Kate Gleason College of Engineering Alumni Newsletter

enginuity

Summer 2005

Dean's Corner

This historic 175th Anniversary year has been noteworthy with respect to initiatives undertaken to foster student success.

For the past several years, the Institute has targeted student retention as a key priority. Although the quality of RIT's freshman class has steadily improved each year, the retention rate of students at RIT consistently has been below average relative to its peer institutions, with engineering lagging the Institute average by several percentage points. To address this issue, the College four years ago initiated a multifaceted program to minimize the impediments to student success, including stronger advising support, early intervention for at-risk students, and a series of co-curricular elements to create a strong sense of community among the students within the College. This year, we celebrate the full impact of these initiatives, as the students entering the College in fall 2003 returned to RIT in fall 2004 at the historically high rate of 91.6%, exceeding 90% for the first time in the College's history. Of the eight RIT colleges, only Imaging Arts & Science (CIAS) had a higher retention rate (92.1%). Since fall 2000, the first-to-second year attrition for those entering the College has been cut nearly in half; the largest degree of improvement of any college at RIT over this time period.

At the Institute level, to improve freshmen retention rates, the concept of learning communities was piloted with first-year students this past fall, and the KGCOE has enthusiastically embraced this initiative. A learning community is comprised of ~ 25 students who take the majority of their courses together, with their instructors meeting regularly to coordinate course content to

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Meet Distinguished Alum Allen Casey

When Allen Casey (EE, '73), KGCOE's Distinguished Alum for 2004, addressed KGCOE graduates, he shared his memories of RIT and what his education has meant to him:

"I credit much of my success to my time at RIT and my co-op experiences. First, I got a great technical education. That education included two years of calculus every morning at 8:00 a.m. - something I will never forget, as hard as I have tried. But just as important as the technical course work, maybe even *more* important, was the thought process that was ingrained in me at RIT - the logical, problem solving methodology, combined with the necessary time management skills, that got me through a very demanding engineering curriculum. It was instilled in me 30 years ago and is still part of me today."

Like many students today, the co-op experience drew Al to RIT in the first place. He thought that co-op made perfect sense – for financial reasons and for the learning process. Like many of the companies that recruit our graduates every year, Al feels that the co-op experience gives students a leg up, not only on technical skills, but on communication skills and understanding the politics of the world of work.

Al leveraged his KGCOE education into professional successes at many companies. He eventually

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Major Research Instrumentation Grant for $400,000 Awarded

Dr. Mustafa Abushagur and a team of RIT researchers including Drs. Alan Raisanen, Santosh Kurinec, Sean Rommel, and Stephen Boedo have been awarded a two-year grant from the National Science Foundation under the Major Research Instrumentation (MRI) program that will significantly enhance the college's ability to fabricate complex micro-devices. RIT teamed with researchers from Alfred University and the State University of New York at Buffalo to win this grant.

The $400,000 will be used to develop a new method for silicon wafer processing that will help create microelectromechanical systems (MEMS) such as microscale mirrors, sensors and motors. The team will develop a multi-chamber and multifunction plasma system to allow for etching and surface modification of a wide range of materials for nanotechnology, MEMS and photonics applications.

Although conventional silicon processing uses standard four- and six-inch silicon wafers, many specialty materials come in different forms, such as smaller wafers, squares, or wafer fragments. Our goal is to develop the methodology for processing many different types of samples, in both form and substance, while minimizing cross-contamination issues between incompatible sets of materials. At present, no single tool is available commercially that has either the ability to meet all of the materials processing needs expected or the specialized wafer handling and plasma diagnostic capabilities to be added at RIT.

The broader impact of the developed instrument will result in an advanced facility capable of etching a wide range of material with greater control. This will impact the future design of etchers and other microfabrication tools. In addition, the new instrument will enable a group of researchers and their students at the four universities to investigate and fabricate innovative micro- and nano-scale devices, while providing cutting edge education and training for a whole generation of undergraduate and graduate students.

