Introduction to the Office of Naval Research Global

Robert Bolia
Associate Director
ONR Global
Santiago, Chile
Why Support Basic Research?

• Defense funding of basic research is *normal* in the United States

• “Basic research leads to new knowledge. It provides scientific capital. It creates the fund from which the practical applications of knowledge must be drawn. New products and new processes do not appear full-grown. They are founded on new principles and new conceptions, which in turn are painstakingly developed by research in the purest realms of science.” – Vannevar Bush, *Science: The Endless Frontier*, 1945

• DoD Basic Research Funding Model
  – Fund a broad range of topics
  – A mix of universities and public and private institutes
  – Independence of researchers
  – Researchers retain intellectual property
  – Free publication of results encouraged

<table>
<thead>
<tr>
<th>Funding Agency</th>
<th>US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Institutes of Health</td>
<td>15,537.5</td>
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<tr>
<td>National Science Foundation</td>
<td>4,476.4</td>
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<tr>
<td>Department of Energy</td>
<td>4,075.3</td>
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<tr>
<td>NASA</td>
<td>3,038.1</td>
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<tr>
<td>Department of Defense</td>
<td>1,983.5</td>
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<tr>
<td>Department of Agriculture</td>
<td>940.9</td>
</tr>
<tr>
<td>All Other</td>
<td>1,161.5</td>
</tr>
<tr>
<td><strong>Total Basic Research</strong></td>
<td>31,213.1</td>
</tr>
</tbody>
</table>
The Naval Research Enterprise

Naval Research Laboratory (Appropriations Act, 1916)
“[Conduct] exploratory and research work...necessary
...for the benefit of Government service, including the construction,
equipment, and operation of a laboratory.”

Office of Naval Research (Public Law 588, 1946)
“...plan, foster, and encourage scientific research in
recognition of its paramount importance as related to the
maintenance of future of naval power, and the preservation of
national security...”
The Naval Research Enterprise

• Funding agencies
  – Office of Naval Research
  – ONR Global

• Research Labs
  – Naval Research Laboratory

• Medical Research Labs
  – Naval Health Research Center
  – Naval Medical Research Center
  – Naval Medical Research Units (including NAMRU-6 in Lima, Peru)
  – Naval Submarine Medical Research Laboratory
  – Navy Experimental Diving Unit

• Development Centers
  – Applied research and advanced technology development
  – Focused on specific spatial domains: aviation, submarine, surface, etc.
ONR has Supported more than 60 Nobel Prize Winners

Andre Geim
University of Manchester, UK
2010 Nobel Prize in Physics “for groundbreaking experiments regarding the two-dimensional material graphene”

David Wineland
University of Colorado, USA
2012 Nobel Prize in Physics “for groundbreaking experimental methods that enable measuring and manipulation of individual quantum systems.”

Arieh Warshel
University of Southern California, USA
2013 Nobel Prize in Chemistry “for the development of multiscale models for complex chemical systems”
ONRG Mission

- Search the globe for promising scientific research
- Develop relationships between international researchers and the Naval Research Enterprise
- Support the advancement and dissemination of scientific knowledge
- Fund research at foreign institutions
Why ONRG?

• There are smart people everywhere – no nation has a monopoly on good scientists
• Although US spending on S&T is not decreasing, the US share of global S&T spending is decreasing rapidly
• Increased opportunity to find innovative S&T around the globe
• Scientific collaboration is good diplomacy
ONRG History

- 1946 – ONR London Office created to survey, assess, and report on European S&T activities
- 1974 – ONR Tokyo Office opened to liaise and assess Asian S&T activities
- 1977 – ONR London and Tokyo Offices combined to form the International Field Office (IFO) to implement integrated DoN S&T strategy for fostering international collaboration
- 2000 – Tokyo Office expands its presence with a Singapore detachment
- 2002 – IFO opens Santiago Office
- 2003 – Office of Naval Research Global established
- 2006 – ONRG opens Singapore Office
- 2010 – ONRG opens Prague Office
- 2014 – ONRG opens São Paulo Office
Who is ONRG?

