

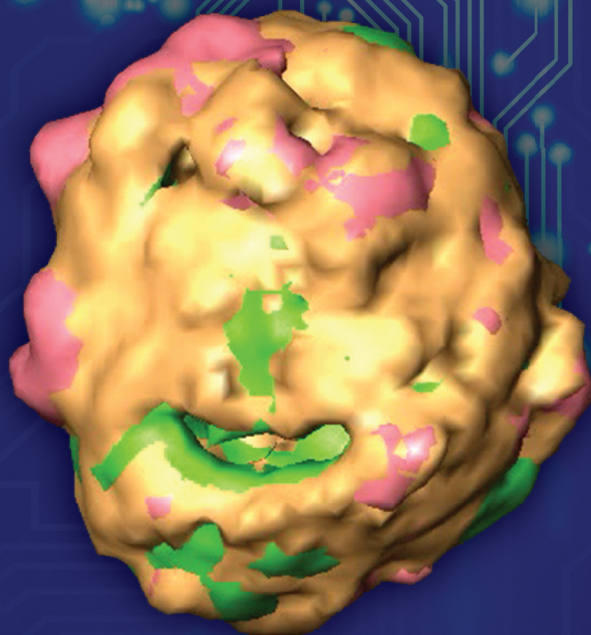
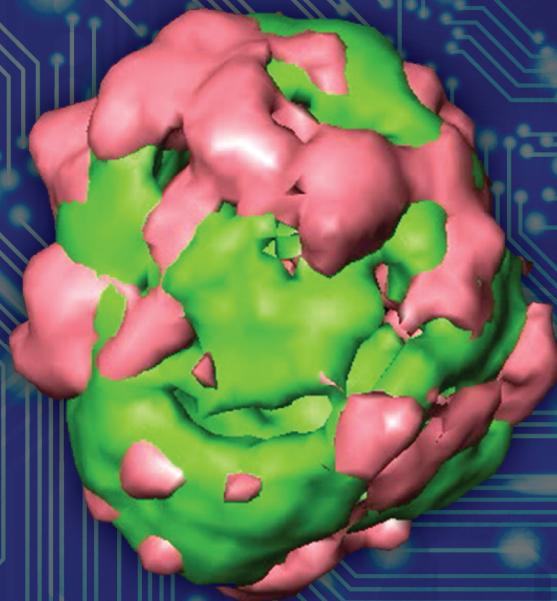
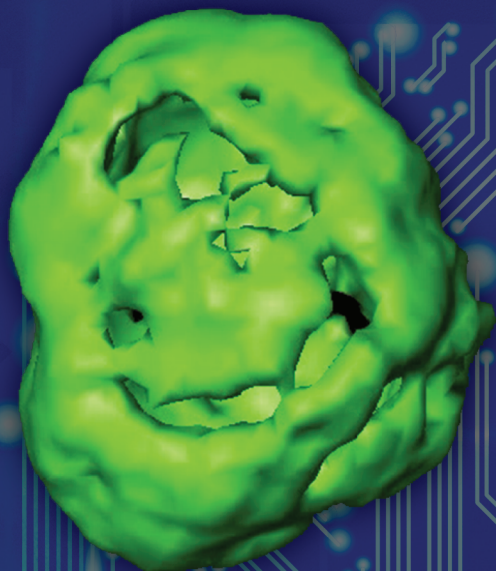
# MRS Bulletin

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YEARS

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April 2020 Vol. 45 No. 4  
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## Nanoscale tomography using x-rays and electrons



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- EL03 Emerging Low-Dimensional Chalcogenides for Electronics and Photonics
- EL04 Beyond Graphene 2D Materials—Synthesis, Properties and Device Applications
- EL05 Putting Photons to Work—Progress in Photomechanical Materials and Applications
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- EL07 Coulomb Interactions in Functional Organic Materials and Devices—A Curse or a Blessing?
- EL08 Frontiers of Halide Perovskites—Linking Fundamental Properties to Devices

## ENERGY

- EN01 Emerging Dielectric Materials—Applications in Energy Transmission, Storage and Conversion
- EN02 Silicon for Photovoltaics
- EN03 Overcoming the Challenges with Metal Anodes for High-Energy Batteries
- EN04 Beyond Lithium-Ion Batteries—Materials, Architectures and Techniques
- EN05 Redox Flow Batteries—Materials, Methods and Devices
- EN06 Advancement of Lithium-Based High-Energy Density Batteries at Multiple Scales, Factoring in Safety
- EN07 Innovative Materials and Cell Design, Processing and Manufacturing Strategies for Solid-State Batteries
- EN08 Scientific Basis for Nuclear Waste Management
- EN09 Developing *In Situ* and *Operando* Methodology for Observation of Energy Conversion, Storage and Transport Processes in Materials and Devices

