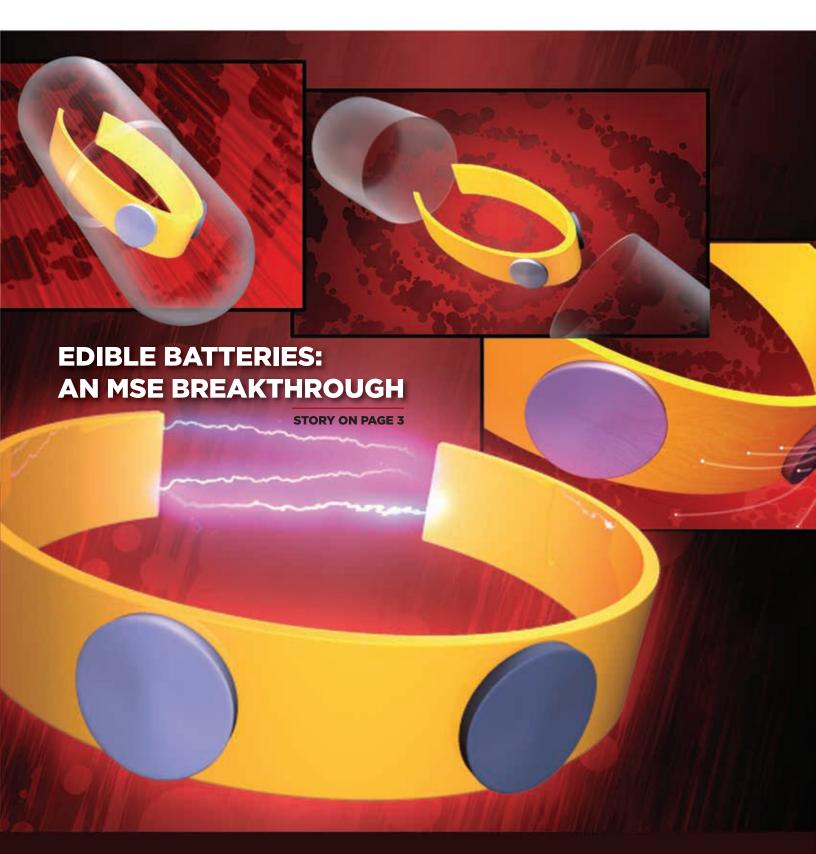


MATERIALS SCIENCE AND ENGINEERING

Carnegie Mellon University

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A NOTE FROM THE DEPARTMENT HEAD

GREGORY S. ROHRER,

W.W. Mullins Professor





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reetings to our MSE alumni! I am happy to report that the Department continues to grow and thrive. From the news items on pages 7 through 11, you will see that our alumni, students, and faculty also continue to celebrate successes in a broad range of endeavors — including technical honors, career advancement, philanthropy, and family milestones.

Perhaps the biggest news for materials engineers on the Carnegie Mellon campus is the selection of our University's new leadership. We were excited to hear that the ninth president of Carnegie Mellon will be **Dr. Subra Suresh**. This enthusiasm derives not just from the fact that Suresh is a materials scientist and engineer, but also from our genuine respect for his accomplishments in scholarship and leadership. Suresh served on former President **Dr. Jared Cohon's** Advisory Board for Materials Science and Engineering, so he is already well-known to many in our Department. He will, of course, hold an appointment as a full Professor of Materials Science and Engineering.

At the same time, Carnegie Mellon also has a new Dean of Engineering, Dr. James

Garrett. He has had a long history in the leadership of the Carnegie Institute of Technology, serving as Associate Dean, Interim Dean, and Head of Civil and Environmental Engineering. As a result, we can be sure that the College of Engineering is in good hands.

With this new leadership, we can anticipate strategic planning activities and new directions for the University, College, and Department.

