

# Physics Careers

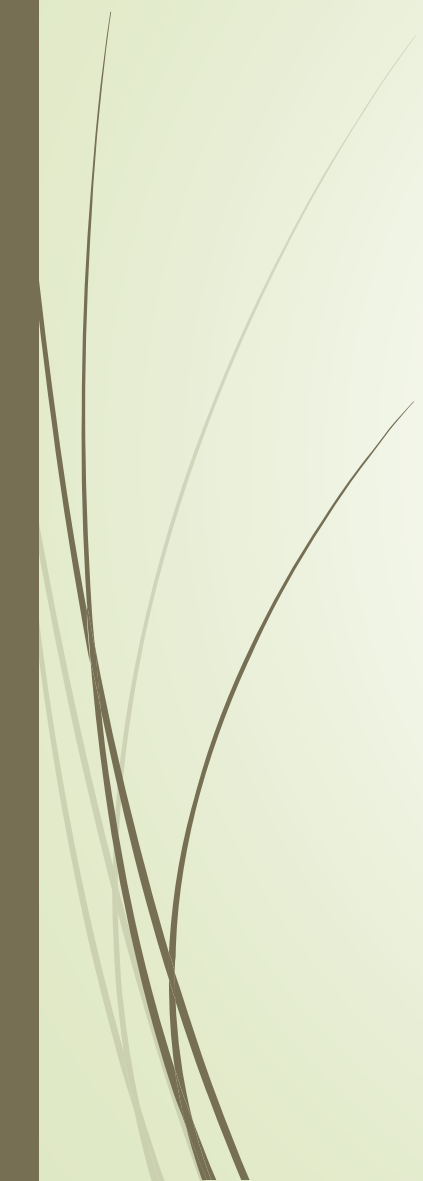
How do I get a job with a physics degree?

Dr. John Stewart





# Physics Career Paths

- Graduate School Physics
  - Graduate School in another discipline
  - Professional School (Medical, Dental, Physical Therapy, Medical Physics)
  - High School Teaching
  - College Teaching (No)
  - Military
  - Private Industry
- 



# The Academic Path

Graduate School



# Graduate School



- ▶ I will discuss applying to graduate school [here](#).
- ▶ I will discuss preparing for the GRE [here](#).



# The Career

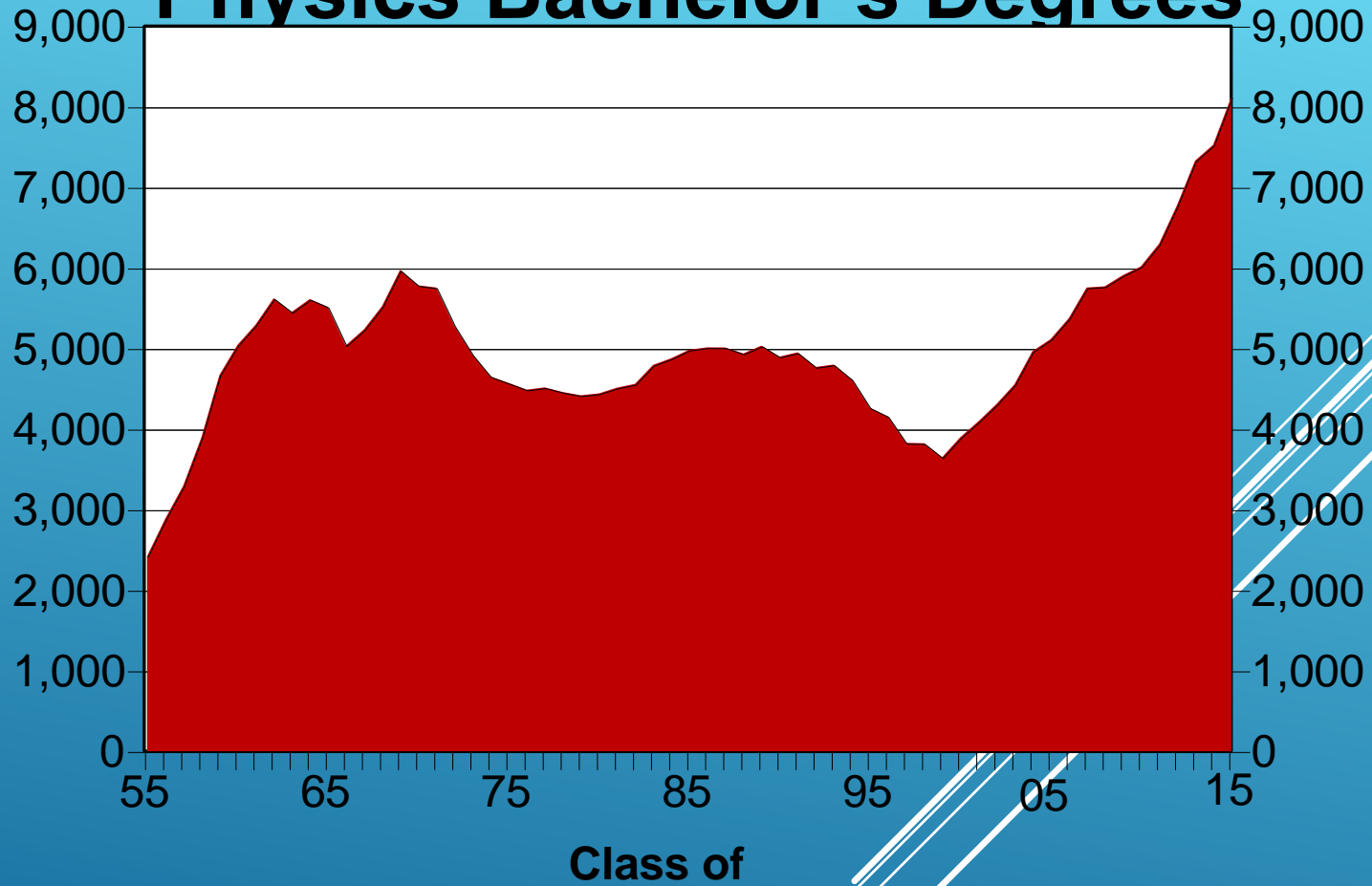
What do physicists do? Thanks to Crystal Bailey (APS) and Patrick Mulvey (AIP)



