University of Connecticut
Institute of Materials Science

IMS Associates Program Newsletter

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Ramprasad Awarded Prestigious Humboldt Fellowship

Ramamurthy ("Rampi") Ramprasad
Associate Professor
Chemical, Materials & Biomolecular Engineering

(From eMaginations, University of Connecticut, School of Engineering. See http://www.engr.uconn.edu/rampivonhumboldt.php for the complete story)

Dr. Ramamurthy ("Rampi") Ramprasad, an associate professor in the Chemical, Materials & Biomolecular Engineering Department *and member of IMS* (ed.), has been awarded an Alexander von Humboldt (AvH) Foundation Fellowship. The award will enable him to conduct research at the Fritz-Haber-Institut of the famed Max Planck Society, in Berlin, Germany.

Dr. Ramprasad plans to spend a full sabbatical year at the Fritz-Haber-Institut commencing in the fall of 2010. The AvH Foundation promotes academic cooperation between German researchers and top scientists and scholars from across the globe. The organization's fellowships and awards allow recipients to conduct

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Shaw Awarded Three NSF Grants in 2009

Dr. Leon Shaw
Professor, Chemical, Materials & Biomolecular Engineering (CMBE)

from the School of Engineering News and Events, by Kate Kurtin, for the complete article see: http://www.engr.uconn.edu/shawnsfgrant.php

His work in the red-hot area of nanotechnology has sparked three NSF-funded research awards for Dr. Leon Shaw, a professor in the Chemical, Materials & Biomolecular Engineering (CMBE) department *and member of IMS (ed.).*

Of the three, one marries nano-materials with biomedical engineering. Working with Dr. Yong Wang, also of CMBE, Dr. Shaw will be developing a titanium/hydroxyapatite orthopedic implant designed to improve implant

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Inside this issue:

UConn Engineering Captures Major Educational Awards

from the School of Engineering News and Events, for the complete article see:
http://www.engr.uconn.edu/gaann2009.php

The School of Engineering has captured four U.S. Department of Education grants aimed at enhancing the nation's technological competitiveness. The three-year grants were made under the agency's Graduate Assistance in Areas of National Need (GAANN) program. The grant support, paired with additional matching funds, totals nearly $1 million per year and will support approximately 30 to 35 graduate students annually.

UConn provost Peter Nicholls hailed the news, saying "I congratulate the UConn teams on their remarkable success. The GAANN program is an important and prestigious one, and we are excited by the prospect of enlarging our engineering graduate programs to address strategic research and education in critical areas of science and technology." The GAANN program provides fellowship grants to support U.S. citizens as they pursue their doctoral degrees in fields deemed to be "areas of national need." Students from traditionally underrepresented populations, including women and minority populations, are a particular focus of the GAANN program.

Dr. Mei Wei, Associate Professor of Chemical, Materials & Biomolecular Engineering (CMBE)

The winning multidisciplinary awards included: A Storrs-UConn Health Center collaboration headed by Mei Wei, an associate professor in the Chemical, Materials & Biomolecular Engineering Department, and Jon Goldberg and Liisa Kuhn of the UConn Health Center's Center for Regenerative Medicine & Skeletal Development *(all members of IMS, ed.)*, to support students conducting research in the area of biomaterials for tissue regeneration.

Other awards were, Mun Choi, Dean of Engineering, for research in advanced energy and environmental technoloiges; Reda Ammar, department head and professor of Computer Science & Engineering, for research in advanced computing targeting biomedical informatics and underwater sensor networks; and John Chandy, associate professor of Electrical & Computer Engineering, for research in advanced computing targeting security to strengthen financial, communications, transportation and defense systems.

Focus on Research: Mei Wei

In each issue of this newsletter we profile one of the active research areas at IMS. In this issue we focus on the research being led by Mei Wei, Associate Professor in Chemical, Materials & Biomolecular Engineering (CMBE).

