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- Alumni receive honors
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Dissolvable Electronics

High performance electronic materials that disappear over time

Greetings from Urbana



Enrollment in the undergraduate program of our department reached a new high (384) this fall, nearly doubling in the past 10 years. I am often asked to what we can attribute this success and popularity. Our high rankings—we're back to #2 in the US News and World Report survey—are certainly part of the story. The increased cost of education, freshmen engineering students at Illinois are paying nearly \$20k per year in tuition and fees, is probably driving more students to select courses of university study that can more directly lead to career opportunities upon graduation. And many students I talk to are well aware that materials science and engineering is an important part of the solution to many of the critical challenges facing our country in energy, security, health-care, the environment, and international competitiveness of the manufacturing sector of the economy.

The continuing challenge of the MatSE faculty and staff is to provide both the breadth of educational experiences demanded by the diverse interests of our students and the technical depth that is our traditional strength. Nearly ½ of B.S. graduates go on to further study in professional and graduate programs. (You can see a listing of placements for May 2012 graduates at <http://www.matse.illinois.edu/downloads/BS2012placement.pdf>) In my many conversations with alumni, I am reminded often that grounding in the fundamentals of the disciplines is as critical as ever for a successful placement in industry.

New assistant professors Cecilia Leal and Andrew Ferguson started their appointments in April and are hard at work establishing their research groups and developing their teaching skills and new courses. Cecilia applies state-of-the art experimental methods to advance the science and engineering of biomolecular structure. Her research program combines a deep study of molecular mechanisms with an eye for translating her discoveries into new approaches for medical therapies and biotechnology. Andy strengthens the theory and computation research in the department. He is pursuing a broad and innovative research agenda working at the intersection of materials science, high performance computing, machine learning, and bioinformatics.

We also completed our first national search for a lecturer and welcomed Matt Sherburne to our community this fall. Matt will be teaching courses on materials to non-engineers and engineers from other engineering disciplines but his main role in our undergraduate program is to strengthen undergraduate research and engineering design in the department. You may be hearing from him soon as he works to get more alumni involved in providing projects and mentoring teams of students enrolled in our senior design course.

Sincerely,

David Cahill
Willett Professor and Head

Jim Barnett inducted into Engineering at Illinois Hall of Fame



The Engineering at Illinois Hall of Fame recognizes Illinois engineering alumni and affiliates who have significant achievements in leadership, entrepreneurship, and innovation of great impact to society. Jim Barnett (BS Cer '67) was among the eight individuals inducted into the 2012 Hall of Fame on September 14 at the Beckman Institute for Advanced Science and Technology. Barnett was honored for his innovations in the fields of semiconductors, liquid crystal displays, and digital watches; his pioneering work in the industry of programmable gate arrays;

and co-founding Xilinx, the field programmable gate array creators.

Based on his experience in two Silicon Valley startup companies, Jim Barnett first discussed founding a company with fellow Illinois alumnus Ross Freeman (MS Physics '71) during a business trip to Hong Kong

in January 1983. Six months after their trip, Freeman came up with an idea for a new semiconductor product that Barnett also recognized as an architectural breakthrough in programmable logic technology. Their new company, Xilinx, was incorporated and founded on January 9, 1984. Within a month of the founding, the new company had solved technical and cost limitations by going to a static RAM-based volatile technology similar to microprocessors instead of nonvolatile e-prom or ee-prom technology used in earlier, small programmable logic devices. The field programmable gate array, or FPGA, was born. The company went public in June 1989, and today, Xilinx has 4,000 employees, more than 3,000 patents, 20,000 customers, and revenues of more than \$2 billion a year.

Barnett is the recipient of three U.S. patents and is a member of the Band of Angels in Palo Alto, CA, the first angel investor organization. He has served on many boards of directors, including Xilinx. Retired from Xilinx, Barnett does private venture investing and consulting through Barnett Ventures.

Next up: Environmentally safe electronics that also vanish in the body

Physicians and environmentalists alike could soon be using a new class of electronic devices: small, robust and high performance, yet also biocompatible and capable of dissolving completely in water – or in bodily fluids.

Researchers at the University of Illinois, in collaboration with Tufts University and Northwestern University, have demonstrated a new type of biodegradable electronics technology that could introduce new design paradigms for medical implants, environmental monitors and consumer devices.

