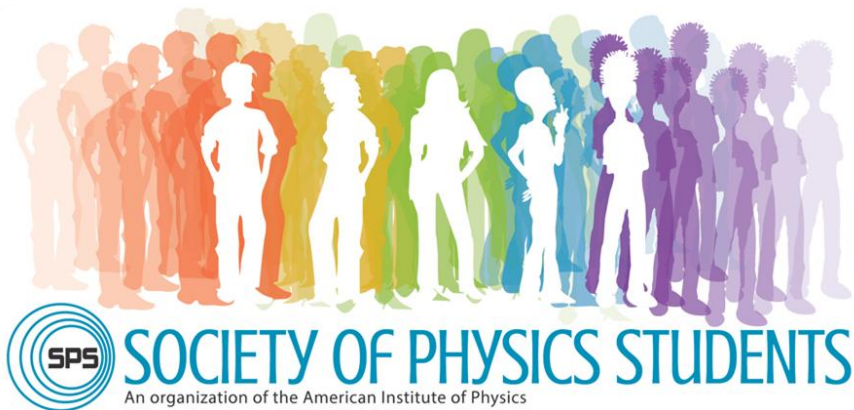


Putting students to work:

Physics-based career opportunities education resources

The Careers Toolbox for Undergraduate Physics Students



The Career Pathways Project
American Institute of Physics
Education Division

The Career Pathways Project

The Project

Motivation
Research
Results

Overview of the Tools

How to set
your own path

The Workshop

Getting started
on the path

careers TOOLBOX

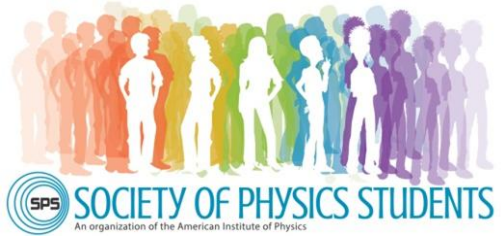
FOR UNDERGRADUATE PHYSICS STUDENTS



American Institute of Physics Career Pathways Project
AIP Statistical Research Center
Society of Physics Students
www.spsnational.org/cup/careerpathways/

NSF Award Number: 1011829





Project Personnel

Project Investigators

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Work is supported by the National Science Foundation under Project No. 1011829, *Expanding the STEM Workforce by Equipping Physics Bachelors Degree Recipients and their Departments to Address the Full Range of Career Options*

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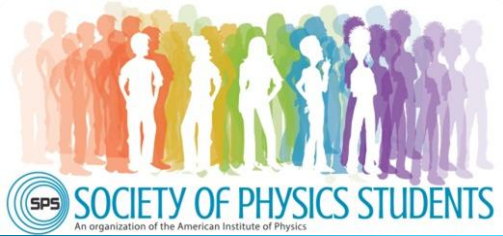
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Sound research begins with
a question.

The Project Motivation

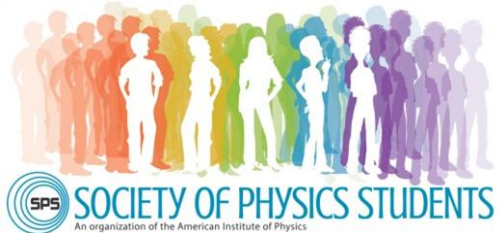
**Where do physics
students go after
graduation?**



The Project Motivation



Hard Working Physics Student



The point of this exercise?

