

according to their simulations, trapping of different numbers of molecules occurs with different probabilities. The researchers discuss this fact in terms of the geometry of the tip. According to their modeling conditions, the most energetically preferred configurations of molecules around the tip correspond to either five particles—a tetragonal pyramid—or eight particles in which six form a hexagon in the plane of the tip and two are out of plane. The researchers said that the configurations and the number of particles are determined by the radius of the tip, molecule conformation, and the tip geometry among other factors.

The research team concluded that changing the pulling velocity enables control of the number of molecules transferred from the surface layer to the tip and vice versa.

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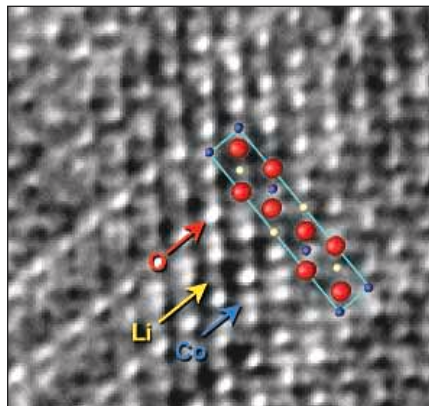
### Focal Reconstruction Produces TEM Images of Individual Lithium Atoms

In work that could aid the development of batteries for products from laptop computers to electric cars, an international team of researchers has taken images of individual atoms of lithium, a key element in state-of-the-art rechargeable batteries.

"The atomic resolution imaging of lithium atoms is a novel and significant achievement, with implications for better understanding not only of lithium-ion battery materials but of many other electroceramic materials as well," said Yang

Shao-Horn, an assistant professor at the Massachusetts Institute of Technology.

Shao-Horn and colleagues M.A. O'Keefe and E.C. Nelson from Lawrence Berkeley National Laboratory used a specially modified transmission electron microscope to simultaneously resolve columns



Experimental image of lithium atoms reconstructed from 20 component images obtained over a range of focus. The image shows the arrangement of lithium ions among cobalt and oxygen atoms in the battery material lithium cobalt oxide—strong white peaks occur at the positions of oxygen atom columns, strong fuzzy peaks at cobalt sites, and the weak white peaks show lithium positions. Reproduced with permission from *Nature Materials* 2 (7) (July 2003), p. 464; © 2003 Nature Publishing Group.

of lithium, cobalt, and oxygen atoms in the lithium battery material lithium cobalt oxide ( $\text{LiCoO}_2$ ). They accomplished this through focal-series reconstruction of the electron wave at the specimen exit surface (see figure).

As reported in the July issue of *Nature Materials*, the researchers obtained series of 20 differently focused images of individual crystals from a  $\text{LiCoO}_2$  powder sample synthesized and characterized by conventional x-ray diffraction in collaboration with colleagues L. Croguennec and C. Delmas from CNRS and the University of Bordeaux I. Using a reconstruction program and their measurements of the microscope parameters, the researchers worked backwards to assemble the focal series of images into one image that is a representation of the electron wave leaving the exit surface of the specimen. At the thin edge of a  $\text{LiCoO}_2$  crystal, this reconstructed experimental image matched the image previously predicted by a simulation program.

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. . . access the Materials Research Society Web site:

[www.mrs.org/gateway/matl\\_news.html](http://www.mrs.org/gateway/matl_news.html)

### News of MRS Members/Materials Researchers

**Reza Abbaschian**, Vladimir A. Grodsky Professor of Materials Science and Engineering at the University of Florida, has received the **Donald E. Marlowe Award** from the American Society for Engineering Education in recognition of his extraordinary vision and leadership in administration, education, and research, and for significant ongoing contributions to engineering education.

**Kenneth T. Barry** has been named President of Unaxis Semiconductors. Barry brings with him more than 15 years of global semiconductor experience.

**Stephen P. Ellis**, laboratory manager at Ecolchem, Inc., has been awarded a **2003 ASTM International Award of Merit** for his technical contributions to the objectives of ASTM Committee D19 on Water.

**Helen Garnett**, presently chief executive of the Australian Nuclear Science and Technology Organisation (ANSTO) and a representative to the United Nations International Atomic Energy Agency, has

### Jeff Wadsworth Named Director of Oak Ridge National Laboratory



UT-Battelle has announced the selection of Jeff Wadsworth as director of the U.S. Department of Energy (DOE) Oak Ridge National Laboratory (ORNL). He succeeds Bill Madia, who has joined Battelle as Executive Vice President of Laboratory Operations. Wadsworth, who began his new duties on August 1, joins ORNL after years of distinguished service as a senior leader at Lawrence Livermore National Laboratory, as well as service at Battelle's world headquarters in Columbus, Ohio as a senior executive in areas such as DOE science programs, technology transfer, and homeland security.

"Jeff [Wadsworth] is an internationally respected scientist, outstanding leader, and innovator in such fields as materials science and homeland security," said Raymond L. Orbach, director of DOE's Office of Science.

Wadsworth holds BS, PhD, and DMet degrees in metallurgy from Sheffield University. In 1987, he was elected a Fellow of the American Society for Metals, and in 2000 a Fellow of The Minerals, Metals, and Materials Society. Most recently, in 2003, he was elected a Fellow of the American Association for the Advancement of Science for "distinguished contributions in developing advanced materials and superplasticity, and in determining the history and origins of Damascus and other steels, and for broad scientific leadership supporting national security."

been appointed as Vice-Chancellor of the new Charles Darwin University at Northern Territory University in Australia. She will begin in October 2003.

