Departments That Excel in Equity, Diversity, and Inclusion at Ohio University and Across the Nation

Edmund Bertschinger, MIT Physics and Program in Women's and Gender Studies

OhioU Physics & Astronomy Colloquium
February 28, 2020
Are universities creating ideal spaces to inspire, support, and educate all students?
Fraction of Engineering Degrees Awarded to Women

Bachelor's Only

- OhioU (3-yr averaging)
- US

Computer Science
- Mechanical Engineering

Year

Discuss with a neighbor what you find interesting about these graphs.

What is your interpretation of the trends?
Two different local contexts: OhioU and MIT

<table>
<thead>
<tr>
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<th>Ohio University (main campus)</th>
<th>MIT</th>
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<tbody>
<tr>
<td>Women undergraduates</td>
<td>60%</td>
<td>46%</td>
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<tr>
<td>White undergraduates</td>
<td>82%</td>
<td>31%</td>
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<tr>
<td>In-state undergraduates</td>
<td>86%</td>
<td>7%</td>
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<td>Undergraduates receiving federal student loans</td>
<td>65%</td>
<td>10%</td>
</tr>
<tr>
<td>Undergraduates receiving Pell grants</td>
<td>28%</td>
<td>20%</td>
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<tr>
<td>First generation undergraduates</td>
<td>33%</td>
<td>18%</td>
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<tr>
<td>Largest on-campus majors</td>
<td>Journalism, Radio and Television, Finance, Zoology</td>
<td>Computer Science, Mechanical Engineering, Math, Physics</td>
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</tbody>
</table>

Source: College Navigator (except first generation undergraduates). Data for fall, 2018
National context: equity, diversity, and inclusion in STEM

AAS Task Force on Diversity and Inclusion in Astronomy Graduate Education

The AAS Task Force on Diversity and Inclusion in Astronomy Graduate Education has completed its final report, and the AAS Board of Trustees has voted to endorse it. The Task Force presented its findings at a plenary held at the AAS 233rd meeting in Seattle.
Theme for this talk:

Find the stories in the data;
Recognize the data in the stories.
Who am I?

Born in Oakland, California.
Second half of childhood: only white family in Latino neighborhood.

Proud son of a Finnish mother.
Diversity, Equity, and Inclusion are not synonyms

image credit: Angus Maguire/IISC
Labels added by E. Bertschinger
Outline

A success story: MIT Mechanical Engineering

Ups and downs: MIT and OhioU Physics

The role of professional societies, departments, and individuals
We're People First

MIT MechE is first and foremost a strong community of faculty, researchers, teachers, post-docs, and staff, dedicated to our students and passionate about our research.
MIT DEPARTMENT OF MECHANICAL ENGINEERING

We Attract the Best

Students like 2019 Marshall Scholar Crystal Winston, left, and Rhodes Scholar Sarah Tress receive a rigorous education, hands-on experience, and support to pursue their dreams.

LEARN MORE

EXPERIENCE THE MIT DEPARTMENT OF MECHANICAL ENGINEERING
MIT Mechanical Engineering

MIT MechE has reached undergraduate gender parity in a field where only 14% of bachelors degrees go to women. URM students are almost twice the national average percentage.
What worked to diversify MechE

- Aggressive recruiting of women faculty: broad searches, proactive calls, cluster hires, male department head and dean committed to increasing the number of women faculty (from 1 of more than 50) – 4 women hired in 2002, 2 more in 2003
- Influential faculty (of all genders) promote gender equity in the department
- A female senior lecturer teaches popular design and manufacturing classes and gives strong encouragement to women and URM.
- Students support and recruit each other. This is especially important for groups that haven’t yet reached critical mass (e.g., URM).

Note: Women and URM students still face a more challenging environment than white males, but they have support and encouragement to persist.

At the PhD level, MechE is now almost double the national average for women and URM.
Undergraduate admissions helped, but department-level efforts are the most important factor.

Why now?
A key enabler: faculty diversity

Large increase in women faculty starting 2002: both recruitment and retention succeeded.

MechE Department Head Rohan Abeyaratne and Engineering Dean Tom Magnanti made faculty diversity a priority.

Full impact of faculty diversity took 8 to 10 years to show up.

