



Charles K. Alexander Appointed Dean of the Fenn College of Engineering

Cleveland State University has appointed Charles Kenneth Alexander, Ph.D., P.E., as Dean of the Fenn College of Engineering, effective July 1. The University's Board of Trustees unanimously approved Alexander's appointment.

"This marks the beginning of a very important and exciting chapter in the continuing evolution of Cleveland State University as a provider of quality education to the citizens of Northeast Ohio," said President Michael Schwartz, Ph.D. "Dr. Alexander is a highly qualified educator who is ready to build upon a solid foundation established by his predecessors in the College of Engineering.

The strength of the College lies in its outstanding faculty and the depth and breadth of its programs," said Dr. Schwartz.

"Dr. Alexander shares a common vision to elevate Fenn College of Engineering to its highest levels of performance and accomplishment. We are most fortunate to have him join the Cleveland State family."

Charles K. Alexander was the Stocker Visiting Professor of Electrical Engineering and Computer Science and Interim Director of the Institute for Corrosion & Multiphase Technology at Ohio University. He has served as Dean of Engineering and Computer Science at California State University at Northridge, Acting Dean of the College of Engineering at Temple University and Professor and Chairman of the Department of Electrical Engineering

at Temple. He held the same positions at Tennessee Technological University. He was a Professor and Associate Professor of Electrical Engineering at Youngstown State University, where he was named



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

Distinguished Professor in recognition of his outstanding teaching and research. Throughout his career, Dr. Alexander has worked to strengthen undergraduate curriculums and graduate programs, increase research and private funding, and increase awareness of his institutions.

"I am delighted to be a part of the Cleveland State community," said Dean Alexander. "I am looking forward to working with the students, faculty and staff at CSU with a great deal of excitement, especially about our future. The Fenn College of Engineering has a long and rich history, which I look to continue, and where possible, strengthen. In particular, I like CSU's focus on education with an emphasis on the student as an individual and as an important part of the educational process."

Dr. Alexander received his Ph.D. and M.S. degrees in Electrical Engineering from Ohio University and his B.S. degree from Ohio Northern University. He has served as a consultant to numerous corporate and governmental organizations and is actively involved in research and development projects ranging from solar energy to

software engineering. He is a Fellow of the Institute of Electrical and Electronic Engineers, and was its 1997 President and CEO. In addition, he has served on the IEEE Board of Directors for eight years. During his tenure with IEEE, he has worked to put the organization on a more positive financial footing and helped develop "Vision 21," an innovative program seeking to challenge and mesh the engineering community, academic community, industry, and government into providing programs and services necessary for a technically literate 21st century society.

"There are many areas that are important to a successful engineering school in the 21st century, including research, development, industrial outreach, alumni relations, graduate programs, etc. The important issue at CSU has been students and I will continue that while addressing all the rest," states Alexander. "Clearly the students, faculty, and staff of the College have a number of goals that we will need to address. If I were to sum up my goals, I would say that we need to strengthen the entire educational environment focusing on making this the best possible place in which to learn and work! My vision is that the Fenn College of Engineering is the engineering college of choice for the region."

Alexander is the father of three daughters: Christina Ruth, Taamara Sue, and Jennifer Marie. His mother, June Alexander, is a resident of Amherst. His brother James, and family reside in Elyria. He and his wife, Hannah, will reside in Cleveland. ■

Dear Alumni and Friends,



John H. Hemann, Ph.D.

As I look to officially step down as Interim Dean and “retire” as Professor of Civil Engineering at the Fenn College of Engineering in December, I am reminded of the number of positive changes and successes that I have seen during my 27 years at Fenn College.

The Fenn College of Engineering in 1975 was somewhat different from today. Our faculty and laboratories were located in several buildings across campus, including Foster Hall, the Chester Building, Main Classroom and Stilwell Hall. We “suffered” through the renovation of Stilwell Hall, which dramatically improved our facilities. Laboratories are much better furnished now than they were in the 1970’s, allowing for more applied learning for our students.

Our master’s programs were only a few years old and our doctoral program was just beginning. I was hired to advise doctoral students. There was very little funded research by faculty. So, it has been a joy to watch Fenn College grow from an undergraduate college, to one that is also serving the community through graduate education and research. I am pleased to have played a role in our development in this area, and will continue my research in nondestructive evaluation in the future, as well as teaching graduate level courses.

I have been pleased to see our growing industrial support through funded research, scholarships, graduate assistantships, laboratories and programs and involvement in senior design projects, internships and cooperative education experiences. Special thanks to all of our supporters including **Parker Hannifin, Washington Group International, URS Corporation, Rockwell Automation, HNTB, Avery Dennison, NASA, ALCOA, FirstEnergy, Lubrizol, General Electric, Lincoln Electric, Honeywell, Bardons & Oliver, Microtek Controls, Jochum-Moll Foundation, ASHRAE** and **Federal-Mogul**. Building industrial partnerships is an area for continuous improvement into the future.

I had the pleasure of working with

Bill Compton (BEE ’41) in 1982 to develop our Engineering Student Enrichment Program. Bill wanted to see better funding for our student organizations as a way to foster their total educational development. Now, as the program celebrates its 20th anniversary, it supports 14 active student organizations, student tutors, professional development, student competitions and more. I’m sure many of you benefited from this program during your years at Fenn. I encourage you to support it today, as the program operates strictly with private gifts.

