

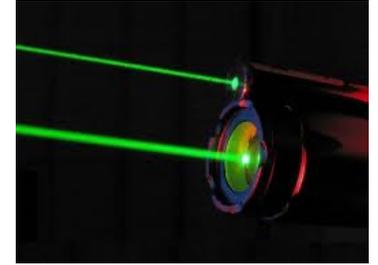
What is Physics?

Why Study Physics?

**Physics is the study of nature
through fundamental concepts**

Look what comes out of

Microelectronics



Low-energy lighting

Lasers! CDs, DVDs, surgery, micromachining

Quantum Mechanics

Understanding of why some atoms bind together.



Pharmaceutical development



Many scientific instrument: STM, TEM, SEM, NMR.

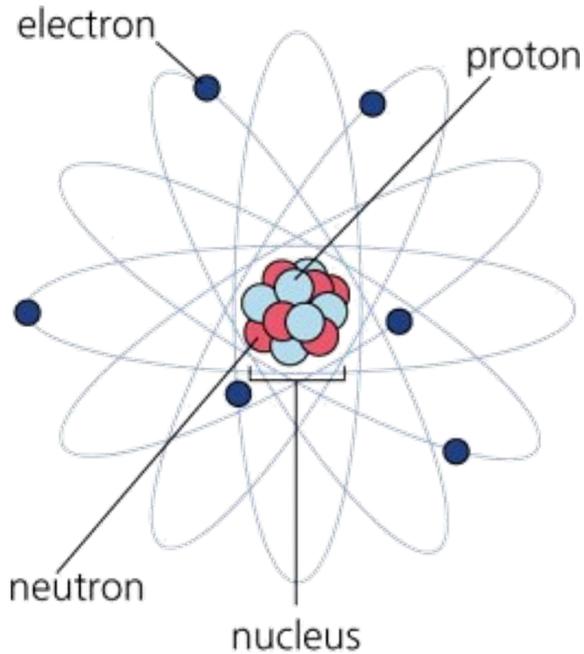
MRI, PET



Using Nuclear Reactions



To Save Lives



Academy Artworks

Nuclear physics is a key element to many techniques used in medical diagnostic and treatment

Medical physicists play an important role in hospitals.





Big questions

Where are we Heading?

Driving Innovation: Elon Musk

From Wikipedia

Elon Reeve Musk (June 28, 1971) is a South African-born Canadian American business magnate, investor, and engineer.

- BSc in Physics (studied at Queen's University and U. Penn)
- BSc Economics (Wharton School of Business at U. Penn)
- Left PhD program in Applied Physics at Stanford after 2 years for entrepreneurial pursuits

- founder, CEO, and lead designer of SpaceX (space exploration)
- co-founder, CEO, and product architect of Tesla (electric cars, batteries)
- Chairman of SolarCity, (solar energy, now part of Tesla)
- co-founder and CEO of Neuralink (brain-computer links)
- co-founder of OpenAI
- In December 2016, he was ranked 21st on the Forbes list of The World's Most Powerful People. In February 2018, he has a net worth of \$20.8 billion and is listed by Forbes as the 53rd richest person in the world. Has gone up since then.

The secret sauce is physics <https://www.youtube.com/watch?v=0JQXoSmC1rs>

What does MUN Offer?

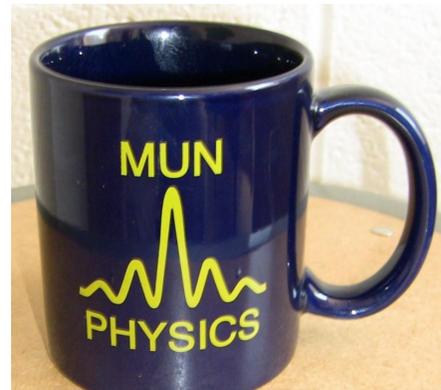
Honours or Major in: Physics, Environmental Physics, and now *Ocean Physics*

- **Smaller classes.**
- **Active undergraduate physics society.** →
- **Summer research jobs.**
- **Travel to conferences.**
- **A personal desk!** ↘

