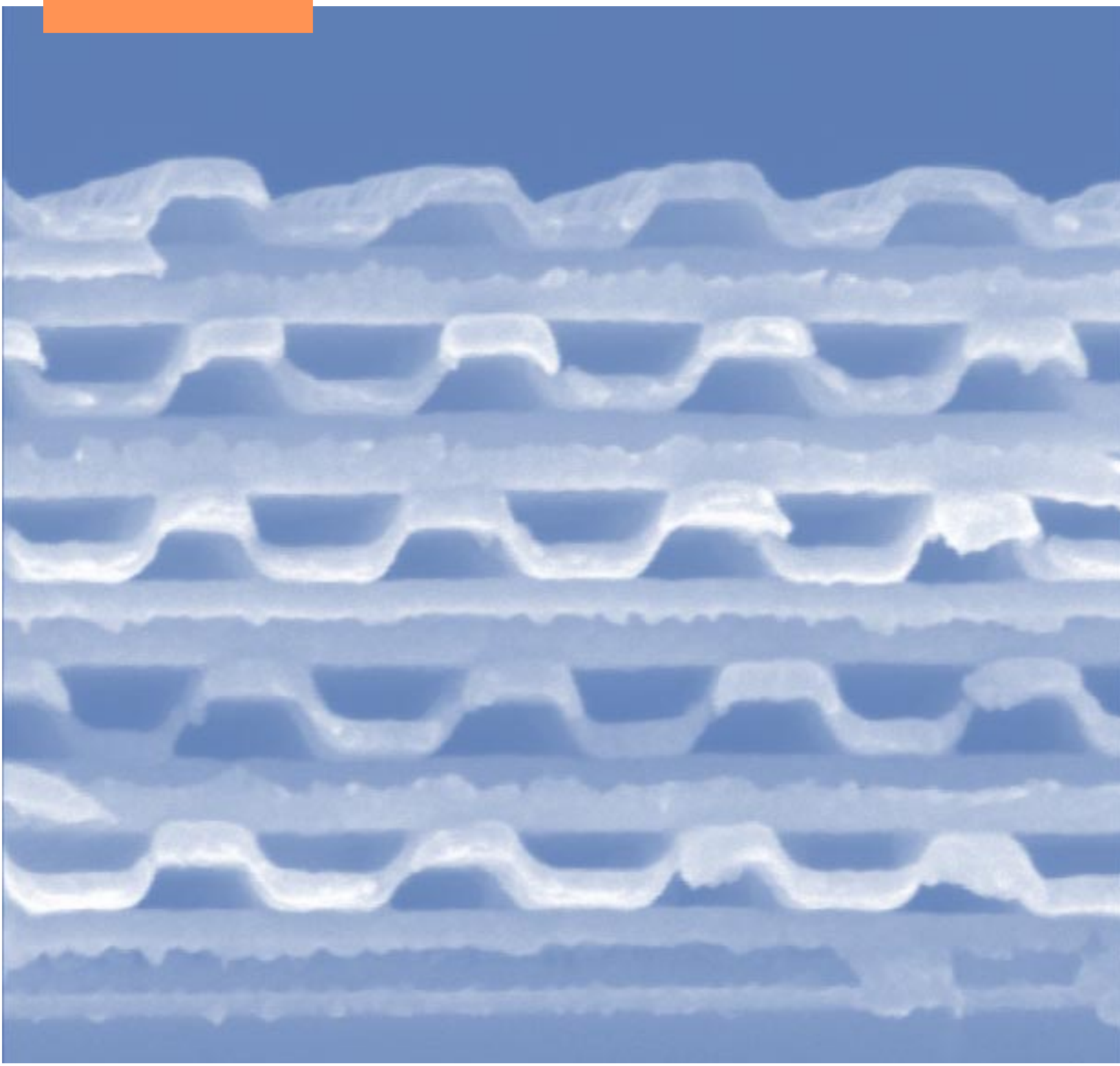
MatSE Illinois

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Department of Materials Science and Engineering



FALL 2003 ALUMNI NEWS

Thurnauer establishes Professorship in MatSE
New faculty involved in nanoscale research

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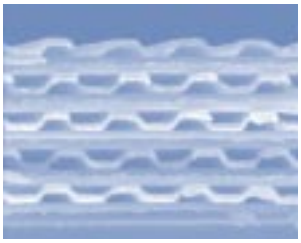

The emerging fields of nanoscience and nanotechnology rely critically on tools for patterning materials on micron and nanometer length scales. The limited capabilities and high level of complexity associated with techniques (photolithography, electron beam lithography, etc.) designed for the microelectronics industry motivate research into new methods for nanofabrication. The image on the cover shows a complex three dimensional nanostructure – a multilayer (10 layers) lattice of crossed gold nanochannels that are each only 100 nm wide — formed with an ultrahigh resolution rubber stamp, using a technique that we refer to as nanotransfer printing. The unusual physical and optical properties of these structures make them useful for certain applications in photonics and nanofluidics.

From the Interim Head

Dear Alumni,

By the time you receive this newsletter, the fall semester will be well underway. As you will learn from the newsletter, we have much to be pleased about in the department despite the difficult budget situation. Our undergraduate recruitment committee was incredibly successful last year and we welcomed 71 freshmen to the program on the first day of classes. This brings our undergraduate population to 215, which is a major achievement for our department. Our graduate student population also increased and we welcomed 41 new students this year, bringing our total to 158. This number reflects the success our faculty has had in attracting research funding.

John Weaver was awarded a Donald B. Willett Professorship by the College of Engineering for his work on the physics and chemistry of surfaces, interfaces, and nanostructures. John joins Joe Greene as the second Willett Professor in the department which is an incredible achievement considering the size of our faculty. Look for more on the Willett Professorship investiture and John's research in the next newsletter.

Hans Thurnauer (MS Cer '32) has established a professorship in the department and we hope to announce the recipient of this award in the coming months. These awards allow us to recognize the outstanding quality of our faculty and increase our ability to attract new faculty. I cannot thank Hans and his family enough for his generous gift.

The builders have finally completed Phase 2 of the renovation of the Materials Science and Engineering Building and we have 7,900 sq. ft. of excellent research laboratory space. While not having the dust and noise in the building is a relief, it marks the end of the current renovation effort and we will have to start raising funds for Phase 3. This may take some time but we need to provide first-rate facilities for our students and faculty.

There is not much to report on the search for our new Department Head. The committee is working diligently to identify and interview candidates. They hope to have the process complete this semester, so look for an announcement on our web site or in the spring newsletter.