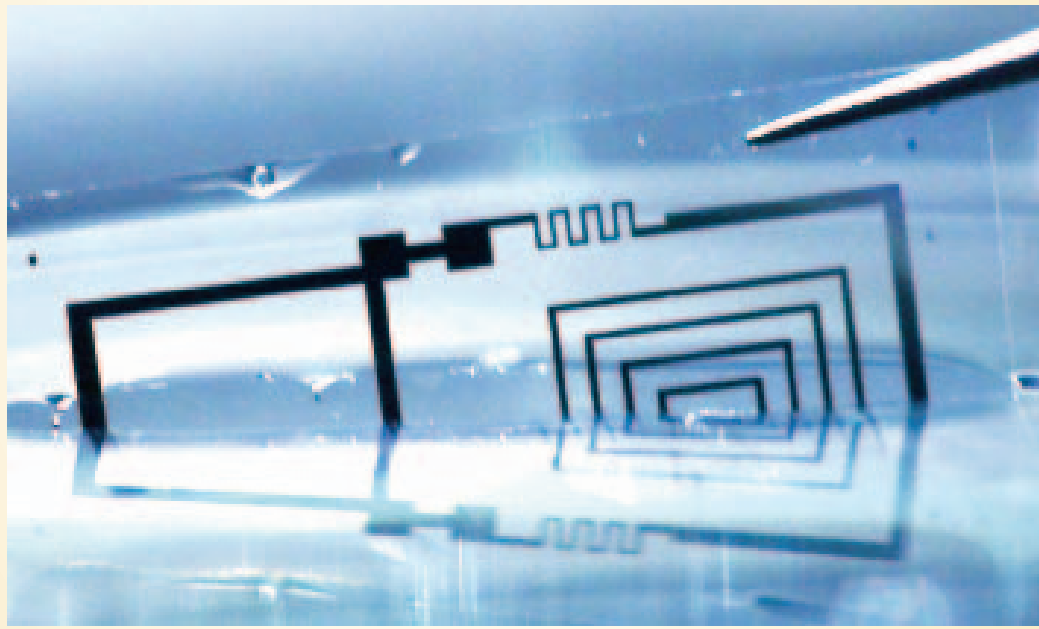
“We refer to this type of technology as transient electronics,” said John A. Rogers, the Lee J. Flory-Founder Professor of Engineering at the U. of I., who led the multidisciplinary research team. “From the earliest days of the electronics industry, a key design goal has been to build devices that last forever – with completely stable performance. But if you think about the opposite possibility – devices that are engineered to physically disappear in a controlled and programmed manner – then other, completely different kinds of application opportunities open up.”

Three application areas appear particularly promising. First are medical implants that perform important diagnostic or therapeutic functions for a useful amount of time and then simply dissolve and resorb in the body. Second are environmental monitors, such as wireless sensors that are dispersed after a chemical spill, that degrade over time to eliminate any ecological impact. Third are consumer electronic systems or sub-components that are compostable, to reduce electronic waste streams generated by devices that are frequently upgraded, such as cellphones or other portable devices.

Transient electronic systems harness and extend various techniques that the Rogers’ group has developed over the years for making tiny, yet high performance electronic systems out of ultrathin sheets of silicon. In transient applications, the sheets are so thin that they completely dissolve in a few days when immersed in biofluids. Together with soluble conductors and dielectrics, based on magnesium and magnesium oxide, these materials provide a complete palette for a wide range of electronic components, sensors, wireless transmission systems and more.

The team has built transient transistors, diodes, wireless power coils, temperature and strain sensors, photodetectors, solar cells, radio oscillators and antennas, and even simple digital cameras. All of the materials are biocompatible and, because they are extraordinarily thin, they can dissolve in even minute volumes of water.

The researchers encapsulate the devices in silk. The structure of the silk determines its rate of dissolution – from minutes, to days, weeks or, potentially, years.



A biodegradable integrated circuit during dissolution in water.

“The different applications that we are considering require different operating time frames,” Rogers said. “A medical implant that is designed to deal with potential infections from surgical site incisions is only needed for a couple of weeks. But for a consumer electronic device, you’d want it to stick around at least for a year or two. The ability to use materials science to engineer those time frames becomes a critical aspect in design.”

Since the group uses silicon, the industry standard material for integrated circuits, they can make highly sophisticated devices in ways that exploit well-established designs by introducing just a few additional tricks in layout, manufacturing and supporting materials. As reported in the Sept. 28 issue of the journal *Science*, the researchers have already demonstrated several system-level devices, including a fully transient 64-pixel digital camera and an implantable applique designed to monitor and prevent bacterial infection at surgical incisions, successfully demonstrated in rats.

Next, the researchers are further refining these and other devices for specific applications, conducting more animal tests, and working with a semiconductor foundry to explore high-volume manufacturing possibilities.

“It’s a new concept, so there are lots of opportunities, many of which we probably have not even identified yet” Rogers said. “We’re very excited. These findings open up entirely new areas of application, and associated directions for research in electronics.”

The Defense Advanced Research Projects Agency supported this work. The Tufts University team was led by Fiorenzoomenetto; the Northwestern University team was led by Youggang Huang. Rogers is affiliated with the departments of materials science and engineering, of chemistry, of mechanical science and engineering, of bioengineering and of electrical and computer engineering, and with the Beckman Institute for Advanced Science and Technology and the Frederick Seitz Materials Research Laboratory at the U. of I.

University of Illinois News Bureau

Watch the video: <http://www.youtube.com/watch?v=NnmHZXvJhIk>

2012 Alumni Awards



Distinguished Merit Award

Kent Budd (BS Cer '81, PhD Cer '86)

Kent Budd is a Senior Staff Scientist and Group Leader for Inorganic and Ceramic Materials in the Corporate Research Materials Laboratory of 3M Company. At 3M Company, Budd has worked primarily in corporate lab and technology center organizations, resulting in technology development with many 3M Divisions. He holds over 35 issued and over 10 pending U.S. patents. This work has included the invention of novel microencapsulated electroluminescent phosphors,

which led to the widespread use of electroluminescent lighting in watches, automobiles, and cell phones. He also co-invented several high refractive index, transparent nanocrystalline glass-ceramic materials, resulting in multiple new pavement marking products with retroreflectivity in both dry and wet conditions. These technologies have helped enable several hundred million dollars in product sales.

He has co-developed additional technology related to composite dielectrics, ceramic fibers, dental fillers, retrochromics, glass bubbles, and roofing materials. Additional commercialized products have included Er-doped optical fibers, embedded capacitors, and dental restoratives. His current group at 3M continues to develop unique materials with high commercial potential, including sapphire like glass-ceramics, translucent high strength zirconia, microreplicated ceramics, and new glass microsphere structures. His work has earned him two 3M "Technical Circle of Excellence" awards, two corporate-funded "Genesis Grants" and a Golden Step Award.

