

**The Office of Naval Research
University/Laboratory Initiative**

March 2004

To attract more academically trained professionals into weapon-related research and thereby increase the “knowledge base” for undersea weapon technology, the Office of Naval Research (ONR) has created the University/Laboratory Initiative (ULI) Program to sponsor graduate-level research performed in collaboration with experienced personnel at Navy laboratories. The program funds a student and academic advisor at a university and, under a separate contract, a “mentor” at a Navy Laboratory. Students must be United States citizens and open to employment at a Navy Laboratory upon graduation. Students are also expected to spend some portion of each year at the collaborating laboratory. Current funding limits are \$64K/year for each university project and \$50K/year for each Navy Laboratory project.

The Office of Naval Research University/Laboratory Initiative

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Background

In 2000, the Naval Studies Board Committee for Undersea Weapons Science and Technology of the National Research Council issued the report *An Assessment of Undersea Weapons Science and Technology*.¹ The report summarized the Committee’s findings after assessing the state of the Navy’s undersea weapons program and evaluating the Navy-sponsored and non-Navy-sponsored research related to the development of future undersea weapons.²

Aside from identifying the decade-long trend of decreasing defense spending by the United States for undersea weapons development and acquisition, the Committee also found that that the pool of technical experts in undersea weapons technology is diminishing:

“The knowledge-base pipeline is thin in academia, government, and industry because of the low levels of funding available to support research. Undersea weapon [science and technology] is not viewed as an attractive career path...”

To attract more academically trained professionals into weapon-related research and thereby increase the “knowledge base” for undersea weapon technology, the Office of Naval Research (ONR) has created the University/Laboratory Initiative (ULI) Program to sponsor graduate-level research performed in collaboration with experienced personnel at Navy laboratories. Here, the term “Navy laboratories” includes not only federal institutions such as the Naval Underwater Warfare Center in Newport, RI, but also university laboratories that have a long-standing history of performing Navy-sponsored research such as the Applied Physics Laboratory of Johns Hopkins University in Laurel, MD. (See Appendix A.)

Program Structure and Activities

The ULI Program is part of the ONR Undersea Weaponry Thrust, a collection of weapon technology programs administered by the ONR Mechanics and Energy Conversion Science and Technology Division (Code 333). These programs fund basic and applied research in the following Undersea Weaponry Core Technology Areas:

¹ Available from the Naval Studies Board, National Research Council, 2101 Constitution Avenue, N.W., Washington, DC 20418

² For the purpose of this program, “undersea weapons” includes not only conventional torpedoes, but other systems such as submarine-launched mines and unmanned underwater vehicles (UUVs).

- Guidance and Control
 - Sensors
 - Signal Processing
 - Planning and Control Algorithms

- Energy Conversion
 - Batteries
 - Fuel Cells
 - Motors

- Hydrodynamics
 - Control Surfaces
 - Propulsors
 - Drag and Noise Reduction

- Warheads
 - Explosives
 - Detonators
 - Fuzes

ULI Program goals, requirements, funding limits and meeting schedule are determined by a single ONR program officer who serves as the ULI Point of Contact. Projects funded under the program may be directly monitored by any one of the program officers administering programs in undersea weapons technology or a related area.

External oversight of the program is provided by the ULI Advisory Board comprised of five distinguished persons with a background in engineering or applied science, experience with undersea weapons technology or related systems, and an understanding of the academic environment. The Board's mission is to review program content, structure and policy and make recommendation it believes will enhance the collective technical effort and the overall goal of recruiting the students to the employ of the Navy laboratories. (See Appendix B.)

ULI Program meetings attended by the Advisory Board are organized by The University of Maryland. The university also assists ONR in program development, maintaining e-mail lists, tracking student progress, conducting surveys, and preparing and issuing meeting reports. Typically, two meetings are held each year: an annual program review in late spring attended by the Advisory Board, students, faculty members and collaborating laboratory personnel participating in the program, and, if necessary, a workshop in late fall with more limited participation.

Requirements

Navy laboratories engaged in undersea weapons research and development and universities are encouraged to seek out graduate students interested in pursuing thesis or post-doctoral research in one or more of the Undersea Weaponry Core Technology Areas listed above. Preference will be shown towards students pursuing a doctorate.

For each ULI project, three individuals are involved: a student, the student's academic advisor and a "mentor" at a Navy laboratory.

Students must be United States citizens.

Laboratory personnel participating in this program (laboratory mentors) are to interact with the student and play an active role in the development of a student's research proposal and its execution. It is expected that a student will spend some portion of each calendar year working at the collaborating laboratory via a summer internship or similar arrangement. This may require a student to obtain a security clearance.

These requirements are subject to change according to recommendations of the ULI Program Advisory Board and the judgment of the ONR program officer administering the program.