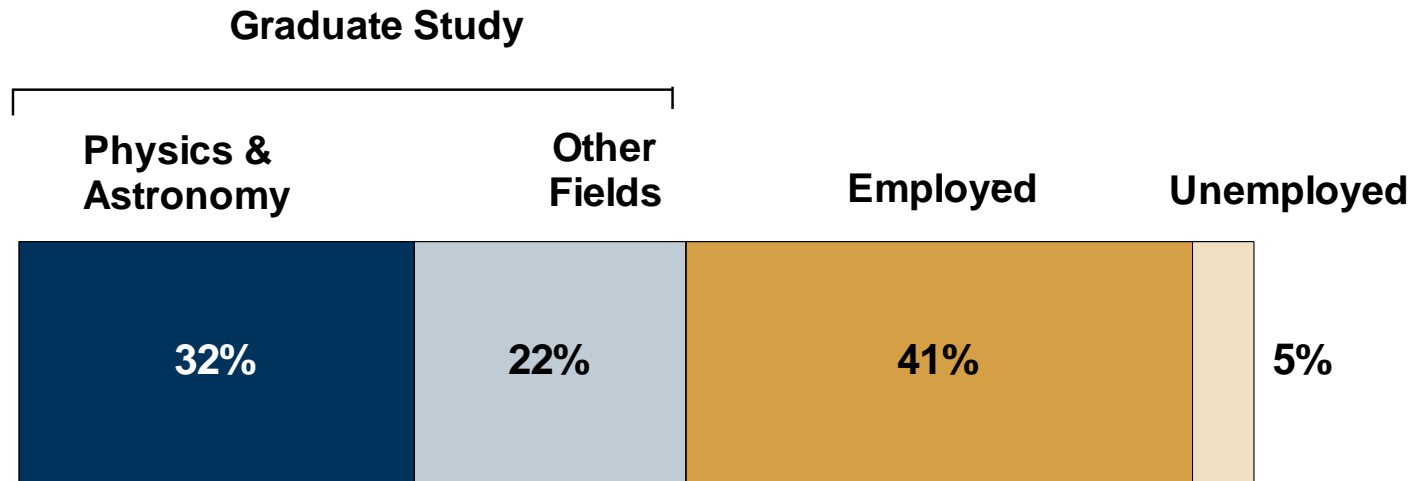
Patrick Mulvey  
Statistical Research Center  
[pmulvey@aip.org](mailto:pmulvey@aip.org)

Number

# Physics Bachelor's Degrees



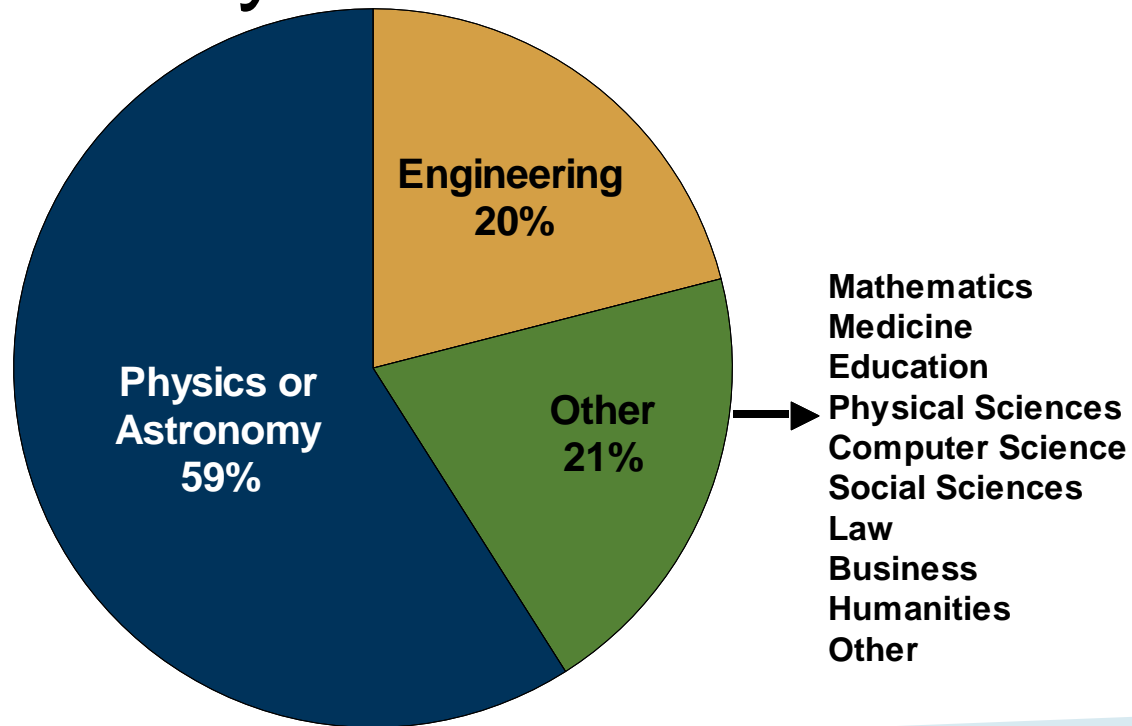
# Physics Bachelor's One year after Degree