Budd has been an adjunct faculty member at the University of St. Thomas since 1995. He has taught classes in ceramics and materials science to graduates, undergraduates, and internally to 3M employees.



Distinguished Alumnus Award

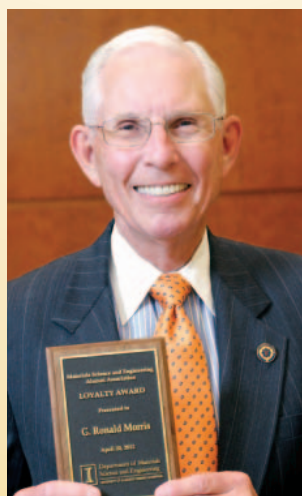
Tsong P. Perng (PhD Met '85)

In 2005, Tsong Perng was appointed as the President of Yuan Ze University (YZU), one of the 12 most prominent universities selected by the Ministry of Education in Taiwan. YZU, founded in 1989, is a private university consisting of five colleges, with an enrollment of approximately 10,000 students. From 1985-2005, Perng was a faculty member in the Department of Materials Science and Engineering at the National Tsing Hua University (NTHU) in Hsinchu, Taiwan. He has

supervised around 80 graduate students, including 20 PhD's and over 65 MS students. He served as the Chairman of the MSE Department at NTHU from 1994-1997 and Dean of Academic Affairs of NTHU, from February 1998 to January 2004.

His professional service includes Editor-in-Chief for the Journal of Chinese Corrosion Engineering, 1994-1996; Associate Editor for Acta Metallurgica and Materialia and Scripta Metallurgica and Materialia (now Acta Materialia and Scripta Materialia), 1996-1999; President of Materials Research Society-Taiwan, 2008-2011; and member of the Senate of the International Union of Materials Research Societies. His service to the government and industry includes coordination to initiate the National Program in Nanoscience and Nanotechnology under the National Science Council and to found the Taiwan Nanotechnology Industry Development Association.

He has received the Outstanding Research Award by the National Science Council, Taiwan, in 1993 and the Academic Award of Ministry of Education, Taiwan, in 2009. He is a Fellow of the Institute of Materials, Minerals, and Mining of the U.K. and a Fellow of Australian Institute of Energy. His current research includes work on the synthesis, structure characterization, and physical and chemical properties for nanotubes, nanowires, nanoparticles, and nanograin bulk metals. Perng has published 140 journal and 120 conference papers and has ten patents.



Loyalty Award

G. Ronald Morris (BS Met '59)

Ron Morris is a member and current chairman of the MatSE Department's Senior Advisory Committee. He served on the University of Illinois Alumni Association Board of Directors for six years and has also served on the College of Engineering Advisory Board. Ron has served on the Board of Directors of the Indianapolis Chamber of Commerce, United Way, American Red Cross, and Junior Achievement, and on the Board of Trustees of the Indianapolis Children's Museum

and the Corporate Board of the Milwaukee School of Engineering. Now retired and living in Savannah, Georgia, Morris still continues to serve. He is currently on the Boards of the Savannah Salvation Army, The Savannah Philharmonic, The Coastal Jail and Prison Ministry and Savannah Veritas Academy. Over the years he has been a Board member of eight public or private corporate Boards of Directors, and still serves on one publicly held corporate Board at this time.

Throughout his career, Morris held virtually every corporate manufacturing and executive position. He served as CEO of both publicly and privately held manufacturing companies, including Tenneco Automotive, PT Components (Link-Belt Company), and Western

Industries. Success in each of the ventures that he directed depended not only on his technical skills but more so on his ability to attract outstanding people, build participative organizations founded on trust, promote professionalism within, and focus the corporation's efforts on sound strategic direction.

Ron Morris and his wife Peg have endowed two undergraduate scholarships and a professorship in the Department of Materials Science and Engineering at the University of Illinois. Morris received the MatSE Department's Distinguished Merit Alumni Award in 1999 and the Alumni Award for Distinguished Service in Engineering from the College of Engineering in 2003.

Young Alumnus Award

J Schwan (BS MatSE '97)

Following his graduation from the University of Illinois in 1997, J Schwan began his career at Accenture. In 2001, he founded Solstice Consulting, Chicago's leading enterprise mobility consulting firm. Solstice provides



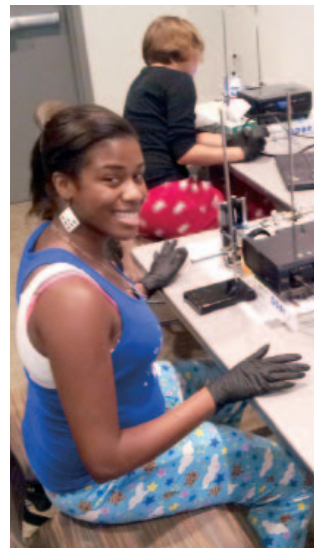
Fortune 1000 companies with mobile strategy, mobile development, mobile security and mobile infrastructure services. Solstice has been recognized by Consulting Magazine as one of America's Seven Small Jewels of Consulting and has made the Inc. 5,000 list of America's Fastest Growing Companies for the past 2 years. Schwan is a national thought leader in the mobile space and his work has been highlighted in leading trade journals such as Information Week, Computer World and CIO magazine. Schwan enjoys speaking about emerging technology topics at educational institutions, technology conferences and focus groups.