**The Project
Motivation**

**Students need to know
that they have
OPTIONS.**

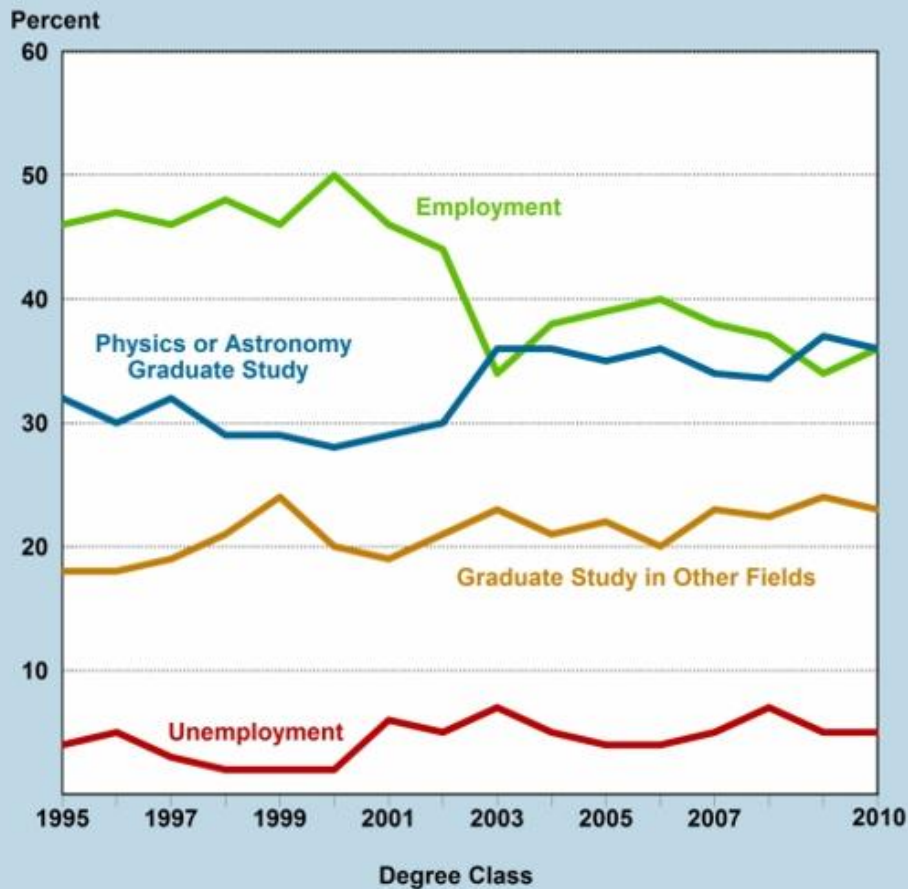
**Earning a degree in physics can lead to
a wide range of career paths.**

Physics BS/BA: One year later

The Project Research

**The best advice
for students about
career options is
based on
statistical
research.**

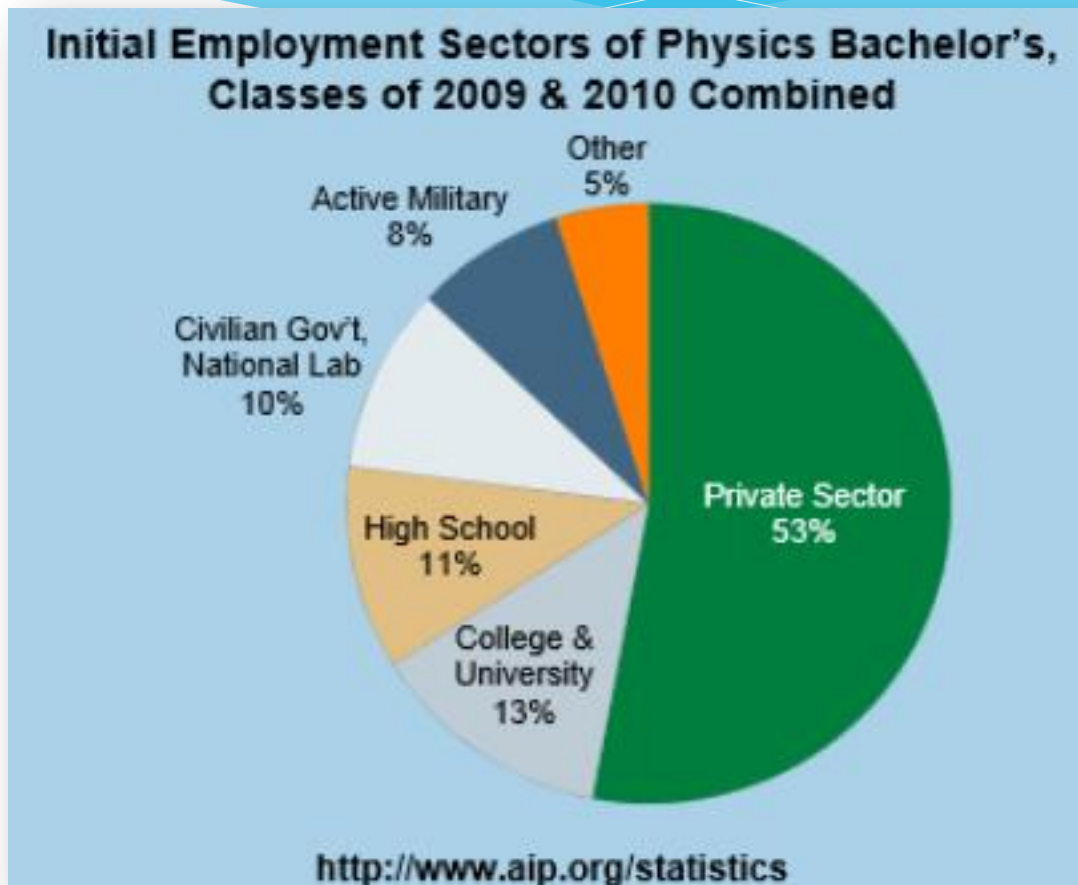
**Trends in Status One Year After Earning a Physics Bachelor's,
Classes 1995 through 2010**



