Hal Brody Receives 2009 Chalmers Award

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

Distinguished Professor of Materials Science & Engineering Harold Brody and IMS Member (ed.) was recently honored by TMS, the Minerals, Metals & Materials Society, which presented him the 2009 Bruce Chalmers Award for outstanding contributions in the field of solidification science. Dr. Brody received the award in recognition for his "seminal contributions to microsegregation and back diffusion during dendritic solidification, in situ composites and peritectic solidification, and computer modeling of solidification processing."

Continued Page 6

Professor Alpay Receives Award from United Technologies Corporation

(from CoMBinE Summer 2009, for the complete article see: http://www.cmbe.engr.uconn.edu/PDFs/CoMBinE%20Summer%202020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summer%202020%2020%20Summi...
Drs. McEvily and Carter Elected Society Fellows

Dr. Arthur J. McEvily
Professor, emeritus of metallurgy

Dr. C. Barry Carter, Department Head and professor of Chemical, Materials & Biomolecular Engineering (CMBE) and member of IMS (Ed.), was elected a Fellow of the Microscopy Society of America (MSA). It is the first year MSA has recognized the Fellow designation, and Dr. Carter will be formally inducted during the Microscopy & Microanalysis 2009 Conference.

Dr. Carter was selected a Fellow of the Materials Research Society (MRS). He was formally recognized during the organization’s spring meeting in April. See http://www.engr.uconn.edu/SoE/carter-mrsaward.php for the complete story.

Dr. McEvily is recognized across the globe as an authority on fatigue and fracture of metals and alloys. After receiving his D.Sc. from Columbia University in 1959, Dr. McEvily worked as an Aeronautical Research Scientist at NASA in Langley, VA and later served as Head of the Solid State Physics Section. He then worked as a Research Scientist at Ford Motor Company for six years before joining UConn as Head of the Metallurgy Department (67-78). He has authored or co-authored more than 240 papers and two books, including the 2002 textbook, Metal Failures -- Mechanisms, Analysis, Prevention (Wiley-Interscience).

Dr. McEvily, a professor emeritus of metallurgy and member of IMS (ed.), was elected a 2009 Fellow of the International Congress on Fracture (ICF) in recognition of his "contributions to the understanding of fatigue mechanisms and processes in structural alloys." He will be officially honored during the conference of ICF in Ottawa as one of only 52 living Fellows.

Making Light Bulbs from DNA

Dr. C. Barry Carter

(From the School of Engineering News and Events, for the complete article see: http://www.engr.uconn.edu/facultyfellowssawards.php)

Making Light Bulbs from DNA

By adding fluorescent dyes to DNA and then spinning the DNA strands into nanofibers, researchers at the University of Connecticut have made a new material that emits bright white light. The material absorbs energy from ultraviolet light and gives off different colors of light—from blue to orange to white—depending on the proportions of dye it contains.

The researchers, led by chemistry professor and IMS member (ed.) Greg Sotzing, create white-light-emitting devices by coating ultraviolet (UV) light-emitting diodes (LEDs) with the material. They are even able to fine-tune the white color tone to make it warm or cold, as they report in a paper published online in the journal Angewandte Chemie.

Continued Page 9
Five Engineering Faculty Elected to CASE

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

Five engineering faculty members have been elected to membership in the Connecticut Academy of Science and Engineering (CASE). They were inducted during the CASE annual meeting May 20th at the New England Air Museum, Windsor Locks. The new members-elect as pictured above are:

- Mark Aindow, member of IMS (ed.) and professor of Materials Science in the Department of Chemical, Materials & Biomolecular Engineering
- Amvrossios Bagtzoglou, professor and incoming Department Head of Civil & Environmental Engineering, and Director of the Environmental Engineering Program
- Mun Y. Choi, Dean of Engineering and professor of Mechanical Engineering
- Monty Escabi, associate professor of Electrical & Computer Engineering
- Cato Laurencin, Dean of the School of Medicine, Vice President for Health Affairs, Van Dusen Distinguished Endowed Chair and professor of Chemical Engineering in the Department of Chemical, Materials & Biomolecular Engineering and Member of IMS (ed.). Dr. Laurencin has also been named among “100 Chemical Engineers of the Modern Era” by the American Institute of Chemical Engineers (AIChE). For the complete article see: http://uconnmagazine.uconn.edu/sprg2009/around.html#a23

“The Connecticut Academy of Science and Engineering is pleased to recognize UConn’s newly elected members of the Academy. Election to the Academy is based upon scientific or engineering distinction achieved through significant original contributions in theory or applications and/or unusual accomplishments in the pioneering of new and developing fields of applied science and technology,” said Myron Genel, CASE President.

Membership is limited to 250 scientists and engineers from Connecticut’s academic, industrial and industrial communities. As a group, members identify and study issues and technological advances of concern to Connecticut residents and provide unbiased, expert advice on science- and technology-related issues to state government and other Connecticut institutions.

Associates Program Participates in MYO

On April 9 2009, 190 female eighth graders from 18 Connecticut middle schools convened at the UConn Storrs campus for the 15th annual Multiply Your Options (MYO) conference. The event is designed to help young women explore engineering and scientific principles and to expose them to female role models in science, mathematics, engineering and technology. Each session is planned and taught in a hands-on, problem solving format by women scientists and engineers. This year’s volunteers included: Vicky Margiott & Julie Reiss of Hamilton Sundstrand, Elizabeth Jordan of Pratt & Whitney, Elizabeth Gounaris & Dulcy O’Rourke of CCAT, Katherine Jordan & Diana Cortes of General Electric, as well as UCONN faculty, graduate and undergraduate students from Chemical Engineering, Mechanical Engineering, Engineering Physics, Civil Engineering, Biomedical Engineering, Materials Science, Computer Science, Pharmacy, Physics and Mathematics. There were twelve different workshops to choose from in the morning session. Topics included constructing a simple galvanic cell with lemons; designing an ecosystem for the International Space Station; designing constructing and racing a balloon-powered rocket car; building a light fountain with optics, making mock asphalt to explore road construction engineering, creating a cross-linked polymer and evaluating its physical properties, exploring
UConn Chemists Find Secret to Increasing Luminescence Efficiency of Carbon Nanotubes

The work of Professor Fotios Papadimitrakopoulos (Associate Director of IMS and professor of Chemistry) regarding the luminescence of carbon nanotubes has recently been featured in many journals.

From e! Science News 3/10/09:

Chemists at the University of Connecticut have found a way to greatly increase the luminescence efficiency of singlewalled carbon nanotubes, a discovery that could have significant applications in medical imaging and other areas. Increasing the luminescence efficiency of carbon nanotubes may someday make it possible for doctors to inject patients with microscopic nanotubes to detect tumors, arterial blockages and other internal problems. Rather than relying on potentially harmful x-rays or the use of radioactive dyes, physicians could simply scan patients with an infrared light that would capture a very sharp resolution of the luminescence of the nanotubes in problem areas.

UConn's process of increasing the luminescence efficiency of single-walled carbon nanotubes will be featured in Science magazine on Friday, March 6, 2009. The research was performed in the Nanomaterials Optoelectronics Laboratory at the Institute of Materials Science at the University of Connecticut, in Storrs, CT. A patent for the process is pending.

University of Connecticut Chemist Fotios Papadimitrakopoulos describes the discovery as a major breakthrough and one of the most significant discoveries in his 10 years of working with single-walled carbon nanotubes. Assisting Papadimitrakopoulos with the research were Polymer Program graduate student Sang-Yong Ju (now a researcher at Cornell University) and William P. Kopcha, a former Chemistry undergraduate assistant in the College of Liberal Arts and Sciences who is now a first-year graduate student at UConn.

