

Yaron Amoyal

Guest Editor for this issue of *MRS Bulletin*

Department of Materials Science and Engineering, Technion–Israel Institute of Technology, Israel; email amoyal@technion.ac.il.

Amoyal is an assistant professor at the Materials Science and Engineering Department, Technion–Israel Institute of Technology, and has been leading a research group focusing on tailoring functional properties of thermoelectric materials by microstructure modifications since 2011. He earned a PhD degree from Technion in 2007, and then joined the Department of Materials Science and Engineering at Northwestern University as a postdoctoral fellow and scientific consultant at the Northwestern University Center for Atom Probe Tomography.

in 2007, and then joined the Department of Materials Science and Engineering at Northwestern University as a postdoctoral fellow and scientific consultant at the Northwestern University Center for Atom Probe Tomography.



Guido Schmitz

Guest Editor for this issue of *MRS Bulletin*

Department of Materials Physics, University of Stuttgart, Germany; email guido.schmitz@mp.imw.uni-stuttgart.de.

Schmitz is director of the Institute of Materials Science at the University of Stuttgart. He earned his PhD degree from the University of Göttingen, Germany, in 1994, and then became a postdoctoral fellow at the Institute of Materials Physics in Göttingen. Schmitz is interested in the atomic mechanisms of solid-state reactions. During the time in Münster, he founded the Laboratory for Atom Probe Tomography.



Hans-Olof André

Department of Applied Physics, Division of Materials Microstructure, Chalmers University of Technology, Sweden; tel. +46 (0)31 772 3309; and email andren@chalmers.se.

André is a professor in the Division of Materials Microstructure at Chalmers University of Technology. He earned a PhD degree in physics from Chalmers University in 1976 and is one of the pioneers of the atom probe technique. His research interests focus on the connection among manufacture, detailed microstructure, and properties of primarily metallic materials.



Paul A.J. Bagot

Department of Materials, University of Oxford, UK; email paul.bagot@materials.ox.ac.uk.

Bagot is a lecturer at the University of Oxford, where he researches catalytic nanoparticles, nuclear materials, oxides, steels, and aerospace alloys. Much of his research combines atom probe tomography with complementary tools (EM, modeling) to understand atomic-scale structure–property links. He has collaborations with Harvard University, the University at Buffalo, UPMC Paris, and the University of Lille. Bagot holds three Engineering and

Physical Sciences Research Council research grants, is an RSC/IMMM member, and is on the editorial board of the journal *Catalysis, Structure & Reactivity*.



Julie M. Cairney

School of Aerospace Mechanical and Mechatronic Engineering, and Australian Centre for Microscopy & Microanalysis, The University of Sydney, Australia; tel. (61) (0)2 9351 4523; and email julie.cairney@sydney.edu.au.

Cairney is a professor at The University of Sydney and the acting director of the Australian Centre for Microscopy & Microanalysis. She leads a research group that focuses on the relationship between microstructure and properties of materials, with a particular emphasis on the appli-

cation and development of new characterization techniques. Cairney is currently investigating materials such as advanced alloys for aerospace and mining, multilayers for fuel cells, and catalyst nanoparticles.



Pyuck-Pa Choi

Department of Microstructure Physics and Alloy Design, Max Planck Institute for Iron Research, Germany; email p.choi@mpie.de.

Choi is the head of the Atom Probe Tomography Group at the Max Planck Institute for Iron Research. He received his PhD degree in material physics in 2003 from the University of Göttingen, Germany. His research focuses on the characterization of nanostructured materials by means of atom probe tomography and complementary techniques, and on structure–property relationships of advanced high-strength steels, superalloys, and thin-film materials.



Brian P. Geiser

CAMECA Instruments, Inc., USA; tel. 608-338-1033; and email brian.geiser@ametec.com.

Geiser is a senior scientist at CAMECA Instruments, Inc. He received his PhD degree in experimental particle physics from Cornell University in 1994. He develops algorithms and software for atom probe simulation, reconstruction, and analysis. Prior, Geiser developed software for medical devices, including radiotherapy, ultrasound, PET, and CT systems.



Stephan S.A. Gerstl

Scientific Center for Optical and Electron Microscopy, ETH Zürich, Switzerland; email stephan.gerstl@scopem.ethz.ch.

