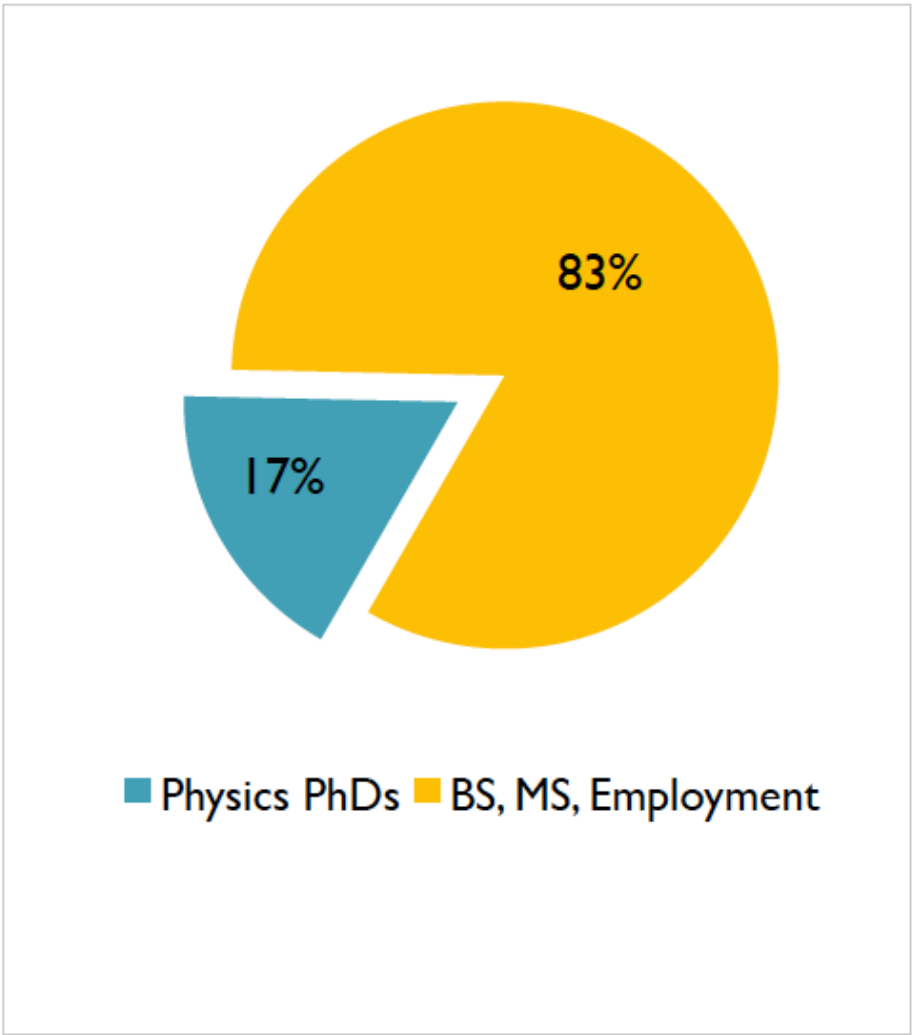
What about the non-PhD physicists?

According to the AIP Statistical Research Center, 83% of physics bachelors will not earn a Physics PhD.



- Roughly one-third to one-half of Physics Bachelors will go straight into the workforce, mostly in STEM fields.
- Another third will go into graduate study in Physics and Astronomy.
- And the remainder will go into graduate study in other fields—including finance, law, and Medical Physics.

What types of employment are possible for these degree paths?

