



Integrity ★ Service ★ Excellence

Opportunities for Partnership with the AFOSR

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AFOSR Mission



Discover, shape, and champion basic science that profoundly impacts the future Air Force

- **Manage the Basic Research Investment for the Air Force**
 - Basic Research is the foundation of all scientific discovery
 - Leads to revolutionary new concepts & technology
- **Find and fund the most dynamic & promising world-class researchers in academia, industry, & government**
 - 277 intramural research projects & 1066 research grants at about 200 U.S. universities
 - Supporting over 1700 Principal Investigators, 3000 graduate students, and 500 post-docs
- **Ensure timely transitions of research results**
 - Offer significant benefits to national warfighting and peacekeeping capabilities, and society at large



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First, some funding perspective...



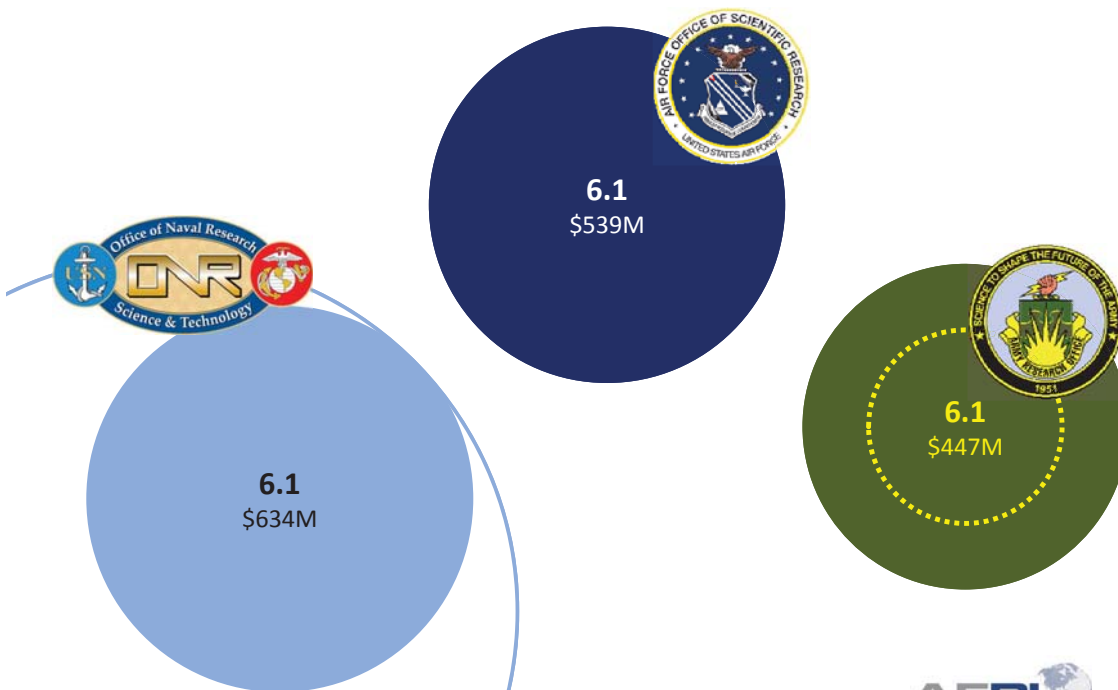
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DOD basic research (6.1) at a glance