Prof. Wei received her B. Eng. in Metallurgy and Material Sciences in Shenyang Polytechnic University, China in 1990. She earned both her master's and Ph.D. degrees in the School of Material Sciences and Engineering and Graduate School of Biomedical Engineering, the University of New South Wales, Australia in 1994 and 1998, respectively. In 1998, she was awarded JSPS (Japan Society for the Promotion of Science) fellow and joined one of the world leading biomaterial research groups in Kyoto

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Piezoelectric Materials and Devices

fromCoMBinE, for the complete article see http://www.cmbe.engr.uconn.edu/PDFs/CoMBinE%20Summer%202009%20.pdf, p. 23.

Associate professor George Rossetti of Chemical, Materials & Biomolecular Engineering (CMBE *and member of IMS, Ed.*) and his team are developing new compositional families of piezoelectric ceramics that efficiently interconvert electrical and mechanical energy and find numerous applications in solid-state devices for actuation, sensing and energy harvesting. Materials with the highest electromechanical coupling efficiencies and greatest piezoelectric response tend to be found in multi-component perovskite-structured oxide systems that display complex hierarchical microstructures with features having characteristic dimensions ranging from just a few nanometers up to fractions of a millimeter.

An important element of Dr. Rossetti's research concerns the development of a phenomenological theory that can reproduce the generic phase diagram topologies of these systems and can be used to understand how microstructure evolution is influenced by the time-temperature-transformation history experienced during processing. Using this theory, Dr. Rossetti and his collaborators have found it possible to explain why specific microstructural features are observed only in particular regions of these phase diagrams, providing new insights into how to tailor materials chemistry and processing to achieve properties that are optimized for device applications. His research on this topic is currently being applied to the development of high power sonar projectors under a University-Laboratory Initiative program sponsored by the Office of Naval Research, and to the processing of materials for anhysteretic actuators under a Short Term Innovative Research project supported by the Army Research Office. Dr. Rossetti also receives support from the Department of Homeland Security as a participant in UConn's National Transportation Security Center of Excellence. Working as part of a team with CMBE professors Rainer Hebert and Bryan Huey and Civil and Environmental Engineering professor Jeong-Ho Kim, research is underway to design and fabricate novel hybrid piezoelectric transducer architectures having both sensing and energy harvesting capabilities. These transducers are intended to function as structural sensing elements that scavenge energy from ambient sources to operate without an external power supply. If successfully developed, these materials would find applications in performing autonomous structural health monitoring of bridges or other critical components of the transportation infrastructure.

Dr. Rossetti currently has three doctoral students working under his direction and is continuing to build specialized laboratory facilities in IMS for carrying out processing studies and property measurements on electroceramic materials. These capabilities include an active materials properties laboratory equipped with a custom-built multi-spectroscopy system for the measurement of pyroelectric, ferroelectric, piezoelectric and dielectric properties on both monolithic ceramic and thin film specimens over wide ranges of temperature, frequency, and applied electric field. The laboratory also has facilities for high-sensitivity differential calorimetry measurements at temperatures in the range of -180 to 1500 °C, as well as processing equipment for the fabrication of monolithic oxide ceramics and the deposition of thin film materials.

Addressing the Future of Hard Drive Storage

from the School of Engineering News and Events, by Kate Kurtin, for the complete article see: http://www.engr.uconn.edu/hueyfinal.php

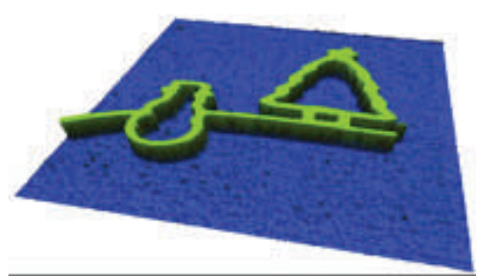
Dr. Bryan Huey, Assistant Professor of Chemical, Materials & Biomolecular Engineering (CMBE)

The goal of revolutionizing data storage is at the heart of research underway in the laboratory of assistant professor Bryan Huey (CMBE *and member of IMS, ed.*). Collaborating with Dr. Oleg Kolosov, a Lancaster University (UK) physics professor Dr. Huey has known since their days together at Oxford University, this team has garnered three-year funding from the National Science Foundation (NSF) to study the fundamentals of a new hard-drive-like device made out of phase change material (PCM). This new drive will have no moving parts; will store data based on states of different resistance; and is especially promising for its predicted high reliability and low power consumption.

