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RUTGERS School of Engineering

ENGINEERING NEWS

FALL 2008

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Dear Colleagues, Friends and Alumni:

On behalf of the faculty, staff and students of the School of Engineering at Rutgers University, I would like to share news of exciting activities and accomplishments of the school. Several senior faculty members have retired. Young dynamic and enthusiastic faculties were hired. Interest has grown in a wide variety of emerging areas, including nanomaterials, transportation, devices, materials processing, biotechnology, energy and environmental systems. I took over as Interim Dean on July 1, 2008 from the previous Dean, Michael T. Klein, who had been at the helm for the last 10 years. Mike, with strong support from Dr. Abdelfattah Zebib, had spearheaded and guided a large number of impressive achievements. Among these, two of the important ones are the growth and development of the Biomedical Engineering Department, including the new impressive BME building, and the Center for Innovative Ventures for Emerging Technologies (CIVET).

Engineering has been a part of Rutgers University for over a century and has had a significant impact on the university, the state, the profession and research and education around the world. The School consists of the core disciplines of Biomedical Engineering, Civil and Environmental Engineering, Chemical and Biochemical Engineering, Electrical and Computer Engineering, Industrial and Systems Engineering, Materials Science and Engineering, and Mechanical and Aerospace Engineering, as well as several interdisciplinary programs and centers. Due to interactions and collaborations with other units within the university, such as Computer Science, Food Science, Life Sciences, and the Business School, the School of Engineering has expanded its reach into a wide range of areas and has succeeded in attracting researchers and engineers from local as well as national industries, labs and organizations to collaborate with the faculty.

Strong faculty research programs have led to impressive achievements in different fields, outstanding international recognition and distinguished awards. These include a large number of prestigious NSF CAREER awards and exceptional achievement awards from professional societies, as mentioned later in the Newsletter. Many faculty members are active in professional societies and play a substantial role in organizing international conferences, and serving on editorial boards and as editors of international leading journals. Many faculty members are fellows of professional societies like APS, ASCE, AIChE, ASME, IEEE, and IIE. Other important achievements of the faculty are the publication of a number of research monographs, books, and review articles, presentations of keynote and plenary lectures, and participation in panels at international conferences and funding agencies.

As part of a major land-grant research university, the School also plays a significant role in education. With over 2,200 undergraduate and over 800 graduate students, the school makes a substantial contribution to education and training of the future leaders in engineering. A long-term growth by about 50 % of the faculty and students over the next 5-7 years is being envisaged, thus graduating about 750 undergraduates each year and producing over 100 Ph.D. dissertations, in order to enhance the impact of the school and meet the demand for well-trained and well-educated engineers.

I hope you find this Newsletter enjoyable and informative. Please visit our web site at *www.soe.rutgers.edu* for further information on the recent progress made by the school and upcoming events. I would certainly love to hear from you and your suggestions on our affairs.

Dr. Yogesh Jaluria

Interim Dean
Board of Governors Professor

Instruction in engineering began at Rutgers in 1864, when the state of New Jersey designated the Rutgers Scientific School as the "State College for the Benefit of Agriculture and Mechanic Arts." The present School of Engineering became a separate entity in 1914. It has departments that cover mechanical & aerospace, chemical & biochemical, civil & environmental, industrial & systems, biomedical, bioresource, electrical & computer and materials science and engineering.

CAIT RECEIVES $25.5 MILLION FHWA CONTRACT TO STUDY U.S. BRIDGES

Transportation officials from Washington, D.C., New Jersey, and a host of other states came together at Rutgers' Center for Advanced Infrastructure and Transportation (CAIT) April 29 to celebrate the award of a five-year contract—worth up to $25.5 million—and the initiation of the Long-Term Bridge Performance (LTBP) program.

LTBP is envisioned as a 20-year comprehensive examination of our nation's "work horse" highway bridges—structures that include what many people commonly think of as elevated roadways. After a competitive bidding process, CAIT was awarded the contract and will lead this important initiative. Funding for the LTBP program was included in the surface transportation highway legislation enacted by the U.S. Congress in 2005: the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The LTBP program is a "new way of doing business," according to FHWA. It is the first time that comprehensive, quantitative bridge performance data will be collected uniformly on a national basis. "Performance" includes how bridges behave under the myriad assaults they are subject to day in and day out traffic loads, fatigue, and environmental factors like temperature fluctuation, freeze-thaw cycles, and corrosion. LTBP researchers will conduct detailed inspections and periodic evaluations on a broad sample of bridges using proven technologies and will monitor and measure the selected bridges over the life of the program. The resulting data will enhance our understanding of bridge behavior, and those insights will help bridge owners make "smarter" decisions in the future regarding maintenance and/or replacement needs.

The FHWA contract coming to CAIT is a great leap forward in Rutgers President Richard L. McCormick's vision to make the university a leader in transportation research. "It is only natural that a comprehensive research university—in a state like New Jersey, which is a hub of commerce in the region, the nation, and the world—should make such a strong commitment to transportation research.

Professor Ali Maher, CAIT director and the principal investigator for LTBP, noted that the LTBP program is vital to the nation's future, citing the age of our transportation infrastructure system.

