

2014 **MRS**

SPRING MEETING & EXHIBIT

April 21-25, San Francisco, CA



# CALL FOR PAPERS

**Abstract Deadline • November 1, 2013**  
Abstract Submission Site Opens • October 1, 2013

## ENERGY

- A Film-Silicon Science and Technology
- B Organic and Inorganic Materials for Dye-Sensitized Solar Cells
- C Synthesis and Processing of Organic and Polymeric Materials for Semiconductor Applications
- D Materials for Photoelectrochemical and Photocatalytic Solar-Energy Harvesting and Storage
- E Earth-Abundant Inorganic Solar-Energy Conversion
- F Controlling the Interaction between Light and Semiconductor Nanostructures for Energy Applications
- G Photoactivated Chemical and Biochemical Processes on Semiconductor Surfaces
- H Defect Engineering in Thin-Film Photovoltaic Materials
- I Materials for Carbon Capture
- J Physics of Oxide Thin Films and Heterostructures
- K Nanostructures, Thin Films and Bulk Oxides—Synthesis, Characterization and Applications
- L Materials and Interfaces in Solid Oxide Fuel Cells
- M Fuel Cells, Electrolyzers and Other Electrochemical Energy Systems
- N Research Frontiers on Electrochemical Energy Storage Materials—Design, Synthesis, Characterization and Modeling
- O Novel Energy-Storage Technologies beyond Li-ion Batteries—From Materials Design to System Integration
- P Mechanics of Energy Storage and Conversion—Batteries, Thermoelectrics and Fuel Cells
- Q Materials, Technologies and Sensor Concepts for Advanced Battery Management Systems
- R Materials Challenges and Integration Strategies for Flexible Energy Devices and Systems
- S Actinides—Basic Science, Applications and Technology
- T Superconductor Materials—From Basic Science to Novel Technology

## SOFT AND BIOMATERIALS

- U Soft Nanomaterials
- V Micro- and Nanofluidic Systems for Materials Synthesis, Device Assembly and Bioanalysis
- W Functional Biomaterials for Regenerative Engineering
- Y Biomaterials for Biomolecule Delivery and Understanding Cell-Niche Interactions
- Z Bioelectronics—Materials, Processes and Applications
- AA Advanced Multifunctional Biomaterials for Neuroprosthetic Interfaces

## ELECTRONICS AND PHOTONICS

- BB Materials for End-of-Roadmap Devices in Logic, Power and Memory
- CC New Materials and Processes for Interconnects, Novel Memory and Advanced Display Technologies
- DD Silicon Carbide—Materials, Processing and Devices
- EE Advances in Inorganic Semiconductor Nanoparticles and Their Applications
- FF The Grand Challenges in Organic Electronics
- GG Few-Dopant Semiconductor Optoelectronics
- HH Phase-Change Materials for Memory, Reconfigurable Electronics and Cognitive Applications
- II Emerging Nanophotonic Materials and Devices
- JJ Materials and Processes for Nonlinear Optics
- KK Resonant Optics—Fundamentals and Applications
- LL Transparent Electrodes

## NANOMATERIALS

- MM Nanotubes and Related Nanostructures
- NN 2D Materials and Devices beyond Graphene
- OO *De Novo* Graphene
- PP Nanodiamonds—Fundamentals and Applications
- QQ Computationally Enabled Discoveries in Synthesis, Structure and Properties of Nanoscale Materials
- RR Solution Synthesis of Inorganic Functional Materials
- SS Nanocrystal Growth via Oriented Attachment and Mesocrystal Formation
- TT Mesoscale Self-Assembly of Nanoparticles—Manufacturing, Functionalization, Assembly and Integration
- UU Semiconductor Nanowires—Synthesis, Properties and Applications
- VV Magnetic Nanomaterials and Nanostructures