If you are visiting the Champaign-Urbana area, I would encourage you to visit and see the new facilities and learn more about your department. If you have questions or concerns, please contact me.

Ian Robertson
Interim Head

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Thurnauer Professorship established

In 1995, Hans Thurnauer (MS Cer '32) endowed a scholarship in Materials Science and Engineering at the University of Illinois. The scholarship was named the Cullen W. Parmelee Scholarship, in honor of Thurnauer's mentor, a former head of Ceramic Engineering at the University. In the years that have passed, the MatSE Department has awarded a total of 47 Parmelee Scholarships.

Now the department is pleased to announce the establishment of the Hans Thurnauer Professorship in Materials Science and Engineering. The professorship will help MatSE attract and retain the best educators in their field. It will provide needed funds for research and add to the reputation of our top-ranked department. The Thurnauer Professorship will be a noble tribute to the alumnus who made it possible.

Hans Thurnauer

"I chose to make this gift because the Department and University both had significant impact not only on my career, but on my life," Thurnauer says. "I was fortunate to have the opportunity to come to Illinois as an exchange masters degree student from Germany at a time (1930) when Germany was experiencing great turmoil, between the two World Wars."

"My sojourn at Illinois was an interesting and exciting experience for me, not only in the classroom, but in experiencing American culture. A few years later, after returning to Germany, I lost my position working for my Ph.D., due to the beginnings of the German Nazi nightmare. I was fortunate to have some 'roots' at the University of Illinois, and I am grateful, particularly to Cullen W. Parmelee, who helped me obtain a job at American Lava Corporation in Chattanooga, Tennessee. In turn, I was able to assist a number of people from Germany, including my former professor, to immigrate to the United States."

Working at American Lava Corporation, Thurnauer produced several patents and published papers on ceramics for high-temperature, wear-resistant, and electronic applications. During 1935-54, he served as a ceramic engineer, research director, vice president and director at the company. He was also hired as a consultant for a variety of government agencies. When 3M acquired the American Lava Corporation in 1955, Thurnauer moved to Minnesota to head the inorganics section of the company's central research lab. He returned to Germany to earn his Ph.D. in 1958 from the Technical University in Berlin.

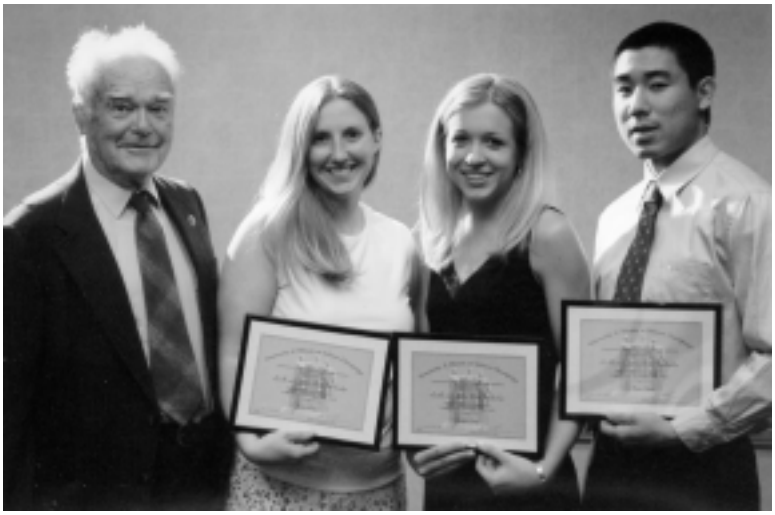
He retired from 3M in 1964 and took a United Nations position as director of the Israel Ceramic and Silicate Institute of Haifa, Israel. Thurnauer spent two years in the U.N. post and then moved to Golden, Colorado, to work as a consultant for Coors Porcelain Company. He retired again in 1972 and began a new career as a consultant and volunteer executive for the International Executive Service Corps. in Boulder, Colorado, where he still resides.

"Clearly the benefits I received from Illinois opened up opportunities beyond my personal sphere," Thurnauer explains his good fortune. "I expect that my gift to the University will impact education, careers, and lives of students and faculty."

The investiture of the first Hans Thurnauer Professor in Materials Science and Engineering is planned for next spring.

2003 Student Awards

A. I. Andrews Scholarship: Matthew Coughlin
Paul A. Beck Scholarship: David Hoying
Harry J. Beckemeyer Jr. Scholarship: Patrick Mahoney
Louis R. Berner Scholarship: Mark Nowakowski
Robert Bohl Scholarships: Paul Ditiangkin, Alicia Kuhl, Nicole Kwasigroch, Justin Montgomery, Ernest Timmons
Caterpillar Scholarships: Charles Holzwarth, Michael Mulholland
Dow Scholarships: Brian Malone, Lynsa Nguyen, Scott Nellis, Morgan Polikoff, Philip Waggoner
Earl J. Eckel Scholarship: Shawn Mack
M. Laird and Charisann Froberg Scholarship: Rachel Williams
Henry E. Grein Jr. Scholarship: Jonathan Hollander
Kimberly Clark Scholarship: Meena Babu, Brian Bertram
Kevin Moore Memorial Scholarship: Rynae Boler
James A. Nelson Scholarship: Eric Pressly
Cullen W. Parmelee Scholarships: Philip Heil, Kyle Hiner, David Narbutas, Miles Szczurek
Norman L. Peterson Scholarship: Timothy Tyler
3M Polymer Materials Scholarships: Laura Copp, Ryan Jensen, Kathryn Petersen
Lucille and Charles Wert Scholarships: Jessica Bump, Zai Kuan Chang, Jennifer Gregg
Alfred W. Allen Awards: Meena Babu, Brian Bertram, Matthew Coughlin, David Hoying, Justin Montgomery, Eric Pressly
Materials Science and Engineering Alumni Board Award: Heather Brenneman
Arthur L. Friedberg Award: Adam Stevenson



Prof. Emeritus Charlie Wert with his 2003-04 scholarship recipients, Jessica Bump, Jennifer Gregg, Zai Chang.

Pigs, pigs, and more pigs

Students presented 20 ceramic pigs to faculty, staff and teaching assistants at the MatSE awards banquet on April 25. This year's pigs included such fine touches as a crystal ball, fuzzy hair, binoculars, and a watch.

