



Fenn Focus

Center for Research in Electronic and Aerospace Technology

The Fenn College of Engineering and The NASA Glenn Research Center have established the Center for Research in Electronics and Aerospace Technology (CREATE).

The Center's mission is to create, sustain, and manage a world-class research program in aerospace electric applications. Applied scientists and engineers from Cleveland State, the NASA Glenn Research Center, and the aerospace industry will research and develop new aerospace electric technologies and improve existing technologies, using cutting edge discoveries from a broad range of other disciplines. In addition, the Center will assist in changing engineering curricula to develop a workforce to support this mission. Technology developed through CREATE activities will be transferred through the Industrial Technology Institute (ITI) to the private sector, stimulating regional economic growth and helping to retain Ohio's technology expertise.

Charles K. Alexander, Ph.D., dean of engineering and professor of Electrical Engineering, will serve as the director of CREATE. Paul Bellini, Ph.D., associate dean of engineering, will initially serve as the associate director. Dan Simon, Ph.D., assistant professor of Electrical Engineering, and Majid Rashidi, Ph.D., associate professor of Mechanical Engineering, will both serve as engineering coordinators and researchers.

The Center will increase communication and collaboration among aerospace industry technical personnel, university



(left to right), Joanne Hundt, Administrative Coordinator, ITI; Brian Fast, graduate student; (standing behind), Dean Charles Alexander; and Mike Drozda, graduate student

faculty, and NASA scientists and engineers.

A ten member Technical Advisory Board will guide the Center's research direction with a roadmap to focus efforts on new technology. In order to increase competitive grant, cooperative agreement, and contract funding for the research and development of new aerospace technologies over the next two years, the Center will:

- 1) Identify regional resources within the aerospace industry, NASA Glenn Research Center and Cleveland State that can be used to pursue the development of more aerospace electric technologies;
- 2) Create any additional state-of-the-art technical facilities needed to support the Center's research and development activities;
- 3) Conduct collaborative research on industry-identified problems to strengthen working relationships and;
- 4) Seek additional funding.

To develop a regional workforce with the skills and expertise necessary to support the aerospace industry's needs, the Center will offer short courses, seminars, and hands-on workshops in new and emerging technologies and techniques at industry locations. Certificate programs, and masters and doctoral level degrees with curricula to enhance the necessary skills and knowledge, will be offered by Cleveland State. To increase the number of new graduates, Cleveland State will: orient high school students and engi-

neering undergraduates about the potential career opportunities in the aerospace electric industry, offer degree programs that emphasize skills and knowledge needed to pursue careers in the electric power industry, and provide both undergraduate and graduate students with opportunities for hands-on work on applied research projects in electric aerospace technology.

The Center's technological focus will be in the areas of rotating machines — both generators and motors — intelligent and

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*PPG
Donates
Glass Patents*

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Dear Alumni and Friends,



Charles K. Alexander,
Ph.D., P.E.

In the spring of 2003, I unveiled my vision.

The Fenn College of Engineering at Cleveland State University will be one of the very best at undergraduate engineering education in the nation, with our graduate programs playing an integral role.

I believe my vision is still in place and expanding. My goal for the College is to create an exciting working and learning environment. I want this to be one of the finest engineering schools of the 21st century.

The undergraduate programs right now are moving in a very positive direction relative to meeting the Accreditation Board for Engineering and Technology's (ABET) Engineering Criteria 2000 (EC 2000).

The basic structure of the program

will be evaluated after the Fall 2004 ABET visit, and appropriate changes will occur then. We really do want to have our undergraduate curricula meet the long term goals of EC 2000.

In the spring of 2003, a freshman design course was developed by Joanne Belovich, Ph.D., associate dean and associate professor of chemical engineering, and a group of faculty and staff from the College. In this course we introduced students to the mathematics, the elements of problem-solving, and the design skills needed to be an engineer. Students not only became aware of what engineering is about, but also that it is a lot of fun. Previously, design courses were not taught until the junior or senior year and we managed to keep the fun part a secret until the senior year. Student feedback on the course and results were outstanding! We are currently offering the course to 120 students during the fall semester.

In order to be more effective with graduate level education, I recommend that the departments consider restructuring the M.S. and doctoral programs to incorporate

two basic levels of courses: first will be fundamental courses which are the foundations of our different research areas, and then advanced courses that will be structured around the state-of-the-art research being done by the faculty member teaching the course.

Both the graduate and undergraduate programs have begun integrating educational modules designed to develop and to enhance the reading, writing, listening, and speaking skills of engineers. Cleveland State is one of the few schools in the country that has done this. All Fenn graduates will have highly developed communication skills and a well-honed ability to solve problems.

The Fenn College of Engineering will be the first college in the country to incorporate the integrated design environment with knowledge capture into the coursework and graduate requirements. This will be an exciting adjunct to our being a leader in engineering education in the 21st century.

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Center for Research

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autonomous systems, diagnostic and prognostic health monitoring, and modular power components.

Currently, CREATE is supporting four projects:

- NASA/National Composite Center (NCC)/CREATE Litecast™ Development Program
- Building a Distributed, Fault-Tolerant and Modular Space Power System
- Multi-Purpose Active Magnetic Bearing Test Rig
- Integrated Design Environment

The NASA/National Composite Center (NCC)/CREATE Litecast™ Development Program has three goals:

- 1) To demonstrate that composite material with Litecast™ end fittings will meet requirements to perform in low earth orbit
- 2) To relocate and install the casting machine to an NCC-licensed partner, and
- 3) To develop other composite materials (carbon, carbon/glass, braid constructions) mated to other metals (steel, titanium, etc.) for Litecast™ applications.

A team of researchers and engineers from NASA Glenn Research Center, Cleveland State, and Core Technology, Inc. will develop and build a new space power system with a modular architecture that is distributed and fault-tolerant. Digital control and communication will be spread throughout the system, making optimum use of the design in terms of reliability, fault tolerance, and reconfigurability. Consequently, in the event of a fault or failure of one part of the power system, another module will be able to take over control, minimizing any effect on the power system. The first objective is to develop the technologies needed to design and build a prototype research test bed of this new power system and its associated distributed control. The second objective will be to actually build a research test bed for evaluating this new space power system architecture.

The development of the concept and the preliminary design of a multi-purpose active magnetic bearing (AMB) test rig for evaluation of certain flywheel components under operating conditions close to those occurring in flywheel (e.g., rotational

speed, rotor-bearings configuration, vacuum) is the third project. The results generated from the rig will be used to develop software simulation tools to analyze and optimize a variety of different flywheel system component designs, and to predict their life, reliability, and rotordynamic effects, including the rotor behavior in a case of AMB power loss.

The integrated design environment with knowledge capture involves the development of a software platform with related applications that will capture and track an engineer's computer work on projects. Cleveland State students in the undergraduate and graduate programs will assist in the design and testing, and will ultimately be the first users.

