Younan Xia selected as MRS Medalist for shape-controlled synthesis

Younan Xia, Georgia Institute of Technology, has received the 2017 Materials Research Society (MRS) Medal "for seminal contributions to shape-controlled synthesis of metal nanocrystals with a major impact on catalysis, plasmonics and biomedicine." Xia will be recognized during the Awards Ceremony at the 2017 MRS Fall Meeting in Boston.

Xia holds the Brock Family Chair and GRA Eminent Scholar in Nanomedicine position at the Georgia Institute of Technology. He received his BS degree from the University of Science and Technology of China in 1987, his MS degree from the University of Pennsylvania in 1993, and his PhD degree from Harvard in 1996. His group has invented a myriad of nanomaterials for applications in catalysis, plasmonics, electronics, display, energy, and medicine. His technology on silver nanowires has been commercialized for the fabrication of flexible, transparent, and conductive films central to touch-screen display and flexible electronics. Xia has co-authored more than 700 publications. He has been named by *Times Higher Education* and Thomson Reuters as one of the Top 10 Chemists and Materials Scientists in the world. He has also received many prestigious awards, including the ACS Award in the Chemistry of Materials, NIH Director's Pioneer Award, and NSF Early Career Development Award.

In his presentation, Xia will discuss how to address the urgent need to maximize the utilization efficiency of noble metals (some of the least abundant elements in the Earth's crust) and thus attain affordable and sustainable products. One approach is based on the development of hollow nanocrystals with well-defined and controllable facets, while their walls are kept below five atomic layers (or 1 nm) in thickness. He will start with a brief introduction to two methods that have been developed for the production of such nanomaterials, with the first involving layer-by-layer atomic deposition followed by etching, and the second involving galvanic replacement with a sacrificial template. Xia will then showcase some remarkable properties and applications of this novel class of nanomaterials, including their use as cost-effective catalysts for energy conversion, as carriers for controlled release and drug delivery, and as theranostic agents for cancer medicine. He will conclude with a discussion on some barriers to the commercialization of these nanomaterials.

James A. Warren to present The Fred Kavli Distinguished Lectureship in Materials Science address

James A. Warren, Director of the Materials Genome Program in the Material Measurement Laboratory of the National Institute of Standards and Technology (NIST), will give the talk, "The Materials Genome Initiative and Artificial Intelligence" at the 2017 MRS Fall Meeting in Boston.

After receiving his PhD degree in theoretical physics at the University of California, Santa Barbara, which was preceded by an AB degree (also in physics) from Dartmouth College, Warren took a position as a National Research Council postdoctoral researcher in the Metallurgy Division at NIST. In 1995, with three other junior NIST staff members, he co-founded the NIST Center for Theoretical and Computational Materials Science, which he has directed since 2001. From 2005 to 2013, he was the leader of the Thermodynamics and Kinetics Group. His research has been broadly concerned with developing both models of materials phenomena and the tools to enable the solution of these models. Specific foci over the years have included solidification, pattern formation, grain structures, creep, diffusion, wetting, and spreading in metals. In 2010–2011, Warren was part of the Ad Hoc Committee within the Office of Science and Technology Policy's National Science and Technology Council (NSTC), which crafted the founding white paper on the administration's Materials Genome Initiative (MGI). Since 2012, he has served as the executive secretary of the NSTC MGI subcommittee, coordinating an interagency effort to achieve the goals laid out in the MGI.

The US MGI is now more than six years old. With a goal of accelerating the discovery, design, development, and deployment of new materials into manufactured products, the MGI is focused

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on the creation of a materials innovation infrastructure. NIST has framed its support for the MGI around the need for a data infrastructure that enables the rapid discovery of existing data and models, the tools to assess and improve the quality of those data, and the development of new methods and metrologies based on those data. In partnership with agencies across government, academia, and industry, these approaches are now yielding significant advances.

Xiaobo Yin to present The Kavli Foundation Early Career Lectureship in Materials Science

Xiaobo Yin is an assistant professor and the Bruce S. Anderson Faculty Fellow in the College of Engineering and Applied Science at the University of Colorado Boulder. He received his PhD degree from Stanford University in 2008. He was a senior scientist at the NSEC Center at the University of California, Berkeley, and a research assistant professor at Stanford University before he joined the faculty of the University of Colorado Boulder in 2013. He received the DARPA Young Faculty Award in 2015. His current research focuses on controlling light–matter interaction at the nanoscale and developing new optical materials for a broad range of applications, from brain imaging to energy harvesting and thermal management. His work addresses both the fundamentals of nano-optics and the technological hurdles of deploying nanomaterials and metamaterials for real-world applications through scalable and sustainable nanomanufacturing.

In his presentation, Yin will discuss understanding size effects in micro- and nanostructures and how this offers a significant new opportunity to design structured materials with unprecedented properties. Tremendous progress has been made recently in a broad range of technical areas, with examples such as well-tailored mechanical structures that are extremely strong but lightweight and optical metamaterials that negatively refract and cloak. However, there is still a tremendous gap between proof-of-principle laboratory demonstrations and real-world applications where large quantities of well-designed micro-/nanostructures are required. Innovative designs and radical improvement in manufacturing technologies are both necessary. Yin will first introduce the group's recent advances in controlling light–matter interactions using nanomaterials and subwavelength optical structures, and then discuss how the insights on structure–function relationships could enable the scalable manufacturing of optical metamaterials for large-scale applications, such as passive radiative cooling.

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