

PENNSTATE



# *imagine*

*The Newsletter of Materials Science and Engineering • Summer 2010*

## **Materials Visualization Competition 2010**

Publicizing the Beauty of Materials Research - Page 5

## **MatSE newsletter is going electronic**

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## Dr. Gary L. Messing

**Distinguished Professor of  
Ceramics Science and Engineering  
Head, Department of  
Materials Science and Engineering**

The Department of Materials Science and Engineering had another successful year in 2009. The department numbers remain steady relative to 2008 and both the undergraduate and graduate programs were ranked 8th in the nation by *US News & World Report*.

After a year of faculty and staff meetings we finished planning for the renovation of Steidle Building and have submitted a renovation plan to Penn State's Facilities Resource Committee (FRC). The plan organizes the department around research and educational clusters. The plan is being reviewed and hopefully will be added to Penn State's list of priorities for renovation. The Millennium Science Complex will open summer 2011. This is an exciting time for materials at Penn State. While the department will not be housed in the MSC, ten of the faculty will move their labs there including new MatSE faculty member, Dr. Engel-Herbert.

Under the leadership of Professor Mike Hickner

and Scott Henninger the department has made great strides in ensuring that we have the safest research environment possible. EAB member Dr. Jim Loftus of Owens Corning was particularly helpful when he brought his companies safety guru to campus to review our safety processes. A sub-committee of the EAB also drafted "The Role of the Employee: Corporate Safety" to help instill a culture of safety amongst the students.

We created the Materials Visualization Competition to celebrate the quality of research in Materials at Penn State. The cover of this newsletter is the grand prize winner in 2010. See page 5 for a complete list of winners.

Finally, we inaugurated the Richard E. Tressler Distinguished Lectures in Materials this spring with an outstanding list of speakers. We were especially pleased that Dr. Joseph Miller, Executive Vice President and Chief Technology Officer at Corning and an industrial leader in materials, presented the inaugural lecture in the new series.

Check us out on Facebook! Search for "Penn State Department of Materials Science and Engineering". This is a great way for current students, alumni and MatSE friends to communicate.

## The MatSE Newsletter is Going Electronic - Send Us Your E-Mail Address!

After this issue of *imagine*, we'll be sending our newsletter to the email address the Penn State Alumni Association has on file for all alumni. If Penn State does not have your email address on file, you will still receive the newsletter by regular mail.

**Please take a moment to update your Penn State information at:  
[www.matse.psu.edu/update](http://www.matse.psu.edu/update)**

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## Imagine

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## Department Welcomes New Faculty Member - Roman Engel-Herbert

The complex oxides search committee concluded its work in 2009 and recommended Dr. Roman Engel-Herbert who will join us in July, 2010. Dr. Engel-Herbert is an expert in oxide molecular beam epitaxy.

His research interests are the growth of oxide thin films and the synthesis of metastable phases to explore their structure-property relationships. This includes interface related phenomena of multilayered and heteroepitaxial oxide thin films. Emphasis is placed on transport properties of materials exhibiting strong electron correlation.

Research activities address the utilization of novel functionalities in all-oxide devices or via epitaxial integration with conventional semiconductors. Roman is a graduate of Friedrich-Schiller University and Paul-Drude-Institute.



## 2010 Nelson W. Taylor Lecture in Materials

The 38th annual Taylor Lecture Series will be held on November 5, 2010 at the HUB Auditorium beginning at 9am. The theme of this year's event is "Materials - Translation Nanomedicine". The Taylor honoree for 2010 is Dr. Chad Mirkin of Northwestern University. Professor Mirkin is the Director of the International Institute for Nanotechnology and the George B. Rathmann Professor of Chemistry, Professor of Chemical and Biological Engineering, Professor of Biomedical Engineering, Professor of Materials Science and Engineering, and Professor of Medicine. Professor Mirkin received his PhD in Inorganic & Organic Chemistry from Penn State in 1989.

## Department Announces Inaugural Richard E. Tressler Distinguished Lecture Series



Dr. Richard Tressler had a huge impact on Materials Science and Engineering at Penn State and the profession. He transformed the Department of Materials Science and Engineering to a modern materials department through reorganization and key faculty hires. To commemorate his legacy, Professor Tressler's friends, alumni and faculty endowed the R. E. Tressler Distinguished Lectures in Materials to

recognize outstanding leaders in materials. Professor Tressler was a Penn State alumnus and an individual who excelled in the commercialization of materials discoveries. Lecturers for 2010 were:



### Joseph A. Miller

Executive Vice President and Chief Technology Officer, Corning, Inc.

*Corning's Growth Strategy –  
Innovation in Materials Science*



### Gerbrand Ceder

R. P. Simmons Professor of Materials Science and Engineering, Massachusetts Institute of Technology.

*Materials Design with First Principles Computations and Application to Materials for Energy Storage and Generation*



### Naomi Watts

Stanley C. Moore Professor in Electrical and Computer Engineering, Rice University.

