Trends in Employment for Mathematical Sciences PhD graduates

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No discernible trends in certain areas (retrospective look at 3 different times)

Doctorates in Mathematics & Statistics in the workforce, 1993

- 5-9 years post-doctorate: 72% are engaged in R&D
- 10-14 years post-doctorate: 37% are employed outside of 4-year academic institutions
- 15+ years post-doctorate: NA

Doctorates in Mathematics & Statistics in the workforce, 2003

- 5-9 years post-doctorate: 71% are engaged in R&D
- 10-14 years post-doctorate: 47% are employed outside of 4-year academic institutions
- 15+ years post-doctorate: 92% are satisfied with their jobs across all employment sectors

Doctorates in Mathematics & Statistics in the workforce, 2013

- 5-9 years post-doctorate: 75% are engaged in R&D
- 10-14 years post-doctorate: 44% are employed outside of 4-year academic institutions
- 15+ years post-doctorate: 93% are satisfied with their jobs across all employment sectors

NSB 2017
NCSES/SDR
The number of PhD degrees granted has been increasing.

Figure A.2: New PhDs Awarded by Group

Comparing PhDs awarded in 2014–15 with those awarded in 2004–05:
- PhDs awarded have increased more than 56% over the last 10 years.
- Degrees awarded by Doctoral Math and by Statistics/Biostatistics combined have increased 48% and 79%, respectively.

2015 AMS Annual Survey
PERCENT WORKING IN EACH EMPLOYMENT SECTOR BY CAREER STAGE

Education
- 4-year colleges and universities: 62%
- 2-year and pre-college institutions: 5%
- For-profit companies: 32%
- Non-profit organizations: 5%

Business
- 4-year colleges and universities: 68%
- 2-year and pre-college institutions: 5%
- For-profit companies: 23%
- Non-profit organizations: 3%

1993:
- 4-year colleges and universities: 73%
- 2-year and pre-college institutions: 8%
- For-profit companies: 15%
- Non-profit organizations: 4%

2003:
- 4-year colleges and universities: 68%
- 2-year and pre-college institutions: 5%
- For-profit companies: 23%
- Non-profit organizations: 3%

2013:
- 4-year colleges and universities: 62%
- 2-year and pre-college institutions: 5%
- For-profit companies: 32%
- Non-profit organizations: 5%

NSF 2017
NCSES/SDR
Expansion of postdoc and non-tenure track hires

Prior jobs of new faculty hired from other universities (survey of 14 departments in the northeast US; data from 8 of the 14 departments).

For starting dates in academic years 2014-15 or 2015-16

- 25 were hired into tenure-track positions – none directly from their PhDs.
- 70 were hired into research post-doctoral positions, 61 directly from PhDs.
- 56 were hired into other full-time NTT teaching positions, 44 directly from PhDs.

For starting dates in academic years 2004-05 or 2005-06

- 18 were hired into tenure-track positions – 2 directly from their PhDs.
- 21 were hired into research post-doctoral positions, 19 directly from PhDs.
- 18 were hired into other full-time NTT teaching positions, all directly from PhDs.

Data courtesy of Amy Cohen
Recent increase in Nonacademic employment for new PhDs

Figure E.7: Percentage of Employed New PhDs by Type of Employer

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<tr>
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<th>Fall 2011</th>
<th>Fall 2012</th>
<th>Fall 2013</th>
<th>Fall 2014</th>
<th>Fall 2015</th>
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<tr>
<td>US Academic*</td>
<td>62%</td>
<td>59%</td>
<td>56%</td>
<td>56%</td>
<td>52%</td>
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<td>US Nonacademic</td>
<td>22%</td>
<td>27%</td>
<td>29%</td>
<td>30%</td>
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<td>Non-US Academic</td>
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<td>12%</td>
<td>13%</td>
<td>12%</td>
<td>11%</td>
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<td>2%</td>
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* Includes other academic departments and research institutes/other non-profits.
Rough Synthesis: Number of Ph.D. graduates in the mathematical sciences has nearly doubled in the last 15 years, and with it has grown the number of postdoctoral appointments, non-tenure track appointments, and graduates taking non-academic employment as their first job post-graduation.
How do we best train our doctoral students given this reality? They are not only becoming academic researchers.

Many stakeholders are thinking about this!

- Widely attended sessions at JMM on career options
- AMS Committee on Education
- IPAM workshop on internships
- TPSE, BIG Math Network
- CGS and NAS studies looking at issue of Ph.D. careers more generally
what DMS is doing?

1. Enriched Doctoral Training program (started in 2014) – currently being revised


3. Discussing with EHR how to correctly advise/direct and fund efforts that broaden participation and bridge the transition from undergraduate to graduate school.
**INCLUDES project - broadening participation**

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**Award Abstract #1649365**

**NSF INCLUDES: WATCH US (Women Achieving Through Community Hubs) in the United States**

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<td>Judy Walker <a href="mailto:judy.walker@unl.edu">judy.walker@unl.edu</a> (Principal Investigator)</td>
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