This issue of MSE News also features two articles about battery research, displaying the progress that researchers in the Department

Our new leadership means strategic planning activities and new directions for the University, College, and Department.

are making in both very small and very large energy storage systems. At the finest scale, the research groups of **Professors Christopher Bettinger** and **Jay Whitacre** have created very small batteries that can be ingested, in order to power electronics within the human body. At a much larger scale, the battery company started by Whitacre, Aquion, has received \$35 million in venture funding capital. Rather than ingestible batteries, Aquion's main focus is on large-scale, stationary energy storage systems for load-leveling applications. Aquion is making a significant regional impact, as it has opened a 340,000-square-foot manufacturing facility where the company plans to employ several hundred workers to make aqueous hybrid ion batteries.

Finally, it is with sadness that I note the passing of **Dr. George Roberts**, a long-time benefactor of the University. When I attended his memorial service in March, along with Jared Cohon and former President **Robert Mehrabian**, I was reminded of the significance of Roberts' legacy to the College through the creation of Roberts Engineering Hall, as well as his contributions to our discipline through his support of ASM materials camps and undergraduate scholarships for education in materials science. George Roberts was a huge presence in our field, and he will be dearly missed.

Gregory S. Rohrer



COVER STORY

EDIBLE BATTERIES: AN MSE BREAKTHROUGH

ecently an edible electronic device developed by

Assistant Professor Christopher Bettinger and

Associate Professor Jay Whitacre has been

attracting a lot of attention, including coverage by the Pittsburgh media, as well as international science and medical journals. This innovation is in the spotlight for a good reason: it has the potential to dramatically improve health care for a wide range of patients.



Shown on the cover of this edition of MSE News is a schematic of the edible battery produced by Professors Bettinger and Whitacre. This device could be used to power a variety of electronically active biodegradable and biocompatible medical devices that can be orally administered—such as sensors and drug delivery vehicles.

"Our research is focused on creating electronically active medical devices that can be implanted in the human body," says Bettinger, who holds a joint appointment in the Department of Biomedical Engineering. "For the patient, it would be like swallowing a pill. But that pill actually contains a tiny power source, which enables an encapsulated medical device to track conditions or deliver care inside the gastro-intestinal tract."

Because the battery uses only materials found in the average diet, it is entirely safe for human consumption—while providing the same type of electric current as a typical battery. "Our unique battery design includes flexible polymer electrodes and a sodium ion electrochemical cell," explains Bettinger. "By folding the mechanism into an edible pill that encapsulates a fully functional device, we've

created a powerful technology that can be easily swallowed and ingested by patients."

Once connected to a miniature power source, groundbreaking edible devices could be programmed and deployed in the gastrointestinal tract or the small intestine, depending upon packaging. Once the device is in place, medical professionals could activate the battery and start performing tests,

delivering care, or simply monitoring changing conditions.

Devices could be customized for a wide range of functionality, including measuring biomarkers or monitoring gastric problems. Edible batteries also power miniature devices that stimulate damaged tissue or deliver targeted drug therapy for certain types of cancer. "There's so much we can accomplish with this novel approach to medical devices," says Bettinger.

Last year, Bettinger received the *National Academy of Sciences Award for Initiatives in Research* for his innovative work on advanced materials for next-generation implanted medical devices (see *MSE News*, Summer 2012). In 2011, Bettinger was selected to *Technology Review* magazine's TR35 list, which honors top innovators under the age of 35. He was also invited to attend the prestigious National

Academy of Engineering's 17th annual U.S. Frontiers of Engineering Symposium, which brings together exceptional researchers in industry, academia, and government.



In April, a crew from KDKA-TV visited MSE for a story about the new edible batteries.

DEPARTMENT NEWS





George A. Roberts

MSE COMMUNITY LOSES FRIEND AND BENEFACTOR

George A. Roberts Dies at Age 93

While it has been over 70 years since **George A. Roberts** (B.S. 1939, M.S. 1941, Ph.D. 1942) graduated from MSE, he maintained a life-long relationship with the Department of Materials Science and Engineering. This close relationship, and his generous spirit, led him to endow the George A. Roberts Engineering Hall, which has played a critical role in elevating the stature of the College of Engineering throughout the world.

It was with sadness that the Department learned of the passing of George Roberts on February 15 at the age of 93.

