What can you do with a physics major?

Physics Bachelors 1 Year Later

4000 Bachelors Degrees

50% Employment
1100 Private Sector
250 High School
190 Government
150 Active Military
230 Other

50% Graduate School
1160 Physics and Astronomy
320 Engineering
200 Other Science and Math
120 Medicine and Law
130 Education and Other

Four percent of the respondents indicated they were unemployed at the time of the survey, which represents about 160 individuals.

Highest Degree Obtained by Physics Bachelors, Five to Seven Years After Degree

Source: 1998 Bachelors Plus Five Study
Two possible routes

Graduate school
• Masters and/or PhD
• Often leads to professional research (in academia or with a company)

Job right after Bachelors degree
• A job is not a career
• Your first job will likely not be your only job
What’s a Bachelor’s Degree Worth?
Typical Salary Offers by Campus Recruiters, AY 2008-09

Bachelor’s Field
- Chemical Engineering
- Computer Science
- Electrical Engineering
- Physics
- Mechanical Engineering
- Mathematics
- Civil Engineering
- Finance
- Nursing
- Accounting
- Marketing
- Chemistry
- Secondary Education
- Psychology
- Biology / Lifescience

Bachelor’s Starting Salaries
Physics Bachelor’s of 2005 & 2006

Employer
- Private Sector STEM
- Private Sector non-STEM
- Active Military
- High School Teachers
- College or University
WHERE
PHYSICS BACHELORS
WORK

Initial employment, classes of 2003 & 2004

- Private Sector: 56%
- High School: 14%
- Colleges & Universities: 12%
- Active Military: 7%
- Civilian government, FFR&DC*: 6%
- Other: 5%

* FFR&DC: Federally Funded Research and Development Center
What Do Physics Bachelors Do?

<table>
<thead>
<tr>
<th>Type of Job</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software</td>
<td>24</td>
</tr>
<tr>
<td>Engineering</td>
<td>19</td>
</tr>
<tr>
<td>Science &amp; Lab Technician</td>
<td>9</td>
</tr>
<tr>
<td>Management, Owner &amp; Finance</td>
<td>20</td>
</tr>
<tr>
<td>Education</td>
<td>12</td>
</tr>
<tr>
<td>Active Military</td>
<td>6</td>
</tr>
<tr>
<td>Service and Other Non-Technical</td>
<td>10</td>
</tr>
</tbody>
</table>

Predominant Work Activities

Recent Physics Bachelors

Private Sector STEM
- Design & Development
- Programming, Simulation & Modeling
- Quality Control

Private Sector Non STEM
- Management & Administration
- Financial & Legal Services
- Sales & Marketing

Civilian Government
- Applied Research
- Basic Research
- Design & Development
Employers in California that Recently Hired New Physics Bachelor Recipients

- AerospaceComputing, Inc.
- Amgen, Inc.
- Apple, Inc.
- Boeing
- California Analytical Instruments
- E&M Electric
- Electronic Arts
- Electro-Optical Industries
- Fire Cause Analysis
- General Atomics
- GreenVolts
- IBM Almaden Research Center
- Intel Corporation
- Jet Propulsion Laboratory (JPL)
- Lawrence Berkeley National Laboratory (LBL)
- Lockheed Martin Corporation
- Maxim Systems, Inc.
- Melles Griot
- Nanosolar, Inc.
- NASA/Caltech Jet Propulsion Lab
- Northrop Grumman
- NVIDIA
- Raytheon
- Scripps Research Institute
- Spectra-Physics
- Walt Disney Imagineering
What Do High School Physics Teachers Teach?

