computational Physics, Quantum computing,
nano-magnetism, disorder, topological effects

Allen, Abanov, Finkel'stein, Katzgraber, Pokrovsky, Saslow,
Sinova

What does it take to get a Ph.D. at TAMU?

- Research!

Active groups in AMO, CM, **HEP**, Nuclear, and Astronomy

HE experiment:

Accelerator Physics, Dark matter (LUX, CDMS), Collider physics (LHC/CMS)

McIntyre, Webb, Mahapatra, Toback; Eusebi, Safonov, Kamon, **TBA**

HE theory

String theory, phenomenology, cosmology

Pope, Sezgin, Becker, Becker, Nanopoulos, Dutta, **TBA**

What does it take to get a Ph.D. at TAMU?

- Research!

Active groups in AMO, CM, HEP, **Nuclear**, and Astronomy

Experiments:

From low to high energy – Parity nonconservation,
Nuclear reactions, nucleon structure, QGP

Gagliardi, Hardy, Melconian, Mioduszewski, Rogachev,
Tribble, Youngblood

Nuclear theory

Rapp, Ko, Fries

What does it take to get a Ph.D. at TAMU?

- Research!

Active groups in AMO, CM, HEP, Nuclear, and **Astronomy**

Galactic structure/cosmology

Supernovas

Astronomical Instrumentation

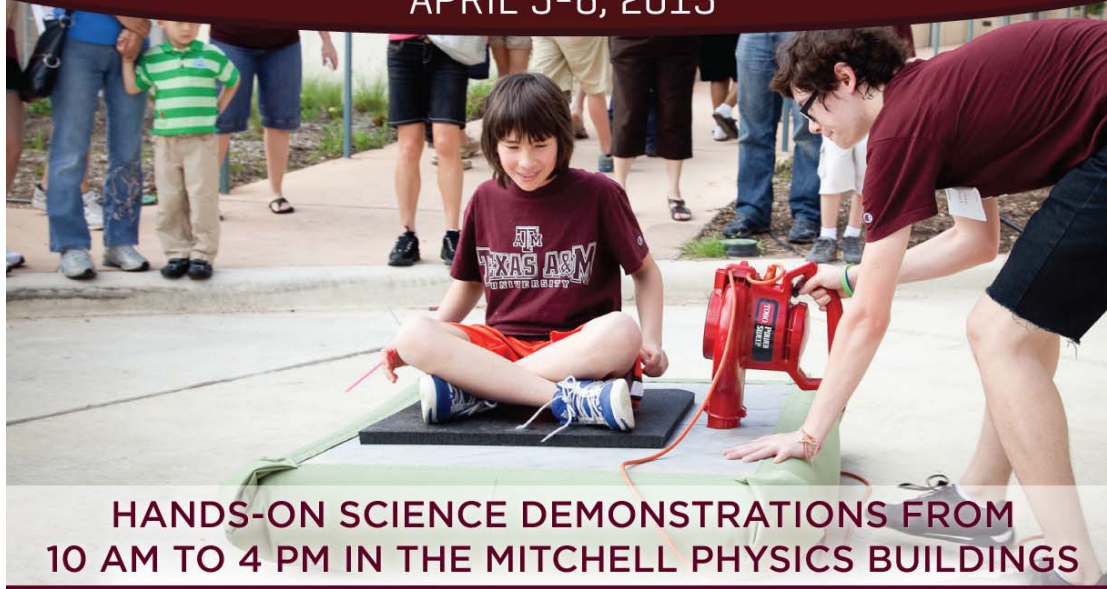
Macri, Tran, Papovich, Wang, Suntzeff, Krisciunas, Depoy,
TBA, TBA