I believe my greatest joy, though, has been working with our students and meeting many of you, our alumni. I have learned from many Fenn College graduates such as **Bill Bland (BSE ’40)** or **Ed Sobey (BChE ’40, BMetEng ’43)** about how good of a general engineering education they received. I continue to hear the same story from graduates of every decade, such as **Larry Cawley (BME ’57)**, **Dennis Rice (BEE ’64)**, **John Ferchill (BEE ’65)**, **Don Washkewicz (BME ’72)**, **George Palko (BCE ’88)**, **Violeta Fuduric (BCE ’89, MSCE ’92)** or **Keith Spalsbury (BME ’02)**. I wish I could name all the wonderful people I have met through the years! One thing about the Fenn College of Engineering that has **NOT** changed is that the education of our students continues to be our number one priority and prepares them to compete with the best from any engineering school. Our graduates are

industry leaders, research directors, college professors, project managers, consultants and more. You should all be very proud of your alma mater and the accomplishments, you, our alumni, have made.

As we look to the future for the Fenn College of Engineering, I am excited. Under the new leadership of Dean Charles Alexander Ph.D., P.E., I have faith that our College of Engineering will not only be in good hands, but will work steadily to advance in many areas. We will continue to develop our industrial partnerships, grow our research programs, enhance our curriculum and educational experiences for students, and make education accessible through scholarships and assistantships. I encourage you to play an active role in your alma mater – get involved in the alumni association, refer students, get your company to sponsor a student through a scholarship or graduate assistantship, invest in the College financially, and take advantage of your company’s matching gift program. There are many ways for you to make a difference and enhance the education of our future students. Your involvement makes a positive difference.

Thanks once again to the many alumni, corporations and friends of the Fenn College of Engineering who support the College through their gifts and volunteer work. I hope to cross paths with many more of you in the future. ■

*John H. Hemann
Interim Dean*

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 CSU 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 CSU Foundation _____ percent of my estate [or the sum of _____] to be used for _____ (specific purpose – scholarship endowment, department, ESEP program, etc.).”

For further information, contact Deborah Miller, Development Officer at 216-687-5513.

Focus on FACULTY

Paul Bosela, Ph.D., P.E.

Department of Civil and Environmental Engineering

Nationally renowned for his expertise in forensic engineering, Paul Bosela, Ph.D., joined the Fenn College of Engineering in 1985 as an assistant professor of Civil Engineering Technology. Prior to joining Cleveland State University, he worked for Milton M. Rudick & Associates as a Forensic Engineer and Building Damage Consultant. It is with Rudick Companies that Bosela gained his experience in determining the causes of building and other structure damages.

Bosela earned his undergraduate and master's degrees in civil engineering from Youngstown State University. He earned his doctorate from the University of Akron in 1991, pursuing his education while teaching in the engineering technology department. He was appointed to the position of Associate Professor and Chair of the Civil and Environmental Engineering Department in July 1997 and maintains that position today.

"I chose to enter the field of higher education because I wanted to make an impact on preventing structure failures through education," said Dr. Bosela. "I felt I could bring my experiences as a practitioner to the classroom. I spent years looking at the failures of structures. I was asked to teach a few courses at Youngstown State while at Rudick & Associates and realized the difference I could make as a professor."

Dr. Bosela has earned several research grants in areas of non-linear finite element modeling of space structures, non-destructive evaluation of transit infrastructure, and using ultrasound to measure icing on aircraft wings. His largest grant proposal, joint with faculty from Case Western Reserve University in the area of earthquake engineering, is currently pending with the National Science Foundation.

Throughout Dr. Bosela's teaching, research and administrative career, he has



Paul Bosela, Ph.D. (second from the right) teaches civil engineering students how to use surveying equipment

continued to be extremely active in the area of forensic engineering. He was appointed to the American Society of Civil Engineer's (ASCE) Technical Council on Forensic Engineering (TCFE) soon after it formed in 1985. TCFE applies engineering principles to the investigation of failures or other performance problems. The purpose of the committee is to develop practices and procedures to reduce the number of such failures, to disseminate information on failures and their causes, to provide guidelines for conducting failure investigations, and to provide guidelines for ethical conduct in forensic engineering. Bosela has chaired the education committee and in 1997, was appointed to the executive committee of TCFE. He served as its chairman during 2000.

Dr. Bosela's forensic engineering activities led to his involvement in the analysis of the World Trade Center disaster. Following the September 11 attacks, the Federal Emergency Management Agency (FEMA) and ASCE deployed a team of civil, structural, and fire protection engineers to study the performance of buildings at the World Trade Center site. This team was led by W. Gene Corley, Senior Vice President with

Construction Technologies Laboratories (CTL) in Illinois, and known for his involvement in investigating the Oklahoma City bombing building collapse. Bosela's role was as reviewer and coordinator for the peer review team of the *World Trade Center Building Performance Study*. The final document can be viewed at www.asce.org/responds.

Dr. Bosela has also been involved in the planning and development of ASCE's First and Second Forensic Congresses. He served as one of three editors of the, *Proceedings of the Second Congress*, a 680-page book that summarizes all technical sessions. ASCE has given approval for the Third Forensic Congress to be held in San Diego, where the World Trade Center collapse will be a main topic of discussion. Bosela will be responsible for the technical program for the entire Congress and serve as lead editor of the proceedings.

To discuss issues involving forensic engineering contact Dr. Paul Bosela at (216) 687-2597 or p.bosela@csuohio.edu. ■

Student Profile

Lisa McFadden

This past winter, Lisa McFadden was recognized as Outstanding Engineering Student of the Year by the Cleveland Engineering Society. One CSU and one CWRU student are chosen each year, based upon academic achievement, professional accomplishment, civic and community involvement and extracurricular activities.



Lisa McFadden

McFadden serves as a model student to receive this award. A junior in chemical engineering, McFadden has maintained a 4.0 GPA. She is the recipient of numerous

awards and scholarships including an Academic Excellence Award, Scholastic Achievement Award, Society of Tribologist and Lubrication Engineers Scholarship and the Lubrizol Scholarship. She is an active member of the American Institute of Chemical Engineers whose team placed fourth among 24 teams in the National Chemically Powered Car Competition in Reno, Nevada. She is also active in the Society of Women Engineers, Joint Engineering Council, Cleveland Engineering Society and the Society of Tribologist and Lubrication Engineers. "I have found my education at Fenn College to be very rewarding," said McFadden. "The professors are approachable and spend extra time with students as needed."