Recently Hired Teachers with Physics Degrees

- 39% Exclusively Physics
- 34% Mostly Physics
- 27% Some Physics
- Other Subjects: Math, Physical Science, Chemistry, Biology, Applied Science

The average teaching load is 5 classes per term.
Getting a PhD

• Research Degree
• Grad School in Physics, Astronomy, Engineering are most common
• Takes an average of six years to complete
• Two years for a masters degree
• Most PhD education in science is funded
• If interested, should get BS not BA
• Undergraduate research important
This graph depicts the number of full-time equivalent years of physics graduate study completed by the PhD class of 2004. US Citizens only.
PhD Starting Salaries

Physics PhDs of 2005 & 2006

Non-Postdoc Positions

Private Sector
PhD-granting Physics Department
Bachelor's-granting Physics Department

Postdocs
National Lab/FFR&DC
University

Typical Salaries in Thousands of Dollars

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
Before You Begin a Job Search

1. Don’t get stressed out about it (3rd most common concern of undergrads)

2. Make contacts from your department
   • Get to know upperclassmen
   • Try to meet alumni

3. Make choices that will set you apart
Setting Yourself Apart

• A physics degree with a solid GPA is the first step.

• Develop other skills
  – Computer programming, writing, communication
  – Second language, business course

• Get some experience
  – Do an internship or arrange to “shadow” someone
  – Do research (summer or next Fall)
Research Experiences of Physics Undergraduates

- Working with a professor on a project: 37%
- As part of a thesis project: 28%
- Research Experience for Undergraduates (REU-Funded by the National Science Foundation): 26%
- Non-departmental employment (e.g. Summer job): 25%
- While in a co-op or internship: 13%
- None: 29%
Preparing to Seek Your First Job

1. Series of questions for self-assessment
2. Identify your own skills
3. Determine what you value in a job
4. Reflect on a list of assets identified by physicists in industry
Preparing for a Job Search: Self Assessment

1. Do I have overarching goals?
2. Do I want my life’s story to be told through my own accomplishments or through my influence on others?
3. Do I want my personal accomplishments to have tangible form?
4. Do I want to be a generalist or specialist?
Other Questions

• What do I enjoy doing?
• What are my personal strengths/weaknesses?
• What are my technical skills and experiences?
• What are my non-technical skills and experiences?
• Am I better at starting a project or at follow-through?
• Am I more a leader or a follower?
• Am I an idea person or a detail person?
• Am I a people person?
• Do I prefer a task where I work alone or with others?
• What is important to me – Money? Job Satisfaction? Prestige?
• Am I willing to relocate?
• What types of positions or responsibilities/dues are not acceptable?
• What are my salary needs?
What’s Important?

Importance of knowledge and skills for physics bachelors, 5 - 7 years after degree

Primary Field of Employment

<table>
<thead>
<tr>
<th>Scientific problem solving</th>
<th>Math &amp; Science</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthesizing information</td>
<td></td>
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<tr>
<td>Mathematical skills</td>
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<tr>
<td>Physics principles</td>
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<tr>
<td>Lab or instrumentation</td>
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<tr>
<td>Scientific software</td>
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<tr>
<td>Knowledge of physics</td>
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<tr>
<td>Modeling or simulation</td>
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<tr>
<td>Product design</td>
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<tr>
<td>Computer programming</td>
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<td></td>
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<tr>
<td>Software development</td>
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</tbody>
</table>

Percent "Very Important"

Communication and People Skills

Percentage of physics bachelors who spend a large amount of time on the following work activities, 5-7 years after earning their degrees

<table>
<thead>
<tr>
<th>Work Activity</th>
<th>Employed in Engineering, Science &amp; Math</th>
<th>Employed in Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working with Co-Workers</td>
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<tr>
<td>Client Services</td>
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<tr>
<td>Managing Projects</td>
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<tr>
<td>Technical Writing</td>
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<tr>
<td>Making Presentations</td>
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<td></td>
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<tr>
<td>Non-Technical Writing</td>
<td></td>
<td></td>
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<tr>
<td>Supervising Others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training People</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Homework – Due next Monday

• Complete the Work Values Inventory
  – Can be done at http://people.usd.edu/~bwjames/tut/time/workinv.html

• Through our Career Center, take either Personal Assessment test (online, but requires a code)

• Go over the lists of important skills (previous slide.)
  – What are your strengths and weaknesses?

• Write your obituary (submit by email)
  – What do you want your legacy to be? What do you want to be remembered for?