Prof. John Abelson: Limerick pig
Prof. Bob Averback: hair entropy pig
Prof. Paul Braun: Dr. J/Straight A pig
Cindy Brya (alumni/student affairs coordinator): Worker Bee pig
Prof. David Cahill: Math Demon pig
Prof. Jim Economy: Rip Van Winkel pig
Prof. Phil Geil: Harry Carey pig
Prof. Richard Keane: Crocodile Hunter/Crocodile Dundee pig
Prof. Trudy Kriven: Geopolymers pig
Prof. Jennifer Lewis: Take your Ritalin pig
Jay Menacher (assistant to the head): I survived the flood pig
Abby Morgan (teaching assistant): I need a clone pig
Dr. Raju Perecherla (instructional lab coordinator): Pig on wheels
Prof. Ian Robertson: Interim Head/countdown pig
Prof. Angus Rockett: Seer pig
Prof. John Rogers: Pig of the Year
Prof. Ken Schweizer: I love Flory pig
Ulas Sevim (teaching assistant): Pastel pig
Prof. Yong-Qian Sun: Dislocation locomotion/ caterpillar pig
Prof. Gerard Wong: Matrix Reloaded pig

Student Awards

Profiles

Laura Copp, 3M Polymer Materials Scholar

I found out about Materials Science and Engineering when I attended an engineering camp at Iowa State after my junior year of high school. I didn't think that chemical engineering sounded very interesting, but I really loved chemistry. I chose MatSE because it also involved chemistry. I decided to come to UIUC because the MatSE program was one of the top programs in the nation.

Laura Copp

I did a semester internship at Pratt and Whitney, working in their rapid prototype casting lab. I also did a lot of metallography and an engineering source approval for a turbine blade the casting lab had produced. The internship taught me a lot about metals that I probably would not have learned since my concentration is polymers. I think I definitely have a better idea of what it will be like when I get a job in the future. I have also had an easier time with interviews that I've done since the internship. I now have experiences to draw from when interviewers ask tough questions.

I've been involved in the Undergraduate Materials Organization (UMO) since my freshman year, and this year I am treasurer. I have been involved with the Society of Woman Engineers (SWE) since I was a freshman. I am part of the SWE Outreach Committee, which goes to local elementary schools and teaches young children about engineering. Last year I was engineering campus tours co-chair for Engineering Council. I have been involved with Engineering Open House for two years, and last year I was project leader for the Edible Atoms project (which won first place). I have also been involved with Keramos.

Scholarships have been very important to me. The U of I is really expensive for an out-of-state student. Every scholarship has helped my family afford for me to go to such a great school!

After graduation, I plan on attending graduate school so I can get a job doing polymer research.

Jessica Bump, Lucille and Charles Wert Scholar

I found out about Materials Science and Engineering as a senior in high school. I came down for a MatSE high school visit day and it seemed interesting and the professors were friendly. I actually received a phone call at home from one of them which was very nice. It also helped that the program offered me a scholarship.

I chose biomedical engineering for my minor because I am very interested in the medical field and I wanted to take advantage of the time I had here to expand on my interests. So far the minor has given me a good physiology and biology background which I think will help me understand the body's reactions to the implantation and use of biomaterials. It also has given me an appreciation for the vast requirements of biomaterials.

I have been involved with MatSE extracurriculars such as UMO, Keramos, and Engineering Open House. I have participated in a bowling league every semester and have been very active with the club softball team, which I am helping to coach this year. I have also enjoyed social extracurriculars such as the Irish Illini and Illini Pride.

Scholarships have been very helpful for me. I am currently making my way through college on student loans so every bit helps. The opportunity for scholarships has also been that little extra motivation I've needed at times to keep pushing through the piles of school work and to do my best.

Jessica Bump

Now, I am uncertain of my immediate future. I plan on applying to grad schools but if the right job offer comes along, I will probably take it. I eventually hope to end up doing research in the biomaterials or tissue engineering industry and perhaps end up teaching high school and coaching.

Tim Tyler, Norman L. Peterson Scholar

I came to the U of I for Worldwide Youth in Science and Engineering (WYSE) after my junior year of high school. I had

Prof. Emeritus Bob Bohl with his scholarship recipients Ernie Timmons, Nicole Kwasigroch, and Paul Ditiangkin.

Student Awards

fun at camp and loved the campus. I applied to a few other places but I knew this is where I wanted to be. The materials lectures at WYSE sounded like exactly what I wanted. For a long time I wanted to be a music major, but I really had fun in my physics class in high school. I decided to keep music as a hobby—engineering is hard to keep as a hobby.

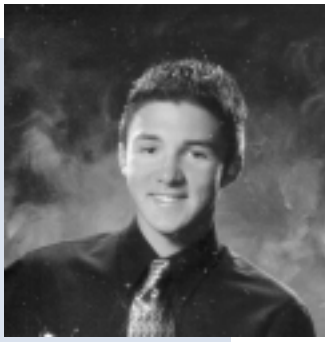
Tim Tyler

I come from a musical family. My parents have played a variety of instruments and my brother will be going to college for cello performance. I started playing the piano in kindergarten. All through high school, I played piano and violin and was in choir. At the university, I've been a member of the Illini Symphony and the Varsity Men's Glee Club. I've recently been accepted into the Other Guys, a comedy a cappella octet that is a subdivision of the Varsity Men's Glee Club. The Other Guys is a big commitment. We have concerts on campus and in Chicago. Next summer the Glee Club will be performing in Europe.

My scholarship from MatSE, combined with a scholarship from my dad's company, has helped a lot. With my parents supporting me in college now and sending my brother to conservatory in a few years, it's been incredibly expensive.

This summer I worked on a research project on alloys. It's not in my specialty (electronic materials) but it's given me a good taste for what it's like to work in a lab. I'm definitely going to graduate school but am not sure if I want to do research as a final career. I'd like to take an internship before I decide so I can see what it's like to work in a company versus working in a lab.

ASM Scholar



The ASM Materials Education Foundation selected Thomas Moore, a freshman in MatSE, as the 2003 ASM Foundation National Merit Scholar. Moore graduated from Centennial High School, Champaign, this year. He was selected based on his outstanding academic achievements, the diversity of his activities, and his interest in pursuing a career in materials engineering. "My long-term goal is to complete doctoral study in engineering and use that knowledge to develop revolutionary medical technology," Moore said. For more information about the National Merit Scholarship Program, visit the ASM Foundation web site at www.asminternational.org/foundation.

Hamer Fellows

Ten graduate students received Donald W. Hamer Fellowships for the 2003-04 academic year. Pictured from left to right: Robert Butera, Eric Duoss, Judith Sorge, Katharine Pfenning, Margaret Shyr, Stephanie Bogel, Sheeny Lan, Parasuraman Swaminathan, Kyle Ritter, and Richard Guaqueta. The fellowships were made possible through the generosity of alumnus Don Hamer (BS Cer '45).