Although carbon is used in many diverse applications, scientists have long been stymied by the element's limited ability to emit light. The best scientists have been able to do with solution-suspended carbon nanotubes was to raise their luminescence efficiency to about one-half of one percent, which is extremely low compared to other materials, such as quantum dots and quantum rods.

By tightly wrapping a chemical 'sleeve' around a single-walled carbon nanotube, Papadimitrakopoulos and his research team were able to reduce exterior defects caused by chemically absorbed oxygen molecules.

This process can best be explained by imagining sliding a small tube into a slightly larger diameter tube, Papadimitrakopoulos says. In order for this to happen, all deposits or protrusions on the smaller tube have to be removed before the tube is allowed to slip into the slightly larger diameter tube. What is most fascinating with carbon nanotubes however, Papadimitrakopoulos says, is the fact that in this case the larger tube is not as rigid as the first tube (i.e. carbon nanotube) but is rather formed by a chemical "sleeve" comprised of a synthetic derivative of flavin (an analog of vitamin B2) that adsorbs and self organizes onto a conformal tube. Papadimitrakopoulos claims that this process of self-assembly is unique in that it not only forms a new structure but also actively "cleans" the surface of the underlying nanotube. It is that active cleaning of the nanotube surface that allows the nanotube to achieve luminescence efficiency to as high as 20 percent.

NOTE: To see a QuickTime animation of how a single-walled carbon nanotube is wrapped with the synthetic flavin derivative to increase its luminescence go to: http://www.ims.uconn.edu/~papadim/research.htm.

More details regarding this research can be found at http://esciencenews.com/articles/2009/03/06/uconn.chemists.find.secret.increasing.luminescence.efficiency.carbon.nanotubes
Winterstein Lands Fulbright Scholarship

(from CoMBinE Summer 2009, for the complete article see: http://www.cmbe.engr.uconn.edu/PDFs/CoMBinE%20Summer%202009%20.pdf, p. 19)

Jonathan Winterstein, a doctoral student in Materials Science & Engineering, has been awarded a Fulbright Scholarship to carry out research at the Austrian Centre for Electron Microscopy and Nanoanalysis—an institute renowned for its high-quality electron spectroscopy and microscopy. The Centre is associated with the Technical University of Graz (TU Graz). Jonathan, who earned his B.S. at Washington State University—Pullman, is advised by Dr. C. Barry Carter, Department Head of Chemical, Materials & Bio-molecular Engineering and member of IMS (ed.).

The Fulbright program is sponsored by the U.S. government and seeks to enhance cultural awareness and cooperation between U.S. scientists and professionals and peers around the globe.

Jonathan's Fulbright research will focus on ceramic fuel cell materials. He explained that ceramics play an important role in making next-generation clean energy technologies, such as solar and wind power, affordable and reliable. “Currently, cost is restrictive and the spread of solar and wind resources is not uniform; that is, not every part of the world receives equal wind or sunlight. Solutions to these barriers may come in the form of new technologies based on ceramic materials. For example, some ceramic materials can be used to convert solar heat into hydrogen that can later be used to power fuel cells. Hydrogen technology is a potential means to reduce cost and distribution difficulties of solar and wind power.”

His research at UConn has focused on the chemical and structural characterization of oxide ceramics and, in particular, cerium oxide, which is a promising material for energy technologies. “A principal tool of his work is transmission electron microscopy, or TEM, which permits researchers to understand materials at the nanometer scale. Jonathan seeks to control defects in the ceramic materials in order to optimize the performance of fuel cell materials.”

During processing, nanometer-scale structures and defects are introduced into materials that must be controlled to produce a useful product. TEM can provide images and data about these defects that are unobtainable by other techniques. Combining TEM with spectroscopy is particularly powerful for studying defects in materials.”

