Karena W. Chapman named 2015 MRS Outstanding Young Investigator for contributions to energy-relevant systems

Karena W. Chapman, a scientist in the X-ray Science Division of Argonne National Laboratory, has been named a 2015 Materials Research Society (MRS) Outstanding Young Investigator. Chapman was cited "for her contributions to understanding the coupled structure and reactivity of energy-relevant systems and for developing the incisive experimental and analytical tools needed to interrogate these complex materials systems." She will be presented with the award at the 2015 MRS Spring Meeting in San Francisco.

With established leadership in an emerging characterization field and a history of seminal developments and contributions on topical materials systems, Chapman has led the development of x-ray pair distribution function (PDF) methods, a rapidly growing and versatile tool capable of probing the atomic and nanoscale structure of materials beyond the limits of conventional crystallography, spanning crystalline, nanoscale, and amorphous materials, alike. Her current materials interests are focused on energy and span battery electrodes and electrolytes, catalysis, and porous framework materials for energetic gas storage and nuclear-waste capture.

Chapman received her BSc and PhD degrees in chemistry from The University of Sydney, Australia. Her doctoral research focused on structure–property relationships in cyanide-bridged open framework materials, including their anomalous thermo-mechanical properties (negative thermal expansion) and hydrogen gas storage. During this time, she employed a wide range of tools, including single-crystal methods, powder diffraction, and PDF methods.

Most recently, Chapman has made significant contributions to the area of chemical energy storage. She has developed *in situ* methodologies to examine the structure of batteries across a wide length scale—from atoms to electrodes—working to combine PDF with small-angle scattering, EXAFS, and imaging modalities to examine important phenomena related to ion/electron transport and structural transitions. Notable achievements include the first *in situ* PDF measurements, which required a new *operando* battery cell to be designed. These developments have had a major impact on a number of important materials systems, including lithium ion ($LiFePO_4$), conversion chemistries, and multivalent systems (e.g., Mg), and have shed new light on storage mechanisms and major issues facing batteries, including cycle life and safety.

Ali Javey named 2015 MRS Outstanding Young Investigator for contributions in integrating nanomaterials

Ali Javey, associate professor at the University of California–Berkeley, has been named a 2015 Materials Research Society (MRS) Outstanding Young Investigator. Javey was cited "for innovative contributions in integrating nanomaterials into device applications." He will be presented with the award at the 2015 MRS Spring Meeting in San Francisco.

Javey developed a novel contact printing strategy for depositing highly uniform, well-aligned, clean monolayer films of semiconductor nanowires with controlled density. His approach represents an implementation of the "bottom-up" paradigm that is general to the material, substrate, and dimensionality of structures. He used this approach to assemble three-dimensional nanoelectronic structures consisting of up to 10 vertically stacked layers of functional nanowire transistors, and novel multifunctional structures consisting of logic gates and nonvolatile memory in distinct, addressable layers. This work has opened up a unique area of nanoscience.

Using the contact printing process, his group demonstrated successful heterogeneous assembly of nanowires for an all-integrated image sensor circuitry in which hundreds of thousands of optically active CdSe and high-mobility Ge/Si nanowires are controllably assembled into arrays of functional circuit elements, demonstrating the versatility of the contact printing process and the unique functionality of nanowire materials. This sensor circuit integration presents the largest functional circuit array demonstrated to date based on any synthetic

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