## GENERAL—THEORY AND CHARACTERIZATION

- WW Materials by Design—Merging Advanced *In-situ* Characterization with Predictive Simulation
- XX Shape Programmable Materials
- YY Meeting the Challenges of Understanding and Visualizing Mesoscale Phenomena
- ZZ Advanced Characterization Techniques for Ion-Beam-Induced Effects in Materials
- AAA Applications of *In-situ* Synchrotron Radiation Techniques in Nanomaterials Research
- BBB Advances in Scanning Probe Microscopy for Material Properties
- CCC *In-situ* Characterization of Material Synthesis and Properties at the Nanoscale with TEM
- DDD Atomic-Resolution Analytical Electron Microscopy of Disruptive and Energy-Related Materials
- EEE Materials Behavior under Extreme Irradiation, Stress or Temperature

## SPECIAL SYMPOSIUM

- FFF Educating and Mentoring Young Materials Scientists for Career Development

[www.mrs.org/spring2014](http://www.mrs.org/spring2014)

### Meeting Chairs

**Jose A. Garrido**, Technische Universität München  
**Sergei V. Kalinin**, Oak Ridge National Laboratory  
**Edson R. Leite**, Federal University of Sao Carlos  
**David Parrillo**, The Dow Chemical Company  
**Molly Stevens**, Imperial College London

### Don't Miss These Future MRS Meetings!

**2014 MRS Fall Meeting & Exhibit**  
November 30-December 5, 2014

Hynes Convention Center & Sheraton Boston Hotel  
Boston, Massachusetts

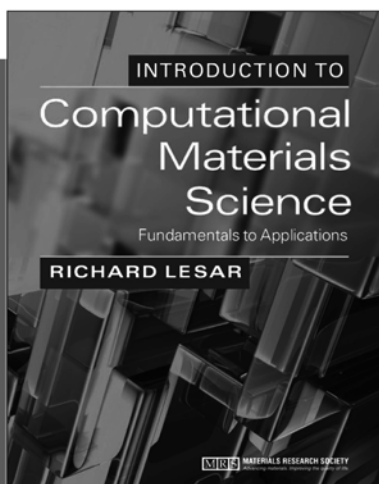
**2015 MRS Spring Meeting & Exhibit**  
April 6-10, 2015

Moscone West & San Francisco Marriott Marquis  
San Francisco, California



**MATERIALS RESEARCH SOCIETY**  
Advancing materials. Improving the quality of life.

506 Keystone Drive • Warrendale, PA 15086-7573  
Tel 724.779.3003 • Fax 724.779.8313  
info@mrs.org • www.mrs.org



Published 2013

### COURSE ADOPTIONS

Visit [www.cambridge.org/lesar](http://www.cambridge.org/lesar) to request an exam copy today!

### MRS MEMBERS

always receive 20% off Cambridge science/engineering books and proceedings!

Enter Discount Code MRSMEMBER at checkout to apply the MRS Member discount.

Not an MRS Member?  
Join today at [www.mrs.org](http://www.mrs.org)

### ORDER TODAY

Online  
[www.cambridge.org/lesar](http://www.cambridge.org/lesar)

E-mail  
[customer\\_service@cambridge.org](mailto:customer_service@cambridge.org)

Phone  
800.872.7423

Fax  
845.353.4141

## Introduction to Computational Materials Science Fundamentals to Applications

Now Available. Purchase Your Copy Today!

Author  
Richard LeSar, Iowa State University

### About the Book

Emphasising essential methods and universal principles, this textbook provides everything students need to understand the basics of simulating materials behavior. All the key topics are covered from electronic structure methods to microstructural evolution, appendices provide crucial background material, and a wealth of practical resources are available online to complete the teaching package. Modeling is examined at a broad range of scales, from the atomic to the mesoscale, providing students with a solid foundation for future study and research. Detailed, accessible explanations of the fundamental equations underpinning materials modelling are presented, including a full chapter summarising essential mathematical background. Extensive appendices, including essential background on classical and quantum mechanics, electrostatics, statistical thermodynamics and linear elasticity, provide the background necessary to fully engage with the fundamentals of computational modelling. Exercises, worked examples, computer codes and discussions of practical implementations methods are all provided online giving students the hands-on experience they need.