Jonathan’s nine-month Fulbright award will provide him access to the Centre’s unique resources. “Few institutions in the world offer the state-of-the-art equipment available at TU Graz and no other institute has the same level of expertise in this field as that possessed by researchers at TU Graz.” Jonathan previously received a prestigious National Defense Science & Engineering Graduate (NDSEG) Fellowship, which has supported much of his doctoral research.

MSE Graduate Student Selected for Internship Sponsored by the Office of Naval Research

(from CoMBinE Summer 2009, for the complete article see: http://www.cmbe.engr.uconn.edu/PDFs/CoMBinE%20Summer%202009%20.pdf, p. 6)

Adam Heitmann, MSE Graduate Student, has been selected to participate in the Naval Research Enterprise Intern Program (NREIP). Adam was one, of sixty-one, graduate students to be chosen for this opportunity through a competitive process. All participants will be engaged in research at a Department of Navy (DoN) laboratory throughout the summer, beginning June 2009. As part of the program, Adam will receive support from the Office of Naval Research (ONR) to pursue a portion of his doctoral thesis work at the Undersea Warfare Center in Newport, RI, comprising 10 week stays during the summer months. The NREIP intern selection process carries an affiliation with the American Society for Engineering Education and is based upon academic achievement, personal statements, letters of recommendation, and career & research interests.

Adam received his BS degree from Rensselaer Polytechnic Institute in Materials Science and Engineering. His research at UConn (ed.) is conducted under the direction of his advisor, George Rossetti, Associate Professor of MS&E and member of IMS (ed.), and involves the development and application of a thermodynamic model to guide the design of single crystal piezoelectric transducer materials. The project that Adam will execute, in collaboration with his advisor and his Navy Laboratory mentor, is entitled “Design and Modeling of High Power Density Acoustic Transducer Materials for Autonomous Undersea Vehicles.”
Claire Weiss Wins SMART Scholarship

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

Claire Weiss, a doctoral student in Materials Science & Engineering, has won a coveted scholarship under the Science, Mathematics, and Research for Transformation (SMART) Scholarship for Service Program. Claire was one of approximately 200 students to capture the competitive award, from among 1,500 applicants. She is advised by Dr. Pamir Alpay, an associate professor in the Chemical, Materials & Biomolecular Engineering Department and member of IMS (ed.).

Under the SMART scholarship, Claire will receive sponsorship from the U.S. Army, which will also provide her summer research opportunities and mentoring throughout the course of her degree program.

Claire is a member of the Functional Materials Group, and her research focuses on the deposition, characterization, and electrical testing of complex oxide thin films for applications in tunable devices, such as phase shifter arrays for electrically steerable antennas. Claire is particularly interested in thin films based on barium strontium titanate \((\text{Ba(x)}\text{Sr(1-x)}\text{TiO(3)})\) or BST. BST is considered a top candidate for use in tunable microwave devices because of its highly non-linear dielectric response to applied electric field. Her current research is exploring many methods to improve the dielectric properties of BST thin films, such as using compositional grading to minimize the temperature dependence and doping to lower the loss.

Brody-Continued from Page 1

Solidification science is the study of the processes by which materials change from a liquid to a solid state. Dr. Brody explained that countless everyday objects, from high-end cookware, sculpture, turbine blades, and automotive components to bicycle frames, are produced using a solidification process in the manufacturing sequence. Dr. Brody’s research has focused on the solidification of alloys. To make an alloy, metallurgists may heat two or more elements to a liquid phase, mix them together at a proportion that provides a uniform solution, and transfer the molten alloy to a mold where it solidifies in a manner that produces desired properties in the cast product.

Dr. Brody joined UConn in 1991, when he was recruited as Dean of Engineering from the University of Pittsburgh. He remained Dean until 1997. He was a faculty member and administrator at the University of Pittsburgh for 25 years prior to joining UConn, holding positions as Chairman of the Department of Metallurgy & Materials Engineering and director of the Casting Industries Science & Engineering Institute.