"It's impossible to express the magnitude of the impact that George Roberts had on our Department and on the entire College of Engineering," says MSE Department Head Gregory S. Rohrer. "Roberts Engineering Hall, along with the J. Earle and Mary Roberts Materials Characterization Laboratory—which is located on the first floor of the building and named for George's parents—have had a transformative effect on the MSE Department. First and foremost, these state-of-the-art facilities have enabled research not otherwise possible. The characterization facilities have been used by students and faculty to make breakthroughs in the study of electronic materials, magnetic materials, and metallic and ceramic microstructures. Second, the modern, well-appointed building has been a factor in attracting the best students and faculty to MSE."

"Equally important was the warm friendship and regard George had for so many of us in the Department," continues Rohrer. "He will be missed by generations of MSE faculty, students, and staff members."

FROM ENGINEER TO ENTREPRENEUR

George Roberts was born in Point Marion, Pennsylvania, on February 18, 1919. He studied at the United States Naval Academy before arriving at the MSE Department—then the Department of Metallurgy—to earn three degrees.

Roberts worked under former **Professor and Department Head Robert F. Mehl**,

with whom he enjoyed a close friendship. In fact, the Roberts Engineering Hall includes the books and important papers of Mehl, a stipulation that Roberts made in funding the building. These archives can be found in the Dilks Room, along with Roberts' own book collection.

Following his graduation from Carnegie Mellon, Roberts worked as a metallurgist for Vanadium Alloys Steel Corporation in Latrobe, Pennsylvania, eventually becoming its President in 1961. In 1966, the company merged with Teledyne, where Roberts became President and Chief Executive until his retirement in 1993. Roberts published *Distant Force*, a memoir of Teledyne, which he grew into a *Fortune* 500



corporation along with his close friend Henry Singleton.

Teledyne was a pioneer in producing high-precision alloys and specialty metals for aerospace applications. The company was so successful in engineering these high-temperature, high-stress materials that annual sales grew to \$3.5 billion in 1984.

A LIFETIME OF PHILANTHROPY

In his long and successful career, George Roberts won virtually every accolade and award in our industry—including serving as the youngest president of ASM International, at the age of just 36. But he will also be remembered for his amazing philanthropy.

In addition to his generous gifts to Carnegie Mellon, Roberts endowed nearly 100 ASM scholarships, with the goal of encouraging young people to enter the field of materials engineering—as well as strengthening American technical expertise. His impact on the field of materials science and engineering has been enormous.



Subra Suresh

CMU NAMES MATERIALS SCIENTIST AS NEW PRESIDENT

arnegie Mellon University has named Dr. Subra Suresh as its ninth President, succeeding Dr. Jared L. Cohon. Suresh, who will assume the post July 1, is currently the Director of the National Science Foundation (NSF), a \$7 billion independent government science agency charged with advancing all fields of fundamental science, engineering research, and education.

A materials engineer by training, Suresh previously served as the Dean of the School of Engineering at the Massachusetts Institute of Technology (MIT). In his leadership roles at MIT, he helped create new state-of-the-art laboratories, the MIT Transportation Initiative, and the Center for Computational Engineering. He also led MIT's efforts in establishing the Singapore-MIT Alliance for Research and Technology (SMART) Center and oversaw the recruitment of a record number of women faculty in engineering.

While at NSF, Suresh launched several new initiatives aimed at furthering innovation, interdisciplinary research, global engagement, international collaboration, and human capital development, as well as broadening participation. Under his leadership, and in response to an invitation from the White House Office of Science and Technology Policy, NSF hosted a Global Summit on Scientific Merit Review in May 2012. This summit included the participation, for the first time, of the heads of leading science funding agencies from nearly 50 countries.

In selecting Suresh, CMU established a 17-member presidential search committee, featuring broad representation of the University's Board of Trustees, esteemed faculty, and alumni. James Rohr, Chairman and CEO of PNC Financial Services Group and CMU life trustee, served as Chairman of the committee. The faculty committee was chaired by MSE Professor Anthony Rollett, former Chair of the Faculty Senate. The Board

COHON

of Trustees unanimously approved Suresh's selection.