To learn more about the MRI program go to: http://www.nsf.gov/pubsys/ods/getpub.cfm?ods_key=nsf04511

News Flash!

The New York State Energy Research and Development Authority has granted $222,612 to the Kate Gleason College of Engineering for the development of a particulate trap to clean diesel, coal and gas engine emission.

Promotions

Congratulations to Dr. Andreas Savakis Department Head of Computer Engineering on his promotion to Full Professor.

Promoted to Associate Professor

Dr. Peter Bajorski (CQAS)
Dr. Stephen Boedo (ME)
Dr. Risa Robinson (ME)
Dr. Vincent Amuso (EE)
Dr. Michael Kuhl (ISE)

Introducing

Jacqueline Reynolds Mozrall, Ph.D.
B.S., Rochester Institute of Technology; M.S., North Carolina State University; Ph.D., SUNY at Buffalo – all in Industrial Engineering. Dr. Mozrall is Department Head and Associate Professor in Industrial and Systems Engineering. She has performed ergonomic training, job/workplace design, and product development functions in manufacturing and office environments for over ten years and is a Certified Professional Ergonomist. Dr. Mozrall has consulted for Dunlop Tire Company, Eastman Kodak-Carolina Eastman Division, MRC Bearings, Northwest Airlines, Scott Aviation, Jansport, Jantzen, Lee, Vanity Fair, and Wrangler. She also has published more than a dozen articles on ergonomic-related topics and has been active in professional societies related to ergonomics and human factors. Dr. Mozrall has a keen interest in undergraduate education, is active in the American Society of Engineering Education (ASEE), and serves as a program evaluator for the Accreditation Board for Engineering and Technology (ABET). She also plays a key role in the coordination of multi-disciplinary senior design for undergraduate engineering students as well as the Women in Engineering Center - WE@RIT.

Everyone's Favorite Professor Retiring

In 1968 RIT took two steps that would have a profound impact on the future Kate Gleason College of Engineering, even though the College of Engineering did not truly exist at that time. In that year, RIT moved from downtown Rochester to the newly constructed Henrietta campus and it hired Dr. Swaminathan Madhu to teach electrical engineering after three years at Rutgers. Dr. Madhu has served the College in many capacities such as Director of Graduate Programs, Associate Dean of Engineering, Acting Dean of Engineering, and Head of the Electrical Engineering Department. In addition to all of these positions, he has taught in every quarter of his time here earning the Eisenhart Award for Outstanding Teaching in 1993 and the ASEE Section Outstanding Teaching Award 1996. Dr. Madhu was instrumental in achieving full accreditation for the College's electrical engineering program and raising the reputation of KGCOE, nationally and internationally, for providing an outstanding engineering education.

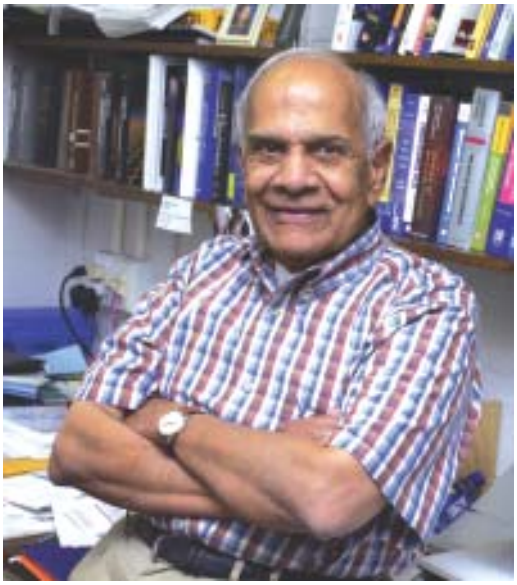


Photo courtesy of A. Sue Weisler / RIT

Dr. Madhu was well prepared for his duties at RIT with an M. A. in physics from the University of Madras and a bachelor's degree in electrical engineering from the Indian Institute of Science, both in India. He came to the United States in 1956 and earned his M.S. in electrical engineering from the University of Tennessee and his Ph. D. in EE at the University of Washington.

