Demographics and Employment for AMO PhDs

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AIP Research

Thank my colleagues:

Jack Pold

Starr Nicholson

Mark McFarling

- Focus primarily on:

  - Number and characteristics of physics PhDs with dissertation subfields of atomic, molecular, and optical physics

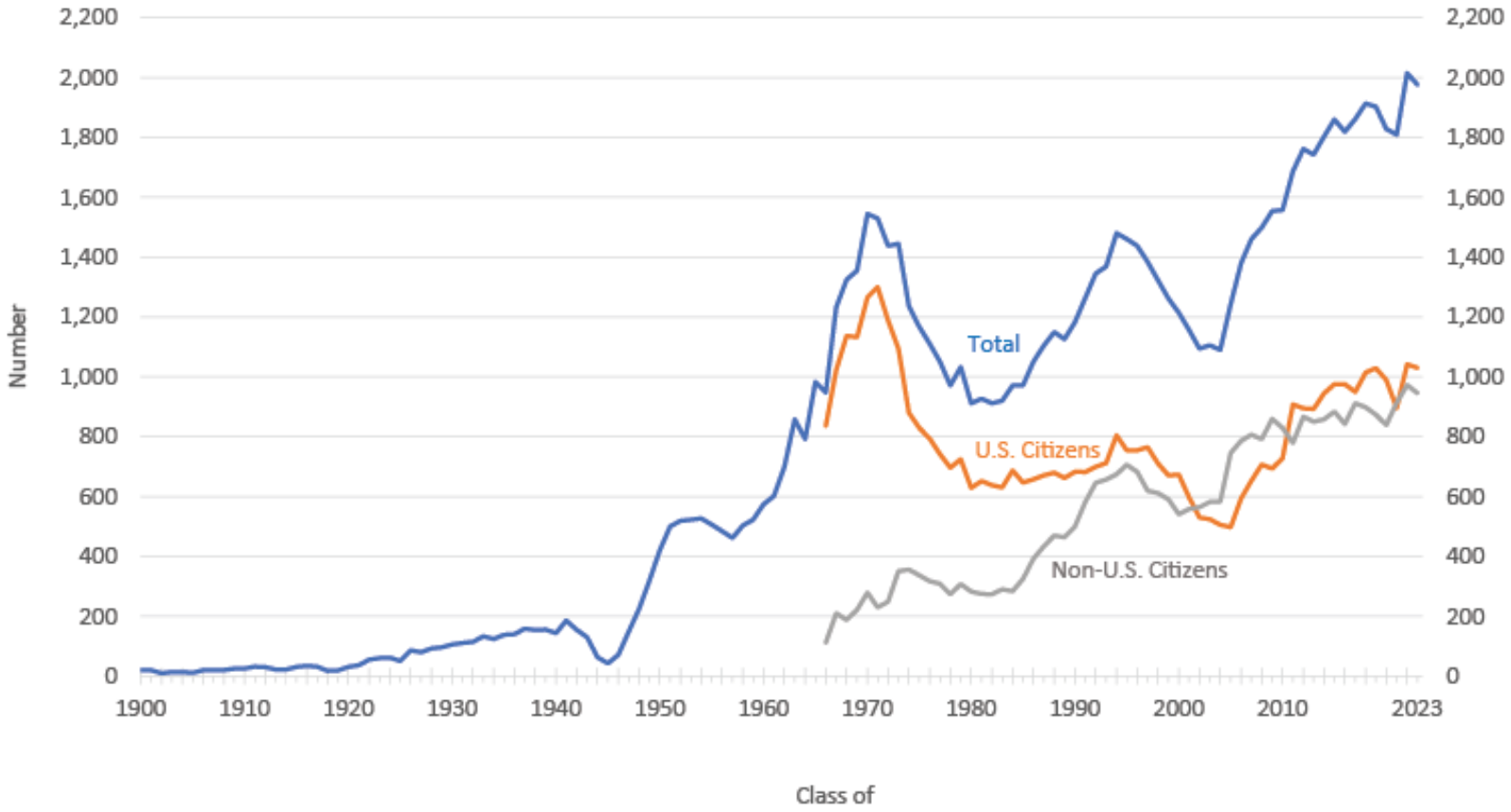
  - Initial post-degree outcomes of AMO PhDs

