From the Director

Few of us can have escaped recent concerns regarding the price of oil, the impact of conflicts in the Middle East, and a growing awareness of the fragility of our small global home. Universities are not exempt from reflecting on these challenges, especially a school such as our own, with a long history of involvement with energy companies such as Exxon, Chevron, Mobil, and Shell (dating from well before their pre-merger days). In this issue of Olin Hall News, I’d like to share with you some of our interests in energy and the quest for sustainable development.

On the educational side, this issue will show you how we introduce our students to contemporary energy-related issues, such as the prospect of a hydrogen economy, in the freshman year and cap their senior-year experience with a biomass design project that explores the viability of making ethanol from corn. If you remember driving toward Ithaca for classes in the fall, I expect you’ll have an appreciation for the abundance of cornstalks maturing in the fields in upstate New York. It’s interesting to think of these fields as a source of energy rather than food. We have new research efforts that reflect our concerns with energy and the environment, from Don Koch’s study of air pollutants in flames and precipitation in clouds, to Brad Anton’s involvement in cellulose hydrolysis of cornstarch.

This theme is continued in our alumni section as we spotlight the career of Gus Noojin, whose B.S. in chemical engineering ultimately led him to a job as president of Shell’s US Power and Gas, and whose commitment to the school continues through his involvement on the Advisory Council. We will also share with you Shell’s support for an urgent need of ours: financial aid for graduate students.

Our young faculty members are already winning national acclaim that reflects our own optimism for their future careers. Abe Stroock won an Office of Naval Research Young Investigator award for his work on microscale "heat pipes" that could offer new approaches to the treatment of burns. Matt Delisa won a NYSTAR J. D. Watson Young Investigator award for his work on the transport of folded proteins across E. coli membranes to create novel biotechnology-based drugs. As you’ll read inside, Fernando Escobedo was the school’s first winner of a prestigious Alfred P. Sloan Fellowship. His promotion to associate professor with indefinite tenure was supported unanimously by the faculty this year. Kelvin Lee’s innovations in proteomics were recognized with the Provost’s Menschel Award for distinguished research scholarship.

We had a successful year recruiting Ph.D. students. This fall, 16 eager young students joined us from universities as distant as Imperial College London and IIT Delhi and as near as M.L.T. and Michigan. In the past two years, our graduate program has grown from 60 to 85, well on the way to our goal of 100 Ph.D. students by 2007. Undergraduate enrollment in Chemical and Biomolecular Engineering is still increasing, with 94 students taking Bill Olbricht’s Mass and Energy Balances course this fall.

Our emeritus faculty continue to enrich the school with their presence: Julian Smith celebrated his 85th birthday this year with us at the A. D. White House following Professor Gerry Fuller’s Smith Lecture. Ray Thorpe and Bob von Berg, both of whom scared us with heart surgery this summer, are well on the mend. Peter Harriot still works every day in Olin Hall. Their devotion to teaching is carried on by this year’s winners of college teaching awards: Dave Putnam, a young faculty recruit with precocious teaching ability, and Al Center, currently our sole industrial practitioner, for his exceptional teaching in Unit Operations, Design, and new courses in Business Development, Applications in Process Control, and Petroleum Refining.

Finally, a grateful thank you to all our alumni readers who do so much, large and small, to support the school. Like the Roman god Janus, you reflect both our past and our future. You remind us of the enduring quality of the enabling education provided in Olin Hall, and you continue to thrill us with your accomplishments in your careers. If you aren’t currently involved with the school but would like to take up the reins, send me an e-mail and just say, “How can I help?” I assure you, we will take you up on your offer.

Paulette Clancy
CBE Director’s Chair Endowed

Miss Austin Hooey was the only child of William C. Hooey '12, a chemical engineering alumnus who worked for the New Jersey Zinc Company from the time he graduated until his retirement in 1960. Mr. Hooey felt fortunate to have received financial assistance from his uncle to attend Cornell, and he attributed much of his success in business to the education he received at Cornell and the School of Chemical Engineering. Understanding how much that financial assistance had meant to his future, Mr. Hooey gave financial support to college students throughout his life. He died in 1963.

