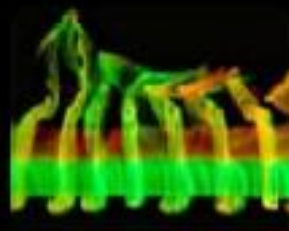


Academic and Career Paths in Physics

Mike Kotlarchyk
Professor & Head
RIT School of Physics & Astronomy



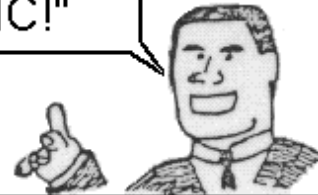
*"All science is
is either
physics or
stamp
collecting"*

E. Rutherford

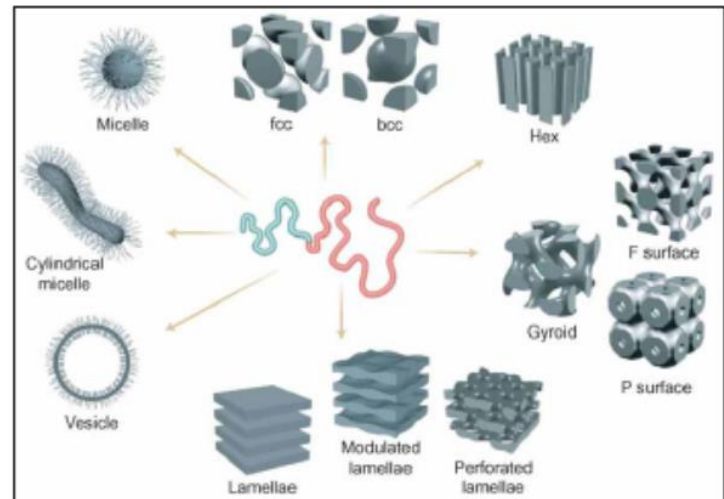
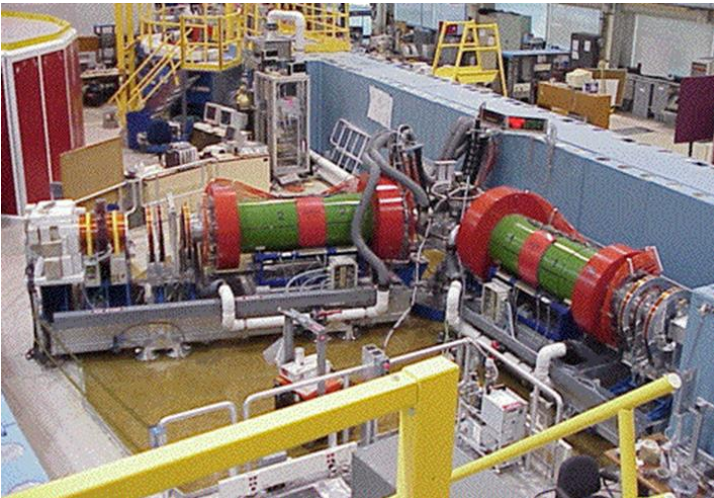
A bit about my personal path....

"In just 38 months, you can earn big PROFIT\$ as a fully trained QUANTUM MECHANIC!"

Learn secrets of QUANTUM MECHANICS in your own home, in your spare time, without quitting your present job!



Just a bit about my research....



