



Basic Research at the Department of Defense

DEPSCoR DoD Day – Northeastern Regional Meeting

September 26, 2019

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Deputy Director

Basic Research Directorate

OUSD(R&E)/DDRE(RT)



How does DoD define basic research?

DoD policy states that basic research is the
“*systematic study directed toward greater
knowledge or understanding of the fundamental
aspects of phenomena and of observable facts...*”

How does DoD define basic research?

TABLE A-3. DoD STANDARD FUNDING CATEGORIES

6.1 Basic Research

6.2 Applied Research

6.3 Advanced Technology Development

6.4 Advanced Component Development and Prototypes

6.5 System Development and Demonstration

6.6 RDT&E Management Support

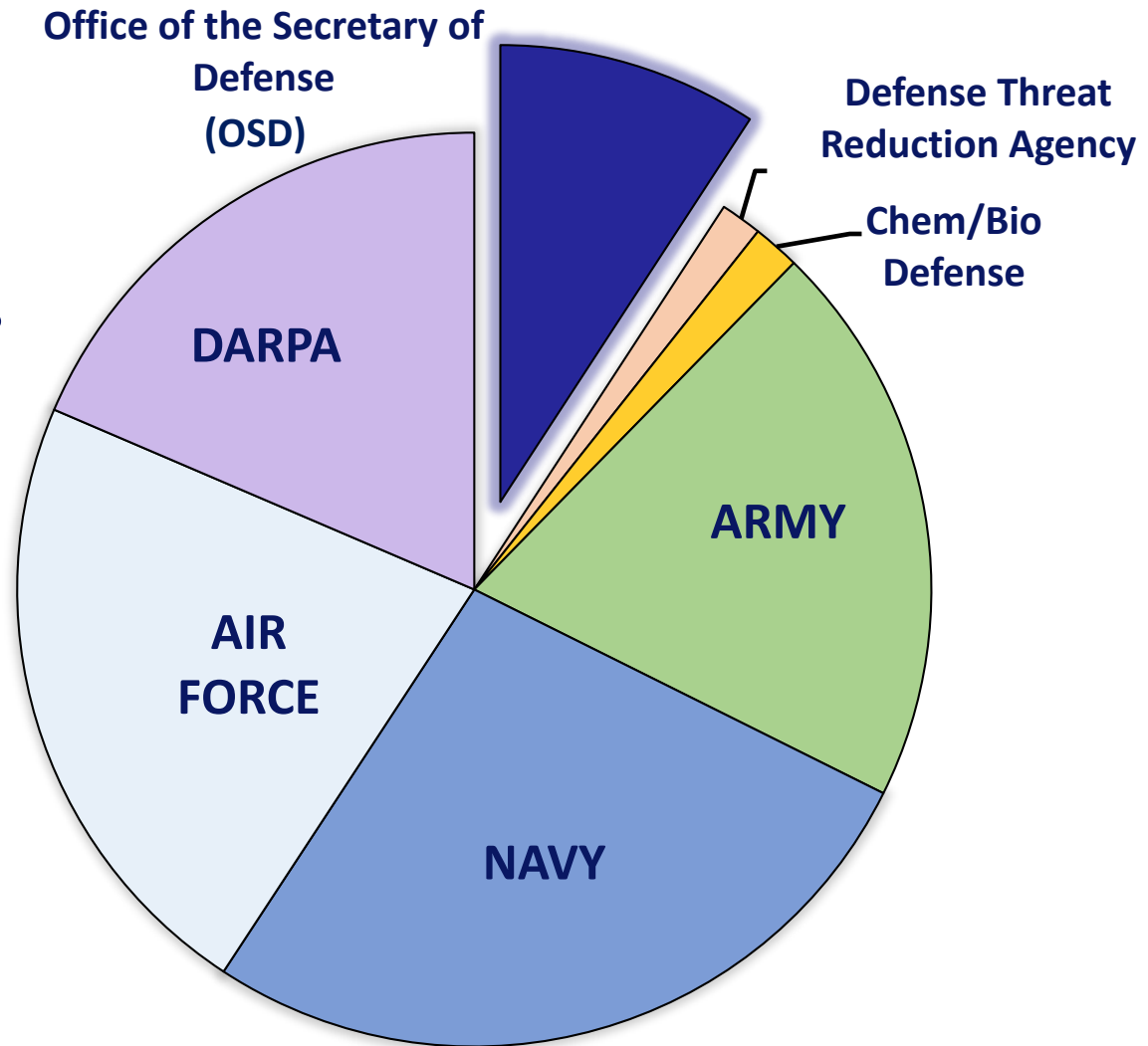
6.7 Operational Systems Development

Note. (DAU, 2016)

