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MATERIALS SCIENCE IN THE MILTON S. EISENHOWER RESEARCH CENTER: AN INTRODUCTION

In the previous issue of the *Johns Hopkins APL Technical Digest* (Volume 7, Number 1), the articles were selected from several topical areas in order to portray the breadth of activities at the Milton S. Eisenhower Research Center. In this issue, we focus on the work in materials science.

The materials science program is directed toward understanding the physics and chemistry of solids and surfaces, with a view to the better use of known materials and to the development of solids with superior physical properties. The program includes (a) the development of advanced materials for structural, electronic, and optical applications; (b) new methods for characterizing properties nondestructively; (c) investigations of the physics and chemistry of surfaces; and (d) work on new material structures and innovative processing methods.

The research is directed toward achieving an integrated program of materials synthesis, physical experiment,

and theory that can contribute to both the understanding and development of solids, a goal that has become realistic with the availability of modern techniques for systematically modifying the physical properties of materials through careful structural and compositional control. The potential significance of producing interesting new organic and inorganic solids has been greatly enhanced by a large family of quantitative analysis methods that allow detailed measurements of the physical properties of materials.

The Research Center's program has successfully created a number of new interesting solids, new innovative methods for improved materials characterization, and an improved understanding of the physics and chemistry of both bulk and surface properties of solids and devices. It includes a wide range of investigations on both the fundamental level and on very practical problems with important results that can be applied to structural materials and electronic devices.