*Plasmonics: From Artificial Molecules to Real Applications*



## Congratulations Spring 2010 MatSE Graduates!

### GRADUATING B.S.

Jared Blecher  
 Kyle Bryson  
 Joelle Buczynski  
 Nicholas Dietz  
 Rachel Duran  
 Matthew Gadinski  
 Thomas Green  
 Joseph Hagan  
 Scott Hills  
 Jacob Kerr  
 Daniel King  
 Helen Larsen

Christopher Leh  
 Robert Long  
 Laura Jean Lucca  
 Patrick Mangiagli  
 Elizabeth Miller  
 Edward Mily Jr.  
 Justin Savrock  
 Joshua Sheldon  
 Titilayo Shodiya  
 Steven Shrawder  
 Kaylan Wessels

### GRADUATING M.S.

Fidel Castro Marcano  
 Andrea Choperena  
 Kelly Feather  
 Christina Lentz  
 Suphannee Pongkitwitoon  
 Phillip Williams

### GRADUATING Ph.D.

Nicholas Antolino  
 Brian S. Deforce  
 Patrick Drummond  
 Youmi Jeong  
 Amit Kumar  
 Xin Li  
 Omar Rosas Camacho  
 Jason Ryan  
 Ponusa Songtipya  
 Christopher Szepesi

### MatSE Integrated B.S./M.S.

Bradley Hasek  
 Jessica Serra

#### B.S. Degree Graduates:

Front row: Joelle Buczynski, Jessica Serra, Helen Larsen, Kaylan Wessels, Laura Jean Lucca  
 Middle row: Joseph Hagan, Justin Savrock, Nicholas Dietz, Bradley Hasek  
 Back row: Daniel King, Elizabeth Miller, Christopher Leh, Titi Shodiya

## 2010 McFarland Lecture

The David Ford McFarland Award for Achievement in Materials Science and Engineering is given annually to a MatSE alumnus of Penn State who has honorably distinguished himself in his profession. The 2010 recipient is Sid Nelson, Jr. Mr. Nelson was awarded his B.S. degree from Penn State under the mineral processing option of the mining engineering program in 1980. He also earned a Masters degree in Public Policy from Harvard University's Kennedy School of Government, where he was a Kennedy Fellow, as well as a Juris Doctor degree from the University of Arizona's College of Law. He is the former president of Sorbent Technologies Corporation, a pioneering developer of new carbon materials to sequester mercury from power plant flue gases. He is currently Albemarle's Global Business Director for Mercury Controls, an Ohio based company. Mr. Nelson gave a lecture titled "Making a Difference: Engineering and Materials Science in the Service of Reducing Mercury Emissions from Coal-Fired Power Plants" on April 20, 2009 to over one hundred alumni, faculty and students at Penn State.



## CDS Goes Abroad

Japan has long been at the forefront of research involving electronic materials and devices, and research concerning electronic materials is a cornerstone of ceramics research at Penn State. The Center for Dielectric Studies, one of the National Science Foundation-sponsored Industry/University Cooperative Research Centers, provides a forum for electroceramics research. Since its



inception, the CDS has encouraged collaboration among scientists and engineers at companies and universities within Japan and the United States. Thus, it was only fitting to hold one of the biennial CDS meetings in Japan. And, although

taking a large group overseas can generate logistical complications, the participants knew that the benefit to the member companies and the research community as a whole would greatly outweigh the complexities of holding the meeting in Japan. Strictly speaking, the U.S. and Japanese gathering officially was a joint spring meeting of the CDS and the new Center for Piezoelectric Materials and Devices (also headquartered at Penn State), held in Narita, Japan, May 19–20, 2009.

Three Penn State faculty members, Clive Randall, Susan Trolier-McKinstry and Elizabeth Dickey, made the trip along with Faith Dogan of Missouri University of Science and Technology. In addition, seven Penn State students were able to attend thanks to generous travel grants provided by NSF and Bayer Materials Science.

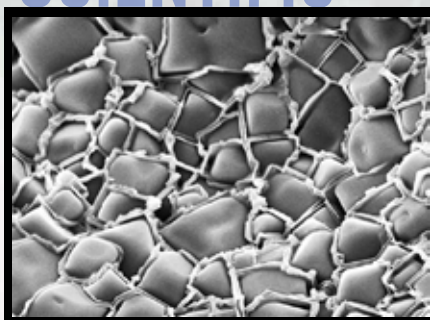
The meeting featured technical presentations on the synthesis, processing and properties of dielectric materials. Courtesy of ACerS.

## BEST OF SHOW



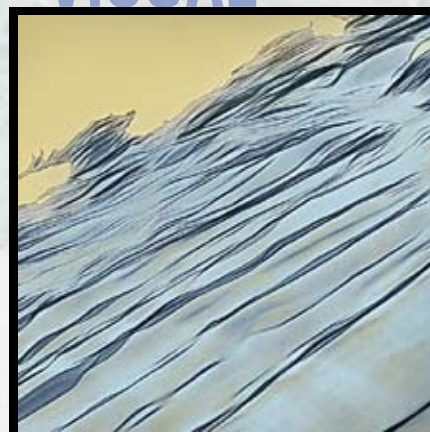
**Ryan White**, Graduate Student,  
Materials Science and Engineering

## SCIENTIFIC



**1ST PLACE SCIENTIFIC:**  
**Julie Anderson**, Research Associate;  
**Libby Kupp**, Research Associate;  
**Gary Messing**, Distinguished Professor,  
Ceramics Science And Engineering