McFadden has served as a research intern at The Environmental Technology Commercialization Center of the Battelle Memorial Institute in Cleveland. She is also currently a student assistant in the Chemical Engineering Department. In her community, she is active in several groups that serve youth and promote human rights.

McFadden grew up in London, Ontario. While attending college in Canada, she decided to change her major from English to engineering. She chose Fenn College of Engineering for several reasons, including its excellent reputation, cooperative education program, proximity to home, and reasonable cost. She learned of Cleveland State University through friends who reside in Elyria.

"I have grown by leaps and bounds during my time at Fenn. The Chemical Engineering Department has a great atmosphere — I feel as if I am with family," said McFadden. "As an alumna, I would definitely support the Fenn College of Engineering. So much has been given to me, that I would want to give something back in return. Many students, who have a lot of potential, cannot afford to attend Cleveland State University, making alumni support that much more important." ■

Advanced Manufacturing Center Awarded \$1 Million For Glass Fiber Technology Program

The Advanced Manufacturing Center (AMC), a partnership of Cleveland State University and CAMP Inc., has been awarded \$967,899 by the U.S. Department of Energy through the Ohio Department of Development to develop a pilot program for the advancement of energy efficient technologies and improve the performance and yield of continuous glass fiber drawing technology.

The DOE's Office of Industrial Technologies through its State Industries of the Future initiative is teaming with individual states to develop and promote programs on energy efficient research and new partnerships that will foster the development of technologies that reduce energy consumption in industrial processes. The AMC received the third highest funding among the 14 projects that were selected from more than 135 proposals submitted in response to the *Energy Efficiency Initiative on Cooperative Programs with States for Research, Development and Demonstration Solicitation*. The awarded agreements total nearly \$10.5 million.

In April 1997, representatives of the glass industry, universities and federal agencies teamed up to begin constructing a detailed research agenda for the glass industry. From this beginning and under the leadership of the newly formed Glass Manufacturing Industry Council (GMIC), the glass industry members agreed to work collaboratively to achieve specific goals to address the competitive challenges that will face the industry during the next two decades.

Two of the goals that will be addressed by the AMC and Glass Forming Technology Consortium (GFTC) members are: reduction of unit production cost by at least 20 percent (from 1995 levels); and achievement of Six Sigma quality through automation, process control, optimized

glass composition and strength and computer simulation. Six Sigma is a quality improvement methodology that is being used to make breakthrough process improvement using a variety of tools, including statistics and design of the focused experiment.

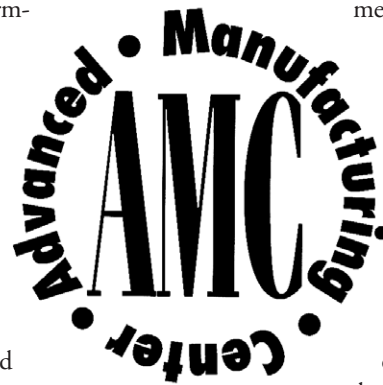
The AMC teamed with GFTC members, PPG Industries and Schott Glass, and with the support of the GMIC, Owens Corning and Saint Gobain Vetrotex America, Inc., proposed a two-year \$1.3 million initiative to make breakthrough improvement on the continuous fiber drawing process. Additional partners may be added to the

Consortium in the future.

The Consortium's initiative is to demonstrate reduced breakage frequency on a piloting fiber-drawing machine from the present state-of-the-art one break per hour to one break per four hours; reduce fiber diameter variation by 30 percent; and drive toward Six Sigma quality through process control and computer simulation. Product applications of this technology are primarily textile glass fibers for a wide range of high performance light weight structural products including automotive and boat bodies, windmill blades and pressure vessels.

"The State of Ohio is geographically and economically at the center of the glass forming industry with 37,000 jobs in the state and \$7 billion in sales," said Phillip A. Sanger, Ph.D., director of AMC.

Simon Rekson, Ph.D, a world-renowned expert in glass forming technology, and former Chief Scientist for Glass Technology at General Electric Lighting, where he demonstrated Six Sigma quality, is now at Cleveland State. In addition, CAMP is dedicating 500 square feet in a newly renovated building to this technology. The start-up date is June of 2002. ■



Fenn College Senior Design Teams Collaborate with Industry and Non-Profit Organizations to Develop Real-World Projects

The senior design project requirement for undergraduate students is a rigorous year-long project which allows students a chance to utilize the engineering knowledge they have gained during their education. The projects become that much more meaningful when they are interdisciplinary and applicable to the real-world.

Many of this year's projects involved collaborations with industry and other local professional and non-profit organizations. In the mechanical engineering department, students worked with a number of local companies, including Lincoln Electric, Parker Hannifin and Honeywell/Bendix. The companies provided the students with a problem they were facing and an employee to serve as an advisor. One project in particular involved redesigning a wire drive for a MIG welding product targeted for the home mechanic. The project not only won an award in the the American Society of Mechanical Engineer's student design competition, but could potentially save Lincoln Electric \$600,000 based on current projected sales data for the company.

Highlighted below is the senior design project for a group of eleven civil engineering students, who represented all specialties within the civil engineering discipline. Their model (pictured above) will soon be on display at CanalWay Center.