"Dr. Suresh's ability to bring groups together to solve problems fits perfectly with Carnegie Mellon's collaborative and interdisciplinary approach," said Rohr in making the announcement. "Along with his global expertise, CMU will benefit from his work as a researcher, educator, and entrepreneur."

While at MIT, Suresh's experimental and modeling work on the mechanical properties of structural and functional materials, innovations in materials design and characterization, and discoveries of possible connections between cellular nanomechanical processes and human disease states have shaped new fields. He has co-authored more than 240 journal articles, registered 21 patents, and written three widely used materials science books.

Suresh received his Bachelor of Technology degree from the Indian Institute of Technology, Madras, in First Class with Distinction; a Masters degree from Iowa State University; and a Doctor of Science degree from MIT. Following postdoctoral research at the University of California, Berkeley, and the Lawrence Berkeley National Laboratory, Suresh joined the faculty of engineering at Brown University in December 1983, and was promoted to full Professor in July 1989. He joined MIT in 1993 as the R.P. Simmons Professor of Materials Science and Engineering and served as head of MIT's Department of Materials Science and Engineering from 2000 until 2006.

"I am truly honored to have the opportunity to lead Carnegie Mellon University as its ninth president," noted

SURESH

Suresh. "The extraordinary ability of the CMU faculty and students in bringing together cutting-edge research and education across

multiple disciplines positions CMU uniquely to address national and global chal-

> lenges. I look forward to working with the CMU community to further our global impact."

DEPARTMENT NEWS

NEW DEAN APPOINTED FOR COLLEGE OF ENGINEERING

Dr. James H. Garrett Jr., the Thomas Lord Professor of Civil and Environmental Engineering (CEE), became the new Dean of the College of Engineering on January 1, succeeding **Pradeep K. Khosla**. Garrett has strong ties to the University community, having received his bachelors

degree (1982), masters degree (1983), and Ph.D. (1986) from the CMU Department of Civil Engineering.

Garrett has been a member of the CEE faculty since 1990, and was named Department Head in 2006. He is also Co-Director of the Pennsylvania Smarter Infrastructure Incubator (PSII), a research center aimed at creating, applying, and evaluating applications of sensing, data analytics, and intelligent decision support for improving the construction, management, and operation of infrastructure systems. Working closely with colleagues from IBM, Garrett established the IBM Smarter Infrastructure Lab, a research facility within the PSII.

In making the announcement, **Mark S. Kamlet**, Provost and Executive Vice President of CMU, said, "We know Jim's broad experience in research, teaching, and creating meaningful partnerships with business and industry make him an excellent choice to head our outstanding College of Engineering."

"For many years, Jim has been a leader in research that has had an impact on the world we live in," added Kamlet. "He has been instrumental in launching research initiatives committed to creating fast, reliable monitoring systems to collect and process data about a myriad of complex networked infrastructure

> James H. Garrett Jr.

systems critical

to both the

nation's security and daily commerce."

Garrett's research and teaching interests are oriented toward applications of sensors and sensor systems to civil infrastructure condition assessment; application of data-mining and machine learning techniques for infrastructure management problems in civil and environmental engineering; mobile-hardware software systems for field applications; and representations and processing strategies to support the usage of engineering codes, standards, specifications, and knowledge-based decision support systems. Garrett has published his

60 refereed journal articles, over 80 refereed conference papers, more than 90 other conference papers, and 10 sections and chapters in books or monographs.

research in more than

"I am honored and excited to have been selected to be the next Dean of CIT," said Garrett. "The College of Engineering is thriving. I greatly look forward to engaging with the entire CIT community, and the greater University community, in discussions of existing and new education and research initiatives in CIT. I also plan to explore the initiatives that will improve the quality of life for faculty, students,

and staff and strengthen the College

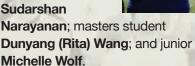
GOING THE DISTANCE

and University."