2003 Alumni Awards

Distinguished Merit Award

for an alumnus who has had an illustrious career and whose accomplishments reflect admirably on the MatSE department.

Rao Tummala

BS Met '64, Indian Institute of Science, Bangalore; Ph.D. Cer '68, UIUC

Professor, Department of Materials Science and Engineering, Georgia Institute of Technology, Atlanta

Rao Tummala joined Georgia Tech in 1993 as a Pettit Chair Professor and Georgia State Research Scholar. He is the director of the Microelectronic Systems Electronic Packaging Research Center funded by the National Science Foundation. Prior to joining the university, Tummala was a fellow at the IBM Corporation. He is a fellow of the Institute of Electrical and Electronics Engineers and the American Ceramic Society, and he is a member of the National Academy of Engineering. He has published 205 technical papers and holds 68 U.S. patents and inventions.

Young Alumnus Award

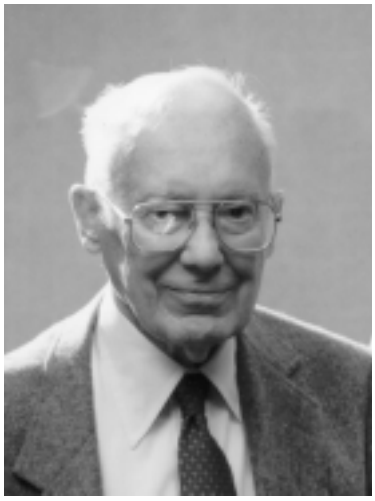
for an alumnus under the age 40 who has demonstrated unusual accomplishments in the early stages of his/her career.

Lorraine Francis

BS Cer '85, Alfred; MS Cer '87, PhD Cer '90, UIUC

Professor, Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis

Lorraine Francis joined the University of Minnesota in 1990 as an assistant professor. She has served as director of undergraduate studies in materials science and engineering since 1999. Her research interests are in ceramic and polymer coatings, interfaces and composites, and biomaterials in dental applications. She has advised or co-advised 34 graduate students (24 have finished their degrees, 10 are current students). She holds a Shell Professorship and has published 60 technical papers.



Loyalty Award

for time, talents, and services so freely given to the department by an alumnus who has displayed extraordinary interest in and loyalty to MatSE.

Joseph Lane

BS Met '43, UIUC; PhD Met '50, MIT

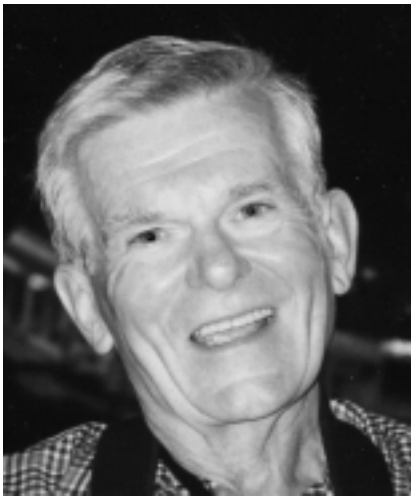
Senior Staff Metallurgist (retired), National Materials Advisory Board, National Academy of Sciences, Washington D.C.

Joseph Lane was fundamental in establishing a scholarship at the University of Illinois in honor of his former professor, Earl Eckel. In 1998, he and his wife, Wyvona (PhD Chemistry '46 UIUC), established a lectureship to foster increased collaboration between the MatSE and Chemistry departments. Most recently, he set up a fund to assist MatSE students with their travel expenses when they attend conferences. Lane joined the University of Chicago's Metallurgy Laboratory in 1943. He left in 1945 to pursue graduate studies at MIT. After receiving his Ph.D., he spent the next five years as the branch head for the Naval Research Laboratory. The majority of his career, 34 years, was spent at the National Academy of Sciences. At the time of his retirement in 1989, he was conducting research on superalloys, refractory metals and aerospace structural materials. He is a fellow of ASM International.

Materials Science and Engineering Alumni Association

Alumni receptions at TMS & MRS

Join us for the University of Illinois alumni receptions at the TMS meeting in Chicago and the MRS meeting in Boston! The TMS reception will be held from 6:00 to 7:30 p.m. Monday, November 10, in the Hyatt Regency Hotel, 151 East Wacker Drive, located in the heart of downtown Chicago. The MRS reception will be held from 6:00 to 7:30 p.m. Tuesday, December 2 (details on which hotel in Boston are forthcoming). Alumni receptions will feature food and drinks, door prizes, and an update on the department. ALL alumni are invited to attend the receptions, not just TMS and MRS attendees. Mark your calendars!



Loyalty Award

for time, talents, and services so freely given to the department by an alumnus who has displayed extraordinary interest in and loyalty to MatSE.

Ray Capek

BS Cer '58, MS Cer '59, PhD Cer '61 UIUC

Manager of Material Technology (retired), Candescent Technologies Corporation, San Jose, California

Ray Capek is an ex-officio member of the MatSE Alumni Board (president, 1994-1996) and serves on the MatSE Department's Senior Advisory Committee. He was manager of ceramic research in the materials and components division of Amphenol Borg Corporation for five years. He worked for Zenith Electronics Corporation for 28 years where he was a senior staff consulting engineer and director of ceramic technology. He was a principal engineer for Telegen Display Laboratories of Redwood City, California, before joining Candescent Technologies Corporation.

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Hilde Schneider *(BS Cer '90, MS Met '92, PhD MatSE '95)*
3M Company
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Vic Tennery *(BS Cer '54, MS Cer '55, PhD Cer '59)*
Tennery Consulting
Oak Ridge, TN

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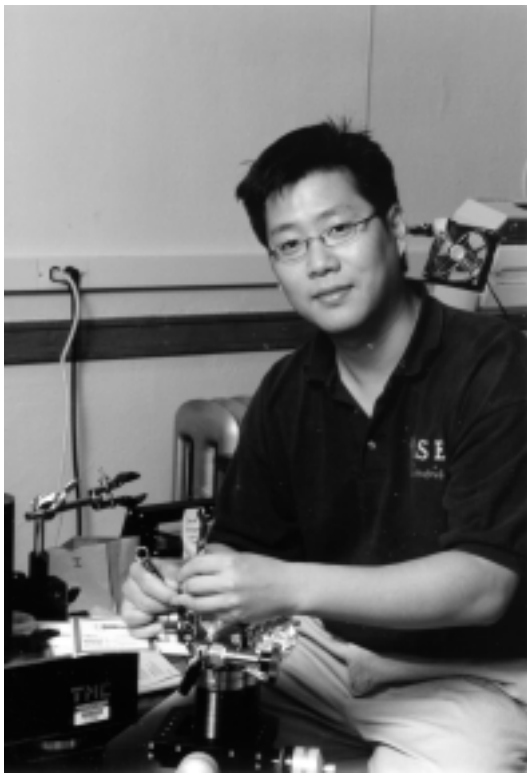
Charles Connors *(BS Cer '60)*
Russ Duttweiler *(BS Met '60)*
Howard Friedman *(BS Met '55)*
Martin Kopchak *(BS Met '73, MS Met '76)*
Ken Kuna *(BS Cer '68, MS Cer '69)*
Keith Meyer *(BS Met '80)*