Endowments in the Department of Physics

item	Name of endowment	Area	Book value	Additional committed	~monthly income to holder	Chairholder or individual with signature authority
1	Herschel E. Burgess Chair	Other than High Energy Physics	776,488		5,518	Marlan Scully
2	Ed Rachal Chair	High Energy Physics	621,190		4,414	Robert Webb
3	Mitchell/Heep Chair in High Energy Physics	Theoretical High Energy Physics	1,000,000		4,428	Dimitri Nanopoulos
4	Mitchell/Heep Chair in Experimental HEP	Experimental High Energy Physics	1,000,000		4,069	Peter McIntyre
5	Schüssler-Laux/Mitchell/Heep Chair	Optical and Biomedical Physics	1,000,000		4,076	Hans Schüssler
6	Stephen Hawking Chair	Fundamental Physics	2,000,000		9,917	Christopher Pope
7	Mitchell/Heep/Munnerlyn/ Chair	Observational Astronomy/Cosmology	1,334,000	666,000	4,997	Nicholas Suntzeff
8	George P. Mitchell Chair	Experimental Physics	1,000,000		3,884	Edward Fry
9	Munnerlyn/Heep Chair	Quantum Optics	699,892	300,000	2,364	Suhail Zubairy
10	Arseven/Mitchell Chair in Astro Statistics	Astronomy Statistics	302,293	697,707	1,314	
11	William R. Thurman '58 Chair in Physics	Physics & Astronomy	362,014	637,986	1,097	
12	Stephen E. Harris Professorship	Quantum Optics	600,000		2,264	Alexei Sokolov
13	Rachal/Mitchell/Heep Professorship	Physics/Astronomy	755,298		3,351	Darren DePoy
14	Mitchell/Munnerlyn/Heep Career Award	Untenured Faculty	666,000	334,000	2,495	L. Macri / R. Eusebi
15	George P. Mitchell Post-Doc. Fellowship	Astronomy	500,100	400,000	1,916	Nicholas Suntzeff
16	George P. Mitchell Post-Doc. Research Fund	Astronomy	200,000		724	Nicholas Suntzeff
17	Nelson M. Duller Endowment	Experimental Physics	458,941	541,059	1,646	Glenn Agnolet
18	Mitchell Institute Endowment	HEP Physics & Astronomy	1,000,000		4,631	Mitchell Inst. Dir.
19	Chia-Lai Wong Memorial Fund	Women Students	25,027		95	Department Head
20	C. F. Squire Fellowships	Graduate Students	66,961		302	Department Head
21	William Robba Fellowship	Graduate Students	40,000		159	Department Head
22	Stephanie & Jack Crawford Fellowship	Graduate Students (or undergrads)	100,000			Department Head
23	Jean R. Whitmore Fellowships	Graduate Students	50,000		278	Department Head
24	Robert and Marianne Hamm Scholarships	Undergraduates	100,000		470	Department Head
25	Katherine & Ronald Wilson '72 Scholarship	Undergraduates	27,500	12,500	100	Department Head
26	Donald F. Hagan Scholarship	Undergraduates	29,700		124	Department Head
27	Physics Scholarship Fund	Undergraduates	17,644		76	Department Head
28	Matthew P. Hodges '00 Memorial Scholarship	Undergraduates	25,125		79	Department Head
29	Jack McIntyre Scholarships	Undergraduates	99,988		328	Department Head
30	James G. Potter Scholarships	Undergraduates	24,008		94	Department Head
31	Cynthia W Mitchell Scholarship for Women	Undergraduates (women)	135,000	15,000	509	Department Head
32	Renate Schüssler-Laux Memorial Fund	Experimental Physics	16,733		95	Hans Schüssler
33	George P. Mitchell Annual Lecture	Astronomy	90,000		326	Nicholas Suntzeff
34	George P. Mitchell Colloquium Fund	Astronomy	100,000		362	Nicholas Suntzeff
35	George P. Mitchell Family Travel Endowment	Physics/Astronomy	72,000		261	Nicholas Suntzeff
36	Friend of Cambridge Visitors' Endowment	Mitchell Institute	250,000		875	Mitchell Inst. Dir.
37	Cynthia Woods Mitchell Garden Endowment	Garden	250,000		846	Department Head
38	William Bassichis Fund-Teaching Excellence	Physics/Astronomy	2,553		2	
39	Charles & Judy Munnerlyn Fund	Physics/Astronomy		2,050,000		
40	Phillip and Dottie Moses Student Support	Physics/Astronomy students		4,000,000		
41	William Thurman Scholarship	Undergraduates		100,000		
42						
Totals			\$15,798,455	\$9,754,252	\$68,484	

PHYSICS & ENGINEERING FESTIVAL

APRIL 5-6, 2013



**HANDS-ON SCIENCE DEMONSTRATIONS FROM
10 AM TO 4 PM IN THE MITCHELL PHYSICS BUILDINGS**

**Impending Close Encounter
with Asteroid Apophis**



JOHN JUNKINS
Distinguished Professor

Friday, 7pm
Hawking Auditorium

**The Accelerating Universe:
Einstein's Blunder Undone**



ROBERT KIRSHNER
Author and Professor

Saturday, 4pm
MPHY Lecture Hall (Rms. 203-205)

GREGORY CHAMITOFF
ASTRONAUT

Public Lecture | 11 AM
Hawking Auditorium

DUDLEY HERSCHBACH
NOBEL LAUREATE

Public Lecture | 1 PM
Hawking Auditorium

DAVID LEE
NOBEL LAUREATE

Public Lecture | 2 PM
Hawking Auditorium

TOM NODDY'S BUBBLE MAGIC

SATURDAY: 11 AM / 1 PM / 2 PM

All events are sponsored by the Texas A&M TOP grant, the Department of Physics & Astronomy, the George P. and Cynthia Woods Mitchell Institute for Fundamental Physics & Astronomy, the Texas A&M College of Science, and the Department of Aerospace Engineering.



Thank you for your time.