MUN PAPOS

Contact: munpapos@gmail.com

President: Galina Sherren



What else does MUN Offer

Joint Honours Programs

- Applied Mathematics and Physics
- Biochemistry and Physics
- Chemistry and Physics
- Computer Science and Physics
- Earth Sciences and Physics
- Geophysics and Physical Oceanography

Joint Major Programs

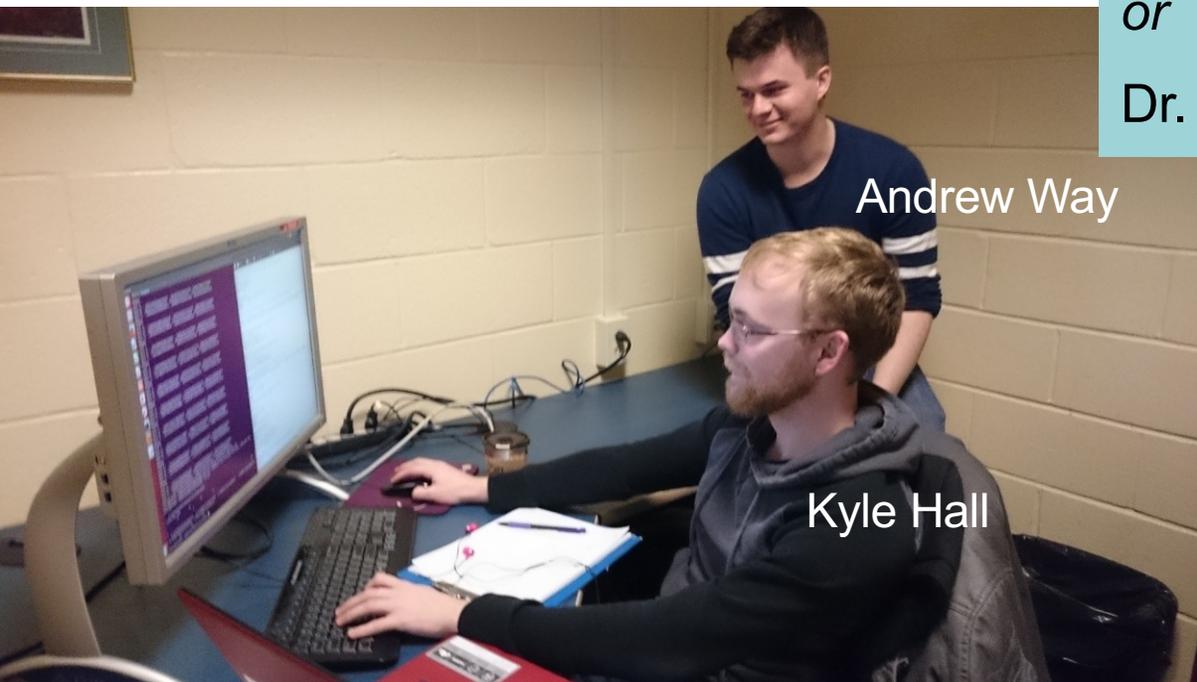
- Applied Mathematics and Physics
- Computer Science and Physics
- Earth Sciences and Physics

Contact:

Dr. Len Zedel (physicshead@mun.ca)

or

Dr. Ivan Saika-Voivod (saika@mun.ca)



Andrew Way

Kyle Hall

Minors

- Minor in Physics
- Minor in Physics for ECE
- Minor in Ocean Science for Physics students
- Engineering minor for Physics students

What does MUN Physics Offer?

RESEARCH AREAS

- Physical Oceanography
- Theoretical & Computational Studies of Materials
- Magnetic Systems
- Soft Matter and Biophysics
- Photonics & Optical properties of thin films
- Sensors and actuators
- Astrophysics



What else does MUN Offer

Departmental Scholarships

-In Fall 2022, the Department of Physics and Physical Oceanography handed out over \$25,000 in Scholarship money

Dept. Scholarships

- Noel \$4010
- Kieft \$1792
- Reddy \$1114
- Breckon \$1023
- Hugh Anderson \$17600 – spread out over multiple students

PAPOS Award \$500

Every Scholarship-Eligible Physics students got at least \$1000 from the Department.