New MatSE faculty involved in nanoscale research

Moonsub Shim

Assistant Professor Moonsub Shim joined the MatSE faculty in August 2002. "I was a chemist up until I came here," Shim notes. He received his bachelor's degrees from the University of California and his Ph.D. from the University of Chicago in 2001. He returned to California to work as a postdoctoral researcher at Stanford University before joining the University of Illinois. Shim has adapted to the life of a professor but admits, "It's been a challenge—setting up a new lab, learning to teach and advise students and constantly applying for funding, among other things."



Moonsub Shim

His first semester on campus, Shim taught a course on materials synthesis and gave a few lectures on carbon nanotubes for a new introductory nanoscience course. This fall he will teach an introduction to engineering materials and again assist in the nanoscience course. Next he will teach the polymer characterization lab. "It helps me stay sharp in many different areas," Shim says of his diverse teaching load.

His research is at least as varied as the classes he is teaching. While it is focused on materials with nanometer dimensions, Shim's research group explores many different aspects including materials synthesis and processing, characterization in optical, electrical and chemical properties, assembly of these materials into ordered arrays and fabrication of functional devices and systems. "I'm particularly interested in nanoscale materials that possess tunable properties such as carbon nanotubes with structure and diameter dependent electrical conductivity and semiconductor nanocrystals with size-dependent optical properties," Shim explains. "These types of materials are often considered as a class of future materials and they will certainly have an important impact on the development of next generation technologies."

Some of the potential applications of Shim's research include miniaturization of electronics beyond current semiconductor technology, efficient and clean energy source/conversion systems, and improved biomedical probes.

> **"If you think in small enough scale, almost everything is nano."**

On a personal note, Shim has lived on both coasts and is now exploring the middle of the country. "I used to enjoy mountain biking but I have not yet run into a mountain out here," Shim says with a smile.

John Rogers

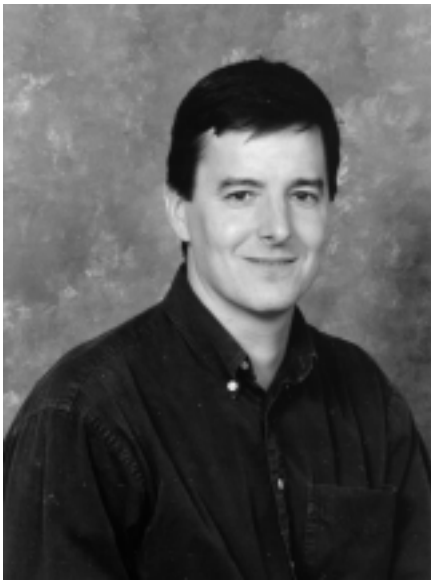
John Rogers joined the MatSE faculty as a Founder Professor of Engineering in January 2003. Like Moonsub Shim, he comes to the department with a chemistry background, but he also holds bachelor's and master's degrees in physics from the University of Texas at Austin and MIT. He received his doctorate degree from MIT in 1995 in physical chemistry. His graduate work formed the basis for what would become a start-up company, Active Impulse Systems.

Rogers entered a business plan competition at MIT and his team made it to the final four. To his advantage, several of the judges were venture capitalists. The judges saw potential in Rogers' product: a laser-based tool for measuring the thickness of very thin metal films used in computer chips. The tool is for use in a clean room facility and monitors the processes of depositing, etching and polishing films.

The tool previously used to monitor thickness of the films was electrical measurement, which required physical contact with the wafer. "The minute you touch the wafer, you introduce contamination," Rogers explains. "The laser tells you the thickness and unlike an electrical probe, it is a non-destructive, non-invasive way of measuring similar property at a much higher spatial resolution, much faster, and with atomic scale precision." He incorporated his new company in fall 1995 and finished a prototype of the tool a year later. By 1997, the start-up was selling 2-3 tools a year, each tool worth $500,000 to $1 million. To increase their production, Rogers realized the start-up had to build a bigger fabrication facility, find a partner, or be acquired by a larger company. The latter was the best course of action, and Phillips Analytical bought Active Impulse Systems in 1998 to add the technology to their portfolio of tools.

At the time he was launching Active Impulse Systems, Rogers was working as a junior fellow at Harvard. He joined Bell Laboratories in 1997 and most recently

served as their director of condensed matter research. Lisa Dhar, Rogers' wife and a member of the same MIT research group,



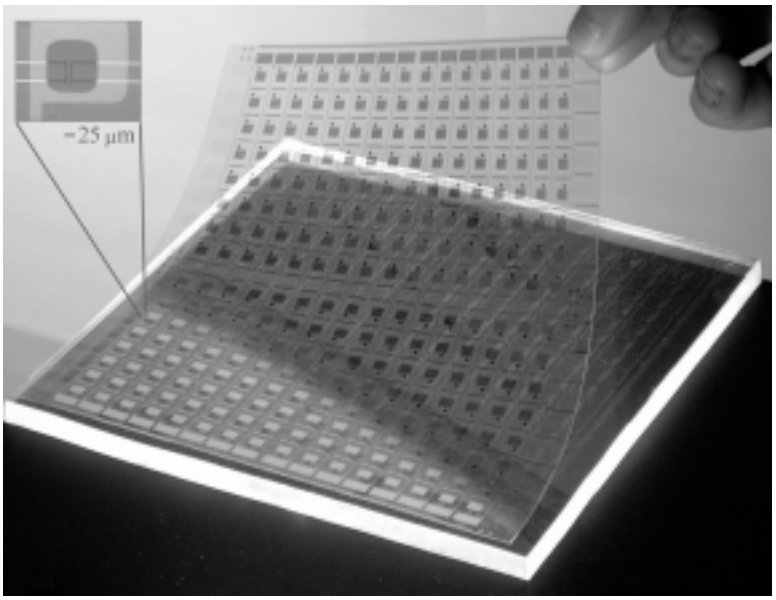
John Rogers

was also at Bell Labs. Dhar moved to Colorado a few years later, to be closer to the start-up company based on her research at Bell Labs. Now together again in Illinois, Rogers and Dhar enjoy spending family time with their 11 month-old son, John Saurav. Dhar continues to work remotely with her company in Colorado.