Funding across the DoD Basic Research Enterprise

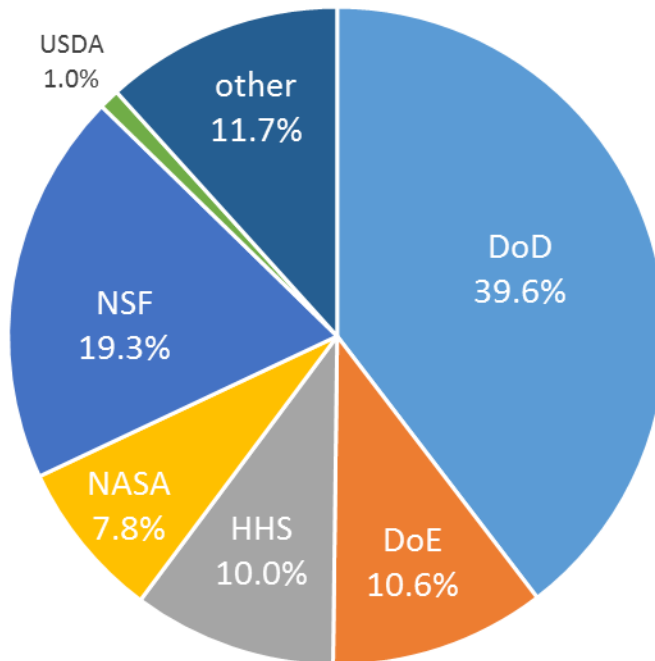
Total 6.1 funds
\$2.5B

- Over two-thirds of funds to extramural programs
- Major funder of basic research in math, physics, and engineering

