A Career in Physics

What do Physicists do?

- space physics
- medicine
- geophysics
- finance
- defense
- consultancy
- semiconductors
- military
- cosmology

Fundamental Research
Physics as a Career

Traditional Path to Becoming a Professional Physicist

- Undergraduate Major (BSc 4 Years)
- Master's Degree (MS 2 Years)
- PhD Degree (PhD 4 Years)
- Private Sector/ National Laboratory
- Academic Position
- Postdoctoral Researcher (Postdoc 2-5 Years)
What happens right after graduation?

SIU Physics Majors:

- 50% attend graduate school in physics or related field after graduation.
- 42% enter the workforce after graduation.
- 8% work as a research scientist after graduation.
Undergraduate Research

Julianna Richie
2014 January: Undergraduate Women in Physics Conference at Chicago
2014 Spring: William Ballowe Physics Award
2014 Spring: Poster presentation@APS March Meeting (Denver)
2014 Summer: International Research Experience for Undergraduates
2014 August: Oral presentation@NanoJapan Research Symposium, Tokyo

Graduated Spring 2016
Present: Scientist@Naval Surface Warfare Center, Bloomington IN

Miller Eaton
2015 April : 2nd Place in SIU undergrad Research Town Hall Forum
2015 May : 1st Place in St. Louis Area Undergraduate Research Conference
2015/16 Summer: Internship@Oak Ridge National Laboratory
2016 Spring: Oral Presentation@APS March Meeting (New Orleans)
2017 Spring semester: Study abroad, Modena, Italy
Graduated Spring 2017
Present: Graduate student in Physics (PhD), University of Virginia

Physics majors experience low unemployment (<4%) and great salary prospects in a wide range of fields: many physics graduates get engineering job.
Competitive Salary Bracket

What’s a Bachelor’s Degree Worth?
Typical Salaries for Bachelor’s Degree Recipients, Class of 2015

**Bachelor’s Field**
- Computer Science
- Aerospace Engineering
- **Physics**
- Chemical Engineering
- Electrical Engineering
- Mathematics
- Mechanical Engineering
- Finance
- Civil Engineering
- Registered Nursing
- Accounting
- Business Admin/Mgmt
- Chemistry
- Psychology
- Biology

Starting Salary in Thousands

Starting Salaries for Physics Bachelor’s Classes of 2011 & 2012 Combined

**Employer**
- Private Sector, STEM
- Private Sector, non-STEM
- Civilian Govt. incl. Natl. Labs
- Active Military
- High School Teachers
- College or University

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.

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Fall 2016

Spring 2015
What about going to **graduate** school?

**Typical Stipends**

**First-Year Physics Graduate Students**

<table>
<thead>
<tr>
<th>PhD Students</th>
<th>Stipend in Thousands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Assistant</td>
<td>10</td>
</tr>
<tr>
<td>Research Assistant</td>
<td>15</td>
</tr>
<tr>
<td>Fellowship</td>
<td>20</td>
</tr>
</tbody>
</table>

**Students in Master’s Departments**

| Teaching Assistant | 10 |

Annual Stipend in Thousands (9 Month Academic Year)

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


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**PhD Salaries 10 Years Later**

**Place of Employment**

- Hospital, Medical Services
- Government
- Industry or Self-Employed
- Federally-Funded R&D Center
- University Research Institute
- University, 11-12 month
- University, 9-10 month
- 4-Year College, 9-10 month

**Typical Salaries in Thousands**

- 0 to 20
- 30 to 40
- 50 to 60
- 70 to 80
- 90 to 100
- 110 to 120
- 130 to 140
- 150 to 160

Typical salaries are the middle 50%, i.e., between the 25th and 75th percentiles, reported by US resident members of the 10 AIP Member Societies who earned their PhDs 10 to 14 years ago.

Wow! But I really want to work in medicine or law...

### Table 1

<table>
<thead>
<tr>
<th>Major</th>
<th>Physical Sciences</th>
<th>Biological Sciences</th>
<th>Verbal Reasoning</th>
<th>Number of Applicants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomedical Engineering</td>
<td>10.9</td>
<td>10.7</td>
<td>9.6</td>
<td>1,005</td>
</tr>
<tr>
<td>Physics</td>
<td><strong>11.1</strong></td>
<td><strong>10.3</strong></td>
<td><strong>9.6</strong></td>
<td>207</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>10.9</td>
<td>10.5</td>
<td>9.4</td>
<td>195</td>
</tr>
<tr>
<td>Economics</td>
<td>10.4</td>
<td>10.5</td>
<td>9.7</td>
<td>566</td>
</tr>
<tr>
<td>Neuroscience</td>
<td>9.9</td>
<td>10.6</td>
<td>9.5</td>
<td>1,066</td>
</tr>
<tr>
<td>Mathematics</td>
<td>10.3</td>
<td>10.1</td>
<td>9.6</td>
<td>374</td>
</tr>
<tr>
<td>English</td>
<td>9.4</td>
<td>9.9</td>
<td>10.3</td>
<td>434</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>9.9</td>
<td>10.3</td>
<td>9.1</td>
<td>2,594</td>
</tr>
<tr>
<td>Chemistry</td>
<td>9.8</td>
<td>9.9</td>
<td>9.0</td>
<td>2,091</td>
</tr>
<tr>
<td>Microbiology (Bacteriology)</td>
<td>9.0</td>
<td>9.9</td>
<td>8.7</td>
<td>775</td>
</tr>
<tr>
<td>Psychology</td>
<td>8.8</td>
<td>9.4</td>
<td>9.1</td>
<td>2,421</td>
</tr>
<tr>
<td>Biology</td>
<td>8.7</td>
<td>9.5</td>
<td>8.7</td>
<td>12,705</td>
</tr>
<tr>
<td>Premedical</td>
<td>8.3</td>
<td>9.0</td>
<td>8.4</td>
<td>663</td>
</tr>
<tr>
<td>All Majors</td>
<td>9.2</td>
<td>9.8</td>
<td>9.0</td>
<td>41,487</td>
</tr>
</tbody>
</table>

The Medical College Admissions Test (MCAT) has three sections of standardized multiple choice questions (total of 219 items) with an additional writing sample comprised of two essays. Scores of 9.5 to 11 in each section are considered competitive by most medical schools.

