

The *Johns Hopkins APL Technical Digest* is an unclassified technical journal published quarterly by APL. The objective of the publication is to communicate the work performed at the Laboratory to its sponsors and to the scientific and engineering communities, defense establishment, academia, and industry.

EDITORIAL BOARD

Harry K. Charles Jr., *Chair and Editor-in-Chief*
Ariel M. Greenberg, *Assistant Editor-in-Chief*
James P. Christ, *Member-at-Large*
Miquel D. Antoine
Ra'id S. Awadallah
Benjamin H. Barnum
Joshua B. Broadwater
Jeffrey P. Hamman
David O. Harper
Mary Kae Lockwood
Zaruhi R. Mnatsakanyan
Neil F. Palumbo
Peter P. Pandolfini
William K. Peter
Charles E. (Terry) Schemm
James C. Spall

EX OFFICIO

Karen M. Gosnell
Erin M. Richardson

STAFF

Erin M. Richardson, *Managing Editor*
Kelly K. Livieratos, *Assistant Managing Editor*
Diane J. Dorsey, *Art Director*
Kenneth R. Moscati, *Senior Illustrator*
Editorial Support: Anne E. King and Peggy M. Moore
Illustration Support: Matthew D. Baughman,
Annie M. Marcotte, Shannon E. Nelson, and
Magda M. Saina
Front Cover Art: Kenneth R. Moscati
Inside Back Cover Art: Kenneth R. Moscati
Web Publisher: Erin M. Richardson
Photographers: Bill Rogers and Edward Whitman
Clearance Coordinator: Bonnie Cubbage-Lain
Production Assistant: Michele G. Tranter

The *Johns Hopkins APL Technical Digest* (ISSN 0270-5214) is published quarterly under the auspices of the Johns Hopkins University Applied Physics Laboratory (APL), 11100 Johns Hopkins Road, Laurel, MD 20723-6099. Requests for individual copies, subscriptions, or permission to reprint the text and/or figures should be submitted to the Office of the Editor-in-Chief at the above address. Phone: (240) 228-6588. E-mail: TechnicalDigest@jhuapl.edu.

The following abstracting services currently cover the *Johns Hopkins APL Technical Digest*: Chemical Abstracts; Current Contents; Science Citation Index; Engineering Village; and the following CSA abstracts: Aerospace and High Technology Database; Aquatic Sciences and Fisheries Abstracts; Computer and Information Systems Abstracts; Electronics and Communications Abstracts; Mechanical and Transportation Engineering Abstracts; Meteorological and Geostrophysical Abstracts; and Oceanic Abstracts.

Postmaster: Send address changes to the *Johns Hopkins APL Technical Digest*, Rm. 21-N322, 11100 Johns Hopkins Road, Laurel, MD 20723-6099. Periodical postage paid at Laurel, MD.

© 2015 by The Johns Hopkins University Applied Physics Laboratory.