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http://www.aro.army.mil

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ARL provides underpinning Science, Technology, and Analysis to the Army

ARO is ARL's principal conduit to engage the university research community
Director

Operations Directorate
- Support Management
- Information Management
- Acquisition Center

Physical Sciences
- Physics
- Chemistry
- Life Sciences

Engineering Sciences
- Mechanical Sciences
- Materials Science
- Electronics
- Environmental Sciences

Informational Sciences
- Mathematical Sciences
- Computational Sciences
- Network Sciences
- Outreach Programs

~ 100 employees at RTP
45 PhD Program Managers

Army Research Office Organization
Army Research Office Mission

Utilize the vast intellectual capital of our nation’s universities to:

- Exploit Scientific Opportunities for Revolutionary New Army Capabilities
- Drive Science to Develop Solutions to Existing Army Technology Needs
- Accelerate Transition of Basic Research
- Strengthen University, Industry, Government Partnerships
- Educate and Train the Future S&E Workforce for the Army

Research ranges from atom optics for underground bunker/tunnel detection to nano-energetics for more powerful and insensitive munitions and propellants.

Research Area:
- Chemistry
- Computing & Info Science
- Electronics
- Environmental Life Sciences
- Materials
- Mathematics
- Mechanics
- Network Science
- Physics

- 256 Institutes of Higher Learning
- 861 individual Investigators
- 47 Research Centers

Research Funding by State:
- >$15M
- >$8M<$15M
- >$2M<$8M
- <$2M
“None of the most important weapons transforming warfare in the 20th century - the airplane, tank, radar, jet engine, helicopter, electronic computer, not even the atomic bomb - owed its initial development to a Doctrinal Requirement or request of the military.”


DoD extramural basic research is the critical source of revolutionary science/engineering:

- Identify/formulate/create
- Nurture/fund/guide
- Disseminate/transition
Generates the New Knowledge Required to Maintain Technological Superiority

- Discovers and creates new science that produces revolutionary new capabilities
- Applies innovative scientific advances to improvements in critical existing capabilities

ARO Spans the Basic Research Continuum

- Matter Wave Lasers for jam-proof GPS precision navigation and detection of bunkers and tunnels regardless of depth
- Nano-Energetics for more powerful and less vulnerable munitions and explosives

ROI

Revolutionary New Capabilities

Improvements in Existing Capabilities

Investment ($, Time)
ARL Basic Research Portfolio
(Mission Funding)

Scientific Maturity

- **Collaborative Technology Alliances**
  - $46M

- **University Centers of Excellence (UARCs)**
  - $30M

- **University Research Initiative**
  - $75M

- **Single Investigator Program**
  - $76M

- **University Centers of Excellence**
  - $17M

Complementary programs cohesively managed
- Rapid and agile exploitation of novel science opportunities world-wide
- Extremely cost-effective (indirect costs less than 35%, grad student rates low, prof time)
- All states and international
- >250 institutions
- 3 year grants; no automatic renewal
- Graduate students supported: ~1400
- ~ 1120 university grants, $120K/yr grant
Development of Ideas

White Papers

Receive Proposals

Science Peer Review

Army Lab/RDEC Review

Analysis of Evaluations

PM Recommendation

Management Assessment

Active Involvement in Execution

Program manager interactions with potential PIs

Evaluate fit to program goals and quality of proposal

Evaluate technical merit, Army relevance, and desired participation: SL/SC

Scores/comments of Army and external reviewers are assessed

Funding decision based on balancing needs and opportunities, program portfolio, Army objectives

Approximately one in three proposals is funded

NSF-like peer-review by university S&Es - evaluates scientific merit

Evaluate fit to program goals and quality of proposal

Funding decision based on balancing needs and opportunities, program portfolio, Army objectives
Includes -
MURI, DURIP, PECASE

Multi-Disciplinary University Research Initiative (MURI)

- Research vital to the Army, but applicable to multiple Services
- Investigates high priority, transformational topics such as biologically inspired mobile networks of autonomous vehicles, self-assembling multifunctional ceramic composites
- Critical mass of researchers; $1.25M/year, 5-years
- Approximately 9 new initiatives started annually
- RDEC/ERDC/MRMC input key in the determination of topics

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Experimental Study of Polymeric Membranes in Fuel Cells
Funding

- Travel Restrictions
- Continuing Resolution
- Sequestration
- Debt Ceiling