Self-assessments from this time:
http://web.mit.edu/fnl/vol/144/lienharch.htm

http://facultygovernance.mit.edu/sites/default/files/reports/2002-03_Status_of_Women_Faculty-All_Reports.pdf
Conclusions from this example:

Diversity succeeds with Inclusion.

Striving for Equity is both motivation and metric.
Find the stories in the data;
Recognize the data in the stories.
Outline

A success story: MIT Mechanical Engineering

Ups and downs: MIT and OhioU Physics

The role of professional societies, departments, and individuals
Women in physics: unnecessary, injurious and out of place?

Despite eight years of affirmative action more changes are necessary to create an atmosphere where women are equally accepted in the field of physics.

Vera Kistiakowsky

The subtitle for this article is taken from a Strindberg essay written at the end of the 19th century opposing the appointment of the mathematician, Sonia Kovalevsky, to a professorship at the University of Stockholm, in which he attempts to prove “as decidedly as that two and two make four, what a monstrosity is a woman who is a professor of mathematics, and how unnecessary, injurious and out of place she is.” ¹ It is certainly a much more self-educated over the opposition of their families. This situation remained about the same until the end of the 19th century.

In the US the situation of women improved somewhat more rapidly than it did elsewhere. The Boston public schools were started in 1642, and although they did not admit girls until 1789, this occurred considerably earlier than was the case in Europe and Great Britain. Many

¹
What happened in 1984?
Hypothesis: department leadership and women faculty

• Herman Feshbach (Department Head 1972-83) made diversity a strategic priority

• Margaret MacVicar became Dean for Undergraduate Education 1985 (previously UROP Director and Assistant Professor of Physics starting 1970)

• Vera Kistiakowsky first MIT woman Full Professor of Physics, in 1973. She founded the APS Committee on the Status of Women in Physics in 1971

• June Matthews first MIT woman promoted to Full Professor of Physics, in 1982 (started Assistant Professor 1972)

• Millie Dresselhaus received secondary appointment as Professor of Physics in 1982 (started Full Professor 1968 in EECS)

• 7 women faculty hired in Physics 1970-78. In 1979, the top 10 physics departments had, between them, 11 women faculty. MIT was a singularity.
Find the stories in the data;
Recognize the data in the stories.
Why the peak in women earning bachelor’s degrees around 2003?
Why the ups and downs for women PhDs since 2000?
Find the stories in the data; Recognize the data in the stories.
Outline

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The role of professional societies, departments, and individuals
Opinion: Seeking Symmetry Among Physicists

February 3, 2020 • Physics 13, 13

Those looking to make their academic departments more diverse, equitable, and inclusive can learn from previous wins and setbacks.

“If those in power cannot drive effective change, then individuals within the department might initiate it with social-movement tactics.”

Achieving equity, diversity, and inclusion is a popular mantra—but is it important for the future of physics? A
Sexual harassment reported by undergraduate female physicists

Lauren M. Aycock, Zahra Hazari, Eric Brewe, Kathryn B. H. Clancy, Theodore Hodapp, and Renee Michelle Goertzen

Published April 22, 2019

To understand some of the behaviors, I recommend this article:

Work as a Masculinity Contest
J. L. Berdahl, M. Cooper, P. Glick, R. W. Livingston, and J. C Williams
A physics department fosters an inclusive environment

The faculty at St Mary's College of Maryland has introduced measures to prevent exclusionary and harassing behaviors toward women and minority students.

Heather Hill
Some lessons from the AIP TEAM-UP Study

ISSUES & EVENTS  Physics Today, February, 2020

Goal: Double the number of African Americans in physics and astronomy

The recommendations of a new AIP report aim to catalyze and guide a huge cultural shift.

Over the past two decades, the numbers of bachelor's recipients in physics and astronomy in the US have rocketed to record highs. Yet even as the increase in African Americans earning bachelor's degrees across all fields has outpaced the overall population, the percentage of physics and astronomy bachelor's degrees earned by African Americans has stalled at around 4%, according to data from the Statistical Research Center at the American Institute of Physics (AIP publisher of Physics Today).