The timeline for this initial series of projects is two years. These projects will have ongoing activities that will be supported in future years, depending upon the availability of funds. Additional projects such as beamed power, led by Taysir Nayfeh, Ph.D., professor of Industrial and Manufacturing Engineering (IME), are being developed. ■

Scholarship Awards and Recipients for the 2003-2004 Academic Year

Abuja Endowed Scholarship Fund

Anwar Sadath, *Industrial Engineering*
(spring 2003)

Shasikanth Malepeddi, *Industrial Engineering* (spring 2003)

Alcoa Foundation Scholarship

Donald Ahrens, *Electrical Engineering*
Maryanne Stasko, *Mechanical Engineering*

American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Gardiner Family Foundation Scholarship

John Halley, *Mechanical Engineering*
Andrew Somrack, *Mechanical Engineering*
Greg Kachka, *Mechanical Engineering*
Debra Shorf, *Mechanical Engineering*

Frank J. Ambrose Engineering Scholarship

Michael Antos, *Industrial Engineering*
Jacob Berger, *Civil Engineering*
Jason Bretmersky, *Chemical Engineering*
Simon Matlak, *Computer Engineering*
Joseph Rymut, *Electrical Engineering*
Megan Schwind, *Industrial Engineering*
Eric Skrout, *Electrical Engineering*

Albert Branham Scholarship

Joshua Burks, *Civil Engineering*

Alen B. Curtis Scholarship

Nichelle Davis, *Chemical Engineering*

ASM International Scholarship

Nicholas Reba, *Chemical Engineering*

Avery Dennison Scholarship

Antsahoby Randrianasolo,
Industrial Engineering

Calvin B. Dalton Memorial Fund Funded by URS Consultants, Inc.

Heather Hlasko, *Civil Engineering*
Maryanne Stasko, *Mechanical Engineering*

Engineering Alumni Scholarship

David Cottrell, *Electrical Engineering*
Denny Matheou, *Civil Engineering*
Elizabeth Mazzei, *Electrical Engineering*

Engineering Dean's Scholarship

James Bartlett, *Electrical Engineering*
William DeGreave, *Mechanical Engineering*
David Keber, *Computer Engineering*
Joshua Kompa, *Mechanical Engineering*

Amanda Murphy, *Industrial Engineering*
Kristen Obush, *Civil Engineering*
Nicholas Reba, *Chemical Engineering*
Chris Sabo, *Mechanical Engineering*
James Strieter, *Electrical Engineering*
Adam Wroblewski, *Mechanical Engineering*
Kyle Zimmer, *Civil Engineering*

Engineering Merit Award

Richard Baxendale, *Mechanical Engineering*
James Blackwell, *Electrical Engineering*
Heather Hlasko, *Civil Engineering*
Jason Pappas, *Computer Engineering*

Environmental Scholarship Funded by The Ohio Academy of Science

Rikako Demko, *Chemical Engineering*

HNTB Corporation Scholarship

Lontia Durham, *Civil Engineering*
Rasheed Warith, *Civil Engineering*

Lubrizol Corporation Scholarship

John Falbo, *Chemical Engineering*
Lisa McFadden, *Chemical Engineering*

National Electrical Contractors Association Scholarship

Dragos Dinca, *Electrical Engineering*

NASA Minority Engineering Scholarship

Keith Blackwell, *Electrical Engineering*
Brandy Hammond, *Computer Engineering*
Telly Smith, *Computer Engineering*
William Wilder, *Computer Engineering*

Albert Ross Memorial Scholarship

Heather Hlasko, *Civil Engineering*

Ohio Space Grant

Undergraduate Scholarships
Rikako Demko, *Chemical Engineering*
Alexandru Negrea, *Industrial Engineering*
Donald Pultz, Jr., *Chemical Engineering*
Joel Warren, *Mechanical Engineering*

Parker Hannifin Scholarship

Antsahoby Randrianasolo,
Industrial Engineering
Anne Yanke, *Mechanical Engineering*

Presidential Scholarship

Marzena Buzanowska,
Industrial Engineering
Heather Dichtl, *Electrical Engineering*
Kyle Jenkins, *Civil Engineering*
Steven Long, *Electrical Engineering*
Gary Meacher, *Electrical Engineering*
Ryan Smalley, *Civil Engineering*

Provost Scholarship

Thomas Dewitte, *Electrical Engineering*
Eric Dolence, *Chemical Engineering*
Thomas Kotula, *Mechanical Engineering*
Grace Luginbuhl, *Chemical Engineering*
Paul Weisheit, *Mechanical Engineering*
Michael Wendolowski,
Chemical Engineering

Raymond L. Knight Engineering Scholarship Funded by Ralph Tyler Companies

Telly Smith, *Electrical Engineering*

Silent Hoist & Crane Materials Handling Prize Award

Michael Kasbek, *Chemical Engineering*
Joel Warren, *Mechanical Engineering*

Charles Stilwell Cooperative Educa- tion Scholarships

Michael Kasbek, *Chemical Engineering*
Anne Yanke, *Mechanical Engineering*

Wade Trim Civil Engineering Scholarship

Joshua Burks, *Civil Engineering*

Washington Group International Scholarship

Rikako Demko, *Chemical Engineering*
Daniel Burkart, *Mechanical Engineering*
Eric Mack, *Civil Engineering*
Donald Pultz, *Chemical Engineering* ■

PPG Patents Bolster Glass Technology Research

Imagine pulling glass fiber so fine that 30 miles of it would comprise just one agate or cat's eye marble. Imagine, in one hour, pulling enough glass fiber — finer than a single human hair — to circle the globe 10 times without breaking.

That's the caliber of world-class research going on at Cleveland State's Center for Glass Forming Technology. It's research that's making a strong impact on Ohio's economy and glass industry, which provides jobs for over 10,000 highly trained employees and contributes over \$7 billion in sales annually.

Cleveland State's Center for Glass Forming Technology, housed in the Industrial Technology Institute on East 23rd Street, is presently supported by five industry partners — PPG Industries Inc., Johns Manville, Schott Glass, U.S. Borax Inc. and Anchor Hocking. Together, the five companies and Cleveland State comprise the High Performance Glass Forming Technology Consortium. For the past two years, its primary focus has been on the science and technology involved in the formation of products from molten glass — specifically, the drawing of high quality continuous glass fiber.

This University/industry-driven center is unique in the glass world with its strategy of providing industrially representative glass processing platforms directed at immediate process improvement, as well as the development of new glass processes and products that create critically needed jobs and business health.

Besides the development of new technology drawing on its staff of Simon Rekhson, Ph.D., James Leonard, Ph.D. as well as faculty members from the Fenn College of Engineering, the Center's research activities afford a rare opportunity for graduate and undergraduate students to get involved in leading-edge research and to experience the excitement of seeing their efforts applied in the real world.

"Traditionally, the science of glass and the production of glass products have lived in two separate worlds. We've brought them together at Cleveland State," says Dr. Rekhson, the center's chief scientist.



Dr. Phillip Sanger, Director High-Performance Glass Forming Technology; Uma Sistu, graduate student; Joanne Hundt, Administrative Coordinator; Dr. Simon Rekhson, Chief Scientist, High-Performance Glass Forming Technology; Dr. James Leonard, Glass Research Scientist, Rudy Began, CAMP consultant, Rick Bartel, undergraduate student.