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

Employment options.

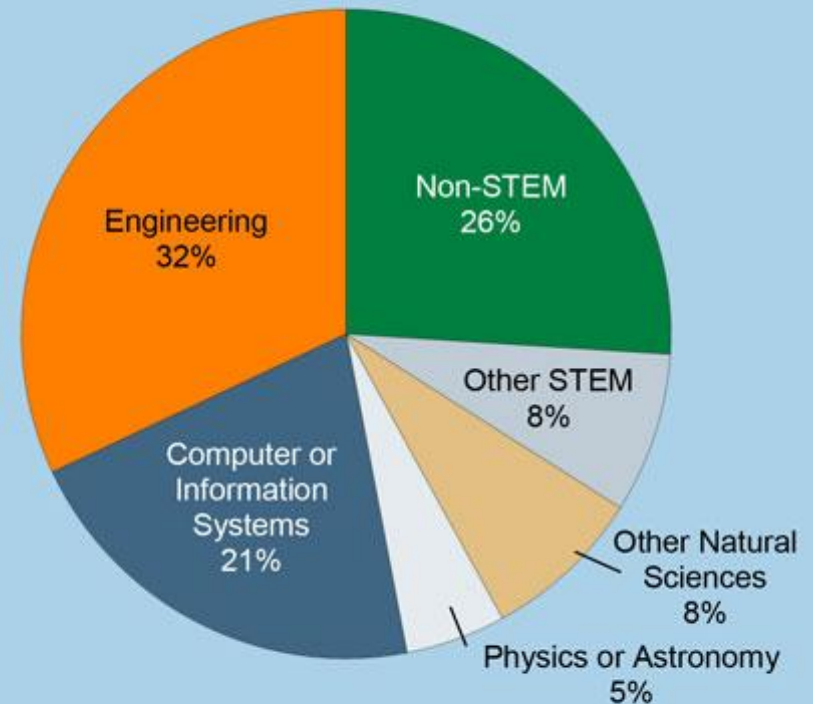
The Project Research



Private Sector Details

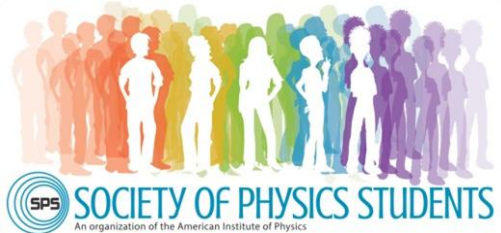
The Project Research

Field of Employment for Physics Bachelor's in the Private Sector, Classes of 2009 & 2010 Combined



STEM refers to natural Science, Technology, Engineering, and Mathematics.

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



Important facts.

The Project Research

FACT: At graduation, physics bachelors students have **OPTIONS**.

