



MatAlumNews

Chair's Chat

The weeks and months seem to fly by, and before you know it, it's time for another issue of MatAlumNews! The last semester has been marked by a series of transitions. After more than two decades of service at Lehigh, **Maxine Mattie** has embarked on a well-earned retirement. Many of you will remember Maxine as our graduate coordinator, who kept you on track with regard to qualifying requirements and procedures. We also had a farewell luncheon for **Arlan Benscoter**, who has decided to retire in the upcoming months. Arlan too has spent more than 20 years at Lehigh, and through his teaching and mentorship has touched the lives of so many of our undergraduate and graduate students. Last, but certainly not least, **Slade Cargill** is casting off his professorial duties for another type of casting, as he begins a new life with a strong maritime flavor. We will miss them all, but wish them the best as they go forward in this new phase of their lives.

Even as we bid sad farewells, we are pleased to welcome new faces to the department. **Ann Marie Lobley** joined us from the Business College at the end of March, and is our new graduate coordinator. **Dr. Masashi Watanabe** will be joining the MSE faculty in July 2009. No stranger to our department or the Lehigh Microscopy School, we are delighted that Masashi has decided to pursue a career in academia at Lehigh. Finally, the department will be holding Alumni Reunions at MS&T'08 (October 5-9, David L. Lawrence Convention Center



in Pittsburgh) and MRS (Dec. 2-4, Boston). More details to follow later, I hope very much that you can join us.

MS&E Professor and Past Department Chair Slade Cargill to Retire in August

Slade Cargill will retire from the Lehigh faculty this summer. He has been a faculty member for eleven years, including six years as MS&E Department Chair. We will all miss his dedication to teaching and research, as well as his energetic participation in the Turkey Trot and the departmental Ski outings!

Slade came to Lehigh in 1997 from Columbia University, where he held a joint appointment in materials and in applied physics. Previously, he was a senior manager at IBM Research, where he spent 18 years. Before joining IBM, he was a faculty member at Yale University. He received his BS degree in physics from Georgia Tech and SM and PhD degrees in applied physics from Harvard.

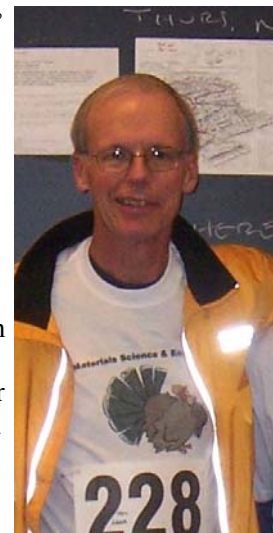
In his research at Lehigh, he and his students have used x-ray and electron beams to study structural defects and strain distributions in electronic materials and devices. Slade has also carried out research on amorphous metallic alloys and on electron-acoustic microscopy, for which he was made a Fellow of the American Physical Society in 1983.

He was President of the Materials Research Society and Chair of the American Physical Society's Division of Materials Physics. He was also an ABET evaluator for materials programs and a member for the ABET

Engineering Accreditation Commission.

At Lehigh Slade has taught graduate courses on thermodynamics and statistical mechanics, on mathematical methods, and on x-ray diffraction, as well as undergraduate courses on electronic properties of materials, electronics, and the materials science of golf balls, drivers and putters.

We held a send-off luncheon in May, where we presented Slade with a gift certificate to Cabela's (for fishing equipment!), as well as a new baseball cap. Borrowing from Martin Harmer's thermodynamic assessment, Slade's departure from MSE will result in an overall decrease in energy (ΔH) and an increase in entropy (ΔS)! After retirement, he and his wife Susan will move from Bethlehem to Athens, NY, where they have house on a small lake, near the Hudson River, and they plan to spend winters on a 44-foot boat, relaxing and cruising along the Florida coast and points south. Slade has said that he will certainly miss many aspects of faculty life at Lehigh, but that he looks forward to having more time for other interests, including travel, boating, sports, and two grandchildren. I would personally like to thank him for all his help during my first year in the Chair position, and wish Susan and Slade all the best in their new adventure.