Big Media Month

In April and May, CAIT got "a lot of ink," as they say in the newspaper business. In addition to press coverage in newspapers and publications, they also had an interview with CAIT Director Ali Maher.

BIOMEDICAL ENGINEERING HAS A NEW HOME

Rutgers University has a long history in the field of Biomedical Engineering, dating back to 1965 when the first MS degree was offered. The PhD degree was first offered in 1981 and the Department of Biomedical Engineering was formed in 1986. With a remarkable drive of proposal writing to state, federal and foundation sources from faculty including Dr. Yarmush, and the institutional support, the Department has been able to move into a new 85,000 square feet building now. The building has three teaching laboratories dedicated to undergraduate education: Molecular and Cellular laboratory, Biomechanics and Ira S. Gottscho Packaging Laboratory and Bioinstrumentation Lab.

On April 18, 2007 Rutgers celebrated the opening of its new Biomedical Engineering building on the university's Busch Campus. This new building became a reality thanks in large part to a $5 million total grant from The Whitaker Foundation, as well as funding from the State of New Jersey, and significant gifts from several key private donors.

WINLAB IS AWARDED SCHWARTZKOPF PRIZE FOR TECHNOLOGY INNOVATION

A research team at the Rutgers University Wireless Information Networking Laboratory (WINLAB) received the fourth annual Alexander Schwarzkopf Prize for Technological Innovation from the I/UCRC Association, a voluntary, independent organization of past and present members of the National Science Foundation's Industry/University Cooperative Research Center (I/UCRC) program. The award, named for the founder of the I/UCRC program, recognizes Rutgers for establishing a unique facility for testing new mobile computing and communications technologies. The facility, known as the ORBIT Open Access Radio Grid Testbed, features a 400-node programmable radio transceiver emulation laboratory and an outdoor field trial system of short- and long-range radios on the university's New Brunswick campus. Accepting the award for the Rutgers team is Ivan Seskar, an associate director at WINLAB and project engineer for ORBIT, leading its design and ongoing operations. The ORBIT facility, funded by a $5.45 million, four-year National Science Foundation (NSF) grant, is the world's largest open, programmable wireless network facility for use by academic and industry researchers worldwide operations.

WINLAB Technology Facility Center

WINLAB, in addition to the Schwartzkopf Prize, has recently been awarded five new NSF grants, totaling $2.5M. This includes a 4-year, $1.5M renewal for ORBIT to support upgrades to programmable radios and continued operation as a community testbed.

NSF ENGINEERING RESEARCH CENTER A FIRST AT RUTGERS

Structured Organic Particulate Systems

The National Science Foundation has awarded a $15 million grant to Rutgers, The State University of New Jersey, and three collaborating universities to improve the way pharmaceuticals, foods and agriculture products are manufactured.

The Engineering Research Center for Structure Organic Particulate Systems (C-SOPS) brings together a cross-disciplinary team of engineers and scientists, as well as industry leaders, to improve the way pharmaceuticals, foods and agricultural products are manufactured. C-SOPS will focus on advancing the scientific foundation for the optimal design of SOPS with advanced functionality while developing the methodologies for their active control and manufacturing. Joining Rutgers University are the New Jersey Institute of Technology and the University of Puerto Rico Mayaguez, schools with established teaching and research programs in engineering, pharmaceutical sciences and technology.

WHAT'S NEW AT CAES?

CAES CENTER FOR ADVANCED ENERGY SYSTEMS

The Center for Advanced Energy Systems (CAES) is taking full advantage of the recent run up in energy prices and a renewed interest in energy from funding agencies. Here are some highlights:

Cyber security takes center stage: One of CAES' new research projects involves quantification of national risk of cyber crime on the electrical grid. This DOE funded project is carried out in collaboration with Siemens and Industrial and Systems Engineering. CAES is modeling the grid and doing a sophisticated sensitivity analysis of power interruption at substations, load centers and generation sites to determine the most critical nodes in the network. The final result will be a software "security agent" that can be installed in high risk substations to identify and protect against intruder attacks.

Service Programs Continue to Flourish: CAES continues to give technical assistance to the State of NJ through a variety of technical assistance programs. Over the last month, CAES has received renewed funding from the Department of Environmental Protection for its *NJ Manufacturing Excellence Program*. This long standing program sends teams of faculty and students into NJ factories to assist them in reducing emissions; meeting environmental regulations; and lower energy costs. In addition to training students in practical techniques in energy systems, this program has lead to several spin off research projects such as our current work with a lubricant manufacturer in northern NJ who is looking to pyrolyze their waste product into an economic fuel.

BME INDUSTRIAL INTERNSHIP PROGRAM (BEIIP)

Thanks to the initial support of the Whitaker Foundation, BME at Rutgers has initiated a dynamic and diverse industrial internship program for its undergraduate and graduate students. Each summer, talented BME students are hosted by industry for 8-12 weeks working on commercially relevant projects. Interns gain significant insight into the workings and culture of the modern biomedical industrial environment to augment the traditional education they receive at Rutgers.

Outreach

Professor **Stephen Tse**, Mechanical and Aerospace Engineering, is the new Outreach Director of Mechanical & Aerospace Engineering, managing industry—university collaborations, alumni activities, high school and community outreach, and public relations.