Dr. Bowman, EE department head has this to say about every student's favorite teacher:

"It is no mystery that the reputation and prestige of Electrical Engineering at RIT has paralleled this man's career. Since 1968 this department has grown in size and stature because of the absolute commitment and vision of the electrical engineering faculty - and Dr. Madhu is key among them. He is a great source of counsel for me and a wellspring of knowledge for students and colleagues alike.

Reading the tea leaves is an essential part of university life. Of course, the Swami's conclaves on Friday afternoons, where small groups of faculty and staff join to share the latest issues facing the department and world, (some of them serious, but most not) are now fully integral in forming the department's collective wisdom. (Swami is short for Swaminathan Madhu.)

If we are to continue to grow in prestige, we must carry on the examples of university commitment and work ethic established by Dr. Madhu."

Fortunately for all of us and for future students, Dr. Madhu will continue to teach one course per quarter for a while. Still, he'll have a bit more time to enjoy his family – his wife of 45 years, his three children and his nine grandchildren. In fact, after living 36 years in the same house in Brighton, he built a new house in Brockport, right next door to his second daughter!

Dr. Madhu has these thoughts to share with us, "RIT has been the perfect place for me. It is hard for me to imagine anywhere else I could have done all the things I did with such excitement and enjoyment."

Introducing

Mechanical Engineering
Lawrence Agbezuge
Visiting Associate Professor
BSME – Ghana/Imperial College, England;
MSME & Eng. Sc.D. – Columbia University

Industrial & Systems Engineering
Marcos Esterman
Assistant Professor
BS, MS Mechanical Engineering – Massachusetts Institute of Technology
Ph.D. Mechanical Engineering – Stanford University

EPA Awards $75,000 to Student Team for Solar Oven Design

A multidisciplinary senior design team won first place and a $75,000 award from the U.S. Environmental Protection Agency for its design of a low-cost, solar oven for use in developing countries in Latin America—their capstone project. The EPA's People, Prosperity and the Planet (P^3) Award recognizes "innovative solutions for an environmentally sustainable future." RIT's interdisciplinary student team was one of seven honored last month in Washington among 65 teams and 400 students.

From left: Wm. A. Wulf, president of the National Academy of Engineering. Students back row: Josh Bates, Carlos Plaz, Jonathan Steiner, Otman El Allam. Front row: Andres Carrano (advisor), Natasha Privorotskaya, Chris Wood, Emma Fulton, Timothy Oppelt, Acting Assistant Administrator for the EPA's office of Research and Development.

The use of solar ovens for cooking and water pasteurization can limit wood consumption, reducing deforestation of carbon sequestering trees, air pollution, and the health problems associated with unsafe water and long exposure to smoky fires, according to the RIT team, led by Emma Fulton, a fifth-year industrial and systems engineering major. The RIT-produced solar oven—constructed of glass, particleboard and reused offset printing plates—is designed to maximize the solar energy gain for a specific latitude/longitude while accommodating customer specifications in the region. Team members traveled twice to South America to gather information from potential users in rural areas as well as to investigate local materials and labor skill sets. It can be built at a cost of $32.33—about one-fourth the price of comparable commercially available solar ovens. Mass production economies of scale would further lower the cost.

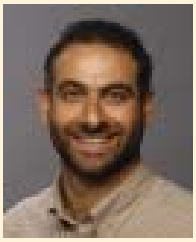
The EPA's P^3 Award, created last year, highlights "people, prosperity and the planet—the three pillars of sustainability," according to the agency. RIT students were recognized in the biology/life sciences category. Teams exhibited designs on the National Mall in Washington and were honored at the National Academy of Sciences, which created a panel to select winners, May 16-17. The awards were presented by William A. Wulf, President of the National Academy of Engineering.

