An attempt to get and keep women involved in physics

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Outline

1. Women in Physics
2. Situation at CSB
3. Our Program
4. Results to date
5. Advice
6. Acknowledgements
7. Bibliography
The “pipeline is leaky” in every step from junior high school till the senior professor level. [Freeman, 2004]

Physics and other analytical majors are perceived in society as bad choices for women. [Hyde et al., 2008]

Being vastly out-numbered by men in mathematics and physical science classes decreases women’s confidence. [CMPWASE, 2007]
The College of Saint Benedict:

- is a women’s liberal arts college in St. Joseph, MN.
- is partnered with Saint John’s University.
- has 90% first-year retention rate and a four-year graduation rate of 76%.

Science majors

<table>
<thead>
<tr>
<th>Major</th>
<th>CSB %</th>
<th>National %</th>
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</thead>
<tbody>
<tr>
<td>Physics</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Mathematics</td>
<td>21</td>
<td>45</td>
</tr>
<tr>
<td>Computer Science</td>
<td>8</td>
<td>21</td>
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</table>
Development of our Program

Called MapCores — Mathematics, Physics, Computer Science, Research Scholars

Timeline

- Spring 2007 — A group of math, physics and computer science faculty considering writing an NSF proposal for a program to increase the number of women in our majors.
- Summer 2008 — A slightly different group of faculty wrote and submitted a proposal for the NSF S-STEM program.
- Winter 2008-9 — Proposal rejected, first MapCores class recruited.
- Summer 2009 — Revised NSF S-STEM proposal submitted with psychology professor added to the team. [Nairn et al., 2008]
- Winter 2009-10 — Proposal accepted, second MapCores cohort recruited
- Fall 2010 — second cohort enrolled.
Team taught by faculty from Mathematica, Computer Science, and Physics

- **First Year — First Year Seminar class**
  - Special section for our students only
  - Build cohort and support network
- **Sophomore — 1 credit Problem Solving Seminar**
  - Work on interesting cross-disciplinary problems
  - Maintain cohort and build skills
- **Junior — 1 credit Research Seminar**
  - Work on mid-sized research projects
- **Senior — Senior/Thesis Research projects**
Scholarship

- Yearly scholarship of $6000 per student — 11 per year for cohorts starting in 2009 and 2010 paid by grant. The rest covered by CSB at this point.
- Cross-cohort social activities — about 1 per semester.
- Encourage students to apply for REU experience, internships, etc.
Student Selection

Select students based on:

- Interview - finalists asked about interest in science, etc.
- GPA and ACT test scores
- Financial need
- Membership in an under-represented minority or being from an under-represented area
- Attempts to balance majors within our program

Selection process:

- Is intensive.
- Builds on other programs.
- A great way to sell our majors.
Results to date

- Enrolled cohort of 12 in 2009, and 18 in 2010
- Cohorts bonding well
- Some attrition in first cohort - 9 students left
- Some switching of majors
Advice

If you want to do something, I suggest that you:

- Commit to do it.
- Build on your strengths.
- Garner support in your department and with your administration
- Be flexible.
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