MATERIALS SCIENCE ENGINEERING OUTREACH EVENT: NANODAY

The Materials Science and Engineering Department recently sponsored a new version of "NanoDay", an event that we've had annually for several years. This time we offered our NanoDay event in conjunction with Johns Hopkins University's Center for Talented Youth (CTY). They did the advertising to top-flight junior-high students in the east coast region and we ended up with an audience of about 500 people who came to campus Saturday, November 3rd to learn about the interdisciplinary aspects of "Nanoscale Science and Engineering". We had selected topical lectures to the large crowd and also opened up nanotechnology laboratories in several departments for small group tours. Parents were also coached about curriculum issues that might be important for students who want a career in nanotechnology. We were energized by the large turnout and hope that this helps spread the word about the innovative nanotechnology education opportunities we provide to our students.

UNDERGRADUATES PRESENT THEIR RESEARCH AT INTERNATIONAL CONFERENCES

Five students from the School of Engineering were selected as part of the delegation from Rutgers University to the 15th International Symposium on Undergraduate Research held annually at the University of Sao Paulo, Brazil. Arriving in Sao Paulo on November 25, 2007, the delegation members presented their work in both poster and oral form at the Engineering School campus in Sao Carlos, the Agricultural School campus in the city of Pirassununga, and the liberal arts home campus in Sao Paulo itself. Each poster presentation was subject to judging, and the RU Engineering delegation received a remarkable number of perfect scores, placing two students (Ekta Patel and Christine Lomiguen) among the top tier of recognition. The students experienced not only the valuable exchange of scientific research conclusions and ideas with the international attendees but also discovered the warmth and wonder of Brazilian culture and heritage. The delegation was led by Assistant Dean Jeffery Rankin with able assitance from Assistant Dean Evelyn Laffey of the Office of Student Development. The week long visit was a highlight of the academic year for the students selected for the delegation.

The delegation members with their departments and topics are listed here:

Michael Boxer, Civil Engineering:

"Permeability Characteristics of High Performance Concrete"

Christine Lomiguen, Biomedical Engineering:

"New Conditions for Greater Purification Yield of Phosphorylated Period Protein"

Ekta Patel, Chemical Engineering:

"Intracellular Gene Regulation via Engineered Nanolipoblockers"

Amy Rose, Mechanical Engineering:

"Aerodynamic Optimization using ModeFrontier"

Karl Suabedissen, Mechanical Engineering:

"Thermal Transport Properties of Magnetically Aligned Carbon Nanotube Suspensions"

While in Brazil, three students (Mr. Boxer, Ms. Lomiguen, and Ms. Patel) were invited to present their work once again at the University of Porto, Portugal in February 2008. This was the first time a Rutgers delegation had been invited to this important conference and internationally known research university campus. Four busy days of research presentations, visits with univerity dignitaries, and traveling to cultural and historical sites left all in the delegation with a sense of the challenges of the future in global research cooperation. The work of the delegation students led to an invitation for a Rutgers Engineering return on an annual basis.

RUTGERS SCHOOL OF ENGINEERING AWARDS ALUMNI MEDALS OF EXCELLENCE

Honors go to Verizon and Corning executives, Michigan and Minnesota educators; alumni association also honors Rutgers emeritus professor

Mrs. Keiko Harvey, Dean Michael T. Klein, Dr. Yicheng Lu

Dr. Walter Weber, Dean Michael T. Klein, Dr. Trefor Williams

Dr. William Plerhoples, Dean Michael T. Klein, Dr. Dunbar Birnie

The School of Engineering at Rutgers University awards its "Medal of Excellence" honors to alumni who have made major contributions to society or achieved notable positions in business, government or education.

The recipients were honored at an awards banquet on May 21, 2008, the evening before the School of Engineering's spring commencement convocation. They are:

• Keiko Harvey, senior vice president for video network services at Verizon Communications. Harvey was honored as alumna of the year. She earned a bachelor's degree in electrical and computer engineering from Rutgers in 1972.

• William Plerhoples, retired from Corning Incorporated in 2006, where he was senior vice president for manufacturing technology and engineering. Plerhoples was honored for lifetime achievement. He earned a bachelor's degree in 1968 and a master's degree in 1973, both in ceramic engineering from Rutgers.

• Walter J. Weber Jr., the Gordon M. Fair and Earnest Boyce Distinguished University Professor of Environmental and Ecological Sciences and Engineering at the University of Michigan. Weber was honored for achievement in academia. He earned a master's degree in sanitary engineering from Rutgers in 1959.

• David J. Odde, professor, Biomedical Engineering, University of Minnesota. Odde was honored as the outstanding young alumnus. He earned a master's degree in 1992 and a doctorate in 1995, both in chemical and biochemical engineering from Rutgers.

At the same event, the school's alumni association – the Rutgers Engineering Society – presents its distinguished engineer award to Reuben H. Karol, professor emeritus, civil and environmental engineering, Rutgers University. Karol received a bachelor's degree in 1944 and master's degree in 1949, both in civil engineering from Rutgers.

"Rutgers has a long and proud history of engineering education, with graduates who have risen to leadership positions in government, industry and academia worldwide," said Michael Klein, dean of the School of Engineering. "These awards, which we issue annually, give us the chance to recognize our alumni.