Student Inventors Impress Professor

by George Graham,
The Republican Newsroom
Sunday December 28, 2008


The sixth grade class at the STEM Middle Academy held their 1st Annual Invention Convention at the High School of Science and Technology on December 18. Bevin I. Brown, left, sits in his Robotic Arm Chair, as he explains it to Professor Gregory A. Sotzing, from the University of Connecticut in Storrs, and classmates Elving L. Rosado and Gabriela A. Santaigo, right.
Materials Science & Engineering Students Participate in the Hartford Chapter of ASM International's Materials Camp

The Hartford chapter of ASM International recently organized the second Hartford Area Materials Camp, which took place at the IMS and in parts of EII (Engineering II, ed.) on April 13. The half-day Materials Camps aim at introducing Materials Science and Engineering to high-school students. For this second camp 24 high-school students and six teachers from the Annual Multicultural Business Youth Educational Services Embarkment (AMBYESE), Yes I Can! Program and Hartford Public High School’s Academy of Engineering and Green Technology were exposed to a variety of hands-on Materials Science and Engineering demonstrations, for example brazing, heat-treatment, casting, or metal forming. Over twenty MSE undergraduate and graduate students volunteered for this Camp as tour-guides or assistants at the different learning stations. The overwhelmingly positive response from the attendees has motivated the ASM Hartford chapter to consider a third camp in 2010.

Myo-Continued from Page 3

Fall Semester Starts

Fall semester classes start August 31, 2009. Some courses that may be of interest include the following.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 5301-001</td>
<td>Thermodynamics of Materials</td>
<td>H. Brody</td>
</tr>
<tr>
<td>MSE 5322-001</td>
<td>Materials Characterization</td>
<td>B. Huey</td>
</tr>
<tr>
<td>MSE 5334-001</td>
<td>Struct. &amp; Defects in Materials</td>
<td>G. Rossetti</td>
</tr>
<tr>
<td>CHEM-5380</td>
<td>Polymer Synthesis</td>
<td>D. Adamson</td>
</tr>
<tr>
<td>CHEM-5381</td>
<td>Polymer Physical Chemistry</td>
<td>T.A.P. Seery</td>
</tr>
<tr>
<td>CHEM-5382</td>
<td>Polymer Characterization I</td>
<td>Y. Lin</td>
</tr>
<tr>
<td>CHEG-5351</td>
<td>Polymer Physics</td>
<td>A.V. Dobrynin</td>
</tr>
</tbody>
</table>

color changes resulting from certain chemical reactions and much more. The afternoon sessions were filled by a deductive reasoning game in which volunteers provided five work “tools” to serves as clues for attendees to guess their careers. Associates Program staff members and UCONN alumni, Fiona Leek & Laura Pinatti, provided fictitious examples of product problems encountered by materials scientists and discussed the analytical tools used daily for investigation.

MYO is an outreach initiative of the Engineering Diversity Program. For additional program details, please visit www.engr.uconn.edu/diversity/myo/. Volunteers for next years program are most welcome, please contact Kevin McLaughlin (860-486-9306, klm@engr.uconn.edu).
Multi-Tasker Extraordinaire: James Bosse

Dr. Bryan Huey - assistant professor of Chemical, Materials & Biomolecular Engineering and member of IMS (ed.) - since the summer of 2007. He has conducted a variety of studies involving atomic force microscopy, or AFM, a technique that allows researchers to image objects and processes at a fraction of a nanometer.

"When I began working with Dr. Huey," he said, "my work involved the use of AFM to efficiently and accurately separate DNA and protein strands by mass. I also researched the mechanisms behind ferroelectric domain switching and stability."

His current research, conducted for his Honors Program thesis, involves the precise application of electrical voltages across ferroelectric/piezoelectric materials to view domain switching and actuation. James has made this type of measurement numerous times in the lab already, even presenting a poster at last year's Materials Research Society conference. For the next step, the goal is to enhance measurement speed, requiring writing software using National Instruments' LabVIEW to integrate, command and control a range of lab equipment. The project exploits his skill in the use of this object oriented programming language that he acquired as an industrial intern at Emhart Glass Research Center.