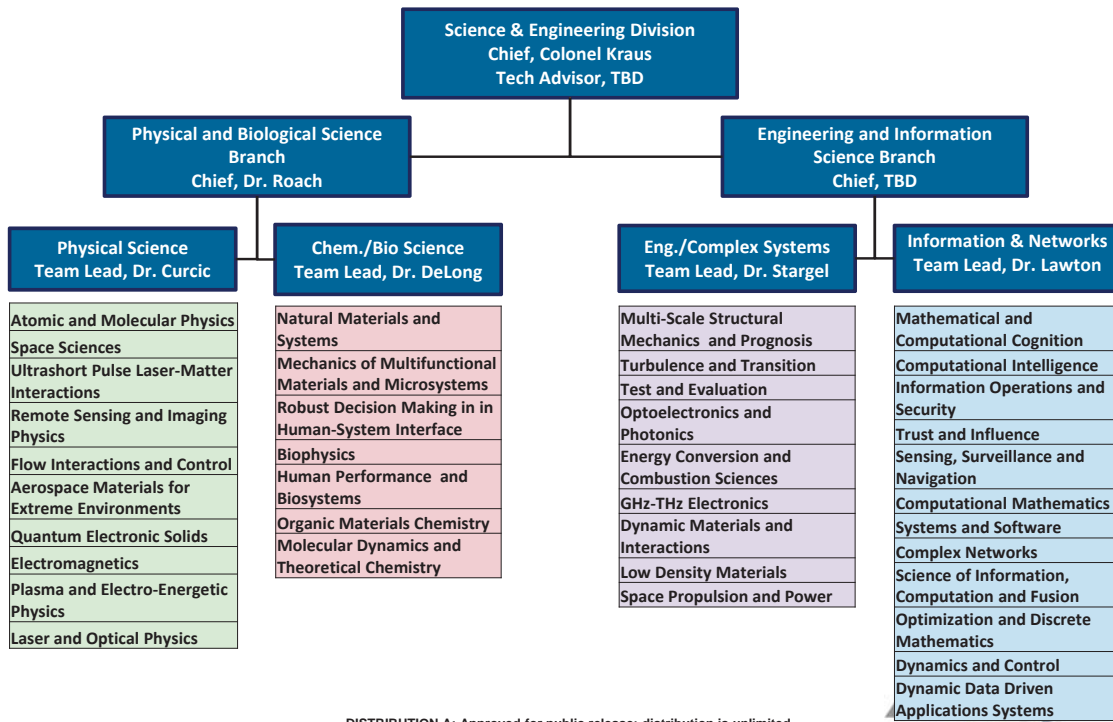
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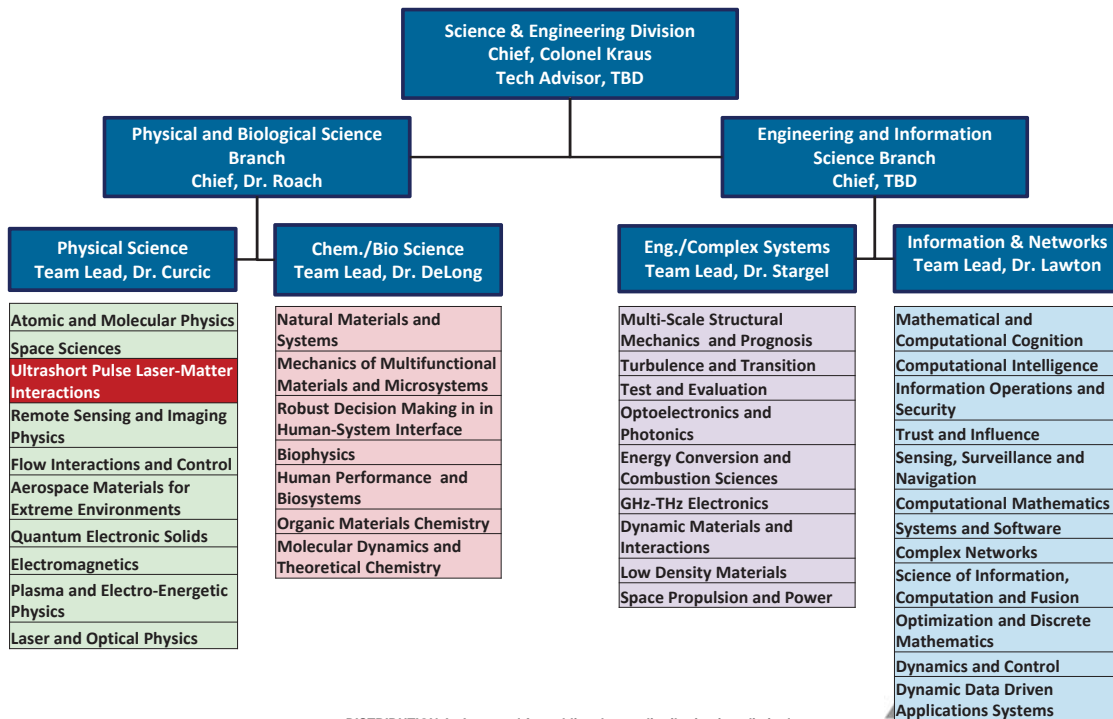
Basic Research Tech Divisions



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Basic Research Tech Divisions



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International Outreach



Arlington **London** **Tokyo**

Santiago

- Accelerating S&T transitions and achievements to the U.S.
- Avoiding technological surprise
- Strengthening partnerships
- Building international goodwill

Awareness of, and access to, international basic research

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APAN collaboration website



OUR MISSION

The All Partners Access Network (APAN) provides for effective information exchange and collaboration between the United States Department of Defense (DOD) and any external country, organization, agency or individual that does not have ready access to traditional DOD systems and networks.

