UWMadisonPGSC-PD

Resources for professional development
within the UW-Madison Physics Department

Where Physics PhDs Work and How to Get There

Rob Morgan

https://rmorgan10.github.io/UWMadisonPGSC-PD/

Right here!

1

The Good News

Physics PhDs work almost everywhere

Starting salaries are high

The vast majority of the skills you'll need you'll obtain by completing your PhD
- Communication, Research, Creative Problem Solving, Critical Thinking, etc.

That's Great! So why am I here?

Whatever job you apply for, there will be competition

Graduate school is the perfect time to add more skills to your repertoire that can make you fully prepared for any job you apply for

Knowing your career options and knowing what skills additional skills you'll need to get there is the first step on your path

Goals for this seminar

**Introduce the most common career paths for physics PhDs**

Outline the additional desired skills for each path

Become familiar with a UW-Madison tool for tracking your skills

Where Do Physics PhDs Want to Work?

Desired Future Employment Sector of New Physics PhDs, Classes of 2015 & 2016 Combined

Private Sector 38%

Academia 42%

Government 15%

Other 5%

Let's start by challenging the idea that we will all be professors.
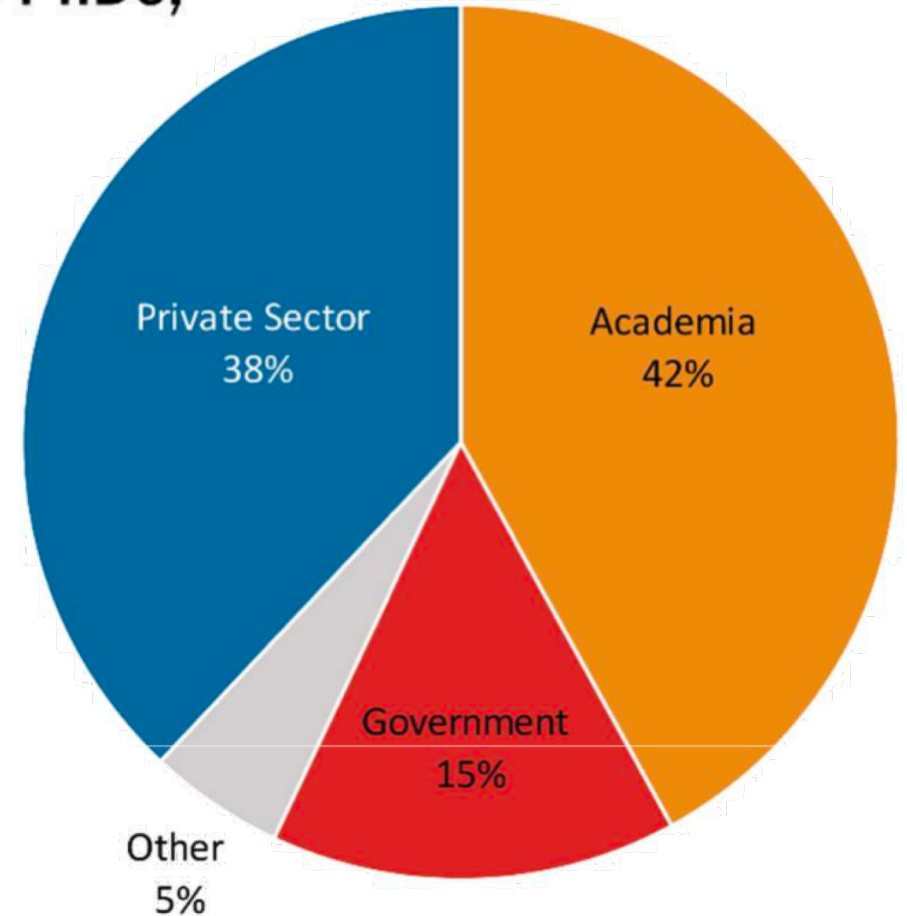
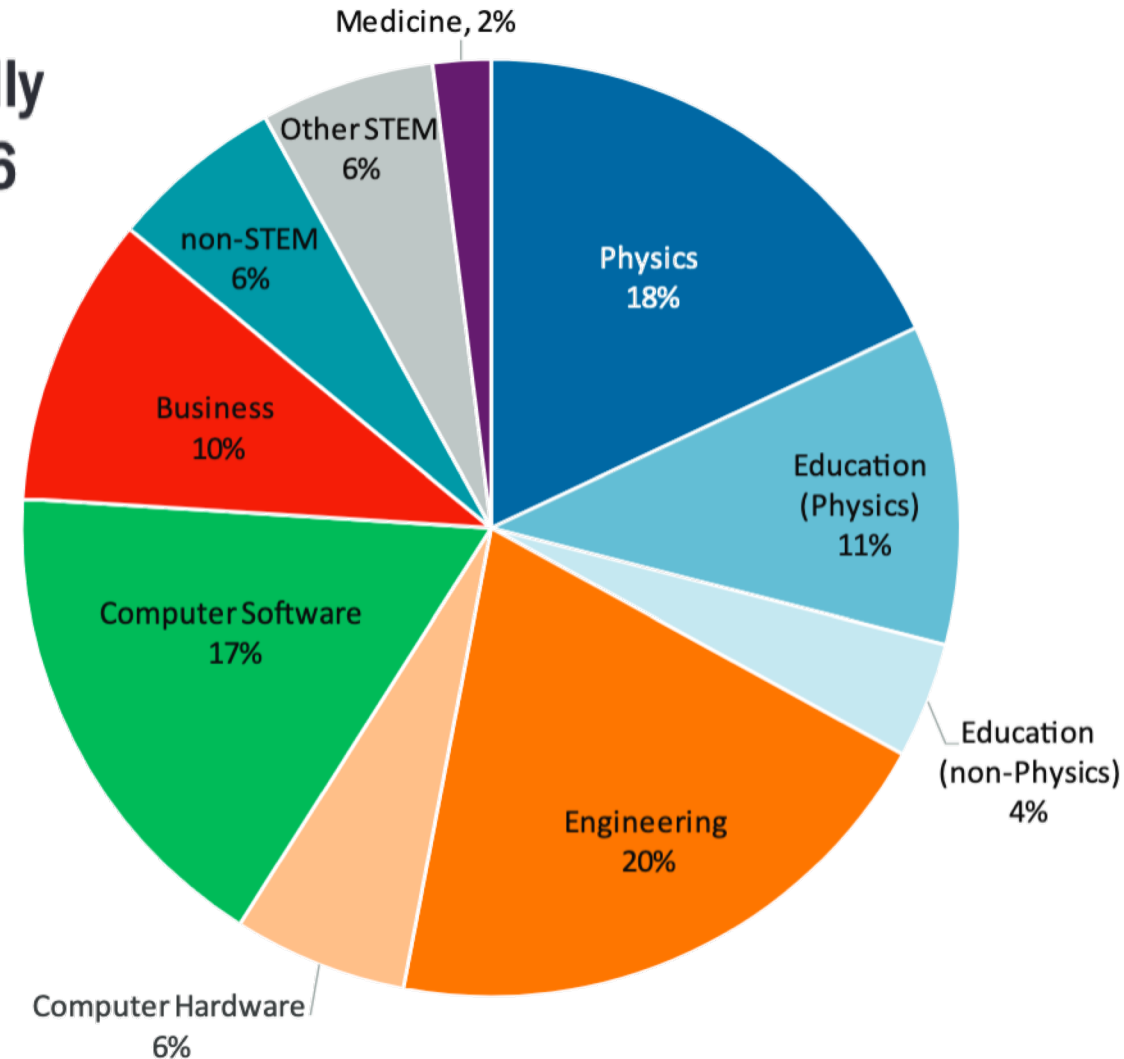Source: American Institute of Physics

Where do Physics PhDs Actually Work?

Employment Type for Physics PhDs One Year After Degree, Classes of 2015 & 2016 Combined

| Postdoc 47% | Potentially Permanent Position 40% | Other Temporary Position 7% | Unemployed 6% |

Source: American Institute of Physics

The Industries for Permanent Positions

Employment Fields for New Physics PhDs in Potentially Permanent Positions, Classes of 2011 through 2016

Medicine, 2%
Other STEM 6%
non-STEM 6%
Business 10%
Computer Software 17%
Computer Hardware 6%
Engineering 20%
Education (non-Physics) 4%
Education (Physics) 11%
Physics 18%

Main takeaway: Wherever you want to end up, you're not alone.