PITTSBURGH

MSE congratulates the faculty and students who participated in the Pittsburgh Marathon on Sunday,

May 5! They include Professors
Jay Whitacre and
Adam Feinberg;
doctoral students
Miaolei Yan,
Clare Mahoney,
Matthew Hecht,
Hoan Ho, and
Sudarshan





FACULTY NEWS





WHITACRE'S AQUION ENERGY TO RECEIVE \$35 MILLION

New Venture Capital Will Support Large-Scale Battery Production



quion Energy, a start-up company founded by **Associate Professor Jay Whitacre**, recently raised \$35 million in new venture capital funding. New investors include Microsoft founder Bill Gates, Bright Capital, and Gentry Venture

Partners, while Aquion will continue to receive support from existing investors Kleiner Perkins and Foundation Capital. The new capital will support Aquion's plans to begin full-scale production of its innovative aqueous hybrid ion (AHI) battery in the second half of 2013. This unique technology is designed to produce energy from abundant, nontoxic materials, resulting in an environmentally friendly product that is both safe and sustainable. The battery's primary materials are sodium sulfate in an aqueous solution for the electrolyte, non-woven synthetic cotton for the separator, manganese oxide for the cathode, and activated carbon for the anode.

The company is currently producing pilot batteries at its facility in Pittsburgh's Lawrenceville neighborhood. Later this year, Aquion expects to begin full-scale manufacturing of AHI batteries at a large production facility in Westmoreland County. The site of a former Sony manufacturing plant, this 340,000-square-foot space in East

Huntingdon is designed to support Aquion as it scales up manufacturing and expands its staff. The company expects to grow from 120 current employees to a staff of 300-500 people by the end of 2014.

"We're very excited to obtain this new round of venture capital funding, which will be used to finance our aggressive plans to expand over the next couple of years," says Whitacre, who serves as Aquion's Chief Technology Officer. "It's been exciting to see my research at MSE grow into a viable commercial business, with the potential to change the future of energy storage."

DISRUPTING THE ENERGY LANDSCAPE

Aquion has also been named one of the Top 50 Disruptive Companies for 2013 by *MIT Technology Review*. In introducing the list, the publication said, "Each company on this list has done something over the past year that will strengthen its hold on a market, challenge the leaders of a market, or create a new market." Other innovative com-



panies on the list include Apple, Facebook, Google, and Intel.

"Our AHI battery technology is 'disruptive' because it has the potential to change the underlying tenets of energy storage — making it cheaper, more widely available, and more environmentally friendly," says Whitacre. "Our goal is to decrease reliance on fossil

fuels and conventional battery technologies that come with high costs, adverse environmental impacts, and operating risks."

Since Whitacre founded Aquion in 2008, he has become a globally recognized expert on battery technologies. Following the well-publicized fires on the new Boeing Dreamliner in January — caused by lithium ion batteries — Whitacre was interviewed by the *New York Times* and the Associated Press, resulting in articles that appeared around the world.

"The recent fires on the Boeing Dreamliner really highlight the problem with conventional battery technologies," says Whitacre. "Because their electrolytes are flammable, you have to be very careful both in manufacturing lithium ion batteries, and in operating them within proper voltage ranges. It's a careful balancing act. Aquion's organic, nonflammable design will address this issue as the battery industry moves into its next generation."

FACULTY NEWS



MCHENRY NAMED IEEE DISTINGUISHED LECTURER

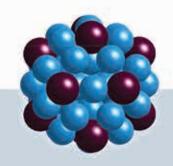
Professor Michael McHenry has been named a Distinguished Lecturer of the Institute of Electrical and Electronics Engineers (IEEE) Magnetics Society. As part of this honor—which recognizes McHenry's career contributions to magnetic materials—he will give more than 30 talks worldwide during the next year.

McHenry's lectures will focus on high-frequency magnetic materials, their use in transformers, and their integration into the power grid.

"I am extremely honored to be selected by such a prestigious professional organization as I work to broadcast the important potential of nanocomposite materials for a variety of industry sectors," says McHenry.

In addition to his work on high-frequency magnetic materials for grid integration of renewable energy sources, McHenry also is developing new materials and processes for improving the efficiency of multicore transformers. This research is expected to impact the economic success of America's manufacturing sector.

For more than a decade, McHenry has been developing new materials, processes, and unique designs for power converters. This critical research could substantially reduce the size of industrial grid transformers and converters for electric



vehicles and other applications.