Classes of 2013 & 2014 combined



# Fields of Graduate Study



Classes of 2013 & 2014  
combined

## Medical School

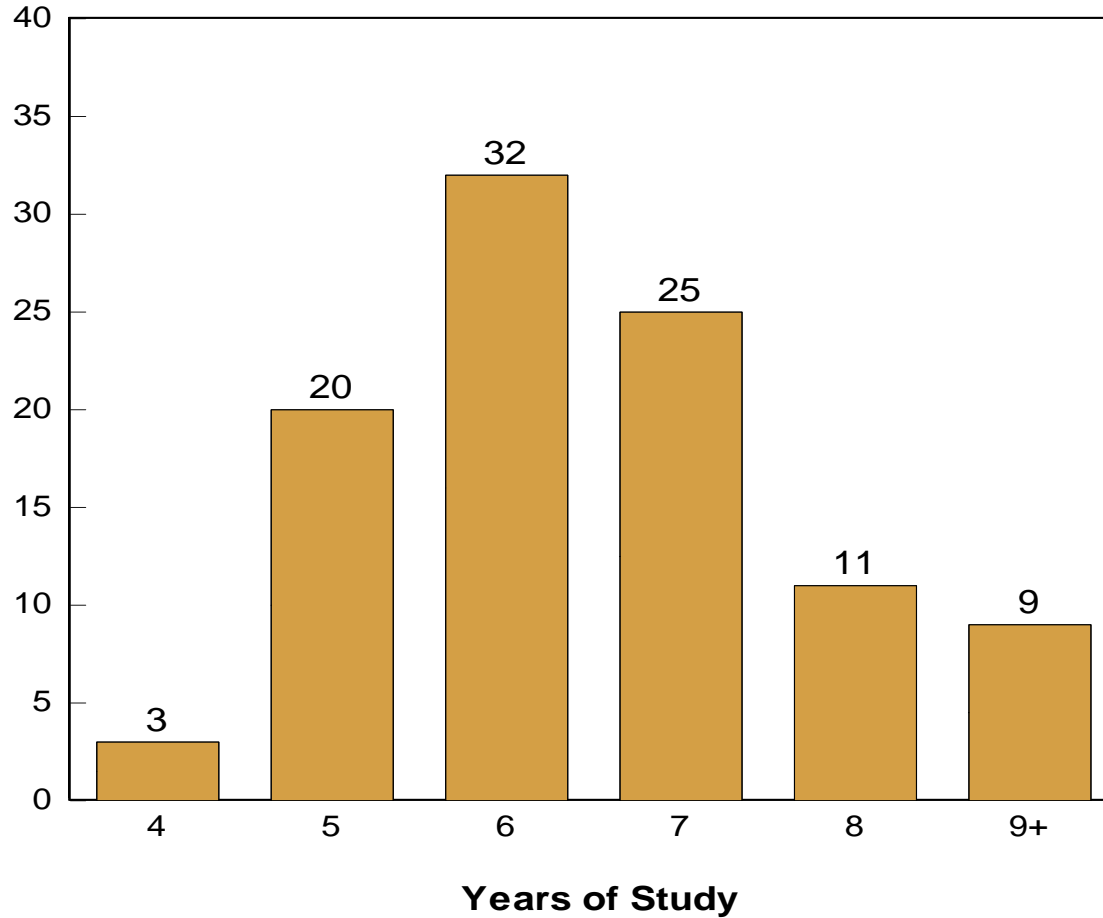
***Physics majors out-perform most other majors (including pre-med and biology) on all three sections on the MCAT.***