Dr. Rekhson is a world-renowned expert in glass forming technology and former chief scientist for glass technology at General Electric Lighting.

Last year, the Center's work went into high gear when, in collaboration with its industry partners and CAMP Inc., it received nearly \$1 million from the U.S. Department of Energy to demonstrate energy efficient technology to improve the performance and yield of continuous glass fiber drawing. The funding was the third highest among 14 projects selected from more than 135 proposals submitted to the DOE. Among the Center's goals for the project are reduction of breakage frequency on the fiber-drawing machine from the present state-of-the-art one break per hour to one break per four hours, reduction of unit production cost by at least 20 percent, and reduction of fiber diameter variation by 30 percent.

"The drawing of glass fibers is a rather dramatic process," explains Dr. Rekhson. In industry, giant furnaces may feed hundreds of glass forming machines, each with 5,000 or more holes through which molten glass, thicker than honey, flows very slowly into strands. As the pulling speed increases to 100 miles per hour, the molten glass changes shape and is stretched very thin — thinner than a human hair.

"Industry produces glass fibers of tremendous length — in one hour, enough to go around the globe 10 times," says Dr. Rekhson. "If one strand breaks, the

process stops. Breakage is a universal and costly problem in the glass industry."

Developing a process to reduce or eliminate breakage of glass fibers is the challenge that the Cleveland State Center has been tackling with a vengeance. Central to the project is a glass fiber drawing tower similar to those found in industry, only smaller.

"It's an actual production machine where we melt glass at 2,500 degrees Fahrenheit and experiment with the forming of glass fibers. The processes that we develop for reducing or eliminating breakage will raise the level of productivity in the glass industry," says Phillip Sanger, Ph.D., executive director of the consortium. "Our consortium partners are very anxious to apply the knowledge we're developing."

Glass fibers are most often used to make plastic and to reinforce polymers for the marine, construction and transportation industries. Boat hulls, automobile fenders and windmill propellers are just some of the products made with glass fibers.

This summer, PPG Industries Inc. awarded the University unique glass melting and refining technology worth an estimated \$5.8 million in intellectual property and patent rights. The portfolio of domestic and international patents is the largest gift of its kind in the University's history and raises Cleveland State to a new plateau in the glass technology world.

"Cleveland State is working with the best glass-producing companies in the world to improve their processes," says

Dr. Sanger. “The PPG patents will allow us to expand what we’ve been doing and position the University to take a central role in advancing glass technology. It’s a tremendous challenge and one that we welcome.”

The patents apply to PPG’s highly regarded “P10” process. This technology, developed over the past two decades, has demonstrated superior, energy-efficient glass processing and can be applied to all glass products, including glass fiber, containers and tableware. Innovative technologies ranging from rotary kiln material preparation and ablative melting to vacuum refining can have impact in a wide range of products and processes beyond the glass industry.

“Glass companies are clamoring for more energy- and cost-efficient ways of doing business,” says Dr. Rekhson. In fact, the U.S. Department of Energy and the glass industry recently launched three research programs related to developing glass-melting technologies that promise dramatic reduction in energy consumption. But there are concerns about the quality of such glass.

“The PPG’s P10 donation opens the door for us to quickly contribute to the national program with ‘fast-follow’ development efforts to refine and condition the glass,” says Dr. Sanger.

“We believe the collaboration between industry and academia plays a vital role in advancing technology and its application. We’re delighted to be able to contribute to the University’s glass technology skill center and look forward to supporting Cleveland State in the commercialization of this technology,” says PPG’s Andrew Calabrese, director of research and development.

“Capitalizing and commercializing existing patents fits perfectly with the prime focus of our Industrial Technology Institute, created to strengthen the University’s role in stimulating jobs and economic growth for Northeast Ohio,” adds President Michael Schwartz.

According to Michael Greenman, executive director of the Glass Manufacturing Industry Council, the PPG patents “fit perfectly with glass industry and U.S. Department of Energy initiatives to revive the industry. We expect components of the P10 process, now available through Cleveland State to the broader marketplace for



the first time, to contribute significantly to efforts to bring further efficiencies to the melting of glass, to increase overall performance, and to facilitate the introduction of innovative new products.”

“We applaud PPG’s willingness to make these tools available and encourage other companies to consider similar contributions to the overall benefit of an industry facing serious challenges from alternative materials, increasing imports and a resulting profit squeeze,” he adds.

“PPG’s extraordinary gift brings Cleveland State University closer to its goal of being the premier glass research institute in the nation and the world. We look forward to continuing our leadership role in this high technology area and in announcing major accomplishments in this area of highly complex technology,” says Dr. Sanger. ■

*Reprinted from Perspective Magazine
Fall 2003/Winter 2004 Issue*

Research AT FENN

Joanne M. Belovich, Ph.D.

Associate Professor of Chemical and Biomedical Engineering
Associate Dean of Academic Affairs

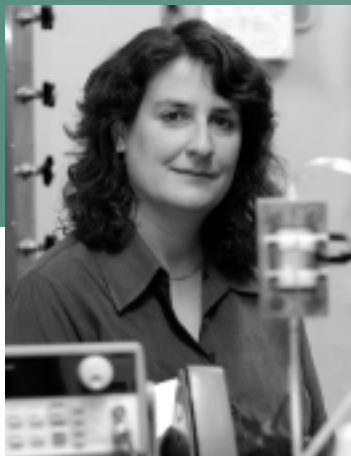
After completing her doctorate in Chemical Engineering at the University of Michigan, Joanne Belovich, Ph.D., began her career at Cleveland State University in 1991 as an assistant professor in the Chemical Engineering Department. She was honored with the Chemical Engineering Faculty Member of the Year Award in 1992.

In 1997, Dr. Belovich became an associate professor of Chemical and Biomedical Engineering, a position she continues to hold. In addition, Dr. Belovich became the associate dean for Academic Affairs in 1999. Dividing her time amongst her administrative, research and teaching roles at the Fenn College of Engineering is

“challenging but rewarding,” says Dr. Belovich. She received the University Award for Administrative Faculty in 2002.

Dr. Belovich started a major and ongoing effort to recruit undergraduate students. She has worked to improve the quality of the engineering education for current and future students of Fenn College of Engineering. Dr. Belovich is leading the college’s preparations for the Accreditation Board for Engineering and Technology (ABET) accreditation process, using the Engineering Criteria 2000 (EC 2000).

With faculty, Dr. Belovich updates the



Joanne M. Belovich, Ph.D.

course content in engineering science core courses when the needs and tools available change. She also assisted with a new course in Engineering Design in which freshmen solve engineering design problems using mathematics, primarily hands-on skills, and problem-solving skills. Previously, design courses were not taught until the junior level.

Dr. Belovich assisted with setting up partnerships and works to continue these partnerships formed with The Cleveland Clinic Foundation, Chung Young Christian University, Ohio universities in the World-Class Manufacturing Consortium, Youngstown State University and local community colleges.

