2014 Great Midwestern Regional Space Grant Conference

Reaching out to Underrepresented and Female Students using Innovative Programs

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University of Michigan
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Participation of Underrepresented Minority Students in MSGC Fellowships and Internships

In 2008, the MSGC had 23% URM student participation. Participation started to dwindle in 2009 and by 2010, the MSGC had just 21% URM student participation. With some bumps in the road, we are back on track – the goal for Michigan is *20.25%.

<table>
<thead>
<tr>
<th>Year</th>
<th>Fellowships &amp; Internships</th>
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</thead>
<tbody>
<tr>
<td>2010</td>
<td>21%</td>
</tr>
<tr>
<td>2011</td>
<td>27%</td>
</tr>
<tr>
<td>2012</td>
<td>34%</td>
</tr>
<tr>
<td>2013</td>
<td>24%</td>
</tr>
<tr>
<td>2014</td>
<td>30%</td>
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27% Average over 5 Years • *Goal derived from the URM college enrollment percentage for Michigan as per the National Center of Education Statistics Digest
Participation of Female Students in MSGC Fellowships and Internships

In 2008, the MSGC had 40% female participation. Participation started to dwindle in 2009 and by 2010, the MSGC had just 31% female participation. With some bumps in the road, we are back on track – the goal for Michigan is *40%.

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>2010</td>
<td>31%</td>
</tr>
<tr>
<td>2011</td>
<td>50%</td>
</tr>
<tr>
<td>2012</td>
<td>46%</td>
</tr>
<tr>
<td>2013</td>
<td>36%</td>
</tr>
<tr>
<td>2014</td>
<td>47%</td>
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42% Average over 5 Years • *Set by NASA Space Grant HQ
Question?

How did the Michigan Space Grant Consortium turn this downward spiral around . . .

Answer:

The programs described in this presentation helped us to attract female and underrepresented minority students.
The Michigan Initiative on Student NASA Exploration Research (MISNER) Internship

In 2008, the MSGC received full funding from the Exploration Systems Mission Directorate (ESMD) Higher Education Program for the Michigan Initiative on Student NASA Exploration Research (MISNER) Program. The MSGC continued the MISNER Program once ESMD funds were no longer available.
The Michigan Initiative on Student NASA Exploration Research (MISNER) Internship

MISNER places a clear emphasis on enhancing diversity in the Science, Technology, Engineering, and Mathematics (STEM) workforce by working with other in-state workforce diversity development programs such as NSF’s Louis Stokes Alliance for Minority Participation (LSAMP) and NSF’s Alliance for Graduate Education and the Professoriate (AGEP) programs -- both of which consist of Michigan-led consortia comprised of the same four State-of-Michigan universities.
The Michigan Initiative on Student NASA Exploration Research (MISNER) Internship

MISNER is a 10-week internship program that focuses on placing undergraduate and graduate students in small, high-tech businesses or university laboratories that develop ESMD-associated technologies.
The Michigan Initiative on Student NASA Exploration Research (MISNER) Internship

Small Michigan high-tech businesses are located by consulting NASA SBIR/STTR* award notification websites, as well as Chambers of Commerce websites.

* Small Business Innovative Research and Small Business Technology Transfer Program
The Michigan Initiative on Student NASA Exploration Research (MISNER) Internship

Students that are placed with a business are paid $6,000. That cost is split between the business and the MSGC.

Students that are placed in a university lab are paid $5,000. The cost for university interns is paid by the MSGC.
The Michigan Initiative on Student NASA Exploration Research (MISNER) Internship

Students who have not been selected for an internship with the MISNER Program are considered for internships within university laboratories, primarily but not exclusively, the Student Space Systems Fabrication Laboratory (S3FL) at the University of Michigan.

As of September 2014, three students have been hired full-time through their MISNER business internships.
The Student Space Systems Fabrication Lab (S3FL) Internship

The Student Space Systems Fabrication Laboratory (S3FL) at the University of Michigan is dedicated to providing students with practical space systems design and fabrication experience not readily available through the academic curriculum.