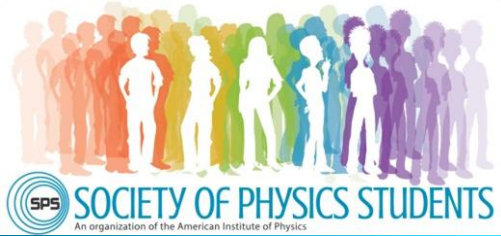
FACT: Many physics students don't know this.

FACT: Many physics faculty members don't know this.

FACT: Many career services personnel don't know this.

FACT: You now know this.

FACT: Even though you now know that you have **OPTIONS**, you may not know how to effectively take advantage of them, for reasons cited above.

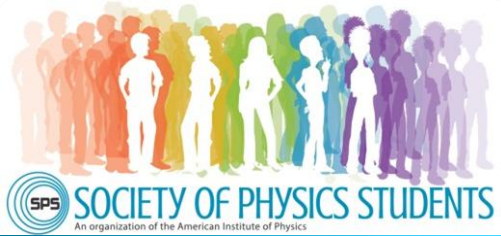


AIP Career Pathways Project

The Project Research

Goals of the work

1. Equip departments with the tools they need to better prepare students to enter the workforce.
2. Equip students with the tools they need to better prepare themselves throughout their undergraduate education.

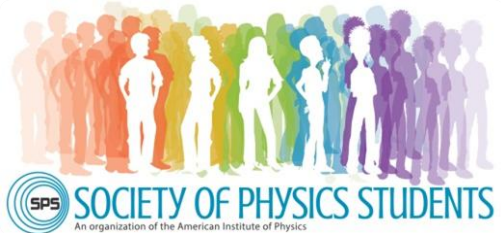


AIP Career Pathways Project

The Project Research

Goals of the work

1. Equip departments with the tools they need to better prepare YOU to enter the workforce.
2. Equip students with the tools YOU need to better prepare yourselves.



AIP Career Pathways Project

The Project Research

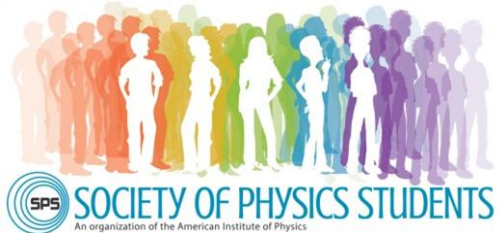
Process / Methods

Identify characteristics of departments successfully graduating students

that enter the STEM workforce within one year of earning a bachelor's degree

and

are intentional about preparing students for careers.



Identified Common Features

The Project Results

How's your
department
doing?

Curricular

- Varied and high quality lab courses
- Research opportunities for undergraduates
- Curricular flexibility
- Communication skills as part of the physics curriculum

Extra-curricular

- Faculty and staff commitment to student success
- Strong community of students
- Connections with alumni
- Relationship with the Career Services Office
- Mentoring/advising in accordance with interests and goals

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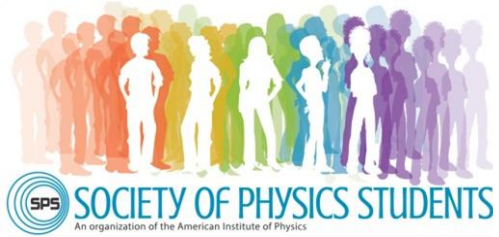
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JOBS.

**What kind of jobs do physics
bachelor's degree holders...
hold?**



List of
**Common
Job
Titles**

Engineering
Systems Engineer
Electrical Engineer
Design Engineer
Mechanical Engineer
Project Engineer
Optical Engineer
Manufacturing Engineer
Manufacturing Technician
Laser Engineer
Associate Engineer
Technical Services Engineer

Application Engineer
Development Engineer
Engineering Technician
Field Engineer
Process Engineer
Process Technician
Product Engineer
Product Manager
Research Engineer
Test Engineer
General Engineer



**Computer Hardware /
Software**
Software Engineer
Programmer
Web Developer
IT Consultant
Systems Analyst
Technical Support Staff
Analyst

Education
High School Physics Teacher
High School Science Teacher
Middle School Science Teacher

Research and Technical
Research Assistant
Research Associate
Research Technician
Lab Technician
Lab Assistant
Accelerator Operator
Physical Sciences Technician



AIP Statistical Research Center
American Institute of Physics

JOB.