## Law School

***As a group, the physics bachelor's who apply to law school achieve high scores on the LSAT exam.***

# Years of Physics Graduate Study to Earn a Physics PhD

Percent



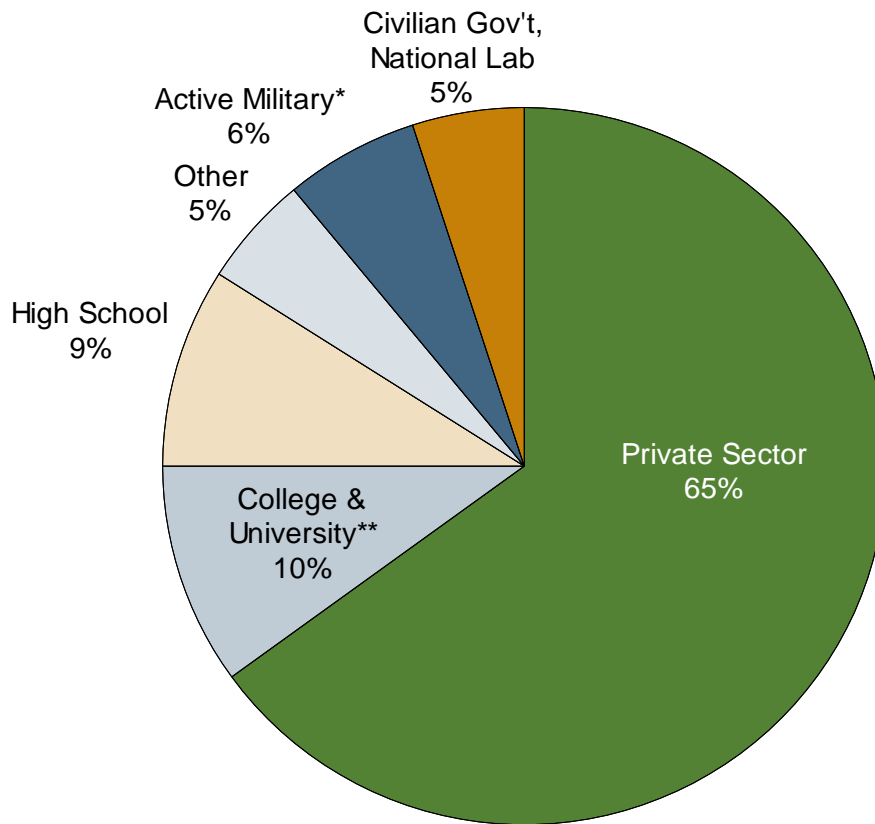


About 1 out of 6  
US physics bachelor's receive a  
physics or astronomy PhD

This is about 6 times the rate for all bachelor's  
degrees.

# Initial Employment Sectors of Physics Bachelors

Classes of 2013 & 2014 Combined  
Students not Enrolling in Graduate School

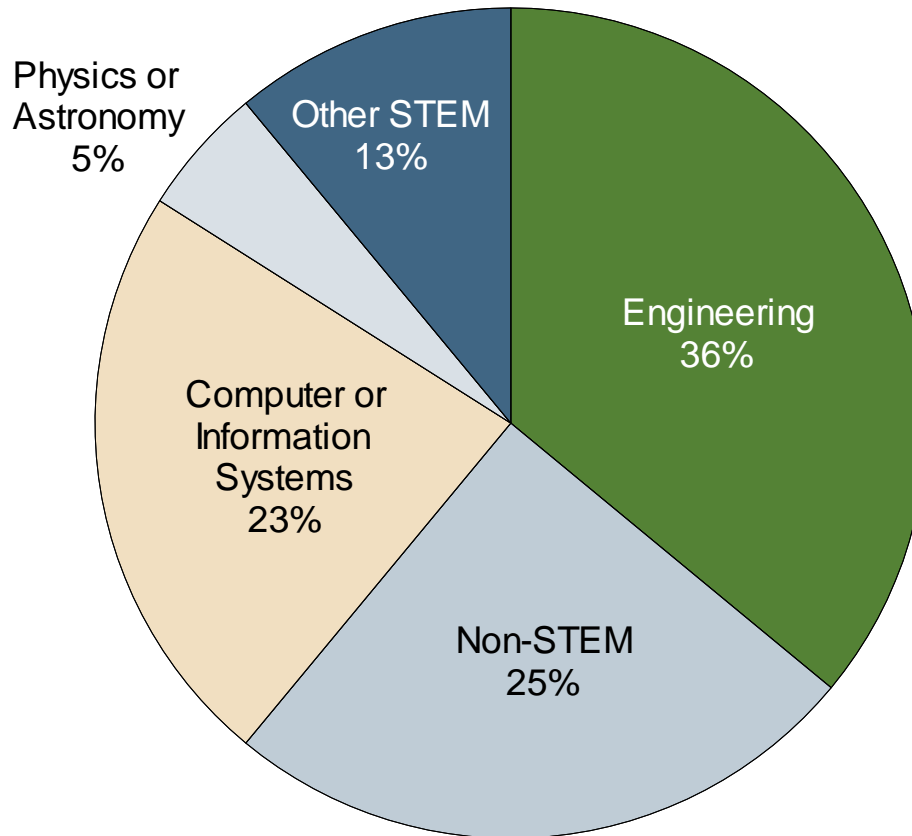


\*Data does not include degree recipients from the three military academies (US Naval Academy, US Military Academy, US Air Force Academy).

\*\* Data include two- and four-year colleges, universities, and university affiliated research institutes.

# Field of Employment for Physics Bachelors in the Private Sector

Classes of 2013 & 2014 Combined





# Who is Hiring Physics Bachelor's?

[www.aip.org/statistics/whos-hiring-physics-bachelors](http://www.aip.org/statistics/whos-hiring-physics-bachelors)

# Employers who recently hired new physics bachelor recipients.

## Louisiana

American Warrior, Inc.  
C & C Technologies, Inc.  
Engineering and Inspection Services, LLC  
IBM  
Mary Bird Perkins Cancer Center  
Oncologics, Inc.  
Tech2000  
TurboSquid  
Waitr Inc.  
Westlake Chemical Corp.  
Zero Chaos

## Texas

3M  
Accruent  
Apple  
Applied Nanotech Holdings, Inc.  
Astrix Technology Group  
Atco Rubber Products, Inc.  
Baylor University Medical Center  
BBVA Compass  
Bell Helicopter  
Boston Consulting Group  
Calvert Systems  
Century Cancer Centers  
Circular Energy  
City Machine & Welding

CPSG Partners  
CSA Materials, Inc.  
Cudd Energy Services  
Cyclotron Institute  
Cypress Semiconductors (formerly Spansion Inc.)  
Dawson Geophysical  
Don Harrington Discovery Center  
DPC  
Evoke Technologies  
Facebook  
Fairfield Nodal  
Ford AV  
General Motors  
Grifols  
Haas Group International  
Halliburton  
Honeywell International  
Houston Methodist Hospital  
IBM  
INEOS  
Intertek Automotive Research  
JW Nutritional  
L-3 Communications  
Lintec of America  
Lyondellbasell Industries  
MD Anderson Cancer Center  
MEI Technologies  
Micro Power Global

National Instruments  
National Oilwell Varco  
North American Development Bank  
Pantex  
PEG Bandwidth, LLC  
Pervasive  
Peterbilt Motors Company  
Principle Energy Services  
PTC, Inc.  
PwC Advisory Services  
Qualified Technical Services  
Quorum Business Solutions  
Raytheon  
Sabre Industries (formerly FWT, LLC.)  
Samsung  
Sheridan Production  
Sylvan Learning Center  
TASC Inc.  
Texas Instruments  
Triumph Aerostructures  
United States Air Force  
United States Army  
University of Texas at Austin  
US Medical IT  
USAA  
Verify Markets  
Wade Wilson Art  
WDS Global  
Weatherford International

This is only a portion of the employers who hired recent physics bachelors into technical positions. Source: AIP Statistical Research Center, classes 2011 thru 2015.