Gerstl is a senior scientist and lecturer at ETH Zürich's Scientific Center for Optical and Electron Microscopy (ScopeM) and administers the Atom Probe Tomography facility. After receiving his PhD degree in materials and engineering at Northwestern University, he was part of the research team at Imago Scientific Instruments (now CAMECA Instruments, Inc.), co-developing and training the LEAP platform. In addition to

training and assisting users of the ScopeM facility, he is advancing one of the first cryo-transfer-enabled LEAPs, which enables APT analyses of dynamic and soft materials.



Kazuhiro Hono

Magnetic Materials Unit, National Institute for Materials Science, Japan; tel. +81-29-859-2718; and email kazuhiro.hono@nims.go.jp.

Hono is an NIMS Fellow and the director of the Magnetic Materials Unit at the National Institute for Materials Science (NIMS). He is also a professor in Materials Science and Engineering at the University of Tsukuba. He received a PhD degree in Metals Science and Engineering from The Pennsylvania State University in 1988, and completed his postdoctoral research at Carnegie Mellon University. Hono's current

research interests are microstructure–property relationships of metallic materials, in particular magnetic and spintronic materials and their devices.



Koji Inoue

Institute for Materials Research, Tohoku University, Japan; email kinoue@imr.tohoku.ac.jp.

Inoue is an associate professor at the Institute for Materials Research, Tohoku University. He received his PhD degree from the University of Tokyo. His recent research interests include the characterization of various kinds of materials from structural materials to semiconductor devices using correlative microscopies, such as atom probe tomography, transmission electron microscopy, and positron annihilation.



David Larson

CAMECA Instruments, Inc., USA; tel. 608-229-1938; and email david.larson@ametech.com.

Larson is the director of scientific marketing for CAMECA Instruments. He received his PhD degree from the University of Wisconsin in 1996. Larson is currently the president of the International Field Emission Society. His honors include the Innovation in Materials Characterization Award from MRS, Visiting Scholar from the Corpus Christi College in Oxford, the Burton Metal from the Microscopy Society of America, Honorary Staff from The University of Sydney,

the Cosslett Award from the Microbeam Analysis Society, and a National Science Foundation International Research Fellowship (Oxford).



Williams Lefebvre

Groupe de Physique des Matériaux, UMR CNRS 6634, Université et INSA de Rouen, France; tel. (33) (0)2 3295 5141; and email williams.lefebvre@univ-rouen.fr.

Lefebvre is an associate professor at the University of Rouen. He received a PhD degree in materials science at Rouen in 2001, and earned a fellowship of the Japan Society for the Promotion of Science in 2002 when he visited the National Institute for Materials Science in Japan. He also worked as a postdoctoral research associate at Chalmers University in

2002. He leads research activities in the field of physical metallurgy, focusing on light alloys systems.



Dominique Mangelinck

Institute Materials Microelectronics Nanosciences of Provence, National Center for Scientific Research (CNRS)/ Aix-Marseille University, France; email dominique.mangelinck@im2np.fr.

Mangelinck is research director in CNRS at the Institute Materials Microelectronics Nanosciences of Provence. He is in charge of the atom probe platform at Marseille, and the METSA-PACA platform (network for APT and TEM). His research interests include diffusion and phase transformation in nanometric materials.

Mangelinck uses *in situ* experiments and other analysis such as APT to understand the fundamental mechanisms of diffusion and reaction and to develop industrial processes for metallurgy, aeronautics, and mainly, microelectronics.



Michael P. Moody

Department of Materials, University of Oxford, UK; tel. +44 1865 273693; and email michael.moody@materials.ox.ac.uk.

Moody is an associate professor of microscopy of materials in the Department of Materials and a Fellow of Trinity College at the University of Oxford. After completing a PhD degree at the University of South Australia, he undertook a postdoctoral research position at Tulane University. He joined the University of Oxford in 2012 to lead the Atom Probe Research Group, which has interests in all aspects of APT research. Moody is a co-author of the textbook *Atom Probe Microscopy*.



Christian Oberdorfer

Institute of Materials Science, University of Stuttgart, Germany; tel. +49 (0) 711 685 61982; and email [christian.oberdorfer@imw.uni-stuttgart.de](mailto:oberdorfer@imw.uni-stuttgart.de).

Oberdorfer is a postdoctoral research associate and the Chair for Materials Physics of G. Schmitz at the University of Stuttgart. His interests include the physics of field evaporation, and in related research, to better understand the trajectories in atom probe tomography experiments aiding the 3D reconstruction approach. In 2014, he received the Erwin Müller Outstanding Young

Scientist Award from the International Field Emission Society for his work on the numerical simulation of atom probe tomography.