## VISUAL



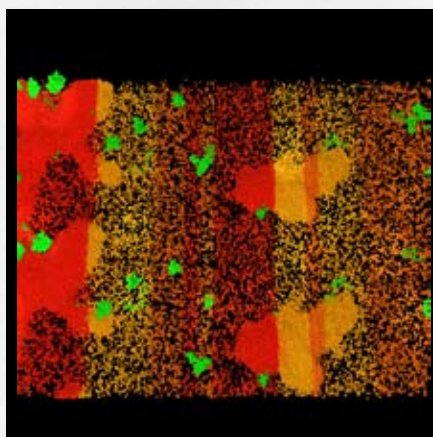
**1ST PLACE VISUAL:**  
**Bryan Gauntt**, Graduate Student,  
Materials Science and Engineering

## Materials Visualization Competition 2010

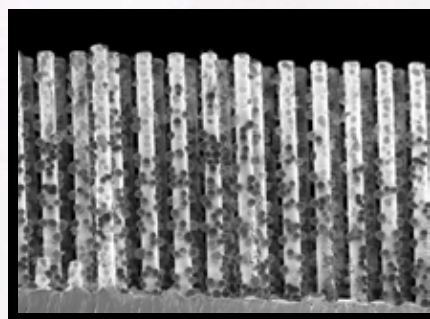
The Materials Visualization Competition (MVC) is a scientific visual and artistic competition co-sponsored by the Department of Materials Science and Engineering and the Materials Research Institute. Created to celebrate the quality of research in Materials at Penn State, this competition seeks to increase awareness of materials science through the creativity and visualization of our researchers.

MVC10 was the second competition to be held. After careful consideration, MVC judges David Green, Allen Kimel, Steve Burns, and Mike Fleck found these images to be particularly striking! Congratulations to our MVC10 winners!

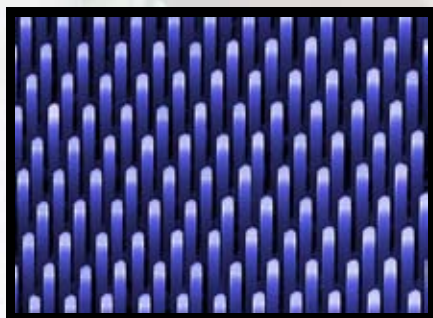
A gallery of winning entries from MVC09 and MVC10 and image descriptions can be found at <http://www.matse.psu.edu/mvc10/index.html>.



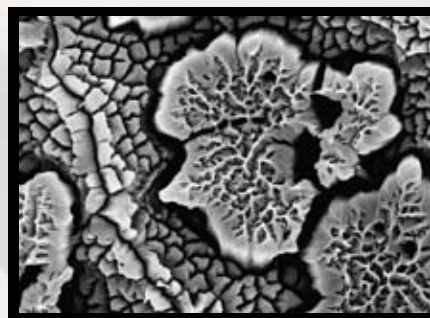
**2ND PLACE SCIENTIFIC:**  
**Shivangi Nangia**, Graduate Student,  
Department of Chemistry



**2ND PLACE VISUAL:**  
**Xin Wang**, Graduate Student,  
Electrical Engineering



**3RD PLACE SCIENTIFIC:**  
**Chito Kendrick**, Post Doc,  
Materials Science and Engineering

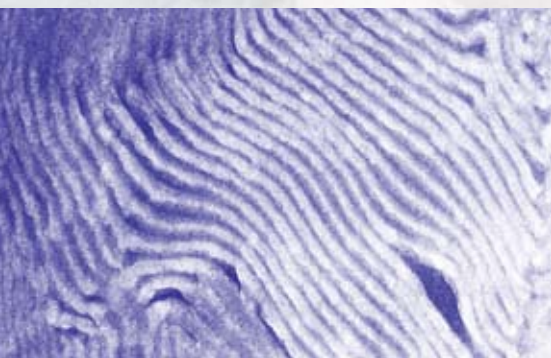


**3RD PLACE VISUAL:**  
**Sorachon Yoriya**, Graduate Student,  
Materials Science and Engineering

## Polymers, Energy, and Water

with Assistant Professor Mike Hickner

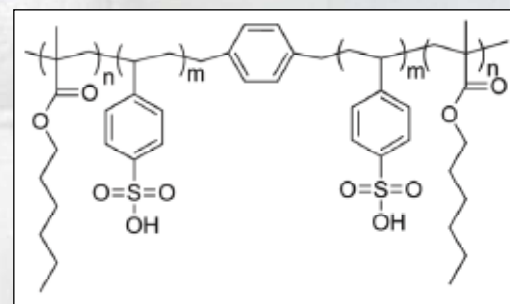
**Mike Hickner's research** is focused on creating chemically distinct nanophase domains in polymeric materials and studying how ions, water, and other molecules move through these structures. His group uses the tools of polymer chemistry, spectroscopy, bottoms-up and top-down assembly, microscopy, and x-ray diffraction/scattering to create and study new molecules. The overarching goal of his work is to develop insights into the molecular mechanisms and performance of membranes for fuel cells and water treatment.



One of his current pursuits is non-fouling polymers for ship hull coatings. His PECASE award cited his work for the Office of Naval Research on environmentally benign coatings that do not kill microorganisms, but rather discourage them from attaching to the bottom of a ship. These coatings are meant to replace copper and currently used biocides that have caused massive environmental damage in harbors around the world. His group is making measurements of surface charge and protein adsorption on polymers with controlled charged groups and surface chemistry. Through these initial studies, coatings will be sent to collaborators in the Navy for barnacle adhesion and in-sea biofouling tests.