Miss Austin Hooey passed away in February 2004. At the time of her death she resided in Chatham, N.J. She was born in Palmerston, Pa., in 1922. After graduating from Mt. Holyoke College in 1943, she went to work on Wall Street as a securities analyst for Lehman Brothers. She retired in 1962, traveled extensively, and maintained an avid interest in civic affairs. Miss Hooey made her first gift to Cornell the year following her father's death and gave generously over the next 40 years, all in memory of her father. She was a member of the Cornell University Council from 1971 to 1977 and again from 1978 to 1981. Inspired by her father's example, she established the William C. Hooey Scholarship Fund at Cornell in 1998. The scholarship is awarded to chemical engineering students in the College of Engineering and to students in the College of Agriculture and Life Sciences who are studying animal science or planning to become veterinarians.

As early as 1993, Miss Hooey was considering a major gift to honor her father's memory. Several months before her death, she made it known that she had left a gift of more than $3 million to the School of Chemical and Biomolecular Engineering to endow the directorship of the school in memory of her father. She also left a sizable gift to the College of Veterinary Medicine to name the deanship there as a testament to her love for animals.

The university will hold a reception and dinner in honor of Miss Hooey's legacy on November 19, 2004.

Editor’s Note

As I approach my seventh year in the School of Chemical and Biomolecular Engineering, I reflect on the growth of this office as it relates to alumni.

When I first arrived I learned quickly the dedication and loyalty of the school’s alumni and strived to enhance the experiences they had during return visits to Olin Hall.

Through intimate dialogue with many of you I learned more about the history of the school and came to appreciate the memories you hold dear, such as the mural in the Rhodes Lounge, the rigor of the unit operations and design courses under the directorship of Dusty Rhodes, and, for younger alumni, DOTWs.

It is my sincere desire to continue to make your visits to Olin Hall a pleasurable experience. Attendance at special events in the school such as Homecoming, Reunion, and invited lectures has increased significantly over the past few years. I look forward to developing closer relationships with you and having the highest attendance ever for Reunion 2005. Some of you have contacted my office to find out how you can support the school for a class project at Reunion, and we are creating a few class efforts tailor to alumni's specific interests while still supporting the school's major initiatives. I encourage any other alumni who would like to engage in a class project for Chemical and Biomolecular Engineering to phone me or send an e-mail (607-255-7427, fk21@cornell.edu) and I will work with you to make this a memorable event. If you are interested in coordinating your class's reunion experience to yield a higher attendance of your classmates, I can also assist with this effort. It is always fun to see classmates you haven't heard from in years.

This is an open call for class cohesion and coordination. Let's work together to make Reunion 2005 one of the best ever and help guide the future of the School of Chemical and Biomolecular Engineering.

Best regards,

Felicia Kornegay

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New Electrospinning Process Leads to Rapid Formation of Nanofibers

By turning an experimental method of fiber spinning into a viable manufacturing process, Yong Joo has attracted the attention of researchers, the food industry, and agencies looking at the next generation of environmental sensors.

Joo, an assistant professor of chemical engineering, developed a process of electrostatic fiber spinning (called electrospinning) that gives him the ability to create fibers of submicron-scale diameters. They allow structures to be built into the nanofibers for specific applications. Whereas traditional fiber manufacturing uses mechanical force to create fibers that are between 5 and 10 microns in diameter, Joo's process, which uses an external electric field, routinely can turn out submicron-scale fibers between 100 and 500 nanometers in diameter.

The electrospinning process forms the fibers through a rapid whipping motion that results in a fibrous mat with randomly distributed fibers and a large surface-area-to-volume ratio. These nanoscale fibers have potential use in filtration, protective clothing, and biomedical applications.

Joo's research group has received funding from several companies and agencies interested in exploring the practical uses of his nanoscale fibers.