Dr. Huey explained that -- unless there is a revolutionary advance in the underlying materials used in standard magnetic hard drives -- the future market for this media looks bleak. "Right now hard drives are very impressive and have been for the last 20 years; however, in the next 5 to 10 years, unless something completely unforeseen occurs, it is unlikely they can continue to compete for the functions they now provide."

The NSF grant supports a novel researcher-exchange aspect between the labs at UConn and Lancaster University that will allow Dr. Huey's graduate student, Gregory Santone, to carry out research in Dr. Kolosov's lab in the UK, and Dr. Kolosov's research student will spend time in Dr. Huey's laboratory at UConn. In addition, Drs. Huey and Kolosov will spend two weeks a year at each other's host university.

The international collaboration will benefit from the unique resources and capabilities of the two labs. At UConn, Dr. Huey can image, map, and quantify properties of materials and the nano-scale very rapidly. Dr. Kolosov's laboratory boasts a complementary capability that measures the thermal properties that are pertinent to this research. Each team is doing something quite unique, but as partners, they will uniquely address the dynamics of PCM.



The snowman is less than 2 um tall--roughly 1/50th the diameter of typical human hair.

Image courtesy of Huey AFM Labs.

New Facilities

Focused Ion Beam – A new FEI Strata 400 Dual Beam (Focused Ion Beam/Scanning Electron Microscope) system has been installed and is up and working at IMS. Quoting from the FEI web site: http://www.fei.com/uploadedFiles/Docments/Content/2006_08_Strat400STEM_Family_Semi_pb.pdf

The Strata 400 product family of DualBeams (FIB/SEM)provides a single source for complete sample management. Preparation, imaging and analysis can now be accomplished with one tool, accelerating your time to answer. FEI's innovative FlipStage moves your sample from milling to scanning transmission electron microscopy (STEM) imaging position in seconds, without breaking vacuum and ensuring the integrity of your sample. And with powerful, state-of-the-art components such as high-performance ion and electron columns, a highly stable stage, and reliable automation software, you can count on getting the most accurate and highest-quality data in the shortest time.

The Strata 400 family is ideal for STEM and transmission electron microscopy (TEM) sample preparation. Now you can automatically prepare multiple thin-film samples in a single session for critical analysis. Strata enables you to obtain the thinnest possible sample with the slice-and-view capability of the DualBeam. You will also experience the benefits of improved sample quality from enhanced low kV milling with the ion beam. As a result, you save valuable time and minimize the potential for error. In addition, the ion beam for milling and electron beam for imaging intersect at your sample, providing unrivaled power to expose the exact feature of interest on your first attempt. Patented beam chemistries can also be used to highlight interface layers for imaging in the system without exposing the whole sample to potential contaminants, getting you the most accurate data possible. The Strata 400 provides high-throughput cross-sectioning and automated TEM-sample preparation, utilizing the Sidewinder ion column and high performance sample stage. The Strata 400 STEM includes integrated sample lift-out and handling, with SEM-STEM imaging to enable high-contrast, high-resolution analysis.