Canal Basin Project

The Heritage Corridor is a network of bike and hiking trails that connect different parks throughout the region while incorporating historical themes into the parks' developments. The National Park Service and other local non-profit organizations have proposed a Heritage Corridor along the old Ohio and Erie Canal, called CanalWay Ohio. Restoring the Northern Terminus of the canal is one of the capstone projects for this corridor, potentially involving rebuilding the towpath, locks and park area.



Members of the Canal Basin project senior design team with their model of the park area are (l-r): Aaron Appell, Joe Barklow, Mike Harrington, Melissa Herbe, Shohei Ishikawa, Brian Meluch and Ed Miltner. Not pictured: Noemy Roman, Amy Skorko, Mark Straub and David Watkins.

Students of the Fenn College of Engineering were inspired to get involved with this project from a series of articles in *The Plain Dealer* written by Steven Litt about "The Forgotten Valley." With that in mind, a team of eleven students from the civil engineering department focused their senior design project on restoration of the Northern Terminus. Their mission: to design an economically feasible, low maintenance park built around an operational reconstructed portion of the Ohio and Erie Canal, that provides recreational land uses for a growing urban population while celebrating the contribution of the Canal to Cleveland's history.

The students initially contacted Tim Donovan, Executive Director of the Ohio Canal Corridor, who encouraged their attendance at a "charrette" or design conference, where various architectural firms presented their concepts for the Canal Basin Project. After hearing the numerous presentations, the student team decided to focus their proposal on a recreational park area for local residents, knowing that the Flats and Warehouse Districts of Cleveland offered many opportunities for restaurants and night clubs, that had been seen in other proposals.

Four sub-teams (bridge, hydraulics, survey/CAD, and geotechnical) studied everything from soil content to lock restoration to bridge development. In the process, they had assistance from a variety of local non-profit organizations including: Cuyahoga Valley National Park Service, Ohio Canal Corridor Association, Greater

Cleveland Rapid Transit Authority, City of Cleveland, Kent State's Urban Design Center, the Cleveland Metroparks, and the Ohio Historical Society. These organizations supplied their vision for the Ohio Canal Corridor, historical information, boring and soil logs and were cooperative in answering the many questions of the students.

"The students presented their proposal to our Board of Directors," said Tim Donovan. "We felt they did an excellent job. Their model showed the depth and breadth of the space and enabled the board to see the potential of the park with new eyes." Ed McCabe, Chairman of the Board of Directors for the Ohio Canal Corridor commented as well, "The project was very impressive and very professionally done. It is refreshing to see students make such a valid presentation and to think outside the normal realm of engineering, considering, for example, the archeology of the site. We intend to utilize their surveying work and infrastructure review and take components of their project into the final design." McCabe is President of McCabe Engineering.

Not only will the final results of this project be put to good use and potentially save money in the development of the park, but the students found it to be a great learning experience as well. "I learned a lot about the politics in the city of Cleveland and how to work with a variety of organizations," said Mike Harrington, one of the project leaders. No doubt, these are skills our students will utilize throughout their career. ■

Research AT FENN

Cutting Edge Biomedical Research Involves Customized and Targeted Drug Delivery

The inhaled drug Ciprofloxacin (Cipro); a computer simulation to customize drug delivery on a patient specific basis; and targeted drug delivery for cancer cells—are the cutting edge research projects that Ananth Annapragada, Ph.D., associate professor of Chemical Engineering and previous director of the Applied Biomedical Engineering Program, finds himself entrenched in these days in his laboratories at the Fenn College of Engineering. Annapragada's expertise in Biomedical Engineering has him partnering in research with northeast Ohio's biomedical community including Case Western Reserve University (CWRU) and the Cleveland Clinic Foundation (CCF). Add to that nearly three-quarters of a million (\$750,000) in research grants and funding that are backing him, including a recently received Whitaker Foundation grant.

Inhaled Drugs Research

Dr. Annapragada points out that perhaps the most common drug one hears of, as an inhalation candidate, is Insulin. Swallowing insulin is not very useful—the stomach and the intestines digest it before it can get into the blood. This is why diabetics have to inject themselves. Inhalation offers a non-invasive route to deliver insulin, and a number of companies have been working on this for years.

“The average adult has enough surface

area in his or her lungs to cover a tennis court. Every drop of blood in the body flows through the lungs, through the alveoli, designed by Mother Nature to allow the exchange of material between the air-



Ananth Annapragada, Ph.D.

side and the blood-side,” says Annapragada. “Spread medication out on the tennis-court-sized area of the lung, and it should get into the blood pretty quickly.”

“But, its not so simple — Mother Nature also knew long ago that foreign particles that come into the lungs would likely leach their contents into the bloodstream rapidly,” says Annapragada. “So, the alveolar macrophage system — scavenger cells that roam the lung and rapidly

swallow any intruding particles — was put in place. We cannot use the tennis court size area for delivering medication, because these scavenger cells go around swallowing up the drug before it gets into the blood,” said Annapragada.

“So that’s where we come in,” says Annapragada.

“We have designed a drug-carrying particle that evades the macrophage cells, and can therefore sit in the lung for as long as we want it to, and it will release the drug continuously into the blood stream. What’s more, we have figured out a way to make these particles release the drug faster on command.”

“We have also been working on inhaled antibiotics, including the now household name since the events of September 11th — Ciprofloxacin (Cipro),” says Annapragada. His research started in this area a couple years ago, because of the threat of inhaled bacteria, including Anthrax. “We knew that since these bacteria primarily gain entry to the body via the lung, we should be able to treat them via the lung,” says Annapragada.

“The concept we are working on in our research is to estab-

lish a base-level of protection of the lung by inhaling our carrier particles loaded with antibiotics, and then, in the event of a known exposure, triggering the release by inhaling accelerant, to provide an added level of protection... with no added antibiotic,” says Annapragada.

The Whitaker Foundation and industrial sources fund Annapragada’s Inhaled Drug research.