United Air Specialists and its parent company, Claircor, are funding Joo's research into creating nanofibers for filtration applications via a solvent-free process. Traditional filter media allow relatively large particles (microns in diameter) to pass through. But by adding electrospun fibers on top of the traditional filter media—like a spider web—Joo says, the filter can capture submicron-scale contaminants or dust without increasing pressure drop. A typical filter medium is cellulose, which is biodegradable.

Joo is also pursuing a process that would be even more environmentally friendly than dissolving polymers into an organic solvent. Normally, additional cost would be involved because of the need to recover the solvents and remove them. But instead of using a solvent at all, Joo wants to raise the temperature of the polymer directly to melt it and then electrospin it at that temperature. That method poses additional challenges, but Joo is tackling each of them.

Joo has received funding from Kraft Foods for his continuing work in the area of nanofibers, which has potential applications in both the biomedical and food science industries. By using self-assembling materials at the nanoscale level, he has been able to engineer shapes and structures—such as spheres and cylinders—into nanofibers. By removing select structures from the nanofibers, Joo can create porous fibers, which have a dramatically increased surface area, or a delivery system for chemicals, food additives, or other nutrients that could be released in a controlled manner. Joo can also create hollow porous nanofibers by creating a nanostructured skin layer and a core that is later removed. Such tiny hollow tubes could provide transport for chemicals or fluid; this area also interests Kraft Foods because of the possible applications for food additives.

"You can mimic vascular materials, for example, because of the large surface area and hollow channel with pores," he says.

Nanofibers could also be used as a template for cell growth. It's a biomedical technology known as scaffolding. "You can easily fool the cell to think that it's on a real living organism, because of the nanofiber's similar scale to structures in the body (size and curvature), to which it can then anchor and grow," says Joo. The nanofiber is made of a biodegradable and biocompatible material, so that it could degrade after it is no longer needed, without harming the body. Joo likens it to self-dissolving sutures. "You may have a wound dressing that's also a scaffolding for new cell growth," he says.

In another area, which is being funded by the U.S. Department of Agriculture, Joo is making a new breed of incredibly sensitive sensor material. He describes the two important requirements for sensing materials: a high selectivity to specific chemicals or molecules and a high sensitivity so that even a tiny amount of specific chemicals can be detected. By incorporating nanoscale sensor materials in Joo's nanofiber mats, the next generation of sensor assemblies could bring a whole new level of detection to the science of biohazard sensing technology.

The high surface area-to-volume ratio of Joo's electrospun fibrous mats shine in this area, too, because if you're looking at a specific material, it can be engineered right into the nanofibers themselves. The nanofiber fibrous mat can even be hooked directly to a surface-oxidized silicon substrate that can measure resistance variations, creating a compact and highly efficient sensing module. A similar technology could be used for liquid detection, in which the nanofibers could be processed into a swallow like a cotton ball, and then swabbing something like the surface of an apple could quickly detect the presence of a pathogen such as E. coli through a response such as a color change on the swab. The sensing swab would be biodegradable and easily disposed of.

Joo says that when he came to Cornell three years ago, he never imagined that he would be working with industries, agencies, and companies on the development of real-world products and technologies. His background is in computational and theoretical work: modeling, simulation, and numerical analysis. He initially set up experiments to give him a "better feel" for the processes he was trying to simulate. The subsequent electrospinning experiments turned out to be fascinating. Joo says, and he realized that these experiments were a good platform for other researchers at Cornell. "There are many researchers here who design and devise novel materials in small quantities because it's in an academic setting, and they want to test out their materials," he explains.

"But often, there's no way of testing these materials in a conventional way—normally, a large amount of real material would be required for testing. This electrospinning process requires only a small amount of material—only a gram is needed for this testing surface area, and that's enough to characterize it and see what kind of application it can have."