GLAM campers find out materials are pretty cool

High school girls discovered the exciting field of materials science and engineering at a week-long summer camp on the University of Illinois campus. Girls Learning About Materials (GLAM), was part of the College of Engineering GAMES camps designed to give academically talented high school aged girls an opportunity to explore engineering and scientific fields through demonstrations, classroom presentations, hands-on activities, and contact with women in these technical fields. GLAM participants were able to examine and build materials down to the atomic scale and learned how the materials in our modern lives work, from smartphones, to solar cells, to lightweight composites. They found out how

materials can deliver drugs, heal themselves, and store energy.

GLAM camper Kennedy Reese's parents, Derrick and Stefanie, were thrilled with the presentation Kennedy gave her family upon her return from camp. "Wow! Our 9 year-old twin daughters stayed focused and asked Kennedy plenty of good questions about the cow skin, solar house, microchip, and liquid nitrogen," they wrote in an email to Prof. Dallas Trinkle who developed the GLAM curriculum. "Knowing how important STEM is to our lives, we say thank you for igniting a passion for science and engineering in our daughter."



Materials Science and Engineering Student Scholarship and Awards 2012-2013

Paul A. Beck Scholarship

Timothy Chiu

Harry J. Beckemeyer Jr. Scholarship

Rachel Garrick

Clifton G. Bergeron Scholarships

Ryan Epping
Parul Koul

Louis R. Berner Scholarships

Aleksander Bapst
Michael Katz
Bo ErTew

Gerson B. Bilow Scholarship

Karen Lamb

Robert Bohl Scholarships

Mark Cavanaugh
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Colin Ringel
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Yiran Xiao

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Spencer Wells

Caterpillar Scholarships

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Andrew Nelson
Jonathan Streufert

Earl J. Eckel Scholarships

Kyle Blouin
Congshan Wan

M. Laird and Charisann Froberg Scholarships

William Andrews
Gregory Kutyla
Jaime Kelleher

Phillip H. Geil Scholarship

Erich Diesel

Henry E. Grein Jr. Scholarship

Luke Shi

Donald W. Hamer Scholarships

Corey Fyock
Jonathan Hestroffer
Jennifer Huffman
Ryan Hurley
Maxwell Li

Joseph and Wyvona Lane Scholarship

Michael Collins

Robert E. and Karen Martin Luetje Scholarship

Martin Kim

Kevin Moore Memorial Scholarship

Taylor Perez

G. Ronald and Margaret H. Morris Scholarship

David Bruk

G. Ronald and Margaret H. Morris Opportunity Scholarship

Austin Listerud

James A. Nelson Scholarship

Jacob Gruber

Cullen W. Parmelee Scholarships

Mitchell Bigelow
Seth Cazzell
Nicholas Demetriou
Anna Mast
Samuel Mo
Daniel Roper
Carrington Watkins
Hongyi Wu
Aaron Zhao
Andrew Zhao

Cullen W. Parmelee International Research Scholarships

Rudi Bredemeier
Lei Che
Lauren Schroeder
Janice Yoshimura

Frederick A. Petersen Scholarship

Scott Lyons

Norman L. Peterson Scholarships

Steven Shewchuk
Ryan Smith

Larry D. and Carol Rakers Scholarships

Yelizaveta Fedonina
Ryan Haney
Douglas Hansel



Charles Stovall

Michael Szymanski

Ian and Victoria Robertson Scholarship

Timothy Ouradnik

Wert Scholarships

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David Broschka
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Janna Eaves
Nicole Ernat
Anthony Griffin
Jingtian Hu
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Alex Katsulis
Kyle Lamson

Shao Mei

Stephanie Nemece

Aniruddh Shivram

Zoey Sowinski

Linus Sulas

Aik Jun Tan

Hui Lin Yang

Wen Yang

Alfred W. Allen Awards

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Dominic Bonucci
Michael Campion
Seth Cazzell
Steven Hartanto
Enjong Lu
Anna Mast
Tan Nilgianskul

Carrington Watkins

Spencer Wells

Raissa Yona

Chenshuo Yue

Arthur L. Friedberg Awards

Colin Stewart

Xiaolin Zhang

Laird Froberg Award

Parul Koul

Materials Science and Engineering Alumni Board Award

Scott Navel

Sheryl Blair Tipton Award

Divija Alluri

First Robertson Scholarship awarded in MatSE

The MatSE Department is pleased to announce the first recipient of the Ian and Victoria Robertson Scholarship. The Robertson Scholar for the 2012-2013 academic year is Tim Ouradnik, a junior from Tinley Park, IL. Ouradnik, a James Scholar honors student and “huge White Sox fan,” is currently pursuing two concentrations, biomaterials and metals.

“I originally came to Illinois as a student in the Division of General Studies,” Ouradnik said. “At first, I thought I might try to pursue a career in the health or business fields. After I took a couple of science classes here and did some research, however, I thought engineering would be a good fit for me. Then I talked to some friends and met some staff and faculty and decided MatSE would be a good fit for me.”

In addition to his rigorous engineering course load, Ouradnik is active in his fraternity, plays intramural soccer and football, works for the Dean of Students in New Student Programs, and is an undergrad research assistant for Professor Cecilia Leal. He said his busy schedule helps him stay focused. He is minoring in Spanish and plans on going to Spain this summer. After he graduates, he wants to travel for a while and then start his career.