<https://community.apan.org/afosr>

AFOSR
The Air Force Office of Scientific Research (AFOSR) provides grants to university scientists, contracts to industry and funding for DOD laboratories. AFOSR also sponsors workshops and conferences where we bring together leading scientists and engineers.

PRESENTATIONS DIRECTORY
Download presentations from past meetings and reviews of our presentations directors.

Research Areas

- Adaptive Computational Remote Sensing Physics & Methods
- Aerospace Materials for Extreme Environments
- Aerothermodynamics & Turbulence Program
- Atomic and Molecular Physics
- Complex Networks
- Computational and Machine Intelligence
- Computational Mathematics
- Dynamic Data Driven Applications Systems (DDADS)
- Dynamics and Control
- Electromagnetics
- Form, Function & Construction

Welcome
We're excited to see APANs to effectively communicate and collaborate with researchers around the world.

Get Started!
In order to use all of the features APAN provides, you'll need to take two quick steps.

Features
Below we have highlighted some useful features you can use to communicate with us.

1. Share first with specific program managers.
2. Stop us in our tracks with specific program areas by visiting pages and subscribing for updates.
3. Find upcoming events, register for them, find agendas and download presentations.

A VIDEO ABOUT AFOSR

Research Areas	Program Managers
Molecular Dynamics and Theoretical Chemistry	Dr. Michael Berman
Space Power and Propulsion	Dr. Mitat Birkan
Complex Networks	Dr. Robert Bonneau
Foundations of Information Systems	Dr. Robert Bonneau
Systems and Software	Dr. Robert Bonneau
Human Performance and Biosystems	Dr. Patrick Bradshaw
Atomic and Molecular Physics	Dr. Tatjana Curic

December 2012				
Event	Dates	Location	Contact	
Natural Materials, Systems and Extreme/High Temperature Program Review	Dec. 3-7, 2012	TBD	Dr. Hugh DeLong hugh.delong@afosr.af.mil	W Long Fahroo Jiller n Harrison
Distributed Intelligence & Information Fusion Program Review	Dec. 4-6, 2012	Arlington, VA	Dr. Tristan Nguyen tristan.nguyen@afosr.af.mil	Hearm L. Harstotz Hwang
4th Asia Pacific Workshop on Structural Health Monitoring	Dec. 5-7, 2012	Melbourne, Australia	Dr. Kenneth Castler kenneth.castler@af.mil	Li
International Conference on Hypersonic Aerothermodynamics	Dec. 9-13, 2012	Bangalore, India	Li-Wei Tammy Low tammy.low@af.mil	J Li ngesland
Third International Symposium on Terrorist Nanoscience (TerNano III)	Dec. 10-12, 2012	Hawaii, USA	Dr. Beng Hong beng.hong@af.mil	i Lyons Ber
Computational and Machine Intelligence				Dr. Jay Maung





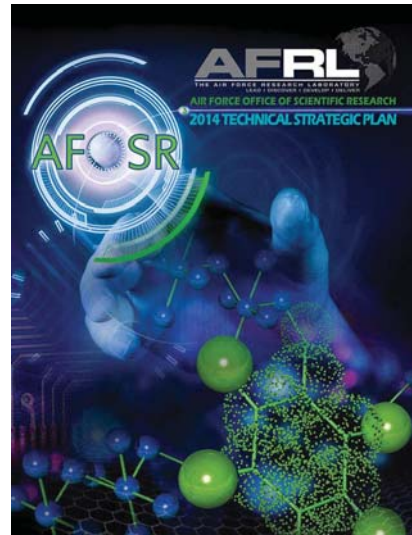
AFOSR APAN downloads



AFOSR 60TH MONOGRAPH



TECHNICAL STRATEGIC PLAN







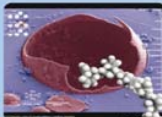




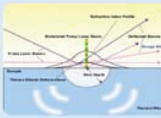





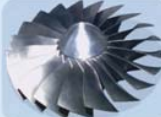

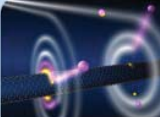
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60 Years of AFOSR Breakthroughs