Retirement of Arlan Bencoter



The department held a retirement party for **Arlan Bencoter** on May 16. Arlan has been a Research Scientist in the MS&E department for over 21 years and also worked closely with the Energy Research Center during his early years at Lehigh. The party was very well attended, with many former students and old friends traveling great distances to make the occasion. Also in attendance were Arlan's wife, Sandy, his daughters, son-in-laws, and grandchildren. There were moments of roasting and reminiscing as Arlan's colleagues told stories of past experiences, both personal and professional. **Arnie Marder**, who worked with Arlan for more than 45 years at Bethlehem Steel and Lehigh, gave Arlan a retirement package consisting of beach chairs, a fishing rod, and a water gun for safe hunting. **Rick Noecker** sparked a sentimental moment as he gave Arlan one of his two Jacquet-Lucas awards to recognize Arlan's tireless dedication to training and mentoring of students. The celebration concluded with a toast to recognize Arlan's dedication, many accomplishments, and close friendships. As we look back on Arlan's career at Lehigh we realize he contributed so much to the department and it's students, faculty, and staff. Arlan is credited with building the department's light optical microscopy laboratory into a world-class facility. He was a

natural and dedicated mentor to his students. The results of his work are reflected in the accomplishments of his students. For example, at one point Arlan's students won the Jacquet-Lucas award seven times over a ten year period, and his students placed an additional 45 times at the annual International Metallographic Society (IMS) competition. His dedication was recognized by the students when they elected him to receive Lehigh's Teaching Excellence Award, and this marked the first time the award was given to a Lehigh staff member. He has also received many additional accolades, including ASM's Distinguished Teacher Award; the IMS Sorby Award (the highest award presented by IMS); and election into the ASM class of Fellows, just to name a few. Arlan has had a significant impact on the lives and careers of many students, faculty, and staff of the department. We will all miss him dearly and wish him and Sandy well as they embark on a new life of retirement.

Given Arlan's lifelong dedication to metallography and the establishment of MSE's first class optical microscopy facilities, the department would like to set up a fund in Arlan's name. This fund would be used to upgrade and purchase new equipment for use by undergraduates and graduate students, and to sponsor student travel to metallography related conferences. Your support to this cause would be greatly appreciated. *Please complete the enclosed card listing the Materials Science and Engineering Department in the other designation, and provide your name and address.*

Faculty News

Dr. **Masashi Watanabe** will be joining the MSE faculty as an Associate Professor in January 2009. He is currently a Staff Scientist at the National Center for Electron Microscopy, Law-



MSE Salaries Highest

According to Lehigh's 2007 placement report, the average starting salary for MSE graduates was the highest listed of all our academic departments.

rence Berkeley National Laboratory, Berkeley, CA. He moved from Lehigh University to his current position in 2007. Dr. Watanabe obtained his Ph.D. in Metallurgy from Kyushu University in 1996 and was a postdoctoral research associate at Lehigh until 1998. He was an associate professor at the Research Laboratory for High Voltage Electron Microscopy in Kyushu, Japan. Following this, Dr. Watanabe returned to Lehigh University as a Research Scientist in 2001 and was promoted to a Senior Research Scientist in 2004. Dr. Watanabe has received numerous awards including the "Young Researcher Award" from the Japan Institute of Metals (1998), the "Young Researcher Award" from the Japanese Society of Electron Microscopy (2001), the K.F.J. Heinrich Award from the Microbeam Analysis Society (2005) and the Kazato Prize for "Developments of Materials Characterization and Quantitative Analysis Methods in Scanning Transmission Electron Microscopy" from the Kazato Research Foundation, Japan. This prize is awarded to researchers under the age of 45 for scientific excellence in the field of electron microscopy. Dr. Watanabe's research emphasizes materials characterization using various electron microscopy approaches; these include compositional analysis via X-rays and energy-loss electrons in analytical electron microscopes (AEMs), and atomic-resolution high angle annular dark-field (HAADF) imaging in scanning transmission electron microscopes (STEMs). He is the developer of the ζ (zeta)-factor method for quantitative X-ray analysis and has implemented multivariate statistical analysis for spectrum images of X-rays and energy-loss electrons.