Undergraduate courses taught by Dr. Belovich include: Chemical Engineering

Orhan Talu, Ph.D.

Professor and Chair
Department of Chemical and Biomedical Engineering



- ◆ Led the establishment and serves as the Director of Applied Biomedical Engineering a joint doctoral program with The Cleveland Clinic Foundation involving 25 students.
- ◆ Internationally recognized researcher in the areas of Thermodynamics of Adsorption, Experimental Methods, Molecular Simulations, Separation Processes.
- ◆ Research interest in adsorptive gas storage, which is of vital industrial interest due to current interest in both natural gas vehicles and hydrogen for fuel-cell vehicles.
- ◆ Conference Chair of the Eighth International Conference on Fundamentals of Adsorption.
- ◆ Chairperson for 13 symposia at national/international conferences.
- ◆ Has 45 papers published in peer-reviewed journals, presented over 70 conference papers, edited three books, received more than \$ 2,000,000 in grants since 1998, and has four patents:
 - Orhan Talu, "Gas Separation Process," U.S. Patent 5,160,512 (1992);
 - Orhan Talu, "Gas Storage Process," U.S. Patent 5,47,971 (1993);
 - Pieter J. von Herrmann and Orhan Talu, "Utilization Systems for Gaseous Fuel Powered Vehicles," U.S. Patent 5,323,752 (1994);
 - Steven M. Kuznicki and Orhan Talu, "Air Separation Process," World Patent 9615842 (1996).
- ◆ Lead Principal Investigator at Cleveland State University for the Power Partnership for Ohio (a consortium of companies and universities to further fuel-cell technology in Ohio) which just received \$18 million from the State of Ohio as one of the two newly established Wright Centers of Innovation.

Engineering Professors and Their Research: Making an Impact in the Community

Principles, Process Control, and Bioprocess Engineering. Dr. Belovich has also taught the following graduate courses: Biochemical Engineering, and Artificial Organ/Pancreas Design.

Currently, Belovich is working in the following research areas: bioprocess systems design, biofilm growth on carriers, liver mathematical models, and transport properties of biocompatible membranes.

Mammalian cells are used for drugs and tissue for organ replacement. Because mammalian cells are small and fragile, processing the cells is difficult, often resulting in damage or loss. This is especially true at high cell concentrations. Dr. Belovich is working with Donald Feke, Ph.D., of Case Western Reserve University, on bioprocess designs that use applications of acoustic fields. The team developed a method to

separate populations of cells by size and acoustic properties. Another method, using a highly porous polyester mesh, was studied and proven effective for cell collection and retention.

Since industrial wastewater treatment often uses biofilm growth on carriers to break down pollutants, Dr. Belovich and her research group are studying several carriers to relate biofilm growth to surface properties. Carriers with promising properties are then evaluated in a scaled-up system.

The Center for Modeling Integrated Metabolic Systems, funded by the National Institute of Health (NIH), is a joint research project led by Case Western Reserve University and Cleveland State University. Jorge E. Gatica, Ph.D., associate professor in the Chemical and Biomedical

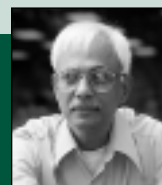
Engineering Department, and Belovich are the directors at Cleveland State. Belovich's research team is developing a comprehensive mathematical model of metabolism and transport in the human liver.

Along with Brian Davis, Ph.D., at The Cleveland Clinic Foundation's Lerner Research Institute, Dr. Belovich is studying the transport properties of hyaluronic acid membranes, which have potential use as biocompatible coating for implantable sensors.

Belovich is professionally affiliated with the American Institute of Chemical Engineers, the American Chemical Society, and the American Society for Engineering Education. ■

Surrendra N. Tewari, Ph.D.

*Professor
Department of Chemical Engineering*



- ◆ **Recognized researcher in the areas of Solidification Processing of Materials, Development of Advanced Materials, Processing-Microstructure-Properties Correlation.**
- ◆ **A research project with BF GOODRICH led to development of high thermal conductivity metal-matrix composites for electronic substrate applications.**
- ◆ **A novel non-destructive-evaluation technique to monitor the health of environmental barrier coatings in-situ for advanced gas turbine engine applications has been developed under HONEYWELL-AIRFORCE-Department of Energy sponsorships.**
- ◆ **A state-of-the-art materials science laboratory has been established at Cleveland State with strong and continued support from NASA-Glenn Research Center.**
- ◆ **Co-Principal Investigator on two future space flight experiments with faculty from Iowa State University and the University of Arizona. These projects, supported by NASA-Marshall Space Flight Center, are aimed at understanding the role of convection on development of cellular and dendritic morphologies during directional solidification. The research associated with these projects has led to improved understanding of microstructural development and defect formation during casting.**
- ◆ **Awarded the "Distinguished Faculty Award for Research" at Cleveland State University (1994), was finalist in the "Northern Ohio Live" Award of Achievement (2000), and has been awarded the Metallurgical Society's Champion H. Mathewson Award for the best paper in Materials and Metallurgical Transactions, 2003.**
- ◆ **Dr. Tewari has 126 publications in peer-reviewed journals. He has brought \$10.7 million worth of sponsored research grants to Cleveland State since 1986.**

A look at our past...

Fenn 80th Celebration

Fenn College of Engineering celebrated its 80th anniversary with a program in Stilwell Hall that showcased the College's achievements and milestones on Saturday, June 7.

Three special alumni were honored. Lawrence Cawley, BME '57, retired chairman of the Kaydon Corporation, received the Dean's Distinguished Alumni Award. Ronald Ledin, BME '68, chairman and chief executive officer of Middough Consulting Inc., received the Outstanding Alumni Award from the Fenn College of Engineering Alumni Organization. William Roberts, BA '69, chief executive officer of PlusPharma Inc. of Vista, California, received his diploma. Roberts attended Cleveland State during the 1960s, majoring in chemistry, switching to

chemical engineering, and then switching back to chemistry. For more than 30 years, he thought he had not earned a degree. A check of his records, however, showed that he had earned a degree in chemistry. He donned cap and gown to officially receive his diploma from President Michael Schwartz.

The 80th anniversary celebration also included the dedication of an Alumni Wall of Fame in Stilwell Hall. The wall honors 27 recipients of the Outstanding Engineering Alumni Award, presented by the Engineering Alumni Organization since 1980.

Fourteen labs were open during the event, allowing alumni to see what is happening at the College today.