SO:

- Maintain scholarship standing*
- Declare yourself a Physics major

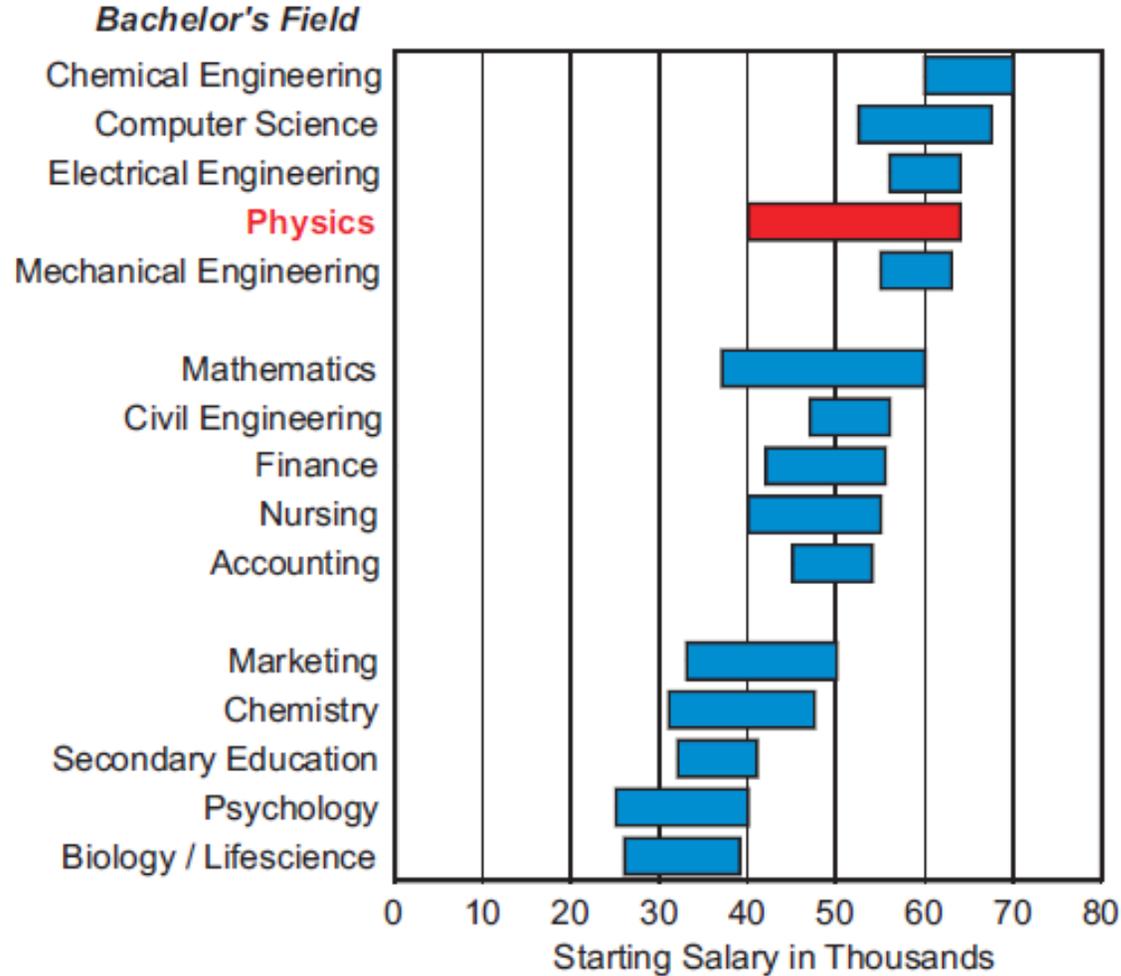
*A 75% average at the end of two out of the last three semesters in the previous scholarship year and the successful completion of not less than 30 credit hours in those two semesters.

What else does Physics Offer

What's a Bachelor's Degree Worth?

Typical Salary Offers by Campus Recruiters, AY 2008-09

\$
(2009)



Typical salaries are the middle 50%, i.e. between the 25th and 75th percentiles.