Rogers taught the polymer characterization lab earlier this year and hopes to introduce a new course on optical materials. His general research thrust is in the area of soft materials—polymers, plastics, small molecules. Rogers wants to find out how these materials might be useful for high-technology applications like consumer electronics, photonics, and optical systems.

"Current technology relies almost exclusively on materials like silicon, glass, and conventional metals," he says. "Polymers and plastics could offer advantages in terms of different kinds of capabilities than what you can achieve with silicon. The idea is not to develop a material that is a direct replacement for silicon but materials that could allow new types of devices like a flexible display (electronic paper) which would be really hard to make with brittle silicon."

"Nanotechnology involves devices or systems where the device's properties or the operations of those devices rely critically on the finite size of its elements."



The image shows a flexible plastic circuit that rests on a large, high resolution rubber stamp that was used to print the critical circuit elements. The inset shows one of the several hundred transistors that are present in this device. Laminating these plastic circuits against thin sheets of electronic inks produces flexible displays that have the look and feel of paper.

Rogers and Shim study carbon nanotubes in a different, yet complementary, context. While Shim's interest lies more closely in building a transistor out of a single tube, Rogers would like to see thousands of the nanotubes on plastic, lined up and operating in unison. "You ultimately need to know what a single tube acts like in order to understand what an array acts like," Rogers says of his collaboration with Shim.

Thanks to all who contributed to MatSE during Fiscal Year '03

Vasantha R. Amarakoon
Rajnikant B. and Nalini R. Amin
Robert Clark Anderson
Roy I. Batista
Clifton G. and Laura K. Bergeron
Neal S. Berke
Robert B. Bieniasz
Gerson B. Bilow
Robert W. and Marie R. Bohl
Alfred J. Bonfiglio
Donald H. Boone
Paul E. Buckles
Donald R. Burnett
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Roland P. and Miriam J. Carreker
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Michael J. Hellige
Lowell M. Hoffman
Harry T. Holgerson
Dale Holloman
William R. Hoskins
Scott E. Hughes
James N. Humenik and Mary Jane Nelson Humenik
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Stephen P. and Mary A. Karas
Betty Kepley
Victor Kerlins
Sooho Kim
Rory S. Kirkpatrick
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Howard J. Kovochich
Ralph G. and Virginia A. Kraft
John F. and Doris M. Krumwiede
Kenneth J. and Mary L. Kuna
Phillip L. LaCroix
James A. Laird
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Carlos G. and Maria L. Levi
Vonne D. and Katherine I. Linse
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Lowell T. Lloyd
William D. Long
George and Petrea Mah
Lawrence L. Martin
Donald O. McCreight
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Joseph J. Meindl
John S. Miller
Roger A. Miller
Thomas J. and Patricia A. Miller
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The student awards highlighted in this issue would not be possible without your support. The list of donors includes alumni and friends who have helped maintain MatSE's outstanding reputation. Included are individuals who directed their gifts to MatSE between July 1, 2002 and June 30, 2003. [We check the list carefully, but if we have overlooked you, please contact the Editor so that we can correct our records.]

Some MatSE alumni chose to support other units of the University of Illinois; those gifts are not listed here but will be acknowledged by those units. If you wish to direct gifts to MatSE, please indicate MatSE on your check and on the donor form.

Individuals listed in boldface are currently Presidents Council members. As of January 1, 1995, individuals must pledge $15,000 over a 10-year period to become Presidents Council members. For more information about this program, contact: University of Illinois Foundation, Harker Hall, MC-386, 1305 W. Green Street, Urbana, IL 61801.

Department of Materials Science & Engineering Fund

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- ❑ Ceramic Engineering [3-75740]
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www.mse.uiuc.edu/alumni/giving.html

MatSE relies upon the support of corporations and foundations, in addition to gifts from alumni and friends. This corporate and foundation support is essential for maintaining high-quality teaching and research within the department. We would like to thank the following corporations and foundations that contributed to MatSE during fiscal year 2003 (July 1, 2002 – June 30, 2003).

Corporations and foundations listed in boldface provided matching funds to supplement the gifts of alumni and friends. If you work for a company that offers a matching gift program, please be sure to include a matching gift form with your donation. For more information on matching gifts, contact the University of Illinois Foundation at 217-333-0675.

Class Notes

1960s

Michael Rechtin (BS Met '66) was named chairman of the Intellectual Property Department

Michael Rechtin

in the Chicago branch of the law firm of Foley and Lardner. He has been a senior partner since 1998 and partner since 1988 in intellectual property law.

1970s

Randy Tustison (MS Met '72, PhD Met '76) is a manager of materials engineering and principal fellow at Raytheon integrated defense systems. In June he was appointed technology area champion of materials and structures for Raytheon Company. He currently manages Raytheon's Lexington Laboratory and lives in Andover, MA, with his wife Kay (BS UIUC '75) and their son Eric and daughter Anna.

1980s

Jaingesh Sekhar (PhD Met '82) received the Established Entrepreneur Award from the University of Cincinnati, where he has been a professor of chemical and materials engineering since 1988. Sekhar launched an advanced material manufacturing company in the 1990s with an agreement with the University of Cincinnati. The company, MHI Inc., sells products manufactured in Cincinnati to customers in over 25 countries.

1990s

Mike Pershing (BS Met '90) has recently joined the research staff at Oak Ridge National Lab in the Materials Processing Group within the Metals and Ceramics Division. He resides in Oak Ridge, TN, with his wife Betsy Landau Pershing (B.S. Physics '90) and his two sons Drew and Brian.

Dan Larson (BS Met '91) is technical services and product quality manager for Nucor Steel in Crawfordsville, IN.

Atif Odeh

Atif Odeh (BS Met '92) owns ATRONA Metallurgical and Engineering Solutions, Inc. in Rockford, IL. ATRONA is an accredited state-of-the-art metallurgical and engineering laboratory with 9 associates and laboratory facilities that exceed 11,000 sq ft. They perform metallurgical testing, evaluations and consulting, mechanical testing and consulting, automotive testing for a wide range of sectors and clients. Odeh recently published a 156-page pocket book entitled "Metallurgy & Heat Treatment, the Pocket Book" which has sold 4,000 + copies so far including some colleges and universities. He invites his friends to email him at aodeh@atrona.com.