Computer Simulation Customizing Drug Delivery

When research was started with inhaled particles, it was realized very quickly that the precise locations where medicine particles fly into the lung are very important. The technology at that time treated all patients the same, and assumed that everyone had the lungs and breathing pattern of a 30-year-old male.

An example Annapragada gives is, “So, imagine what my four-year old daughter had to deal with last year — she had an attack of bronchitis, and had some wheezing symptoms, so she was prescribed inhaled steroids. Well, guess what, the drug she took was identical to what an adult would take, and the device she used to inhale it was identical too,” says Annapragada. “Doesn’t make sense, does it?”

“Now, add to this the changes in breathing pattern with a disease-state. As her breathing patterns improved, her bronchitis got better, and one would expect the medicine to fly differently into her lungs,” says Annapragada. “However, there is no correction for this either.”

What was decided was to build a detailed computer model of the human lungs. Not one selected lung that corresponds to a 30-year-old male, but from CT-scans of a large number of patients—young and old; all races; male and female; healthy; asthmatic; with lung cancer; with emphysema; all the variants that can be thought of. What Annapragada is showing in his research is that every lung is different, and it cannot be expected that any two lungs deposit medicine the same way.

What Annapragada hopes to do in the next 10 years is build a system by which a physician could “scan” a patient on a given day, and run a computer simulation that would predict the optimal way for that patient to inhale medication on that day— customized drug delivery on a patient specific basis. “We think this will be reality in our lifetimes,” says Annapragada. Annapragada’s computer simulation research is funded by Aerogen Inc.

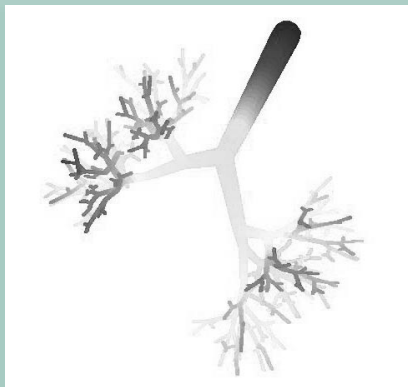
Targeted Delivery Research

Annapragada’s Targeted Delivery research project is the subject of a Bioengineering Research grant application to the National Institute of Health (NIH).

His research in Targeted Delivery is personal. “About 15 years ago, my mother was diagnosed with breast cancer. She chose not to treat it — she was worried about the side effects of chemotherapy. She also knew that if she took chemo, and lost her hair, everyone who saw her would know she had cancer,” says Annapragada. “I was planning on emigrating to the U.S. at the time. She knew that if she had revealed that she had cancer, I would have changed my plans and stayed in India. She didn’t want that to happen. By the time I found out, she was already in Stage 3 of her cancer, and died shortly afterwards.”

“Chemotherapy is a dreadful thing to face. You know it poses a slim chance of beating cancer. But the side effects are horrendous. I don’t blame my mother for her choice, but I do wish she didn’t have to make it,” says Annapragada. “And so, for the last six years, I have worked on a number of technologies to reduce these side effects.”

Today, in collaboration with Ravi Belamkonda, Ph.D., at Case Western Reserve University, Annapragada works on a technology known as 2nd - Generation Targeting (2GT). It has long been known that chemotherapy is a fine line between killing the tumor and killing the patient. This is because the toxic drug used to kill the cancer cells also kills other healthy cells in the body — hence the side effects. “However, what if one could specifically send the medicine to the cancer cells alone? A number of companies are working on such technologies; two names that you



may have heard in the news recently are Gleevec and Erbitux — targeted drugs for treating cancer,” says Annapragada.

“In Ravi’s lab and mine, we have found a way to increase the specificity of targeting—

the precision with which the drug goes to the tumor rather than to healthy tissue,” says Annapragada. “In fact, our 2GT technology can enhance the specificity by more than a factor of a thousand, that is, cause a 1000-fold reduction in side effects. In the near future, we hope to have cancer drugs so precisely targeted to the tumor that side effects would be completely eliminated.”

Dr. Annapragada first learned of the faculty position at Fenn College from Dr. Joanne Belovich, associate dean and professor of chemical engineering. He holds a Ph.D. in Chemical Engineering from the University of Michigan (1989), and was a post-Doctoral associate at the University of Minnesota and at the Massachusetts Institute of Technology (1990-1991). He worked at Abbott Laboratories in the Pharmaceutical Research and Development (R&D) area for five years and at SEQUUS Pharmaceuticals/ALZA Corporation for three years in the Drug Delivery area. He is the author of more than 20-refereed papers in technical journals and publications. He has presented at conferences, conventions and meetings. Recently he presented his findings in Rome and throughout Europe.

To reach Dr. Annapragada call (216)-687-2572 or visit his website at http://www.csu.ohio.edu/chemical_engineering/faculty/aa/annapragada.html. ■

Fenn College Center Offers Tools for Success

The Productivity and Quality Center (PQC) of Fenn College of Engineering is currently offering training and consulting in Six Sigma, a high powered business process optimization tool. Through a partnership with Uniworld Consulting Group, a world class leader in Six Sigma

corporate deployments, the PQC can provide training to various levels of the following topics:

- Leader/Champion Training
- Transactional Process Improvement
- Operations Process Improvement
- Design for Six Sigma

Design for Six Sigma

Design for Six Sigma is a methodology that will provide companies with the means to build high quality, manufacturability, and on-time delivery into products from the start.

- Systematic Design Methodology; Common language and measures
- Identifies customer performance expectations (Customer Critical Parameter Management)
- Utilizes Common set of statistical tools and methods to optimize performance quality (on-target functions with low sensitivity to noise)
- Engineers learn to design statistically

Schedule

July 29th - August 2nd, Green/Black Belts
 August 26th - 30th, Green/Black Belts
 September 23rd - 27th, Black Belts
 October 28th - November 1st, Black Belts

Operations 2 + 2 Six Sigma

Black Belt training creates process improvement experts who are armed with the tools to reduce costs and improve overall process performance. Black Belts tackle projects that produce bottom line results.