S3FL's approach is to enhance education by coupling classroom knowledge with practicum experience involving real engineering design, analysis, test, fabrication, integration, and operation of actual flight vehicles and space payloads.
The Student Space Systems Fabrication Lab (S3FL) Internship

Each year, S3FL involves over a hundred undergraduate and graduate students in activities ranging from balloon payloads to microgravity experiments to nanosatellites.

By participating in the end-to-end development of complete space systems, students acquire knowledge and expertise that would otherwise take years of post-graduate experience to be achieved.
Gabriel Arroyo inside the anechoic chamber at EMAG Technologies in Ann Arbor. The anechoic chamber was designed for testing the near and far field reactions of antennas for hardware and software validation.
Daniel Rebori-Carretero worked with EMAG Technologies on their electromagnetic simulation software, EM.CUBE. Daniel was assigned to testing and user education as well as writing tutorials.
Kutessa Garnett says that support from the MSGC gave her the opportunity to step outside her field and explore an area of study that she would not have realized interested her. Kutessa is shown working on plans for a CubeSat structure.
Terrence McKnight works on a test set-up for a model of the electrical power system of the Radio Aurora Explorer 2 (RAX-2) satellite.
The Summer Research Opportunities Program (SROP)

The Summer Research Opportunity Program (SROP) is a longstanding student recruitment program for underrepresented minorities that focuses on exposing rising sophomores, juniors, and seniors to on-campus research activities in preparation for graduate school.

SROP is supported by the Council of Graduate Schools, a *Big Ten Plus* consortium of graduate schools, and routinely brings dozens of high achieving underrepresented minority undergraduates to its campuses each summer.
The MSGC works with Michigan’s Rackham Graduate School to dedicate internship funds for additional SROP students. The MSGC has partially supported an average of 10 SROP students each summer for the last four years.

Students are selected to conduct NASA-related research and are recruited through the existing mechanisms the graduate school uses to recruit SROP students.
SROP Interns

Ariana Betts creates collagen hydrogels in the fume hood within Professor Jan Stegemann’s Laboratory at the University of Michigan.
Alex Roman completes a procedure to analyze a sample on the thermogravimetric analyzer within Professor Johannes Schwank’s Laboratory, Chemical Engineering at the University of Michigan.
The NextProf Future Faculty Workshops

The Goal

Increase the diversity (both gender and ethnicity) of faculty in the College of Engineering.
The NextProf Future Faculty Workshops

The Plan

- Future faculty development workshops recommended by the Dean’s Advisory Committee on Faculty Diversity (DACFD).
- NextProf 2012 focused on underrepresented minorities (53 participants).
- NextProf 2013 focused on women (69 participants).
- Both workshops were highly ranked by participants.
The NextProf Future Faculty Workshops

The Objectives

• Elevate our visibility and attract potential junior faculty members, focusing on female and underrepresented graduate students and postdocs.

• Enable our faculty to engage with participants through presentations, interactive sessions, discussions, and social events.

• Strengthen our reputation as an institution that is committed to diversity, while developing a pipeline of highly sought-after faculty candidates.
The NextProf Future Faculty Workshops

The Michigan Difference

Significant Faculty Contact with Participants is the NextProf Difference.
100% of attendees rated the 2012 conference as “Excellent” (80%+) or “Very Good.”

Comment from participants: “Large participation of faculty members from different engineering departments” was key.
100% of attendees rated the 2013 conference as either “Excellent” (78+%) or “Very Good.”

Typical comment from participants: “This workshop exceed my expectations. The speakers were phenomenal, everything was perfectly organized, and the other participants were great.”
The NextProf Future Faculty Workshops

Moving Forward

• Working on ways to stay connected with the participants (surveys, LinkedIn, etc.).

• NextProf 2014 is scheduled for September 30 through October 3.

• Plans are underway for an internal version of NextProf, exclusively for engineering students to be held in May 2015.