Ouradnik feels honored to have received the first Ian and Victoria Robertson Scholarship. “I hope to set a strong precedent for future candidates,” he said. “Scholarships are great things that really keep people motivated and confident.” He has not met the Robertsons yet but hopes to meet them on their return to Champaign-Urbana. Ian and Vicky Robertson have been in Washington, D.C., since January 2011 when Ian was appointed Division Director for Materials Research in the Mathematical and Physical Sciences Directorate of the National Science Foundation.

“We would like to thank all those who have given anonymously to the Ian and Victoria Robertson Scholarship. Because of your generous support, we were able to award our first scholarship this year to sophomore, Tim Ouradnik. We hope to continue building the scholarship, so that we can continue to help provide needed funds to many students for many years to come.”

In gratitude, Ian and Victoria Robertson



Tim Ouradnik

Thank You for Your Support!

The student awards highlighted in this issue would not be possible without your support. Gifts to the MatSE Department provide scholarships for outstanding and in-need students, allow us to continuously improve the quality of our instructional laboratories, and support special events such as our back-to-school picnics and annual awards banquet. Alumni gifts also support travel by undergraduate researchers to attend professional conferences and enable us to provide beneficial services such as our job placement program.

This list of donors includes alumni and friends who have helped maintain MatSE's outstanding reputation. Included are individuals who have directed their gifts to MatSE between July 1, 2011, and June 30, 2012. We check the list carefully, but if we have overlooked you, please contact us so that we can correct our records. Individuals listed in boldface are first-time donors to MatSE.

Some MatSE alumni choose to support other units of the University of Illinois; those gifts are not listed here but will be acknowledged by those units. Gifts to “Engineering at Illinois” are directed to the College of Engineering, not the MatSE Department. If you wish to direct gifts to MatSE, please indicate MatSE on your check and on the donor form. You can donate online at www.matse.illinois.edu/support or use the form included in this newsletter.

The Engineering Dean's Club recognizes individuals whose annual giving to engineering departments or the engineering fund is \$1,000 or more over the course of a year. Members receive a Dean's Club lapel pin to help them show their pride and commitment to Engineering at Illinois.

For further information about making a gift to the Department of Materials Science and Engineering, contact Allison Winter, awinter@illinois.edu, (217) 244-8307. Thank you for your support!



“Not only did this scholarship provide my family with financial support, it also served as motivation for me to continue to work hard towards my degree. I have had the opportunity to work as an intern at both the United States Steel Corporation and Alton Steel, Inc. After graduation, I would like to enter industry as a metallurgical engineer.”

Ryan Epping, Bergeron Scholar
Senior from Bethalto, IL



“The financial assistance I have received from this university has given me the opportunity to undertake technical experiences, including research in John Rogers' group, and has allowed me to make time for committee positions in the MatSE honors society, Keramos, and the Illinois Triathlon Team.”

Wen Yang, Wert Scholar
Senior from Normal, IL

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PhD Met '90)
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John Schwan III (BS MatSE '97)
William Scott
Alvin Shulman (BS Met '52)
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Donald Stevens (BS Cer '42)
and Adele de Werff Stevens
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Daniel (BS Met '61) and Orleen Stoltz
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William (BS Met '79) and Eileen Taylor
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PhD Cer '59)
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Jim Economy

Department Notes

The undergraduate program in Materials Science and Engineering at the University of Illinois is ranked #2 in the nation, according to the U.S. News & World Report rankings for 2013.

Jim Economy was named a 2012 Fellow of the American Chemical Society. During the past 40 years, Economy and his research teams have played a major role in the design and development of a number of polymer systems, including liquid crystalline materials for structural uses, novel thermosetting resins that can be recycled, and activated fibers for filtering environmental contaminants. Most recently he and his group have developed a new composite based on carbon fibers in a boron nitride matrix, which shows a 10x improvement in wear for aircraft brakes as compared to the currently used carbon/carbon composites.

Steve Granick was selected as the 2013 recipient of the Colloid and Surface Chemistry Award of the American Chemical Society, the highest honor in colloid science in the United States. The award, sponsored by Procter & Gamble Co., recognizes and encourages outstanding scientific contributions to colloid and/or surface chemistry in North America. Granick specializes in the field of soft materials—fluid membranes, liposomes, polymers, colloids, and other structured liquids, and presently focuses on their behavior at surfaces.

Dallas Trinkle was promoted to Associate Professor.

John Rogers is among 81 researchers receiving awards to pursue visionary science that exhibits the potential to transform scientific fields and speed the translation of research into improved health, under the High Risk High Reward program supported by the National Institutes of Health (NIH) Common Fund.

Spencer Wells, senior in MatSE, won the Student Speaking Contest at MS&T'12 in Pittsburgh, PA.

Sandy Helregel joined MatSE as a chief clerk in the business office and is in charge of processing orders and reimbursements. She transferred to the MatSE Department from the School of Music. She has worked for the University for 14 years.



Steve Granick



Sandy Helregel

Lunch with a Professor



Professors Lane Martin and Nancy Sottos participated in the first Student-Professor Lunch of the 2012-2013 academic year. They talked to students about their research and the classes they teach in MatSE. The Material Advantage student chapter organizes the monthly lunches, and the MatSE Department supplies the pizza.

