



# Air Force Basic Research

CALVIN D. SCOTT

AFRL/AFOSR/RBKC 23 SEP 19

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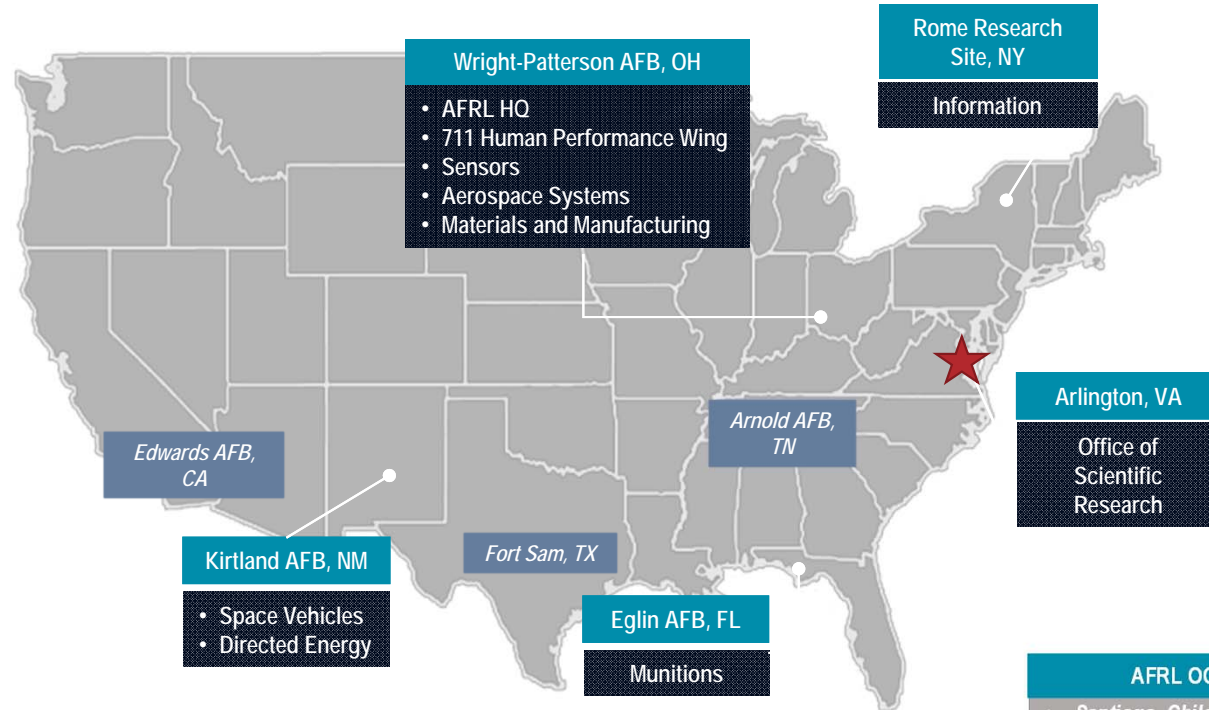
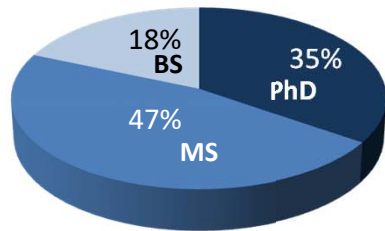
# Agenda

- About us
- Our Granting Process
- Research Areas
- Improving Competitiveness
- Opportunities



# About Us

## LOCATIONS AND WORKFORCE



AFRL OCONUS
<ul style="list-style-type: none"> <li>• Santiago, Chile</li> <li>• London, UK</li> <li>• Tokyo, Japan</li> <li>• Maui Research Site, HI</li> </ul>

	Employees	Civilian	Military
Total	6,254	5,072	1,182
S&Es	3,611	3,041	570

[www.AFResearchLab.com](http://www.AFResearchLab.com)

# About Us

## AFRL TECHNOLOGY DIRECTORATES

### AF Office of Scientific Research

- Physics and Electronics
- Aerospace, Chemical and Materials Sciences
- Mathematics, Information, and Life Sciences



### Aerospace Systems

- Aerospace Vehicles
- Control, Power and Thermal Management
- High Speed Systems
- Space and Missile Propulsion
- Turbine Engines