# Physics Job Titles.

<https://www.aip.org/statistics/common-job-titles-physics-bachelors>

## Engineering

- Systems Engineer
- Electrical Engineer
- Design Engineer
- Mechanical Engineer
- Project Engineer
- Optical Engineer
- Manufacturing Engineer
- Manufacturing Technician
- Laser Engineer
- Associate Engineer
- Application Engineer
- Development Engineer
- Engineering Technician
- Field Engineer
- Process Engineer
- Process Technician
- Product Engineer
- Product Manager
- Research Engineer
- Test Engineer
- General Engineer
- Technical Services Engineer

## Computer

### Hardware / Software

- Software Engineer
- Programmer
- Web Developer
- IT Consultant
- Systems Analyst
- Technical Support Staff
- Analyst

### Education

- High School Physics Teacher
- High School Science Teacher
- Middle School Science Teacher

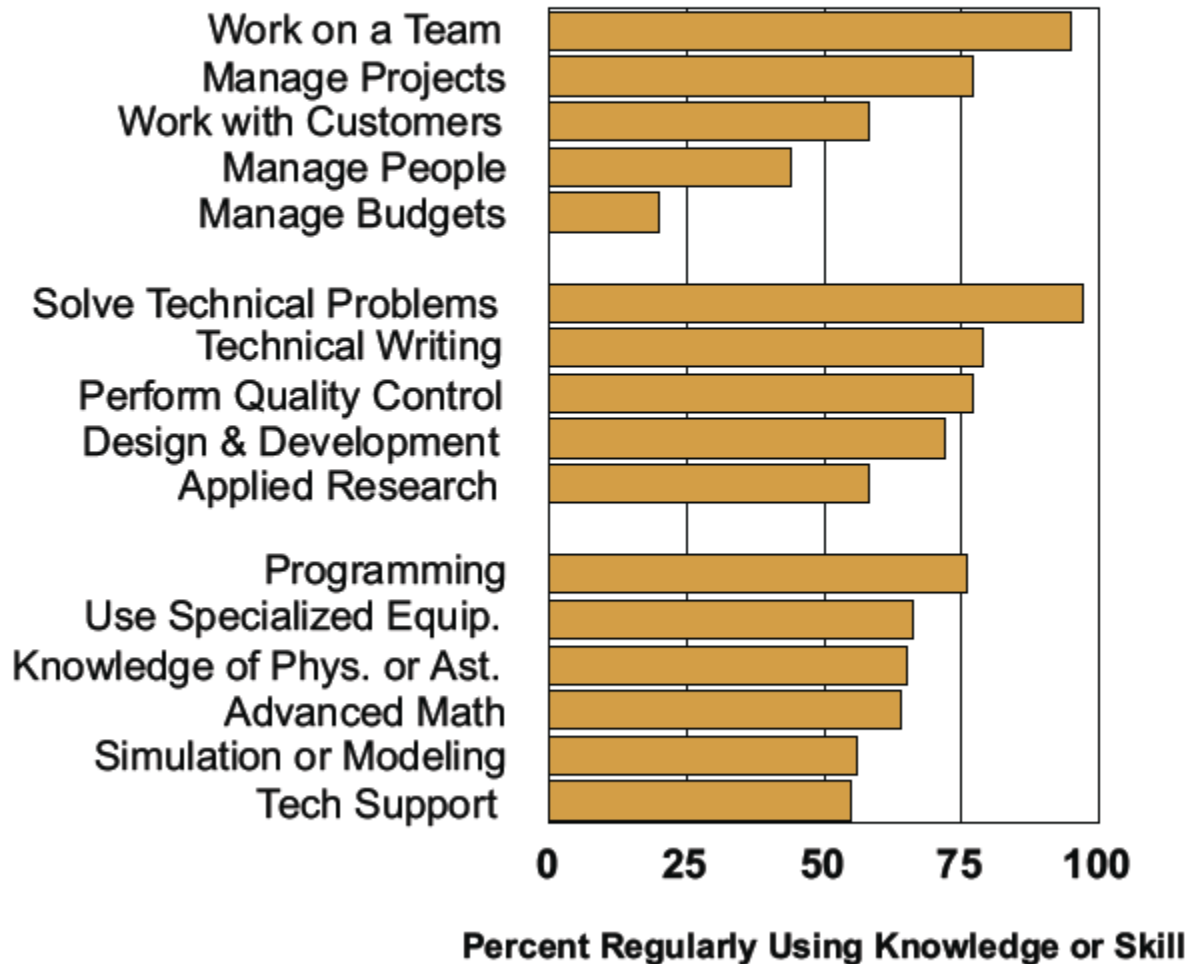
### Research and Technical

- Research Assistant
- Research Associate
- Research Technician
- Lab Technician
- Lab Assistant
- Accelerator Operator
- Physical Sciences Technician

Note: No physicist, so if you use the career center on campus, you need to be aware of the job titles you are actually searching for.