## FLEXIBLE, WEARABLE ELECTRONICS, TEXTILES AND SENSORS

- FL01 Bioelectronic Materials for Neural Interfaces—Stimulation, Sensing, Power and Packaging
- FL02 Advanced Neural Interfacing Materials, Devices and Microsystems
- FL03 Flexible, Wearable Electronics and Textiles

## MATERIALS THEORY, CHARACTERIZATION AND DATA SCIENCE

- MT01 Advanced *In Situ* Characterization of Materials Kinetics
- MT02 Multimodal, Functional and Smart Scanning Probe Microscopies for Characterization and Fabrication
- MT03 Frontiers of Imaging and Spectroscopy in Electron Microscopy
- MT04 Using Machine Learning and Multiscale Modeling to Study Soft Materials and Interfaces
- MT05 Advancing Materials Characterization Through Atom Probe Tomography
- MT06 Strain and Defect-Driven Transport Properties in van der Waals Solids
- MT07 Data Science and Automation to Accelerate Materials Development and Discovery

## NANOMATERIALS AND QUANTUM MATERIALS

- NM01 Nanophotonics—Emerging Hybrid Platforms, Materials and Functions
- NM02 Advanced Linear/Nonlinear, Tunable and Quantum Materials for Metasurfaces, Metamaterials and Plasmonics
- NM03 Nanotubes, Graphene and Related Nanostructures
- NM04 Material Systems for Manipulating and Controlling Magnetic Skyrmions
- NM05 Emerging Materials for Quantum Information Technologies
- NM06 Spin Dynamics in Materials for Quantum Sensing, Optoelectronics and Spintronics
- NM07 Progress in Neuromorphic Computing Materials, Devices and Systems

## SOFT MATERIALS AND BIOMATERIALS

- SM01 Lessons from Nature—From Biology to Bioinspired Materials
- SM02 Hydrogel Technology for Humans and Machines
- SM03 Materials and Mechanics Challenges in Haptics for Human–Machine Interfaces
- SM04 Degradable and Self-Healing Electronic Materials for Biological Interfaces
- SM05 Brain-Inspired Information Processing—From Novel Material Concepts for Neuromorphic Computing to Sensing, Manipulation and Local Processing of Biological Signals
- SM06 Biofabrication for Emulating Biological Tissues
- SM07 Biomaterials for Studying and Controlling the Immune System
- SM08 Regenerative Engineering and Synthetic Biology

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- SF01 Materials for Extreme Conditions (MEC)
- SF02 Bulk Metallic Glasses
- SF03 New Frontiers in the Design, Fabrication and Application of Metamaterials
- SF04 Solution-Processed Semiconductors and Devices for Form-Free Displays, Logic and Sensors
- SF05 Advanced Materials for Additive Manufacturing
- SF06 High-Entropy and Compositionally Complex Alloys
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- SF08 Defect-Dominated Plasticity and Chemistry in Metals and Alloys

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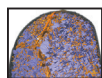
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# CONTENTS

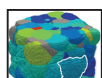
## NANOSCALE TOMOGRAPHY USING X-RAYS AND ELECTRONS



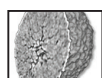
- 264 **Nanoscale x-ray and electron tomography**  
Hanfei Yan, Peter W. Voorhees, and Huolin L. Xin,  
Guest Editors



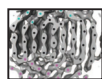
- 272 **Multimodal x-ray nanotomography**  
Doğa Gürsoy and Chris Jacobsen



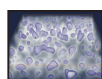
- 277 **Probing nanoscale structure and strain by dark-field x-ray microscopy**  
Can Yildirim, Phil Cook, Carsten Detlefs,  
Hugh Simons, and Henning Friis Poulsen



- 283 **High-dimensional and high-resolution x-ray tomography for energy materials science**  
Zhenjiang Yu, Jiajun Wang, and Yijin Liu



- 290 **Atomic electron tomography in three and four dimensions**  
Jihan Zhou, Yongsoo Yang, Peter Ercius,  
and Jianwei Miao



- 298 **Electron tomography for functional nanomaterials**  
Robert Hovden and David A. Muller