Greg Determan (BS Cer '93) is a technical manager for Vesuvius in Chicago Heights, IL.

Ron Kastner (BS Met '93) is a senior materials engineer for ExxonMobil Research and Engineering in Fairfax, VA. He received his master's degree in MatSE from The University of Texas in 1995 and has been working for ExxonMobil since 1996.

Cory J. Padfield (BS Met '96) is the technical director for OMNI Metals Laboratory in Ann Arbor, MI.

Mike Vasaune (BS Cer '98) is corporate special projects engineer for Vesuvius. This year he spent 4 months in Europe, working for Vesuvius in the Czech Republic, Scotland, England and France. He did some engineering support work at these various plants in addition to writing the new procedures.

Greg Schlenz (BS MatSE '99) is an associate in the firm Wallenstein & Wagner, Ltd., in Chicago. He received his law degree from the University of Illinois in 2002.

Brian Skocypec (BS MatSE '99) is a process engineer for NextGen Fiber Optics LLC in Dayville, CT. He is working in the Military/Specialty Fiber Cable Manufacturing Cell.

2000s

Paige Reardon (BS MatSE '00) married Michael Bensing on June 21 in Starlight, IN. She is an applied research engineer for Lexmark International. Her husband is a chemical engineer for Lexmark. They reside in Lexington, KY.

Andy Powell (BS MatSE '01) married Kate Johnson on June 20 in Cincinnati. Powell is part of GE Aircraft Engine Edison Engineering Development Program and works in failure analysis. He met his wife when they were in high school in Cincinnati. She is currently working as a lawyer in St. Louis.

Jeremy Repede (BS MatSE '01) is a manufacturing engineer for Owens Corning in Amarillo, TX.

Katy Gordon (BS MatSE '02) married Scott MacGregor (BA Economics '00) on August 9 in Bloomington, IL. She is a metallurgist at Caterpillar's Mossville Metallurgical Lab. Her husband is an analyst for Ford Credit in Downers Grove, IL.

Zaluzec receives R&D 100 Award

Nestor Zaluzec

A technology developed by a MatSE alumnus at Argonne National Lab has been recognized with an R&D 100 Award, which highlights some of the best products and technologies from around the world. Nestor Zaluzec (PhD Met '79) received the award for his Scanning Confocal Electron Microscope (SCEM), an electron optical instrument that merges the principles of confocal imaging by combining the ease of a Scanning Electron Microscope and the penetration ability of both the Scanning Transmission X-ray Microscope and the Transmission/Scanning Transmission Electron Microscope. The SCEM enables imaging of sub-surface structures of thick, optically opaque materials that previously required an X-ray microscope. It also enables imaging at large fields of view and at small, billionths-of-a-meter or nanometer-level resolution. The SCEM's main application is in studies of nanomaterials, particularly the next generation of electronic, magnetic and photonic devices.

Zaluzec is a scientist and principle investigator for the Advanced AEM and TelePresence Collaboratory Projects in the Materials Science Division of Argonne National Laboratory. He is also an adjunct professor of physics at Northern Illinois University and the University of Illinois-Chicago. As an instrument scientist, Zaluzec's main research interests are divided into both R&D and applications to materials science. They include analytical electron microscopy, electron optics, X-ray and electron spectroscopy, electron diffraction, irradiation effects/damage, magnetism, TelePresence collaboration and computationally mediated experimental science. Zaluzec spends time on the Net as the systems operator for resources for the society and microscopy community worldwide.

This is the 40th year that the technology awards have been given by R&D magazine. The awards recognize the "100 most technologically significant new products" from the entries the magazine receives. The judges look for products that can change people's lives for the better, improve the standard of living for large numbers of people, save lives, promote health, protect the environment or advance our ability to solve vexing problems of importance to the nation and the world.

Alumni return for Career Night

MatSE alumni Drew Kofahl (BS Met '97), Matt Frey (BS Cer '92, PhD MatSE '96), and Dan Lillig (BS Met '93, PhD MatSE '00) participated in the department's Career Night on September 24. Kofahl is a sales engineer for The Timken Company in Lemont, IL. Frey is a research engineer for 3M in St. Paul, MN. Lillig is research engineer for ExxonMobil in Houston, TX. All three stressed the importance of networking and advised undergraduates to be active in their job search by reading trade publications and doing their research.

Alumni who are interested in joining us for a future career night should contact Cindy Brya at brya@uiuc.edu, ph: 217-333-8312. Check out the MatSE Department's placement website for job opportunities and information on recruiting MatSE graduates.

Career Night 2003 panelists: Drew Kofahl, Matt Frey, Dan Lillig

www.mse.uiuc.edu/info/placement.html

Obituaries

Carl R. Weymueller (BS Met '49) died November 22, 2002. He was an editor at ASM for nearly 20 years, before joining the staff of Welding Design & Fabrication magazine in 1977. He and his wife, Eileen, lived in Newbury, OH.

James Ernest Becker (BS Met '55) died July 4 in Collinsville, IL. He was a retired civil engineer with the state highway department with 36 years of service. He was a U.S. army veteran and belonged to Amvets, Loyal Order of the Moose and Illinois Retired Highway Engineers. After retiring, he worked for Federal Emergency Navigational Agency and volunteered as a tax preparer for senior citizens. Surviving are his wife, Marian Evansco-Becker, and his four children.

Joseph Adam Pask (BS Cer '34, PhD Cer '41), a pioneer in the field of ceramics engineering, died on June 14 at the age of 90. After teaching at several universities, Pask joined the University of California-Berkeley faculty in 1948. He and a colleague, the late Richard M. Fulrath, soon launched the university's first graduate and undergraduate programs in ceramic engineering.

Joseph Pask

"He conducted very sound science in the ceramics area at a time when ceramics was considered the dirty cousin of metallurgy," said Andreas Glaeser, a professor of material science and engineering at UC Berkeley who was recruited by Pask. Pask's work with mullite, an aluminum-silica compound commonly used in engines and turbines and to line the furnaces used to make steel and other metals, remains a benchmark.

At UC Berkeley, Pask was named chairman of the Department of Materials Science and Engineering in 1958, a post he held for three years. He later served as associate dean of graduate affairs in the College of Engineering from 1969 until his retirement in 1980.

He earned many prestigious awards during his career, including the 1967 John Jeppson Medal for outstanding achievement in ceramic technology and the highest honor bestowed by the American Ceramic Society; and the 1980 Berkeley Citation, one of the campus' highest honors for extraordinary achievement.