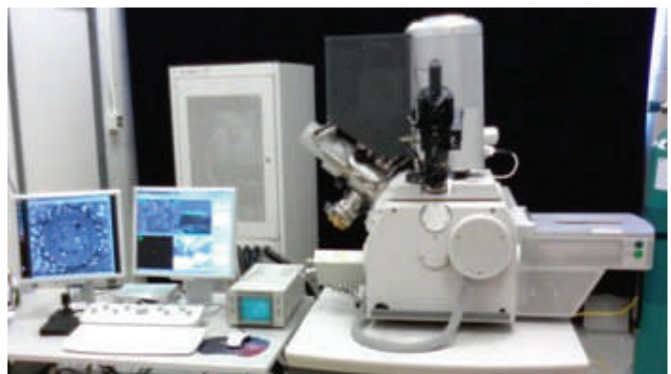
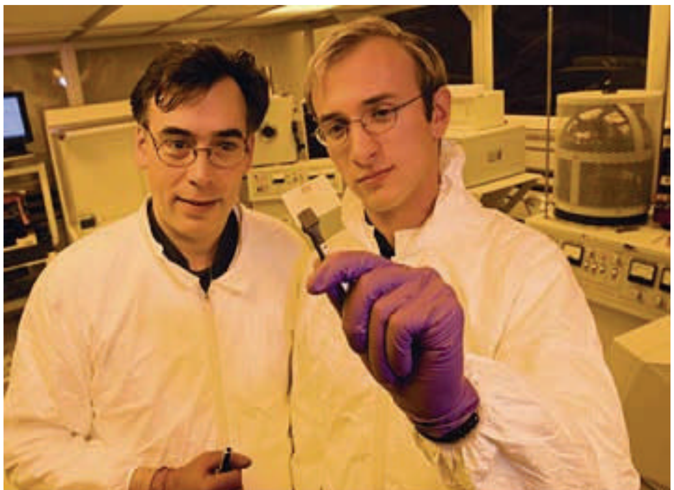


Photo by Roger Ristau

The FEI Strata 400 at IMS is also configured with Energy Dispersive X-ray analysis capability. X-ray analysis with energy dispersive spectroscopy (EDS) provides chemical composition analysis for both thin and bulk samples. Although EDS analysis of bulk samples is typically characterized by very large excitation volume and limited spatial resolution at 500 nm at best, the Strata 400 surpasses these standards by not only making conventional cross sections, but also by preparing thin TEM-like sections to deliver analytical resolutions below 30 nm – more than an order of magnitude better than can be typically achieved on a bulk sample.

Advancing Technology and Training Tomorrow's Scientists

from the University of Connecticut Foundation, for the complete article see: http://www.foundation.uconn.edu/advancing-tech.html



Dr. Fotios Papadimitrakopoulos (left) and PhD Student William Kopcha

Imagine a minute transistor so powerful that it can multiply present day computing capacity by thousands of times. Or a glucose sensor that fits in a single human cell of a diabetes patient. This is the promise of nanotechnology. More than 60 faculty members, along with their students, from various disciplines are working to unlock its power.

When New England Scholar William Kopcha arrived at UConn, he explored the diverse branches of chemistry he could pursue.

"A friend suggested I consider nanotechnology and that I contact Dr. Papadim," Kopcha says. "An undergraduate research project in his lab made the difference for me."

Fotios Papadimitrakopoulos (Dr. Papadim to his students), professor of chemistry and associate director of the Institute of Materials Science, is leading promising research with the potential to save lives through advancements in drug and gene delivery.

"Nanotechnology has the capacity to transform our lives," says Papadimitrakopoulos, a foremost scientist in the field. "It can solve problems related to health care, computer technology, space travel, energy, the environment and so much more. It is hard to imagine the scope of its potential impact."

A hallmark of UConn's academic plan is expanding opportunities for undergraduate students to undertake research and creative projects. Kopcha was able to work alongside Papadimitrakopoulos on cutting-edge research. Kopcha found a way to separate nanotubes and increase their luminescence, and coauthored an article published in Science magazine about his discovery.

"The more I learn about nanotechnology, the more I like it," Kopcha explains. "The opportunity to work with a well-respected scientist like Dr. Papadim helped solidify my future goals. It's also why I returned to UConn to earn my Ph.D."

Department Seminars

Spring seminar schedules have not been finalized at the time of this writing. Seminar schedules will be available near the beginning of the semester and can be found on the department web sites (http://www.ims.uconn.edu/polymer and http://www.cmbe.engr.uconn.edu). This information will be updated as additional seminars are added.

Abstracts of seminars are usually available about a week in advance. We can also put you in touch with the faculty member sponsoring the seminar to learn more about the specific seminar of interest. We suggest you call before attending to be sure the seminar has not been canceled due to illness or weather.