His work on ship hull coatings and fuel cell membranes has also translated to the study of new materials for water treatment membranes. Commercially-available reverse osmosis membranes degrade in chlorinated environments and foul easily, so the control of the water chemistry and detailed cleaning procedures employed to pre-

serve the membranes adds significantly to the cost of clean water. Hickner's group is engaged in the study of how water and polymers interact on a molecular level through hydrogen bonding, ion solvation, and physical confinement. By studying the basic physical chemistry of how water is bound within a polymer framework with varying chemistry and characteristic dimensions, he is able to rationalize the behavior of the materials in real-world environments.



Self-assembled lamellar domains in a mid-block sulfonated triblock copolymer that promote high proton conductivity. Saito, et al. *Macromolecules* 2010; Moore, et al. *J. Mater. Chem.* 2010.

## Hickner Receives PECASE Award

Michael Hickner, Assistant Professor of Materials Science was named by President Obama as one of 100 young researchers to receive the Presidential Early Career Award for Scientists and Engineers (PECASE), the highest honor bestowed on beginning researchers by the United States government. Mike was nominated for the PECASE by the Department of Defense for his work on anti-fouling properties of polymers - important research for keeping Navy ships free from marine organisms and in making long-lived water treatment membranes that operate in harsh environments. Congratulations Mike on this well deserved honor!



President Barack Obama joins recipients of the Presidential Early Career Awards for Scientists and Engineers (PECASE) for a group photo in the East Room of the White House, Jan. 13, 2010. Mike Hickner can be seen here; second row, fourth from the right.

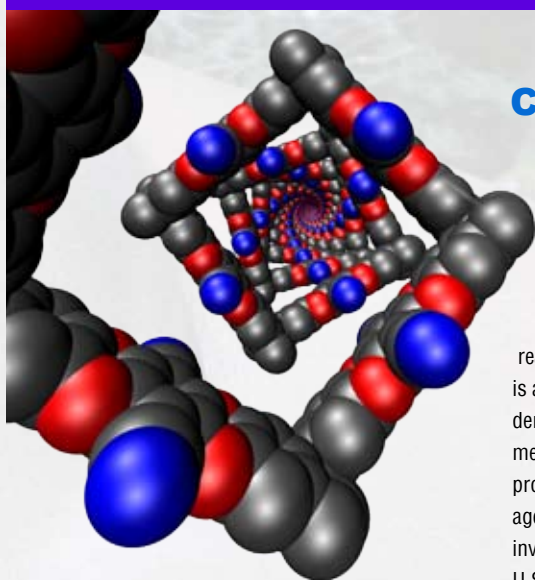
(Official White House Photo by Lawrence Jackson).

## Hickner named Walker Faculty Fellow

The department is pleased to announce that Dr. Michael Hickner, Assistant Professor of Materials Science and Engineering has been named the Philip



L. Walker Jr. Faculty Fellow beginning July 1, 2010. Dr. Walker was Head of Materials Science and Engineering from 1967-1979. He and his wife Ginnie generously endowed the Faculty Fellowship in 1998.



## Computational Biophysics and Soft Materials

with Associate Professor Coray Colina

**Our ability** to manipulate matter and predict its physical properties constitutes the driving force for designing tailor-made materials. Computational science has allowed the study of systems not previously possible, and solutions to problems that were previously intractable. The fusion of materials science and computational science gives us the opportunity to engineer materials for applications in separations, sensors, microelectronics, drug delivery, and biomaterials, just to name a few.

Prof. Colina's research group utilizes materials theory, modeling, and simulation methods. Her experience and recent work in all of these areas has allowed her group to develop an interdisciplinary effort aimed at designing new materials with desired properties for specific applications. On one hand, they are developing computational techniques that allow the creation of a novel bridge between rigid-structure materials and amorphous nanoporous

materials. Specifically, polymers of intrinsic microporosity are amorphous polymers that derive their porosity from rigid and contorted monomers, which inhibit spatially-efficient packing. Development of realistic models of complex polymeric systems is a challenging task, as efficient packing at high densities requires sophisticated computational methods. These polymeric systems are extremely promising for applications involving energy storage and separations, among others. This research involves collaborations with labs both within the U.S. and around the world.

In the field of biomaterials, Prof. Colina's group is also interested in understanding the relationship between dynamics and function in a protein, enzyme, virus or aggregates of them. Her group's overarching goal here is to utilize their molecular simulation capabilities in the biomedical and biomaterials areas to help increase our overall knowledge and thus ultimately find cures for life-threatening diseases.