Other underrepresented groups have made larger gains. For example, from 1995 to 2018 the percentage of physics bachelor's degrees earned by women grew from 17% to 21%; for Hispanics that percentage rose from 2.7% to 8.8%. Across
# TEAM-UP Findings & Recommendations by Theme

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Belonging</strong></td>
<td><strong>Identity</strong></td>
<td><strong>Academic Support</strong></td>
<td><strong>Personal Support</strong></td>
<td><strong>Leadership and Structures</strong></td>
<td><strong>Change Management</strong></td>
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<td>a</td>
<td>Faculty role</td>
<td>Faculty role</td>
<td>Faculty preparation</td>
<td>Financial</td>
<td>Department chairs</td>
<td>Theory of change</td>
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<td>b</td>
<td>Student role</td>
<td>Co-curriculum</td>
<td>Faculty commitment</td>
<td>Paid work</td>
<td>McNair and similar programs</td>
<td>Alignment with related efforts</td>
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<td>Counterspaces</td>
<td>Faculty diversity</td>
<td>Advising</td>
<td>Mental health</td>
<td>Campus resources</td>
<td>Faculty preparation and training</td>
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<td>d</td>
<td>Climate</td>
<td>Prosocial behaviors</td>
<td>Curriculum</td>
<td>Intersectional identity</td>
<td>Incentives and rewards</td>
<td>Rewards and incentives</td>
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<td>e</td>
<td>Harassment response</td>
<td>Career options</td>
<td>Resource guide for students</td>
<td>$50M endowment for financial aid</td>
<td>Professional societies support</td>
<td>Ongoing data collection, assessment, and accountability</td>
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</tbody>
</table>

Items in blue cells describe **both key findings and recommendations**. Items in gray cells describe **recommendations only**.
Example 1a: Belonging, Faculty Role

Key finding
• Faculty interactions have a powerful effect on student retention in, or departure from, the major. Students’ sense of belonging increases with the number of faculty who get to know them as individuals and demonstrate support for their success.

Recommendation
• With the encouragement and support of their chairs, faculty should learn, practice, and improve skills that foster student belonging in their interactions with African American undergraduates.
Example 1a: Belonging, Faculty Role

“There is a tension in many departments concerning the relative importance of research and education. Developing the habit of seeking student perspectives, showing interest in and concern for events and topics relevant to their culture, and providing encouragement to those who may not feel they belong requires minimal financing, yet offers substantial benefits in terms of improved student outcomes. Actors with social power must demonstrate inclusive actions in order to increase students’ sense of belonging.”
Faculty Voices from a top-performing department

“You have to set high expectations of students, be realistic about where they are, then take them [to] where they can be.”

“Building community takes a lot of sweat equity.”

“These are the most talented students anyone could want.”

“Our students are our strength.”
Professional societies are taking steps to advance equity in education and work
From the report:

“Underlying the Task Force’s recommendations is current organizational and social theory about why and how large, distributed organizations change.... To summarize, we believe the best way for astronomy to make progress as a field toward diversity and inclusion is through a combination of top-down actions by AAS and bottom up actions by departments.”
What can you and your department do?
### Self-Assessment Rubrics!

**AAS Graduate Education report (left)**

**AIP TEAM-UP report (right)**

<table>
<thead>
<tr>
<th>Departmental climate</th>
<th>Stage 1: Emerging</th>
<th>Stage 2: Developing</th>
<th>Stage 3: Transforming</th>
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<tbody>
<tr>
<td><strong>Communications</strong></td>
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<tr>
<td>Department website provides information on policies and procedures and points to university-wide resources. Department communications use minimal language around equity and inclusion.</td>
<td>Department chair communicates the importance of equity and inclusion in person and in writing shared with all department members. The department website provides details on family-friendly policies, mentorship, inclusive teaching, and responding to harassment and bullying.</td>
<td>The department has adopted a values statement and a code of conduct. The department chair advises other departments on how to improve the climate for all people. The department chair periodically hosts colloquia on topics related to diversity, equity, and inclusion in academia.</td>
<td>The department tracks academic progress and analyzes differences by race, ethnicity, and gender. Faculty utilize evidence-based practices to strengthen students’ sense of physics identity, including encouragement and recognition. The department funds student travel for physics-related career opportunities.</td>
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<tr>
<td><strong>Training</strong></td>
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<tr>
<td>Department members participated in mandatory university trainings on lab safety, Title IX, etc.</td>
<td>New faculty receive training on teaching, mentoring, and on university resources to support the success of all people. Faculty search committee members receive training on implicit bias and best practices for inclusive searches.</td>
<td>Department chairs receive training on diversity, equity, and inclusion, and on mediation and conflict management. They receive regular coaching. The department hosts training for all members on topics such as “being an ally,” responding to microaggressions and harassment, and inclusive teaching practices. The majority of faculty attend these trainings.</td>
<td>Faculty recruitment seeks the “best” hires based on letters of recommendation and who presents the most strongly in their interview.</td>
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### Physics Identity

