

Applied Research Laboratory (ARL) at UH

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Background Information

12 UARCs Managed by the Office of the Secretary of Defense

5 Navy UARCs

5 Army UARCs

1 Missile Defense Agency

1 National Security Agency



Navy UARCs

- Applied Physics Laboratory, at Johns Hopkins University
- Applied Research Laboratory, at Penn State University
- Applied Research Laboratories, at University of Texas at Austin
- Applied Physics Laboratory, at University of Washington
- Applied Research Laboratory, at University of Hawaii



Army UARCs

- Georgia Tech Research Institute, at Georgia Institute of Technology
- Institute for Advanced Technology, at University of Texas at Austin
- Institute for Creative Technologies, at University of Southern California
- Institute for Collaborative Biotechnologies, at University of California Santa Barbara
- Institute for Soldier Nanotechnologies, at Massachusetts Institute of Technology



The rest of the UARCs

- Center of Advanced Study Language, at University of Maryland, sponsored by the National Security Agency
- Space Dynamics Laboratory, at Utah State University, sponsored by the Missile Defense Agency



UARC Strategic Relationships

- Responsiveness to evolving sponsor's requirements.
- Comprehensive knowledge of sponsor's needs and problems
- Broad access to information, including proprietary data
- Broad Navy/DOD corporate knowledge and technical memory.
- Objectivity and independence from commercial interests.
- Quick response capability.
- Current operational experience.
- Freedom from real and perceived conflicts of interest.



UARC Strategic Roles

- Perform research, exploratory development, advanced development, test and evaluation.
- Provide independent technical evaluation and advice during the acquisition process.
- Serve as systems architects, consultants, and/or technical direction agents during the formative stages of systems developments.
- Critique proposed system specifications.
- Plan and oversee the integration of new systems.
- Develop selected systems and subsystems, including prototype or demonstration hardware/software and models.



UARC Strategic Roles (cont.)

- Conduct independent quantitative evaluations of operational systems in special cases.
- Provide technical leadership in identifying and resolving operational problems.
- Provide engineering interpretations of intelligence information in support of system design or evaluation.
- Organize collaborative activities and promote other linkages between Navy/DOD, academia, and industry.
- Assist in the transfer of technology to industry.
- Foster education in engineering and scientific disciplines that are especially relevant to Navy/DOD needs.



Funding Comparisons (FY 09)

Navy UARC	Established	Level of Funding
Johns Hopkins APL	1942	~ \$1 billion
ARL Penn State	1945	~ \$165 million
ARL Univ. of Texas	1945	~ \$71 million
APL Univ. of Washington	1943	~ \$61 million
Univ. of Hawaii ARL	2008	~ \$4 million

Source: *Status and Future of the Naval R&D Establishment*. Page 162. U.S. Naval National Research Advisory Committee (September 2010).

Note: Establishment dates added for informational purposes and were not included the source document.



ARL at UH *Core Competencies*

Basic and applied research in the areas of ocean environmental effects and the interaction of natural and man made underwater noise sources on marine life, mammals and Naval experiments.

Astronomical research utilizing existing unique facilities and development of world-class state-of-the-art optics and sensors for defense applications. This research has been applied to advanced satellite tracking systems and development of adaptive optics.



ARL at UH *Core Competencies*

Advanced electro optical systems, detectors, arrays and instrumentation. This competency had been applied to virtually all the astronomical research as well as other electro-optic devices including LIDAR, laser, and remote sensing technologies.

Fundamental research and applied engineering supporting improvements in the utilization of various regions of the electromagnetic spectrum, advancements in communications, networks and protocols, C4I systems hardware and signal processing.



ARL at UH *Core Competencies*

Develop and sustain systems, applications, methodologies, tools, academic disciplines, and collaborative relationships for maintaining program, asset, and information integrity and for identifying, characterizing, and mitigating/defeating cyber attacks on platforms, systems, components, and critical technologies and data associated with efforts executed under the UARC's mission areas and supporting core competencies.

Mission-Related and Public Services Oriented R&D required to provide a quick response to rapidly evolving DoD and other government agency requirements through the application of the DoD-approved core competencies and the complementary capabilities of other divisions of the University of Hawaii System.



ARL at UH *Core Competencies*

Basic and applied research and engineering, systems engineering, modeling and simulation, and test and evaluation of technologies and techniques for the efficient and cost-effective development, use, and integration of renewable energy sources to address National Security needs and issues.



