Ultrafast laser synthesis and processing of materials

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ON THE COVER
Ultrafast laser synthesis and processing of materials. Ultrafast laser–solid interactions have made a great deal of progress recently, especially in the understanding of atomistic mechanisms and dynamics controlling material response. This issue of MRS Bulletin discusses the fundamental interactions at the shortest time scales for a wide range of applications as well as other emerging opportunities of ultrafast laser synthesis and processing. The cover image shows the formation of a polyicosahedral structure in a frozen nanospike in a molecular dynamics simulation of an Ag target irradiated by a 100 fs laser pulse. Analysis reveals a remarkable variability of structural motifs coexisting in the nanospike, including a region of continuous networks of pentagonal twinned structural elements arranged into the polyicosahedral structure. Fcc atoms are shown in yellow, stacking faults and twin boundaries are red, and other defects are purple. Image courtesy of the American Chemical Society (C. Wu, L.V. Zhigilei, J. Phys. Chem. C 120, 4438 [2016]). See the technical theme that begins on page 955.
OPINION

34

Material Matters
The critical role of creativity in research
Katherine L. Van Aken

NEWS & ANALYSIS

Materials News
- Research highlights: Perovskites
  Prachi Patel
  FEATURE EDITOR: Pabitra K. Nayak
- 2016 Nobel Prizes in physics and chemistry: A materials view
  Prachi Patel
- IR vibrational crystallography visualizes molecular orientation on the nanoscale
  Xiwen Gong
- Designed imperfections in graphene maximize charge-storage potential of supercapacitors
  Boris Dyatkin
- Bayesian inference supersedes Rietveld technique in crystallographic structure refinement
  Vineet Venugopal

Science Policy
- Brexit leaves UK scientific research community in uncertainty
  Michael Kenward

FEATURES

Books
- MEMS and Nanotechnology for Gas Sensors
  Sunipa Roy and Chandan Kumar Sarkar
  Reviewed by K. Kamala Bharathi
- Earth-Abundant Materials for Solar Cells: Cu2-II-IV-VI4 Semiconductors
  Sadao Adachi
  Reviewed by N. Balasubramanian
- Magnetic Perovskites: Synthesis, Structure and Physical Properties
  Asish K. Kundu
  Reviewed by Wilfrid Prellier

Image Gallery
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ADVERTISERS IN THIS ISSUE

Page No.
ACSM Publications ................................................................. 936–937
American Elements .......................................................... Outside back cover
Goodfellow Corporation .............................................. 929
High Voltage Engineering .................................................. Inside front cover
JEOL USA, Inc. ................................................................. Inside back cover
MilliporeSigma (Sigma-Aldrich Materials Science) ............... 933
National Electrostatics Corp ............................................. 983
Rigaku Corporation .......................................................... 992
Zurich Instruments, an Oxford Instruments Company ............. 954

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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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