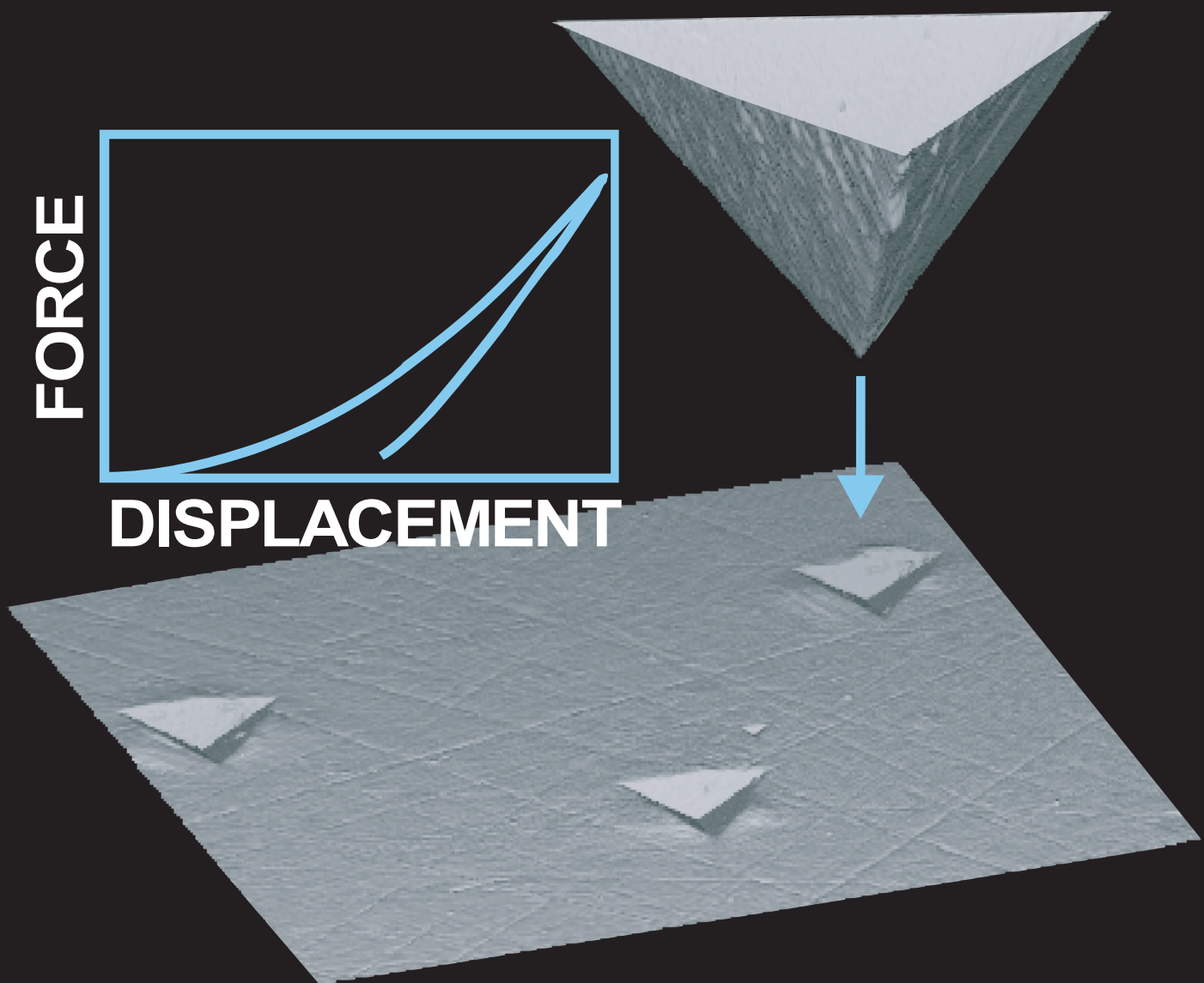


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NIST

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The National Institute of Standards and Technology was established in 1988 by Congress to “assist industry in the development of technology ... needed to improve product quality, to modernize manufacturing processes, to ensure product reliability ... and to facilitate rapid commercialization ... of products based on new scientific discoveries.”

NIST, originally founded as the National Bureau of Standards in 1901, works to strengthen U.S. industry’s competitiveness; advance science and engineering; and improve public health, safety, and the environment. One of the agency’s basic functions is to develop, maintain, and retain custody of the national standards of measurement, and provide the means and methods for comparing standards used in science, engineering, manufacturing, commerce, industry, and education with the standards adopted or recognized by the Federal Government.

As an agency of the U.S. Commerce Department’s Technology Administration, NIST conducts basic and applied research in the physical sciences and engineering, and develops measurement techniques, test methods, standards, and related services. The Institute does generic and precompetitive work on new and advanced technologies. NIST’s research facilities are located at Gaithersburg, MD 20899, and at Boulder, CO 80303. Major technical operating units and their principal activities are listed below. For more information visit the NIST Website at <http://www.nist.gov>, or contact the Publications and Program Inquiries Desk, 301-975-3058.

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- Statistical Engineering

¹At Boulder, CO 80303

²Some elements at Boulder, CO

Note to Readers

Dear Reader,

With this issue, we begin a new feature in the *Journal of Research of the National Institute of Standards and Technology*. The article, "Review of Instrumented Indentation," by Mark VanLandingham is the first in a series of Invited Reviews of key research areas at NIST. These review articles are intended primarily for a general technical audience, not only for practitioners in the subjects written about, but also to highlight the diversity and importance of NIST research for a wide audience. Instrumented indentation, for example, as discussed in Mark VanLandingham's leadoff review article, is an important method for studying the mechanical response of materials over a wide range of hardness. Because displacements measured with this technique are typically in the nanometer range, the results are particularly useful for materials applications in Nanotechnology, a field with great technical and economic potential.

The Board of Editors and the staff of the Journal have worked with the Laboratory Directors and their staffs to develop an initial series of topics that shows the diversity of NIST research activities. We are looking forward to review articles on such topics as radioactive carbon dating, international arrangements for comparing national measurement standards, and NIST research related to the automotive industry. If anyone has suggestions for additional topics for featured reviews, please feel free to contact me (email: tvvtv@nist.gov) or another member of the Board of Editors. We hope to hear from you.

Theodore Vorburger
Chief Editor

Cover: The cover illustration is a collage showing a 3-dimensional atomic force microscopy (AFM) image of a sample surface with permanent deformations (below), an AFM image of the indentation probe tip used in the indentation measurements (above right), and the resulting force-displacement curve recorded from one of the measurements. For more information regarding instrumented indentation, please see the article “Review of Instrumented Indentation” by Mark R. VanLandingham on page 249 of this issue. Cover arranged by C. Carey.

The *Journal of Research of the National Institute of Standards and Technology*, the flagship periodic publication of the national metrology institute of the United States, features advances in metrology and related fields of physical science, engineering, applied mathematics, statistics, biotechnology, and information technology that reflect the scientific and technical programs of the Institute. The *Journal* publishes papers on instrumentation for making accurate measurements, mathematical models of physical phenomena, including computational models, critical data, calibration techniques, well-characterized reference materials, and quality assurance programs that report the results of current NIST work in these areas. Occasionally, a Special Issue of the *Journal* is devoted to papers on a single topic. Also appearing on occasion are review articles and reports on conferences and workshops sponsored in whole or in part by NIST.

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