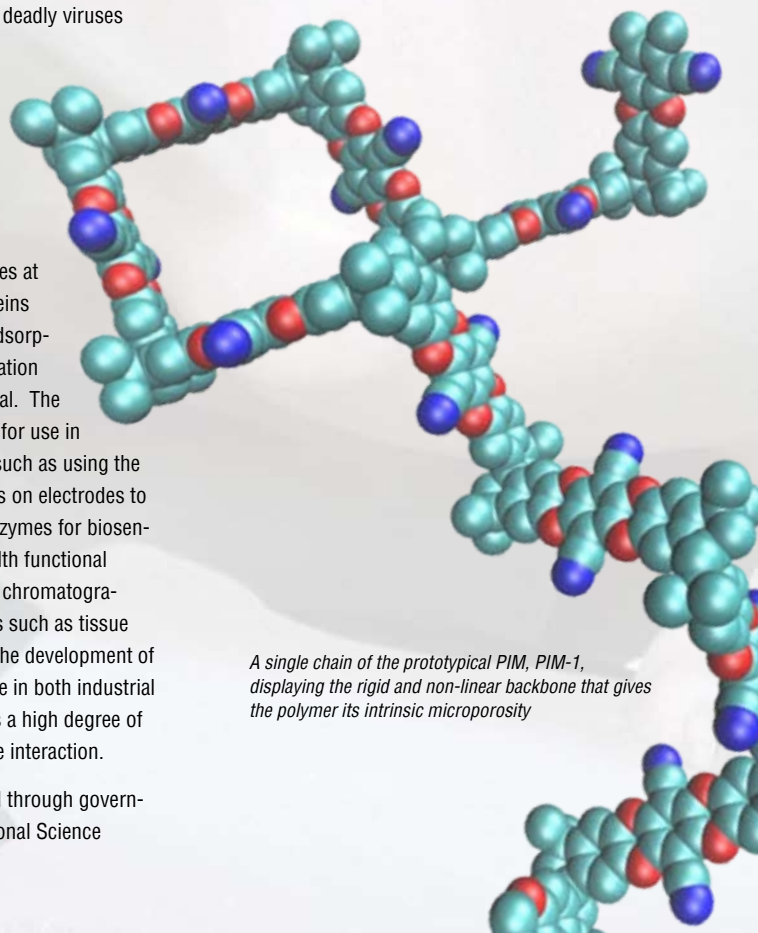
The Colina group is working with collaborators to understand the relationship between movement and function in an enzyme called polymerase, which helps viruses replicate and mutate.

Finding new vaccines to combat deadly viruses such as SARS or West Nile, as well as viruses that could be used as biological weapons, such as Ebola or smallpox, requires the production of an attenuated virus. Emphasis in her group's work also includes molecular engineering approaches at interfaces, where adsorbed proteins are of special interest. Protein adsorption is the first step in the integration of an implanted device or material. The phenomena is being considered for use in nanotechnological applications such as using the self-assembly of layered proteins on electrodes to exploit the signaling ability of enzymes for biosensors, nano-encapsulation of health functional ingredients in the food industry, chromatography, and biomedical applications such as tissue engineering and drug delivery. The development of novel functional materials for use in both industrial and biomedical settings requires a high degree of understanding of protein-surface interaction.

Prof. Colina's research is funded through government agencies, such as the National Science

Foundation, and private organizations, such as the Petroleum Research Fund. Her research group is currently comprised of 4 graduate students, 2 post-doctoral associates and several undergraduate students. The Computational Biophysics and Soft Materials Group is collaborating with Profs. James Runt, Ralph Colby, Scott Milner, Craig Cameron, David Boehr, and Dr. Ping Lin at Penn State in a variety of projects. External collaborations include those with Flor Siperstein and Peter Budd, both from Manchester University, Neil McKeown from Cardiff, Silvia Siquier and Claudio Olivera-Fuentes from Simón Bolívar, Venezuela, Jairo Perilla, from the National University of Colombia, Martin Lísal from the Institute of Chemical Process Fundamentals of the ASCR, Czech Republic, Lee Pedersen and Lalith Perera from UNC-CH and NIEHS, respectively.

Facilities in her lab include access to computer clusters on the PSU campus and the Pittsburgh Supercomputing Center. Among her service duties, she currently co-directs the REU in Soft Materials, serves as a Liaison Director of the Computational Molecular Science and Engineering Forum of the AIChE (2009-2011), and serves as the advisor of the Nu Chapter for the Graduate Women in Science (2009- ), a stand-alone national organization, just to name a few.



*A single chain of the prototypical PIM, PIM-1, displaying the rigid and non-linear backbone that gives the polymer its intrinsic microporosity*

### Colina Receives Corning Faculty Fellowship



Dr. Coray Colina, Associate Professor of Materials Science and Engineering has been appointed the Corning Faculty Fellow in Materials Science and Engineering. The purpose of this fellowship is to provide supplementary funds to an outstanding MatSE faculty member. Congratulations Coray on receiving this honor.

## Research Experience for Undergraduates (REU) in Soft Materials

Summer 2009 kicked off the first year of the Research Experience for Undergraduates (REU) in Soft Materials Program. Twenty-two undergraduate students from universities across the United States spent nine weeks working with Penn State faculty and graduate mentors in their laboratories. Each undergraduate student was engaged in his/her research project, training sessions and social activities. A participant from Mercyhurst College commented that the best part of the program for him was getting to experience the “day to day” regime of research. From the University of Pittsburgh, another participant noted that having an opportunity to work in a “real” research group, while having responsibilities within the group topped her experience. She went on to say that because of this experience, she is definitely considering graduate school in her future.

The REU research projects open pathways for the new researchers not only to work in internationally recognized research groups, but also to interact with young and senior scientists. Each participant was also guided by graduate student mentors, in partnership with the faculty advisor. The graduate mentor students were trained and applied mentoring techniques that will also be useful for integrating into their own future research group. This cross fertilization extends the faculty mentor’s ability to train undergraduate and graduate students for future employment in a global, academic and technical arena. In short, undergraduate and graduate students gained experience in different research techniques for advanced soft materials, they actively participated in the design and performance



Participants of the 2009 REU Soft Materials Program with Coray Colina, Allen Kimel, and Jenneth Layau.

of experiments (or virtual experiments), and they benefited from the interaction and immersion in global collaborative research with international experts.