At Emhart, James said, "I write LabVIEW software to automate data collection systems, such as thermal history via pyrometers and thermocouples. I also automated a density comparison system." He recently cut back on his work hours to allow for more time in the lab. During his years at UConn, he has also stayed active as a top bowler, maintaining a schedule of league play twice weekly and competing in major tournaments monthly. He has won numerous national titles as a junior bowler and recently won his first adult tournament.

With a view to his post-graduation plans, James said "I plan to earn my doctorate in materials science, hopefully at UConn. I also plan to go for an MBA in finance. I've grown very interested in business and investing over the past year. As for my career, I'd like to ascend to a senior vice president, CEO, or CTO position."

(from the University of Connecticut, School of Engineering, for the complete article see http://www.engr.uconn.edu/SoE/bosse-extraordinaire.php, p. 11)

James Bosse, who is completing his B.S. degree in Materials Science & Engineering this term, is a master multi-tasker who manages to juggle demanding coursework with original lab research and a part-time job. Oh, and he’s also a nationally competitive bowler who participates in tournaments about once a month.

James, who hails from Berlin, CT, has worked in the research laboratory of Dr. Bryan Huey - assistant professor of Chemical, Materials & Biomolecular Engineering and member of IMS (ed.) - since the summer of 2007. He has conducted a variety of studies involving atomic force microscopy, or AFM, a technique that allows researchers to image objects and processes at a fraction of a nanometer.

"When I began working with Dr. Huey," he said, "my work involved the use of AFM to efficiently and accurately separate DNA and protein strands by mass. I also researched the mechanisms behind ferroelectric domain switching and stability."

His current research, conducted for his Honors Program thesis, involves the precise application of electrical voltages across ferroelectric/piezoelectric materials to view domain switching and actuation. James has made this type of measurement numerous times in the lab already, even presenting a poster at last year's Materials Research Society conference. For the next step, the goal is to enhance measurement speed, requiring writing software using National Instruments’ LabVIEW to integrate, command and control a range of lab equipment. The project exploits his skill in the use of this object oriented programming language that he acquired as an industrial intern at Emhart Glass Research Center.

At Emhart, James said, "I write LabVIEW software to automate data collection systems, such as thermal history via pyrometers and thermocouples. I also automated a density comparison system." He recently cut back on his work hours to allow for more time in the lab. During his years at UConn, he has also stayed active as a top bowler, maintaining a schedule of league play twice weekly and competing in major tournaments monthly. He has won numerous national titles as a junior bowler and recently won his first adult tournament.

With a view to his post-graduation plans, James said "I plan to earn my doctorate in materials science, hopefully at UConn. I also plan to go for an MBA in finance. I've grown very interested in business and investing over the past year. As for my career, I'd like to ascend to a senior vice president, CEO, or CTO position."

Inventors-continued from Page 6

Middle Academy are clearly an inventive lot.

Their talents were on full display earlier this month during their "invention convention" in the library of The High School of Science and Technology, which houses the newly created magnet school.

Even a real inventor, a University of Connecticut professor, was impressed.

"They have got some sharp minds," said Gregory A. Sotzing, professor of Chemistry, Director of the Polymer Program and member of IMS (ed.), adding that a number of the students proved to be pretty good salesmen and saleswomen, adept at extolling the merits of their creations.

The ability to access the Internet has also fueled students' creativity, Sotzing said.

Teacher Kate M. Brati said students were challenged to create a new invention or improve on an existing one.

Andrea C. Lewis, principal of the school, also known as STEM Middle Academy, said she was pleased with the creativity on display.

"I think it's awesome," Lewis said. "When I see the ideas and the problems they were trying to solve, I was very impressed."