Placement of BS Physics Graduates National Data

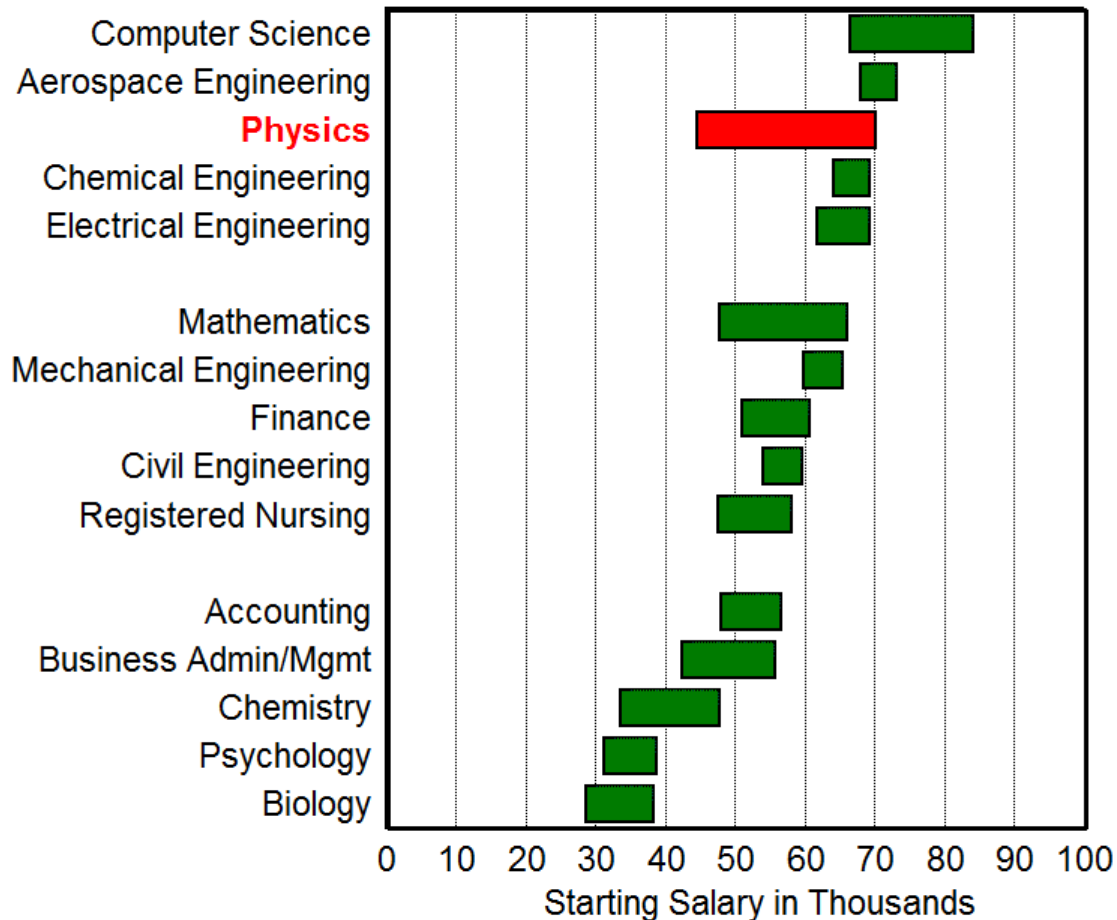
(American Institute of Physics)

- Placement Statistics 1-Year After Graduation (2019)
 - Graduate Study in Physics or Astronomy (29%)**
 - Graduate Study in Other Fields (20%)**
 - Employment (47%)**
 - Unemployed/Seeking (4%)**

What's a Bachelor's Degree Worth?

