

tissue papers with well-defined lutein concentrations were attached. Strong and clearly resolved Raman signals were measured with the intensity varying linearly with lutein concentration. Further experiments were carried out on the healthy eye of a volunteer. In these measurements the laser power was 300  $\mu$ W, the exposure time 1 s, and the spot diameter on the macula maintained at about 1 mm. This corresponds to a dose of  $\sim$ 38 mJ/cm<sup>2</sup>, a value which is about 400 times lower than the ANSI maximum permissible safe dose of 15.5 J/cm<sup>2</sup>.

"Raman signals are typically of very weak intensity and therefore we usually need to use relatively powerful lasers in combination with sophisticated light collection and analysis instrumentation," said Gellermann. "As physicists, we're trained to not to stare into lasers. But, when our colleagues in ophthalmology pointed out the strong need to measure macular pigments in a noninvasive and objective way, we decided to take this unique approach and it has worked out very well."

CORA LIND

### Silver Selectively Deposited on Ferroelectric Barium Titanate Domains Enable Creation of Metallic Patterns with Submicron Features

In the February issue of *Chemistry of Materials*, Jennifer L. Giocondi and Gregory S. Rohrer from the Department of Materials Science and Engineering at Carnegie Mellon University reported that silver had been selectively deposited on some specific ferroelectric BaTiO<sub>3</sub> domains during photochemical reduction of aqueous Ag<sup>+</sup>. This domain decoration-related finding makes it possible to create metallic patterns with submicron features.

In this study, the photochemical reduction was accomplished by exposing the surface of BaTiO<sub>3</sub> polycrystals to a 300-W Hg lamp for 3 s in the presence of a 0.115 M aqueous AgNO<sub>3</sub> solution. The sample, after rinsing and drying, was imaged using atomic force microscopy (AFM). By comparing the topographic AFM images of the samples before and after the reduction reaction, silver appeared to be selectively deposited on certain regions of the surface that corresponded to specific domains. Photochemical reduction of silver on BaTiO<sub>3</sub> single crystal was conducted and acid-etching techniques were applied by the researchers in order to identify the domains. The AFM images demonstrated that the up domains, where the positive ends of the dipoles point at the surface, etched the fastest and accumulated the most silver. The down domains were the least favored for

the silver deposition. The researchers believe that this selective deposition of silver in up domains was not due to the preferential adsorption of Ag<sup>+</sup> cations before reduction, but to the influence of the static dipolar fields in the domains. The field in up domains pushed electrons to the surface where they could reduce silver, while the field in down domains urged electrons away from the surface

where they were unable to react with the silver cations.

According to the researchers, this study provides a potential approach to "creating metallic patterns with submicron features." They said that this highly selective deposition technique would make it possible to "predefine a pattern and then metalize the surface" in the future.

XIANLONG GE

## Send Letters to the Editor to:

Editor, *MRS Bulletin*

Materials Research Society, 506 Keystone Drive  
Warrendale, PA 15086-7573 USA

Fax: 724-779-8313; E-mail: Bulletin@mrs.org

Letters must include your full name, institution, address, phone number, and e-mail.



### Applied Statistical Physics Molecular Engineering Conference ASTATPHYS-MEX-2001 Cancun, Mexico, July 23 - 27, 2001

Dear Colleague:

It is my pleasure to invite you to attend/or contribute with an oral or poster presentation to the "First International Conference on Applied Statistical Physics: Molecular Engineering (ASTATPHYS-MEX-2001)", which will be held in Cancun, Mexico on July 23-27, 2001.

The aim of the Conference is to gather applied and basic scientists interested in the design and understanding of nano-structures, nano-circuits and gene-delivery. Applications to catalysis, electronics and gene-therapy are particularly sought.

The Conference topics will be: molecular catalysis, nano-tubes and fullerenes, nano-structures, nano-circuits microlithography, supramolecular materials, polymers, gene-delivery, self assembling, confined complex fluids, ionic channels, dynamics of confined fluids, phase transitions and layered materials.

What these topics have in common is self-assembling of supramolecular materials and/or molecular confinement, at micro or nano-scale level. The approach can be, for example, chemical synthesis, ATM, electronic microscopy, characterization, evaluation and prospective experiments, solid and soft condensed matter physics, quantum physics and chemistry, and equilibrium and non-equilibrium statistical mechanics. I hope that the various Conference sessions will promote fruitful discussions among pure and applied scientists and technologists from all over the world. We all can help to identify key areas of opportunity to enhance our understanding of nano-science.

The program will have both invited and contributed presentations. Additionally, beach-level poster sessions, where informal discussions might be particularly favored, will take place some of the afternoons. During the Conference, there will be a Technological Exhibition, EXPO-ASTATPHYS-MEX-2001, where state-of-the-art experimental equipment, computer software and pharmaceutical products will be shown.

The excellent facilities of the Marriott Casamagna and the Sheraton and Westin Hotels in Cancun together with the turquoise-blue beaches of the Mexican Caribbean will offer an excellent natural frame to all of the above activities. If you would like to give a talk or poster presentation, please send us a title of your contribution to: <http://www.aspm2001.com.mx>

Sincerely yours,

Marcelo Lozada-Cassou  
Conference Chairman

Sponsored by



Circle No. 12 on Inside Back Cover