The EPA provided selected universities with initial funding of $10,000 to pursue Phase I research and design ideas related to P^3 objectives. Rochester's "lack of sunshine" and relatively high average wind speed presented testing challenges, according to the RIT team members. The resulting work was the product of five undergraduate students participating in their multidisciplinary senior design project and two graduate students. They were guided by advisors, Andres Carrano and Brian Thorn, professors of industrial and systems engineering.

Jacquie Mozrall, Department Head of Industrial and Systems Engineering had this to say: "This was truly a multidisciplinary effort! The student team worked very well together, applying their complementary engineering knowledge to design, develop, fabricate, and test several outstanding prototypes in a short period of time. These students are an exceptional group of individuals."

Introducing New Faculty in Electrical Engineering

David Borkholder
Assistant Professor
BS Microelectronic Engineering – RIT
MS and Ph.D. Electrical Engineering – Stanford University



Eli Saber
Associate Professor
BS Electrical & Computer Engineering – State University of New York at Buffalo
MS and Ph.D. Electrical Engineering – University of Rochester

Edward Brown
Assistant Professor
BS Electrical Engineering – University of Pennsylvania
MS and Ph.D. Electrical Engineering – Vanderbilt University

Eric Peskin
Assistant Professor
BS Electrical Engineering – Princeton University
Ph.D. Computer Science – University of Utah

Engineering Students Aim High

They said it couldn't be done. They said the students were starting too late and didn't have adequate funding. They all said it was an impossible dream.

Fortunately, KGCOE students don't listen to the nay-sayers and they dream big. When the Defense Department announced a challenge grant to develop a fully autonomous vehicle, **Chris Armenio**, 3rd year CE, approached **Mark Baybutt**, 3rd year EE, about taking on the DARPA (Defense Advanced Research Projects Agency) grand challenge to build a fully autonomous vehicle that could traverse 175 miles of various and rugged terrain from Los Angles to Las Vegas and to do it by October 2005.

The G-cart Executive Board, from left to right: Josh Joseph, Greg Needel, Phil Gurbacki, Drew Stephens, Nathan Pendleton, Mark Baybutt, Chris Armenio. (absent: Tay Al Karim)

Chris and Mark pitched the idea to some faculty in Engineering, Computer Science and Engineering Technology in February 2004. **Ferat Sahin**, Assistant Professor EE/KGCOE and **Bill Leonard**, Assistant Professor MMET/CAST, agreed to serve as advisors. Mark and Chris formed an executive board with **Phillip Gurbacki**, 2nd year ME, **Josh Joseph**, 4th year ME, **Tay Al Karim**, 3rd year Computer Science, and **Grey Needel**, 3rd year ME Tech.

The team set their sights high and prepared for the completion of Phase One—wireless control of a full-size vehicle by—May 2004. Another student on campus donated a '91 Geo Storm to the group, and they worked very hard on it over winter/spring break last year-stripping the interior, adding actuators for controlled steering, gas, shifting and brakes. The computer in the car could communicate wirelessly and they were able to control everything from not only the passenger seat, but remotely as well.

At the end of spring quarter last year, G-CART@RIT successfully completed Phase One with their Geo Storm navigating RIT's roads and parking lots driverless.

Phase Two requires the students to enable the vehicle to follow a path defined by GPS points without obstacles. Eventually, the vehicle must navigate around obstacles as well. Phase Three means fully autonomous operation.

On March 11, 2005, the team submitted a video to DAPRA demonstrating the successful completion of Phase Two. A total of 195 teams submitted videos and out of them G-CART@RIT was selected as one of 115 that earned the right to a DARPA Site Visit. The team spent the next few months intensely working to prepare for inspection. Their hard work paid off on May 3 when the team welcomed the DARPA Inspectors and completed the three required runs with flying colors! The next hurdle for G-CART is to be selected as one of the top 40 teams to receive invitations to compete in the final qualifying rounds one week prior to the Grand Challenge in sunny California. Building on that success and with funding in place, the team fully expects to put RIT "on the map" with a winning performance in October '05!

