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An Attempt to Get and Keep Women Involved in Physics

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An attempt to get and keep women involved in physics

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College of Saint Benedict / Saint John's University

October 30, 2010
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
Several science departments have low percentages of women majors:

<table>
<thead>
<tr>
<th>Major</th>
<th>CSB %</th>
<th>National %</th>
</tr>
</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>
</tr>
</tbody>
</table>
Development of our Program

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

<table>
<thead>
<tr>
<th>Timeline</th>
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<tr>
<td>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.</td>
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<tr>
<td>Summer 2008 — A slightly different group of faculty wrote and submitted a proposal for the NSF S-STEM program.</td>
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<td>Winter 2008-9 — Proposal rejected, first MapCores class recruited.</td>
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<tr>
<td>Summer 2009 — Revised NSF S-STEM proposal submitted with psychology professor added to the team. [Nairn et al., 2008]</td>
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<tr>
<td>Winter 2009-10 — Proposal accepted, second MapCores cohort recruited</td>
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<tr>
<td>Fall 2010 — second cohort enrolled.</td>
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</tbody>
</table>
Curricular Program

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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