caused by the tumbling of rods about their short axes, this result indicates that the trapping causes suppression of rotational diffusion along the short axes, so that the long axes of the rods are oriented relative to the trapping laser polarization. Also, clear signs of stably trapped rods are seen at longer times, with trapping times that follow the expected Kramer's escape rate. According to the researchers, the selectivity of optical forces to the plasmon resonance frequency could allow setting up an array of optical traps to separate metal nanoparticles of different shapes.

TUSHAR PRASAD

Silicon's Role in Photonics May be Enhanced by Nanowires and Nanocones

Silicon, the element responsible for most of the advances made in computer and electronics technology, has played a comparatively lesser role in photonic and optical devices. Although the detection of light by silicon can be very efficient, depending upon wavelength, the emission of light is very inefficient because of the indirect energy bandgap. Optical gain has been obtained from silicon only by using nanocrystals or stimulated Raman scattering. While Raman signals can be obtained from bulk crystals of silicon, the Raman scattering efficiency from a nanowire can be nearly 1000 times larger than from the bulk, depending on the diameter of the nanowire, as reported recently by L. Cao and colleagues from Drexel University.

As discussed in the April 21 issue of *Physical Review Letters* (#157402; DOI: 10.1103/PhysRevLett.96.157402), graduate student Cao and professors J.E. Spanier and B. Nabet studied nanowires with widths just below and above 100 nm, sizes which are larger than those that many researchers have been investigating. The research team also examined the effects of the variable diameter accessed when studying nanocones. The researchers prepared solid silicon nanocones (with diameters ranging from several micrometers at the base to <5 nm at the tip) and silicon nanowires of selected diameters (ranging from ~130 nm to ~1 μm) by metal-catalyzed chemical vapor deposition. The researchers studied Raman scattering from the nanocones, nanowires, and a bulk single-crystalline Si(100) wafer.

Using Raman scattering spectroscopy and scanning electron microscopy (SEM) analysis, the researchers explained their experimental results in terms of strong resonant enhancement of the incident electromagnetic field inside the tiny cross section of the nanostructures when "the wavelength of the incident field is commensurate with that of an electromagnetic eigenmode of the particle, which depends upon its size and on the refractive indices of the particle and the surrounding medium." The researchers measured the Raman signal obtained from excitation at 514.5 nm (Ar^+ laser), 632.8 nm (HeNe laser), and 785 nm (diode laser) wavelengths. The results were consistent with their model calculations based on the dimensions of the structures observed by SEM as well as the excitation wavelengths and the polarization state of the incident light.

The researchers said that the results open the possibility of engineering silicon nanostructures to enhance the coupling of light for photonic and sensing applications.

News of MRS Members/Materials Researchers

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

Chunli Bai, Chinese Academy of Sciences;

Jillian F. Banfield, University of California, Berkeley;

Paul F. Barbara, University of Texas at Austin;

David M. Ceperley, University of Illinois at Urbana-Champaign;

Luiz Davidovich, Federal University of Rio de Janeiro;

Mark E. Davis, California Institute of Technology;

William A. Eaton, National Institutes of Health;

Joachim Frank, New York State Department of Health;

Leslie Greengard, New York University;

Harold W. Kroto, Florida State University; and

E. Ward Plummer, University of Tennessee, Knoxville.

News of MRS Corporate Affiliates/Materials Institutions

The **Alabama A&M University Research Institute (AAMURI)** Mentor–Protégé projects received three **Nunn–Perry Awards** at the annual Department of Defense Mentor–Protégé Conference in March. The AAMURI team consisted of SAIC, Boeing, Kemco Manufacturing, Arrowhead Contracting Inc., and Ellis Environmental Group. AAMURI, furthermore, has been selected by the Defense Information Systems Agency (DISA) as the prime contractor for the DISA Minority Institutions Technical Support Services (MITSS II) project; AAMURI will manage the $16 million contract over the next four years with the assistance of AAMURI partners.

FEI has received four awards for the design, performance, and innovation of its Titan™ scanning transmission electron microscope (Titan S/TEM). Honors include the **iF Design Award** bestowed by the International Design Forum (iF) in Hanover, Germany, and the **Innovative Product of the Year Award** presented by the Oregon Tech Awards in the United States. The Titan S/TEM was also selected as one of the **Top Products of 2005** by *Solid State Technology* magazine and one of the **Greatest Hits of 2005** by *MICRO* magazine.

Flowserve Corp. has received a **certificate of appreciation** from the National Aeronautics and Space Administration (NASA) for custom-engineering new valves for the Johnson, Marshall, and Stennis Space Centers.

The **Mitsubishi Chemical Corporation** of Tokyo and the **University of California, Santa Barbara (UCSB)**, announced in February that they are extending their research and education alliance. Under the terms of the new agreement, Mitsubishi Chemical will invest between $8.5 million and $10 million at UCSB over the next four years. The funds will support research as well as the administration of the Mitsubishi Chemical Center for Advanced Materials (MC-CAM) center. The total also includes a philanthropic contribution of $800,000 to permanently endow new graduate fellowships in materials and chemical engineering.

Structured Materials Industries Inc. (SMI) has been awarded a **Phase II SBIR** (Small Business Innovation Research) grant by the Department of Energy to develop *p*-type doping of ZnO. □

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