That same weekend, nostalgia filled the



air as Fenn College graduates returned to campus for a Spring Reunion Celebration. Members of the Classes of '33, '38, '43, '48, '53, '58 and '63 celebrated their 70th, 65th, 60th, 55th, 50th, 45th and 40th class reunions with a variety of activities, including a reception with President and

An Early Beginnings Timeline

- 1881 — Evening classes offered by Young Men's Christian Association (YMCA)
- 1890 — Mechanical drawing class introduced
- 1898 — Steam Engineering included in curriculum
- 1906 — September – Department of Mechanical Engineering part of new Day School
- 1909 — The Technical School is one of four Day School programs offered by the YMCA
- 1910 — April – First request of the Educational Department by the Hill-Clutch Company to arrange for a cooperative [education] plan for young mechanics to receive their practical training during the day in the commercial shop at the company and theory in class at night. The apprenticeship cooperative plan was held that year and sponsored by the Cleveland Twist Drill Company, The Hill-Clutch Company, the Cleveland Foundry Company and the Peerless Motor Car Company.
- 1917 — May – Sereno Peck Fenn's 25-year term as president of the YMCA ends
- 1920 — New Machine Shop School opens at Chester Avenue and East 23rd
- 1921 — March – Board of Governors changes name of Educational Branch of the Cleveland YMCA to "The Cleveland School of Technology"
- 1923 — First college credit day classes established
- 1921-1927 — Day Cooperative Engineering program organized



Mrs. Michael Schwartz, a cruise on the Goodtime III, a dinner hosted by the Class of '63, campus tours, and a reunion brunch in Mather Mansion.

While many Fenn alumni still live in the Cleveland area, Edwin Stone traveled to Reunion Weekend from his home in Seattle, Washington. After receiving an engineering degree in '53, he went on to earn a law degree from Cleveland-Marshall College of Law in 1958.

All alumni received commemorative gifts and class directories filled with old and new information about classmates, and members of the Classes of '43 and '53 received specially created gold medallions. ■



Focus on FACULTY

Taysir Nayfeh, Ph.D.

After obtaining his B.S. in physics and engineering mechanics in 1979, Taysir Nayfeh worked for Schlumberger Well Services, a multinational oil field services company, for ten years in various capacities. He credits this experience for his approach to engineering today.

According to Nayfeh, engineers need to work as a team and to communicate, exchanging ideas to develop innovative solutions. As a manager at Schlumberger, Nayfeh often combined the expertise of workers in different areas to produce innovative solutions to engineering problems.

A proponent of innovative versus repetitive thinking, Nayfeh stresses originality and creativity with his students.

Dr. Nayfeh came to Cleveland State University after completing his doctorate in Industrial and Manufacturing Systems in 1993 at Virginia Polytechnic and State University. He is an associate professor and the director of the Industrial Automation Laboratories. Dr. Nayfeh is also the deputy director and chief technical officer of the Industrial Technology Institute (ITI) at Cleveland State.

In order to prepare the technical staff for accomplishing the ITI goal of moving intellectual property (IP) from research to commercial products, Dr. Nayfeh is guiding a twofold process. The first is the development of manufacturing processes that will be needed in the commercialization effort. The second is the development of the techniques to commercialize IP.

The Institute is focusing on developing core expertise as follows:

- 1) Manufacturing Technologies
 - Advanced materials and composites for commercial and aerospace applications
 - Application of fuel cell technologies



Taysir Nayfeh, Ph.D.

- Manufacturing technologies for micro injection molding fabrication
- Thin film Technology for Power, Sensors, and Actuators
- 2) Control Systems
 - Industrial process control
 - Sensors and actuators
 - Software engineering for automation and imbedded control
 - Wireless factory and laboratory control

Through these research efforts, the Institute will seek to develop products and to disseminate expertise in the new manufacturing processes and control systems that are relevant to the production of technology-based products, including biomedical instruments and nano/micro fabrication. In addition, the Institute will seek to mine some of the technology currently under development at NASA Glenn Research Center (NASA-GRC), other national labs, and the Fenn College of Engineering, for products and processes that can be commercialized locally.

Dr. Nayfeh is also the principal investigator for a beamed space power and

propulsion system, which will be developed through the Center for Research in Electrical and Aerospace Technology (CRE-ATE) at Cleveland State.

To date, space exploration and utilization for commercial and military uses has been somewhat limited. This is due in part to the current high cost of placing satellites in orbit and to the heavy infrastructure required for electrical energy generation and storage for continued operation while in orbit. In general, a large part of the cost can be attributed to the large amount of fuel needed to launch a satellite into orbit or to ferry it to a Low Earth Orbit (LEO) aboard the space shuttle. As such, it is imperative that a low cost satellite launching

and energy generating system be developed in order to make space exploration and commercialization cost effective.

Dr. Nayfeh, along with program manager and doctoral candidate Brian Fast, are proposing a novel system for high intensity laser power beaming and energy conversion for use by satellites and other space vehicles including high-flying aircraft. The proposed system will deliver sufficient power to be used for the operation and/or main/supplementary propulsion energy.

A sequence of two Nano-Satellites from the space shuttle will be deployed to test the first two phases of the program. Finally, in phase three, a Shuttle Scout satellite will be deployed to demonstrate the overall utility of the beamed power and propulsion system and to provide a much needed, non-contact, in-space inspection system. ■

Distinguished Alumni Awards Program Honors Jack Crow and Ken Hall

A capacity audience filled Windows on the River in the Flats for the University's 13th-annual Distinguished Alumni Awards ceremony. Five outstanding graduates were honored

for their service, leadership and career achievements including Fenn College of Engineering Alumni Jack Crow, Ph.D., '62 and Kenwood Hall, '74.

"In honoring the career achievements and community service of our award winners, we focus the spotlight on the impact that Cleveland State University and Fenn College graduates have had on the quality of life in Northeast Ohio and around the world," said President Michael Schwartz.

An accomplished physicist and a pioneer in the field of magnetics, Jack E.

Crow, Ph.D., received the Special Achievement Award. He holds a bachelor of engineering science degree, magna cum laude, from the Fenn College of Engineering and a Ph.D. in physics from the University of Rochester. The day of the awards banquet, he delivered a special lecture to faculty and others.

Dr. Crow led the efforts that brought the National High Magnetic Field Laboratory (NHMFL) to Florida State University from MIT. He has served as director since 1992.

Funded by the National Science Foundation and the state of Florida, the NHMFL is a user laboratory that provides state-of-the-art facilities for magnet-related research in all areas of science and engineering. It is one of nine such labs in the world and the only one in the Western Hemisphere.

Kenwood H. Hall received the George B. Davis Award for Service to the University.

Hall holds a bachelor's degree in electrical engineering from the Fenn College of Engineering and has been a member of the College's Visiting Committee since 1996, serving as chairman since 1999.

Hall has been very involved in the development of Fenn's computer engineering program and instrumental in securing much-needed equipment and software donations, valued at over \$300,000, for the College. He also has provided counsel and assistance on many fronts, including

student recruitment strategies, a strategic plan and key partnerships.

Hall has worked for more than 25 years in engineering and engineering management for Keithley Instruments, Picker International Inc., Firestone Tire and Rubber, Allen-Bradley and Rockwell Automation, where he is vice president of architecture and systems advanced technology. ■



Jack Crow, Ph.D.



Ken Hall

Renowned Scientist and Distinguished Alumnus Presents Lecture

Jack E. Crow, Ph.D., physicist, director of the National High Magnetic Field Laboratory at Florida State University, and one of Cleveland State University's 2003 Distinguished Alumni Award recipients, presented a guest lecture on "High Magnetic Field Research and Technology: From Quantum Wells to Floating Frogs" on June 30 in Compton Lounge in the Fenn College of Engineering.