Implantable Glucose Sensor Could Spell Relief for Millions of Diabetics

from UConn Today, by Colin Poitras, Nov. 2, 2009. For the complete article and a short video see http://today.uconn.edu/?p=4713

A team of researchers in chemistry, pharmaceutics, and engineering is developing a long term implantable biosensor that could dramatically change the way of life for millions of people diagnosed with diabetes.

Inside the laboratories of Board of Trustees distinguished professor of pharmaceutics Diane Burgess, chemistry professor Fotios Papadimitrakopoulos, and engineering professor Faquir Jain *(all members of IMS, ed.)*, teams of graduate students and postdoctoral fellows are helping develop a miniaturized wireless device that will monitor blood glucose levels for three months or more after being inserted under a patient's skin.

Prototypes of the device are smaller than a grain of rice yet embedded with an array of highly sensitive, microscopic electronic chips, sensors, and transmitters.

The device would be injected into a diabetic patient subcutaneously using a hypodermic needle. Patients would then wear a special watch-like monitor that would receive transmissions from the sensor so they could track their blood sugar level throughout the day.

The researchers hope to make the device adaptable so that Type I diabetics can wirelessly connect the glucose monitor to a portable insulin pump that would automatically infuse insulin into their body as needed. Type 2 diabetics would use the device to monitor their body's reactions after they eat particular foods or before or after exercise. It would replace the more common finger prick blood sugar test that is both painful and time-consuming.

"In my opinion, this device will be a dream come true for diabetics," says Papadimitrakopoulos, associate director of the University's Institute of Materials Science and an expert in nanotechnology. "It is not only going to improve their standard of living but it will also help educate people on how to go about living with this disease."

Postdocs and doctoral students from the College of Liberal Arts and Sciences, the Institute of Materials Science, and the Schools of Engineering and Pharmacy who are working on the sensor research include: Santhisagar Vaddiraju, Yan Wang, Upkar Bhardwaj, Jacqueline Morias, Liangliang Qiang, Vincent Ustach, Fuad Al-Amoody, Robert Croce, Mukesh Gogna, and Supriya Karmakar.

Currently about 23.6 million children and adults in the United States, or 7.8 percent of the population, are living with diabetes, according to the American Diabetes Association. The overwhelming majority of those individuals have Type 2 diabetes, which results from the body failing to properly use insulin, combined with insulin deficiency. Complications from diabetes can lead to kidney disease, blindness, and limb amputation.

The biggest challenge for Papadimitrakopoulos and Jain was finding a way to translate the body's internal metabolic functions into electrical charges that could be recorded and monitored by a small external device.

Working in UConn's Nanobionics Device Fabrication Facility, Papadimitrakopoulos' research team was able to create special inner polymer membranes for the enzymatic sensory component of the device. These enzymes create a catalytic reaction when they come in contact with glucose in the blood, and an electrical signal is generated. As blood glucose concentration goes up or down, the scientists found it can be detected by the device and recorded graphically over time, like a chart in the stock market.

The miniature biosensor is not limited to glucose monitoring, the researchers say. It can be modified to monitor other metabolic functions, such as cholesterol levels and lactic acid levels. But for now, the team is focused on glucose and diabetes.

"We're at the pre-clinical testing stage right now and hope to go into clinical testing in two to three years," Burgess says, "with entry into the market predicted in maybe four to seven years."

Ramprasad—Continued from page 1

research in Germany, and also enable German scientists and scholars to carry out research with Humboldt Foundation alumni worldwide.

Dr. Ramprasad noted that he is deeply honored to receive this distinguished fellowship, and is thankful to his German host, Dr. Matthias Scheffler, who directs the Theory Department at the Fritz-Haber-Institut.