Sotzing, whose work with electrochromic polymers has been featured in National Geographic News and New Scientist magazine, spent time with students after the convention to explain his own inventions.
UConnomy Report Highlights Impact of Research on State's Citizens

by David Bauman - February 2, 2009 (from the UConn Advance, see http://advance.uconn.edu/2009/090202/09020209.htm for the complete article)

Starting in the Jan. 26 issue and continuing for several weeks, the Advance presented portions of a report produced by the Office of University Communications in conjunction with a study conducted by Stanley McMillen, chief economist at the Connecticut Department of Economic and Community Development.

The report, UConnomy, outlines the many ways the University is vital to the state’s economic well being.

The full report and fast facts are available at www.uconn.edu/uconnomy.

Part of the report discusses research and innovation. It says faculty members from across the University, including the Health Center, are engaged in cutting-edge research projects aimed at transforming the lives of citizens – now and into the future: “Their work brings about the knowledge and innovations that will ultimately foster business development, an enhanced quality of life, improved education, and stronger economic growth in Connecticut and beyond.”

Examples include:

• UConn stands at the forefront of stem cell research. Scientists on the Storrs campus and at the Health Center are learning what makes stem cells grow, how to affect their development and, ultimately, how to turn them into therapies to treat a host of diseases.

• Scientists from across the University are immersed in the study of nanotechnology, an emerging discipline in which materials are examined and manipulated on a molecular scale. Faculty advances in this area hold great potential in diagnosing and treating disease, enhancing sustainable energy efforts, strengthening military defense capabilities, and building far more sophisticated electronics.

Toxic and Bio-Contaminated Samples

On a small number of occasions over the past several months member companies have sent us toxic samples for examination, either without informing us before the samples arrived or sending them in spite of our request that they not send the samples in question. 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.

Light Bulbs—continued from Page 2

The new material could be used to make a novel type of organic light bulb. The light emitters should also be longer-lasting because DNA is a very strong polymer, Sotzing says. “It’s well beyond other polymers [in strength],” he notes, adding that it lasts 50 times longer than acrylic.

The color-tunable DNA material relies on an energy-transfer mechanism between two different fluorescent dyes. The key is to keep the dye molecules separated at a distance of 2 to 10 nanometers from each other. When UV light is shined on the material, one dye absorbs the energy and produces blue light. If the other dye molecule is at the right distance, it will absorb part of that blue-light energy and emit orange light.
Materials Science and Engineering Senior Capstone
Design Project Reports

Materials Science and Engineering Capstone Design Projects were presented on May 1, 2009. The following is a list of projects, students, faculty and industrial sponsors for this year’s projects.

Primary Gamma Prime Dissolution Kinetics in Powder-Processed Inconel 100
Student: Daniel Gynther
Sponsor: Pratt & Whitney
Industry Advisor: Dr. Agnieszka Wusatowska-Sarnek
Faculty Advisor: Prof. Mark Aindow

Design Rule for Strength & Modulus with Fiber Orientation
Students: Brian Gardner and Matthew Kuba
Sponsor: Hamilton Sundstrand
Industry Advisors: Noah Toth, Blair Smith
Faculty Advisor: Prof. Puxian Gao

Design and Implement Wear Test for Dynamically Loaded Component
Students: Stephanie Gagliardi and Melissa Jacques
Sponsor: Hamilton Sundstrand
Industry Advisors: Tim Boysen, Kevin Rankin, Blair Smith, & Glen Grandischer
Faculty Advisor: Profs. George Rossetti and Thomas Barber (ME)

Specify Allowable Contamination on Adhesive Surface
Students: Gregory Santone and Alex Williams
Sponsor: Sikorsky Aircraft
Industry Advisor: John Csonka and Daniel Ursenbach
Faculty Advisor: Prof. Bryan Huey

Process Design to Reduce Cracking Sensitivity of Laser Cut Heat Treatable Al-alloys
Students: Keith Grayeb and Richard Gursky
Sponsor: Sikorsky Aircraft, with Support by CCAT & Trumpf
Industry Advisors: Dr. Michael Urban and Paul Denney
Faculty Advisor: Prof. Harris Marcus