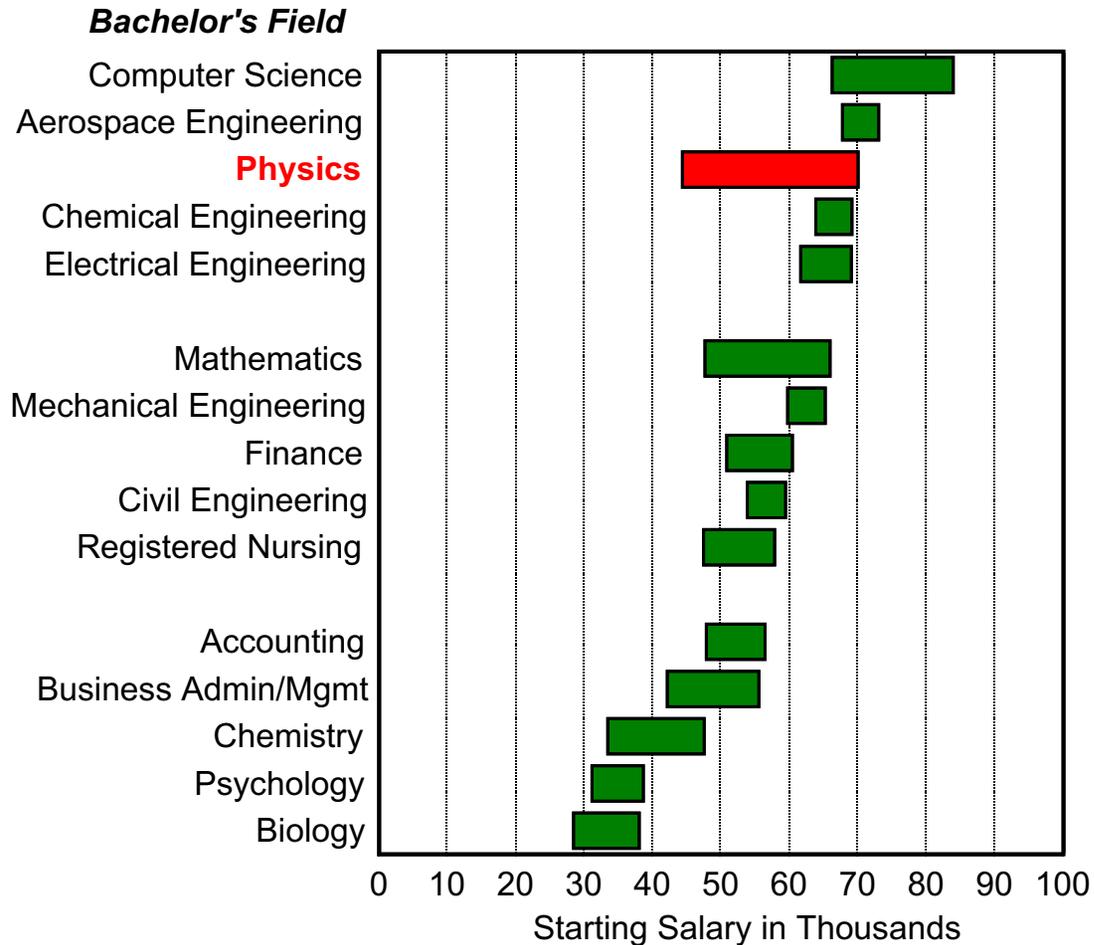
Reprinted from the Fall 2009 Salary Survey, with permission of the National Association of Colleges and Employers, copyright holder.

What else does Physics Offer

\$
(2015)

What's a Bachelor's Degree Worth?