**How can I figure out which
job might be best for me?**



A new research project:
what kind of job do I want?



What is an
“informational interview”?
How do I do this?
Who should I contact?
What do I say?

PROFESSIONAL NETWORK.

How do I build mine?



Where/when/how to network

How to build your list of professional contacts

Putting together
YOUR Elevator
Speech



KEY TO SUCCESS.

Careful consideration of your skills.



Careful assessment

Assessing and Articulating
YOUR knowledge and skills

The single most important tool

Translation of what *you know* into language
that describes desirable and marketable
SKILLS

SEARCHING.

Finding your opportunity.



Using powerful online resources
Efficient use of time to match **YOUR SKILLS**
with a **JOB YOU WANT**



THE RESUME.

Putting you on paper.



What is the goal of the resume?



How to write a resume that achieves
the goal of getting an interview

What to include
(and what not to include)

Customize resume to job application!

INTRODUCING YOU.

Writing a cover letter that carries impact.



Putting it together

A formal introduction of
yourself...on paper

Format, content, how to make
sure you stand out as a candidate
for the position you want *and are
qualified to have!*



PRESENCE.

**Making the most of an
interview opportunity.**



Making the interview count!
Face-to-face or on the phone

Another opportunity
*to demonstrate your
knowledge and skills*



The Student Piece: an Interactive Workshop

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SHAPING YOUR KEY.

Knowledge and skills assessment.

WHO ARE YOU??



Carefully examine your experiences. Identify one of the commonly used skills that appears in your experiences. Write this skill at the top of the "Identifying My Skills" page:

- ⇒ working with laboratory equipment
- ⇒ conducting research
- ⇒ communicating complex ideas
- ⇒ proficiency with computer hardware and software
- ⇒ analysis and quantitative thinking
- ⇒ working with others
- ⇒ problem solving
- ⇒ critical thinking

BRAINSTORMING

My classes / training / My leadership experiences /
group activities /
professional associations

Consider this a giant brainstorm

My job / research / My hobbies / other
experiences / internships

of your cumulative life experience!

Put it ALL down on paper!

BRAINSTORMING

(example)

<p>My classes / training</p> <p>Math double major-through advance calc LaTEX training class Certified Camp counselor Intro Physics (made B's) AFM, SEM training Labview Tutorial Advanced Lab – Experimental techniques</p> <p>CPR certified Machine Shop safety training Cryogenics handling safety training Advanced Physics glasses (thermal, EM, Quantum, Mechanics) Error analysis training</p>	<p>My leadership experiences / group activities / professional associations</p> <p>Learning assistant (1yr) Drum major – marching band (2 yrs) Tutor for freshman physics (2yrs) Helped organize campus research symp SPS member-outreach presenter Tutor in language lab (spanish) International Student Union-member</p>
<p>My jobs / research experiences / internships</p> <p>Worked in research lab as a sophomore (mostly data reduction) Part time cashier at Lowe's Paid tutor at the YMCA after school program Summer research assistant in professor's lab (responsible for interfacing spectrometer)</p> <p>Workshop on gravitational wave astronomy</p>	<p>My hobbies / others</p> <p>Accomplished knitter Sing in community choir Attended comicon</p>