Source: American Institute of Physics

From Where to How

Hopefully I've convinced you that you can work almost anywhere with a Physics PhD

Let's talk about how to get there.

Postdoc via University

Advisor status plays a large role

Clearly present research (job talk)

Possibility of required additional training

Publications / recognition

Mentoring skills

Nicole Vassh
Postdoc
Notre Dame
Advisor BALANTEKIN

Source: American Physical Society

Postdoc via National Laboratory

Experimental and computational skills are valued

Data analysis skills are valued

Being able to work on a team with scientists from other backgrounds

Grant writing

Joshua Sauppe
Postdoc
Los Alamos National Lab
Advisor SOVINEC

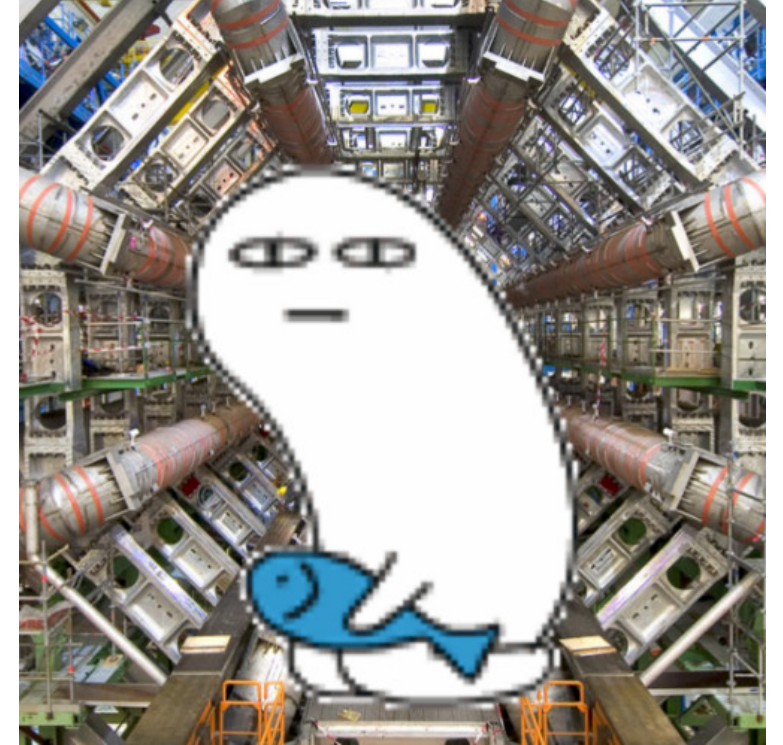Source: American Physical Society

Postdoc via Fellowship

Extremely competitive

Multiple influential publications required

Clear presentation of research

You have a say in what university you work at

Hongtao Yang
Chamberlin Fellow
CERN / LBNL
Advisor WU

Instructor

Liberal arts / 4-year / community college

Typically a postdoc is not required

Teaching and outreach highly valued

Interpersonal skills necessary

Mentoring experience

Frank McNally
Visiting Assistant Professor
Carleton College
Advisor WESTERHOFF

Source: American Physical Society

Science Outreach

Data analysis

Clearly present research

Get people excited about your research

Led an outreach program during graduate school

Organizational and management skills

Source: American Physical Society

Data Science

Data Science

Strong programming and statistical skills

A very active GitHub
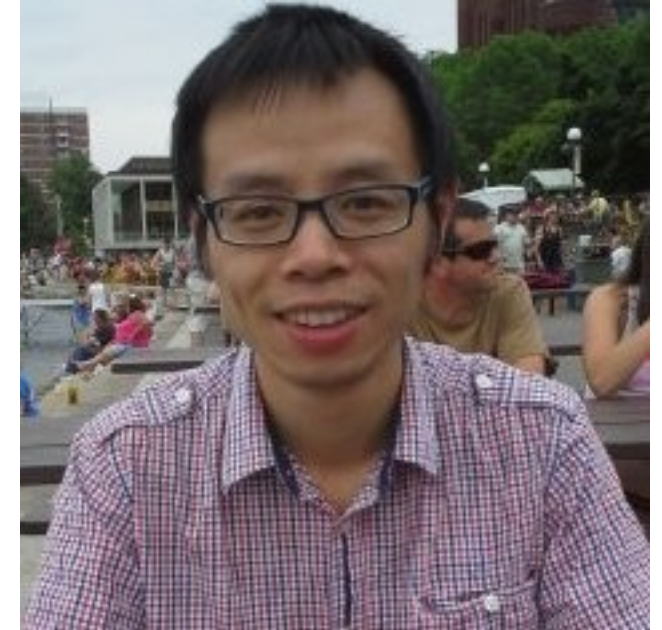
An updated LinkedIn

Deemphasis on publications