# Skills Used Regularly

## New Physics Bachelors Employed in STEM Fields



# Starting Salaries for Physics

## Bachelor's Employer

Classes of 2013 & 2014  
Combined

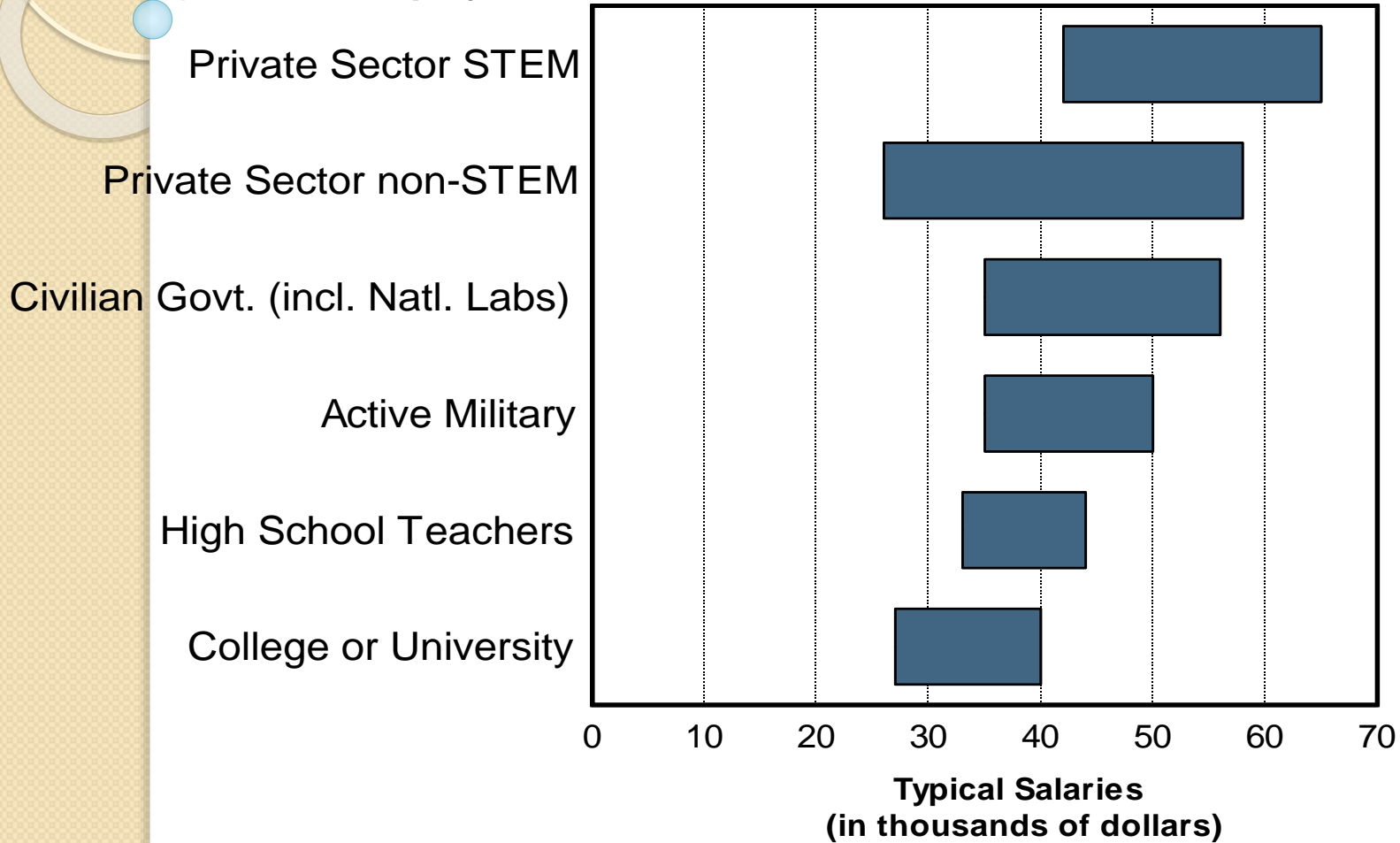


Figure 1: Top-paid math and science majors at the bachelor's level

Major	Average Starting Salary
Physics	\$64,625
Construction science	\$56,750
Mathematics/statistics	\$56,714
Chemistry	\$55,750
Geology/geological sciences	\$53,079
Environmental science	\$51,811
Biology/biological sciences	\$51,218

Source: January 2015 Salary Survey, National Association of Colleges and Employers