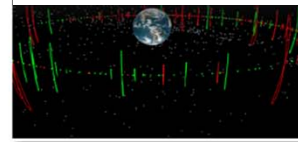
### Directed Energy

- High Power Electromagnetics (HPEM)
- Laser Systems (LS)
- Directed Energy
- Electro-Optics for Space Superiority
- Weapons Modeling & Simulation (WM&S)



### Information

- Autonomy, Command and Control, and Decision Support
- Processing & Exploitation
- Cyber Science and Technology
- Connectivity and Dissemination



### Human Performance

- Decision Making
- Bioeffects
- Human Centered ISR



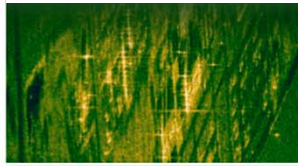
### Munitions

- Ordnance Sciences
- Fuze Technology
- Terminal Seeker Sciences
- Munitions Airframe, Guidance, Navigation & Control
- Munitions System Effects Sciences



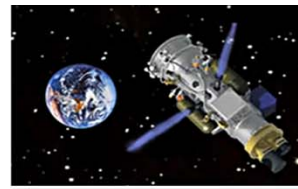
### Sensors

- Spectrum Warfare
- Layered Sensing Exploitation
- Enabling Devices and Components
- RF Sensing
- EO Sensing



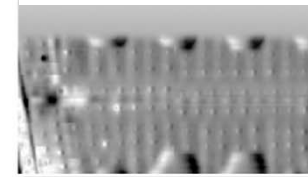
### Space Vehicles

- Space Electronics
- Space Remote Sensing
- Space Environment Impacts & Mitigation
- Space Experiments
- Space Platforms