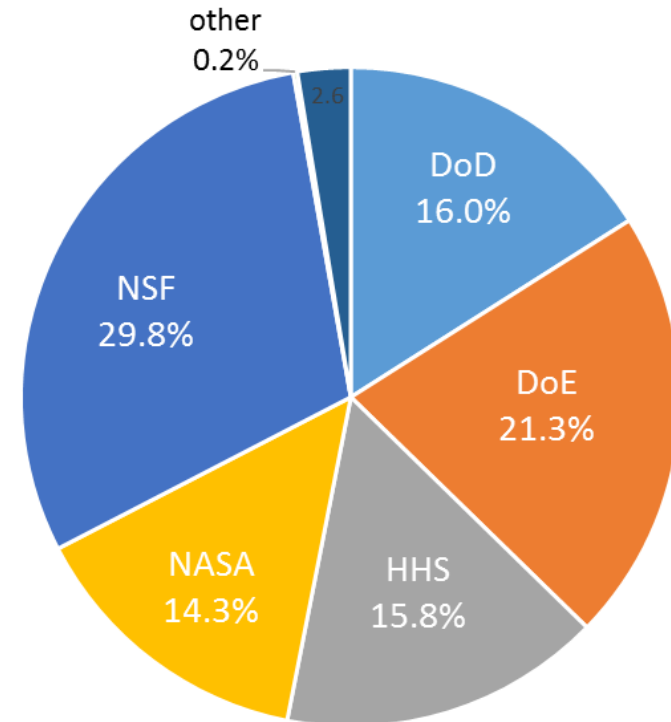


Basic Research Funding by Agency

Engineering

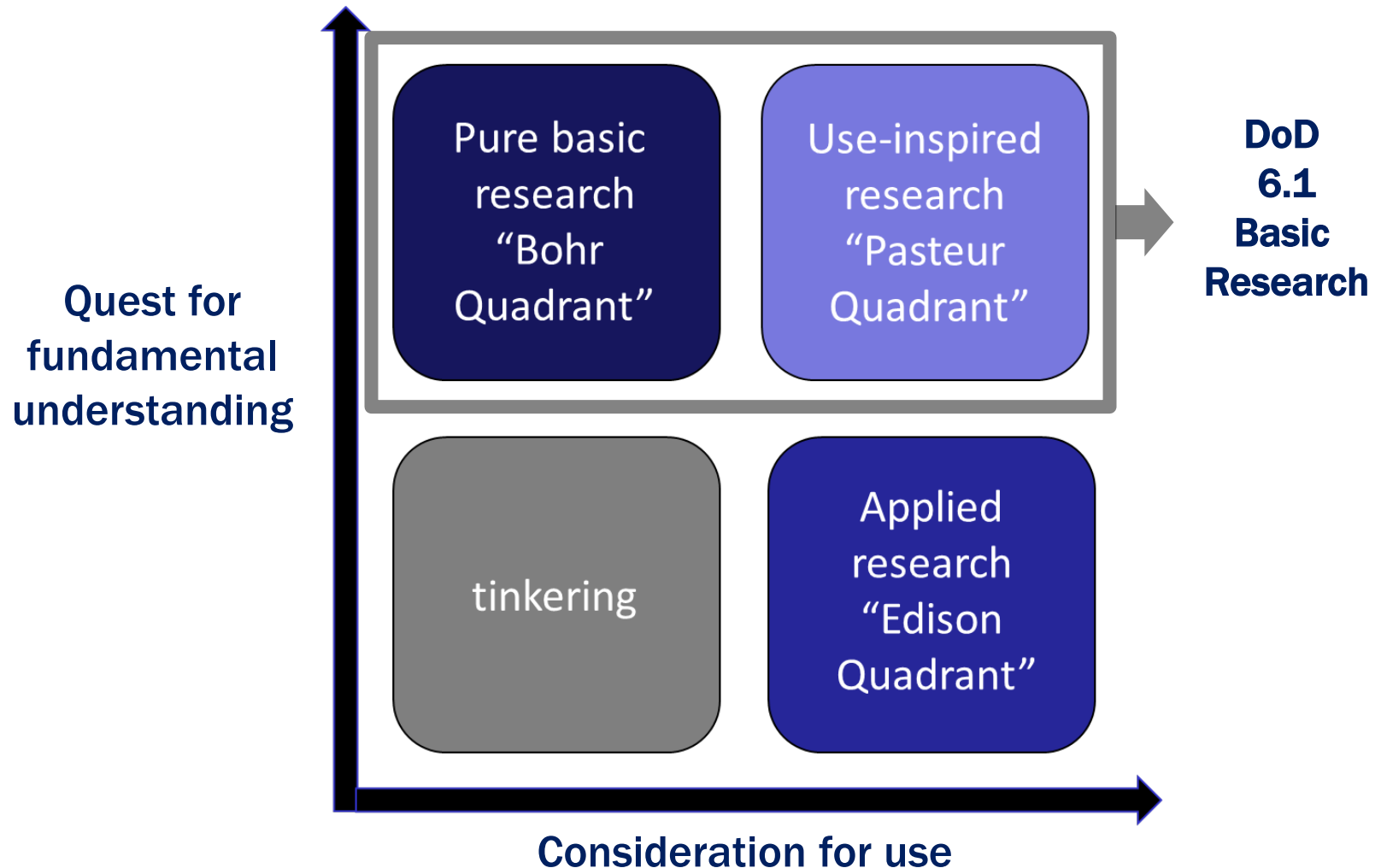


Physical Sciences



DoD third largest funder of basic research to universities

Donald Stokes: 'Pasteur's Quadrant.'



Oversee and Connect

Across DoD Offices & Agencies



With Other Government Agencies



With Institutions of Higher Education

Cultivate and Collaborate

Vannevar Bush Faculty Fellowship

Minerva Research Initiative

Multi-University Research Initiatives
(MURIs)

National Defense Science and
Engineering Graduate Fellowship
(NDSEG)

Defense Established Program to
Stimulate Competitive Research
(DEPSCoR)