**Yuri Gogotsi**, professor of materials science and engineering and associate dean of the College of Engineering at Drexel University, has been chosen to be the director of the newly formed A.J. Drexel Nanotechnology Institute (DNI). The DNI is being established as a university research center to conduct and coordinate education and basic and applied research in the field of nanotechnology and nanostructured materials.

**Raymund Singleton**, president of

Singleton Corp., has been awarded the **2003 ASTM Award of Merit** in honor of his service contributions to ASTM Committee G01 on Corrosion of Metals.

**Stuart A. Solin**, professor of physics at Washington University in St. Louis, has been awarded an honorary doctor of science degree from Purdue University. Solin, a Principal Editor of the *Journal of Materials Research*, is a leading figure in condensed-matter physics and materials science, focusing on fundamental physical phenomena in ordered and disordered solids.

**Shyamkumar Surthi**, a postdoctoral fellow at North Carolina State University,

has received the **2001–2002 Outstanding Dissertation Award** from the College of Engineering at the University of Alabama in recognition of his dissertation titled "Integration of Colossal Magnetoresistive Materials with Ferroelectrics."

**Jerry M. Woodall**, D. Baldwin Sawyer Professor of Electrical Engineering at Yale University, was awarded the **National Materials Advancement Award** from the Federation of Materials Societies for his work in advancing the effective and economic use of materials and the field of materials science and engineering in general.

The **U.S. National Academy of Sciences** has announced the election of 72 new members and 18 foreign associates in recognition of their distinguished and continuing achievements in original research, including:

**Praveen Chaudhari**, director of Brookhaven National Laboratory;

**Herbert Kroemer**, professor of electrical engineering and materials at the University of California, Santa Barbara (Nobel Prize in physics, 2000), as a foreign associate;

**Sidney R. Nagel**, professor of physics, University of Chicago;

**William D. Nix**, Lee Otterson Professor of Engineering Emeritus in the Department of Materials Science and Engineering at Stanford University;

**Ryoji Noyori**, professor of chemistry and director of the Research Center for Materials Science at Nagoya University, Japan (Nobel Prize in chemistry, 2001), as a foreign associate;

**Robert J. Silbey**, professor of chemistry and dean of science, Massachusetts Institute of Technology;

**Bruce D. Smith**, senior scientist and curator of North American archaeology, director of the archaeobiology program, Smithsonian Institution;

**Dale J. Van Harlingen**, professor of physics, University of Illinois at Urbana-Champaign; and

**Eli Yablonovitch**, professor of electrical engineering, University of California at Los Angeles.

The **Society of Plastics Engineers (SPE)** has announced the recipients of its 2003 awards presented at the Society's 61st Annual Technical Conference:

**Glen L. Beall**, president of Glenn Beall Plastics, Ltd., has received the **2003 SPE International Award** for his plenary presentation titled "The Importance of Plastic Production Design";

**Robert A. Weiss**, the A.T. DiBenedetto Distinguished Professor of Engineering at the University of Connecticut, has received the **2003 SPE Plastics Engineering/Technology Award**; Weiss has centered his research on ionomers, liquid-crystalline polymers, and polymer blends;

**Jimmy Carter**, former U.S. President, has received the **2003 SPE John W. Hyatt Award** for administering the use of a special nylon monofilament cloth filter that has largely eradicated Guinea worm disease by filtering out the worm's larva from drinking water;

**Donald G. Baird**, the Harry C. Wyatt Professor of Chemical Engineering and co-director of the Center for Composite Materials and Structures at Virginia Polytechnic Institute and State University, has received the **2003 SPE Research Award**; Baird is known for his work in polymer rheology and its application to polymer processing, especially for liquid-crystalline polymers;

**Charles L. Beatty**, professor in the Materials Science and Engineering Department at the University of Florida,

has received the **2003 SPE Education Award**; Beatty was instrumental in establishing a plastics engineering curriculum at the University of Florida and has developed eight core polymer courses for undergraduate and graduate students including specialty courses on plastics product design engineering and rapid prototyping;

**William S. Stavropoulos**, Chair of the Board of Directors, President, and CEO of the Dow Chemical Co., has received the **2003 SPE Business Management Award**.

The **State University of New York** has announced the recipients of its **SUNY Chancellor's Awards for Excellence**. The following Alfred University students received the award for their academic success at the School of Ceramic Engineering and Materials Science:

**Carlos C. Chang**, an Alfred University December 2002 graduate, received his BS degree in ceramic engineering, as well as a Bachelor of Fine Arts degree from Alfred University's School of Art and Design;

**Shawn M. Allan** received his BS degree in materials science and engineering from Alfred University in December 2002;

**James F. Carroll III** received his BS degree in ceramic engineering from Alfred University in May; and

**Nathanael Lawton** received his BS degree in materials science and engineering from Alfred University in May. □

## **MRS** Outstanding Young Investigator Award

**Nomination Deadline—October 1, 2003**

The **MRS Outstanding Young Investigator Award** recognizes outstanding, interdisciplinary scientific work in materials research by a young scientist or engineer. The award recipient must also show exceptional promise as a developing leader in the materials area.

For a nomination form, or additional information on rules and eligibility, visit [www.mrs.org/awards/OYI.html](http://www.mrs.org/awards/OYI.html)