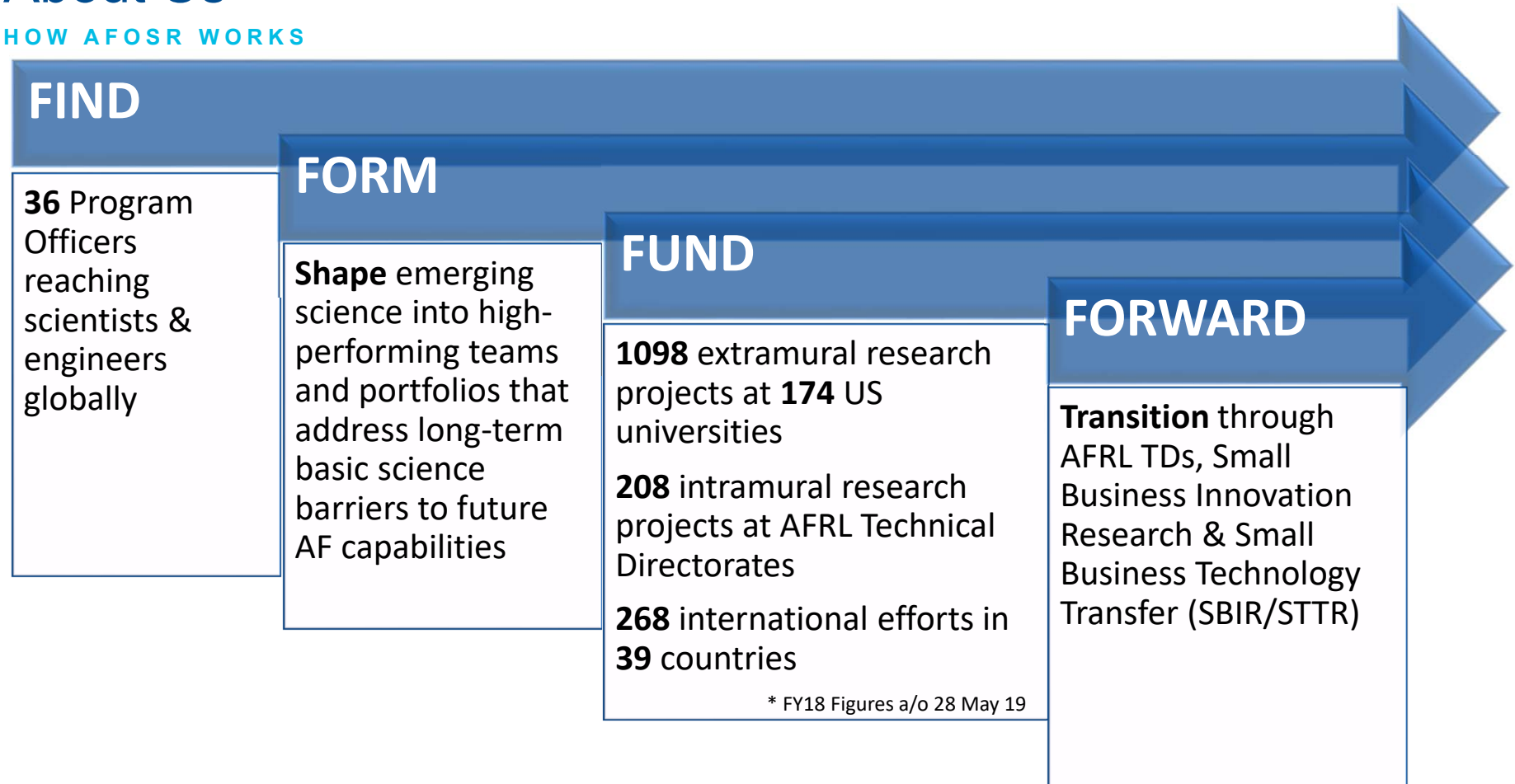
### Materials and Manufacturing

- Structural Materials
- Functional Materials
- Manufacturing Technologies
- Support for Operations