An innovative researcher, McHenry has served as Editor, Publication Chair, and a member of the Program Committee for the Annual Conference on Magnetism and Magnetic Materials (MMM) and Intermag Conference. He has published more than 250 papers

and a textbook, and owns two patents in the field.

"This is a wonderful honor for Michael McHenry as he continues to pioneer new research and as we seek to transform energy research and education," says **MSE Department Head Gregory Rohrer**. "This appointment recognizes the distinguished contributions he has made to the area of magnetic materials."

McHenry received his B.S. degree in metallurgical engineering and materials science from Case Western Reserve University in 1980, and a Ph.D. in materials science and engineering from the Massachusetts Institute of Technology in 1988. He was a Post-Doctoral Fellow at Los Alamos Lab before joining MSE in 1989.

FACULTY NEWS UPDATES



Assistant Professor Adam Feinberg was selected by the 2012 CIT Faculty Awards Committee to receive the George Tallman Ladd Research Award from the College of

Engineering. Feinberg was presented with the award at the CIT Faculty Awards Reception on March 28. This annual award is made to an assistant professor or research engineer within the Carnegie Institute of Technology to recognize their outstanding research and professional accomplishments, as well as their potential. The basis for assessing nominees is excellence in research, as measured by scholarly

publications, research program development, development of funding, and awards and other recognition. With a dual appointment in Biomedical Engineering, Feinberg's research is focused on identifying materials-based strategies for tissue regeneration.

Professor Krzysztof Matyjaszewski, who holds a courtesy appointment in MSE, has been named the first recipient of the *AkzoNobel North America Science Award* for his cutting-edge polymer chemistry research. The award is given by AkzoNobel, the world's largest paints and coatings company, and the American Chemical Society (ACS), the world's largest scientific society. This award recognizes outstanding scientific contributions by an individual in the fields of chemistry and materi-

als research conducted in the U.S. or Canada. Matyjaszewski will receive a \$75,000 cash award and certificate of recognition. He was officially honored for his achievements at the ACS 245th National Meeting and Exposition, held in April in New Orleans.

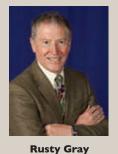


Professor Sridhar Seetharaman has left the Department to become the Royal Academy of Engineering/Tata Steel Research Chair in Low Carbon Materi-

als Technologies at Warwick University in Coventry, United Kingdom. Seeth-araman joined MSE in April 2000. The Department wishes him the best in his future endeavors.

ALUMNI NEWS





Alumni Profile | RUSTY GRAY

BUILDING BRIDGES

During his entire career, **George T. "Rusty" Gray III** (*Ph.D.* 1981) has been balancing his dual interests in fundamental materials research and applied problem-solving. In his 28 years at Los Alamos National Laboratory, he has been building bridges between materials science and engineering problems.

"As a kid, I always knew I wanted to be an engineer —

because I liked to imagine the future," Gray says. "Today I have the perfect job, because I am able to combine materials science research with solving 'big picture' engineering problems like the damage response of materials for industrial and defense applications. From improving the crash-worthiness of cars to helping aircraft withstand bird strikes, I feel like I really am helping to create a better future." A Fellow at Los Alamos, Gray's volume of research is reflected in over 350 technical publications.

While Gray grew up in upstate New York, a family road trip across the U.S. drew him to the West when he was very young. Based on that trip, and an early interest in geology, he attended the South Dakota School of Mines for his B.S. and M.S. degrees in metallurgy.

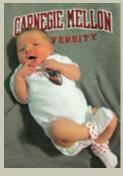
But Gray was drawn to the MSE Department for his doctoral studies because of **Professor Jim Williams**' emphasis on structure-property relations aimed at understanding industrial problems. "Jim became my mentor because of

his keen interest in both fundamental materials research/metallurgical engineering and industrial applications," says Gray. "My Ph.D. research on fatigue and crack growth in steel had immediate applications in the railroad industry. I felt like I was making a real impact."