Revenue Growth: Increase top line through capacity expansion and new product introduction/extension.

Operating Income: Bottom-line impact of capacity expansion (growth) or cost reduction (productivity).

Working Capital: Cash impact of inventory and receivable reductions or reduced thruput time (cycle time reduction - improved turns)

Schedule

July 15th - July 19th, All
 August 12th - 16th, Green/Black Belts
 September 16th - 20th, Green/Black Belts
 October 21st - 25th, Black Belts

The Productivity and Quality Center (PQC) at Fenn College has been established to introduce organizations to the right tools for becoming more effective, helping them compete in a global marketplace. The PQC provides training and consulting in

the tools needed to meet both short-term tactical and long-term strategic objectives. This allows for the building of organizations capable of meeting the challenges of today, while looking to take advantage of tomorrow's opportunities.



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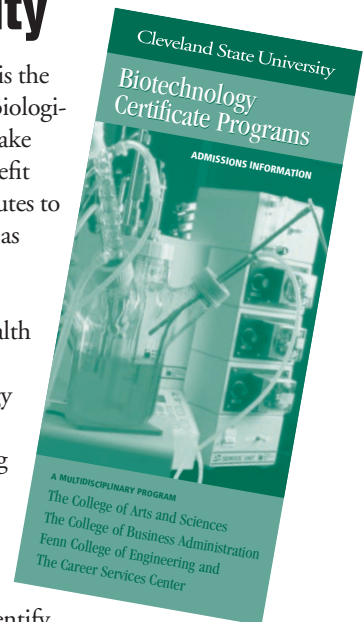
Biotechnology Certificate Programs Offered at Cleveland State University

Biotechnology is the manipulation of biological processes to make products that benefit people. It contributes to such diverse areas as food production, waste disposal, medicine, and health care equipment. The biotechnology industry is one of the fastest growing industries in Northeast Ohio. More than 100 companies in the Cleveland area identify

themselves as pursuing a biotechnology focus. Specific skills identified by employers for this field include basic engineering, quality control, laboratory, biochemistry and computer skills.

The program features three tracks: laboratory track, engineering track or business track. Courses are offered through the Fenn College of Engineering, College of Business Administration and College of Arts & Sciences. The program provides students who are working towards or already have a bachelor's degree the opportunity to add the necessary coursework that will enable them to focus on the biotechnology field. Likewise, working technical professionals can add credentials to their career portfolio, receive supplemental training or retrain for a career in a new or related field.

A sample of jobs for which the Biotechnology Certificate prepares graduates for include: quality control, regulatory coordinator, research and development assistant, technical marketing and sales, operations management, business support and development, field engineering or process development engineer. For more information about the program, contact the University's Admissions Office at (216) 687-2100. ■



Bits and Pieces

NEWS FROM AROUND THE COLLEGE

• Congratulations to **Fuqin Xiong, Ph.D.** (electrical and computer engineering) who was promoted to full professor. Dr. Xiong joined CSU in 1990 as an assistant professor. He holds bachelor's and master's degrees from Tsinghua University and a doctoral degree from the University of Manitoba. His recent book *Digital Modulation Technique*, has been praised as an enormous work of synthesis and as "a standard reference in the digital communication field." Dr. Xiong also recently received research grants from NASA Glenn Research Center to investigate the performance of the newly developed power efficient reflectarray antenna in high-data-rate digital communication systems and to study robust timing synchronization in aeronautical mobile communication systems.

• Congratulations to **Don Zeller** (engineering technology) who was promoted to associate professor with tenure. Zeller holds bachelor's and master's degrees in electrical engineering from the University of Notre Dame and the Massachusetts Institute of Technology. He worked for many years in private industry, occasionally teaching at Fenn. He began his full-time academic career in 1997 as an assistant professor. Professor Zeller has been successful in acquiring industry equipment gifts to support his laboratories and classes.

• A **Graduate Certificate in Software Engineering** was recently approved and is now offered through the Department of Electrical and Computer Engineering, jointly with the Department of Computer and Information Science. Software engineering is the application of a systematic, disciplined, and quantifiable approach to the development, operation, and maintenance of software systems. The program consists of six courses, totaling 21 credit hours. Additional prerequisite courses may be required depending on one's bachelor's degree. All courses will apply toward a Master of Science in Software Engineering (MSSE) degree program, which has been developed and is in the approval process.

For further information, contact Dr. Eugenio Villaseca, Chairman, Electrical and Computer Engineering Department at 216-687-2589 or by e-mail at f.villaseca@csuohio.edu.

• Congratulations to **Michael Harrington**, who received the J. Maurice Struchen Fellowship Award. The J. Maurice Struchen Fellowship Award Endowment was established at the Cleveland State University Foundation to honor the memory of Struchen and his strong legacy of commitment, integrity and service. Established in 2001, the annual award is given to an undergraduate student who displays exceptional leadership potential. Harrington, who graduated with a bachelor's degree in civil engineering in May, was Activities Committee Chairman for Tau Beta Pi, President of the American Society of Civil Engineers student chapter, and project manager for his senior design team. He will be working as a structural engineer with Burgess and Niple.

• Cleveland State University **President Michael Schwartz** has accepted a three-year appointment to the Board of Directors of the **Cleveland Engineering Society**.

• Congratulations to the Department of Civil and Environmental Engineering's **Steel Bridge Team** who placed second in the regional steel bridge competition.

The team went to Madison, Wisconsin in June to compete in the national competition at ASCE's 150th Student Convention.