### Key Features

- Examines modelling materials across a broad range of scales, from the atomic to the mesoscale, providing students with a solid foundation for future study and research
- Presents detailed, accessible explanations of the fundamental equations underpinning materials modelling and includes a full chapter summarising essential mathematical background.
- Extensive appendices, including essential background on classical and quantum mechanics, electrostatics, statistical thermodynamics and linear elasticity, provide students with all the background necessary to fully engage with the fundamentals of computational modelling

Hardback | ISBN: 9780521845878  
428 pages 339 b/w illus. 15 tables  
List Price: USD 95.00  
MRS Member Discount Price: USD 76.00

Electronic | ISBN: 9781139033398  
Visit [ebooks.cambridge.org](http://ebooks.cambridge.org) for more information.

# MATERIALS RESEARCH SOCIETY®

## 2013 Board of Directors

### Officers

O. Auciello, *President*  
B.M. Clemens, *Immediate Past President*  
T. Benson Tolle, *Vice President and President-Elect*  
S.J. Hearne, *Secretary*  
M.R. Fitzsimmons, *Treasurer*  
T.M. Osman, *Executive Director*

### Directors

A.C. Arias  
S.M. Baker  
D. Cahen  
D.B. Dimos  
S.J. Eglash  
C-B. Eom  
S. Ermer  
E. Garfunkel  
S.M. Haile  
A.M. Hodge  
O. Kraft  
H. Matsumura  
F.C. Meldrum  
E.A. Stach  
S.K. Streiffer  
S.E. Trolrier-McKinstry

## 2013 Publications Committee

P.C. McIntyre, *Chair*  
P.B. Messersmith, *Editors Subcommittee*  
R.A. Vaia, *New Publication Products Subcommittee*  
J.M. Phillips, *Publications Quality Subcommittee*

## 2013 MRS Committee Chairs

M.S. Whittingham, *Academic Affairs*  
C.B. Carter, *Awards*  
N. Bassim, *Government Affairs*  
D.S. Ginley, *Meetings Committee*

Y. Chabal, *Member Engagement*  
P.C. McIntyre, *Publications*  
A. Risbud, *Public Outreach*

## MRS Headquarters

T.M. Osman, *Executive Director*  
J.A. Dillen, *Director of Finance and Administration*  
P.A. Hastings, *Director of Meeting Activities*  
E.K. Novak, *Director of Communications*

## Journal of Materials Research Founding Sponsors

Allied-Signal Inc.  
Xerox Corporation

## About the Materials Research Society

The Materials Research Society (MRS®) is a not-for-profit scientific association founded in 1973 to promote interdisciplinary goal-oriented basic research on materials of technological importance. Membership in the Society includes over 16,000 scientists from industrial, government, and university research laboratories in the United States and abroad.

The Society's interdisciplinary approach to the exchange of technical information is qualitatively different from that provided by single-discipline professional societies because it promotes technical exchange across the various fields of science affecting materials development. MRS sponsors three major international annual meetings encompassing many topical symposia, as well as numerous single-topic scientific meetings each year. It recognizes professional and technical excellence, conducts tutorials, and fosters technical exchange in various local geographical regions through Section activities and Student Chapters on university campuses.

MRS publishes symposia proceedings, the *MRS Bulletin*, and other volumes on current scientific developments. The *Journal of Materials Research*, the archival journal spanning fundamental developments in materials science, is published twenty-four times a year by Cambridge University Press for the MRS. *MRS Communications* is a full-color letters and perspectives journal focused on groundbreaking work across the spectrum of materials research.

MRS regular and student members may subscribe to *Journal of Materials Research*. See inside front cover for subscription rates for *Journal of Materials Research*.

MRS is an Affiliated Society of the American Institute of Physics and participates in the international arena of materials research through associations with professional organizations.

For further information on the Society's activities, contact MRS Headquarters, 506 Keystone Drive, Warrendale, PA 15086-7573; telephone (724) 779-3003; fax (724) 779-8313.



A publication of the  
**MRS** MATERIALS RESEARCH SOCIETY  
*Advancing materials - Improving the quality of life.*

Periodical Rate Postage Paid at New York, NY  
and Additional Mailing Offices

Postmaster—Send change of address notice to:

ISSN: 0884-2914

Cambridge University Press  
100 Brook Hill Drive  
West Nyack, NY 10994-2113, USA