Keiko Harvey, ECE '72, Senior Vice President for video network services at Verizon Communications.

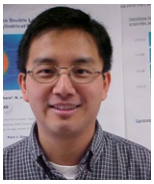
William Plerhoples, MSE '73, Senior Vice President for manufacturing technology and engineering at Corning Inc. Currently retired.

Walter J. Weber, Jr., CEE '59, Distinguished University Professor at the University of Michigan.

David J. Odde, CBE '95, University Professor at University of Minnesotta

YOUNG SOE PROFESSORS RECEIVE PRESTIGIOUS AWARDS

Jerry W. Shan and Hao Lin, Assistant Professors in the Mechanical and Aerospace Engineering Department, have received the National Science Foundation's (NSF) most prestigious honor for outstanding young researchers. As a recipient of the NSF's Faculty Early Career Development (CAREER) award, each will receive $400,000 over five years. **Professor Shan** will study nano-scale hydrodynamics and "smart" fluids having actively controllable thermal and flow properties. The fundamental understanding arising from this research could lead to the development of smart fluids with applications in clutches, dampers and a variety of heat-transfer systems. The research effort will be integrated into an outreach, educational and mentoring program aimed at female students who are historically under-represented in engineering. **Professor Lin** will study complex electric-field-mediated transport phenomena in both engineered microfluidic systems and biomedical/biophysical applications. The fundamental knowledge obtained from this research could lead to optimized design of lab-on-a-chip systems for bio-chemical analysis, and innovations in biomedical applications such as drug and gene delivery, and cancer therapy. The program has also a strong emphasis on education via integrated efforts in outreach activities, improving curriculum and interdisciplinary training, and recruiting underrepresented minority students into the engineering disciplines.



Yannis Androulakis, Chemical Biochemical Engineering, received a 3 year $1.2M award from NIH R01. This award will support his research in the area of Bioinformatics Analysis of Control Mechanisms of Hypermetabolism. This work is in collaboration with Professors Charlie Roth, Marianthi Ierapetritou (CBE), and Francois Berthiaume (Harvard Medical School/ Massachusetts General Hospital).

Anant Madabushi, Biomedical Engineering, has been awarded the following awards for 2007/2008: Early Career Award (Phase 2), Walter H. Coulter Foundation for Translational Research, the Society for Imaging Informatics in Medicine (SIIM) Research Award and New investigator Award, Cancer Institute of New Jersey.

OTHER DISTINGUISHED AWARDS

Michael T. Klein, Chemical and Biochemical Engineering received the Wilhelm Award in Chemical reaction engineering from the American Institute of Chemical Engineers. This award is sponsored by ExxonMobil research Engineering Company.

Fernando Muzzio, Chemical and Biochemical Engineering, is awarded the NAMF Award for Excellence and Sustained Contributions to Mixing Research and Practice. This award is sponsored by The Procter & Gamble Company.

M. John Matthewson, has been honored with the "Fellow" ranking of the American Ceramic Society this year for his outstanding career contributions to ceramic science. He has authored or coauthored over 100 papers in the field of mechanical behavior of materials, most of them concerning the strength, fatigue and reliability of optical fibers.

Manish Parashar, Electrical and Computer Engineering, was awarded a 2008 IBM Faculty Award for his research on autonomic data extraction, streaming and in-transit data manipulation for petascale computing.

Yogesh Jaluria, Mechanical and Aerospace Engineering, received The Donald Q. Kern Award for 2007 from the American Institute of Chemcial Engineers (AIChE). This award is given each year by AIChE to a researcher for outstanding contributions in heat transfer or energy conversion.

Noshir Langrana, Biomedical Engineering and Mechanical and Aerospace Engineering, has been selected to receive the 2008 H.R. Lissner Medal for his outstanding achievement in bioengineering.

Prabhas Moghe, Biomedical Engineering and Chemical and Biochemical Engineering, was awarded a $3.2 Million NSF grant as part of IGERT program for breakthroughs on stem cell research. This effort builds upon Dr. Moghe's previous IGERT grant, which trained 36 doctoral students from eight programs to use cross-disciplinary research techniques.

RECENTLY PUBLISHED BOOKS

A. Safari and E. K. Akdogan, Piezoelectric and Acoustic Materials for Transducer Applications, Springer, 2008

T. Altiok and B. Melamed, Simulation Modeling and Analysis with ARENA, Academic Press, 2007

E. Nawy, Reinforced Concrete—Fundamental Approach, Prentice Hall/Pearson Education, 2008

Y. Jaluria, Design and Optimization of Thermal Systems, CRC Press, 2008

P. Sannuti Ali Saberi, AntonA. Stoorvogel, Filtering Thery: with Applications to Fault Detection, Solution, and Estimation, Birkhouser, 2007

E. Dill, Continuum Mechanics: Elasticity, Plasticity, Viscoelasticity, CRC Press, 2007

JERSEY ROOTS, GLOBAL REACH: ISE ALUMNUS AND QUALITY ENGINEERING IN SOUTH AFRICA

When Patrick McLaren arrived at Rutgers University in 1998, the ISE Department was arguably at the center of research and education in quality and reliability engineering. There was already in place a successful collaboration with the Statistics Department for granting masters degrees in quality engineering and quality management. ISE had recently joined with Arizona State University to establish a National Science Foundation Center for Industry/University Cooperative Research. So it was natural that Patrick chose to earn a graduate degree in quality engineering at Rutgers.