New Lecturer in MatSE



Matt Sherburne joined the MatSE Department at Illinois after finishing his Ph.D. in Materials Science and Engineering at the University of California, Berkeley. Sherburne was working as the deputy in charge of several new instructional efforts and as a coordinator for the surveillance

unit for the Sacramento County Sheriff Department when he decided to go back to school at American River Community College (ARC). While attending ARC as a business major, he became involved in the Human

Powered Vehicle competition which inspired him to change his major to engineering. He transferred from ARC to UC-Berkeley, where he double-majored in Mechanical Engineering and Materials Science and Engineering.

“As a graduate student, I mentored undergraduate student research projects and helped with student group projects,” Sherburne said. “I am looking forward to being involved with the senior design course in the MatSE Department and the department’s new initiative for an undergraduate research thesis program.” Sherburne is actively involved as an engineering consultant and will continue his efforts in this area, trying to get students involved when possible. “I am also in the process of starting an educational nonprofit which will focus on education in the developing world and improving the access to course material via online sources.” In addition, he is working on coauthoring a book on bonding, crystal structure and defects.

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Class Notes

Larry Fehrenbacher (BS Cer '61, PhD Cer '69) is the President of Technology Assessment & Transfer, which specializes in high technology, developing and commercializing advanced materials for defense, bio-medical and industrial applications. Technology Assessment & Transfer Inc. created the ceramic heater bodies which house an oven inside the Mars rover Curiosity. The heater bodies can withstand temperatures exceeding 1,000 degrees Celsius.



Krishan Chawla (MS Met '67, PhD Met '71) recently published the third edition of his book *Composite Materials*.

Sanak Mishra (MS Met '70, PhD Met '73) received the 2011 IIM Platinum Medal in recognition of his outstanding contributions to the metallurgical profession, industry, and to the Indian Institute of Metals. Mishra is Vice President of ArcelorMittal in New Delhi, India, and chairperson of the International Organisation of Materials, Metals and Minerals Societies.



Randy Tustison

Randy Tustison (MS Met '72, PhD Met '76) is a principal engineering fellow in the Integrated Defense Systems' Mechanical Engineering Directorate at Raytheon. He is also Mechanical, Materials and Structures Technology Area Champion for Raytheon, involved in all aspects of materials and mechanical engineering science. Since joining the company 32 years ago, Tustison has been active in the

area of optical materials and coatings development. He is past chair of the Vacuum Technology Division of the American Vacuum Society and currently serves on the industrial advisory board of the National Science Foundation's Center for High-Rate Nanomanufacturing.

Mini Reunion



Chuck (BS Met '63) and Carole Schaffhauser, Doug (BS Met '64) and Pat Ruhmann, and Ken (BS Met '64) and Sandy Boris enjoyed a campus visit in September. They were in town to help classmate Bob Munson (BS EE '63) celebrate his receiving an alumni award from the Electrical and Computer Engineering Department.



Tom, Pat and Daniel Miller

Nestor Zaluzec (PhD Met '79) has received the Microanalysis Society's Presidential Science Award, which honors a senior scientist for outstanding technical contributions to the field of microanalysis over a sustained period. The award winner is chosen annually by the society's president. Zaluzec is a senior scientist and principal investigator in Argonne's Electron Microscopy Center as well as a fellow of both Oak Ridge National Laboratory and the Computational Institute of the



The Hansen family

University of Chicago. His research includes the development of state-of-the-art instrumentation, software and techniques for X-ray and electron spectroscopy, analytical and scanning confocal electron microscopy.

Robert Schwartz (PhD Cer '89) is chief of staff for the University of Missouri System. He had most recently served as interim provost and executive vice chancellor for Academic Affairs at Missouri University of Science and Technology. He joined Missouri S&T in 2002 as professor of ceramic engineering, and later became the associate chair of the department and served as faculty senate president.

Tom (BS Met '79) and **Pat** (BS Met '79, MS Met '86) **Miller** and their son Daniel attended the Engineering at Illinois event at the Chicago White Sox game on August 7 in the US Cellular Coliseum.

Dawn Rigazio Shafer (BS Met '80) is an account for Keystone Symposia on Cellular and Molecular Biology in Silverthorne, CO.

Neal Berke (PhD Met '80) is Vice President, Research, for the Tourney Consulting Group, Ltd., in Kalamazoo, MI.

Jim (BS Met '82) and **Jean** (BS Cer '89) **Hansen** visited campus with their sons Jimmy (15) and Danny (13). Jim and Jean work at Pratt & Whitney in Connecticut. The Hansen's arrived in Champaign-Urbana on August 6 and were glad to be able to take a picture with the Alma Mater before it was removed for restoration.

Jim Becker (BS Cer '92) is an associate professor of electrical and computer engineering at Montana State University.

Jinn Chu (PhD Met '92) is Vice Dean of the College of Engineering, director of the nanotechnology center, and distinguished professor in materials science and engineering at the National Taiwan University of Science and Technology.

Steve Kilgore (BS Met '93, MS MatSE '96) is a senior reliability engineer for Freescale Semiconductor in Tempe, AZ.

John Olson (MS Cer '93) will be on detail to the Office of Science and Technology Policy for the next 1 to 3 years as the Assistant Director for Space and Aeronautics in the Executive Office of the President. He serves as Director, Strategic Analysis and Integration Division (SAID) and Director, Mission Support Services Office (MSSO) at the Human Exploration and Operations Mission Directorate at NASA headquarters.

James Shull (MS Cer '93, PhD MatSE '97) is a principal engineer for Siemens Energy in Pittsburgh, PA.

James Hancock (BS Cer '97) is a physician at Medical Hills Internists in Bloomington, IL. He is board certified in internal medicine and pediatrics.

