

Interface Chemistry and Engineering
Formerly Interfacial and Processing Sciences

News Notes

December 20, 2001

**Environmental and Molecular Sciences Laboratory
Pacific Northwest National Laboratory**

News Notes, established to help keep our Users and others who have had a connection with us up-to-date on activities, events, capabilities, and interesting results, including short summaries of the work of users.

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This issue includes:

- **Holiday and New Year's Greetings**
- **Chuck Peden—New Associate Director for IC&E**
- **In the News**
- **FY02 Annual Report Ready for Distribution**

Holiday and New Year's Greetings

The year 2001 brought chaos and change for many people around the world. It seems especially important in these times to maintain contact with the many friends and Users of IC&E. We wish you all a very happy holiday season, and a successful, healthy, and rewarding new year. This News Notes, the first in many months, will highlight some IC&E related work that was noted in the technical and popular press.

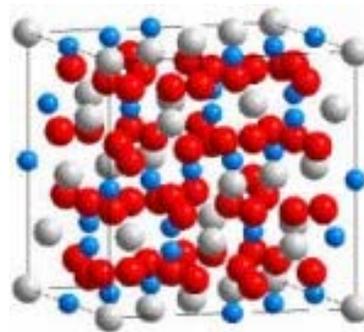
Chuck Peden — Named New Associate Director for IC&E

After two practice rounds as acting AD and some arm-twisting, Chuck Peden accepted the position of EMSL Associate Director for IC&E, after having served as a Technical Group Leader in IC&E or precursor groups for eight years. He has an international reputation for his research studies of the surface and interfacial chemistry of inorganic solids in general and the heterogeneous catalytic chemistry of metals and oxides in particular. He has a B.A. in Chemistry from California State University, Chico, and an M.S. and Ph.D. in Physical Chemistry from the University of California at Santa Barbara.

In the News

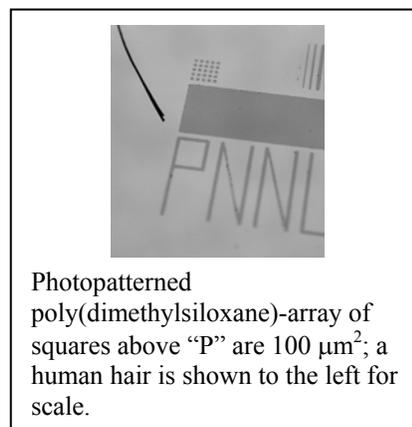
- Work by Glen Fryxell and Yuehe Lin on Cs sorption on SAMMS (self assembled monolayers on mesoporous silica) was featured in the Oct. 15 issue of *Chemical & Engineering News*.

- The Office of Science names top 101 discoveries, including one by IC&E staff member Bill Weber. The discovery by William J. Weber and Rod Ewing of the University of Michigan that gadolinium zirconate materials are resistant to radiation damage was one of the five accomplishments by EMSL staff to be named by the Office of Science in their list of the top 101 most important scientific discoveries in the past 25 years. Using simulation techniques, Weber and Ewing discovered that gadolinium zirconate materials resist radiation damage for millennia. These compounds absorb energy through the rearrangement of atoms within the crystal structure without becoming amorphous or structurally unstable—making them superior to the titanate materials being considered internationally for plutonium immobilization.



- Work by EMSL users Ernesto Paparazzo and Peter Northover conducted in collaboration with Scott Lea and Don Baer has received attention in an AIP news release and in *Physics Today*. Ernesto Paparazzo brought several types of samples on his visit to EMSL and work on a 3000-year-old Bronze-Age belt from Syria resulted in a publication and attention in the Physics Update part of *Physics Today* (October 2001) and in *Physics Updates News* (554 #2, August 30, 2001) an AIP online newsletter.
- A recent article in *Analytical Chemistry* highlighted work by IC&E scientist Cynthia Bruckner-Lea and a team of chemists, biologists and engineers to develop the Biodetection-Enabling Analyte Delivery System (BEADS). BEADS, used for environmental testing, is a briefcase-sized, automated immunoassay system in which analytes specifically bind to the surface of microbeads as the sample flows over them. Because the microbeads are used only once, there is no sensor fouling, and complex sample matrixes can be analyzed. Other advantages include low cost, real-time analysis and automated handling of multiple samples.
- Scott Chambers' work on room temperature magnetic semiconductors received considerable attention including a note in the *New York Times* and a short news item on the work in an issue of *Information Week*. The item can be found in the magazine's Innovation section at <http://www.informationweek.com/thisweek/story/IWK20010809S0008>.

- PNNL leaves its mark in the latest catalog from Gelest on Metal-Organics for Material and Polymer Technology. In recognition of the exciting work being done by IC&E staff in the EMSL, Gelest asked to cite an invited article by Dr. Jay Grate that appeared in the November 2000 issue of *Chemical Innovation* (volume 30:11, page 29) and to show an image of a photopatterned polymer that appeared in the article. The PNNL initials are shown in the image. The photopatterning was done in the EMSL clean room by Mr. Glen Dunham, using an approach set out by Dr. Grate. The method uses a photoactivatable catalyst in the film formulation. PNNL has filed a patent application on this approach.



Photopatterned poly(dimethylsiloxane)-array of squares above "P" are $100 \mu\text{m}^2$; a human hair is shown to the left for scale.

- In a June 29 press release, R&D Magazine announced its top 100 winners for this year's award in recognition of groundbreaking technology advances. Lou Balmer-Miller (former PNNL/IC&E staff member), Russell Tonkyn (PNNL), Stephan Barlow, Alexander Panov (PNNL/IC&E post-doc), John Hoard (Ford Research Laboratory), Galen Fisher (Delphi Research Labs), Suresh Baskaran (PNNL), and Darrell Herling (PNNL) received the award at the October 2001 ceremony for "Catalyst Materials for Plasma-Catalysis Engine Exhaust Treatment". The IC&E-developed technology was nominated for the award by Chuck Peden. Chuck continues as the Principal Investigator on this program with funding from the Department of Energy/Energy Efficiency and Renewable Energy/Office of Transportation Technology.
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- Don Baer was a guest on KUOW's "Weekday" show in Seattle. He appeared along with Viola Vogel of the University of Washington to discuss advancements in nanoscience and nanotechnology. KUOW is Seattle's National Public Radio affiliate and has a wide audience. You can listen to the segment if you have Real Player at <http://128.208.34.102:8080/ramgen/weekday/wkdy011012-a.rm?start='00:06:57.000'>. In addition, Don was quoted extensively in a recent article on nanoscience in the *Seattle Post-Intelligencer*. The article attempted to put into perspective the promise of nanoscience. He noted there has been a tremendous amount of hype surrounding this branch of science and said any rewards of the research are still a ways down the road. Don was also interviewed for a *Seattle Post Intelligencer* article, entitled "UW, Richland lab join in brave new world of nano," *Seattle Post-Intelligencer* (September 10, 2001).
 - The Sept/Oct issue of *Sharing the Excitement of Science* has been distributed to state and community leaders. It includes stories about PNNL science contributions to Motorola's semiconductor advances, the partnership with Oregon Universities, water and energy, habitat mapping to preserve the environment and Reinhold Mann. It is available at <http://www.pnl.gov/sharingscience>.

Annual Report Ready for Distribution

The 2000 IC&E annual reports are ready for distribution. If you would like to receive a copy, please send your email request to Terry Law at terry.law@pnl.gov.

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EMSL and IC&E Information and EMSL Proposals (<http://www.emsl.pnl.gov>)