But Patrick was no ordinary graduate student. He is the son of a distinguished activist family in the Western Cape of South Africa that had been fighting against apartheid for generations. His family suffered a great deal in the struggle and, as a teenager, Patrick often had to sleep in a different place each night to avoid arrest. With the end of the apartheid era and the founding of the modern South African democracy in 1994, Patrick could focus on achieving his higher educational goals. Having earned the BS and MS degrees in Mechanical Engineering, he had served on the engineering faculty of Peninsula Technikon, in Cape Town, South Africa. In 1998 he was awarded a USAID Tertiary Educational Linkage Program scholarship, initiated by Nelson Mandela, to conduct post graduate studies in the United States. He registered at Rutgers in September of 1998 and completed his Master of Science in ISE's Quality and Reliability Engineering Option in 2000.

During his time at Rutgers, Professor Susan Albin developed a supportive relationship with Patrick, often talking with him about his plans for contributing to the educational future of the new South Africa. She was invited to join him at Peninsula Technikon as a visiting professor. Professors McLaren and Albin have attended two conferences on Collaborative African-American Graduate Education, in Cape Town and in Nairobi, Kenya. These conferences brought together graduate educators from about 100 universities in the US and in Africa, including Mozambique, South Africa, Nigeria, Swaziland, Kenya, Togo, Malawi, Madagascar, Gabon, Ethiopia, Ghana, Cameroon, Botswana, Uganda, Rwanda, Lesotho, and the Democratic Republic of the Congo. More than a dozen new graduate programs were initiated with the encouragement of these Collaboration Conferences.

Professor McLaren is currently Head of the Industrial and Systems Engineering Department at Cape Peninsula University of Technology in Cape Town, South Africa.

ALUMNI HELP INVENT THE FUTURE

One sure mark of program excellence is the willingness of alumni and other individuals to invest in its future, or more importantly, in the ability of faculty and students to invent the future. Cristian and Andreea Frâncu, Rutgers Alumni 2001 have made just such an investment in the technical expertise and vision of Rutgers E&CE by donating $150,000 over three years to support a Post-Doctoral Associate in Virtual Reality research, an area of particular strength within the department (see www.caip.rutgers.edu/vrlab). The Frâncus have a particular interest in advancing virtual reality research. Besides its obvious potential impact on activities as diverse as gaming and telemedicine, virtual reality is a potentially "leveling technology"— making the chance of birthplace much less important than talent and expertise.

The implicit issue of fair access strikes a particularly strong chord with the Frâncus who are Romanian by birth and intimately familiar with the difficulties faced by Southeastern European youth interested in science and technology. Thus, the fellowship is also targeted at individuals who have a demonstrated commitment to advancing electrical and computer engineering in Romania in particular and Southeastern Europe in general. The faculty of Rutgers E&CE applaud the spirit and the substance of the Frâncu E&CE Fellowship and look forward to continuing to invent the future with their support.

Andreea and Cristian Frâncu

MECHANICAL AND AEROSPACE ALUMNI NEWS

Mukund V. Karwe (Ph.D. Rutgers, 1987) has been selected to receive this year's Warren I. Susman Award for Excellence in Teaching. This prestigious award is the University's highest honor given to its most outstanding teacher. Mukund Karwe's teaching is in the area of Thermal and non-Thermal Processing of Foods, Food Engineering Fundamentals and Processes, and Applied Mathmatics in Food Science. His research interests cover Stability, Formation, and Enhancement of Nutraceuticals in Processing of Selected Grains and Stability of proanthocryanidins and anthocyanins during cranberry processing, among others. Mukund Karwe also took over as Chair of the Food Science Department, Rutgers University, in Fall 2007. He is a Professor in the department and is an active researcher in Food Engineering, Nutraceuticals, and Food Extrusion.

Mukund V. Karwe

FACULTY HIRING

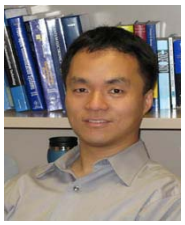
NEW FACULTY

Electrical and Computer Engineering:

- **Dario Pompili** joined the faculty at Rutgers as an Assistant Professor in Fall 2007. He is the author of many influential papers in ad hoc and sensor networks, underwater acoustic communications, wireless sensor and actor network optimization and control. He received his PhD from Georgia Institute of Technology.

Dario Pompili

- **Wei Jiang** joined Rutgers as an Assistant Professor in Fall 2007. His research interests encompass silicon photonics, photonic crystals, nanophotonics, nanoimprint, and optical interconnects. He received his PhD from the University of Texas Austin.



Wei Jiang

- **Moncef B. Tayahi** joined Rutgers as an Assistant Professor in Spring 2008. His research interests are carbon nanotube and power electronics devices, wide bandgap material and devices, sensors applications and sensor networks and photonics devices and systems. He received his PhD from the University of Connecticut .

