2012 ONR Naval S&T Partnership Conference & ASNE Expo

Science, Technology, Engineering, & Mathematics (STEM)

Building our Future Naval STEM Workforce

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Why Naval STEM?

• >50% of DoN’s current S&T workforce will be retirement eligible by 2020

• Reductions in the STEM talent base will negatively impact DoN’s technological superiority

• DoN must rely on U.S. citizens for classified technical work

First university degrees in natural sciences and engineering, selected countries

We must grow our future STEM leaders
The Navy’s Vision

“...The need is clear – large numbers of Naval STEM professionals will be retiring over the next few years, and fewer American students are graduating with the preparation and interest needed to pursue STEM careers...” – SECNAV 2011

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Consequences of Success...

At a national level

0.5σ increase in math / science scores may increase GDP growth rates by up to 0.87%
Naval STEM
Priorities and Themes

- Diversity -- Engage more with under-represented populations
- Best Practices -- Partner with nationally recognized, best practice organizations
- Collaboration -- Support the valuable implementation role of SYSCOMS and local organizations; leverage resources for maximum impact
- Naval Relevance -- Ensure programs are relevant to the Naval services; especially efforts supported with non-Navy funds
- Metrics -- Establish & implement metrics to assess progress & impact across the Naval STEM Portfolio
- Go Viral -- Invest in tools with potential for rapid growth & geographic expansion
# STEM Landscape

<table>
<thead>
<tr>
<th>Elementary</th>
<th>Middle</th>
<th>High School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underrepresented Family Science</td>
<td>Internships</td>
<td>Undergraduate</td>
</tr>
<tr>
<td>Science Fairs</td>
<td>Digital Tutors</td>
<td>Internships</td>
</tr>
<tr>
<td>iApps</td>
<td>Robotics</td>
<td>Scholarships</td>
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<td></td>
<td>Camps</td>
<td>Competitions</td>
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<td>Cohorts</td>
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<table>
<thead>
<tr>
<th>Undergraduate</th>
<th>Masters</th>
<th>PhD</th>
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<tbody>
<tr>
<td>Internships</td>
<td>Internships</td>
<td>Scholarships</td>
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<table>
<thead>
<tr>
<th>Faculty Research, Teacher Training &amp; Professional Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young Investigator</td>
</tr>
<tr>
<td>Summer faculty</td>
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</tbody>
</table>

### Programs
- Fun
- Interesting
- Hands-on
- Real-world
- Family Involvement
- Use of Near-Peers

### Levers

### Metrics
- Inspire
- Engage
- Educate

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**Inspire ➔ Engage ➔ Educate**
## ONR STEM

### Selected Efforts

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
<th>Students / Teachers</th>
<th>Minority Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>K-12</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• SeaPerch</td>
<td>Middle School robotics competition -- Nationwide</td>
<td>35,000 / 4,000</td>
<td>45%</td>
</tr>
<tr>
<td>• Technovation</td>
<td>High School Girls App Development competition</td>
<td>730</td>
<td>40%</td>
</tr>
<tr>
<td>• Iridescent Family Science</td>
<td>Elementary and Middle School hands-on after school program</td>
<td>7,270</td>
<td>95%</td>
</tr>
<tr>
<td>• National Math and Science Initiative</td>
<td>High School AP courses for Military Dependents</td>
<td>800</td>
<td>26%</td>
</tr>
<tr>
<td>• SEAP</td>
<td>High School internship program</td>
<td>215</td>
<td>21%</td>
</tr>
<tr>
<td>• Sally Ride Science and ASM Teacher Training</td>
<td>Middle and High School Teacher Training Programs</td>
<td>200</td>
<td>From Rural AL, MS and LA</td>
</tr>
<tr>
<td>• Summer Camps (CSI, NSBE)</td>
<td>Middle School hands-on camps</td>
<td>300</td>
<td>80%</td>
</tr>
</tbody>
</table>
# ONR STEM

## Selected Efforts

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<th>Target</th>
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<tr>
<td><strong>Higher Ed</strong></td>
<td></td>
<td></td>
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<tr>
<td>• NREIP</td>
<td>College Internship program at the Labs and Centers</td>
<td>155</td>
<td>15%</td>
</tr>
<tr>
<td>• NRL STEM Academy</td>
<td>Minority focused College Internship at NRL</td>
<td>45</td>
<td>100%</td>
</tr>
<tr>
<td>• Florida International University</td>
<td>Reinventing Curriculum for basic STEM Courses</td>
<td>Development beginning in Fall</td>
<td>83%</td>
</tr>
<tr>
<td>• UT Pan American</td>
<td>Developing 10-15 Navy Relevant STEM Courses</td>
<td>1700</td>
<td>97%</td>
</tr>
<tr>
<td><strong>Tools</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• BHEF Higher Ed STEM Model</td>
<td>Developed Model of best practices for Higher Ed Retention Programs</td>
<td>To be used to select future Naval Programs</td>
<td>Launch Fall 2012</td>
</tr>
<tr>
<td>• Digital Tutor Grand Challenge</td>
<td>Development of Middle School and new recruit STEM Tutor</td>
<td>4 Awards</td>
<td>Oct. 1 Start Date</td>
</tr>
<tr>
<td>• Gooru</td>
<td>Online Student and Teacher Resource</td>
<td>4500 / 200</td>
<td>60%</td>
</tr>
</tbody>
</table>

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ONR’s FOA
Help us achieve our future

FOA (Funding Opportunity Announcement) requests innovative ideas to extend and enhance ONR’s current STEM portfolio to:

- Inspire the next generation of scientists and engineers, including women and persons from populations under-represented in STEM.
- Engage students in STEM-related hands-on learning activities using Naval-relevant content.
- Educate students to be well prepared for employment in STEM disciplines in the Navy or in supporting organizations

• Successful proposals will:
  - Provide “game changing” solutions
  - Include active participation by DoN personnel, and/or collaborations with DoN Activities, Commands, or Labs
  - Contain a strategy for self – sufficiency

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For More Information
Visit the STEM Spaces

STEM Pitch-a-Principle

STEM Exhibit Area