

Vannevar Bush Faculty Fellowship Program

Jiwei Lu
Basic Research Office, ASD (R&E)

Ellen Livingston
Office of Naval Research

Natalie Gluck
Mike Finnin
Institute of Defense Analyses



Vannevar Bush (1890-1974)



Basic research was "the pacemaker of technological progress". "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."

Program Overview

- **Established in 2008 as National Security Science and Engineering Faculty Fellowship (NSSEFF)**
- **Program name was changed in 2016.**
- **Currently sponsored by Dr. Robin Staffin, Director for Basic Research Office, ASD(R&E).**
- **ONR manages the grants. The program manager is Dr. Ellen Livingston.**

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

Program Goals

- **Support “Blue Sky”, curiosity driven fundamental research**
- **Educate and recruit next generation researchers to research enterprise in the department**
- **Develop and sustain career-long association between Fellows and DoD**
- **Expose the university researchers and their students with DoD’s current and future challenges**

Current DOD Research Areas of Interest

- **Engineering Biology**
- **Quantum Information Science**
- **Cognitive Neuroscience**
- **Novel Engineered Materials**
- **Applied Math & Statistics**
- **Manufacturing Science**
- **Other research fields with high potential**

Grant Information

- **Tenured faculty and full time staff at Ph.D.-granting educational institutions are eligible**
- **PIs from HBCU/MI are encouraged to submit proposals. However, no separate funding will be set aside for HCBU/MI participation.**
- **Single-investigator research grants, although collaboration is encouraged**
- **Security clearance is not required for award**
- **Fellows are expected to participate in DOD activities**
 - **Workshops, lab visits, program reviews, host DOD visitors at their site, serve on advisory panels, send students to lab internships**
- **Approximately 10 Fellows selected each competition**

Competition Process Overview

- Applicants submit 3 page white papers.
- White papers are reviewed by general technical experts in the DOD and other government agencies.
- Panels discuss their papers and put forward names for consideration as semi-finalists.
- Invited semi-finalists (~20-30) submit full proposals, CV, budget, 3 letters of recommendation.
- Proposals are reviewed online by specific subject matter experts in academia and government. The white paper panelists review all proposals from their panel.
- Panels meet to recommend awards.
- Basic Science Director selects Fellows.

Important dates for FY18 competition

Event	Date	Time
AcquTrak website open for registration and submission: https://acqpass.noblis.org/applyVBFF	19 June 2017	
Questions Regarding White Paper and Supporting Documentation (submitted by)	26 July 2017	
AcquTrak Registration (required by)	14 August 2017	11:59 PM EDT
White Paper and Supporting Documentation (required by)	16 August 2017	11:59 PM EDT
Notification of White Paper Selection	27 October 2017*	
Proposal and Confidential Letters of Recommendation (by invitation only)	8 January 2018	11:59 PM EDT

* Estimated date

Past competitions

Class	White paper	Fellows
2008*	358	8
2009	490	10
2010	678	11
2014**	132	10
2015	153	7
2016	185	15
2017	285	13

*Opened to all disciplines

** Started as a stand-alone program element after a pause of competition. The topic areas were limited to selected emerging research areas that are of importance to DoD.

Interactions Between Fellows and DoD

- Fellows present their work at DOD-sponsored conferences.
- Fellows serve on panels and participate in DOD program reviews.
- Fellows participate in workshops for ASD(R&E)'s Basic Science Office to discuss future horizons in basic science.
- Fellows collaborate with DOD researchers on joint projects.
- Trips for Fellows and their students to the 3 service labs (ARL, NRL, AFRL).
- DOD's STEM development office funded 15 internships in DOD research labs for the Fellows' students in 2010.
- Non-selectees – In 2009, NDEP funded 4 non-selectees as regular OXR grants due to service specific interest in a modified version of some ideas.

Program Philosophy

Q: What are the specific goals that differentiate the Vannevar Bush Faculty Fellowship program from the normal array of OXR programs that range from SI to MURI to Centers to in-house lab research?

A: This fellowship enables purely scientific investigations that require sustained investment for a long period of time.

- For basic scientific research only
- Funding level is higher than that generally given for scientific study programs → research will be larger in scope and longer in duration than typical OXR funded research
- Not aimed at solving a particular technological problem
- No milestones
- Focused on projects that might achieve major scientific breakthroughs
- Results expected to lead to revolutionary advances in DOD in the long term

Program Philosophy

Q: (2) What are the specific goals that differentiate the Vannevar Bush Faculty Fellowship program from the normal array of OXR programs that range from SI to MURI to Centers to in-house lab research?

•**OXR SI (single investigator):**

- Science is loosely coupled with a military need.
- \$100-200K/yr for 3 yrs

•**MURI (multi-university):**

- Multiagency program overseen by DOD (ARO, ONR, AFOSR).
- Supports multidisciplinary basic research in areas with potential for both defense and commercial apps
- Typically ~\$0.5-1.5M/yr for 3 yrs + 2 additional option yrs
- Greater sustained support than SI awards.

•**DARPA award:**

- Mainly high risk, high payoff technology development for military missions
- Some basic research (~10% of \$3B budget)
- Teaming between industry and universities common
- Larger programs than OXRs
- Funding typically \$100K - \$10M/year up to 4 years

Program Philosophy

Q: (3) What are the specific goals that differentiate the Vannevar Bush Faculty Fellowship program from the normal array of OXR programs that range from SI to MURI to Centers to in-house lab research?

• **Centers (UARCS)**

Maintain sustained excellence in a particular field. Needs sources of funding indefinitely.

- **Perform research**
- **Host lectures and workshops**

• **In house DOD Laboratories**

- **Maintain DOD's technology base and support users in the field.**
- **Translate user needs into technology requirements for industry.**
- **Support user in application of emerging technology and introduction of new systems.**
- **Basic research and exploratory development focused on new and improved military functional capabilities.**

Program Philosophy

Q: Why shouldn't the services individually or jointly run the selection and execution of the program so they can ensure appropriate coordination/integration with their other programs?

A: The oversight of OSD enables the long term, exploratory nature of the research projects, and identifies department wide needs.