He is survived by his wife, Margaret; a son; a daughter; three grandchildren; and four great- grandchildren.

-UC Berkeley Office of Public Affairs

The Ultimate Pre-Law Program: Materials Science and Engineering at the University of Illinois College of Law

by Christopher Carroll (BS MatSE '00)

Upon deciding to enter law school after my graduation from the University of Illinois College of Engineering, I received many similar remarks from friends: "Law school? Engineers don't go to law school!" or "Don't you have to be able write well in order to go to law school? Engineers don't know how to write." But my favorite remark came from a close friend who stated, "Engineering students aren't prepared well enough for law school. Law school is a completely different ballgame. You won't be able to match up with all those history and political science majors."

Well, three years later, with a J.D. *cum laude* from the University of Illinois College of Law, I can happily say that my engineering degree from the Materials Science and Engineering department (MatSE) was an excellent preparation for the challenges of law school. My friends could not have been more incorrect in their assertions of how ill-equipped engineers are for law school.

First, engineers do go to law school. Patent law is an area of the practice of law which invariably has an insatiable demand for attorneys with an engineering background. During my first year of law school, at a time when summer associate or clerk positions with law firms or judges were nearly impossible to find, every single law student with an engineering background had a summer position. In addition, at graduation, every single law student with an engineering background had a job waiting for them once they finished the bar exam.

Second, engineers do know how to write. While engineering students may not have as many essay exams as do other undergraduate programs, the laboratory reports that most engineering students (and especially MatSE students) are required to do are much more relevant to achieving success in law school. Law school teaches students to sort through a conglomerate of relevant and irrelevant information, organize this information in a clear, informative, and persuasive manner, and present this information in a logical, step-by-step analytical argument. This is exactly what engineering students (and especially MatSE students) are taught to do in their lab reports! Lab reports require engineering students to sort through relevant and irrelevant data, organize the data in a clear and informative manner, and present this data in a logical and analytical method to support their ultimate conclusions.

Finally, engineering students are prepared for law school. As I previously stated, engineering students have an excellent ability to sort through information and present relevant information in an organized, informative, and logical manner. In addition, engineering students have a work ethic that cannot be matched by any other undergraduate degree program. This work ethic is what propels engineering students to great success in law school.

However, I feel that my MatSE degree in particular prepared me for law school in a way that most other engineering programs could not – by giving me confidence in presenting my conclusions. As most everyone knows, the Socratic method of law school is dreaded by virtually every first year law student. While the Socratic method is far from a pleasurable experience, I feel that my MatSE degree prepared me for it more so than other undergraduate programs could have. This preparation came in the form of an electronic materials laboratory course where the professor required each student to present his or her laboratory results to the class. The presentation included questions from the professor in a very Socratic method. While this was far from an easy exercise, this helped to prepare me to orally present findings and conclusions in a clear and concise manner and to learn to "think on my feet," both of which were essential to succeeding in law school.

> **"During my first year of law school, at a time when summer associate or clerk positions with law firms or judges were nearly impossible to find, every single law student with an engineering background had a summer position."**

In conclusion, the MatSE program at the University of Illinois did an excellent job preparing me for the challenges of law school. The work ethic, writing ability, and speaking ability that I was taught during my undergraduate years were all essential tools for my success in law school.

Chris Carroll is a graduate of the University of Illinois College of Law, J.D. cum laude, 2003. He is currently employed as a first year associate awaiting the results of the Illinois bar exam at McAndrews, Held & Malloy, Ltd., of Chicago, Illinois, a patent law firm.

Department Notes

Back to School

The MatSE Department kicked off the fall semester with a picnic for graduate students in August and undergraduates in September. Student enrollment is at an all-time high: 215 undergraduates and 158 graduate students.

Graduate students Brent Kraczek and Jacob Palmer enjoy the picnic with their families.

Above: Prof. Jim Economy visits with postdoc Liu Chunqing, new graduate student Dennis Graham and wife Colleeen Graham.

Undergraduates and faculty gather for the annual picnic at the Illini Groves in Urbana.

Microscopy workshop held

Professor John Abelson organized a workshop on advanced structural analysis in the transmission electron microscope, entitled "Fluctuation Electron Microscopy and Nanoscale Ordering in Amorphous Materials," which was held at UIUC on June 23-24, 2003. There were 65 participants from universities, national laboratories and industry, including three international participants (from England, Australia, and Korea).

The *fluctuation electron microscopy* technique has the potential to provide, for the first time, a detailed understanding of nanometer–scale structural ordering in amorphous materials, including semiconductors, metallic glasses, oxides, and soft materials. This event brought together researchers who are engaged in various aspects of the problem, including specialists on scattering experiments, theory, and models of amorphous structures. The workshop featured 12 invited talks by distinguished speakers, including keynote talks by the inventors of the fluctuation electron microscopy technique, M. M. J. Treacy and J. M. Gibson.

A second workshop will be held in 2005. Details are posted on the site http://cmm.mrl.uiuc.edu/FEM_Workshop/FEM_Invited.htm

Weaver named Willett Professor

John Weaver has been named a Donald Biggar Willett Professor by the College of Engineering. In making its decision, the College's selection committee considers such qualities as a faculty member who will bring highest distinction to the College; someone who has a demonstrated national and international reputation in research and scholarship; and a well-rounded professional who will contribute to research, teaching, and service, serving as a role model for other faculty members.

Renovation complete

The second of five planned phases to renovate the Materials Science and Engineering Building was recently completed after about 16 months of work. Phase 2 involved the east wings of the 2nd, 3rd and 4th floors and the south side of the 4th floor. The renovation involved significant ventilation system improvements and the installation of 20 fumehoods. Phase 2 resulted in 7,900 sq. ft. of renovated space that is assignable for use (labs, offices, storage) by the MatSE Department.

Renovated research laboratories such as the one pictured above, will allow MatSE faculty to increase activities in the area of biomaterials.

Students no longer walk along the banks of the Boneyard Creek on their way from Engineering Hall to the Kiln House. The creek is now a tree-lined walk. The Bardeen Gardens will bring color to the south Engineering Quad next spring.

We want to hear from you...

and find out what has been happening in your life. Your fellow alumni, as well as the MatSE Department, want to hear about your activities.

Name _____

UIUC degree(s) and year(s) _____

_____

Business address _____

_____

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News about you (continue on separate sheet) _____

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Flashback

Do you remember using the metallurgy laboratory pictured above? Do you recognize any of the classmates? Please share your memories with us as well as any pictures you may have from the department's past. Contact the Editor at 217-333-8312, brya@uiuc.edu.

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