John Dupont was elected a Fellow of the American Welding Society. The induction ceremony will take place at this year's AWS conference in October at Las Vegas.

Don Smyth recently spent a week at the Technical University in Darmstadt, Germany where he gave two seminars and started a collaboration with their research program on the defect chemistry of metal oxides. Our former graduate student Mike Drahus is a doctoral candidate there.

Himanshu Jain's daughter, **Isha Himani Jain**, 16, a senior at Freedom High School in Bethlehem, Pa., won first place in the individual category in the Siemens Competition in Math, Science and Technology for her material science studies. The Siemens Competition is one of the nation's most coveted student science awards, with 1,600 competitors attending this year.

Two papers co-authored by **Chris Kiely** and others at MS&E are now ranked #3 and #6 of the most cited papers in chemistry. The papers are: "Solvent-Free Oxidation Of Primary Alcohols To Aldehydes Using Titania-Supported Au-Pd Catalysts" D.I.Enache, J.Edwards, P.Landon, B.Solsana-Espriu, A.F.Carley, A.A.Herzing, M.Watanabe, C.J.Kiely, D.W Knight and G.J.Hutchings, *Science*, (2006), 311, 362-365. "Direct Synthesis Of Hydrogen Peroxide From H₂ And O₂ Using TiO₂ Supported Au-Pd Catalysts" B.E.Solsana, J.Edwards, P.Landon, A.F.Carley, A.Herzing, C.J.Kiely and G.J.Hutchings, *J.Catal.* (2005), 236, 69-79.



Graduate Coordinator

MS&E Graduate Coordinator **Maxine Mattie** retired at the end of February after her 21 year career at Lehigh. Maxine started working at Lehigh on November 1, 1987. She started her career at MS&E as a secretary and typist, and later worked for **Dave Williams** with the editorial duties of *Acta Materialia*. In 1993 she became the Graduate Coordinator for the MS&E Department. As graduate coordinator, Maxine has befriended graduate students and their families, and shepherded generations of students through the maze of Lehigh and departmental requirements. She will be missed by many. Maxine's Hawaii-themed retirement party was held on Feb 29th at Campus Pizza.



Ann Marie Lobley joined us from the Business College at the end of March, and is MSE's new graduate coordinator. Anne Marie began her employment at

Lehigh almost ten years ago in November 1998: first, supporting the Finance and Administrative stem as a Payroll Coordinator for three years, and second, serving the Graduate Programs Office in the College of Business and Economics for six years. Her primary responsibilities in the College of Business & Economics were to provide administrative support for the Associate Dean and Director as well as to support 300+ MBA, Masters and PhD Students. In Anne Marie's own words "I am excited to share the knowledge I gained in a business setting while learning a new layer of Lehigh within the College of Engineering and Applied Sciences. Since my arrival in March 2008, the faculty, students and staff have provided not only a very welcoming environment, but also an environment ready to embrace change. I am looking forward to many years of service and dedication to the Materials Science and Engineering department!"

Student News

Undergraduate students **Greg Brentrup '08** and **David Browne '09** participated in the 'Undergraduate Research Symposium' sponsored by David and Lorraine Freed. The purpose of the symposium is to highlight undergraduate research in RCEAS. David Browne received second prize for his poster entitled "Sol-gel Synthesis and Conversion of Spinel Thin Films".

At the Spring SMS picnic, undergraduate and graduate students received departmental awards for outstanding academic performance and promise for future professional success. The award winners were:

Allen S. Quier Award - **Lauren N.**

Bacigalupo

Cyril John Osborn Award - **Gregory**

J. Brentrup

Kahn Memorial Award - **Thomas**

Humplik

Bradley Stoughton Student Award -

Peter G. Burke

Handwerk Prize - **Peter G. Burke**

Gilbert Doan Award - **Joshua A.**

Anderson

Harmer Prize - **Jamie L. Bertha**

Conard Graduate Award - **Hongqing Zhang**

Come See the NanoWorld this Summer at the DaVinci Discovery Center!