• Welcome to **Chansu Yu, Ph.D.** who joined the Department of Electrical and Computer Engineering in the fall as associate professor. Dr. Yu received his doctoral degree from Penn State University, and his master's and bachelor's degrees from The Seoul National University. Previously he taught at ICU (Information and Communications University) and worked at LG Electronics, Inc. His research interests are in Mobile and Embedded Computing, Parallel and Cluster Systems, Computer Architecture and Performance Evaluation.

• The **American Institute of Chemical Engineers** Chemical Car Team finished fourth out of 22 teams at the national competition in Reno, Nevada held during the 2001-2002 academic year. The competition involved developing a pressurized gas propulsion car fueled by an HCl/baking soda reaction. Next year's team is in the process of formation with hopes of bettering this year's results.

• Professor **Rama Gorla** of the Mechanical Engineering Department, received a \$75,000 grant from NASA Glenn Research Center to do research on unsteady probabilistic analysis of aircraft turbomachinery. ■

Keith Spalsbury is Cleveland State's Outstanding Graduate



Keith Spalsbury of Franklin Township has been named the outstanding graduate of Cleveland State University's Class of 2002. He was honored with the President's Award during the commencement ceremony on May 12.

Spalsbury, an honor student with a perfect 4.0 grade point average, graduated magna cum laude with a bachelor's degree in mechanical engineering. In June, he begins working as a manufacturing engineer at Parker Hannifin Corporation's Parflex Division in Ravenna. He is pictured with his wife Gail.

Focus on ALUMNI

Engineering Alumni Recognized

Two Fenn College of Engineering alumni were recognized for their accomplishments at the Cleveland State University Distinguished Alumni Awards Banquet, held June 17 at Windows on the River. Margaret Taber, Ph.D. and Donald Washkewicz were honored at the annual event that recognizes alumni for exceptional achievements and leadership that have brought pride and recognition to the University community.

Alumni Lifetime Leadership Award

The award recognizes a graduate who has shown an exceptional ability to lead others and has brought pride and recognition to the University.

Dr. Margaret Taber has accomplished much in her professional and personal lives, so the Lifetime Leadership Award is truly fitting. Fenn College offered Taber a freshman scholarship, which she accepted. Cooperative education allowed her to continue her education and provided valuable experience leading to her first job at the TOCCO Division of The Ohio Crankshaft Company of Cleveland.



Margaret Taber, Ph.D.

Taber received a bachelor's of science degree in engineering in 1958, majoring in electrical engineering. She went on to earn her master's in engineering from the University of Akron, and doctorate in education from Nova Southeastern University.

Professionally, Taber assisted in the development of the electrical-electronic engineering technology program at Cuyahoga Community College, working her way to professor and chair of the engineering technology department. She was affiliated with Purdue University for 21 years,

where she was the first woman full professor in the School of Technology. When she retired, Purdue named a lab in her honor – the Margaret R. Taber Microcomputer Laboratory. She is the co-author of two textbooks and author of several journal articles, has mentored students and advised student organizations, including the Society of Women Engineers.

A cancer survivor who lives in Indiana, Taber has devoted her retirement years to volunteering with the American Cancer Society and Sunburst Farm and Rainbow Ranch in Arizona. She has served as honorary chair of the American Cancer Society's Relay for Life and organized an effort to bring the CanSurmount program to Lafayette. The program provides visits from trained volunteers who have had cancer, such as emotional support for families. Taber also compiled and directed the Community Connections Resource Information and Guidance effort that lists cancer survivor resources. Through the Federated Church of West Lafayette, she travels to Sunburst Farm in Arizona to help mentally disabled adults. Finally, she has established scholarships at Cleveland State University and The University of Akron for women engineering students.

Her achievements have been recognized with many honors, including the Distinguished Engineering Educator Award from the Society of Women Engineers, Helen B. Schleman Gold Medallion Award from Purdue, and Outstanding Alumni Award from The University of Akron's College of Engineering. In addition, she is listed in *Who's Who in America*.

George B. Davis Award for Service to the University

The award recognizes a graduate's generous dedication to the growth and advancement of Cleveland State University. Alumnus Davis, for whom the award is named, received a BBA in 1941 and an MBA in 1981.

Don Washkewicz joined Parker Hannifin Corporation upon graduating from the Fenn College of Engineering in 1972 with a bachelor's degree in mechanical engineering. He later received an MBA from Case Western Reserve University.

Washkewicz's first major assignment was to help develop a new line of thermoplastic

hoses. Working with a team of engineers in a garage-like building, Washkewicz, the youngest engineer of that group, spent hours



Donald Washkewicz

pouring over existing product patents and the properties of new materials. The venture cost a lot of money, but the work paid off with the development of a broad line of thermoplastic hoses able to withstand pressures as high as 50,000 pounds per square inch. During Washkewicz's time in research and development (R & D) he developed a number of proprietary processes in addition to earning five patents for hoses he designed. Washkewicz was later named General Manager of this division, the Parflex Division in 1982. The workforce grew to more than 400 people, with sales in excess of \$100 million.

His rise through Parker Hannifin has been marked by steady accomplishments. He went on to serve as vice president of the Fluid Connectors Group, president of the Hydraulics Group, and was named to the newly created position of president and chief operating officer in 2000. Seventeen months later, he was named president and CEO. He currently sits on the boards of the Greater Cleveland Growth Association and Cleveland Tomorrow and is involved on an education committee for National Fluid Power.

Over the last two years, Washkewicz has been instrumental in the Fenn College of Engineering receiving \$110,000 from Parker Hannifin to develop a motion and control laboratory. He has pledged that the firm will regularly maintain and upgrade lab equipment so students can learn by using the most advanced technology.

