Permanence in the STEM Workforce: The Route to Tenure in Academia

Karen R. Ríos-Soto
Associate Professor
Department of Mathematical Sciences
University of Puerto Rico Mayaguez

Careers in the Mathematical Sciences Workshop at IMA
April, 2012 Report INSIDE HIGHER ED: Why Women Leave Academia by Curt Rice

- Young women scientists leave academia in far greater numbers than men.
- Change of interest during PhD years among expressing an intention to pursue careers as researchers, either in industry or academia.

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<tr>
<td>Elec Eng</td>
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<td>Physics</td>
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<td>Mech Eng</td>
<td>16.19</td>
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<td>Chemistry</td>
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<tr>
<td>Comp Sci</td>
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<td>Civil Eng</td>
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IMA: 3/27/15
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<td>4.45</td>
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Trends in Faculty Employment Status

Trends in Faculty Employment Status, 1975 and 1976 to 2011

Notes: Figures in this chart have been updated from those published by AAUP in 1975-76. Figures for full-time faculty are for 1975 and are estimated; part-time figures are for 1976.
Source: US Department of Education, IPEDS Fall Staff Survey. Tabulation by John W. Curtis, American Association of University Professors, Washington, DC.

American Association of University Professors  The Employment Status of Instructional Staff, Fall 2011  April 2014, Page 4
Faculty Employment Status by Race or Ethnicity

Faculty Employment Status, by Race or Ethnicity, Fall 2011

- Full-Time Tenured Faculty
- Full-Time Tenure-Track Faculty
- Full-Time Non-Tenure-Track Faculty
- Part-Time Faculty

Percent of Total Faculty

- Asian: 27.9, 24.3, 32.2
- Black or African American: 15.6, 13.9, 17.3
- Hispanic or Latino: 20.2, 8.2, 17.2
- White: 22.0, 7.8, 19.5
- Other: 11.4, 9.0, 18.7

Notes: “Other” race or ethnicity includes American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, Two or More Races, Race/Ethnicity Unknown, and Nonresident Alien.

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April 2014, Page 40
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The few URM in academia usually concentrated as assistant professors.

A relatively large proportion of minority faculty members lack tenure.

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## STEM and URM Professors by Rank

**Table 1. URM Professors (Black, Hispanic, Native American) by Rank and Year at the Top 50**

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<tr>
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<th>FY2002*</th>
<th></th>
<th></th>
<th>FY2007</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assistant</td>
<td>Associate</td>
<td>Full</td>
<td>All Ranks</td>
<td>Assistant</td>
<td>Associate</td>
</tr>
<tr>
<td>Chemistry</td>
<td>2.8%</td>
<td>7.5%</td>
<td>2.3%</td>
<td>3.2%</td>
<td>4.7%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Math</td>
<td>6.0%</td>
<td>4.6%</td>
<td>3.0%</td>
<td>3.6%</td>
<td>2.3%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Computer Science</td>
<td>2.1%</td>
<td>1.7%</td>
<td>1.3%</td>
<td>1.6%</td>
<td>3.1%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Astronomy**</td>
<td>5.5%</td>
<td>4.0%</td>
<td>1.6%</td>
<td>2.5%</td>
<td>3.3%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Physics</td>
<td>5.2%</td>
<td>2.8%</td>
<td>2.0%</td>
<td>2.6%</td>
<td>4.4%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Chemical Eng.</td>
<td>3.4%</td>
<td>8.2%</td>
<td>4.2%</td>
<td>4.9%</td>
<td>7.7%</td>
<td>6.8%</td>
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<tr>
<td>Civil Eng.</td>
<td>9.3%</td>
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<td>Electrical Eng.</td>
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<td>Mechanical Eng.</td>
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<tr>
<td>Economics</td>
<td>6.6%</td>
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<tr>
<td>Political Science</td>
<td>8.0%</td>
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<td>14.8%</td>
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<tr>
<td>Earth Sciences</td>
<td>not available</td>
<td></td>
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*Chemistry and astronomy data are for FY2003. **Top 40 departments in FY2007*

**Figure:** Nelson and Brammer (2010)
Culture and Institutional Expectations at Most Institutions

- Teaching
- Scholarship
- Service
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Teaching

Show evidence of excellence in teaching characterized by clarity, effectiveness, and organization.

- Students Evaluations
- Peer teaching evaluations with classroom visit.
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Typically considered are activities that involve an external (off-campus) peer review and dissemination process.

- A paper published in a peer-reviewed journal or conference proceedings.
- Appropriate book chapter(s).
- An externally funded grant devoted to scholarship in the area.
- An invited presentation (e.g. keynote speaker, major presenter, etc.) at an appropriate meeting.
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  - Serving on a departmental or university committee.
  - Projects that develop bridges between the department and groups external to the department and university.
  - Applying one’s academic expertise to enhance and invigorate community activities.
  - Interdisciplinary projects.
  - Organizing and advising clubs connected with the Department of Mathematics.
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Strategies

- Keep yourself available
  - Be active... become a journal reviewer.
  - Take advantage of summer months and programs for faculty.
  - Supervise undergraduate/graduate students research.
  - Attend meetings... and remember networking is the key.
  - Read papers to know current research.
  - Be a member of key professional societies in your field.
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- Supervise undergraduate/graduate students research.
- Attend meetings... and remember networking is the key.
- Read papers to know current research.
- Be a member of key professional societies in your field.
- Participate on proposal review panels even as junior reviewer.
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Karen R. Ríos-Soto  IMA: 3/27/15
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