Programs to develop ideas and people

Ongoing Programs

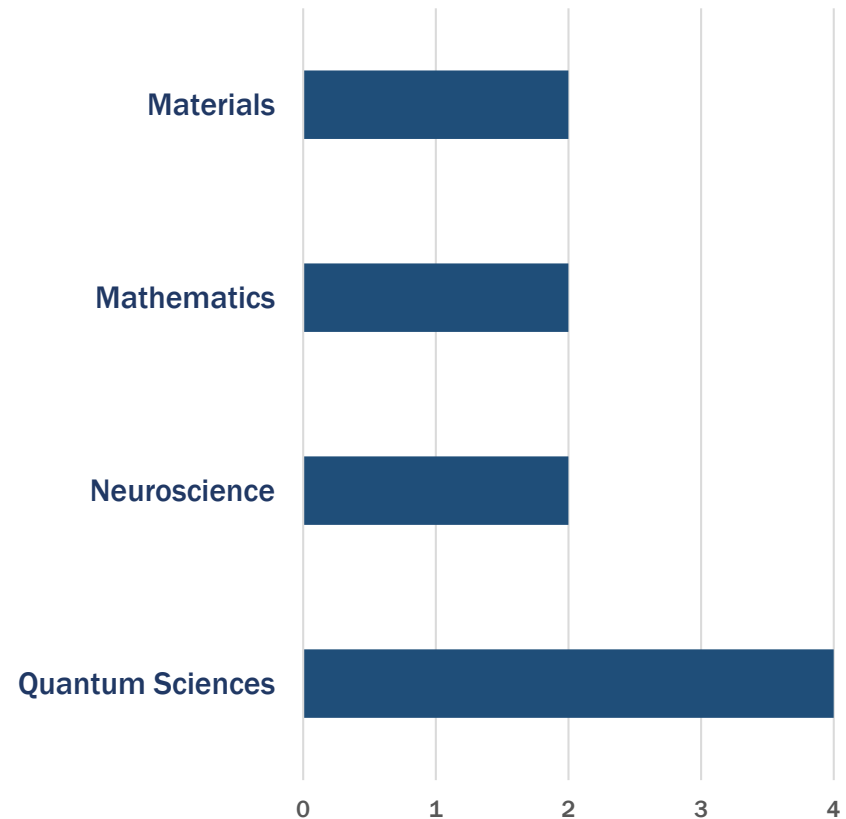
Vannevar Bush Faculty Fellowship

Defense Department's largest single-investigator program:
5-year fellowship with up to \$3M for research with potentially extraordinary outcomes

Program Goals

- Support transformative, high-risk, basic research
- Attract distinguished, productive, and creative candidates and sustain career-long association between Fellows and DoD
- Establish a group of experts that can study and advise DoD on emerging scientific and technical challenges
- Areas of interest also include: fluid dynamics, physics, materials science, oceanography, engineered/synthetic biology, and others with high potential

2019 Vannevar Bush Fellows

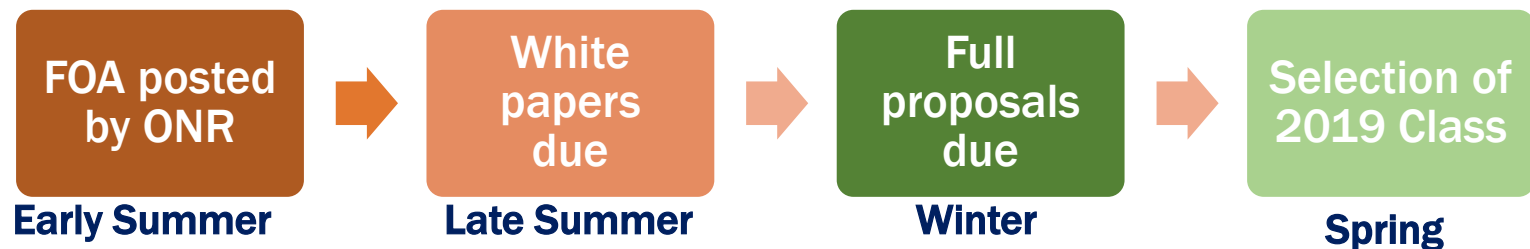


Vannevar Bush Faculty Fellowship

Defense Department's largest single-investigator program:
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2019

**Vannevar Bush
Faculty Fellows**



Informational webinar, project descriptions available on website

Minerva Research Initiative

DoD's basic social sciences program to better understand the social and cultural forces shaping security