Moncef Tayahi

Biomedical Engineering

- **Francois Berthiaume** will join Rutgers as an Associate Professor starting January 2009. His research is in metabolic and tissue engineering which focuses on three different areas: Metabolic engineering analysis of metabolic diseases; Metabolic engineering for tissue engineering, cell and organ transplantation; and stem cell engineering for improved wound healing. He received his PhD from Pennsylvania State University.

Industrial and Systems Engineering

- **Myong K. Jeong** who is jointly appointed with the Rutgers Center for Operations Research (RUTCOR). His research interests include data mining, health monitoring, quality and reliability engineering, stochastic processes, and sensor data analysis. Received his PhD from Georgia Institute of Technology .

Myong Jeong

Mechanical and Aerospace Engineering

- **Shaurya Prakash**, graduated with a Ph.D. in mechanical engineering from the University of Illinois at Urbana-Champaign in October 2007. He joined the Department of Mechanical and Aerospace Engineering in fall 2007. His research focuses on developing microsystems and nanosystems for applications in water purification, renewable and alternate energy, and chemical and biological separations.

Shaurya Prakash

- **Kimberly Ann Cook-Chennault** holds a MS degree in Mechanical Engineering from Stanford University; and a PhD in engineering from the University of Michigan. As an Assistant Professor at Rutgers University, Dr. Cook-Chennault continues her work in the design of hybrid power systems for power generation, transmittal and storage for devices and systems that range in scale with emphases on battery technology, energetic materials and urban wind systems.

Kimberly Cook

- **Jingang Yi** has joined the Department of Mechanical and Aerospace Engineering as an assistant professor starting Fall 2008. Prior to joining the Department, Dr. Yi was an Assistant Professor in mechanical engineering at the San Diego State University. His research interests include autonomous robotic systems, dynamic systems and control, intelligent sensing and actuation systems, mechatronics, and automation science and engineering, with applications to semiconductor manufacturing, intelligent transportation, and biomedical systems.

Jingang Yi

Chemical and Biochemical Engineering

- **Nina Shapley** is a new Associate Professor . She joined us on July 1, 2008 having been an Assistant Professor in the Chemical Engineering department at Columbia University. Dr. Shapley has a background in physics (Harvard B.S.) and chemical engineering (MIT, D.Sc.) and has taught in the core curriculum as well as specialized elective courses in her area of expertise. Professor Shapleys research emphasizes noninvasive imaging of concentrated suspension and emulsion flows, using nuclear magnetic resonance imaging and optical techniques such as video microscopy.

Nina Shapley

GATES FELLOWSHIPS

Rutgers students to receive 2008 Gates Scholarship.

RUTGERS TIES HARVARD FOR MOST GATES SCHOLARS FROM A SINGLE UNIVERSITY THIS YEAR; STUDENTS TO PURSUE GRADUATE STUDY AT CAMBRIDGE UNIVERSITY

The Gates Cambridge Scholarships, established in 2000 by the Bill and Melinda Gates Foundation, cover all fees and living expenses for a student's full-time master's or doctoral studies at the University of Cambridge in the United Kingdom. Cambridge is one of the oldest and most esteemed universities in the English-speaking world. Depending on the student's program of study, a scholarship's value could exceed $50,000 annually for one to four years.

Originally from Sewell, New Jersey, the 22-year-old **Brian Spatocco** rattles off his occupational ambitions in – materials science, nanotechnology, self-assembly – when he talks about his occupational ambitions. But his work as a member and president of the Engineering Governing Council and experience lobbying Trenton for the interests of engineering and science students as well as students at-large show his leadership skills! Rutgers' other Gates scholar is **Ronn Friedlander** of Cranford, N.J., who graduated from the Rutgers School of Engineering May 22 with a 4.0 grade point average in biomedical engineering. His undergraduate studies also included a major in ecology and natural resources. At Rutgers, Friedlander has been active in the humanitarian organization "Engineers Without Borders." This summer, he and some fellow students are traveling to Thailand to begin work on a long-term water purification project.

Brian Spatocco

SCHERING-PLOUGH SCIENCE AND INNOVATION AWARD

Eric Wallenstein, a fifth-year BME PhD student, was selected as the 2007 Schering-Plough Science and Innovation Award recipient from Rutgers University, April 26, 2007. The award recognizes and promotes academic excellence in the areas of analytical chemistry, synthetic organic chemistry, chemical engineering, pharmaceutics and biotechnology.

Ronn Friedlander

ELECTRICAL AND COMPUTER ENGINEERING PHD NEWS

Vincent Matossian, a senior computer engineering Ph.D. student working under the direction of Professor Manish Parashar, was one of ten graduate students selected worldwide to participate in the summer workshop in computational social science at the prestigious Santa Fe Institute. Vincent was selected based on his research proposal, which focused on the nature of complex evolving network topologies, and is part of his thesis research. The two-week workshop focused on the nature of complexity in computational social science and included students from economics, social sciences, and philosophy.