Joo is now collaborating with researchers in materials science and in textiles, where researchers find new applications for fiber science. "I'm sitting in the middle as a chemical engineer who will process this," he says of his role. He takes feedback from materials scientists and applies their findings to real systems—for which the textiles researchers then give him guidance. "So it's kind of a three-body collaboration," he says. "Materials science, processing, characterizing, and applications."

Joo is working with several students in his research, including seven Ph.D. students and two master's degree students.

"—Joe Willinsky"
CBE Faculty Team Collaborates on Pollution Studies

Don Koch, the M. L. Hart Professor of Chemical Engineering, has taken his background and research in fundamental atmospheric sciences and added a collaboration with Lance Collins, a professor of mechanical and aerospace engineering who is a member of the field of chemical and biomolecular engineering. The result is a growing thrust area that aims to increase our understanding of air pollution, particle behavior, and even meteorology.

Koch and Collins are currently working together on pollution studies and pollutant reduction research. Both are members of the Complex Fluids research group and are also doing studies in the Energy and a Sustainable Environment research area.

Much of Koch's work looks at the makeup and behavior of aerosol particles, which include everything from dust and precipitation in the atmosphere to sprays and powders and particular air pollutants. Air pollution is created by incomplete combustion processes that create polyatomic hydrocarbons that collide with each other, forming into larger and larger molecules. Eventually the molecules become large enough to be classified as soot particles. Koch studies the subsequent growth of these particles as the particles collide with one another in a gas flow. Koch and Collins have discovered that turbulence in flow fields causes particles to cluster in certain areas so they collide much more frequently than one would expect based on a statistical treatment of a homogeneous aerosol.

Applications of this research include better understanding the behavior of clouds and how raindrops form. Natural aerosols play a large part in energy management of the planet—they scatter radiation, affect the energy input of the sun, and act as condensation nuclei in the process of cloud formation. Cloud cover of the planet plays a large role in modulating the incoming energy from the sun as well as losses from the earth.

There is a long-standing question in the field of meteorology, Collins explains, about how clouds evolve. The microphysical processes that take a cloud from its initial formation to full rain happen much faster than predicted by current cloud models. Therefore, typical models include empirical weights that speed up the prediction process, although a gap remains in the fundamental understanding of what happens.

"When the droplets form, they are initially nucleated at a very small, submicron size," Collins explains. A classic series of experiments suggests that until these droplets grow to a size of between 10 and 20 microns, they will not be able to coalesce efficiently, and that at 20 microns and larger, they collide easily and can grow quickly in size. The knowledge gap lies between their nucleation size and their coalescing size and how the droplets grow during that period.

"In the absence of coalescence, the only way that they can grow is by condensation," Collins explains. While water vapor in the air can condense onto these droplets (because cloud formation exists at an altitude high enough and at a temperature low enough to allow this), this still cannot predict the evolution to rain.

Collins and Koch hope that their continuing research can shed more light onto what has become a hot topic in the turbulence community—one that could explain other processes, such as pollution and pollutant reduction, with more clarity. Collins notes that one of the challenges is that their simulations take place in a system that corresponds to approximately a 10-centimeter cube in real atmospheric units.

"Since the atmosphere is really many kilometers in size, you have an extrapolation problem that's very serious," he says. "Trying to figure out what really goes on in the atmosphere is still unclear."

Koch points out that traditional cloud measurements in meteorology, made by essentially sticking a sensor onto the exterior of an airplane and flying it through a cloud, cause their own set of problems. Since the effect the aircraft has on the readings being taken are very difficult to quantify.

Their research also studies and takes into account that most studies of turbulent coagulation have involved particles suspended in liquids; they cannot directly be used to estimate rates or behavior of aerosol particles. These challenges are being met and distilled through Koch and Collins's continuing collaboration on simulation and theory. Koch says that their experience with fluid mechanics and connections with chemical engineering bring a formidable combination of scientific expertise to bear on these areas.

