About the Materials Research Society

The Materials Research Society (MRS), a not-forprofit scientific association founded in 1973, promotes interdisciplinary goal-oriented basic research on materials of technological importance. Membership in the Society includes almost 16,000 scientists, engineers, and research managers from industrial, government, and university research laboratories in the United States and close to 70 countries.

The Society's interdisciplinary approach differs from that of single-discipline professional societies because it promotes information exchange across the many technical fields touching materials development. MRS sponsors two major international annual meetings encompassing approximately 90 topical symposia, and also sponsors numerous single-topic scientific meetings. The Society recognizes professional and technical excellence and fosters technical interaction in local geographic regions through Sections and University Chapters.

MRS participates in the international arena of materials research through the International Union of Materials Research Societies (IUMRS). MRS is a member of ASTRA and is an affiliate of the American Institute of Physics.

MRS publishes symposium proceedings, MRS Bulletin, Journal of Materials Research, and other pub-

lications related to current research activities.

MRS Bulletin (ISSN: 0883-7694, print; ISSN 1938-1425, online) is published monthly by the Materials Research Society, 506 Keystone Drive, Warrendale, PA 15086-7573. Copyright ©2009, Materials Research Society. Permission required to reproduce content. Periodical postage paid at Warrendale, PA, and at additional mailing offices. POSTMASTER: Send address changes to MRS Bulletin in care of the Materials Research Society, at the address listed; tel. 724-779-3003; fax 724-779-8313. Printed in the U.S.A.

Membership in MRS is \$115 annually for regular members, \$30 for students. Dues include an allocation of \$29 (\$17 for students) to a subscription to MRS Bulletin. Individual member subscriptions are for personal use only. Non-member subscription rates are \$275 for one calendar year (12 issues) within the U.S.A. and \$335 elsewhere. Single copies may be purchased for \$50 each. Requests from subscribers for missing journal issues will be honored without charge only if received within six months of the issue's actual date of publication; otherwise, the issue may be purchased at the single-copy price.

MRS Bulletin is included in Current Contents®/ Engineering, Computing, and Technology; Current Contents®/Physical, Chemical, and Earth Sciences, the SciSearch® online database, Research Alert®, Science Citation Index®, and the Materials Science Citation Index[™]. Back volumes of MRS Bulletin are available on microfiche through University Microfilms Inc., 300 North Zeeb Road, Ann Arbor, MI 48106, USA

Send Letters to the Editor to:

MRS Bulletin Materials Research Society 506 Keystone Drive Warrendale, PA 15086-7573 USA Fax 724-779-8313 Bulletin@mrs.org

Letters must include your name, affiliation, and full contact information.

MRS BULLETII

Editorial Office • 506 Keystone Drive • Warrendale, PA 15086-7573 USA Tel. 724-779-2747; fax 724-779-8313; Bulletin@mrs.org; http://www.mrs.org/

Editor

E.L. Fleischer

Managing Editor

J. Meiksin

Technical Editor

L. Wilson

Associate Technical Editor

C. Tseng

Editorial Assistants

B. Moriarty and L. Snyder

Guest Editors

S. Kim, S. Yamaguchi, and J.A. Elliott

Special Contributors

J.J. Carvajal, S. Cooper, L. Eldada, T.H. Geballe, A. Hatt, G. Lister, J. Rantschler, and S. Trohalaki

Special Consultants

B. Chalamala, R.L. Fleischer, and R.G. Ford

InterFaces

C. Trager-Cowan (Chair), Y.-T. Cheng, and U. Ramamurty

MRS Office of Public Affairs

R. Kelley

499 South Capitol Street SW, Suite 600, Washington, DC 20003

Art Director K. Bruniany

Production/Design

Franklin Design and SPI Technologies, Inc.

Advertising

M.E. Kaufold and D.L. Watterson

Circulation

M. Judt

EDITORIAL BOARD

P.S. Drzaic, Chair **Drzaic Consulting Services** Morgan Hill, CA

V.S. Arunachalam Center for Study of Science, Technology & Policy Bangalore, India

M.-I. Baraton University of Limoges Limoges, France

R.C. Cammarata Johns Hopkins University Baltimore, MD

L. Fornaro University of Uruguay

Montevideo, Uruguay

H.-U. Habermeier Max Planck Institute Stuttgart, Germany

S.C. Moss Aerospace Corp. Los Angeles, CA

J.A. Nucci Cornell University Ithaca, NY

L.J. Olafsen Baylor University Waco, TX

D.N. Seidman Northwestern University Evanston, IL

J.R. Weertman Northwestern University Evanston, IL

E. Werwa Washington, DC

S.M. Yalisove University of Michigan Ann Arbor, MI

VOLUME ORGANIZERS

2009

A. Misra

Los Alamos National Laboratory

T.J. Balk

University of Kentucky

2011 K.-S. Choi

Purdue University

R. O'Hayre

Colorado School of Mines

D. Cahen Weizmann Institute of

Science

R T Collins Colorado School of Mines K. Shull

Northwestern University

F. Meldrum

University of Leeds

G Redmond University College Dublin S. Stemmer University of California,

Santa Barbara S. Streiffer

Argonne National Laboratory

S.E. Shaheen University of Denver

2009 MRS OFFICERS

President S.P. Baker

Cornell University

Vice President and President-Elect D.S. Ginley National Renewable Energy Laboratory

Secretary B.J.H. Stadler

University of Minnesota

Executive Director Materials Research Society T Osman

General Secretary

Evanston, IL, USA

Northwestern University

R.P.H. Chang

Immediate Past President

C.A. Volkert

University of Göttingen

INTERNATIONAL UNION OF MATERIALS RESEARCH SOCIETIES

First Vice President Second Vice President Secretary Treasurer Immediate Past President President B.V.R. Chowdari H Katz O. Takai Q. Feng Y Han G.M. Crean Johns Hopkins University University of Science Inst. of Aeronautical Atomic Energy Commission Natl. Univ. of Singapore Nagoya University and Technology Baltimore, MD, USA Singapore Japan Materials Grenoble, France Beijing, China Beijing, China

IUMRS ADHERING BODIES

Australian Materials Research Society (A-MRS) J.S. Williams, Australian National University Brazil Materials Research Society (B-MRS) F. Lázaro Freire Jr., PUC-Rio

Chinese Materials Research Society (C-MRS) X. Peng, Beijing, China

European Materials Research Society (E-MRS) F. Priolo, INFM

Materials Research Society (MRS) S.P. Baker, Cornell University

Materials Research Society of Argentina (MRS-Argentina) J. Ovejero García, CNEA

Materials Research Society of India (MRS-I) T. Ramasami, Ministry of Science and Technology

Materials Research Society of Japan (MRS-J) N. Kishimoto, National Institute for Materials Science Materials Research Society of Korea (MRS-K)

Materials Research Society of Russia (MRS-Russia) N.Z. Lyakhov, Russian Academy of Sciences

J.-W. Park, Hanyang University

Materials Research Society of Singapore (MRS-S) B.V.R. Chowdari, National University of Singapore

Materials Research Society of Taiwan (MRS-T) T.P. Perng, Yuan Ze University

Mexican Materials Research Society (Mexican-MRS) P.H. Hernández Tejeda, Benemérita Universidad Autónoma de Puebla