Daniel E. Perea

Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, USA; tel. 509-731-8660; and email daniel.perea@pnnl.gov.

Perea is a staff scientist at the Environmental Molecular Sciences (EMSL) user facility located at the Pacific Northwest National Laboratory. He received his PhD degree in materials science and engineering from Northwestern University in 2009. His honors include a Director's Postdoctoral Fellowship at Los Alamos National Laboratory in 2009 and an EMSL Director's Award in 2013. Perea has over 30 publications and two book chapters.



Ivan Povstugar

Department of Microstructure Physics and Alloy Design, Max Planck Institute for Iron Research, Germany; tel. +49 211 6792 172; and email i.povstugar@mpie.de.

Povstugar is a research scientist at the Max Planck Institute for Iron Research (MPIE). He received his PhD degree in chemical physics at the Moscow Institute of Physics and Technology, Russia, in 2003. After working as a researcher at the Physical-Technical Institute of the Russian Academy of Sciences, he joined MPIE in 2009. His current research interests

include high-resolution characterization of nanostructured and high-temperature materials with a particular focus on superalloys and thin-film hard coatings.



Ty J. Prosa

CAMECA Instruments, Inc., USA; email ty.prosa@ametec.com.

Prosa is the applications manager and a senior staff scientist at CAMECA since 2005. He received his BS degree in physics and mathematics from the University of Wisconsin–Eau Claire, and PhD degree in experimental condensed matter physics from the University of Wisconsin–Madison in 1996. After a National Research Council postdoctoral period at the National Institute of Standards and Technology–Gaithersburg in the Polymers Division, Prosa held positions

at Kutztown University of Pennsylvania and Hamline University in Saint Paul, Minn.



Dierk Raabe

Department of Microstructure Physics and Alloy Design, Max Planck Institute for Iron Research, Germany; tel. +492116792100; and email d.raabe@mpie.de.

Raabe has been director at the Max Planck Institute for Iron Research since 1999 and is also a professor at Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen, Germany. He earned his PhD degree in 1992 and then received his Habilitation degree at RWTH Aachen in physical metallurgy and metal physics in 1997. His research interests

include alloy design, computational materials science, crystal plasticity, and atom probe tomography.



Krishna Rajan

Department of Materials Design and Innovation, The State University of New York at Buffalo, USA; tel. 716-645-1380; and email krajan3@buffalo.edu.

Rajan is the Empire Innovation Professor and the inaugural Eric Bloch Chair of the newly founded Department of Materials Design and Innovation at The State University of New York at Buffalo. He received the 2015 Alexander von Humboldt Research Award for his work in pioneering the field of materials informatics linking the fields of data science with materials science. Rajan is the founding editor-in-chief of the journal *Materials Discovery*.



Simon P. Ringer

Australian Institute for Nanoscale Science and Technology, and School of Aerospace Mechanical and Mechatronic Engineering, The University of Sydney, Australia; tel. (61) 2 8627 4258; and email simon.ringer@sydney.edu.au.

Ringer is a director of the Australian Institute for Nanoscale Science and Technology, and director of core research facilities at The University of Sydney. He is a materials scientist specializing in the design of microstructure. Ringer's work spans both functional materials, particularly semiconducting nanowires and catalytic nanoparticles, and structural materials, including advanced high-strength steels and light alloys.

Research interests include the kinetics of phase-separation in concentrated multicomponent superalloys; and ultrahigh-strength explosion-resistant steels. Seidman is a Fellow of the American Academy of Arts & Sciences and the American Association for the Advancement of Science. He was twice a John Simon Guggenheim Memorial Foundation Fellow and is a Fellow of ASM International, MRS, MSA, and TMS. His honors include the David Turnbull Lectureship Award, Sauveur Achievement Award, Institute of Metals Lecture and Robert F. Mehl Award, Max Planck Research Prize, Alexander von Humboldt Stiftung Prize, and Robert Lansing Hardy Gold Medal.



David N. Seidman

Department of Materials Science and Engineering and the Northwestern University Center for Atom Probe Tomography, Northwestern University, USA; tel. 847-491-4391; and email d-seidman@northwestern.edu.