REU in Soft Materials 2010 will welcome twenty-two new participants on June 5th. Undergraduate students from as far away as Hawaii, Puerto Rico, Venezuela, and Spain will be in attendance. New for this incoming group, the program will partner with the Materials Research Laboratory to offer special training sessions for the participants,

with topics varying from X-ray Photoelectron Spectroscopy to Atomic Force Microscopy.

The summer experience will conclude with the REU 2nd Annual Symposium and Poster Session, on August 5, 2010. Along with the REU in Soft Materials participants, sixty additional students from other Penn State REU programs, organized by the Departments of Chemical Engineering, Chemistry, and Physics will present their summer research.

## Student Awards

Congratulations to the following Penn State graduate students who were selected for The Graduate Student Award of the Materials Research Society at its fall 2009 meeting in Boston, MA.:

**Xin Li** is a Ph.D. candidate advised by Professor Elizabeth Dickey of the Department of Materials Science and Engineering,

**Cary Supala** is a Ph.D. candidate advised by Professor Tom Mallouk in Chemistry

**Yue Bing Zheng** is a Ph.D. student advised by Professor Tony Jun Huang in Engineering Science and Mechanics.



**Erhan Altinoglu** received 1st place in the Engineering division at the 2010 Penn State Graduate Exhibition with a poster titled “Indocyanine Green-Encapsulating Calcium Phosphate Nanoparticles: Bifunctional Vectors for Simultaneous Near Infrared Diagnostic Imaging and Photodynamic Therapy of Cancer”.



**Guang Sheng** received 3rd place in the Engineering division at the 2010 Penn State Graduate Exhibition and 1st place at the TMS Technical Division Student Poster Competition in the Electronic, Magnetic and Photonic Materials Division with a poster titled “Phase-Field Simulation of Domain Stabilities and Structures in Ferroelectric and Multiferroic Thin Films”.





### Messing Named MRS Fellow and Editor-in-Chief of *JMR*

Gary L. Messing, Distinguished Professor of Ceramic Science and Engineering and Head of the Department of Materials Science and Engineering, has been elected, Fellow of the Materials Research Society. The title of MRS Fellow honors members who are notable for their distinguished research accomplishments and their outstanding contributions to the advancement of materials research, world-wide. The induction and recognition of the inaugural class of MRS Fellows took place at the 2010 Spring Meeting to be held in San Francisco. Professor Messing's citation reads "In recognition of his seminal contributions to ceramic processing science and engineering and his distinguished record of leadership and service in the materials research community."

Professor Messing was named editor-in-chief of the *Journal of Materials Research (JMR)* in Spring 2009. *JMR* is an archival front-runner in international materials research, as evidenced by its 1.916 Impact Factor in Materials Science, Interdisciplinary. Published monthly (over 3500 technical pages annually), *JMR* contains archival papers, rapid communications and reviews. It is comprehensive in nature, and over the past 23 years has addressed more than 150 different topics on materials synthesis and processing, microstructure, and properties.

### Green, Macdonald & Messing Receive Lee Hsun Awards

These awards are presented to individuals who "made significant contributions to the materials science and engineering, and have a good personal reputation in some aspect of materials sciences and engineering." The award recipients are chosen by a committee consisting of chief professors at the Institute of Metal Research (IMR) Shenyang, China. The award has been given since 2002, and has been awarded to researchers the world over for their contributions to materials research.

The award is named for Professor Lee Hsun, who was the director of the IMR from 1951 until his death in 1983. Prof. Lee Hsun is best known for his discovery of hydrogen embrittlement, for which he received a Brunton medal in 1945.

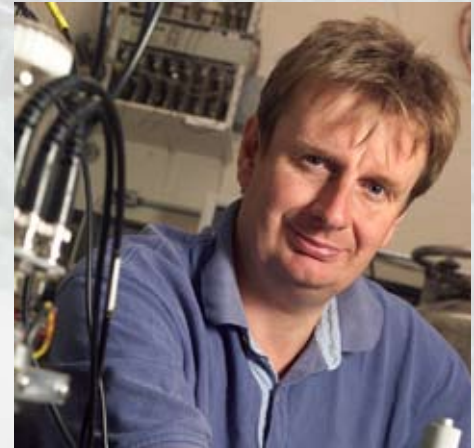
[www.matse.psu.edu](http://www.matse.psu.edu)

### CCMD Wraps Up 5 Year Program, Looking To Extend Another 5 Years

The National Science Foundation Industry/University Cooperative Research Center (I/UCRC), Center for Computational Materials Design (CCMD) is jointly created by the Pennsylvania State University and the Georgia Institute of Technology with Prof. Zi-Kui Liu, Director, and Prof. David L. McDowell, co-Director. The CCMD has successfully completed its first five year program and has recently submitted a five-year, Phase II proposal. Membership during the first five years include: Air Force Research Laboratory, Auraryd, Boeing, Corning, Ford Motor Company, GE Global Research, General Motors, Knolls Atomic Power Laboratory, Lawrence Livermore National Laboratory, nGiMat, Pacific Northwest National Laboratory, Pratt & Whitney, Procter & Gamble Company, Thermo-Calc Software, Inc., Timken, U.S. Army Research Laboratory, and Y12 National Security Complex.