Thirty years later, Gray continues to strive to make an impact with his research at Los Alamos, as well as his hands-on involvement in The Minerals, Metals, and Materials Society (TMS). A TMS Fellow and past President of

TMS, in 2012 Gray was named Chairman of the Board of Governors of Acta Materialia, Inc. In this new role, Gray has oversight for the three Acta journals—Acta Materialia, Scripta Materialia, and Acta Biomaterialia. "My role is to work with the Acta Editors and Board of Governors to make sure these publications stay at the forefront of emerging topics in materials science and engineering—to make sure they really do anticipate the future of our field," explains Gray. "I'm honored and excited by this unique opportunity."

ALUMNI NEWS UPDATES



Matthew Lucas (B.S. 2003) and Amber Andreaco (B.S. 2004) welcomed their first child, Genevieve Presley Lucas, on March 18. She weighed 8 pounds, 5 ounces. Genevieve is hap-

pily supporting Tartan Pride! After completing GE Aviation's Edison Engineering Development Program, graduating with an M.S. from Ohio State University in 2008, Andreaco has been working as a Materials Behavior Engineer for the past five years. She specializes in high-temperature, single crystal alloys as well

as characterizing various 3D printed materials. Lucas graduated from California Institute of Technology with his Ph.D. in 2008. He completed a post-doc at Oak Ridge National Laboratory, as well as a visiting scientist role at Wright-Patternson Air Force Base. He recently accepted a position at GE Aviation in the Special Technologies Division.

Debdutta Roy (M.S. 2010, Ph.D. 2012) was selected as a recipient of the 2013 Ladle and Secondary Refining Award for Best Paper for "The Effect of Silicon on Desulfurization of Al-Killed Steels." Coauthors are Professors Chris Pistorius and Richard Fruehan. The award is presented by the Association for Iron & Steel Technology's (AIST) Refining and Casting Technical Division, Ladle and



Left to right:
Dr. Sunday
Abraham of
AIST, Chris
Pistorius,
Debdutta
Roy, and Dr.
Kamalesh
Mandal of
AIST.

Secondary Refining Technology Committee. AIST presented Roy and Pistorius with their awards at AISTech 2013, held in Pittsburgh in early May.

Barry Gordon (B.S. 1969, M.S. 1971) and his wife Aldene have endowed a scholarship for MSE undergrads. The Aldene and Barry Gordon Scholarship in

STUDENT NEWS

Materials Science & Engineering will provide \$2500 in annual support to an undergraduate student who qualifies for financial aid. Barry is the San Jose Chairperson for the Carnegie Mellon Admission Council. The Department thanks the Gordons for their generosity in funding this scholarship!

Joe Fonseca (M.S. 1997) is a Research and Development Materials Scientist, Principal Member of the Technical Staff at Sandia National Laboratories. His three focus areas are Materials Qualification, Risk Management, and Production Assembly Team Lead.

Otavio Fortini (M.S. 1999, Ph.D. 2004, M.B.A. Tepper 2012) is now Operating Director at Milo Information Services Corporation.

Gabriel Gerson (B.S. 2010) has accepted a position with Alcoa Howmet in Dover, New Jersey. He will be the Plant Metallurgist, responsible for supervising the technicians in the metallography lab, as well as working on quality improvement initiatives in the heat treat facilities. Alcoa Howmet manufactures nickel/cobalt and titanium-based superalloys (single crystal, directionally solidified, and equiaxed) for the aerospace and power/propulsion industries.

Sumit Goenka (M.S. 2012) received the Shri Ram Arora Award from The Minerals. Metals, and Materials Society (TMS). Presented by the TMS Foundation through a grant from the Dr. Om Arora family — as a means of perpetuating the quest of their father, Shri Ram Arora, for continual learning and academic challenge - this award recognizes, encourages, and supports the quest for knowledge within the materials science and engineering community. Winners receive an engraved award and cash honorarium. Goenka received the award at the 2013 TMS-AIME Honors & Awards Banquet, held in March at the Henry B. Gonzalez Convention Center in San Antonio, Texas, as part of the TMS 2013 Annual Meeting & Exhibition.