# Typical Starting Salaries of Exiting Physics Masters

## One Year after Degree

Classes 2012, 2013, & 2014 Combined

Private Sector

College & University



# Starting Salaries for Physics

## PhDs

*Potentially Permanent Positions*

Private Sector

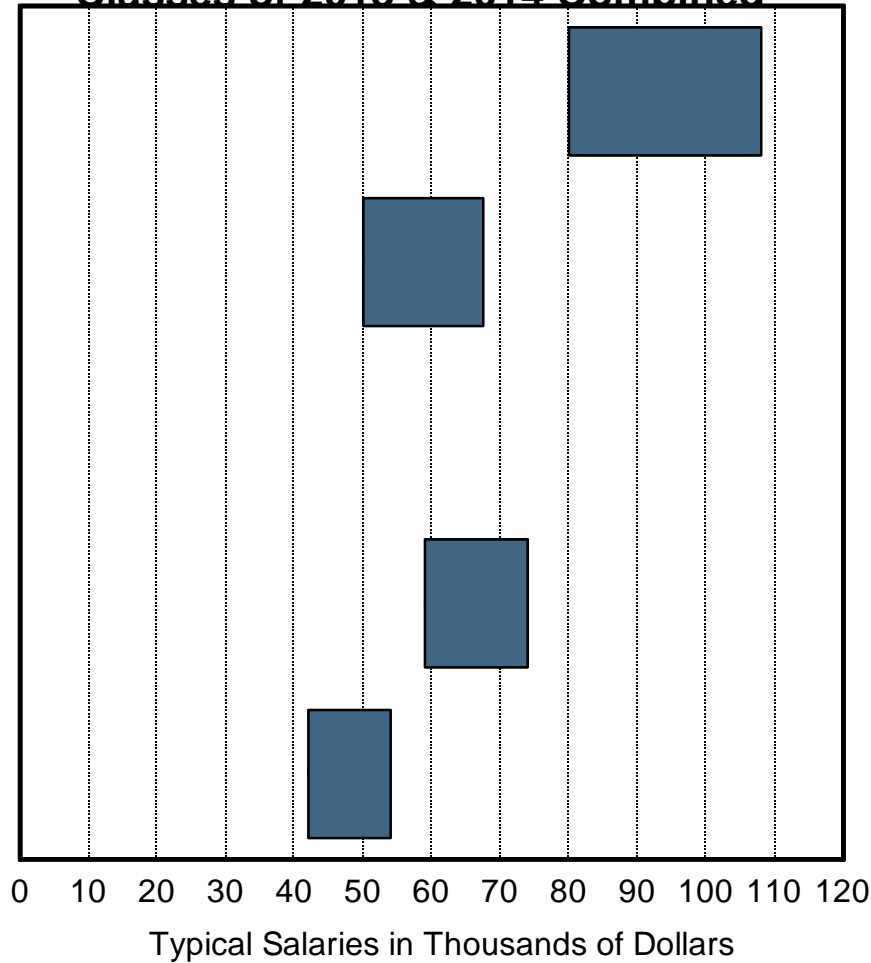
University &  
4-year College

*Postdocs*

Government Lab

University  
& UARI

Classes of 2013 & 2014 Combined





# Teaching

Change Lives



# You need training and a license

- ▶ The nation has a desperate shortage of qualified physics teachers. (desperate=opportunity)
- ▶ It is also an excellent option if you need a break between undergrad and grad school.
- ▶ Preparing to teach builds valuable communication skills for any career.
- ▶ Understanding teaching will make you a more successful professor (6% of the time).
- ▶ It may also be the career that is right for you: flexible, touch lives individually, give back.
- ▶ We have just funded a scholarship to support a fifth year if needed to achieve a license.





# Students underestimate high school teaching

- Teachers make more than you think (by about \$10,000).
- Teachers are government employees and get pensions.
- Teachers can often retire comfortably earlier than other physics professions.
- Teachers have more control over their lives than other professions (a teacher is not going to be told they have to move or that they need to be in Kokomo for the next month).
- Teachers get the summer off (if they want it off).

Get a license and great training in 4 years



WVU Home

Search this site...

Search this site

About WVUteach Staff Students Mentor Teachers UTeach WVUCE-STEM

# EMPOWERING THE FUTURE.

WVUteach is an innovative program uniting in-depth science and mathematics education with teacher preparation.

Pass on your enthusiasm and knowledge to the next generation!



# Be aware of deadlines

- ▶ If you are finishing your freshman year, enroll in ARSC 120 (Step 1) in the fall and you are on track for a teaching license in 4 years.
- ▶ If you are finishing your sophomore year, you can complete in two more years but you should see me and I will get you in contact with an adviser who is an expert in the process. The first step is still taking ARSC 120 in the fall.
- ▶ If you are finishing your junior year, you will probably need a 5<sup>th</sup> year to finish. If you are sure you want to teach, we have a \$14,500 scholarship that can support you in that additional year.
- ▶ If you are finishing your senior year, we can discuss options but it is much more difficult.



# Professional School

Change Lives with Debt



# Medical/Professional School



- Doctor, dentist, physical therapist, medical physicist, lawyer.
- Each profession will have some additional requirements (OChem) and probably additional standardized tests (MCAT/LSAT). There will be specific advisers who can help you.
- You will have to pay for most professional schools, unlike graduate schools.
- You should contact admissions at a target school to determine additional course requirements.



# Medical/Professional School

## FAQ

### Physics Degree and Medical School

---

**What is the Medical College Admission Test (MCAT)?** Required by all Medical Schools, the test is divided into four sections: Physical Sciences, Biological Sciences, Verbal Reasoning, and a Writing portion. Each section (except Writing) is scored out of 15. The Writing portion is graded by a letter, J through T. For example, a MCAT score might be 36-S.

**What classes should I take before applying to Medical School?** The MCAT challenges areas in the Physical Sciences, Biological Sciences, and Verbal Reasoning with a writing sample given at the end.

- Biology with lab (BIOL 115 & 117)
- Inorganic Chemistry with lab (CHEM 115 & 116)
- Organic Chemistry with lab (CHEM 235 & 236)
- Physics (PHYS 101 & 102)
- English (ENGL 101 & 102)
- Calculus (MATH 155)
- Biochemistry (BIOC 531)





# WVU Admissions Site

## Medical College Admissions Test (MCAT)

- The [Medical College Admission Test \(MCAT\)](#) is required of all applicants.
- MCAT scores will be accepted from exams taken between **September, 2015** and **September, 2018**.
- There is no required minimum MCAT score to apply for Regular Decision. Applicants should refer to the [Class Profile](#) for more information.
- [Early Decision](#) applicants must have a 125 or greater in each sub-section.