## DEPARTMENTS



## NEWS & ANALYSIS

### 253 **Materials News**

- **Research Highlights: Perovskites**  
Prachi Patel  
FEATURE EDITOR: Pabitra K. Nayak
- **Defect engineering increases polarization retention in ferroelectric thin films**  
Kendra Redmond
- **Parallelized two-photon lithography enables submicrometer additive microfabrication**  
Nora M. Hassan
- **Simulations uncover highly transparent ferroelectric piezoelectric crystal**  
Lauren Borja
- **Ultrasound strengthens 3D printed metal alloys**  
Tianyu Liu

### 259 **Science Policy**

- **US Department of Energy launches grant program in quantum materials**  
Clinton Park
- **South African science ministries respond favorably to State of the Nation address by president**

### 261 **White Paper**

- **The ultimate microscopy—enabling nanotechnology**  
Robert Ulfig



## SOCIETY NEWS

### 262 MRS Journal Highlights

- 306 ■ **Career progression through professional engagement: The impact of MRS student-led activities**  
Daniel Stadler, Eva Hemmer, Babak Anasori, Zachary D. Hood, and Sanjay Mathur

### 308 MRS Awards Program Recipients

- Guo to receive MRS Innovation in Materials Characterization Award
- Duan to receive Mid-Career Researcher Award
- Foskey to receive MRS Impact Award
- Rivnay to receive Outstanding Early-Career Investigator Award
- Li and Mao to receive MRS Postdoctoral Awards
- Aselage to receive MRS Woody White Service Award
- 2020 MRS Fellows

- 276 ■ 2019 EU-40 Materials Prize awarded to Liu

### 312 2019 MRS Year in Review

### 314 MRS Communications Abstracts

### 316 Profiles

- **Husam Alshareef: Prominent materials researcher, passionate educator**  
Humaira Taz



## FEATURES

### 317 Book Reviews

- **Introduction to Materials for Advanced Energy Systems**  
Colin Tong  
Reviewed by Chinnia Subramanian
- **The Alchemy of Us**  
Ainissa Ramirez  
Reviewed by Judy Meiksin
- **Spoof Surface Plasmon Metamaterials**  
Paloma Arroyo Huidobro, Antonio I. Fernández-Domínguez, John B. Pendry, Luis Martín-Moreno, and Francisco J. García-Vidal  
Reviewed by Pramod H. Borse

### 320 Image Gallery

Look Again

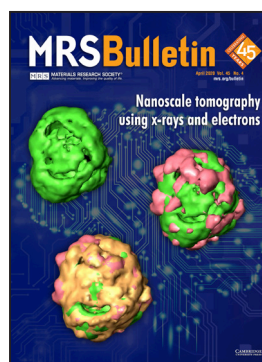


## 319 CAREER CENTRAL

### ADVERTISERS IN THIS ISSUE

Page No.

American Elements .....	Outside back cover
CAMECA Instruments, Inc. ....	Inside back cover
High Voltage Engineering .....	Inside front cover



### ON THE COVER

**Nanoscale tomography using x-rays and electrons.** Three-dimensional (3D) tomographic imaging, using x-rays or electrons, of the structural, chemical, and physical properties of a material links the structure of a material to its processing that is central to studies across a broad spectrum of materials. In recent years, advances in technology have enabled new imaging capabilities at the nanometer or atomic scale for 3D reconstruction. This issue of *MRS Bulletin* discusses the development of these new techniques for nanoscale x-ray and electron tomography as well as future directions. The cover shows a 3D reconstruction of

an iron (green)-cobalt (pink) oxide (gold) nanoparticle obtained using electron energy-loss spectroscopic scanning transmission electron microscopy (STEM-EELS) tomography. It reveals chemical segregation and nanoscale pinholes formed in the hollow structured oxide shell induced by the Kirkendall effect during oxidation of the iron-cobalt alloy particle. (Credit: Huolin L. Xin.) See the technical theme that begins on p. 264.



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The Materials Research Society (MRS), a not-for-profit scientific association founded in 1973 and headquartered in Warrendale, Pennsylvania, USA, promotes interdisciplinary materials research. Today, MRS is a growing, vibrant, member-driven organization of over 16,000 materials researchers spanning over 80 countries, from academia, industry, and government, and a recognized leader in the advancement of interdisciplinary materials research.

The Society's interdisciplinary approach differs from that of single-discipline professional societies because it promotes information exchange across many scientific and technical fields touching materials development. MRS conducts three major international annual meetings and also sponsors numerous single-topic scientific meetings. The Society recognizes professional and technical excellence and fosters technical interaction through University Chapters. In the international arena, MRS implements bilateral projects with partner organizations to benefit the worldwide materials community. The Materials Research Society Foundation helps the Society advance its mission by supporting various projects and initiatives.

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