January 2008

Cleanroom News

Updated Procedures for Work Requests
This month we have worked to make project requests and tracking more efficient. To request work done at our facility, we have developed a Project Request Form. This includes requests for prototyping by cleanroom staff, training, materials, and cleanroom usage by IPP member companies. The basic procedure is outlined below:

1. Download the Work Request Form for IPP members and external users. This form is available on the IPP website: http://www.lci.kent.edu/ipp/07/requestform.doc
2. Fill out Part 1 with details of your request, per form instructions.
3. Return form to Doug Bryant or Bentley Wall for review. As necessary, they will contact you for further details in order to generate an accurate quotation. This step may take up to 5 days for complex requests.
4. Cleanroom staff will return the form to you with step 2 complete. This includes a quotation for the work to be performed, and a tentative timeline for completion. A project number for your request will be included, as well.
5. If you wish to proceed with the work, sign the form at step 3 and return to cleanroom staff.
6. You can check the status of your project on the project update website, http://lcdrf.lci.kent.edu/ The site is updated daily by 10AM.

Equipment Update
Several tools in the LCDRF will be undergoing maintenance and upgrades, or have recently completed maintenance:

Dr. Qihuo Wei’s Oxford 80+ reactive ion etcher (RIE) system was installed early in October. An Oxford engineer will return in a few weeks for process training. Standard processes on this tool will be etching of Si, SiO2, and silicon nitrides. Other processes are possible using the SF6 and CHF3 gases (along with Ar or O2).

The Oriel Mask Aligner has undergone lamp replacement / alignment and stage planarization. This should improve performance with high resolution photolithography. Camera positioners are also being upgraded for easier and higher accuracy alignment.

The Technics PlanarEtch II plasma etcher is currently down. No work is planned on this machine in the next month. If you have interest in using this machine, please contact Doug Bryant; if there is a need for it, we can bump this up in priority.

The Clean Air Systems Wet Bench has been gutted and is being rebuilt for maximum efficiency in working with 6” and 7” glass. Kevin Ballard, an undergraduate cleanroom assistant, has nearly
completed rebuilding the work surface to accommodate new process tanks, which are expected to arrive in late January. Installation in the cleanroom will likely take place in February.

**LCI NEWS**

**Spring 2008 LCI Seminar Schedule**

Jan. 14, Dr. Shanju Zhang, School of Polymer, Textile and Fiber Engineering, Georgia Institute of Technology, "Liquid Crystalline Self-Assembly in Bio and Nano Materials"

Jan. 16, Dr. Chanjoong Kim, Department of Physics and SEAS, Harvard University, "Perturbed Dynamics of Soft Materials: Colloidal glasses and gels under stress"

Jan. 30, Dr. Ruben Ramos Garcia, National Institute of Astrophysics, Optics and Electronics, Mexico, "Nonlinear phase contrast microscope using dye-doped liquid crystals"

Feb 4, (4:00 PM, Monday) Prof. B. Zalar, Department of Solid State Physics, J. Stefan Institute, Ljubljana, Slovenia, "Some current topics in liquid crystal elastomer research: deuteron NMR study of paranematic-nematic transition criticality and piezoresistivity of nanoparticle-reprocessed networks"

Feb. 6, Prof. Richard J. Spontak, Department of Chemical and Biomolecular Engineering, North Carolina State University. “Molecular Design of Nanostructured Block Copolymers as a Route to High-Performance Electroelastomers”

Feb. 20, Prof. Sasha Govorov, Department of Physics, Ohio University, “Exciton-plasmon interaction in coupled semiconductor and metal nanocrystals”

March 5, Prof. Linda Hirst, Department of Physics, Florida State University, Title: TBA.

March 7 (12:00 PM, Friday), Prof. Kenji Urayama, Department of Material Chemistry, Kyoto University, "Stimulus Response of Swollen Nematic Elastomers"

March 19, Prof. Mark Warner, Cavendish Laboratory, University of Cambridge, UK, Title: TBA

April 2, Prof. Vladimir M. Agranovich, The NanoTech Institute, The University of Texas at Dallas, and Institute of Spectroscopy, Russian Academy of Science, "Negative refraction, polaritons and negative group velocity"

April 16 Prof. Matthew A. Glaser, Department of Physics, University of Colorado, “Nanophase segregation and frustration: chirality, splay, and curvature in bent-core smectics”

April 23 Prof. Robert Austin, Department of Physics, Princeton University, Title: TBA

April 30 Prof. Paul Goldbart, Department of Physics, University of Illinois at Urbana-Champaign, Title: TBA

Chien named SPIE Fellow
Kent State University Chemical Physics Professor Liang-Chy Chien has been promoted to Fellow of SPIE. He is recognized for his research on liquid crystals as materials for optical and electrooptical applications.