Following the lecture, audience members participated in a discussion of current trends and uses of magnet-related research in science and technology.

The National High Magnetic Field Laboratory (NHMFL) is one of nine such labs in the world and the only lab of its kind in the Western Hemisphere. A pioneer in the field of magnetics, Crow led the efforts that brought the NHMFL to Florida State and has served as director since 1992.

NHMFL supports research in all areas of science and engineering and has established a magnet science and technology program which is driving advancements in magnet technology and magnet materials for a variety of application areas. The laboratory is supported by the National Science Foundation and the state of Florida and is charged to develop and maintain advanced instrumentation and infrastructure in support of magnet-related research and technology.

Crow's presentation included an overview of facilities and capacity, along with a discussion of areas where magnetic fields have impacted science. Notable examples of impact on science include the awarding of Nobel prizes in 1985 and 1998 for the discovery and theoretical understanding of the quantum hall effect, an unanticipated state of matter at high magnetic fields. Magnetic fields are also extensively utilized in many old and new technologies, including energy generation and storage, transportation, electro-magnetic launch of satellites, magnetic separation, magnetic bearings and magnetic levitation of diamagnetic materials. Crow's overview examined magnet-related science and technology areas and briefly discussed worldwide facilities that have been developed to help support these activities.

Crow graduated from Cleveland State University's Fenn College of Engineering in 1962 with a bachelor of engineering science degree, magna cum laude. He went on to receive a Ph.D. in physics from the University of Rochester.

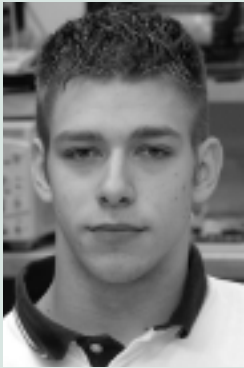
He is the 2003 recipient of the Cleveland State University Alumni Association's Distinguished Alumni Award for Special Achievement. See related story this page. ■

Student Profile

Bob Tulevski

Q: What made you pursue electrical engineering?

A: Since I was four, I wanted to be a fighter pilot. Then, in high school, I became really interested in the space program and electrical engineering. I was in the 11th grade when I attended the Engineer for a Day Program at Cleveland State, and that finalized my plans.



Bob Tulevski

Q: Why did you choose Cleveland State University?

A: Cleveland State is close to home. It has several accreditations and offers a lot of opportunities. You can also co-op. I'm starting the co-op program in the spring 2004 semester.

Q: Which faculty member or course had a major impact on you in electrical engineering?

A: Dean Alexander has been great. He has furthered my interest and opportunities, along with Brian Fast, especially in the areas of intelligent controls and artificial intelligence. Fast is a Fenn College of Engineering doctoral candidate and program manager for the Center for Research in Electrical and Aerospace Technology (CREATE).

Q: What organizations are you involved with at Cleveland State?

A: I am president of both the Institute of Electrical and Electronics Engineers (IEEE) and the American Institute of Aeronautics and Astronautics (AIAA). I am trying to revive the Cleveland State chapter of AIAA after an absence. Last summer, I was also an Orientation Leader for the Office of Student Life.

Q: How have you been involved in IEEE?

A: During my sophomore and junior years, I have been president of the Cleveland State Student Chapter of IEEE. The IEEE student chapter has more than doubled the previous record high membership this year. We are in the planning stages for several events. This year, I am also the IEEE Region 2 Student Representative. Region 2 covers the eastern U.S. I assisted with bringing the IEEE Regional Conference to Cleveland State this coming April.

Q: Can you tell me about the IEEE Regional Conference?

A: It will be held April 23-25, 2004 at Cleveland State. There is a robotics and hardware competition with autonomous robots, a leadership workshop, and a paper/poster research competition. On Saturday night, there is a banquet at the Science Center. It would be great if alumni could help support us. The alumni are the transition to industry. They could tie into everything nicely.

Q: Has IEEE given you a chance to network with other Cleveland State alumni?

A: Yes. Brian Fast and I are working on developing a networking database. Students need a better relationship between school and industry. If the database is accessible from the website, students could find alumni with similar areas of interest and specialization. Alumni really are the key to success.

Q: Would you like to see more alumni involvement?

A: It would be great if alumni could come to some of the engineering events throughout the year. We need to keep communication up. Sponsorship from alumni would also be great. Getting involved with Cleveland State is the best part.

Q: Have you received any awards while at Cleveland State?

A: I received the William H. Compton Award for leadership contributions and the Outstanding IEEE Member Award last year.

Q: What are your plans after graduation?

A: I would like to pursue my M.S. in Electrical Engineering right away. ■

Students Win Two Awards at Regional Chem-E Car Conference

The Cleveland State University student chapter of the American Institute of Chemical Engineers (AIChE) won two awards at the North Central Regional Student Conference, held at Michigan Technical University in Houghton, Michigan, this past May.

The Cleveland State student chapter won second place out of eight teams in the Chapter Chem-E Car Competition. The competing teams included The University of Wisconsin (1st place), Cleveland State University (2nd place), The University of Dayton (3rd place), Michigan Technological University (4th place), The Ohio State University (5th place), The University of Michigan (6th place), Western Michigan University (7th place) and Purdue University (8th place). The Chem-E Car Competition is conducted to explore the use of alternative fuels in future vehicles. The students design, construct and race a small vehicle that is powered by chemical reactions.

In the Chapter Design Competition, the Cleveland State student chapter won the award for "Most Creative Design."

The Cleveland State students qualified to compete in the AIChE National Student Conference to be held in San Francisco this November. The students that participated in the competition are Eric Dolence of Cleveland's West Side, John Falbo of Lorain, Jeff Gyurky of Columbia Station, Mike Wendolowski of Parma, and Damir Banusic of Eastlake.

AIChE is the chemical engineers' resource for professional and personal growth. More than 50,000 chemical engineers belong to AIChE, which has student chapters throughout the U.S. The Cleveland State AIChE faculty advisor is Joanne M. Belovich, Ph.D., Associate Dean and Professor of Chemical Engineering. ■

Students Are Big Winners in Regional Steel Bridge Competition

The Cleveland State University student chapter of the American Society of Civil Engineers (ASCE) won four first place awards this past May at the Student Steel Bridge Competition held at the University of Kentucky in Lexington, Kentucky. ASCE and the American Institute of Steel Construction Inc. (AISC) sponsored the Regional Steel Bridge Competition.

In the Chapter Steel Bridge Competition, the Cleveland State students won first place in the categories of lightness, stiffness, structural efficiency and overall. They competed against 12 university teams with more than 100 students participating. The Steel Bridge Competition is set up to explore the depth to which a student design team can synthesize design, construction, cost, lightness and aesthetics.

The Cleveland State students qualified to compete in the ASCE's National Student Conference to be held in San Diego. The students who participated in the regional competition include Paul Bosela of Copley, Jay Bruckner of Cleveland, Tariq Dahleh of Lakewood, Cathy Findley of Parma, Heather Hlasko of Medina, Kim Lihvarchik of Pittsburgh, Pa.,

Eric Mack of Cleveland, Rasheed Warith of Richmond Heights, Tony Zabiegala of Cuyahoga Heights and Author Tarrellari of Albania.