Funding

Universities participating in the ULI Program may receive up to \$64K per project per year through a grant, and collaborating Navy laboratories may receive concomitant funding of up to \$50K per project per year. Funds will be provided in annual increments. These increment amounts, as well as per-project limits, are subject to change according to year-to-year changes in funds made available to support the program. The duration of funding will depend upon the nature of the research and the degree pursued by student. Projects related to a student pursuing a doctorate are anticipated to be funded for three years, and for a master's degree, two years. For additional details, see "Grant Terms and Conditions" at <http://www.onr.navy.mil/02/default.htm>.

The funds directed to a university are to pay the full-time stipend of one graduate student, some fraction of the salary of the student's academic advisor, as well as the cost of travel, publication and equipment. The funding directed to the associated Navy laboratory is for part-time support of the student's laboratory mentor and possibly some or all of the student's salary while working at the laboratory.

It will generally be convenient and expeditious for a student to work at the laboratory as a contractor, thus eliminating the need for the laboratory to hire the student directly (often a lengthy process). If this arrangement is used, students are encouraged to apply to the ONR Naval Research Enterprise Intern Program (NREIP) to receive a stipend. Currently, NREIP offers graduate students a \$6,500 stipend for a ten-week term. Funds for ULI students participating in NREIP will be provided apart from the funds sent to the laboratory and university. Additional information on the NREIP can be found at http://www.onr.navy.mil/sci_tech/industrial/nreip.htm.

How to Submit a Proposal

Prior to submitting any paperwork, the ONR point of contact (listed below) should be contacted to determine if a proposed research project is appropriate and funding is available. Depending on which Core Technology Area the project falls under, the inquiry may be directed to one or more ONR program officers administering programs within the Undersea Weaponry Thrust. A single white paper may be submitted to the assigned program officer by either the university or laboratory before proposals containing extensive technical and cost statements are submitted.

To formally pursue funding, the laboratory and university must submit separate proposals to the assigned ONR program officer. Although the technical content of these proposals can be similar, each must state the tasks and funding requirements unique to each institution. If accepted, the assigned program officer will directly monitor and evaluate the technical progress of the research projects.

The student must provide a vita and proof of United States citizenship. A copy of a state birth certificate or passport will suffice.

Students must be open to employment at the collaborating laboratory, or any laboratory that performs undersea-weapons research, upon completion of their degrees. A statement to this effect must be provided with each student's vita and proof of citizenship.

Guidance for submitting a proposal to ONR may be found on the ONR web site at <http://www.onr.navy.mil/02/default.htm>. Additional information may be found in the document *Guidance for Preparing White Papers and Proposals* available at the following web page: http://www.onr.navy.mil/sci_tech/engineering/333_mechanics/usea_uli.asp.

Point of Contact

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Appendix A: ULI Program Charter

The mission of the University/Laboratory Initiative (ULI) Program is to attract academically trained professionals into weapon-related research so as to increase the “knowledge base” for the United States Navy, helping to restore and revitalize the currently diminishing pool of technical experts in undersea weapons technology, as well as revitalize existing, and establish new, connections between Navy laboratories and academic institutions.

The mission will be accomplished by sponsoring graduate students who will perform their degree research in collaboration with experienced personnel at Navy laboratories or university laboratories that have a long-standing history of performing Navy-sponsored research. Students must seek degrees at either the masters, doctoral or post-doctoral level, and must be United State Citizens to be eligible for employment at defense research and development institutions upon graduation. Each student’s thesis research must be in, or related to, at least one of the following Undersea Weaponry Core Technology Areas: Guidance and Control, Energy Conversion, Hydrodynamics, and Warheads.

Appendix B: ULI Advisory Board Charter

The mission of the Advisory Board is to provide broad oversight of the University/Laboratory Initiative (ULI) Program, making recommendations for improving the program. It will do this by attending an annual technical conference of for ULI principle investigators, their students and associated Navy laboratory mentors, reviewing their research, providing awards for best performance and instituting other activities that it believes will enhance the collective technical effort and the overall goal of recruiting the best students to the employ of the Navy laboratories. Additional meetings will be held as deemed necessary.

During each meeting, the Board is to address the following questions:

1. Are the number and distribution of students among academic areas consistent with the Core Undersea Weaponry Core Technology Areas and appropriate to meet the recommendations of the Naval Studies Board of the National Research Council?
2. Are the right institutions participating in the ULI Program?
3. How should the success of the ULI Program be measured?
4. What is the current state of undersea weapons science and technology, and research and development activities and infrastructures, and will the ULI Program have any impact on them if implemented in the best manner possible?

The Board shall consist of four or five distinguished persons who have a background in engineering or applied science, experience in the technology of undersea weapons, or related systems, and an understanding of the academic environment. They should be individuals of vision, dedicated to the advancement of naval technology.