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

Bachelor's Field

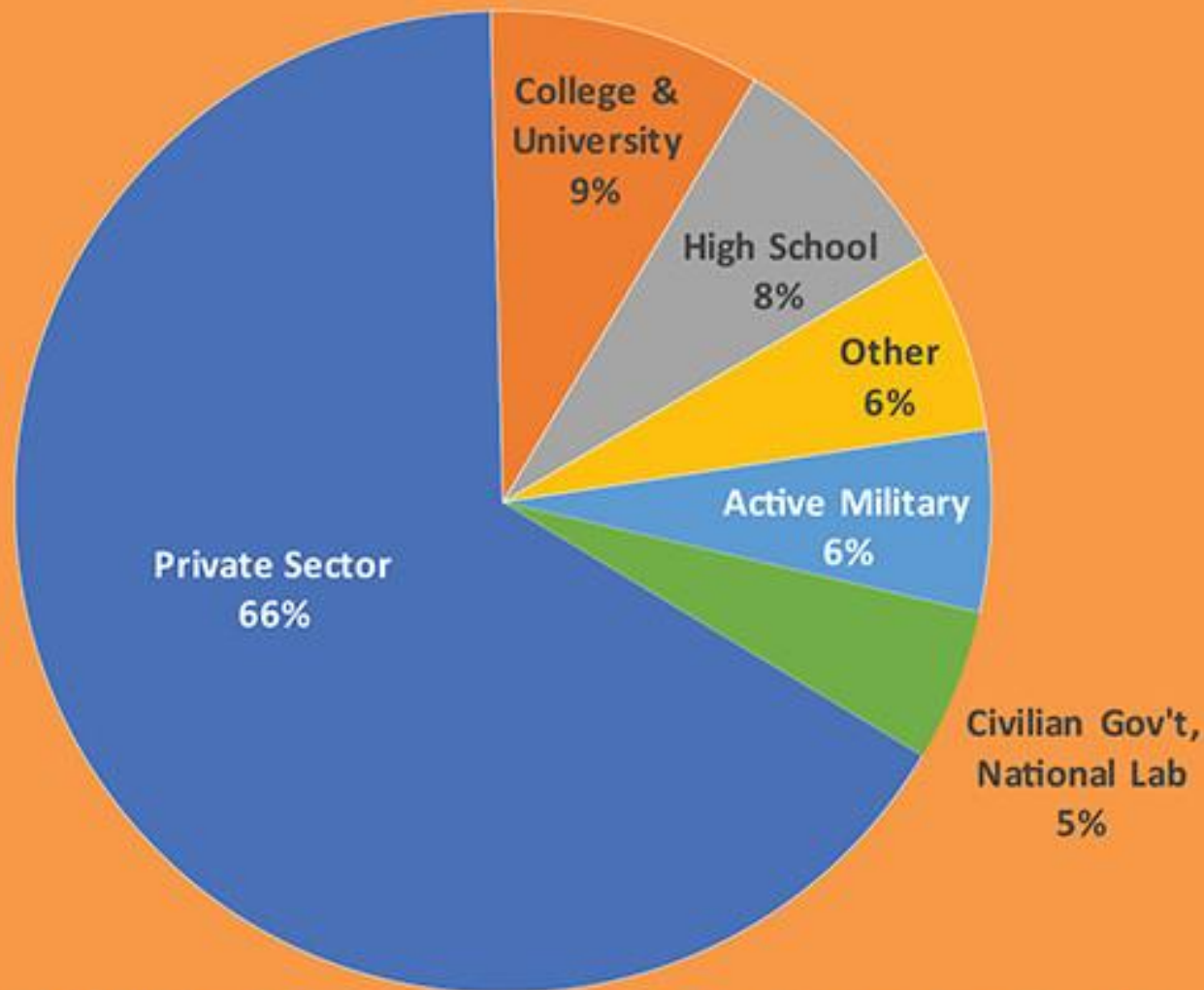


Avg Starting
Salary with
Physics BS:
~\$58,000

Note: Typical salaries are the middle 50%, i.e. between the 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.

Initial Employment* Sectors of New Physics Bachelors, Classes of 2015 & 2016 Combined



* 47% of physics bachelor's degree recipients from these classes were employed in the winter following the year in which they received their degree. 49% enrolled in graduate study – 29% in physics or astronomy and 20% in some other discipline.

Recent RIT Physics Graduate School Placements

(~ Last 5 Years)

- Cornell University (PhD, Applied Physics)
- University of Chicago (PhD, Medical Physics)
- University of Rochester, Institute of Optics (PhD, Optics)
- University of Southern California (MS, Mechanical Engineering)
- University of Georgia (Law School)
- Virginia Tech (PhD, Aerospace Engineering)
- Brandeis University (PhD, Physics)
- University of Maryland (PhD, Physics)
- New York University (PhD, Physics)
- University California at Davis (PhD, Economics)
- Montana State University (PhD, Physics)
- Northwestern University (PhD, Physics)
- Rutgers University (PhD, Mathematics)
- Nazareth College (MS, Education)
- University of Colorado, Boulder (PhD, Physics)
- University of North Carolina, Chapel Hill (PhD, Physics)

Recent RIT Physics Industry and Government Placements (~ Last 5 Years)

- Optimax (optical engineer)
- L3 Harris Technologies (systems scientist)
- Radiation Monitoring Devices (staff scientist)
- Lawrence Berkeley National Laboratory (research scientist)
- Rochester Museum of Science (planetarium shows and presenter)
- Ball Aerospace (space systems engineer)
- Corning Tropel (photonics industry)
- Naval Research Laboratory (solid state division)
- Triad Semiconductor (semiconductor industry)
- Navy Nuclear Power School (nuclear sub training)
- National Instruments (laboratory interfacing software)
- Lockheed Martin Space Systems (astronomical instrumentation)
- High School Physics Teacher

Some Summer Research Placements: NIST SURF Program, NASA-Glenn, REU's (such as SLAC, others), Max-Planck Institute for Gravitational Physics, RIT COS Research Fellowships

Interested in a Teaching Career?

According to a recent report by the American Assn of Employment in Education, universities report that

Physics tops the list of
63 education disciplines for teacher demand

- 1. Physics teachers**
- 2. Teachers for those with severe/profound disabilities**
- 3. Math teachers**
- 4. Chemistry teachers**
- 5. Teachers for students with emotional disabilities**

So You Want to Go on to Graduate School?

If you go on to seek a Ph.D. in Physics or related field, tuition costs are normally covered by the hosting institution.

In addition, you are paid a living stipend typically in the range of approx. \$20-30K.

Partnership Between RIT Physics and Office of Career Services & Co-op

- How to identify and apply for summer co-ops in industry and other areas of the private sector
- How physics majors should structure a resume and cover letter
- How to apply to graduate school
- Applying for summer research internships (REU's, SURF's, etc.) at universities and national laboratories
- Honing interviewing skills
- Networking and applying for positions
- Developing an "elevator speech."
- Preparing for the RIT Career Fair
- Applying for jobs after graduation

RIT Graduate Programs for Physics

PhD and MS Programs

- Astrophysical Sciences and Technology (**PhD** and **MS**)
- Physics (**MS**)
- *Pending Approval*: Physics (**PhD**)