The ASCE is a national organization for Civil Engineers. It provides essential value to its members, their careers, its partners, and the public by developing leadership, advancing technology, advocating lifelong learning and promoting the profession. The student chapters of ASCE provide the opportunity to network with individuals in the field, receive real-world experience, and establish relationships and future career contacts. The Cleveland State ASCE faculty advisor is Stephen Duffy, Ph.D., P.E., Professor of Civil and Environmental Engineering. The Cleveland State industry advisor is Robert J. Hlasko, President and Owner of the RJ Hlasko Company, Inc., North Ridgeville.

The AISC is a not-for-profit technical institute and trade association established in 1921 to serve the structural steel design community and construction industry in the U.S. An AISC award recognizes commitment to excellence in steel design and construction. ■

Where there's a will, there's a way...

Please consider investing in the mission and future of the Fenn College of Engineering. When you write or review your will, please consider leaving a charitable bequest. Ask your attorney to include such words as these:

An Unrestricted Gift to the Fenn College of Engineering:

"I give and bequeath to the Fenn College of Engineering at Cleveland State University in Cleveland, Ohio, through the Cleveland State University Foundation _____ percent of my estate [or the sum of _____]."

A Gift for a Specific Purpose within the Fenn College of Engineering:

"I give to the Fenn College of Engineering at Cleveland State University in Cleveland, Ohio, through the Cleveland State University Foundation _____ percent of my estate [or the sum of _____] to be used for _____ (specific purpose – scholarship endowment, department, program, etc.)."

For further information, contact Deborah Miller, Major Gifts Officer at (216) 687-5513.

Class Notes

Thomas G. Apathy, PE (BME '80, BSME '84) is a quality manager at Saint-Gobain in Mantua, Ohio. His son Christopher is a Cleveland State student majoring in Mathematics with a minor in Education.

Phillip L. Dines, M.D., Ph.D. (BSEE '72) was elected a Distinguished Fellow of the American Psychiatric Association. He is director of the Department of Psychiatry at St. Vincent Charity Hospital in Cleveland, Ohio.

William V. Fredrick, P.E. (BEE '75) is president of Fredrick, Fredrick and Heller Engineers, Inc.

John C. Hanson, D.D.S. (BME '91) is in private practice in Winston-Salem, North Carolina. He received his D.D.S. from the University of Illinois of Chicago and Specialty Certification in Orthodontics from the University of Rochester. He is married with four children.

Mark A. Hoersten (MEE, '86) was elected vice president of Business Management at Keithley Instruments, Inc. He joined Keithley in 1980 as a design engineer. Hoersten received his bachelor's degree in Electrical Engineering from the University of Toledo and an MBA from Case Western Reserve University.

Gary Horvat, Ph.D. (BIE, '77, MIE, '84, Ph.D., '90) was featured in *The Plain Dealer* in an article titled "Ohio Native's Career is Byproduct of Necessity." Dr. Horvat supervised the creation of General Motors' new 3.5-liter V6 engine.

Tom McGuire (BS MET, '01) is an applications engineer with Integrated Technologies.

Tatyana (Emerman) Rehn (BME, '86) was featured in an article titled "Hot from the Heights." The article appeared in the August 20, 2003 edition of *The Plain Dealer*. Rehn owns the Stone Oven Bakery and Café located in Cleveland Heights.

Tod Stephens (BS ECE, '89) and Carolyn Deichen were married on December 28, 2002.

In Memoriam

Joseph E. Dudas

William J. Gerner (BME, '48)
November 7, 2002

Alfred L. Hadick (BS ECE, '68)
June 7, 2003

Virgil P. Jenney ('34)
July 25, 2003

Byron Whittier Johnson

STEM Provides Educational Outreach Programs for Teachers and Students

The Science, Technology, Engineering, and Mathematics (STEM) Collaboration is a unique partnership between Cleveland State University's Colleges of Education and Engineering. STEM provides educational outreach programs for both teachers and students, addressing the need for effective STEM skills for life-long learning. The goal of STEM is to increase the pool of highly skilled engineers and technologists.

Ron Abate, Ph.D. associate professor and assistant director of Teacher Education, leads the STEM Collaboration, with the assistance of two project coordinators, Terri Byrnes, educational outreach coordinator and Renee Overton, student coordinator both of the Teacher Education Program. Activities are held in a lab in Stilwell Hall, complete with computers, a resource library, and building materials.

The STEM Collaboration activities are based upon the belief that a strong foundation early in a student's career will increase his or her potential of becoming career focused. Byrnes hopes to make students aware of engineering and the skills needed to prepare for a career in the field.

"Only a handful of universities have this kind of partnership between engineering and education," says Byrnes. "Teachers need to learn innovative ways to teach these subjects in order for us to have students that have the potential to enter into high tech careers in engineering."

Cleveland area teachers and students from 40 districts have participated to date. The engineering camps have had more than 250 participants since their inception in 1999, with a diverse population including Cleveland, Chardon, East Cleveland, Elyria, Lakewood, Parma, Rocky River, and Shaker Heights. "More than 65 percent of the middle school camp participants are returnees from previous camps," says Overton. Several of the middle school students go on to attend the high school camps. Six high school students have chosen to pursue engineering at Cleveland State.

The Middle School Advanced Technology Education (MSATE) project, funded by the National Science Foundation (NSF), is offered to middle school teachers of

science, technology, or math. Geared to helping teachers learn better ways to integrate science, math, and technology into their classrooms, the MSATE project provides a two-week summer externship with engineers and technologists, working on real world STEM projects. In addition, a variety of workshops are held to introduce teachers to innovative STEM learning tools and software.

Byrnes asserts that teachers need to use problem-based learning with real world problems, stressing teaming and communication in the classroom. This is a systemic change in the way students are currently taught.

Teachers gain professional and curriculum development materials through the MSATE project. A resource lending library is also available to all teachers who have been in the program, offering design challenge components in free standing kits, lesson plans, calculators, etc.

Along with the externship, teachers agree to conduct a standards-based classroom engineering challenge with their students during the school year. This year's challenge involved teachers building an icebox, an insulated container to house an ice cube and a temperature probe, for the purpose of demonstrating efficient and effective insulation methods.

During the 2002-2003 school year, the High School Engineering Challenges were open to students in grades 10 through 12.

It was a year-round program in which students work in teams with Cleveland State University professors and engineers from industry to find innovative solutions to real-world engineering problems through design challenges.

High school students submitted an essay, a teacher recommendation, and had a minimum grade point average of 2.7. "Enthusiasm, teamwork, and a willingness to learn were the qualities sought," says Overton.

During July 2003, there were three one-week camps. Students attended a single week or all three.

Besides learning in this hands-on and minds-on program, Overton stressed,



Photo by Dean Charles Alexander

students learned to work as a team.