Sources of AMO Data:

- AIP
  - Degree Recipient Follow-Up Survey

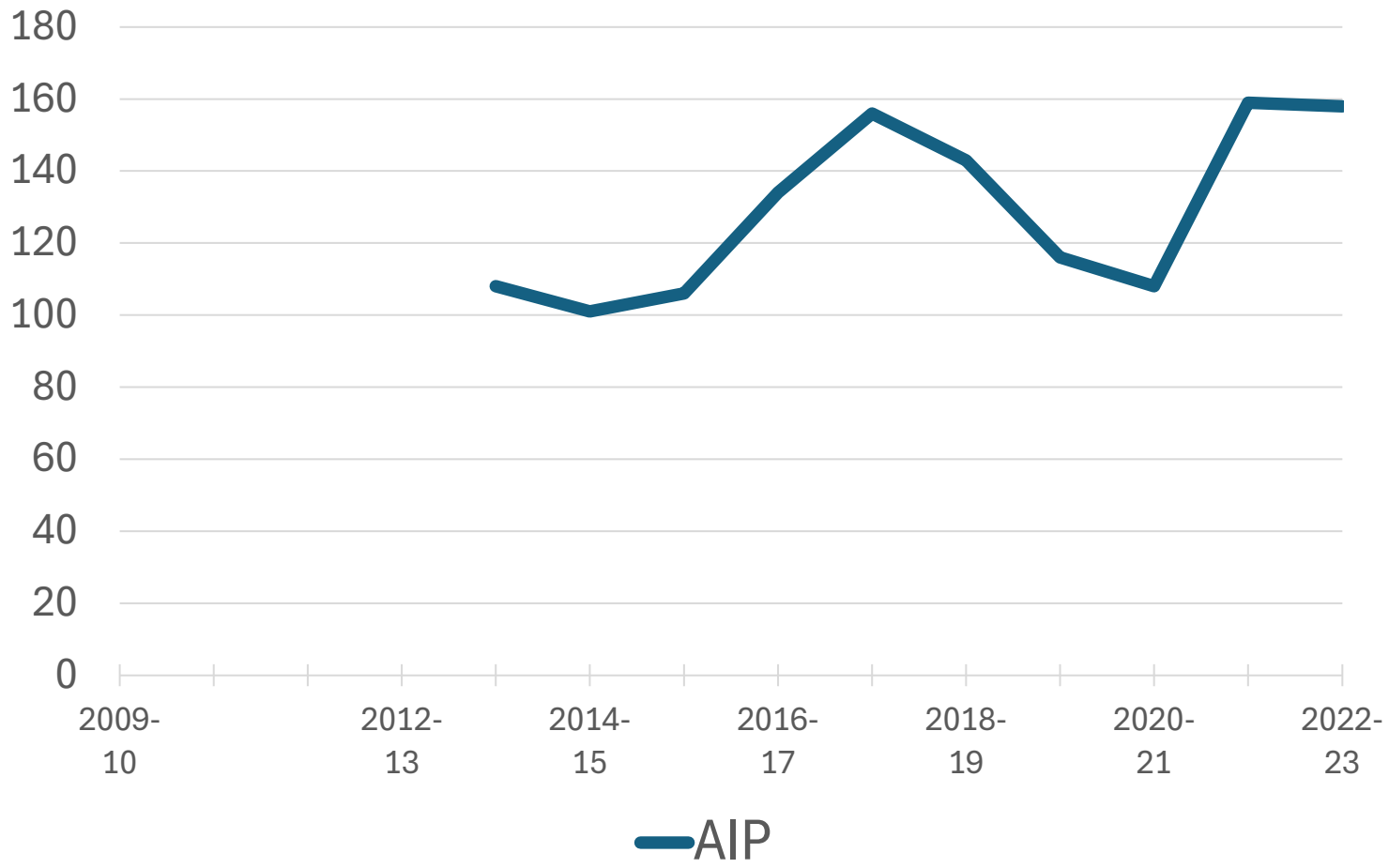
- National Science Foundation (NSF)
  - Survey of Earned Doctorates (SED)