Liquid Crystal Institute (LCI) Director Oleg Lavrentovich nominated Chien for the fellowship and explained its significance: “It underlines the importance and international recognition of research performed by scientists at the LCI, in particular, by L.-C. Chien.” The nomination was also supported by Prof. Shin-Tson Wu, CREOL, Univ. of Central Florida, and Dr. James Grote of USAF AFRL/MLPS.

Prof. Chien is an accomplished professor, researcher and author of book chapters and publications including more than 120 papers in peer-reviewed journals with international circulation and has given more than 100 invited presentations at international and national conferences. He edited a book and wrote chapters to five other books; has numerous SPIE publications and proceedings; has authored and co-authored 17 patents and disclosures, including the ground-breaking inventions related to polymer-stabilized and polymer-dispersed liquid crystals.

“He is the world-leading expert in the field of hybrid materials for optical applications, namely, in polymer-liquid crystal composites,” Lavrentovich said. “As a co-inventor of several polymer-stabilized liquid crystal technologies for electro-optical and optical applications such as reflective cholesteric displays, spatial light modulators and switchable optical elements, his groundbreaking research helped to establish the modern state of polymer-dispersed liquid crystals and polymer-stabilized liquid crystals. He is currently designing new approaches to fabricate liquid crystals with record-setting optical and dielectric anisotropy. His other area of accomplishment is the development of flexible liquid crystal displays.”

Prof. Chien’s service to the community and SPIE is multifaceted. He chaired the annual "Liquid Crystal Day" at the LCI (2004, 2005), "PolymerOhio" workshop (2005), also held at the LCI, a symposium on Nanostructured liquid crystal materials and applications (2003) and several SPIE Conferences. He was the editor of seven SPIE proceedings based on these conferences that he has chaired. Recently, he was elected to be the Vice Chair (2009) and Chair (2011) of the Gordon Research Conference on Liquid Crystals. And, he will chair a session at the upcoming SPIE Conference Photonics West 2008: Emerging Liquid Crystal Technologies III from January 20-22, 2008.

SPIE is an international membership society, serving scientists and engineers in industry, academia, and government, as well as companies producing leading-edge products. SPIE constituents work in a wide variety of fields that utilize some aspect of optics and photonics, which is the science and application of light. http://spie.org/ 

For more information about the KSU LCI and CPIP, visit www.lci.kent.edu.

Jan. 9, 2008 -- Cleveland Plain Dealer article highlights LCI partnership with the Cleveland Botanical Garden: http://blog.cleveland.com/business/2008/01/greenhouse_experiment_to_use_1.html

International Research Experience for Students (IRES) will kick-off this summer
Professor Antal Jakli recently received NSF funding to lead a program that will provide nine U.S. KSU graduate and undergraduate students an opportunity to research liquid crystals in a foreign country during the next three summers. The students will be involved in collaborative work in timely and important specific areas of liquid crystal science, including liquid crystal fibers, liquid crystal gels and elastomers, and liquid crystals with biological importance. This summer’s participants include CPIP students Jake Fontana, Stefanie Taushanoff, and Nick Diorio. Fontana will visit the Research Institute for Solid State Physics and Optics of the Hungarian Academy of Sciences in Budapest, Hungary, hosted by Prof. Istvan Janossy. Taushanoff will visit the Department of Materials Sciences of the University of New Lisbon in
Lisbon, Portugal hosted by Prof. Helena Godinho. Diorio will visit the Institute of Experimental Physics, Otto-von-Guericke University of Magdeburg Germany hosted by Professor Ralf Stanarius. To learn more, visit: http://www.lci.kent.edu/crelic_ires/index.html.

Recent Publications by Oleg D. Lavrentovich

Please let us know if you would like more detailed information about any activities at the LCI.

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