SAPPHIRE AWARD

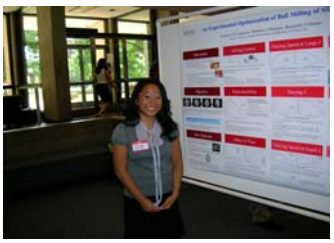
Jennifer Czerepinski (graduate student) was selected as a Sapphire Award winner for the Graduate Excellence in Materials Science (GEMS) Award at the Fall 2007 MS&T meeting. Her winning talk was entitled "A Computational Model to Determine Chemical Uniformity in Rare Earth-Doped Ceramics".

She was the holder of a Corning Incorporated Graduate Student Fellowship for the last two years.

Eric Wallenstein

MERCK UNDERGRADUATE RESEARCH SCHOLAR AWARD

Kathryn Camacho, a chemical and biochemical engineering junior, carried out research at Rutgers University during the 2008 summer as a Merck Undergraduate Research Scholar. Funding provided by Merck Research Labs allowed Kathryn to work with Professor Ben Glasser on problems related to pharmaceutical engineering. She presented the results of her work, shown here, at a symposium on July 25, 2008 in connection with the RISE Summer Program.



Kathryn is also a member of the chemical engineering national honor society, Omega Chi Epsilon.

FUNDRAISING NEWS

Enrica Gioè Chrétien

The School of Engineering has been the grateful beneficiary of the generosity and gift planning foresight of several Rutgers alumni who named the Rutgers School of Engineering in their Wills. Since FY '07, the SoE has received a total of $5.65 million from three bequests. These gifts have been used to create the following endowed funds:

- Eugene V. Du Bois (RC '55) Endowed Scholarships in Engineering and Science
- A. Walter Tyson (ENG '51) Endowed Term Professorship in Engineering
- A. Walter Tyson (ENG '51) Endowed Scholarship in Engineering
- Hannah Sands Endowed Scholarship in Engineering (gift from the Estate of Gordon C. Sands, RC '51)

Legacy gifts such as these have a deep and lasting impact on the school. They help us to recruit and to retain leading scholars, which in turn helps us attract talented students who wish to learn from and work with noted teachers and researchers. With the assistance of endowed fellowships, the Rutgers School of Engineering can offer competitive financial aid packages to recruit graduate students who are being actively sought after by some of the finest universities in the United States. Likewise, endowed undergraduate scholarships help us draw bright young men and women into our vibrant community of relevant academic inquiry.

Gifts used to create endowed funds truly are gifts that go on giving. Not only do they provide immediate assistance to the current recipients, but in nearly every instance students who were themselves beneficiaries of alumni generosity return the favor by giving back to the school as soon as they are able after they graduate.

For more information on ways to give to the School of Engineering, please contact me - Enrica Gioè Chrétien, Director of Development, at chretien@soemail.rutgers.edu or, via telephone at 732-445-4288 (office); or, 732-904-4304 (cell).

MESSAGE FROM THE DIRECTOR OF DEVELOPMENT

Greetings to all SOE alumni, faculty, students and friends! Tayfur Altiok of the newsletter committee asked me to compose a few lines by means of introducing myself to you and to outline some of the fundraising goals for the School of Engineering.

I assumed my new position as Director of Development for the School of Engineering in November, 2003. While I am "*new*" to the School of Engineering, I am by no means new to the university. From 1996 to 2003, I served as the Assistant Secretary of the University where I provided staff support to the Rutgers Boards of Governors and Trustees. I was responsible for the planning, preparation and efficient conduct of Board and Committee meetings, the direction and planning of the University Commencement, as well as the promulgation of the *University Regulations and Procedures Manual*. Prior to that, I served for five years as Departmental Administrator in the Office of the President at Rutgers.

Indeed, my Rutgers connections are long and deep. Following completion of course work toward a Master of Arts in Italian at the Rutgers Graduate School-New Brunswick, I served as Assistant Director of the Annual Fund with the Rutgers University Foundation. I later served as Development Officer and Director of Alumni Relations for Wagner College in Staten Island, New York.

Working to ensure adequate funding to support the Rutgers School of Engineering faculty, students and staff is very rewarding. We stand at the threshold of a very exciting period in the history of the school. Under the leadership of Interim Dean Yogesh Jaluria, the faculty and students are working to achieve the very ambitious goal set by the university to raise the school up in rankings to be one of the premier schools of engineering in the country. To meet this challenge, financial support from alumni, corporations and foundations will become ever more critical.

Dean Jaluria and the Rutgers University Foundation have identified crucial areas of financial need, which include endowment funds for named professorships, graduate fellowships, and undergraduate scholarships. To be sure, these are lofty yet attainable goals. I look forward to getting to meet alumni and industry partners and to working together with you to help maintain the School of Engineering's excellence and competitive edge.