To test their predictions in the laboratory, Koch, in collaboration with Claude Cohen in CBE, has developed an experiment in which aerosol drops grow due to a turbulent flow. The drop size is measured using light scattering. Collins is collaborating with Hu Meng at the State University of New York at Buffalo on an experimental study of the clustering particles in turbulent flows. He has also received funding from NASA to develop digital three-dimensional imaging technology that will measure and study particle positions in turbulent flow fields.

"Koch explains how, through their work together and their collaborations with others, he and Collins are looking at both the large picture—how particles behave in turbulent flows and what their relative velocities are, for example—and a much simpler picture, such as what individual particles or drops "see" when they're colliding with each other. He likens it to someone going outside and discovering that it's raining. "You don't know that there's a front coming through in Nebraska and there's another front coming up from the Gulf of Mexico and colliding with it," he says. "But you see that it's raining here."

Similarly, a couple of micron-sized particles may be about to have a collision, and they may form a larger particle or they may have a near miss, but how the two particles don't "see" the whole turbulent flow—they see just the local behavior. "So by distilling from the full simulations and using some theory, we can say what the flow field seen by particles is," Koch says. "And then we can apply much more into the physics of the micron-scale particle interaction, including intermolecular forces and the discrete molecular nature of the gas. If you can start to put that level of sophistication into how you treat the collisions, you can determine whether you will have coalescence or not."

In a related area, Koch and Collins's research may have an impact in an area where the creation of particles is something desirable, rather than something to lessen. Processes like the creation of carbon black, which is used in the manufacture of rubber as a reinforcing agent, could benefit from a greater understanding of how particles form together in clusters and how the size and distribution can be controlled.

—Joe Wilensky
2004 ChemE Casino Night Marks Milestone

This past April marked the 10th anniversary of Casino Night, hosted by T. Michael Duncan, associate professor of chemical engineering. The event is informally tied to the key senior course—the capstone laboratory course (Unit Operations Laboratory) and capstone design course (Chemical Process Design), both of which simulate a professional environment. Experiments and design projects are administered by a fictitious company, Olin Engineering. Seniors serve as entry-level technicians, junior engineers, and M.Eng. students serve as managers in training. At the end of the semester, Duncan hosts Casino Night, a company party, for employees and managers.

Guests begin with $1,000 in chips, which they attempt to increase by playing various table games. After the games, the evening’s guests use their winnings to bid in an auction of “fabulous prizes”—chiefly memorabilia from Ithaca (especially Collegetown) and Olin Hall.

The party educates as well as entertains. Students have an opportunity to practice the fine points of blackjack, such as when to split pairs and when to double down on soft hands. Seniors learn that although the frenzy at a craps table can be intimidating, craps is easy to learn and fun to play. And one’s play can be extended by making good bets (such as backing a line bet with an odds bet) and avoiding poor bets (the field). Students also learn just how fast $1,000 can disappear.

Since its inception, ChemE Casino Night has offered blackjack, roulette, craps, and poker. Recently added games include Let It Ride and baccarat. For a few years pari-mutuel betting on Thoroughbred racing was offered. Each year a dedicated (and skilled) group of graduate students volunteers to serve as croupiers. It is always impressive to see the apparent ease with which the Ph.D. and M.Eng. students master the subtleties of craps and baccarat and their stamina behind the tables.

The event was first held in April 1992 under a slightly different format—a party for ChemE faculty and guests at which seniors were recruited to serve as dealers. The inaugural dealers were Tim Slicker, Aileen Smith, Meg Valentine, Lilly Chen, Sharon Boyle, and See-Eng Phan. In April 1994, Duncan invited the ChemE senior class and recruited graduate students for dealers. The party has grown steadily in popularity, and in April 2003 Duncan hosted 118 guests and dealers.
The fabulous prizes auctioned each year are carefully selected for each graduating class, but some prizes have become traditions. A popular prize is to buy the distinction of Best Gambler of the Class (which includes a certificate suitable for framing and presentation at the Senior Dinner).