While at the Fritz-Haber-Institut, Dr. Ramprasad's research will focus upon understanding -- at a fundamental level -- why ceramic coatings used on turbine blades are so effective in protecting the blades from the extremes of temperature, pressure and high-speed debris. Turbine blades are found in diverse applications, from jet engines to power plants. "Jet engines, for example, are subjected to extraordinary extremes of temperatures during flight, particularly during take-off and landing. In fact, they are subjected to temperatures beyond the melting point of the metal blades. Only the insulating ceramic coatings keep them intact." He remarked, "This is one of the cases where commercialization has outpaced science. Outstanding coatings have been developed, but we're not certain how they function. We want to gain an atomic-level understanding of how these coatings protect the blades. If we can understand how they work, we can improve upon them." Dr. Ramprasad's research will span computational and modeling studies of the coatings, which have properties of low thermal conductivity.

Dr. Ramprasad received his Ph.D. in Materials Science & Engineering at the University of Illinois, Urbana-Champaign. Before joining UConn, he was employed with Motorola's R&D laboratories at Tempe, AZ, as a Principal Staff Scientist. Earlier in the year, Dr. Ramprasad was awarded a Max Planck Society Fellowship for Distinguished Scientists.

Shaw—Continued from page 1

longevity and reduce the need for revision surgery, thus reducing long-term health care costs along with patient stress.

Dr. Shaw's other NSF grants are also collaborative efforts. For one, Dr. Shaw will be teaming with Kennametal, Inc., a global leader in hard metal technology. This project is aimed at the development of innovative manufacturing methods that can produce novel materials with superior mechanical properties derived from nanocrystalline powder. This collaboration will ensure that the research is relevant to the hard metal industry and that the results will be disseminated to end users.

The third research project is in collaboration with Dr. Mahmoud Zawrah, a researcher from the National Research Center in Cairo, Egypt. Together, they are looking at the processing and fabrication of nano-Si_3N_4 and SiC composites using the waste material, silica fume, as the starting material. If successful, this project will lead to advancements in the production of large quantities of high purity nano-composite powders and sintered (or densified) Si_3N_4/SiC components from silica fume in a reproducible, precise and economical fashion.

Mei Wei—Continued from page 2

University, Japan. In late 1999, she returned to Australia taking a research fellow position with Queensland University of Technology before she joined the faculty at the University of Connecticut as an Assistant Professor in early 2002. In 2007, she was promoted to Associate Professor at the University of Connecticut.
Prof. Wei's research concentrates in biomaterials and related areas including:

1. Bioactive Implant Guided Supracrestal Bone Formation
2. A Novel Approach to Improve the Bonding Strength between the HA Coating and Metallic Substrates
3. Multi-functional Composites for Load-bearing Skeletal Applications
4. Delivery of Growth Factors Using a Novel Composite for Bone Repair
5. Bone and cartilage regeneration using novel scaffolds loaded with different types of donor cells

She has published over 60 refereed papers in academic journals and conference proceedings, and has presented invited talks at conferences, and other occasions. She also serves as a reviewer for several major journals and funding agencies. She is the recipient of both 2007 Professional Excellence Awards, Educator of the Year at UConn and 2007 Women of Innovation Award elected by Connecticut Technology Council.

Selected recent publications include:

[1] H. Qu and M. Wei, "Improvement of Adhesive Strength of Biomimetically Coated Titanium Implants", Journal of Biomedical Materials Research Part B, Applied Biomaterials, 84B, 436-443, 2008.

[2] X. Yu, H. Qu, D.A. Knecht, and M. Wei, "Incorporation of Bovine Serum Albumin into Biomimetic Coatings on Titanium with High Loading Efficacy and Its Release Behavior", Journal of Materials Science, Materials in Medicine, 20, 287-94, 2009.

[3] M. Freilich, D. Shafer, M. Wei, R. Kompalli, D. Adams, and L. Kuhn, "Implant Systems for Guiding A New Layer of Bone Computed Microtomography and Histomorphometric Analysis in the Rabbit Mandible", Clinical Oral Implants Research, 20, 201-207, 2009.

[4] F. Peng, J.R. Olson, M.T. Shaw, M.Wei, "Influence of Pre-treatment on the Surface Characteristics of PLLA Fibers and Subsequent Hydroxyapatite Coating", Journal of Biomedical Materials Research: Part B, Applied Biomaterials, 88B, 220-229, 2009.