Data structures, algorithms, SQL

Machine learning

Internships (during graduate school) are not unheard of

Kaggle competitions & Coursera certificates

Tao Peng
Data Scientist
Conversant
Advisor BALANTEKIN

Research and Development

Common job title: Engineer, Scientist

Working as part of a team

Presenting research

Cost-benefit analysis, intellectual property laws, ethics

Internships during graduate school and advisor connections helpful

This path often leads to management positions

James Hostetter
Research Scientist
Honeywell
Advisor SAFFMAN

Source: American Physical Society

Software

Common job title: developer

A very active GitHub

-Helps to have side projects in addition to research

Experience with multiple programming and markup languages

Depending on job, you may need website development experience

Depending on job, you may need machine learning experience

Andrew Hard
Machine Learning Engineer
Google
Advisor WU

Finance, Sales, and Marketing

Common Job Title: Consultant

Data analysis

Statistical inference (consumer trends)

Machine learning (not required but super helpful)

Doing market research, optimizing sales strategies

Domain knowledge is highly valued

Cost-benefit analysis

Teaching and outreach

Fangzhou Zhang
Senior Consultant
Ernst and Young
Advisor WU

Source: American Physical Society

Medicine

Medical image analysis

Medical physics degrees will often have an upper hand

**Experience with radiation and live tissue**

Teaching and outreach

Demonstration of domain knowledge

Source: American Physical Society

Did anyone else notice all that overlap?

Not only are the skills you obtain on the normal PhD track broadly applicable, but also:

There are many skills that can be learned simultaneously to make you the perfect candidate for any job.
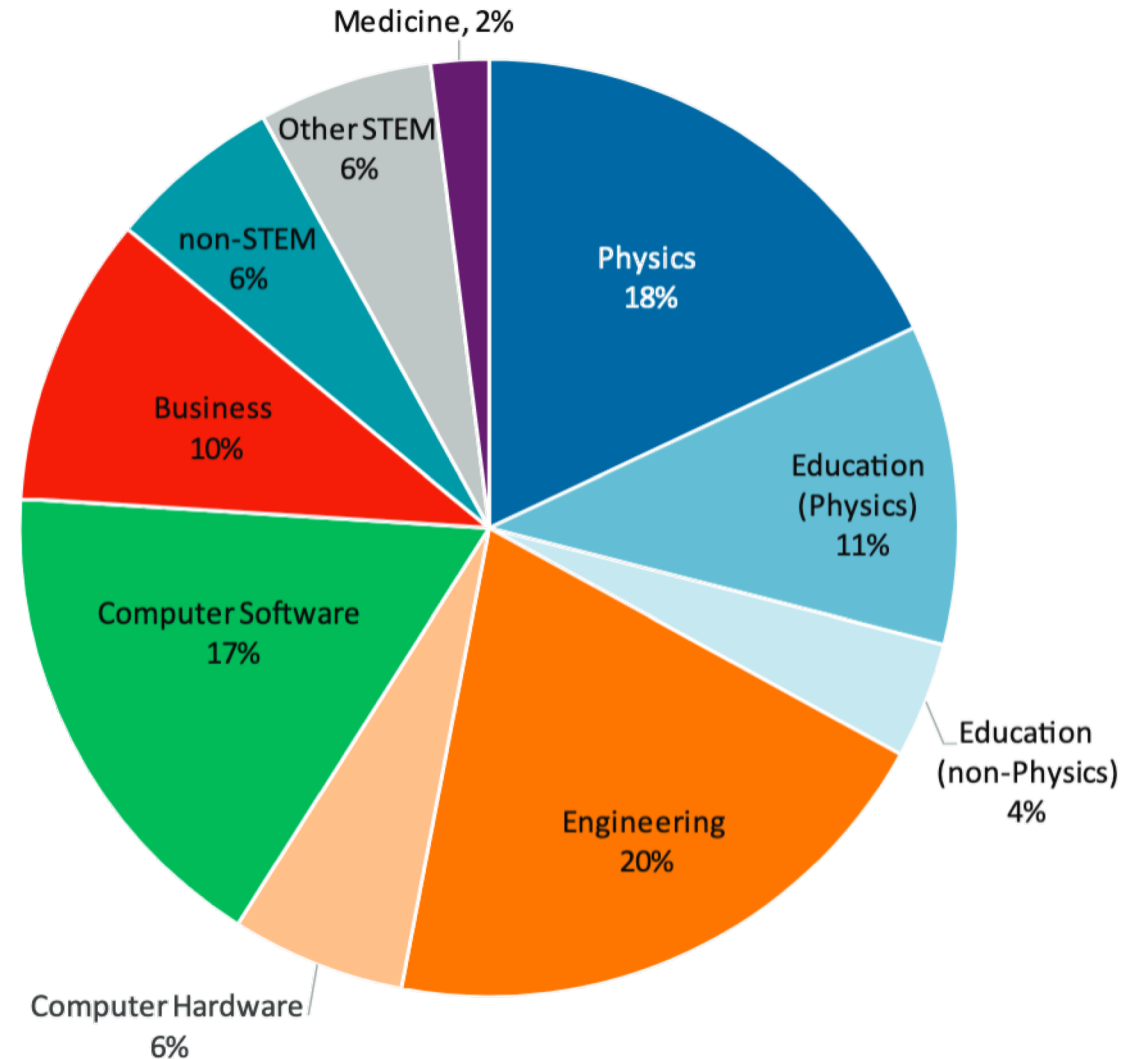
Source: American Institute of Physics

Where to start?

Where do Physics PhDs Work:

    You have several available career paths in various industries

How to Get There:

    The few additional skills you may need are tangible and obtainable

Luckily, there are convenient tools for tracking what skills you obtain…

DiscoverPD at UW-Madison

Self-Assessment

https://my.grad.wisc.edu/DiscoverPD/Assessment

Self-Assessment

UNIVERSITY OF WISCONSIN–MADISON

Morgan, Robert ▼

MyGradPortal

PROGRAM   DEGREE FEE PAYMENT   PROFESSIONAL DEVELOPMENT   ADD FEEDBACK

DiscoverPD Home   Self-Assessment   My Reports & Recommendations   My Favorites & Development Tracker   Search All Opportunities

Self-Assessment

Rate your confidence in your ability to do the following activities. After completing the self-assessment, you will get a personalized report and recommendations about how to strengthen your ability within each area.

The scale for self-assessment is 1-5 (**1 = not at all confident; 5 = very confident**). You can hover over the number headers to view the corresponding value for each number.

You can find your saved assessments in My Reports & Recommendations.

https://my.grad.wisc.edu/DiscoverPD/Assessment

24

Next Time

Speaker: Michelle Holland

/// Session 3: Your Resume: From Good to Great

When and Where: October 17, 2019; 2:30-3:30; Room 5310, Chamberlin Hall

Overview: In this workshop we will begin with the basics and talk through strategies and steps to create a winning resume. Good resume's don't get you jobs but great ones do! From the various parts of a resume to the fine details that really matter, this workshop will include a 10 point checklist to ensure you focus on what really matters. After this workshop you will have the skills, tools, and know how to update your existing resume or start from scratch if you don't have one yet. Feel free to bring any resume related questions to the workshop. (Speaker Michelle Holland)

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