Seidman is a Walter P. Murphy Professor of Materials Science and Engineering at Northwestern University. He is the founding director of the Northwestern University Center for Atom Probe Tomography (NUCAPT). His research interests include the kinetics of phase-separation in concentrated multicomponent superalloys; and ultrahigh-strength explosion-resistant steels. Seidman is a Fellow of the American Academy of Arts & Sciences and the American Association for the Advancement of Science. He was twice a John Simon Guggenheim Memorial Foundation Fellow and is a Fellow of ASM International, MRS, MSA, and TMS. His honors include the David Turnbull Lectureship Award, Sauveur Achievement Award, Institute of Metals Lecture and Robert F. Mehl Award, Max Planck Research Prize, Alexander von Humboldt Stiftung Prize, and Robert Lansing Hardy Gold Medal.

Stiller is a professor in the Division of Materials Microstructure at Chalmers University of Technology. She received a PhD degree in physics at the University of Gothenburg in 1980. Her research interests include the study of the structure, composition, and properties of materials at the atomic level. She is one of the first researchers to apply the atom probe technique to materials sciences.



Krystyna Stiller

Department of Applied Physics, Division of Materials Microstructure, Chalmers University of Technology, Sweden; tel. +46 31 772 33 20; and email stiller@chalmers.se.

Stiller is a professor in the Division of Materials Microstructure at Chalmers University of Technology. She received a PhD degree in physics at the University of Gothenburg in 1980. Her research interests include the study of the structure, composition, and properties of materials at the atomic level. She is one of the first researchers to apply the atom probe technique to materials sciences.



Mattias Thuvander

Department of Applied Physics, Division of Materials Microstructure, Chalmers University of Technology, Sweden; tel. +46 31 7723322; and email mattias.thuvander@chalmers.se.

Thuvander is an associate professor in the Division of Materials Microstructure at Chalmers University of Technology. He completed a PhD degree in physics at Chalmers University in 1998. Thuvander's research focuses on steel and welding metallurgy, structural nuclear materials, and thin films (e.g., hard coatings and semiconductors). Atom probe tomography plays a central role in his work.



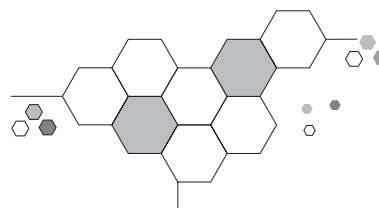
Angela Vella
 Groupe de Physique des Matériaux, Université et INSA de Rouen, Normandie University, France; email angela.vella@univ-rouen.fr.
 Vella earned her PhD degree with a focus on nonlinear optics at the University of Naples. After two years of postdoctoral research in France, she joined the Groupe de Physique des Matériaux group as an assistant professor in 2005. She has been involved in work on the development of the atom probe tomography (APT) laser assisted by ultrafast laser pulses. She recently demonstrated the capabilities of

APT as an investigational tool of thermal and optical properties of materials at the nanometer scale. In 2015, Vella received the CNRS Bronze Medal.



François Vurpillot
 Groupe de Physique des Matériaux, UMR CNRS 6634, Université et INSA de Rouen, France; email francois.vurpillot@univ-rouen.fr.
 Vurpillot is a professor at the University of Rouen and a researcher in the Groupe de Physique des Matériaux, CNRS laboratory. He is head of the scientific instrumentation team. He earned his PhD degree at Rouen, and completed his postdoctoral research at the University of Oxford on a Marie Curie Fellowship in the Department of Materials. He is a specialist in field emission and laser-induced field emission

and has contributed to the development of several generations of atom probe instruments. Vurpillot is currently vice president of the International Field Emission Society.



www.mrs.org



NANO-PARTICULATE THIN FILMS BY GISAXS AND XRR



Platinum nano-particles are of particular interest due to its novel properties. The data show such a nano-particle film deposited on silicon as analyzed with a Rigaku SmartLab. XRR data reveals that the film is about 8.55 nm thick with an average density of 14.23 g/cm³, which is lower than the density of metallic platinum. This suggests that the film is quite porous. The complimentary GISAXS data shows that the platinum particles have a very narrow size distribution around 8.67 nm, which is about the film thickness, indicating that the film is made of only a single layer of nano-particles. The GISAXS data also shows that pores indeed exist in the film with an average pore size of 1.52 nm, again in agreement with the density calculation from the XRR data. Learn more about SmartLab.

APPBYTE

Rigaku Corporation and its Global Subsidiaries
www.Rigaku.com | info@Rigaku.com