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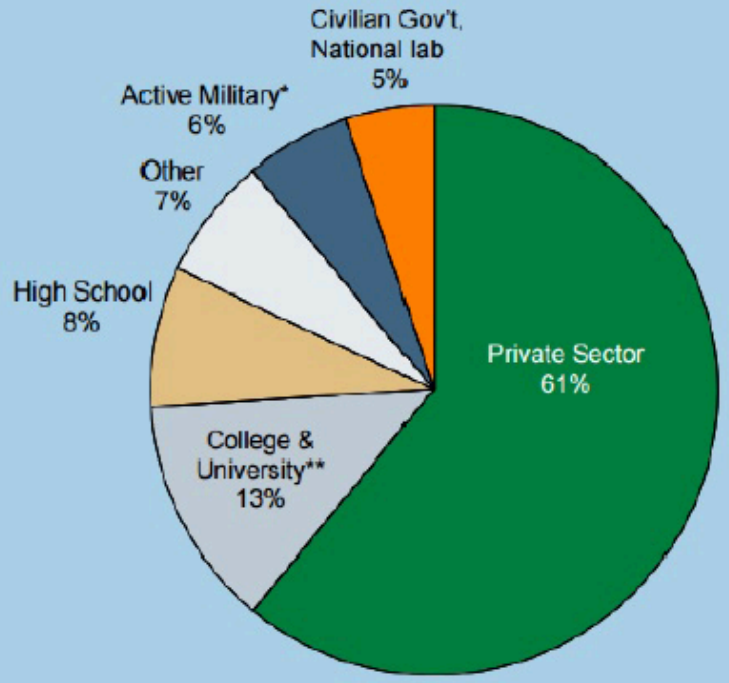
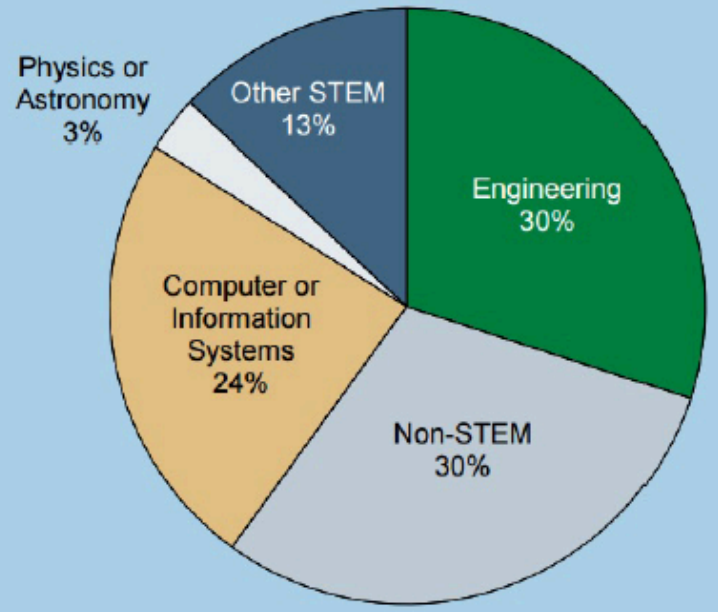
Initial Employment of Physics Bachelors

On average between 1995 and 2012, about 40% of physics bachelors went directly into the workforce after graduation.

Initial Employment Sectors of Physics Bachelor's, Classes of 2011 & 2012 Combined.



Field of Employment for Physics Bachelor's in the Private Sector, Classes of 2011 & 2012 Combined.



STEM refers to natural science, technology, engineering, and mathematics.

http://www.aip.org/statistics

Bottom line: at all degree paths, the largest initial employment sector for physics graduates is the private sector.

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Why Are Physics Grads Valuable to Industry?

Employers in STEM fields value physics graduates in their companies as members of interdisciplinary teams

- Standard physics curriculum creates familiarity with technologies commonly used in STEM workforce
  - Programming languages (e.g. C++, Fortran)
  - Circuit design and diagnostics (e.g. oscilloscopes, soldering)
  - Mathematical proficiency (e.g. differential equations, linear algebra)
  - Fabrication (e.g. lathes, bandsaws, screws)
- Language of Job Descriptions[3]
  - Common job titles across STEM recruitments (including physics), e.g. "analyst," "engineer," "developer," etc.
  - Common skills listed in recruitments for physics and engineering graduates:

    perform testing/analysis
    develop/design
    implement
    run queries and reports

[3]APS Job Board search, 4-year degree job postings

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- They Tell Us
  - "BYOCEO" meeting, April 2013. Nate Seidle, SparkFun:

    "Engineering is about putting the period on the sentence. The engineer may write the code, but the physics guy understands what it has to do with the larger context. Together they are very effective."
  - ABET Survey for Applied Physics and Engineering Physics Graduates, Kettering University.