Typical Salaries for Bachelor's Degree Recipients, Class of 2015



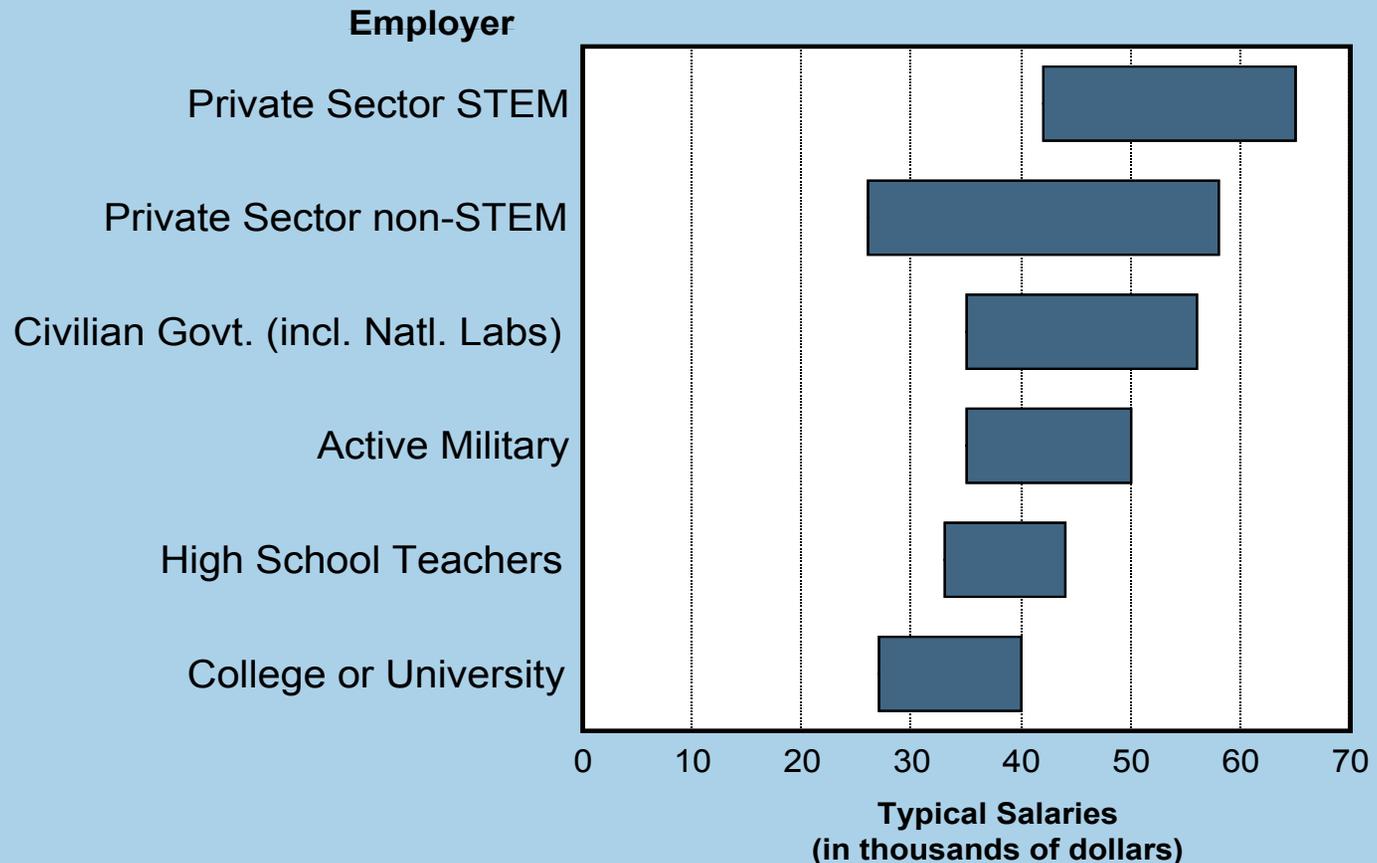
Note: Typical salaries are the middle 50%, i.e. between the 25th and the 75th percentiles.

Reprinted from the Spring 2016 *Salary Survey*, with permission of the National Association of Colleges and Employers, copyright holder.

What else does Physics Offer



Typical Starting Salaries for Physics Bachelors, Classes of 2013 & 2014 Combined



This figure includes only bachelors in full-time, newly accepted positions. Typical salaries are the middle 50% i.e. between the 25th and 75th percentiles. STEM refers to positions in natural science, technology, engineering, and math. Data are based on respondents holding potentially permanent jobs in private sector STEM positions (498), private sector non-STEM positions (114), civilian government positions (52), the active military (44), high school teaching positions (82), and universities or colleges (84).