• 25 Associate Directors distributed around the globe
  – Diverse scientific backgrounds
  – Competitively recruited from US defense labs, academia and industry
  – Each AD has both technology-specific and country-specific areas of responsibility
ONRG Around the World

Washington, D.C. Region
Executive Officer
International Programs Manager

ONRG London
Commanding Officer
Technical Director
Regional Director
Associate Directors

ONRG Prague
Associate Directors

ONRG Tokyo
Regional Director
Associate Directors

ONRG São Paulo
Associate Director

ONRG Santiago
Associate Directors

ONRG Singapore
Associate Directors

ONRG co-located with other defense S&T offices
- London (USA/USAF)
- Tokyo (USA/USAF)
- Santiago (USA/USAF)
- Singapore (USA only)
Science Program Tools

Liaison Visits
- ONRG Associate Directors visit international institutions to discover world-class S&T

Collaborative Science Program (CSP)
- Grants to support non-US workshops and conferences

Visiting Scientist Program (VSP)
- Support travel of non-US scientists to US to socialize new research ideas with the Naval Research Enterprise

Naval International Cooperative Opportunities Programs (NICOP)
- Research grants to overseas institutions
- Typically 1-3 year projects

ONRG provides seed funding for innovative research
2013 Grants Distribution

432 Grants in 52 Countries Totaling $13.7 Million
## ONRG Areas of Interest

<table>
<thead>
<tr>
<th>Category</th>
<th>Area</th>
<th>Subarea</th>
<th>Area</th>
<th>Subarea</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative Energy</td>
<td>Energetic Materials</td>
<td>Marginal Ice Zone Dynamics</td>
<td>Ocean Acoustics</td>
<td>Space Weather</td>
<td></td>
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<tr>
<td>Antifouling</td>
<td>Energy Distribution &amp; Storage</td>
<td>Marine Mammals</td>
<td>Ocean/Atmospheric Modeling</td>
<td>Stress Physiology</td>
<td></td>
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<tr>
<td>Artificial Intelligence</td>
<td>Fatigue Management</td>
<td>Marine Meteorology</td>
<td>Ocean Engineering</td>
<td>Structural Materials</td>
<td></td>
</tr>
<tr>
<td>Autonomous Vehicles</td>
<td>Fuels</td>
<td>Metamaterials</td>
<td>Photonics</td>
<td>Synthetic Biology</td>
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<tr>
<td>Climate Change</td>
<td>Gut Microbiology</td>
<td>Multi-Scale Modeling</td>
<td>Precision Navigation &amp; Timing</td>
<td>Training &amp; Education</td>
<td></td>
</tr>
<tr>
<td>Composite Materials</td>
<td>Human Performance</td>
<td>Nanoscience/Nanotechnology</td>
<td>Propulsion Systems</td>
<td>Traumatic Injury</td>
<td></td>
</tr>
<tr>
<td>Computational Fluid Dynamics</td>
<td>Human-Robot Interaction</td>
<td>Neural Computation</td>
<td>Quantum Computing</td>
<td>Ultra-High-Temperature Materials</td>
<td></td>
</tr>
<tr>
<td>Control Systems</td>
<td>Hypersonics</td>
<td>Noise-Induced Hearing Loss</td>
<td>Radar</td>
<td>Undersea Medicine</td>
<td></td>
</tr>
<tr>
<td>Decision Making</td>
<td>Lasers</td>
<td>Non-Destructive Evaluation</td>
<td>Sensors</td>
<td>Water Desalination/Purification</td>
<td></td>
</tr>
<tr>
<td>Electrochemistry</td>
<td>Littoral Geosciences</td>
<td>Nonlinear Dynamics</td>
<td>Social Networks</td>
<td>Wave Processes in the Arctic</td>
<td></td>
</tr>
</tbody>
</table>
How to Apply for a Grant

• Send me a 1-3 page white paper
  – Explain what you want to do
  – How much it will cost
  – Why it is important

• If I think it’s a good fit, I will try to find co-funding from the Naval Research Enterprise and/or other agencies

• If this is successful, I will ask for a full proposal and send instructions on how to submit it
Other International Funding Opportunities

- **US Air Force**
  - Southern Office of Aerospace Research & Development (Santiago)

- **US Army**
  - RFEC Americas
    - Santiago
    - Buenos Aires
    - São Paulo (coming soon – 2015)
Questions?

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