Pick around in your brainstorm

2

Find a skill that appears in several of
your experiences

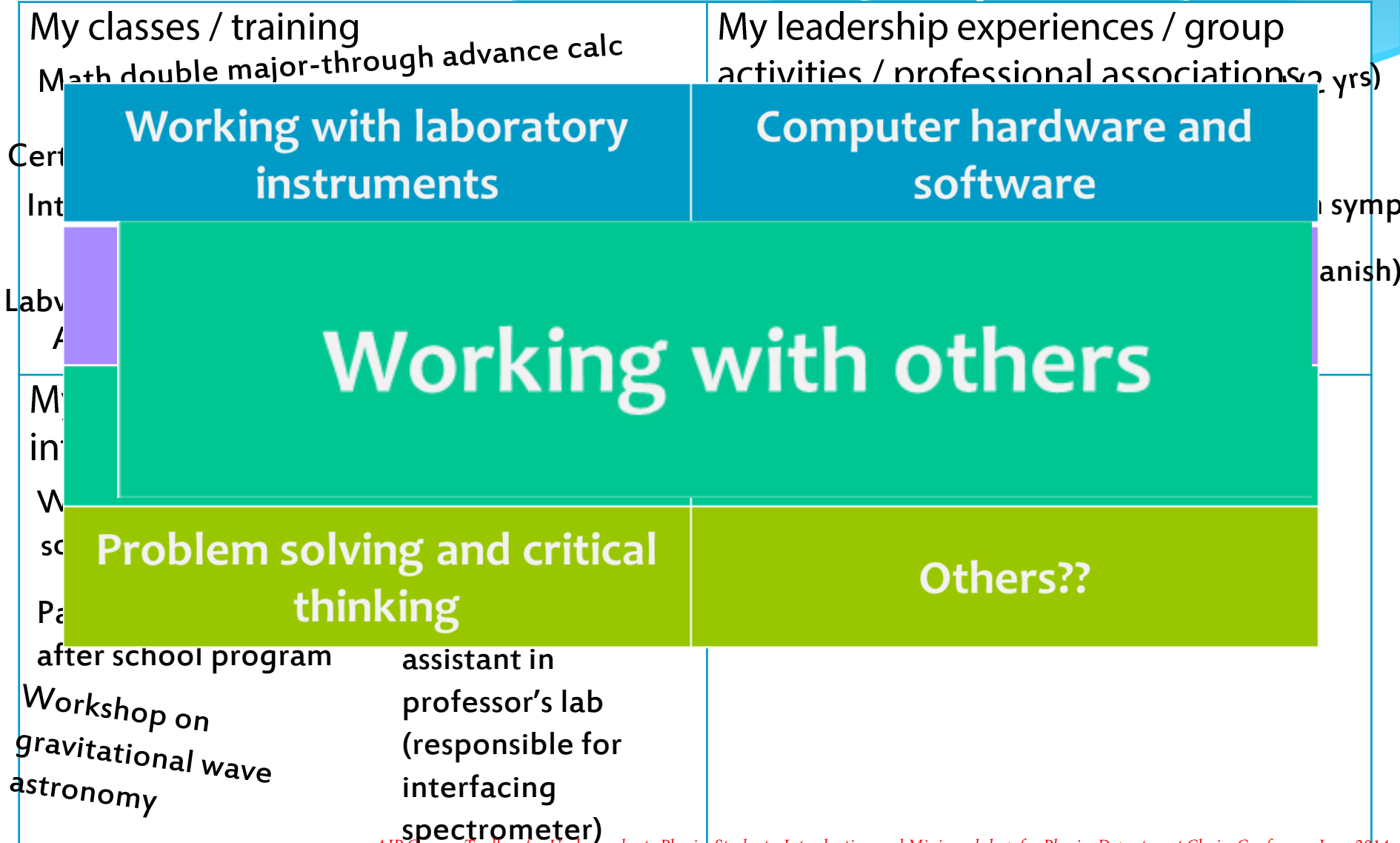
Back to the brainstormed list of experiences.

- ⇒ Now, regroup.
- ⇒ Use your list to write down all your experiences related to the skill. Include all the experiences that contribute to the development of this skill.
- ⇒ Consider classes, REU or internship experiences, summer jobs, teaching or research assistant experiences, club activities, outreach experiences, related hobbies.

Physics – Common skills

Working with laboratory instruments	Computer hardware and software
Conducting research	Analysis and quantitative thinking
Communicating complex ideas	Working with others
Problem solving and critical thinking	Others??

BRAINSTORMING (example)




BRAINSTORMING (example)

<p>My classes / training</p> <ul style="list-style-type: none"> Math double major-through advance calc LaTEX training class CPR certified Machine Shop safety training Certified Camp counselor Cryogenics handling 	<p>My leadership experiences / group activities / professional associations</p> <ul style="list-style-type: none"> Learning assistant (1yr) Drum major – marching band (2 yrs) Tutor for freshman physics (2yrs)
<div style="border: 2px solid red; padding: 20px; background-color: #00b050; color: white; font-size: 2em; font-weight: bold;">Working with others</div>	
<p>My interests</p> <ul style="list-style-type: none"> Worked in research lab as a sophomore (mostly data reduction) Part time cashier at Paid tutor at the YMCA after school program Workshop on gravitational wave astronomy 	<ul style="list-style-type: none"> Sing in community choir Attended comicon Summer research assistant in professor's lab – part of group - (responsible for interfacing spectrometer)

Get to the point.