Develop Process Parameters for Laser Hole Drilling in Superalloy Sheet
Students: Salay Stannard
Sponsor: Connecticut Center for Advanced Technology
Industry Advisor: Paul Denney
Faculty Advisor: Prof. Harris Marcus

Duplex Stainless Steel Welding Electrode Procedures
Students: Jason Brown and Robert Scalise
Sponsor: General Dynamics-Electric Boat
Industry Advisors: Neil Fichtelberg, Robert Peirce, and Jeff Hall
Faculty Advisor: Prof. Harold Brody

The Effects of HIPing on Recycled A356-T6 Alloys with Iron-rich Particles
Students: Anthony Tenaglier and Nathan Dew
Sponsor: Bodycote International
Industry Advisor: Dr. Stephan Mashl
Faculty Advisor: Prof. Harold Brody

Design Rule Development for High Strength Investment Cast Heat Treated Aluminum Alloys
Students: James Bosse and Julie Mackey
Sponsor: Integra-Cast, Inc.
Industry Advisor: David Arcesi
Faculty Advisor: Prof. Harold Brody

Optimization and Selection of Stainless Steel for Elevator Applications
Students: Sarah Winiarz
Sponsor: Otis Elevator
Industry Advisor: Mark Thompson
Faculty Advisors: Profs. Barry Carter and Alevtina Smirnova

Design of a Characterization Protocol for Carbon-based Fuel Cell Catalyst Supports
Students: Adam Wentworth
Sponsor: United Technologies Power
Industry Advisors: T.T. Chen-Aindow
Faculty Advisor: Prof. Mark Aindow

Design of a Recrystallization Process for Niobium
Students: Timothy Kazienko
Sponsor: Ulbrich Steel
Industry Advisor: William Keenan
Faculty Advisor: Prof. Rainer Hebert

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/index.html and http://www.engr.uconn.edu/cmbe/). 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.
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.

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/](http://www.ims.uconn.edu/) and clicking on Outreach. The site consists of two sections: 1) postings of open positions from industry/academia; and 2) postings of student resumes. Both graduate and undergraduate students can participate.

The initial job page has brief information concerning each position and a link for more details. We will post announcements of open positions from industry/academia for full-time or part-time employment. Please forward any open position announcements you wish to post to Shari Masinda (smasinda@ims.uconn.edu).

We have a few positions on the website now, with your help we can build this database of information, which will benefit both students and employers.

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@mail.ims.uconn.edu)
IMS Associates Program

Edward Kurz, Ph.D., Director
Phone: 860-486-4186
Fax: 860-486-4745
ekurz@mail.ims.uconn.edu

Fiona Leek, Ph.D., Associate Director
Phone: 860-486-1040
Fax: 860-486-4745
fiona.leek@uconn.edu

Research Assistants
Mark Dudley
Gary Lavigne
Laura Pinatti

Administrative Assistant
Shari Masinda

University of Connecticut
Institute of Materials Science
97 N. Eagleville Road • Unit 3136
Storrs, CT 06269-3136

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

IMS Talent Show

Thanks primarily to the efforts of Kim Post, June 24th saw the IMS talent show/picnic. The event, normally held on the plaza outside IMS, was held indoors due to the weather. But spirits were high and a good time was had by all. We close this issue of the newsletter with a few images from the event. Thanks to Deb Perko and Shari Masinda for the photos.

30 Years of One Ton Sundae

(from UConn Magazine, for the complete article see: http://uconnmagazine.uconn.edu/sprg2009/around.html#fa23)

The annual One Ton Sundae began in 1979 when ice cream from the popular Dairy Bar was piled up on a table so students could make their own sundaes during Winter Weekend.

The tradition continued in February with the 30th anniversary of frozen treats warming up a winter’s day.