Enrica Gioè Chrétien

PETER CHERASIA ENDOWED FACULTY SCHOLAR AWARD

This endowed fund is established by **Peter D. Cherasia**, ENG. '83 Electrical, to provide financial assistance to the School of Engineering for a faculty scholar award to recognize and to foster excellence in teaching and scholarly activity in highly quantitative and computational aspects in engineering research. The recipient of this award will engage students, both graduate and undergraduate, in their work of this nature. (*Photo by Shelley Kusnetz*)

Dr. Abdel Zebib has been selected as the first recipient of the Peter Cherasia Faculty Scholar Award. Abdel, is a highly quantitative and computational engineering researcher whose work has garnered national and international distinction. Over the course of his distinguished career at Rutgers, Abdel has risen through the faculty ranks reaching the level of Professor II – the highest recognition of scholarly excellence at Rutgers. He is a Fellow of the American Physical Society and a past Associate Editor of the *Physics of Fluids*. In addition, he has supervised fifteen PhD students, including some who have enjoyed highly successful careers in business and finance:

- Dr. Kevin J. Kennedy, CEO of JDS Uniphase
- Dr. Ziaolong Yang, Senior Financial Analyst at Freddie Mac
- Dr. Camille Gervasio, former First VP of the Republic National Bank of New York
- Dr. Michael R. Mundrane, Rutgers University Director of Information Technology.

PRESIDENT ELECT OF INFORMS

Susan Albin, Professor and Graduate Director of Industrial and Systems Engineering, has just been elected President Elect of INFORMS, the Institute for Operations Research and the Management Sciences. The Institute serves the scientific and professional community of O.R. and Industrial Engineering researchers, educators, scientists, students, and practitioners in academic, government, non-profit, and industrial organizations. INFORMS publishes 12 highly ranked scholarly journals that describe the latest O.R. advances. The Institute organizes international and national conferences for academics and professionals. INFORMS is comprised of technical subdivisions that focus on specific methodical and application areas that form the backbone for the Institute. Prof. Albin has previously served on the INFORMS Board of Directors and as Secretary. She was the founding Advisory Board Chair for the INFORMS subdivision in Quality, Statistics, and Reliability.

Prof. Albin's research field is quality engineering, multivariate process control, data mining, and stochastic modeling. Her work has been applied in areas including semiconductor manufacturing, plastics recycling, food processing, and medical devices. Dr. Albin's work has been supported by NSF, FAA, DOD, and various industrial partners. She is currently the Focus Issue Editor for *IIE Transactions on Quality and Reliability Engineering*. In 2008, Prof. Albin was honored with the Excellence in Teaching Award from the Engineering Governing Council at Rutgers.

SENIOR DESIGN PROJECTS

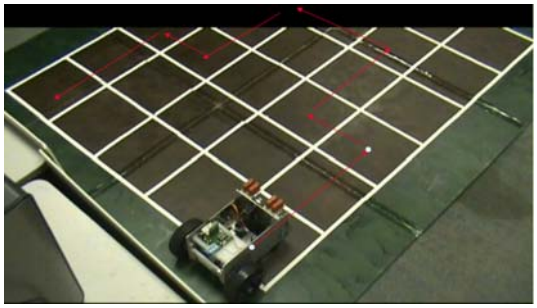
All of the engineering programs in the School of Engineering are accredited by ABET. Accreditation rules require that engineering seniors complete a design project. Working in groups, our seniors come up with some very interesting projects. Our departments showcase their projects throughout the year. The pictures below highlight some of our design projects.

The School of Engineering introduces design to the engineering curriculum early in the year. We also partner with the Governor's School of Engineering and Technology and teach design to high school students.

Our senior design projects have become graduate research topics, as well as military and industrial design projects. We invite you to find more about our senior design projects by visiting SOE department websites and by attending our senior project presentations. If your company, or organization has an idea that can be turned into a design project we would love to partner with you.

Erin Curcio, a BME senior, examined the rates of sensory neuron fasciculation for her senior design project. The figure above shows sensory neurons grown on a pattern where neurites are stained with neurofilament (yellow), growth cones and non-neuronal cells with phalloidin (red), nuclei with DAPI (blue) and laminin with FITC (green). Scale bars 200 and 50 micrometers.

A group of ISE seniors, designed a fully automated seed planting system capable of planting four different types of seeds. The compact design optimizes the travel route in order to save time and uses wireless communication to receive commands from a base computer.



A group of MAE seniors designed and built a functioning hele-shaw flow cell. The purpose of a hele-shaw flow cell is to rapidly visualize the streamlines of a fluid in two dimensions. The flow shell, which is easily transportable, can be used as a teaching tool in the classroom.

PROFESSIONAL SHORT COURSES

Professor Deborah Silver was appointed Associate Dean for Professional and Continuing Education for the School of Engineering.

The School of Engineering has been offering engineering licensing exams for the past twenty years, both review for the Fundamentals of Engineering (FE) exam, and also discipline specific review courses (Civil, Electrical, Environmental and Mechanical) for the Professional Engineering (PE) exam. The course offerings are all available through the Rutgers Advanced Technology Exchange.

We have recently introduced some short course certificate programs "mini Masters" in advanced technology topics including Software Process Management, Human Computer Interaction, Reliability Engineering, and Linux Administration. In addition, we have a selection of short courses of interest in emerging technologies, biomedical and chemical engineering. These are taught by our world renowned faculty and proven leaders in their fields. There are also exciting new certificate programs and a professional masters degree.

Please check our web site for detailed information, http://rate.rutgers.edu.

Newsletter Committee: Dr. T. Altiok, Dr. H. Baruh, Dr. D. Birnie, Dr. N. Boustany, K. Cameron
For questions, comments, suggestions and possible items for inclusion in future editions, contact Kendra Cameron at 732-445-2214 or kendrac@soemail.rutgers.edu

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