1950s	1960s	1970s	1980s	1990s	2000+
 Maser/Laser	 The Computer Mouse	 Chemical Oxygen Iodine Laser (Coil)	 Low-Temperature Gallium Arsenide	 Self-healing Plastics	 Joint Precision Airdrop System
 Stealth	 Code Division Multiple Access System for GPS	 Superplastics Forming	 Laser Diagnostics	 Dip-pen Nanolithography	 Graphene Material
 Kalman Filter	 Viterbi Decoding Algorithm	 Air Fracture Mechanics Methodology	 High-Efficiency Compressor Blades	 Laser Trapping	 Ultracold Atoms



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AFOSR-funded Nobel Timeline

A Strong Legacy of Nobel Prize Winning Research

The Air Force Office of Scientific Research has created a strong legacy of Nobel Prize winning research. Since its establishment in 1951, AFOSR has sponsored 72 researchers who went on to become Nobel laureates. On average, these laureates received AFOSR funding 17 years prior to winning their Nobel awards. The accomplishments of these laureates demonstrate the astute ability of AFOSR Program Managers to choose world-class researchers to address Air Force requirements and advance Air Force programs. AFOSR has funded 36 laureates in Physics, 24 in Chemistry, eight in Physiology or Medicine, and three in Economics.¹⁰

1950's

1955 PHYSICS
Patrick Blackett, Maria Goeppert-Aymon
"Fundamental work in the field of quantum electronics, which has led to the construction of oscillators and profilers based on the maser-laser principle"

1956 PHYSICS
John Bardeen
"Co-invention of the transistor"

1960 CHEMISTRY
Willard Libby
"Method for using carbon-14 for age determination in archeology, geology, and other branches of science"

1961 PHYSICS
Robert Hofstadter
"Investigating structure of electron scattering in atomic nuclei and for his thereby achieved discoveries concerning the structure of the nucleus"

1963 PHYSICS
Eugene Wigner
"Contributions to the theory of the atomic nucleus and the elementary particles, particularly through the discovery and application of fundamental symmetry principles"

1964 PHYSICS
Charles Townes
"Fundamental work in the field of quantum electronics, which has led to the construction of oscillators and profilers based on the maser-laser principle"

1966 CHEMISTRY
Robert Mulliken
"Fundamental work concerning chemical bonds and the electronic structure of molecules by the molecular orbital method"

1967 MEDICINE
Ragnar Granit
"Fundamental researches concerning the physiology and chemical visual processes in the eye"

1967 PHYSICS
Hans Bethe
"Contributions to the theory of nuclear reactions, especially his discoveries concerning the energy production in stars"

1967 CHEMISTRY
George Porter
"Discoveries concerning extremely fast chemical reactions, effected by disturbing the equilibrium by means of very short pulses of energy"

1968 PHYSICS
Lars Onsager
"For the discovery of the reciprocal relations bearing his name, which are fundamental for the thermodynamics of irreversible processes"

1969 PHYSICS
Murray Gell-Mann
"Contributions and discoveries concerning the classification of elementary particles and their interactions"

1970 MEDICINE
Ulf von Euler
"Discoveries concerning the humoral transmitters in the nerve terminals and the mechanisms for their storage, release and inactivation"

1972 PHYSICS
Leon Cooper, John Schrieffer
"Theory of superconductivity, usually called the BCS theory"

1973 PHYSIOLOGY/MEDICINE
Nikolaas Tinbergen
"Discoveries concerning organization and elicitation of individual and social behavior patterns"

1973 PHYSICS
Isaac Asimov
"Theoretical predictions of the properties of a superconductor through a tunnel barrier, in particular those phenomena that are generally known as the Josephson effects"

1974 CHEMISTRY
Paul Flory
"Fundamental achievements in the physical chemistry of macromolecules"

1976 CHEMISTRY
William Lipscomb
"Studies on the structure of boranes illuminating problems of chemical bonding"

1977 PHYSICS
Philip Anderson, John Van Vleck
"Fundamental theoretical investigations of the electronic structure of magnetic and disordered systems"

1977 CHEMISTRY
Ilya Prigogine
"Contributions to non-equilibrium thermodynamics, particularly the theory of dissipative structures"

1978 ECONOMICS
Herbert A. Simon
"For his pioneering research into the decision-making process within economic organizations"