Physics PhDs Conferred in the US, 1900 through 2023

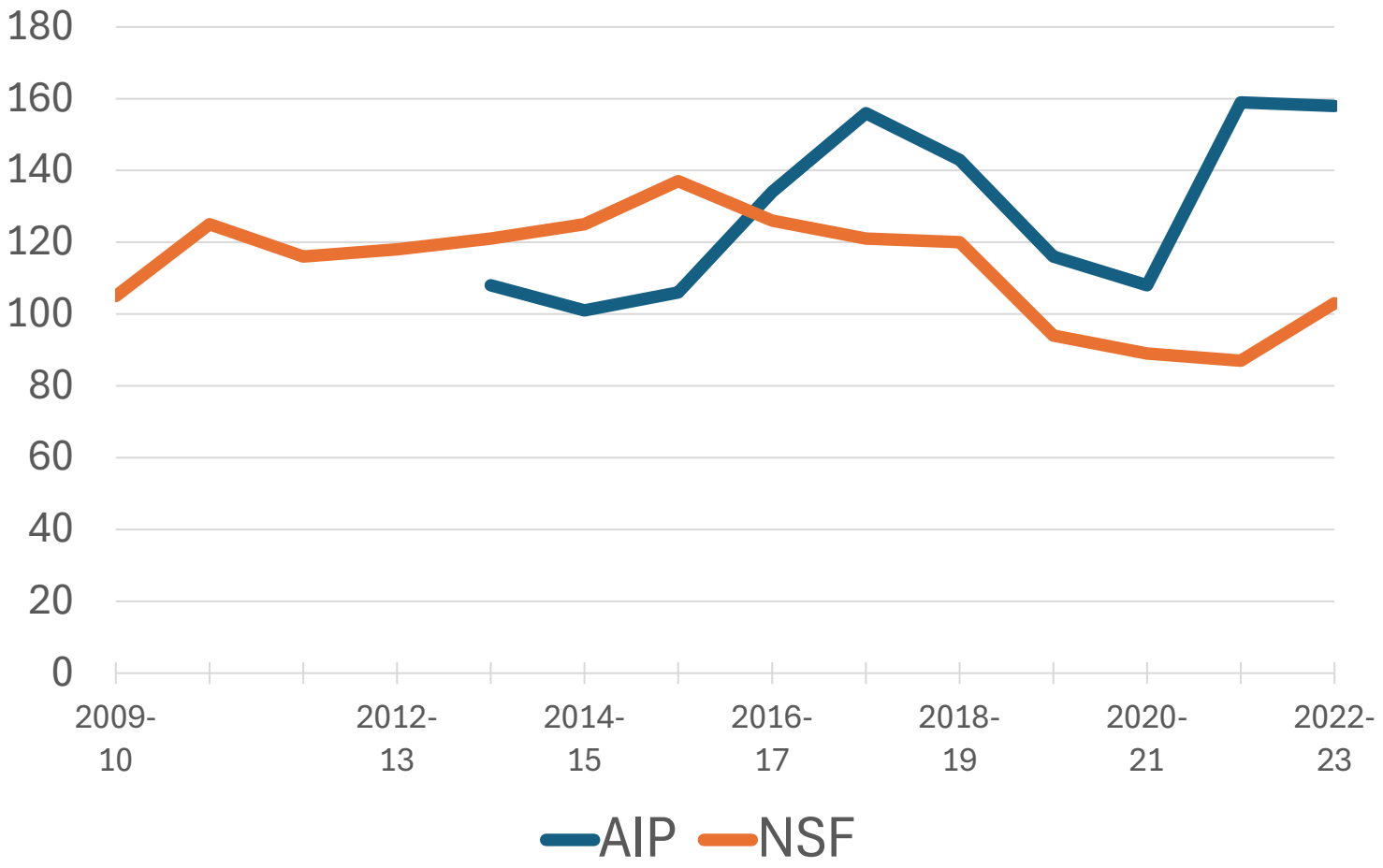


Sources: ACE (1900-1919), NAS (1920-1961), AIP (1962-2023)

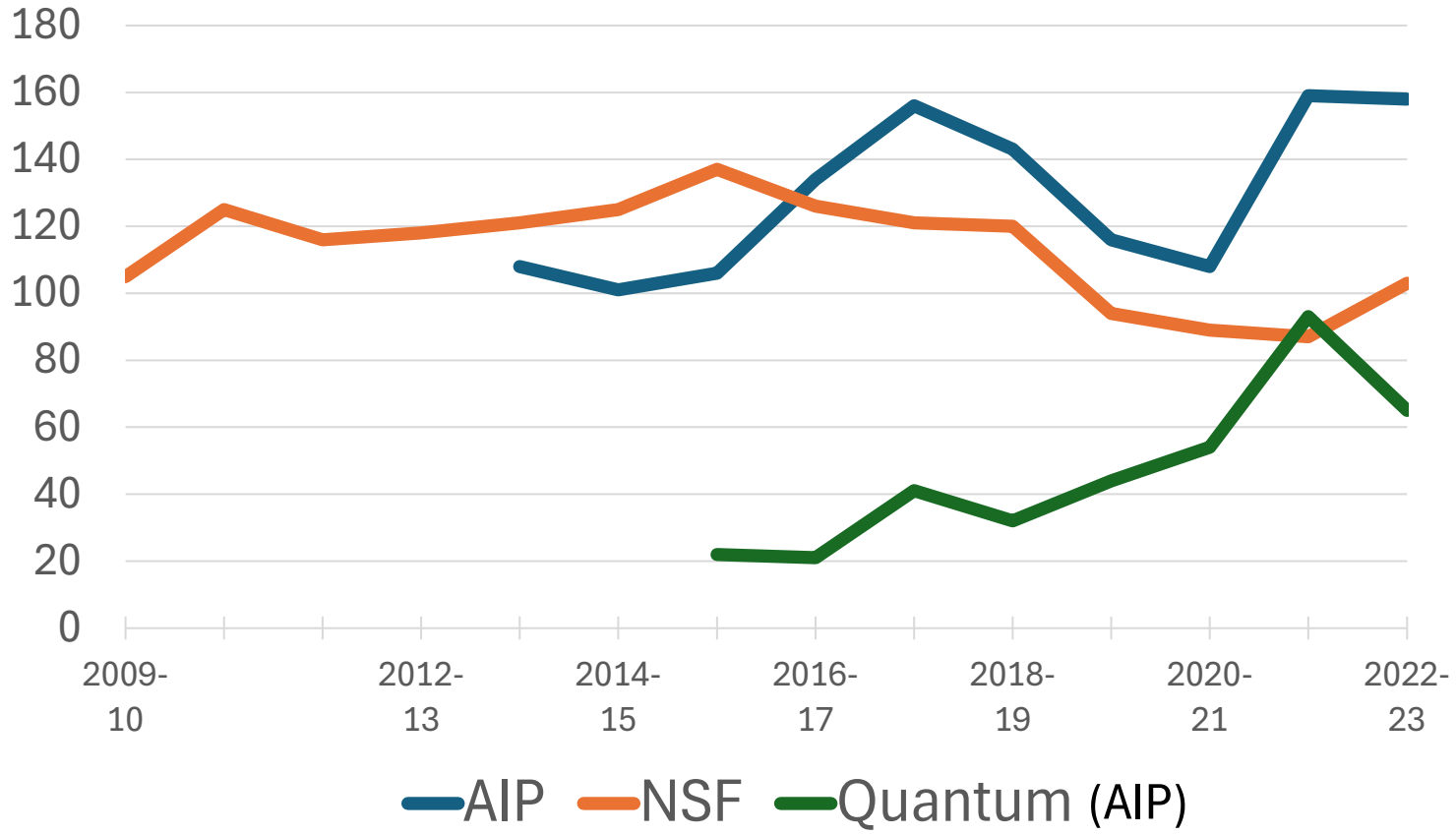
Atomic, Molecular, and (Optical) PhDs Awarded