Allen Casey

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partnered with Joe Straub and two other RIT graduates, Bill Liberto (’82) and Ron Mead (’81) to form a highly successful engineering company – M/E Engineering – in 1991. The company has experienced phenomenal growth in these few short years and now has 125 employees, including 24 RIT alums (see photo below), in offices in Rochester, Buffalo, Syracuse and Albany.

Several years ago M/E established a scholarship fund to honor RIT and show their appreciation of the great graduates the company hires. The M/E Engineering Scholarship is awarded to mechanical or electrical engineering students in the KGCOE or the College of Applied Science and Technology.

Al’s professional accomplishments, his appreciation for his education, and his commitment to RIT, and the larger community clearly demonstrate the best of RIT and we are delighted to honor Al Casey as the 2004 KGCOE Distinguished Alum of the Year.

The difference between theory and practice is that in theory there is no difference between theory and practice, but in practice there is.

Anonymous

BRICK CITY HOMECOMING

Thursday, Oct. 6 - Sunday, Oct. 9, 2005

In addition to all the other activities and entertainment of Brick City Homecoming, the Kate Gleason College of Engineering will present several lectures and host a college reception on Saturday morning, with other activities scheduled throughout the day.

Drs. Mustafa Abushagur and Alan Raisanen will highlight the recent advances in nanotechnology and the exciting possibilities for enhancing the quality of life through the development of microsystem-based products. Dr. Kevin Kochersberger will talk about his experience in the recreation of the Wright Brothers' flight at Kittyhawk.

Watch your mailbox for the *Brick City* brochure and make your plans to visit campus in October.

If you haven't been here in a while, you'll be delighted by all the changes and the beautiful landscaping surrounding the academic areas.

Call your friends and invite them to join you in the celebration! We'd love to see you all there!

RIT Alumni at M/E Engineering, P.C.

From left to right: 1st Row: John A. Dredger (BS ’93), William P. Liberto (BS ’82), Bernard C. Fischer (BS ’79), Allen G. Casey (BS ’73), James D. Pascarella (BS ’70); 2nd Row: Ronald C. Mead (BT ’81), Kerry A. Fikes (BS ’02), Charles T. Sidoti (BS ’86), Darren J. Pieters (BS ’02), Norman A. Johnson (BS ’89), Robert C. Zingo (BT ’84), Tracy L. Strong (BS ’01), Muchineripi M. Chirenje (AAS ’94), Craig E. Mott (BS ’04), James P. Chatelle (BT ’85), Jonathan R. Eastman (BS ’78); 3rd Row: Douglas A. Rose (BS ’97), Chad E. Fikes (BS ’97), Richard F. Gostling (BS ’01), David N. Wylie (BS ’91), Kristofer A. Johnson (BS ’01), James P. Barnum (BS ’00)
Not present in photograph: Calvin J. Puffer (BS ’76), Kurt P. Kubli (BT ’82)

Great Work by KGCOE Faculty

The Institute of Industrial Engineers awarded **Dr. Matthew Marshall**, **assistant professor of Industrial and Systems Engineering**, the faculty advisor award. Matt advises the RIT student chapter of IIE (Institute of Industrial Engineers) that won a silver award for planning and hosting a three-day regional conference, among other activities.

Dr. Mustafa Abushagur (Ph.D. Microsystems Engineering Program) was elected Fellow by the International Society for Optical Engineering (SPIE). Fellows are members of distinction who have made significant scientific and technical contributions in the fields of optics, photonics, and imaging. Mustafa joins a select group of 500 SPIE members who have been honored for their contributions to the discipline since the Society's inception in 1955.

Dr. Vinnie Gupta (ME) won ASEE's Spread the Word/ Campus Representative Award for the highest percentage of faculty recruited in the St. Lawrence Section.

The American Society for Quality named **John Hromi, professor emeritus, Quality & Applied Statistics**, an honorary member of the board of directors.

Dr. Vinny Amuso (EE) - Funding for the first Annual International Conference on Waveform Diversity and Design Outreach co-sponsored by IEEE that was held in Scotland in November 2004 —$50,000 from Air Force Research Laboratory.