Source: Association of American Medical Colleges, Data Warehouse

[http://www.aip.org/statistics](http://www.aip.org/statistics)

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### Table 2

<table>
<thead>
<tr>
<th>Major</th>
<th>Mean Score</th>
<th>Number of Applicants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics</td>
<td><strong>151.6</strong></td>
<td><strong>180</strong></td>
</tr>
<tr>
<td>Mathematics</td>
<td>159.7</td>
<td>335</td>
</tr>
<tr>
<td>Economics</td>
<td>157.4</td>
<td>3,047</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>156.3</td>
<td>546</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>156.0</td>
<td>427</td>
</tr>
<tr>
<td>Chemistry</td>
<td>155.7</td>
<td>555</td>
</tr>
<tr>
<td>English</td>
<td>154.7</td>
<td>6,120</td>
</tr>
<tr>
<td>Biology</td>
<td>154.5</td>
<td>1,055</td>
</tr>
<tr>
<td>Computer Science</td>
<td>154.0</td>
<td>682</td>
</tr>
<tr>
<td>Political Science</td>
<td>152.0</td>
<td>14,864</td>
</tr>
<tr>
<td>Psychology</td>
<td>152.5</td>
<td>4,056</td>
</tr>
<tr>
<td>Pre Law</td>
<td>148.3</td>
<td>1,078</td>
</tr>
<tr>
<td>Criminal Justice</td>
<td>145.6</td>
<td>3,306</td>
</tr>
<tr>
<td>All Majors</td>
<td>152.6</td>
<td>81,539</td>
</tr>
</tbody>
</table>

*The scores in the table are for individuals who applied to Law school for the 2007-08 academic year. All test takers are not represented. Individuals may have taken the LSAT months or possibly years earlier.

Source: AIP Statistical Research Center compiled data from the Law School Admission Council, Newton, PA

[http://www.aip.org/statistics](http://www.aip.org/statistics)

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A physics bachelor’s is an excellent entry degree for medical school.

Contact Patrick Mulvey for more information.
...And I also want to stay close to my family

Why Study Physics? Future of a Physicist with a BS.

Employers in Illinois that recently hired new physics bachelor recipients

Accenture
Aerotech Scientific
Arisin Electronics Illinois, LLC
Analysts, Inc.
Argonne National Lab
Army Corps of Engineers
Beckman Institute (University of Illinois)
Caterpillar, Inc.
CONTAX, Inc.
Creative Thermal Solutions
CSG Systems
Delcross Technologies, LLC
Deloitte Consulting, LLP
Exelon
Fermi National Lab
Fuji Machine America Corporation
GMS / Vedior
Greenlight Planet, Inc.
Highland Engineerin, P.C.
Imaje
Leo Burnett
Lockheed Martin
Northrop Grumman
Orchid Tree Web Solutions
Quantum Design
S&C Electric Company
Sargent & Lundy
United Conveyor Corporation
Val-Matic Valve & Manufacturing Corporation
Wellpoint, Inc.
Zurich North America S&C

This is only a portion of the employers who hired recent physics bachelors into technical positions. Source: AIP Statistical Research Center, Initial Employment Surveys, classes 2007 thru 2009.
Society of Physics Students (SPS) & Physics Club

- Help with homework/studying
- Community outreach including local science fairs
- Assist and participate in astronomy observations
- Trips to national laboratories (Argon, Fermi, Berkley)
- SPS and Physics Club is tons of fun, great for your resume, and great for your education!

Email: Chapter President, Sean Goff
sgoff95@siu.edu

Meetings: Every other Monday in Neckers 456 (Physics Lounge)
Saluki Astronomy Association

PUBLIC ASTRONOMY OBSERVATIONS
WINTER 2017 - SPRING 2018
HOSTED BY SIU PHYSICS & SALUKI ASTRONOMY ASSOCIATION

OBSERVATION TIMES

- Sunday, Nov 12: 5pm - 7pm @ Neckers
- Sunday, Dec 10: 8:30pm - 10pm @ Farms
- Sunday, Jan 21: 6:30pm - 8pm @ Neckers
- Sunday, Feb 18: 7:30pm - 9pm @ Farms
- Sunday, Mar 4: 7:30pm - 9pm @ Neckers
- Sunday, Apr 22: 8pm - 9:30pm @ Neckers
- Sunday, May 6: 8:30pm - 10pm @ Neckers

https://www.facebook.com/pg/SIUC.Physics/events/
Flexible Degree Program

- Traditional physics
- Materials physics
- Computational physics
- Biophysics

Scholarships and Research Opportunities

- Scholarships available
- Paid work experience
- Class credit for doing research
  >80% of SIU physics majors do research
- >25% of SIU physics majors are co-authors on published journal articles