RIT Accelerated 5-Year Dual Degree Options

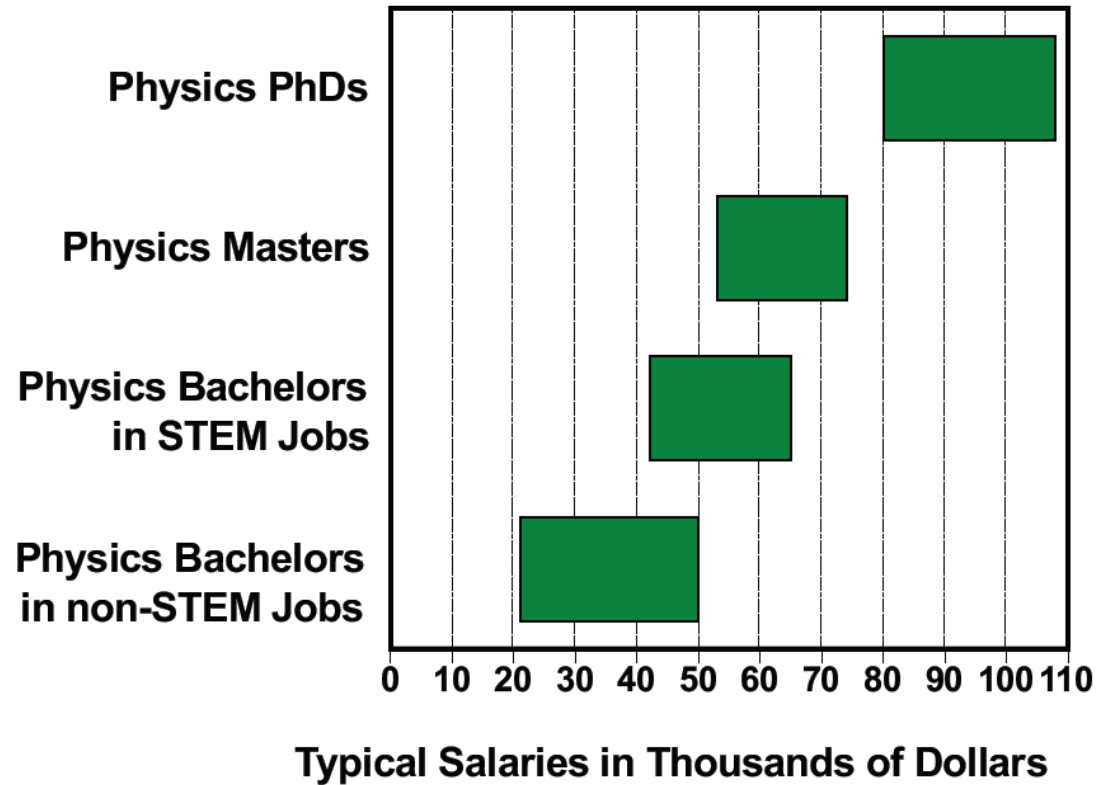
- **BS** Physics + **MS** Materials Science & Engineering
- **BS** Physics + **MS** Science, Technology & Public Policy
- **BS** Physics + **MS** Astrophysical Sciences & Technology
- **BS** Physics + **MS** Physics
- *Pending Approval*: **BS** Physics + **MS** Sustainable Systems

Student UG Research Opportunities in RIT Physics

- Astrophysics and Astronomy
- Nanoscale materials and device physics
- Condensed matter and materials physics
- Optics and photonics
- Atomic/molecular physics
- Biological, soft-matter, and disordered materials
- Physics education research
- Particle and nuclear physics

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.

Initial Employment of Physics and Astronomy PhDs by Subfield of Dissertation, Classes of 2011 & 2012 Combined.

Percent

0 20 40 60 80 100

Applied Physics

Plasma & Fusion

Optics & Photonics

Condensed Matter

Atomic & Molecular

Materials Science

Particles & Fields

Astronomy & Astrophysics

Biological Physics

Nuclear Physics

■ Postdoctoral Appointment ■ Other Temporary ■ Potentially Permanent

Initial employment outcomes of new physics PhDs are affected by their subfield of research.

Where can I find out more?

ComPADRE Physics Careers Resource Website

- The comPADRE Careers Resource Website provides advice and resources for students, educators and parents who want to know more about physics and physics careers.

www.careersinphysics.org

APS Webinars

- APS webinars are designed to connect you with individuals who can offer insight into physics careers, educational programs, and professional development for students, working physicists, and educators.

www.aps.org/careers/webinars

AIP Statistical Research Center

- The latest statistics are available on physics employment, enrollment, demographics, and more!

www.aip.org/statistics

APS Job Center

- Partnered w/ Physics Today, AAPT, AVS Science and Technology, IEEE Computer Society, and SPS. Store copies of your resume, set up job alerts, search the database, and apply for jobs online for FREE!

careers.aps.org