The Center's focus is to develop tools to accelerate insertion of materials into products and to educate the next generation of scientists and engineers with industrially relevant perspectives on engineering research and practice. Member organizations benefit directly from the results of research projects, and from the long reaching value derived from mentoring students as prospective employees and extensive interaction with a broad range of faculty members.

The CCMD has made great strides in leading the way to revolutionary new scientific and engineering advances in terms of methods and tools to support systems-base computational materials design. For a comprehensive listing of these major achievements, as well as Director's remarks, listing of current and previously funded projects, and related publications, please visit the CCMD website at <http://www.ccmd.psu.edu/getStarted.html>.



### Randall Awarded Penn State's Faculty Scholar Medal in Engineering

Clive A. Randall, Professor of Materials Science and Engineering and Director of the Center for Dielectric Studies, received the 2009 Faculty Scholar Medal in Engineering. The Faculty Scholar Medal is given in recognition of scholarly excellence demonstrated by a single contribution or series of contributions focusing on a coherent theme. Professor Randall was recognized for his creative and scholarly contributions as well as his leadership in the field of dielectrics.

The focus of Professor Randall's research is in process development, new material design, characterization, material physics, and applications of functional oxides. In the last few years, he has developed a number of revolutionary approaches to improving the reliability of multilayer dielectric and piezoelectric devices based on fundamental thermodynamics and defect chemistry. These have led to the discovery of a number of new dielectric oxide materials for extreme environments. Professor Randall's scholarly achievements in engineering dielectric oxides are well recognized both nationally and internationally. For his outstanding contributions to the field of ceramics in general, and high-temperature dielectrics in particular, Professor Randall was elected Academician of World Academy of Ceramics in 2006 and the Fellow of the American Ceramic Society in 2005.

MatSE has been fortunate in that four other faculty have received this prestigious award in recent years including Darrell Schlom 2006, Long-Qing Chen 2003, Kwadwo Osseo-Asare 1999 and Tarasankar Debroy 1997.

## James Tietjen '58 Receives Alumni Achievement Award

James Tietjen '58 PhD, Fuel Science, received the Graduates of Earth and Mineral Sciences (GEMS)



(L-R) William Easterling, EMS Dean; Mary-Ellen Tietjen; James Tietjen (recipient)

Alumni Achievement Award at the annual Obelisk Dinner and Awards Ceremony on Friday, September 18, 2009. This award is given to

an outstanding alumnus who exemplifies the ideals of the College. Dr. Tietjen is a titan of the scientific and engineering industries and has been honored on many previous occasions for his technical and managerial contributions and achievements.

Dr. Tietjen received his MS and Ph.D. degrees in Physical Chemistry from E&MS's Fuel Technology Program in 1958 and 1963, respectively. After that, his rise through the ranks of industrial R&D was truly meteoric. Thus, he joined RCA Laboratories in Princeton, NJ as a member of the technical staff. Over the following 20 years, he rose rapidly in the organization to the position of Staff Vice President (1977 – 1983). In 1983, he assumed the position of President and COO (1983 -1984) and CBO (1984-1985) at RCA Communications, a pioneer in satellite communications. In 1985 he then became Vice President at RCA Laboratories (later named the David Sarnoff Laboratories, one of the most prestigious laboratories in the World). He remained in that position for two years and then became President and CEO of David Sarnoff Laboratories in 1987. With the acquisition of the Sarnoff Laboratories by SRI International, Menlo Park, CA in 1990, Dr Tietjen moved to California to become President and CEO of that organization, a position that he held until his "retirement" in 1994.

After his time at SRI, Dr. Tietjen joined academia as Department Head, Department of Management and Engineering Management (1994 – 1997), then as Dean of the Wesley J. Howe School of Technology Management (1997 – 2000), and finally as Dean Emeritus of the Wesley J. Howe School of Technology Management (2000), Stevens Institute of Technology in New Jersey. Not one to rest on his laurels during this incredible journey, Dr. Tietjen has contributed greatly to the service of the public and his profession.

## Kotanchek '84, '87, '91 Receives 2009 Alumni Fellow Award

The Alumni Fellow award is the most prestigious award given by the Penn State Alumni Association.

Since 1973, the Alumni Fellow award has been given to select alumni who, as leaders in their professional



(L-R) Barry Simpson, PSAA President; William Easterling, EMS Dean; Theresa Kotanchek (recipient); Graham Spanier, PSU President

fields, are nominated by an academic college and accept an invitation from the President of the University to return to campus to share their expertise with students, faculty, and administrators. The award is a cast bronze medallion and framed certificate. Dr. Theresa Kotanchek is Dow's Global Technology Director for Asia Pacific and India-Middle East-Africa. In this role, she leads all Asia Pacific and IMEA R&D, including the development and

staffing of Dow's new state-of-the-art R&D center in Shanghai, China and Dow's future build-out in India.

In addition to establishing world-class R&D capabilities in our emerging geographies, she is responsible for achieving the company's Asia Pacific growth strategy through market-driven scientific and technological innovations, enhancing current products as well as creating new business and technology platforms. She is located in Shanghai.



