

## ADVANCED ENGINEERING RESEARCH AND DEVELOPMENT

The Advanced Engineering Research and Development (AERD) Thrust Area, also known as the Collaborative Research and Development Initiative, grew out of discussions between Gary L. Smith, Director of APL, and Don P. Giddens, Dean of the Whiting School of Engineering. Dean Giddens successfully used the concept at the Georgia Institute of Technology, and the idea seemed especially appropriate for the Hopkins community. The effort pairs researchers from APL with researchers from the Whiting School, thereby expanding the capabilities of scientists from both divisions of the University and positioning them to solicit external funding in a time of shrinking federal outlays.

The AERD Thrust Area provides research seed grants for faculty and staff at APL and the Whiting School, with each institution supporting its own staff members or graduate students. The seed money is intended to help researchers through the early stages of their work, allowing them to reach the stage at which their work demonstrates sufficient promise to attract external funding based upon the project's utility to potential sponsors. At the start of the program, Don Giddens stated, "The basic concept of the program is to invest in innovative, interdisciplinary research...[emphasizing] areas where we see a good potential for intellectual challenges and new funding opportunities." Gary Smith added, "We at Hopkins have long recognized the unique opportunities we have because of the complementary strengths of our different divisions. This initiative is intended to foster our joint pursuit of these opportunities."

Thrust area teams normally include an APL researcher, a Whiting School faculty member, and a graduate student. The Whiting School funds support graduate students and postdoctoral fellows and provide incidentals such as supplies and computer access. The APL funds support staff members, typically at a 20% level, and provide incidental supplies and computer access. A meaningful commitment of time by a participating faculty member and an APL staff member has proven to be an essential element, just as originally envisioned by Director Smith and Dean Giddens.

When the AERD Thrust Area was initiated, Associate Dean for Research Doug Green of the Whiting School and Aeronautics Department Head Dick Garritson of APL were named to co-chair the oversight committee. They in turn selected committee members from the faculty and staff of the Whiting School and APL to assist in the process. (Two members were chosen from each division: from the Whiting School, A. Prosperetti and R. S. Kosaraju served in 1994 and G. L. Meyer and R. S. Kosaraju were selected for 1995; from APL, J. L.

Abita and J. C. Sommerer were selected for both years.) Working with Vincent L. Pisacane, Assistant Director of APL for Research and Exploratory Development, and Dean Giddens, Drs. Green and Garritson continue in those duties; they completed the second cycle of selection and recommendation in late June and early July 1994.

Implementation focused on maintaining our customary high standards for independent research and development by adherence to the selection criteria established in the call for proposals. The specific criteria for AERD include significant scientific and technical merit, value to the participating divisions and the to U.S. government, potential for external funding, and the capabilities and commitment of the investigators. The implementation capitalizes on the benefit of collaborative effort as we face issues such as reduced growth in federal research funding, with the associated increased competition; the recognition that in a research-intensive university, no division is comprehensive; the growing requirement for interdisciplinary approaches to complex research initiatives; and the increasing need for technology to be shared throughout the national economic infrastructure.

Although the technical merits of the proposed efforts can be assessed in terms of expected value added and the capabilities and commitment of the investigators, the potential for external funding and the ultimate value to the individual divisions of the University and to the government require evaluators to combine insight with a willingness to take a "leap of faith" based upon a best assessment of future requirements and likely federal budgets. The uncertainties of the current federal budget cycle must not be allowed to staunch the flow of creativity, innovation, and quality.

In the first year of this thrust area's existence, fiscal 1994, we received eleven proposals. On the basis of merit and available funding, six were selected for implementation. By now, these initial projects are complete, and researchers should be preparing proposals to obtain funding from external sources for continuation of their work.

For fiscal 1995, the committee received seven new proposals and three requests for 1-year extensions of ongoing efforts. Again the selections were based on merit within the bounds of available funding. The committee selected four new efforts and one renewal effort. Although it is early to declare victory, the indications of the program's success are positive enough that the Whiting School has decided to extend the model this thrust area represents into two other areas through the Young Faculty Research Initiative and the Materials Research Initiative.

The technical projects undertaken reflect the wide-ranging individual capabilities and the many areas of

technical expertise extant within APL and the Whiting School. They include such diverse topics as development of microdevices for medical applications, study of endothermic fuels, control of plankton distribution, and development of design methodology for low-energy digital very large scale integrated circuit systems. The national interest in economic enhancement through technology promises to add impetus to the Hopkins community's long-standing tradition of joining arms to contribute to the national good.

Through the AERD Thrust Area, APL and the Whiting School of Engineering together will tap the potential synergy that our complementary capabilities represent. Such collaboration will continue to be a strength as we face the changing world of research and advanced engineering.

#### THE AUTHOR



G. RICHARD GARRITSON received a B.S. in naval science from the U.S. Naval Academy in 1961 and was awarded a Ph.D. in physics from the University of Notre Dame in 1968. He served as a career naval officer before joining APL in 1988, where he heads the Aeronautics Department. He and Dean Doug Green co-chair the Advanced Engineering Research and Development Thrust Area as a collaboration between APL and the Whiting School of Engineering.