Narrow it down. Draft a bullet point related to this skill like one you might use on a resume

⇒ Keep this short and to the point



3 **Refine the language.**

Refine your bullet point, focusing on *what you know how to do* and *how well you know how to do it*. You may want to do a few drafts and get feedback from others on which is most clear, concise, and meaningful.



4 **Tell it.**

Write down a few specific anecdotes that demonstrate your experiences related to this skill.

Skills Assessment Sheet

Skill category:

Brainstorming: My experiences related to this skill category

Tell it: Draft a bullet point related to this skill

Refine the language: Refine your bullet point, focusing on *what you know how to do* and *how well you know how to do it*

Show it: Write down a few anecdotes that demonstrate your experiences related to this skill

Skills Assessment Sheet: Example

Skill category:

Working with others

Brainstorming: My experiences related to this skill category

Camp counselor, tutor (in Spanish and in freshman physics, and for math at YMCA), learning assistant, working with lab group (research), sing in choir and helped organize a research conference for my peers

Tell it: Draft a bullet point related to this skill

Good at working in teams and cooperating in group situations

Refine the language: Refine your bullet point, focusing on *what you know how to do* and *how well you know how to do it*

Show it: Write down a few anecdotes that demonstrate your experiences related to this skill

Skills Assessment Sheet: Example

Working with others

Refine the language: Refine your bullet point, focusing on *what you know how to do* and *how well you know how to do it*

~~Good at working in teams and cooperating in group situations~~

~~Team work and group skills—really good at it.~~

Strong teamwork skills; demonstrated comfort in a variety of group dynamics.

Show it: Write down a few anecdotes that demonstrate your experiences related to this skill

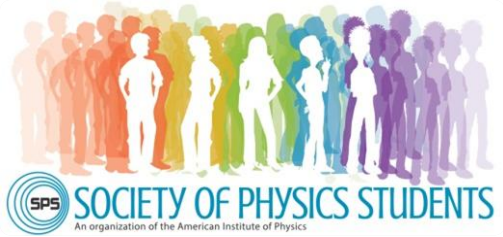
Your set of strengths. YOUR skills

- Aim for about 5-10 skill sheets
- Should be revised regularly as your experiences grow and change
- Practice on-going self assessment to continuously update skills/knowledge list

List your "Tell it" bullet points below

Hard work DONE.

List your "Show it" stories below



Practice

Browser window: Sigma Pi Sigma (SPS x) | jobs.spsnational.org/jobs/#/detail/6091471/1,false

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SIGMA PI SIGMA

The Physics Honor Society

Menu: About | Chapter Admin | Awards | Radiations | Congresses | SPS Jobs | Donate

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Science and technology careers presented by Sigma Pi Sigma and the Society of Physics Students

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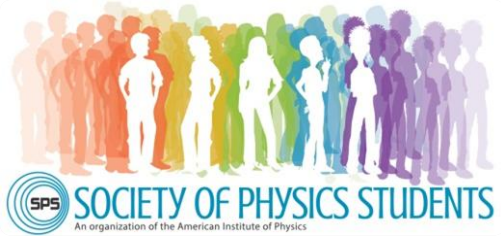
Enter Keywords [] Zip Code [] [Search](#) [New Search](#) [Search Tips](#)

Search job titles only Exact match Posted within: **all active jobs** ▾

[Save Search as Job Alert](#) [My Job Alerts](#) [ADVANCED SEARCH](#) ▾

[Previous Job](#) Job 10 of 393 Matches [Next Job](#)

Taskbar: 4:37 PM 3/21/2014



Now its up to you!

Use the binder – DO YOUR HOMEWORK

This homework impacts the rest of your life!