MSE STUDENTS HONORED AT ASM YOUNG MEMBERS' NIGHT

tudents from MSE were in the spotlight at the annual ASM Pittsburgh Golden Triangle Chapter's Young Members' Night, held on February 21 at the University Club. The event featured a poster session, awards ceremony, speakers, and an opportunity for students to network with members of the materials community.

MSE junior Elise Hall won the undergraduate poster competition, while junior Marvin Alim was award- annual ASM Young Members' event. ed second place. In the graduate

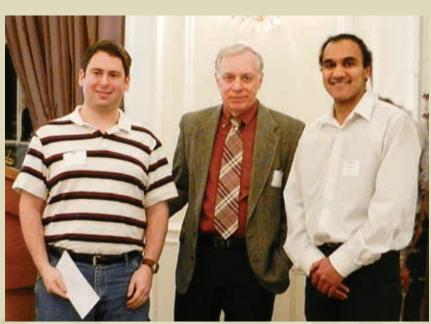


Doctoral student Sutatch Ratanaphan won the graduate poster competition at the

competition, doctoral students from MSE won all the awards: Sutatch Ratanaphan won first place, Reeju Pokharel was in second place, and Evan Lieberman and Sudarshan Narayana tied for third.

Junior **Madeline Cramer** was honored with the *Past Chairpersons* Educational Assistance Scholarship (PCEAS) Junior Award, while sophomore Catherine Groschner received the PCEAS Sophomore Award. MSE senior Brooke Gladstone won the Outstanding College Senior Award.

Congratulations to all the winners from our Department!



Ph.D. candidates Evan Lieberman (left) and Sudarshan Narayanan (right) receive their third-place awards from invited speaker Gary Shiflet.





MSE HOSTS SIXTH ANNUAL SYMPOSIUM

n March 8, the Department came together to celebrate students at its sixth annual MSE Graduate Symposium, held in the Singleton Room of Roberts Engineering Hall. Through oral presentations and a poster session, MSE graduate students had a unique opportunity to showcase their research results, spanning such topics as photo-oxidation, magnetism, conductivity, stresses, and grain boundary characteristics.

Stephanie Bojarski won the *Best Poster Award*. In the Oral Presentations category, **Lauren Powell** won first place, **Huseyin Ucar** was awarded second place, and **Sutatch Ratanaphan** won third place. The entire MSE community enjoyed the chance to gather and celebrate the important work of all the student participants.











STUDENT NEWS UPDATES

Doctoral student Erica Sampson has won the Jerry Silver Award for Best Paper 2013, presented by AIST's Metallurgy Technology Division. Sampson's paper, "Effect of Silicon on Hot Shortness," was co-authored by Professor Sridhar Seetharaman. Originally established in 1991, then re-established as an AIST award in 2005, this award was named in honor of Jerry Silver in recognition of his leadership in the development of student affairs and programs for the Iron & Steel Society. The award is presented to the author of a process metallurgy or product applications technical paper judged to be the best of class by the AIST Metallurgy-Processing, Products and Applications Technology Committee. One of the authors must be a student. Sampson will receive the award during the AIST Metallurgy, Processing, Products, and Applications Technology Committee Meeting, co-located with the MS&T 2013 conference in Montreal this October.

Junior Daniel Shafrir will be doing a summer fellowship at JFE Steel, a Japanese manufacturer that produces sheets, plates, shapes, pipes and tubes, stainless and specialty steels, electrical steels, bars and wire rods, and iron powders. Shafrir will be focusing on research that looks at inclusion control in steel. "I've done research here with Professor Sridhar Seetharaman that focuses on low-carbon steel at high temperature in the confocal scanning laser microscope, with the help of US Steel," says Shafrir. "I'll be in Fukuyama, Hiroshima. As a foreign student (originally from Israel) who has been all over Europe and North America, I'm looking forward to expanding my cultural knowledge by immersing myself in East Asia."

Department of Materials Science and Engineering Carnegie Mellon University Pittsburgh, PA 15213-3890



Left to right: Professors Adam Feinberg, Yoosuf Picard, Chris Bettinger, Mohammad Islam and Greg Rohrer

Carnegie Mellon University



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Obtain general information about Carnegie Mellon University by calling 412-268-2000

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