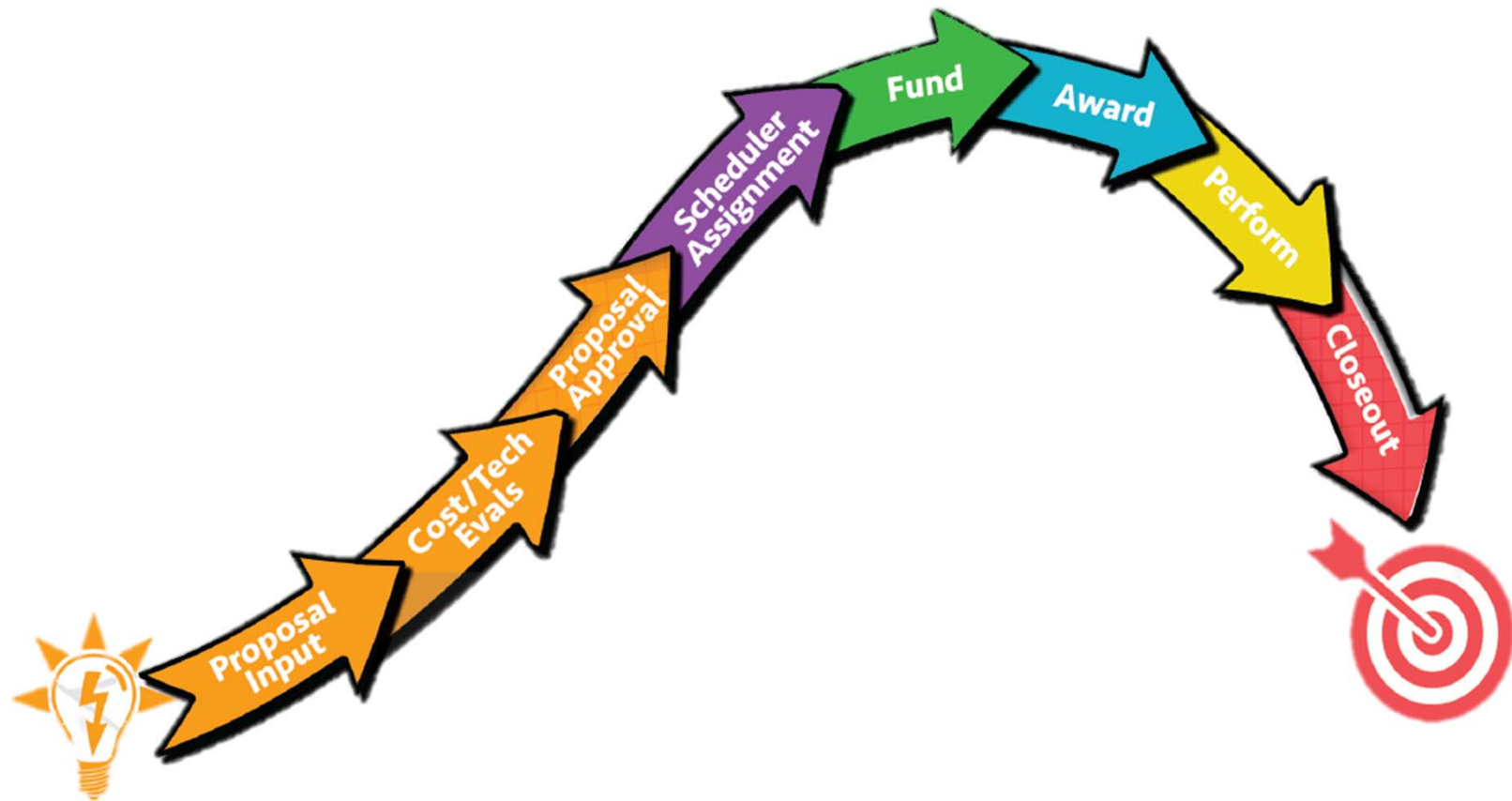


# About Us

## HOW AFOSR WORKS



## AFOSR Granting Process



[www.AFResearchLab.com](http://www.AFResearchLab.com)

# AFOSR Research Areas

## AFOSR GENERAL BAA

- Outlines research areas of interest
- FA9550-19-S-0003 can be found on [www.grants.gov](http://www.grants.gov)  
<https://www.grants.gov/web/grants/view-opportunity.html?oppld=314753>

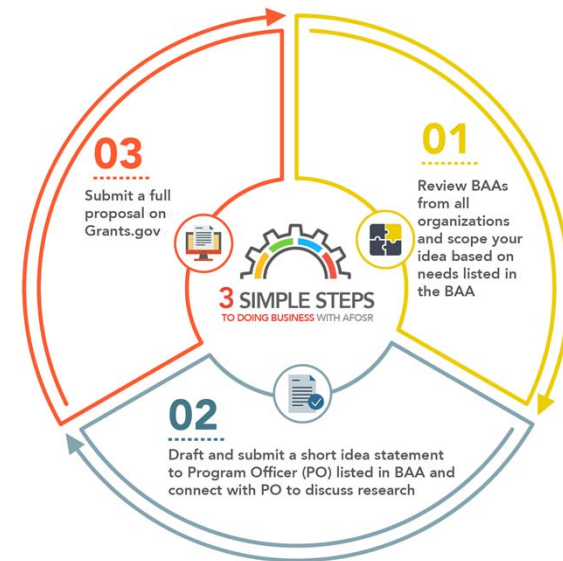
Engineering and Complex Systems	Information and Networks	Physical Sciences	Chemistry and Biological Sciences
Dynamic Materials and Interactions	Computational Cognition and Machine Intelligence	Materials with Extreme Properties	Biophysics
GHz-THz Electronics and Materials	Computational Mathematics	Atomic and Molecular Physics	Human Performance and Biosystems
Energy, Combustion, and Non-Equilibrium Thermodynamics	Dynamics and Control	Electromagnetics	Mechanics of Multifunctional Materials and Microsystems
Unsteady Aerodynamics and Turbulent Flows	Dynamic Data and Information Processing	Laser and Optical Physics	Molecular Dynamics and Theoretical Chemistry
High-Speed Aerodynamics	Information Assurance and Cybersecurity	Optoelectronics and Photonics	Natural Materials, Systems, and Extremophiles
Low Density Materials	Optimization and Discrete Mathematics	Plasma and Electro-Energetic Physics	Organic Materials Chemistry
Multiscale Structural Mechanics and Prognosis	Science of Information, Computation, Learning, and Fusion	Quantum Information Sciences	
Space Propulsion and Power	Trust and Influence	Remote Sensing	
Agile Science of Test and Evaluation (T&E)	Complex Networks	Space Science	
	Cognitive and Computational Neurosciences	Ultrashort Pulse Laser-Matter Interactions	
		Condensed Matter Physics	



# Improving Competitiveness

## DOING BUSINESS WITH AFOSR

- **Engage with AFOSR PO researchers** to discuss your idea statement
- Promising ideas may begin an ongoing dialogue leading to full proposal submission
- Throughout your working relationship with AFOSR, you can expect an AFOSR PO to take on a number of roles:
  - Topical / Program Expert
  - Educator / Communicator
  - Team Builder
  - Advocate
  - Evaluator
  - Administrator
  - Active Member of AFRL, DoD & Scientific Communities





# Improving Competitiveness

## DOING BUSINESS WITH AFOSR

- **Attend grant writing courses**
- In general, a good proposal is one that includes:
  - Strong technical merit
  - Air Force relevance
  - Solid budget justification
  - Consideration given to every requirement stated in the BAA