Jessica Nelson (BS MatSE '99) married Nathan Troup, a computer science graduate from Michigan, on October 12. They live in Rolling Meadows, IL.

Kate Pripusich-Sienkiewicz (BS MatSE '03) is working on a master's degree in environmental engineering at the University of Illinois. She worked at the State Department in Washington, D.C., since 2003 and enjoys living in the Midwest again.

Greg Gratson (PhD MatSE '05) is Assistant Vice President for GE Capital. His role is to build research partnerships with GE's Global Research Center and the many companies that borrow from GE Capital. It is a new partnering mechanism for GRC that will showcase the value of GE Capital being part of the larger GE and differentiate GE Capital from other banks as they compete for new financing opportunities. He will be based at the GE Capital office on Park Ave. in New York City.

Jonathan Hollander (BS MatSE '05) founded an energy policy think tank after completing his doctorate degree at Cambridge University in England. He moved to New York City to take a job as Business Development Manager of a British technology start-up hoping to expand into the U.S. market. He is also teaching a few distance-learning courses at a university in his hometown.

Pittsburgh Reception



Professor Dallas Trinkle visits with Tim (MS Cer '86, PhD Cer '89) and Beth (BS Cer '88) Armstrong at the MatSE reception in Pittsburgh during MS&T'12. The Armstrong's work at Oak Ridge National Laboratory.

Shawn Mack (BS MatSE '05) completed his Ph.D. at the University of California, Santa Barbara, and is now a researcher at the Naval Research Laboratory in Washington, D.C.

Patrick Kurtz (BS MatSE '07) is a continuous improvement manager at GATX Corporation in Chicago.

Tom Miller (BS MatSE '08) married Jennifer Weizeorick on October 20 at St. Joan of Arc Church in Lisle, IL. She is a fellow Illini, having received her bachelor's and master's degrees in Urban Planning from the U of I. He is employed at ArcelorMittal in New Carlisle, IN.



Patrick Coyle

Patrick Coyle (BS MatSE '09) has joined the Intellectual Property practice group in the St. Louis office of the law firm Armstrong Teasdale. He received his J.D. in 2012 from Washington University School of Law.

Pam (Wojtulewicz) Tanner (BS MatSE '09) moved to St. John's, Newfoundland, Canada in February 2012. She and her husband are working on the Hebron Project for ExxonMobil.

Alumni Panelists

Members of the MatSE Alumni Board participated in a panel discussion in MSE 182, the introductory materials course for freshmen. Panelists were Geoff Brenneka (Sandia National Laboratories), Dave Teter (Los Alamos National Laboratory), Howard Savage (Cummins), and Britt Turkot (Intel).





MatSE graduate student wins second place in inventor competition

Brett Walker, a graduate student in Materials Science and Engineering, won second place in the Collegiate Inventors Competition. His invention is reactive silver inks, a project related to his Ph.D. research under Thurnauer Professor Jennifer Lewis.

Silver-based inks are the heart of the printed electronics industry, but they are difficult and expensive to manufacture. Walker said, "Reactive silver inks have many applications. Their main application is printing techniques to replace more costly sputter coated or evaporated metals while maintaining the same performance level."

Introduced by the National Inventors Hall of Fame in 1990, the Collegiate Inventors Competition has awarded over \$1 million to individuals or teams for their innovative work and scientific achievement. Entries from collegiate inventors are judged on the originality of the new idea, process or technology, as well as potential value and usefulness to society.

On November 12, Walker and the other thirteen finalists in the 2012 Collegiate Inventors Competition traveled to Washington, D.C., to present their inventions to an esteemed panel of judges, which included several Inductees to the National Inventors Hall of Fame. The winners were announced the following day at an event at the Newseum, an interactive museum of news and journalism located in the nation's capital. The top undergraduate winner received \$12,500, with second and third place winners receiving \$10,000 and \$7,500. The top graduate winner received \$15,000, with second (Brett Walker) and third place winners receiving \$12,500 and \$10,000. Sponsors for this year's competition included the Abbott Fund, the philanthropic foundation of the global health care company Abbott, the Ewing Marion Kauffman Foundation, and the United States Patent and Trademark Office (USPTO).

Walker plans to finish his Ph.D. degree in the spring of 2013 and is weighing his options for the future. "I'm currently looking at starting a company based on these (reactive silver) inks or working for a government lab," he said.

MatSE merchandise

Show your pride in your alma mater by wearing a MatSE shirt.

All clothing items have the MatSE Illinois logo embroidered on them. Polo shirts are 100% cotton and come in navy or orange, men's and women's sizes. Windshirts are 100% polyester microfiber and are wind and water-resistant with side pockets. Windshirts come in navy, men's size only. Nano-Fleece shirts are ¼ zipped, non-static and non-pill. The nano-fleece shirts are ultrasoft and come in navy, men's and women's sizes.

Prices include shipping (domestic) and handling.

For questions about orders and information on international shipping, contact Cindy Brya at brya@illinois.edu or 217-333-8312.



In Memoriam

Bruce Craig (BS Cer '45) passed away June 24, 2012. He was a ceramic engineer and WWII Army Air Corps veteran. He was a navigator on B-24 bombers in the European theater, flying 18 missions out of England over Germany. He retired from Johns-Manville Corp. in 1988, holding several patents. He was known for his abstract photography and originated techniques for manipulating photos on the computer. In 1999 he and his wife formed "The Eldertainers" and performed at numerous retirement centers. He wrote the book "Survival: Self and Country, WWII." He is survived by his wife Pauline.