Parker Hannifin also supports student scholarships through the Mechanical Engineering Department and the LINK Program in Career Services. The company provides cooperative education experiences for students as well. Last year, Washkewicz hosted an alumni breakfast at Parker Hannifin for CSU graduates and personally led a tour of the company's facilities. ■

Class Notes

Sam Birel (BSMET '92) has been appointed Vice President, Operations at PFERD, Inc., a subsidiary of August Rugeberg GmbH & Co. He is responsible for the production, manufacturing, engineering, materials and scheduling functions of the company.

Craig A. Black (BEE '75, MSEE '76) was recently approved by the Cleveland State University Board of Trustees Committee on College Visiting Committees to serve on the Fenn College of Engineering Visiting Committee. Welcome! Black serves as Vice President & Chief Technology Officer at Eaton Corporation.

Michael Claus (BIE '99) began working as a Manufac-

turing Engineer for Graco Children's Products at the Macedonia facility in November. The facility makes Century and Graco-brand car seats.

John Domanski (MSEE '75) is now with Industrial Systems Technolgy.

Thomas A. Galvin (BChE '97) is a Network Support Specialist with Per-Se' Technologies, Health Data Services in Highland Heights, Ohio.

William Gruszka (BIE '75, MSIE '89) is Chief Information Officer for Southern Polytechnic State University in Marietta, Georgia.

Craig Hebebrand (BCE '82, MSCE '89) is project manager for the Ohio Department of Transportation's Innerbelt study. He was featured in an article titled "Ideas Diverge for Road Plan to Connect University Circle" that appeared in *Crain's Cleveland Business* this past winter.

Chelley R. Hopson (BME '93) is a full-time professional real estate agent.

Mohamad Hussein, P.E. (BCE '82) is Vice President of GRL and Associates, Inc., a consulting civil engineering firm and partner in Pile Dynamics, Inc., located in Orlando, Florida. He is a presenter of the Deep Foundations: Design, Construction & Quality Control seminar for ASCE.

Elain M. Lose (BME '92) is Engineering Group Leader for Aero Controlex Group.

Andrew Lux (BME '73) has been elected to the Board of Directors of Memry Corporation. Lux is President and Chief Operating Officer of Ciomec, Inc., which specializes in functional electrical stimulation and medical electronics.

James MacMillan, P.E. (BME '89) Principle at Bacik Karpinski and Associates,

recently obtained his LEED Certification, making him one of only nine Ohio LEED Certified Design Professionals. LEED Certification exams are administered by the US Green Building Council.

Paul L. Nowicki (MSChE '87) has been appointed Marketing Director of Propack Data's U.S. headquarters, a subsidiary of Rockwell Automation.

Michael B. Olex (MSEE '80) has been appointed Senior Vice President, Operations and Manufacturing of U.S. Genomics.

Joseph A. Williams (BME '70) was recently approved by the Cleveland State University Board of Trustees Committee on College Visiting Committees to serve on the Fenn College of Engineering Visiting Committee. Welcome! Williams serves as Director of Engineering for URS Corporation.

In Memoriam

John E. Alexandrou (BCE '74)
November 16, 2002

Robert Belknap (BSE '48)
January 27, 2002

Regis I. Campbell (BSE '54)
February 15, 2002

Louis V. Granger (BEE '42, JD '49)
January 6, 2002

Chester Kishel (BME '44)
Professor Emeritus of Industrial Engineering
September 4, 2001

William R. Lindquist (BChE '50)
April 29, 2002

Joseph C. Monastra (BME '52)
April 4, 2002 ■

Our special thanks to the Family of Regis I. Campbell who had memorial contributions designated to the Fenn College of Engineering.

What's New?

Return to:

Deborah Miller, Development Officer
College of Engineering
Cleveland State University
2121 Euclid Avenue SH 104
Cleveland, OH 44115-2214

Complete the form below or e-mail d.s.miller@csuohio.edu. 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 _____

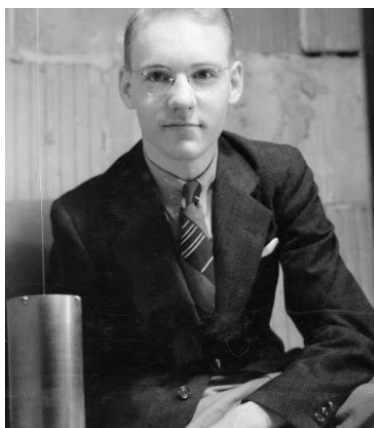
Job Title/Place of Employment _____

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

Fenn Tower Once Housed World's Longest Pendulum

Many alumni may fondly recall the work of sophomore engineering student, Walter Schaefer, in 1939. Schaefer, who received his bachelor's in mechanical engineering in 1942, had a dream to bring to Fenn, one of the most exact scientific instruments that it could get at that time, a Foucault Pendulum, named after Foucault, the French physicist who proved that the world revolved about an axis in 1851, with the use of a pendulum hung from the top of the Pantheon in Paris.

Working with Willard J. Poppy Ph.D., then head of the physics department, Walter built his pendulum from 211 feet of steel piano wire with a 40-pound bob at its end. The pendulum was suspended from near the top of Fenn Tower, hanging in an air-vent that went through the building into the basement. The pendulum could be viewed in the basement through a glass window.



Walter Schaefer (left) with his pendulum in 1939. Willard J. Poppy Ph.D. is pictured below.



The pendulum served several experimental uses, including telling time, determining the amount of sway of Fenn Tower, and studying other changes as the length of the wire changed in various temperatures. Schaeffer passed away in 1999, but his creation will live on in the memories of many graduates for years to come. The pendulum still hangs today in Fenn Tower, and was recently viewed by Fenn College alumni reunions. ■

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Fenn Focus

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