Atomic, Molecular, and (Optical) PhDs Awarded



Atomic, Molecular, and (Optical), and Quantum Foundations | Information Theory PhDs Awarded



Physics departments with a large number of PhDs with AMO dissertations

Harvard University
University of California, Berkeley
University of Colorado-Boulder
Massachusetts Institute of Technology.
University of Michigan, Ann Arbor
University of Wisconsin, Madison
Kansas State University
Stanford University
University of Virginia
University of Washington
University of Maryland, College Park
Pennsylvania State University
University of California, Los Angeles
Georgia Institute of Technology

Characteristics of AMO PhDs

- The AIP data is based on responses from 140 PhDs from the classes of 2019, 2020, 2021, and 2022 combined.

- The NSF data (gender and citizenship) is based on an average of three degree classes: 2021, 2022, and 2023

Educational Characteristics of AMO PhDs

- 90% Had BS in physics
- ~5% Started at two-year college
- Years (FTE) of graduate study to earn PhD 6 - 6.5
- 85% experimentalists
- 25% of Quantum Foundations | Information Theory
- ~50% indicated that computer simulation or modeling was a major research tool for their dissertation work.

All AIP Data

Gender and Citizenship

- Women: 18% (NSF) (21% AIP)
- Non-US Citizens 39% (NSF) (37% AIP)
- Race or Ethnicity (NSF Average of 3 years of data)