Program Goals

- Connect social science insights and methods to improve decision-making
- Build fundamental understanding of social, cultural, and historical forces that shape strategically important regions of the world



www.minerva.defense.gov

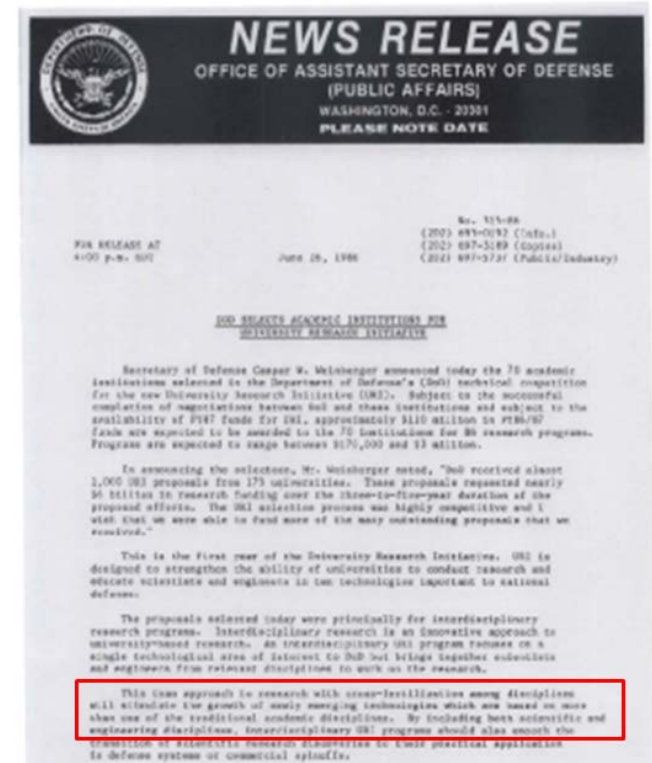


Multidisciplinary University Research Initiative (MURI)

Tri-service program that supports basic research teams intersecting with more than one traditional science and engineering discipline

Program Goals

- Educate scientists and engineers in the interdisciplinary areas important to national defense
- Promote rapid technology transition directly to Service applications
- Complement other DoD programs that support university research through the single-investigator awards.
- MURI awards are 3-5 years, with teams funded up to \$1.5M/year.



1986 Press Release: “This team approach in research with cross-facilitation among disciplines will stimulate the growth of newly emerging technologies....

Multidisciplinary University Research Initiative (MURI)

DoDs tri-service program that supports basic research teams intersecting with more than one traditional science and engineering discipline

MURI FY20

White paper
inquiries
and
questions



White
papers
due



Application
inquiries
and
questions



Applications
due

May 24, 2019

June 30, 2019

Aug 20, 2019

Sept 13, 2019

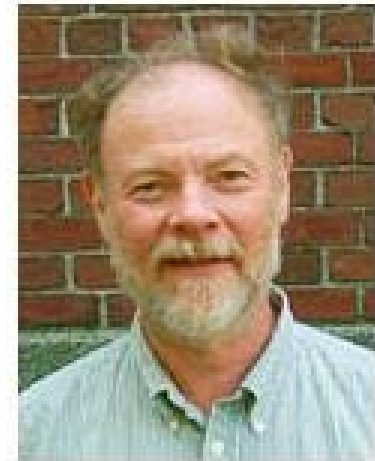
MURI FY21

FOA
Publishing

Feb 14, 2020

ONR 2017 MURI

**Bio-inspired Adaptive Sonar for
Classification and Guidance in Complex
Environments**



**Lead PI: James Simmons,
Brown University**

Selected topics from most recent funding call (FY20):