## Credit Hour and Course Requirements

- Minimum of 90 Credit Hours PLUS Three years of higher education post-high school (at the undergraduate or graduate level) in an accredited US or Canadian Institution.
- All pre-requisites must be completed at an accredited US or Canadian Institution.
- One gap year which would include meaningful mission-based experiences could potentially be substituted for up to one year of higher education.
- **Biology or Zoology:** 6 hours
- **General Chemistry:** 6 hours
- **Organic Chemistry:** 6 hours  
*Substitute with 3 Hours Organic Chemistry and 3 Hours Biochemistry*
- **Physics:** 6 hours
- **Lab Courses:** 6 hours  
*Lab Courses must be in Biology, Biochemistry, Physics, Inorganic or Organic Chemistry*



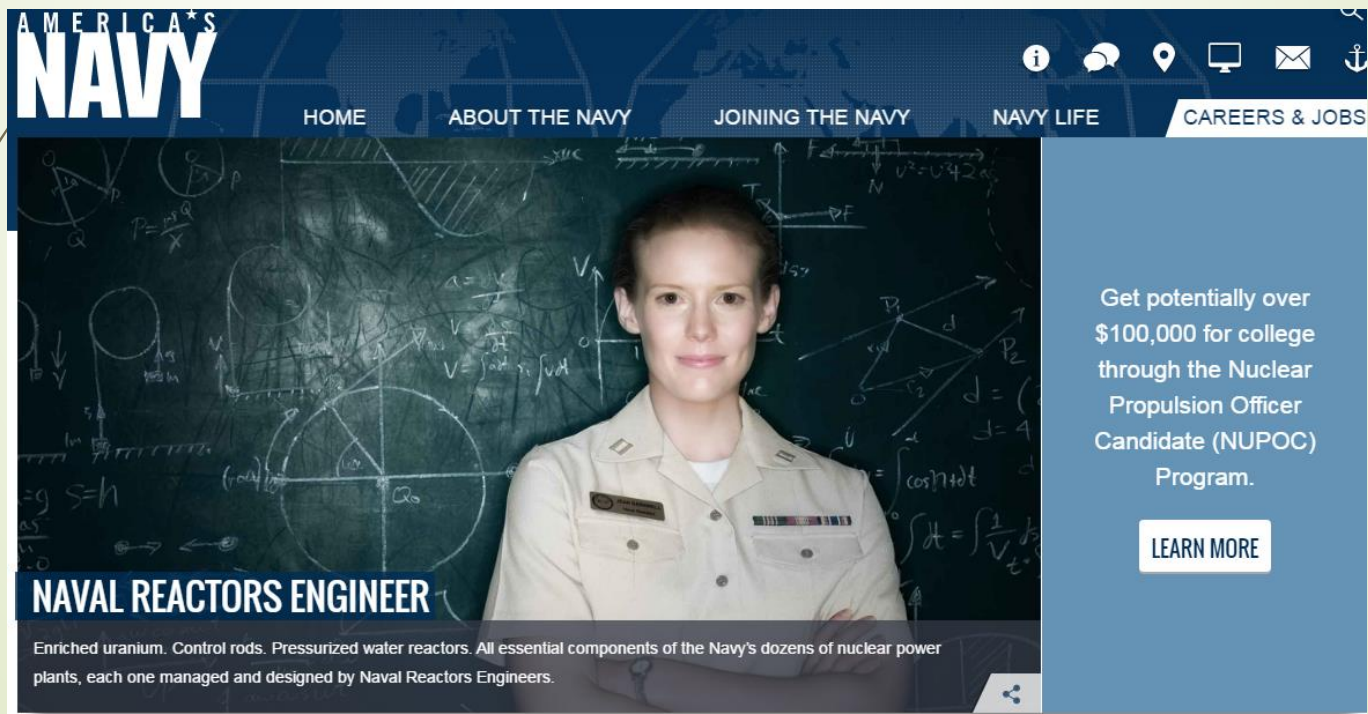
# Military

An option that is more attractive than you might think.



# Military

- Officer programs, Navy Nuclear Power Program (I love this program).



A screenshot of the American Navy website. The top navigation bar includes the text "AMERICA'S NAVY" and menu items: "HOME", "ABOUT THE NAVY", "JOINING THE NAVY", "NAVY LIFE", and "CAREERS & JOBS". The main content area features a woman in a Navy uniform standing in front of a chalkboard filled with mathematical equations and diagrams. Below her is the text "NAVAL REACTORS ENGINEER" and a paragraph: "Enriched uranium. Control rods. Pressurized water reactors. All essential components of the Navy's dozens of nuclear power plants, each one managed and designed by Naval Reactors Engineers." To the right of the image is a blue sidebar with the text: "Get potentially over \$100,000 for college through the Nuclear Propulsion Officer Candidate (NUPOC) Program." and a "LEARN MORE" button.

AMERICA'S  
**NAVY**

HOME ABOUT THE NAVY JOINING THE NAVY NAVY LIFE CAREERS & JOBS

**NAVAL REACTORS ENGINEER**

Enriched uranium. Control rods. Pressurized water reactors. All essential components of the Navy's dozens of nuclear power plants, each one managed and designed by Naval Reactors Engineers.

Get potentially over \$100,000 for college through the Nuclear Propulsion Officer Candidate (NUPOC) Program.

[LEARN MORE](#)



# Still have to prepare

- These program have an extensive interview and induction process. If you might be interested, you should contact a recruiter as soon as possible.
- These are not sure things and should be one of multiple options.