Addressing the Leaky STEM Pipeline
(STEM = Science, Technology, Engineering, Mathematics)

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### AP Tests Taken in 2016 by Subject & Gender

**Source:** The College Board, The 10th Annual AP® Report to the Nation—Subject Supplement. Science and Engineering Indicators 2016

<table>
<thead>
<tr>
<th>Subject</th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computer Science</strong></td>
<td>19%</td>
<td>81%</td>
</tr>
<tr>
<td><strong>Physics C. Electricity &amp; Magnetism</strong></td>
<td>23%</td>
<td>77%</td>
</tr>
<tr>
<td><strong>Physics C. Mechanics</strong></td>
<td>26%</td>
<td>74%</td>
</tr>
<tr>
<td><strong>Calculus BC</strong></td>
<td>41%</td>
<td>59%</td>
</tr>
<tr>
<td><strong>Calculus AB</strong></td>
<td>49%</td>
<td>51%</td>
</tr>
<tr>
<td><strong>Chemistry</strong></td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td><strong>Biology</strong></td>
<td>61%</td>
<td>39%</td>
</tr>
</tbody>
</table>
The Leaky Pipeline
Female Representation Decreases With Increase In Academic Level

% FEMALE. EARNED DEGREE LEVEL OR FACULTY RANK

Disparities are Compounded by Race/Ethnicity

Sources: NSF, Women, Minorities, Persons w/Disabilities in Science & Engineering, 2017; U.S. Census Bureau
Why The Leaky Pipe?

Some Important Factors
- Socialization & Gender Stereotypes
- Limited Role Models
- Need for more inclusiveness (work/school)
- Family responsibilities and priorities
- Evaluation (and other types of) bias
Why The Leaky Pipe?

Who belongs?
Why The Leaky Pipe?

Some Important Factors

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Evaluation Bias Example

127 science faculty evaluated an application for a lab manager position.

- Half of the time, the application carried a stereotypically male name; the other half carried a female name.

- When the application carried a male name, the individual scored higher on all factors (competence, hiring, mentoring, salary).

Moss-Racusin, et al., 2012; PNAS109:16474-16479
What are some solutions?

**UD NSF ADVANCE Institute.**

Broad goals are to diversify and strengthen UD’s faculty as well as foster positive departmental climates.

- Recruitment workshops & resources
- Formal mentoring workshops & resources
- Networking and leadership events for women faculty.
- Policy advocacy.
- Faculty climate survey and other institutional data analysis.

National Science Foundation ADVANCE-IT HRD 1409472
What are Some Solutions?

*Change the culture*

- More exposure to STEM for girls at early ages.
- Exposure to positive role models.
- Encourage gender equity in the home.
- Create welcoming academic / professional environments
What are Some Solutions?

Reduce the effects of implicit bias

• Raise awareness about implicit bias
  - when it is most likely to be at play,
  - how to reduce the effects of implicit bias.
• Blind evaluation
• Slow down; don’t multi-task
• Rely on pre-defined evaluation criteria.
What are Some Solutions?

Change Policies and Practices

• Use data to document areas in need of improvement.
• Family friendly policies/practices (paid maternity leave or flex-time).
• Formalized evaluation metrics (raises, promotion, etc.).
• Formalized mentoring programs.
• Improved/more equitable recruitment practices.
• Leadership development.

Accountability is important!
Thank you!

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