Rogers Westlake (BS Cer '48) passed away July 2, 2012. After graduation, he earned his master's degree in ceramics from North Carolina State University. He moved back to Illinois to work on the family farm in 1951. He worked as a ceramic engineer in Antioch and Wooster. He and his wife, Grace, retired to Fairfield Glade, TN, in 1991. He enjoyed aviation, computers, photography and singing in the church choir. He was preceded in death by his wife who passed away in 2001. He is survived by five children, Mark, Carol, Ross, Betsy, and Grant.

Sherman Elliott (BS Met '50) passed away May 25, 2012. He served in the U.S. Army occupation forces and in the Army Reserve. He was hired as chief metallurgist for the W.F. and John Barnes Rockford Ordinance Plant during the Korean War. He retired from Rockford Power Train as chief metallurgist. He previously worked at Barber-Colman and Rockford Products. He was a member of the American Society for Metals since 1952, and was a past president of the Rockford chapter. He had an avid interest in politics and photography. He is survived by his daughter, Kathleen, and sons, Charles and James.

John Schultz (BS Cer '52, MS Cer '53) passed away May 13, 2012. He worked at Battelle Institute in Columbus, OH, doing research and development on projects for the Atomic Energy Commission and the Air Force. In 1956, he married Virginia (Ginny) Rogers, and they moved to Louisville when he was offered a job in the laboratory at General Electric's Appliance Park. He retired in 1990 after 34+ years at GE working in research and development and earning 10 patents for his work. He is survived by Ginny and their daughter, Ginger.

Gert Ehrlich, 86, research professor in the Department of Materials Science and Engineering at the University of Illinois, Urbana-Champaign, passed away August 10, 2012. He is survived by his devoted wife, Anne.

Professor Ehrlich received his bachelor's degree in chemistry from Columbia University in 1948, and his master's and doctorate degrees in chemistry and physical chemistry from Harvard University in 1950 and 1952. He was an NIH post-doctoral fellow at Harvard University from 1951 to 1952 and a post-doc in the physics department at the University of Michigan from 1952 to 1953.

He began his professional career at the General Electric Research Laboratory, Schenectady, NY, where he conducted research on surfaces at the atomic scale from 1953 to 1968. He joined the faculty at the University of Illinois in 1968 and continued his research until five weeks before his death.

Professor Ehrlich was a Guggenheim Fellow and a Fellow of the American Physical Society, New York Academy of Science, and American Vacuum Society (AVS). He was a Member of the National Academy of Sciences and American Chemical Society (ACS). His honors include the Medard W. Welch Award from the AVS, the ACS Kendall Award for Surface Chemistry, University Scholar, Humboldt-Forschungspreisträger, and the Tau Beta Pi Daniel C. Drucker Eminent Faculty Award from the College of Engineering.

William "Bill" Stoewer (BS Met '53) passed away May 31, 2012. He served in the U.S. Army, First Cavalry Division, in two tours of duty; 1946-1947 and also during 1951. He was the City Engineer for Moline, IL, from 1956-1973 and then branched out on his own, creating Stoewer Engineering and Associates and Cloverleaf Mobile Home Park of Moline. He and his wife of 61 years, Faye, enjoyed many world travels and spent winters in Tempe, AZ. He is survived by Faye and their sons, Greg and Jon.

David Ports (BS Cer '56, MS Cer '57) passed away July 20, 2012. He served in the U.S. Army during the Korean War. He was employed by the former Western Electric on the Telstar Satellite Project and integrated circuits before retiring in 1989 after 28 years of employment. He was an avid reader. He was a member of the National Society of Professional Engineers and the American Ceramic Society. He was a parishioner of the Cathedral St. Catharine of Siena Church in Allentown, PA. He is survived by his wife, Mary Lou, and three sons, Michael, William, and David.

William Mossner (BS Met '61) passed away June 26, 2012. He worked at Advanced Metalworking as a metallurgical engineer in the field of powder metal. He received numerous professional honors and awards, including earning the designation of Powdered Metal Technologist (PM) and being published in the International Journal of Powder Metallurgy. Because he served on the committee that wrote the difficult exam, he was not allowed to earn the designation himself until he left that committee. He was an active volunteer and also enjoyed writing poems and children's books. He is survived by his wife, Edith, and two children, David and Danielle.

Donald Gentry (BS Met '65) passed away July 2, 2012. He received his Ph.D. in mining and finance from the University of Arizona. He was a retired professor emeritus and Dean of Engineering of the Colorado School of Mines. Previously he was President and CEO of PolyMet Mining Corporation in Golden, CO. He was on the Board of Directors of Gryphon Gold Corporation and had served on the Board of Santa Fe Gold Corporation, Newmont Mining Corporation, and Newmont Gold Company. He was a member of SME, AIME, and the National Academy of Engineering. He is survived by his wife, Sheila, son, Chad, and daughter, Tara.



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Welcome new students

The MatSE Department welcomed 37 new graduate students in August 2012. New and current graduate students and professors enjoyed a picnic at Crystal Lake Park in Urbana.

Connect with MatSE!

Join us on Facebook (www.facebook.com/matse.illinois) and LinkedIn (www.linkedin.com).

The MatSE at Illinois LinkedIn group is a networking group for alumni and students of the Department of Materials Science and Engineering at the University of Illinois. Stay in touch with your classmates and find out the latest department happenings.