Dr. Sergey Lyshevski (EE) - Development and Dissemination of a Sophomore Course in Nano-Science, Engineering and Technology - $99,000 from the National Science Foundation.

Dr. P.R. Mukund (EE) - Chip-Package Co-Design Methodology for Integrated RF Microsystems— $42,079 from the Semiconductor Research Corporation.

Dr. Satish Kandlikar (ME)- renewed a grant from IBM Corp. in conjunction with his selection as the IBM Faculty Award recipient for 2004.

KGCOE Students Distinguish Themselves

At the Society of Women Engineers (SWE) national conference, 13 members of RIT's student section proudly received the first place Outstanding Student Section (OSS) award for medium-sized sections. RIT won the first place OSS award for small-sized sections last year, but has since grown into the medium-sized (35-100 members) category. This award is based on the quality and level of programming as well as other accomplishments. Third-year students **Anna Murray** (ME and co-President of SWE) and **Pat Kelley** (CE) were on the team of five students from Region E who won the SME (subject matter expert) Bowl at the conference. The other students on the team were from Cornell, Virginia Tech, and New Jersey Institute of Technology. Students representing each of the ten SWE regions competed in this College Bowl-type competition. Each member of the winning team received $100 and Region E won $2,000, which is available to benefit students in our region.

Matt Sheppard, Mechanical Engineering, won first place in a 105-lap Modified Super Dirt Series race in Quebec last summer. Matt earned $6,000 for his team with a win in the quarter-mile, dirt-track race with the fastest qualifying speed at 103.7 mph.

Greg Laubisch, BS/MS '04 ISE and **Dr. Michael Kuhl** (ISE) , received a best paper award for "A Simulation Study of Dispatching Rules and Rework Strategies in Semiconductor Manufacturing" presented at the 2004 IEEE/SEMI Advanced Semiconductor Manufacturing Conference last spring in Boston.

In their first competition, the ISE student team of **Jason Kistner, Sarah Ballard, Joshua Dennie, and Emily Johnson** placed third in the 2003-2004 Material Handling Student Design Competition sponsored by the College-Industry Council on Material Handling Education and *Modern Materials Handling* magazine. They designed a facility and material handling system for Vital Vitamins, a vitamin and weight-management manufacturer and distributor. Historically this competition has included the best schools and students, including graduate students, in the country.

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provide connectedness across disciplines. For example, in one learning community, computer engineering students enrolled in the same sections of computer science, writing and literature, and calculus. Of the 15 learning communities created for freshmen institute wide, seven were based in the KGCOE. Although we will not know the full impact of this initiative until next fall, evidence suggests that students in the learning communities are half as likely to perform unsatisfactorily in their course work as those who are not in learning communities.

Possibly the most exciting among the student-centered initiatives this year has been the institute-wide focus on curricular reform, the goal being to create adequate flexibility to allow students to customize their educational programs to address personal goals and career aspirations. Career opportunities are becoming increasingly broad, and the breadth of interests of the typical RIT student has expanded dramatically in recent years. In response to student demand as well as the changing landscape of the marketplace, all undergraduate degree programs at RIT underwent review and modification this past year, with changes going into effect in September 2005. In every instance, the changes provide more student choice, easier transferability from one major to another, opportunities for minors and even double majors, and greater opportunity to take courses in other colleges. In the KGCOE, students will have more professional electives and three free electives with which to customize their program of study. While some students no doubt will pursue minors in disciplines such as a foreign language, business and public policy, still others are expressing interest in the newly constructed minors in each of the engineering disciplines; for example, a BS in mechanical engineering with a minor in electrical engineering. It will be a few years before we fully appreciate the impact of these changes, but it is already clear that the changes resonate well with both our current and prospective students.

All of these changes come at a most fitting time – as we close out our 175th anniversary year of celebration and embark on an exciting future. Stay tuned to hear more about how these new initiatives are meeting our goals.

Enginuity Contributors

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