What else does Physics Offer

Status of Physics Bachelors One Year After Degree, Classes of 2013 & 2014 Combined

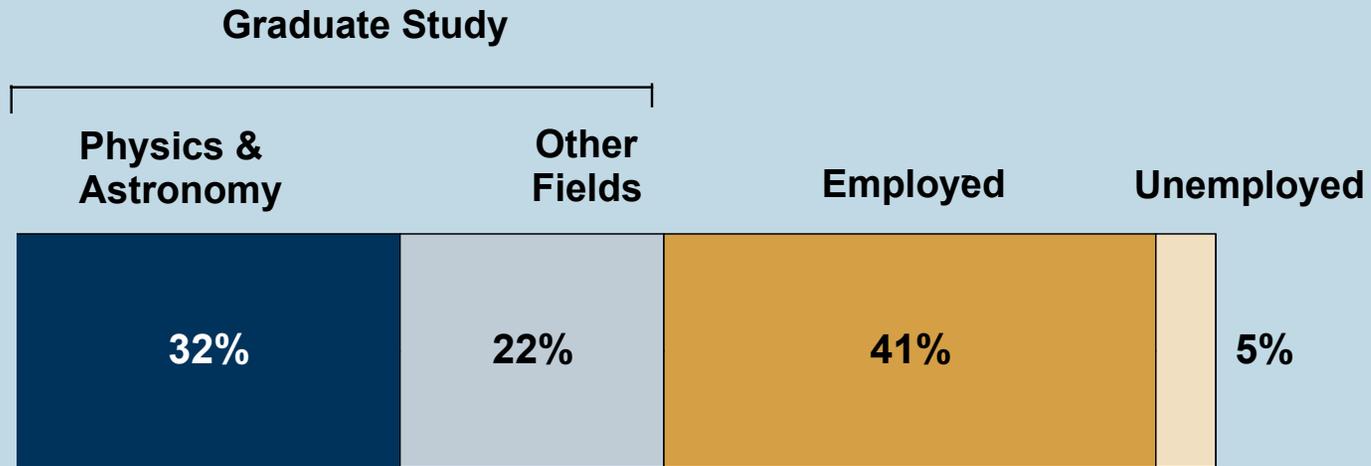


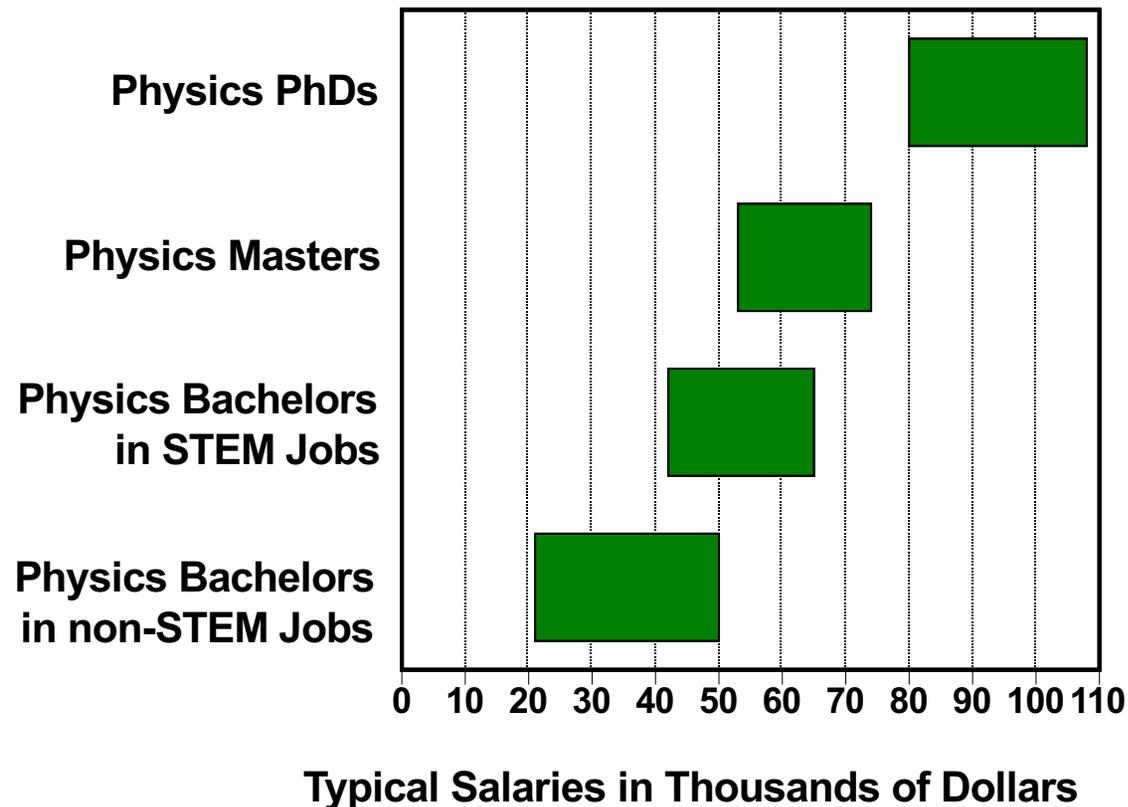
Figure based on 4,886 individuals.