ARL at UH *Contract Vehicle*

IDIQ: Indefinite Delivery Indefinite Quantity Contract;
Period of Performance: Five Years (2008-2013; no-cost extension to 2018)

Management: Naval Sea Systems, UARC Office

Ceiling of the Contract: \$50M (2008-2018); remaining ceiling ~\$25 million

Administration: Office of the VPRI



Historical funding received to date

Task orders: \$23.8 million

State contracts: \$2.13 million

Federal intergovernmental personnel agreements: \$540,000





History

In 2008, the University of Hawai'i Applied Research Laboratory (ARL at UH) became the fifth US Navy University Affiliated Research Center (UARC) joining the Johns Hopkins Applied Physics Laboratory (1942), University of Washington Applied Physics Laboratory (1943), Pennsylvania State University Applied Research Laboratory (1945), and the University of Texas at Austin Applied Research Laboratory (1945). Together, the five Navy UARCs serve as centers for excellence for critical Navy and national defense science, technology and engineering needs in their respective core competencies.

Core Competencies

The ARL at UH core competencies are as follows:

- Basic and applied research in the areas of ocean environmental effects and the interaction of natural and man-made underwater noises on marine life, mammals and Naval experiments;
- Astronomical research and development of world class state-of-the-art optics and sensors for defense applications;
- Advanced electro-optical systems, detectors, arrays, and instrumentation;
- Fundamental research and applied engineering in communications, networks and protocols, and C4I hardware and signal processing;
- Systems, applications, methodologies, tools, and academic disciplines for maintaining program, asset, and information integrity and for identifying, characterizing, and mitigating/defeating cyberattacks;
- Mission-related and public services oriented research and development required to provide a quick response to rapidly evolving Department of Defense and other government agency requirements
- Basic and applied research and engineering, systems engineering, modeling and simulation, and test and evaluation of technologies and techniques for the efficient and cost-effective development, use, and integration of renewable energy sources to address National Security needs and issues

Organization and Facilities

The ARL at UH is a unit that reports to the Vice President for Research and Innovation and is managed by an Executive Director. The Executive Director is assisted in long-range planning by an Advisory Board. Each of the core competencies is headed by a Director, who will oversee the research management of the respective area. Finally, a Director of Business and Administration oversees the unit's finances and operations. All positions are soft money supported.

The ARL at UH has no dedicated building or research facilities. It leases a small administrative space at the Mānoa Innovation Center (MIC) that houses the core administrative personnel. The administrative space lease is paid through the prorated direct cost (PDC) rate charged across every task order. The ARL at UH leverages the research facilities of the Mānoa campus for conducting unclassified research. Currently, the

majority of task orders are unclassified. If classified work is performed under this contract, arrangements are made to use any of the Department of Defense facilities in the State or the mainland that is equipped to do so, rather than establish another facility.

Finances and Operations

The start-up investment in the ARL at UH was \$1.5 million in research and training revolving funds (RTRF): \$1 million from the Office of the Vice President for Research and Innovation and \$500,000 from the Office of the UH Mānoa Vice Chancellor for Research. This initial investment is in line with similar investments that the University has made in the past towards the financing and establishment of research initiatives, programs and centers that benefit the research productivity and infrastructure at UH. The ARL is currently financially self-supported by conducting research in the core competency areas, which is consistent with the business model of the other four Navy UARCs.

Faculty and staff participating in the ARL at UH engage in research in manner that is analogous to other federally funded grants and contracts and are subject to the same compliance requirements. Under the ARL at UH, both graduate and undergraduate students are allowed to work on unclassified research task orders.

Contract Vehicle

Contract Type: Indefinite Delivery Indefinite Quantity (IDIQ) contract

Period of Performance: Five years (2008-2013; no cost extension to 2018)

Management: Naval Sea Systems (NAVSEA), UARC Office

Contract Ceiling: Approximately \$50 million (2008-2018); remaining ceiling – approximately \$25 million

The IDIQ contract represents a sole-source mechanism that faculty can use to fund their research within the identified core competencies. Although the work is primarily for Navy task sponsors, the ARL at UH may also conduct research for the Department of Defense and other government agencies under the NAVSEA umbrella, for programs conducted jointly with the Navy or have Navy relevance.

Faculty do not have to write specific proposals for funding. Instead, they respond to requests from the Navy or any other Department of Defense sponsor, which are called task orders. Faculty have the choice to respond to any/all task orders at their discretion. In addition, UARC designation does not preclude faculty participation from existing funding mechanisms.

Funding Received to Date

- Task orders: \$23.8 million; State contracts: \$2.13 million; Federal intergovernmental personnel agreements: \$540K

Immediate Goals

- Utilize remaining ceiling and ideally, request increase in ceiling before 2018 due to task volume
- Receive high performance and satisfaction ratings from task sponsors for contract review cycle
- Successfully negotiate new contract with \$100 million ceiling