1979 PHYSICS
Sheldon Glashow, Steven Weinberg, Abdus Salam
"Contributions to the theory of the unified weak and electromagnetic interaction between elementary particles, including also the prediction of the weak neutral current"

1980 CHEMISTRY
Walter Kaelin
"Contributions concerning the determination of the structure of low-molecular weight organic acids"

1981 PHYSICS
Nicolas Bloembergen, Arthur Schawlow, Kai Siegfried
"Contributions to the development of laser spectroscopy"

1981 CHEMISTRY
Rigoberto Fukui, Ronald Hoffman
"Theories concerning the course of chemical reactions"

1981 MEDICINE
David Hubel, Torsten Wiesel
"Discoveries concerning information processing in the visual system"

1983 PHYSICS
Subramanyam ChandraSekhar, William Fowler
"Theoretical studies of the physical processes important to the structure and evolution of the stars, and theoretical and experimental studies of the nuclear reactions of importance in the formation of the chemical elements in the universe"

1986 CHEMISTRY
Walt Lee, Dudley Rye
"Discovery of a new form of quantum fluid, fractionally charged excitations"

1987 CHEMISTRY
Donald Cram
"Development and use of molecules with structure-specific interactions of high selectivity"

1988 PHYSICS
Melvin Schwartz
"Autotuning beam method and the demonstration of the double structure of the neutron through the discovery of the muon neutrino"

1990 CHEMISTRY
Elias Corey
"Development of the theory and methodology of organic synthesis"

1990 PHYSICS
Ripin-Hongyng Agazzi
"Pioneering investigations concerning deep inelastic scattering of electrons on protons and bound neutrons"

1992 CHEMISTRY
Rudolph Marcus
"Contributions to the theory of electron transfer reactions in chemical systems"

1995 CHEMISTRY
Mario Molina
"Work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone"

1996 CHEMISTRY
Richard E. Smalley
"Shared award for the discovery of fullerenes"

1997 PHYSICS
Steven Chu
"Development of methods to cool and trap atoms with laser light"

1998 PHYSICS
Dennis Gai
"Discovery of a new form of quantum fluid, fractionally charged excitations"

1999 CHEMISTRY
Ahmed Zewail
"Studies of the transition of chemical reactions using femtosecond spectroscopy"

2000 CHEMISTRY
Eric J. Maniaci, Paul MacQuarrie
"Discovery and development of conductive polymers"

2000 PHYSICS
Herbert Kroemer
"Developing semiconductor heterostructures, used in high-speed and optoelectronics"

2000 MEDICINE
Eric S. Knudsen, Paul Greengard
"Signal transduction in the nervous system"

2000 PHYSICS
Nick Kikell
"Invention of the integrated circuit"

2001 PHYSICS
Wolfgang Ketterle
"Work for the achievement of Bose-Einstein condensation in dilute gases of alkali atoms, and for early fundamental studies of the properties of the condensates"

2002 ECONOMICS
Daniel Kahneman
"Integrated insights from psychological research into economic science, especially concerning human judgment and decision making under uncertainty"

2002 CHEMISTRY
John Fera
"For the development of methods for identification and structural analysis of biological macromolecules" and "for the development of soft description ionization methods for mass spectrometric analyses of biological macromolecules"

2003 PHYSIOLOGY/MEDICINE
Paul C. Lauterbur
"For discoveries concerning magnetic resonance imaging"

2006 PHYSICS
John Hall, Ron G. Clauser, Theodor W. Hansch
"Contribution to the quantum theory of optical coherence and jointly for development of laser precision spectroscopy"

2007 CHEMISTRY
Robert Grubbs
"Development of the metathesis method in organic synthesis"

2008 ECONOMICS
Thomas Schelling
"For having enhanced our understanding of conflict and cooperation through game theory analysis"

2008 PHYSICS
George Smoot
"Discovery of the blackbody form and anisotropy of the cosmic microwave background radiation"

2008 PHYSICS
Riccardo Fieschi
"Discovery of the mechanism of spontaneous broken symmetry in subatomic physics"

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Writing the History of Science (1964)



THE USE OF CITATION DATA
IN WRITING THE HISTORY OF SCIENCE

December 31, 1964

Eugene Garfield, Ph.D., Director
Irving H. Sher, Sc.D., Director of Research
Richard J. Topie, Research Associate

Research sponsored by the Information Research Division, SRI, Air Force Office of Scientific Research, under Contract AF 49(639)-1256