[5] Y. Zhang, G. Zhang, and M. Wei, "Controlling the Biodegradation Rate of Magnesium Using Biomimetic Apatite Coating", Journal of Biomedical Materials Research: Part B, 89, 408-14, 2009.

More information regarding Dr. Wei's research interest can be found at http://www.cmbe.engr.uconn.edu/facultywei.html or by contacting Professor Wei directly (Mei.Wei@uconn.edu).

UConn Material Advantage Chapter Wins Chapter of Excellence Award

Five members of the UConn Material Advantage Chapter went to the Materials Science & Technology Conference in Pittsburgh, PA on October 24-27, 2009. The award recognizes our outstanding efforts as a chapter to promote materials science and engineering through outreach and other activities. This is the third consecutive year the chapter has been recognized for the hard work of its members with this award.

Last year, the chapter participated in numerous outreach events to local elementary, middle, and high schools as well as took an active role assisting the ASM Hartford chapter with the Materials Camps held in IMS. In addition, the chapter organized social and other events to network with other chapters and promote the broadening of the knowledge of its members of current areas of interest in materials science.

Shown in photo of group receiving award at conference L-R: Nicole Marino, Brendan O'Brien, Kathryn Czaja,

Spring Semester Starts

Spring semester classes started January 19, 2010. Some courses that may be of interest include the following.

MSE 5309-001	Transport Phenomena in Materials Science and Engineering	G. Rossetti
MSE 5320-001	Computational Materials Science	R. Ramprasad
MSE 5320-002	Materials for Energy	P. Singh
MSE 5323-001	Transmission Electron Microscopy	M. Aindow
CHEG 5352	Polymer Properties	R. Parnas
CHEM 5384	Polymer Characterization II	A. Asandei
CHEM 5394	Special Topics in Chemistry:	F. Papadimitrakopoulos
	Semiconducting Polymers & Nanomaterials and Devices	
MCB 5015	X-Ray Analysis	P. Burkhard
MCB 5003	Biophysical Chemistry I	P. Burkhard

Employment Web Page

The Institute of Materials Science has a web page to help match students with potential employers. The IMS Employment Center can be accessed from the IMS home page http://www.ims.uconn.edu/ and clicking on Outreach.

The initial job page has brief information concerning each available position and a link for more details. Please forward any open position announcements you wish to post to Shari Masinda (smasinda@ims.uconn.edu). We have several positions on the website now, with your help we can build this database of information, which will benefit both students and employers.

Toxic and Bio-Contaminated Samples

On a small number of occasions member companies have sent us toxic samples for examination without informing us. IMS is not set up to handle such materials. We operate in a very open environment with multiple users and shared laboratory facilities. We can not accept toxic materials, materials that present biological hazards or similar materials such as drugs that require very specialized handling. If we do receive such a sample we must return them (and may need your assistance to do so as shipping these materials can be time consuming and expensive). We can not dispose of these types of material at UConn when they are created by external sources.

Mid-Length Projects (MLP) Program

The Institute of Materials Science (IMS) announces the continuation of a program that addresses seed research/development projects of an intermediate length. This program is designed to encourage university/industry collaboration on projects that are too extensive for the existing Associates Program yet smaller than full-blown university research projects. Typical student/post-doc supporting research projects at IMS (and most of UConn and other institutions) last for some number of years. Industry often has exploratory projects of intermediate length between these extremes, projects that may require several months to a year of full time effort. Through the Mid-Length Projects (MLP) Program IMS will assist industry in matching the available resources of IMS to those required for the project of interest.