  73% White

  14% Asian

  5% Hispanic or Latino

  1% Black or African American

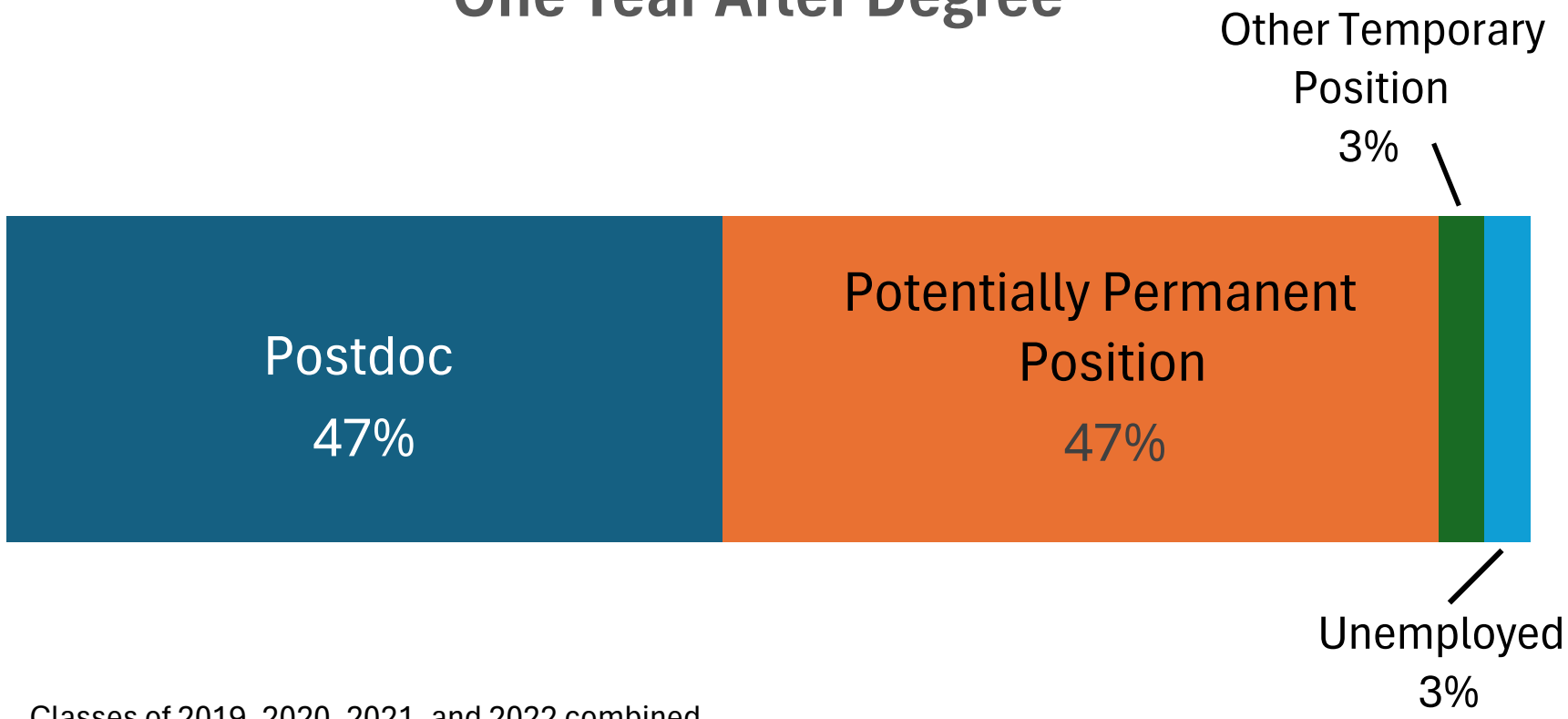
  0% American Indian or Alaska Native

  5% More than One Race

  2% Unknown

Initial Post-degree Outcomes

Status of AMO Physics PhDs One Year After Degree



Classes of 2019, 2020, 2021, and 2022 combined

Source: AIP Follow-up Survey

Sectors of Employment

Postdocs

Large Research Universities
National labs

Potentially Permanent Positions

Amazon Web Services
Atom Computing
Booz Allen Hamilton
ColdQuanta
Facebook
Intel
Lam Research
Lockheed Martin
LSP Technologies
Microsoft
Quantinuum
QuEra Computing
Waymo
Many Others

Field of Employment

Postdocs

Most work in AMO

Potentially Permanent Positions

About half work in field of Physics
¾ in AMO

Also: Engineering
Software Development
Data Science

Attitudes Toward Their Employment

Most did not feel under employed

Over 90% felt their PhD was an appropriate background for the work they were doing

Large majority felt their work was “professionally challenging”

~90% indicated that:

“Overall, they were satisfied with their positions”

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How AIP collects its data and its limitations

- Enrollments and Degree Survey (A census)
  90%-95% response rate

  ~ Provides contact information for about 55% - 65% of a degree class

- Follow-up Survey

  -Response Rates vs Coverage Rates

  Usually, response rates are higher than coverage rates

  ~ 33% Response rate from the PhDs we were able to reach

  ~ Have data on ~40% of the estimated population of physics PhDs

  - some is limited

  - sourced from advisors and the internet

PhDs were asked:

“If you had to do it over again, would you still get a PhD in Physics?”

All PhDs	AMO PhDs	
65%	66%	Yes, at the same institution
16%	16%	Yes, at a different institution
10%	7%	No, I would get a PhD in another subject
9%	11%	No, I would not get a PhD