<table>
<thead>
<tr>
<th>Faculty role</th>
<th>Stage 1: Emerging</th>
<th>Stage 2: Developing</th>
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<tbody>
<tr>
<td><strong>Student Role</strong></td>
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<tr>
<td>Black students do not view themselves as part of the department, and often isolate themselves (e.g., they come to the department only to attend classes).</td>
<td>Black students come to departmental seminars and seek opportunities to participate in undergraduate research.</td>
<td>When asked to describe the ideal physics student, marginalized students respond that it could be someone like them.</td>
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<tr>
<td><strong>Curriculum and Co-curriculum</strong></td>
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<tr>
<td>Faculty encourage undergraduates to join their research group and select the “strongest” students.</td>
<td>The department has a Learning Assistant program and supports undergraduate attendance to identity-based conferences (such as CUSBMP and the NSBP Conference).</td>
<td>The department utilizes physics education research methods, disaggregating by social identities, to assess whether their current activities foster physics identity. Working with students, faculty seek continuous improvement in their co-curricular support for physics identity development.</td>
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<tr>
<td><strong>Faculty diversity</strong></td>
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<tr>
<td>Faculty recruitment committees are aware of implicit bias and utilize recommended practices. They invite a diverse set of candidates to interview, but have not been able to retain faculty of color.</td>
<td>Faculty search committees are aware of implicit bias and utilize recommended practices. They invite a diverse set of candidates to interview, but have not been able to retain faculty of color.</td>
<td>The department raised funds for an endowed chair designated to support equity and inclusion. Cluster hiring is utilized to recruit additional faculty of color, who join White faculty to mentor a growing number of underrepresented students.</td>
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### Career options

<table>
<thead>
<tr>
<th>Career options</th>
<th>Stage 1: Emerging</th>
<th>Stage 2: Developing</th>
<th>Stage 3: Transforming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career advising is left to a central campus office; faculty discuss with graduate school options with students whom they think will succeed.</td>
<td>The department highlights the AIP/PSF Careers Toolbox during the departmental open house for recruitment and during a students’ third year when advisors discuss career options with their advisees.</td>
<td>Every year the departmental colloquium series includes a physics alum working outside the profession. Faculty speak with equal pride about alumni working for non-profits, government, industry, and academia.</td>
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</table>
Join a movement to catalyze cultural change in Physics
APS Inclusion, Diversity, and Equity Alliance (APS-IDEA)

Two-year pilot project funded by APS Innovation Fund (10/19–9/21)
Addresses multiple levels of change: individual, organization, society
30 Physics Departments or Labs will be recruited to join a national network

• **Vision:** As a result of collective efforts, physics and related fields will become more inclusive of all social identities, with a diversity reflective of the nation, and with an equitable distribution of opportunities and resources.

• **Mission:** APS-IDEA seeks to empower and support physics departments, laboratories, and other organizations to identify and enact strategies for improving equity, diversity, and inclusion. It will do so by establishing a community of transformation.

*If there is no struggle, there is no progress.*
—Frederick Douglass
Basics of APS-IDEA

• Guiding principles:
  • Center people whose identities are marginalized
  • Utilize sensemaking, including creating brave spaces supporting learning from mistakes
  • Start with research-based change-management methods
  • Shared leadership: departmental teams should span the range of social power from students to faculty

Complementary with related efforts
• AIP TEAM-UP recommendations
• AAS Diversity and Inclusion in Astronomy Graduate Education recommendations
• AAS Climate Site Visits Program
• TaMIA: Towards a More Inclusive Astronomy
• The Access Network
Outline

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Ups and downs: MIT and OhioU Physics

The role of professional societies, departments, and individuals
Discuss with a neighbor one thing you learned in this presentation.
For further information:

5. https://www.cimerproject.org/ – learning to become an excellent research mentor
7. https://seachange.aaas.org/ – the SEA Change initiative