Harvesting Oxygen from the Ocean

Engineering Endosymbionts to Produce Novel Functional Materials

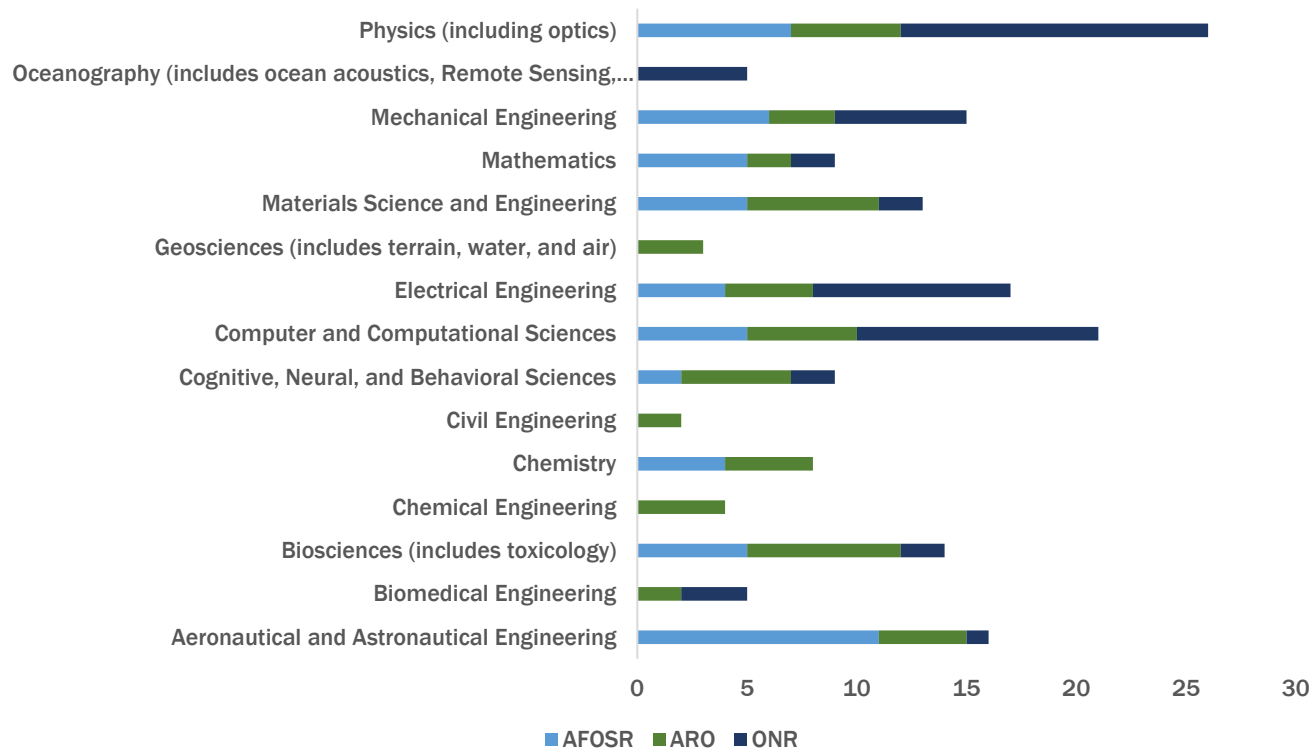
Machine Learning and Physics-Based Modeling and Simulation

Full list: <https://www.grants.gov/custom/viewOppDetails.jsp?oppld=302058>

National Defense Science and Engineering Graduate Fellowship (NDSEG)

The NDSEG fellowship supports graduate students in science and engineering disciplines of military importance

2019 NDSEG Fellows



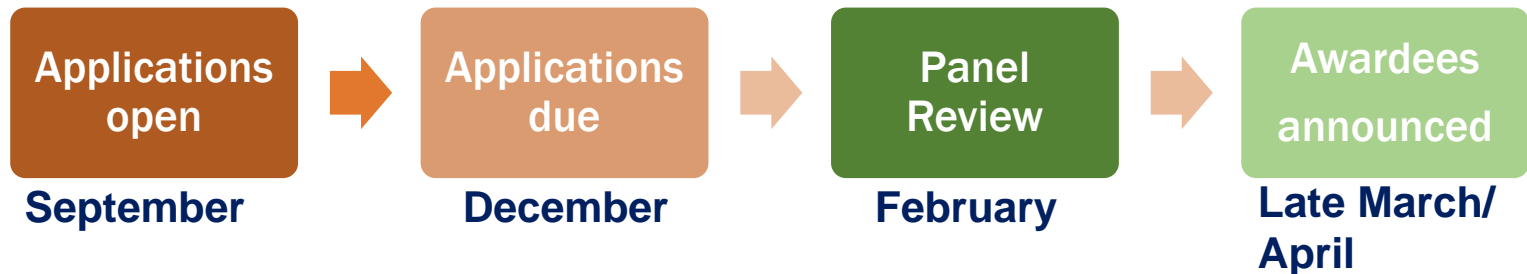
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For three years:

Covers full tuition, mandatory fees, & health insurance cost up to \$1200/year, travel costs up to \$5,00 for the fellowship duration

Fellows also receive a monthly stipend of \$3200.



DEPSCoR – Northeastern Region 2019 NDSEG Fellows

Catharine Shipps (Yale), Chemistry

THANK YOU



<http://basicresearch.defense.gov>



[@DoD_STIx](https://twitter.com/DoD_STIx)