# Improving Competitiveness

## DOING BUSINESS WITH AFOSR

- **Understand funding considerations**
- AFOSR receives far more good proposals than it is able to fund every year
- POs must factor many other considerations into funding decisions. Those include, but aren't limited to:
  - Overlap with program interests and connecting to DoD labs
  - Potential for scientific breakthroughs
  - Strategic directions
  - Budget realities
  - Peer review recommendations

# Improving Competitiveness

## DOING BUSINESS WITH AFOSR

- **Look for opportunities to forge partnerships**
- Once funded, remain engaged and continue with the process by
  - Reviewing BAAs
  - Attending program reviews
  - Collaborating with other PIs in the program
- Seek out Center of Excellence BAAs
  - University-led efforts, sponsored by 1+ AFRL Technology Directorate and AFOSR
  - Prime opportunity for academic engagement and student pipeline
  - Nominal three-year arrangement, with two-year renewal option
  - AFRL and University share costs (with AF investment up to \$500K/year)

**Professor David Awschalom, University of California Santa Barbara: Quantum Information Processing/Spintronics**



"I am extremely grateful to the AFOSR for launching my career at the University of California, and for **having the courage to fund ambitious, high-risk research**. Without their **steadfast support** and thoughtful guidance, the field of quantum spintronics would almost certainly not be where it is today." - Dr. Awschalom

# AFOSR Funding Opportunities

## TRADITIONAL GRANTS

- Extramural Grants
- Lab Tasks
- Historically Black Colleges and University/Minority Serving Institution Grants
- Young Investigator Grants
- Center of Excellence Grants

## ADD'L FUNDING OPPORTUNITIES

- [Multidisciplinary University Research Grants](#)
- [Instrumentation Grants](#)
- Small Business Tech Transfer Grants/Contracts
- [Defense Enterprise Science Initiative](#)
- Summer Faculty Fellowships
- Windows on Science
- [MINERVA](#)

## WORKFORCE DEVELOPMENT

- Undergraduate Research Experiences
- [Graduate Fellowships](#)
- AFRL Internships
- Windows on World
- AFRL Science and Technology Fellowships
- [Lab Univ Collaboration Initiative](#)

- Core ~ \$350M, [OSD ~ \\$150M](#), Total Budget ~ \$500M
- 65% of core mission funds extramural, 30% intramural, 5% international

# Army Research Office (ARO) Funding Opportunities

## TRADITIONAL GRANTS

- Extramural Grants
- Lab Tasks
- Historically Black Colleges and University/Minority Serving Institution Grants
- Young Investigator Grants
- Center of Excellence Grants

## ADD'L FUNDING OPPORTUNITIES

- Multidisciplinary University Research Grants
- Instrumentation Grants
- Small Business Tech Transfer Grants/Contracts

## WORKFORCE DEVELOPMENT

- Undergraduate Research Experiences
- Graduate Fellowships

- Core ~ \$350M, OSD ~ \$150M, Total Budget ~ \$500M
- 65% of core mission funds extramural, 30% intramural, 5% international

# Office of Naval Research (ONR) Funding Opportunities

## TRADITIONAL GRANTS

- Extramural Grants
- Lab Tasks
- Historically Black Colleges and University/Minority Serving Institution Grants
- Young Investigator Grants
- Center of Excellence Grants

## ADD'L FUNDING OPPORTUNITIES

- Multidisciplinary University Research Grants
- Instrumentation Grants
- Small Business Tech Transfer Grants/Contracts

## WORKFORCE DEVELOPMENT

- Undergraduate Research Experiences
- Graduate Fellowships

- Core ~ \$350M, OSD ~ \$150M, Total Budget ~ \$500M
- 65% of core mission funds extramural, 30% intramural, 5% international

# DoD SBIR/STTR Program

## TRADITIONAL CONTRACTS/GRANTS

- The **Small Business Innovation Research** (SBIR) program is a United States Government program, coordinated by the Small Business Administration, and currently authorized through September 30, 2017, in which all federal agencies with extramural research budgets in excess of \$100 million have a percentage reserved for contracts or grants to small businesses.
  - Congress established the **Small Business Technology Transfer** (STTR) Program in 1992. It is similar in structure to SBIR and funds cooperative research and development projects with small businesses in partnership with not-for-profit research institutions (such as universities) to move research to the marketplace.
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- <https://www.acq.osd.mil/osbp/sbir/index.shtml>



# Questions?