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

What else does Physics Offer

Starting Salaries in the Private Sector

Physics Degree Recipients, Classes of 2013 & 2014

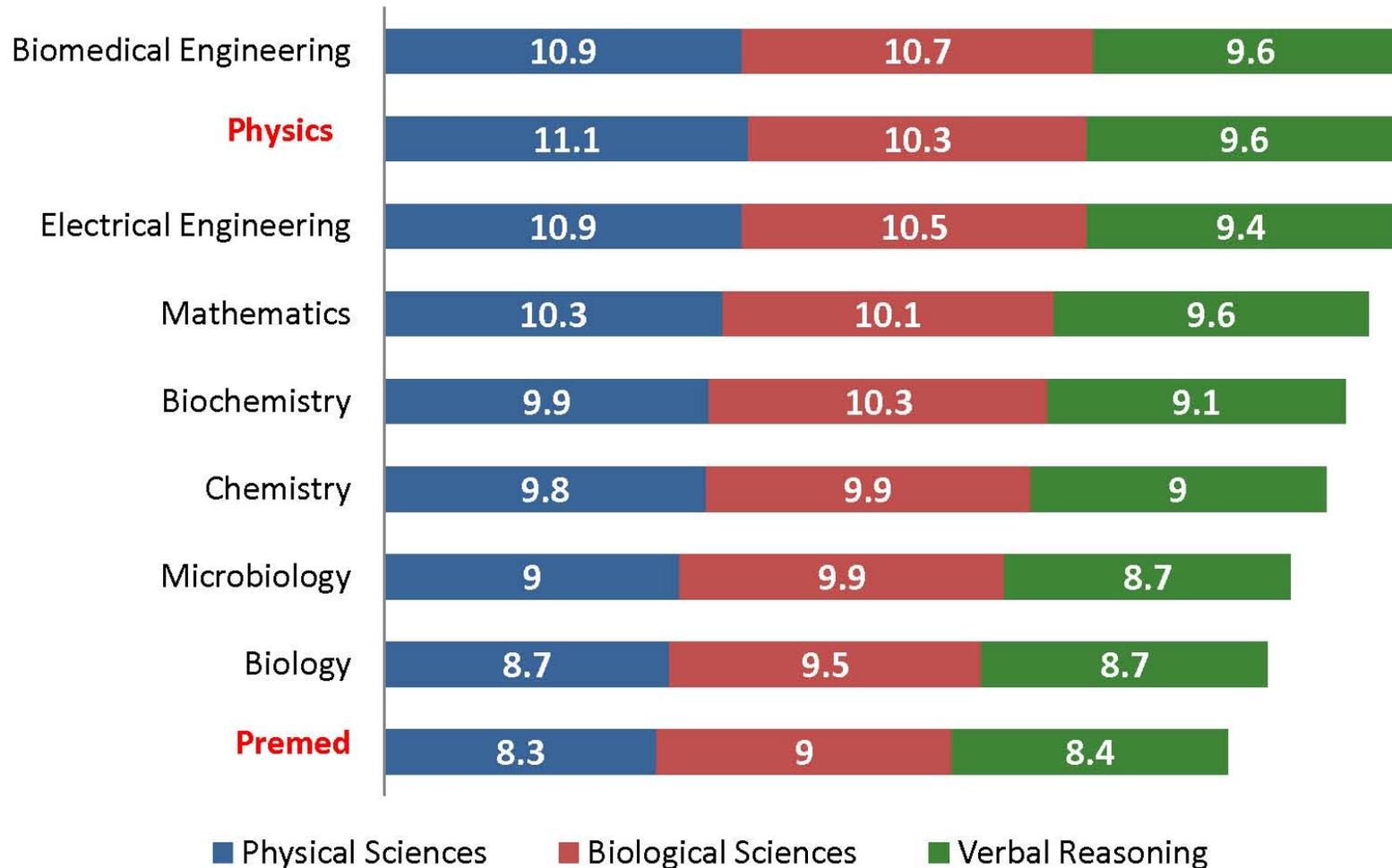


Note: Typical salaries are the middle 50%, i.e. between the 25th and 75th percentiles.
STEM refers to positions in Science, Technology, Engineering, and Math.

What does Physics Offer

Average MCAT Scores by Selected Majors, 2009

Scores above 9.5 in each section are considered competitive by most medical schools



Source: AIP Statistical Research Center compiled data from the Data Warehouse of the American Association of Medical Colleges

What does Physics Offer

MCAT, 2012

Average MCAT Scores* by Selected Majors, 2012

| | Physical Science | Biological Science | Verbal Reasoning | Number of Applicants |
|------------------------|------------------|--------------------|------------------|----------------------|
| Economics | 10.8 | 10.8 | 9.9 | 633 |
| Physics | 11.1 | 10.4 | 9.8 | 228 |
| Biomedical Engineering | 11.1 | 10.6 | 9.6 | 1,147 |
| Mathematics | 10.6 | 10.4 | 9.3 | 340 |
| Electrical Engineering | 10.9 | 10.1 | 9.4 | 135 |
| Neuroscience | 10.1 | 10.6 | 9.5 | 1,615 |
| English | 9.6 | 10.1 | 10.2 | 380 |
| Biochemistry | 10.1 | 10.4 | 9.0 | 2,864 |
| Chemistry | 9.5 | 10.0 | 9.0 | 2,113 |
| Microbiology | 9.2 | 10.1 | 8.8 | 759 |
| Psychology | 9.1 | 9.6 | 9.1 | 2,327 |
| Biology | 9.0 | 9.7 | 8.7 | 13,605 |
| Premedical | 8.3 | 8.9 | 8.1 | 587 |
| All Majors | 9.5 | 9.9 | 9.0 | 44,464 |