## Basil Marple '90 receives TSS President's Award

Dr. Basil Marple '90, retired Senior Research Officer, Surface Technologies, NRC Industrial Materials Institute is the recipient of the 2010 Thermal Spray Society (TSS) President's Award. This award was presented to Dr. Marple "in sincere and grateful appreciation for exemplary service to TSS." He was recently named Lead Editor of the *Journal of Thermal Spray Technology (JTST)*. Dr. Marple received his PhD in ceramic science in 1990. He began to work at the NRC in 1975 as a technician and after completing his Ph.D. in 1990 was appointed research officer, reaching the rank of senior research officer (SRO) of

the NRC in 1999. His expertise is in the design and development of ceramic and cermet coatings for industrial use where resistance to wear and corrosion as well as high temperature stability are required. Dr. Marple has been a member of the Board of the ASM Thermal Spray Society since 2006, and he was reelected in 2009 for another three-year term.

If you would like to nominate a fellow alumni for a Departmental, College or University Alumni Award, please contact Katina at [iyb7@psu.edu](mailto:iyb7@psu.edu) for more information on the various awards.

## Generous Donor, Cathleen McFarlane-Ross Passes



Cathleen McFarlane-Ross, longtime friend of Penn State passed away on February 8, 2010. Known as “Kate the Great”, Cathleen was an advocate for homeless and hungry. She founded St. Ann Place,

a center where the homeless can receive mail, make telephone calls, shower and get a lunch. Before her death

she pledged \$1 million that will establish two endowments to benefit students and faculty of the Materials Science and Engineering Department in the University’s College of Earth and Mineral Sciences. McFarlane-Ross’s gift honors her late husband, industrialist and alumnus Norris “Mac” McFarlane who graduated from Penn State in 1934 with a bachelor’s degree in metallurgy. After holding executive positions with Pittsburgh Metallurgical Co. and Airo Inc., he served as president and owner of Macalloy Corp. in Charleston, S.C., the single-largest ferrochrome producer in the United States. A member of the American Iron and Steel Institute, McFarlane received many awards during his lifetime, including the David Ford McFarland Award for Achievement in Metallurgy from Penn State in 1990. Words cannot express how grateful the department is

for her generous gift that will live on and benefit countless students.

The two new endowments she has created are:

### The Norris B. McFarlane Faculty Career

Development Professorship in Materials Science and Engineering, which will provide critical financial support and encouragement to junior faculty members beginning their careers. The fund will allow young faculty members to direct initial energies to the classroom, will provide start-up funds for new areas of research and teaching laboratories and will offer early recognition for outstanding accomplishments.

### The Norris B. McFarlane Scholarship Fund,

which will provide financial support to deserving undergraduate and graduate students pursuing degrees in materials science and engineering.

## Dear Alumni,

You may remember that we, alumni and members of the External Advisory Board (EAB) for MatSE wrote to you November 2009 requesting a donation to help support the Department. There are many reasons for this request, not the least of which is the need to continue to educate, enrich, and inspire the next generation of engineers and scientists. Your donation may be used for traditional scholarships, as well as for travel to conferences, speakers to enhance what is learned in the classroom, or upgrades to labs and equipment. By specifying that your donation is for MatSE, you give Dr. Messing the ability to build an even stronger program.

Walk through Steidle and the memories will flood

back but talk to some of the students and you’ll immediately realize how some things have changed considerably. You’ll hear students and staff talking about the new emphasis on safety. You’ll hear discussions throughout the year about the Spring Awards Banquet. Some students will highlight their incredible experience learning abroad as part of the International Internship in Materials. You may even hear about the construction of the new \$225 million Millennium Science Building for Materials Science and Life Sciences located in the center of campus.

The Department would be nonexistent if not for the alumni who have passed through the doors of Steidle. The Department would also be unable to make many of these changes without the generos-

ity of its alumni, and for that we thank you. But there is a long way to go on the journey to Great and like everything else; there is a financial burden to do so. If you have given to the Department, thank you. If you give to Penn State, did you know you can direct your gift directly to the department? There are multiple options in doing so including unrestricted gifts, scholarships, and numerous endowments. If you haven’t given in the past, now would be a great time to start. Consider a donation no matter the size and give the students in MatSE the opportunities to excel and become the stars of the future.

Sincerely,  
The Members of the External  
Advisory Board for MatSE

## Opportunities for Giving back to MatSE!



**If you would like to make a gift to either of these funds, please complete and return this form, including a check made payable to:**

The Pennsylvania State University  
Department of Materials Science and Engineering  
121 Steidle Building  
University Park, PA 16802

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

e-mail: \_\_\_\_\_

**Yes, I want to support MatSE with my gift to:**

- Robert E. Newnham Distinguished Graduate Fellowship in Materials Science and Engineering
- MatSE Alumni Appeals Donation (see above)
- Undergraduate Scholarships

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## 2010 MS&T Alumni Reception in Houston

The department is hosting a MatSE Alumni Reception held in conjunction with MS&T 2010 in Houston Texas on Tuesday, October 19th at the Hilton Americas Houston. More information to come!



MatSE News is a publication of the Department of Materials Science and Engineering. For a free subscription, send your name and address to: MatSE, 121 Steidle Building, The Pennsylvania State University, University Park, PA 16802

This publication is available in alternative media on request.

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