Last spring, for 12 Saturdays, students worked on building and programming complex machines from Fischer Technik materials. In the fall, students spent eight Saturdays building Sumo wrestling vehicles.

The Middle School Engineering Camp was offered to students entering grades 7, 8, and 9 to encourage students about exciting engineering careers and activities. Three weeklong camps were held during July, for a cost of \$200 each week. The requirements are similar to those of the high school students, except that parents also submitted an essay on why their child would benefit from the program.

Students working in teams of four or five, used engineering software and design applications to build and program projects, such as a robotic vehicle, for maneuverability and speed. Each day, students recorded their activities in a PowerPoint program. Each camp culminated in a Friday Challenge and awards program where parents shared in the excitement of the final competition.

Supporting the student camps is a challenge, according to Byrnes. Industry and individual support is greatly needed. This year, the Alcoa Foundation and the Eaton Foundation, along with parent fees, funded the middle school camps. A Teacher Education Grant from the U.S. Department of Education funded the high school camps. Byrnes and Overton are always looking for funding sources and donations. "We would greatly appreciate any alumni support," Byrnes says. Companies have donated furniture, software, etc., for the lab in Stilwell Hall. ■

Dean's Letter

continued from page 2

Typically with engineering projects, an engineer will use several different software applications. Currently, there is not a formal way of collecting and tracking the engineer's work. Consequently, if the engineer leaves the project, someone else might have to restart the project from the beginning. If the original engineer returns the project at a later date, he or she may not be able to just plug into the process where they left off. Consequently, too much engineering work is lost or repeated on projects because of the lack of engineering knowledge capture.

Using an integrated design environment with knowledge capture, previous work can be tracked and either that engineer or someone else can plug into the process at any point in time. This is especially important for the future, since the engineering workforce will be limited, but the amount of engineering and its complexity will increase dramatically.

The integrated design environment with knowledge capture will not only be a process to be used; it will be a foundation for the field of engineering in general. It will be an effective way to communicate

and track work, enabling engineers to do their work much more effectively and easily. This is, in fact, the only way we will be able to deal with the explosive growth of technology.

A major part of the Center for Research in Electronics and Aerospace Technology (CREATE), the integrated design environment with knowledge capture will impact the whole Fenn College of Engineering. Clearly, electrical engineering and mechanical engineering will play a major role. Software and hardware engineers will work with faculty and students to develop and implement the platform, which will most likely initially be Windows-based. As the engineer loads the various applications and starts to work in them, the integrated design environment with knowledge capture will track the work, perform book-keeping, ask questions, and provide a record. The goal is to make it as user-friendly and as transparent as possible.

Currently, we are deciding how to develop the integrated design environment with knowledge capture for our students and how to integrate it into the curriculum for homework, projects, theses, and dissertations. We want to make sure that the platform and associated applications are user-friendly. The engineering students

will be directly involved in evaluating and using the integrated design environment. Since Fenn engineering students will be experienced with integrated design environments, their marketability will be enhanced as well.

One of our most important programs and a star of the college, the co-op program has been strengthened under the leadership of a new coordinator, Angie Stoller, from career services, with the assistance of engineer Lee Penkowski, from industry. Lee has had an outstanding career at Reliance Electric, as well as several years of experience serving the Cleveland Engineering Society in many capacities.

I am also pleased that research funding has increased significantly this year, a healthy indicator for the Fenn College of Engineering.

Although some alumni visit their alma mater, it is my hope that more will become involved. I would like to see alumni coming into classes and classrooms, supporting student organization activities, helping students understand what a practicing engineer does and letting them see real engineers. I encourage you to visit as often as you can to see what we are doing and to become an active part of the new Fenn College. Thank you. ■

Return to:

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What's New?

Complete the form below or E-mail c.alexander@iecee.org
We're interested in hearing your good news, for example, about job changes, awards and personal achievements as well as your input on our newsletter.

If you need more space, feel free to attach a separate sheet.

Here's what's new with me.

Name

Former Name (if applicable)

Degree Graduation Date

Address

City State Zip

[]

Telephone (Day)

[]

(Evening)

E-mail

Job Title/Place of Employment

Send us your E-mail address!
Fenn College will use E-mail more often to inform alumni of current news.

Upcoming EVENTS

Distinguished Alumni Awards 2004 Nomination Deadline—November 28, 2003

If you know a Fenn College or Cleveland State University graduate you would like to nominate for an award, call the Alumni Office at (216) 687-2078 for a nomination form or log onto <http://www.csuohio.edu/alumni> and go to Distinguished Alumni Award on the pull down menu.

Homecoming/Fall Reunions. . . Save the Date — December 6

Reserve Saturday, December 6, for Homecoming 2003 at the Cleveland State University Convocation Center. This event will be a Cleveland State University community-wide celebration! Bring the family and enjoy activities that include a pregame dinner, basketball game, postgame "Winter Festival of Magic" featuring music by the Ed Stephens' Band. A post game concert will also take place in the arena featuring Common, a highly acclaimed "conscientious" rapper who is regarded as one of the most intelligent wordsmiths in the genre. Watch your mailbox for more exciting details or log on to <http://www.csuohio.edu/> for more details.

Alumni Association Discount for Continuing Education Classes

When you become a Cleveland State graduate, your Cleveland State education does not need to end. Cleveland State's Division of Continuing Education offers noncredit classes downtown and in the new West Center (Westlake) to help you sharpen your professional skills, advance your career, or maintain your credentials. The Division is offering four professional certificate programs this spring, ideal for alumni in a wide range of fields. Take advantage of the 15 percent discount offered to all Alumni Association members. Call (216) 687-2144 or E-mail conted@csuohio.edu to receive a catalog of classes in computers, business and management, health and human services, and more. Or, visit the Continuing Education web site at <http://www.csuohio.edu/ce>

Cleveland State University Alumni Association Members Get Discount on CAVS Tickets

Cleveland State University Alumni Association members may now order tickets on-line to see LeBron James and the Cleveland Cavaliers during the 2003-04 season.

With all of the anticipation surrounding the Cavaliers season, the Cleveland State Alumni Association and the Cleveland Cavaliers are offering members the opportunity to purchase individual game tickets. Cleveland State Alumni discounts are available for many of the biggest games of the season.

You may log on to <http://www.gundarena.com/store/groupbr.html> and reserve tickets to some of the biggest games of the year. Please include Cleveland State Alumni as your company or group affiliation on the order form. If you have any questions, call Brian Ralston at (216) 420-2472 or E-mail him at bralston@gundarena.com.

Monthly Calendar

Go to <http://www.csuohio.edu/alumni> for updates on events and meetings from the Cleveland State Alumni Association. Use the pull-down menu and go to the event calendar. You will find information about alumni group meetings and special events. New listings: Cleveland State University "On the Road" events are listed online. These events take place in or near neighborhoods in the Greater Cleveland area.

**Cleveland State Basketball, call (216) 687-4848,
or visit the web site at www.csu vikings.com**

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Department of Marketing and Public Affairs
03-00702 /11M

Cleveland State University
FALL/WINTER 2003

Fenn Focus

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