Over 80% of surveyed employers[4] agreed that physics majors:

- Could easily grasp new knowledge and concepts
- Were able to identify, formulate, and solve problems
- Were able to successfully analyze and interpret data
- Could competently use computer applications and databases
- Were able to use current techniques/ tools for technical practices
- Could engage in *continued* learning and problem solving

[4]ABET Survey of applied and engineering physics graduates, Kettering University

What else do STEM employers say?

That physics graduates are also missing important training and experience:

- Ability to design a system, component or process to meet a specific need[5]
- Ability to function on multi-disciplinary teams[5,6]
- Ability to recognize value of diverse relationships (customers, supervisors, etc.)[5]
- Leadership Skills[5]
- Familiarity with basic business concepts (i.e. cost-benefit analysis, funding sources, IP, project management)[5,6]
- Communication skills (oral and written) – esp. how to tailor message to audience[5]
- Real-world experience in companies before graduation[6]
- Awareness of career paths outside of academia[6]

[5]ABET survey of applied and engineering physics graduates, Kettering University
[6]APS Workshop on Nat'l. Issues in Industrial Physics

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To summarize:

Based on available information we can say the following about the physics discipline regarding student career preparedness:

- Some content/knowledge overlap with other STEM disciplines.
  - e.g. particularly technical skills, techniques, equipment
- Some characteristics which are distinct from other STEM disciplines.
  - ability to grasp wider scientific context of work
  - ability to formulate problem solutions from first principles (i.e. the people who start the process rather than "putting the period on the sentence").

Some important content is missing from physics training, including communication and leadership skills, an ability to function well in an interdisciplinary context, and an awareness of careers outside of academia.

Students are able to engage in a degree of career self-advocacy. But the discipline should also provide them with appropriate, realistic training for future careers in non-academic sectors.

What Can Students Do?

Perform a detailed self-assessment

- Understand what you love doing, what you're good at doing, and what you want. Think beyond job specifics.
- Take advantage of existing tools to help you understand your strengths (e.g. the Strong® Interest Inventory).

Attend Informational Interviews

- Use connections (LinkedIn® and alumni networks are especially helpful) to reach out to a company or industry you're interested in.
- Not only builds connections in the company, but gives you an "insider education" about that industry.

Build Your Network

- Develop a "pitch"—be able to describe your background and what types of career paths you're interested in a few sentences.
- Talk to EVERYONE!!

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Keep a Career Journal and Document Skills

- Every experience gives you valuable transferrable skills. Try to sit and write down every single one (don't just focus on "hard science"). This list is a set of "building blocks" for every resume you will ever write.

Capitalize on Opportunity

- Know good places to search for science and technology jobs (e.g. the APS Job Board)
- Understand the skills the job requires, and honestly asses whether you have them, or would be interested in building them.

Know How to Write and Effective *Resume (not a CV)*!

- They are not interchangeable!
- Resumes are the only document appropriate for non-academic jobs, and should be only one page long.
- Write a unique resume for every single position you apply for.

http://go.aps.org/physicsresume

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Take Advantage of APS Resources!!

APS Online Professional Guidebook

- Detailed advice on key aspects of career development.
- Features 5-minute "webinette" clips from the top APS careers webinars
  - APS webinar *"Putting Your Science to Work,"* with Peter Fiske
  - APS webinar *"Career Self-Advocacy: How I Got A Six Figure Job in the Private Sector,"* with Meghan Anzelc
- Topics include self-assessment, networking, interviewing and negotiation strategies, and more.

go.aps.org/physicspdguide

APS Careers Website

- APS Job Board
- Physicist Profiles and Job Prospects pages
- Employment and Salary Information
- APS Webinars archive

APS physics Physics Job Center

www.aps.org/careers

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APS Local Links

- Locally based, grassroots gatherings of students and physicists.
- Focus on students and physicists working in academia, industry, and national labs.
- Groups meet about every 6-8 weeks, usually in a pub or restaurant ("neutral ground").
- Goal is to build mutually beneficial relationships, raise awareness of non-academic careers, and promote recruitment of student and postdocs into industries.
- Current sites include:
  - Ann Arbor
  - Austin
  - Boston
  - DC - Baltimore
  - Denver - Boulder
  - Los Angeles
  - Silicon Valley
  - St. Louis
  - Research Triangle

http://go.aps.org/local_links

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