For more information or to discuss specific projects please contact Ed Kurz (860-486-4186, ekurz@mail.ims.uconn.edu) or Harris Marcus (860-486-4623, hmarcus@ims.uconn.edu)

Sample Preparation

In many projects that the Associates Program deals with, such as adhesion and coatings, surface analysis techniques are extremely important. The techniques used for such analysis, particularly GC/MS, Auger electron spectroscopy (AES) and x-ray photoelectron spectroscopy (XPS) are extremely sensitive to small amounts of material on the surface. It is important to make efforts not to contaminate these surfaces during sample preparation, collection and shipment. **Shipment in common plastic bags should be avoided**! Common plastic bags typically contain significant amounts of additives used to prevent the plastics from adhering to themselves and other materials. These additives will migrate to the sample during shipment and at best make interpretation difficult and sometimes impossible. It is much better to ship such samples in common kitchen aluminum foil (not industrial aluminum foil which is often coated with an oil or other release agent). Samples can also be shipped in glass containers with aluminum foil over the opening under the cap.

Alternatively special polyester bags that do not contain such additives can be purchased. One source of such bags is the Kapak Corporation (now Ampac) Typical price is about $200 per thousand depending on the exact size. Be sure to specify non-contaminating/non-plasticized material.

IMS Associates Program

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We're on the Web!
www.ims.uconn.edu/associate/associates

Things Are Looking Green on Gant Plaza

from UConn Today, by Richard Veilleux, Sept. 4, 2009. For the complete article and a short video see http://today.uconn.edu/?p=4348

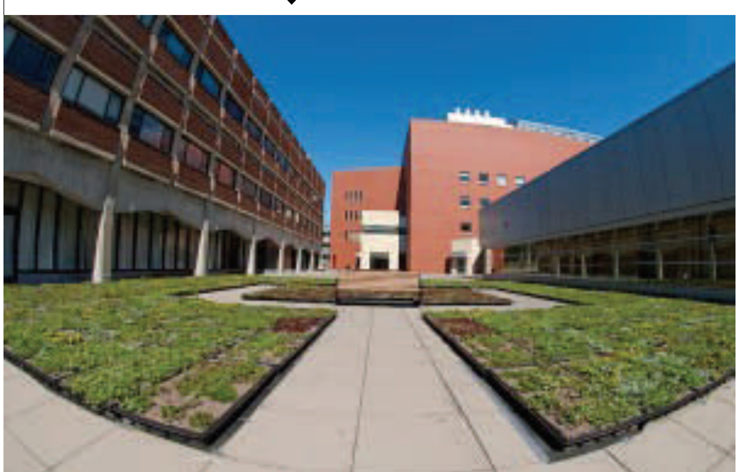
The University has its first "green" roof – a garden of more than 300 raised beds of sedum and other flowering plants installed on 3,600 square feet of a plaza at the Edward V. Gant Complex.

The installation was constructed Sept. 2 by a group of faculty, staff, and students.

The garden, which is intersected by a walkway and includes refurbished benches, will provide a fertile area where faculty researchers can analyze whether environmentally friendly roof gardens actually display the abundance of positive properties they are said to offer.

"Green roofs have been around for centuries," says Jack Clausen, a professor of natural resources and the environment and co-principal investigator on the project. "They're predominant in many areas of Europe. But the concept is fairly new in the United States – maybe 10-15 years – and there hasn't been a lot of research, especially in the Northeast."

That's about to change. Clausen, Allison MacKay, an associate professor of civil and environmental engineering and co- principal investigator with Clausen, and Joe Bushy, an assistant professor of civil and environmental engineering, plan to study virtually every property environmentalists attribute to green roofs, including whether it will actually reduce runoff; whether it will improve the quality of atmospheric deposition of water; whether it will reduce the presence of metals in the air above the garden, including mercury; and whether it will help regulate the temperature in the building beneath the garden.



The Green Roof on Gant Plaza as seen from IMS
Photo by Frank Dahlmeyer

On Sept. 2, a group of about 30 students, mostly members of the EcoHusky student group and the student chapter of the Soil and Water Conservation Society, along with residents from UConn's new environmental learning community, EcoHouse, carted the 334 modules of plants from the area in front of the BioPhysics Building to the adjacent plaza on the Gant Complex. They then assembled the two foot by four foot plastic trays into the design created by John Alexopoulos, an associate professor of landscape architecture.