Revisit your knowledge and skills assessment

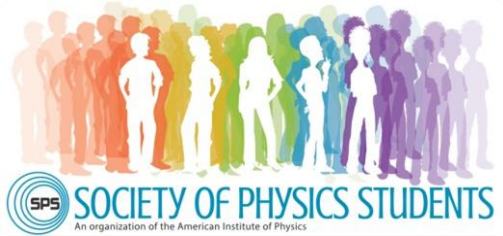
Maybe at the end of each semester

Start (or continue) your networking

Consider scheduling some informational interviews

Begin investigating job advertisements.

Your career pathway is up to you!



Adding a Careers Training component to your program

Should you?

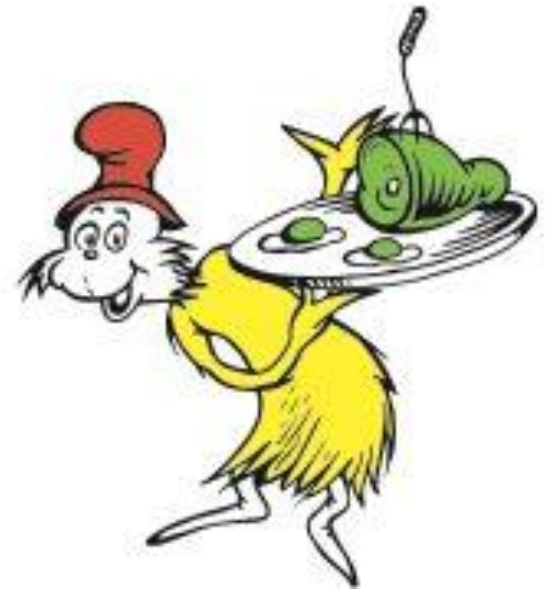
Would you?

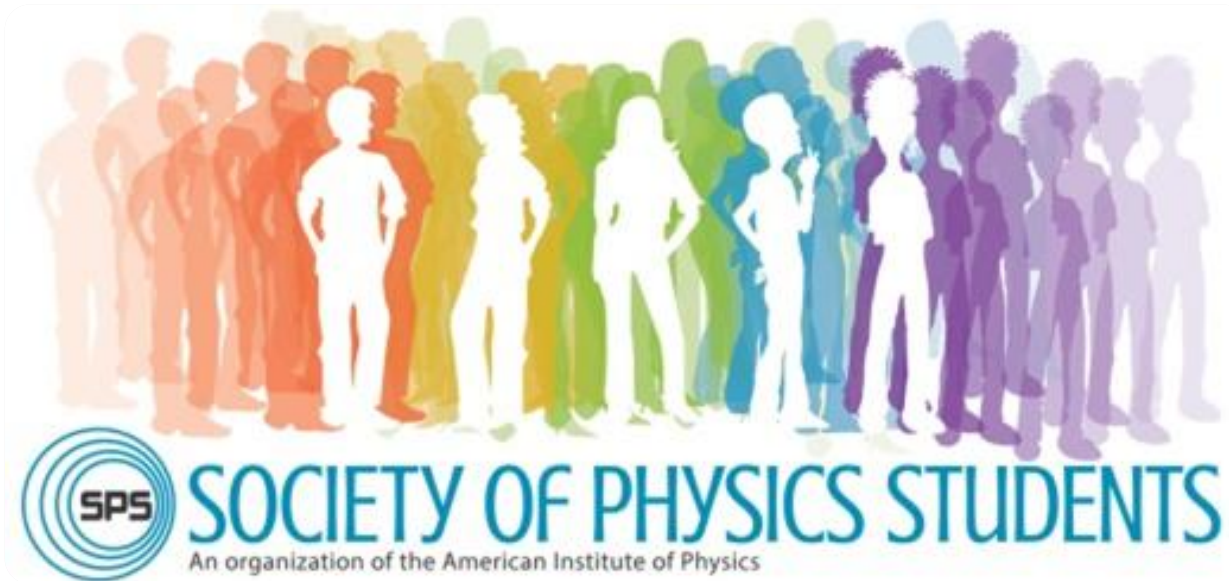
Could you?

make the Toolbox part of your undergraduate program?

Will it help my students become super stars?

And —will it grow my two “big R’s”?





www.spsnational.org