* Sorted by total score. Based on test takers who applied to Medical School. Applicants are allowed to take the MCAT exam more than once; these averages are computed using each applicant's most recent MCAT exam scores.

Source: Compiled by the Statistical Research Center based on data collected by the Association of American Medical Colleges

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

What does Physics Offer

LSAT, 2012

Average LSAT Scores* by Selected Majors, 2012

| | Average Score* | Number of Applicants |
|-------------------|----------------|----------------------|
| Mathematics | 162.2 | 254 |
| Physics | 162.1 | 126 |
| Economics | 159.1 | 2,468 |
| Engineering | 157.3 | 1,127 |
| Chemistry | 156.7 | 267 |
| History | 156.7 | 3,323 |
| English | 155.8 | 3,728 |
| Biology | 155.2 | 1,095 |
| Political Science | 154.3 | 12,215 |
| Psychology | 153.3 | 3,335 |
| Computer Science | 152.3 | 327 |
| Pre-Law | 149.0 | 994 |
| Criminal Justice | 145.3 | 2,878 |
| All Majors | 153.6 | 66,197 |

* Based on test takers who applied to Law School. Applicants are allowed to take the LSAT exam more than once; these averages are computed using each applicant's highest score on the LSAT exam.

Source: Compiled by the Statistical Research Center based on data collected by the Law School Admission Council

More information?

MUN Dept. of Physics and Physical
Oceanography

www.mun.ca/physics

- Programs
- Courses
- Local research interests

Canadian Association of Physicists

www.cap.ca

- Careers and employment
- PPhys Certification
- Graduate programs in Canada

American Physical Society

www.aps.org

American Institute of Physics

www.aip.org