Lehigh University's Materials Science and Engineering Department and Center for Advanced Materials and Nanotechnology collaborated with the

DaVinci Discovery Center for Science and Technology in Allentown, PA to construct a NASA-funded exhibit with an emphasis on nanotechnology for space travel. Under the direction of **Andrea Harmer**, Director of Educational Outreach, and **Xiaoli Zhao**, Web Developer, the exhibit was designed to help visitors understand the scale of nanoparticles, tools for viewing and manipulating nanoscale particles, and nanoparticle interactions and property changes. Nanotechnology applications, along with societal and ethical considerations of these new technologies, were also highlighted in the exhibit, which covers approximately 600 square feet and will be open to the public until 2009. Some interesting exhibits include; a nano growth chart, where children may measure themselves in nanometers, a nano particle assembler, where students attempt to remotely assemble particles on a very small scale, and a sticky maze, where students experience property changes on the nanoscale. The exhibit also features an interactive dome display, which allows visitors to tour the universe. See <http://www.davinci-center.org/> for more details.

NanoDays



On Saturday, March 29, a team of 17 Materials undergrads and one grad student spent four hours at the DaVinci Science Center in Allentown running nanotechnology-themed activities for children (grades K-8) and their families. It was the culmination of weeks of planning and organizing led by Professors **Richard Vinci** and **Sabrina Jedlicka**, and it went off incredibly well. The event was motivated by an NSF-sponsored national

outreach effort called NanoDays that was held for the first time from March 29 to April 5, 2008. Approximately 250 Science Center visitors participated in 10 different hands-on activities, including an exploration of water and cornstarch as a model for non-newtonian nanoparticle suspensions, making sol-gel nanoporous bioglass in a test tube in real time, diffracting lasers from CDs and DVDs to measure track spacing, and squirting fluids onto NanoTex fabrics to study water and stain resistance.

Mat Camp



For the past several years, the graduate students in the MS&E Department have put together a week long camp for high school students. The camp is one of many international materials camps sponsored by ASM with the goal of educating college bound students about the field of Materials Science and Engineering. This year marks the fifth time the camp will be held at Lehigh and the camp hopes to match the success of previous years, as evidenced by the extremely positive feedback of the campers. The camp is loaded with lectures by experts in industry and academia, fun demonstrations, and plenty of hands-on experiments. The goal is for the campers to become immersed in a field many high school students are unfamiliar with. The campers will be treated to a lecture by Professor Emeritus **Richard Hertzberg** on failure analysis, a presentation on Samurai swords by Profes-

sor Emeritus **Mike Notis**, a tour of Air Products, and more! Some of the labs the campers will encounter include casting aluminum and analyzing the effect of cooling rate on grain structure, fabricating and testing epoxy composites in a competition to design the strongest, reverse engineering a loudspeaker, and testing the flexural strength of hockey sticks. This year the camp runs from July 7-11 and we are all looking forward to a fun filled week of materials education.

Winter School on New Functionalities in Glass

15 students from U.S. universities traveled in January to Kyoto, Japan, to join 15 of their Japanese peers at the first U.S.-Japan Winter School on New Functionalities in Glass. The Winter School was a collaboration between the International Materials Institute (IMI) for New Functionality in Glass at Lehigh, the International Center for Integrated Research and Advanced Education in Materials Science and Kyoto University. The students at the Winter School included undergraduate and graduate students as well as postdoctoral researchers. The classes they attended were taught by experts in glass science and technology from Brazil, France, Japan and the U.S. Those classes covered 12 topics, including laser patterning, the use of glass surfaces and coatings in biotechnology, the application of glass to fuel cells and the novel functionalities of chalcogenide glasses. The students also had field trips to visit glass manufacturing companies as well as the glass research laboratories of Kyoto University. MS&E Graduate student **Donghui Zhao** gave a presentation titled "From Chalcogenide to Oxychalcogenide Glasses" at the winter school.

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