1994 (records lost)*
1995 (records lost)*
1996 Darin Moberg
1997 Susan Lee
1998 Robert Cameron
1999 Tara Fiegel
2000 Tom Richards
2001 Stephen Bernal
2002 Benjamin Davis
2003 Emily Miles
2004 Jason Berman

Prices provided by faculty consistently bring fevered bidding.

An afternoon of golf with Ken Ackley was among the most popular of the prizes. The participants included the following (comments by Ken):

1996 (records lost)*
1997 Mary Gasco had never played and I beat her easily. (Tom Dzarmata) and Mike Murdoch challenged Ken in a separate match.)
1998 Gretchen Shaw beat the living hell out of me.
1999 Tara Fiegel and Kristy Bullard never played and I won handily.
2000 Tom Richards, with guests Cate Bierne and Mike Ivan
2001 Kristina Carlson, with guests Evan McCaskey and Karen Chastain
2002 Tiffany Wong
2003 Andrew Vogel

The series ended in a tie: Ken won four games and the senior class delegate won four games.

Ride around Watkins Glen Racetrack with Brad Anton. This is another long-standing and ongoing prize—and the one that garnered the highest bid in 2004. Unfortunately, our records are incomplete. Perhaps our alumni can fill in the blanks:

1996 Kerri McDermott
1997 (records lost)
1998 Scott Meyers
1999 (records lost)
2000 (records lost)
2001 Debora Wang
2002 Yueh-Chia Sin Fai Lam
2003 Stephanie Johnson
2004 Jason Konopack

This year two new prizes were offered by younger faculty:

Brunch for a senior and guests at David Putnam's house. Rob Ferris '04 and guests arrived at Putnam's house one Sunday morning in their FJs carrying empty coffee cups.

A night of No-Limit Texas Hold 'em, complete with dealer and refreshments, offered by Matthew DiLisa. Peter Makowskyj '04 and his guests enjoyed this prize. The identity of the evening's winner is still a secret.

Of course, the success of the auction depends on creativity in planning and enthusiasm in hawking. The following organizers and auctioneers have contributed to the fun:

1996 Marty Palma
1997 Jeff and Heather Pelham
1998 Scott Meyers and Cindy Jaros
1999 Robert Penty and Ory Holtzman (organizers), and John Murphy and Julie Golladay (auctioneers)
2000 Tom Richards and Merle Smith
2001 Colleen Brosnan and Dina Agraides
2002 Chris Johnson and Tara Green
2003 Tracy Elsperman and Elizabeth Hastings
2004 Matt Ritz and Michelle Berner

*Readers who recall the names of the winners, please send the names to Professor Duncan. We will print them in our next issue.

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Gerald Fuller Delivers 2004 Julian C. Smith Lectures

Gerald Fuller, professor in the Department of Chemical Engineering at Stanford University, delivered the 17th annual Julian C. Smith Lecture in the School of Chemical and Biomolecular Engineering on Monday, April 19, and Tuesday, April 20, 2004. Fuller’s talks were titled “Complex Fluid Interfaces: Rheology on the Edge” and “Connect the Dots: Wetting, Adhesion, and Rheology of 2D Suspensions.”

Professor Fuller received his B.Sc. degree from the University of Calgary in 1975 and his Ph.D. degree from the California Institute of Technology in 1980. Fuller has dedicated his career, which began at Stanford University in 1980, to advancing the science of rheology and in particular to the development of optical and mechanical rheometric methods to elucidate the structure and dynamics of complex liquids and interfaces. The techniques pioneered in his laboratory have made accessible new, automated optical probes of structure that take advantage of the many interactions of light with flowing matter: polarimetry, light scattering, fluorescence, Raman scattering, and reflection. Fuller also is responsible for the design of an interfacial stress rheometer that has achieved the highest sensitivity in the measurement of interfacial material functions. The result of his work has led to the establishment of new classes of instrumentation capable of fast and sensitive responses to flow-induced changes in the field of rheology. In recognition of his contributions to the field of rheology, Fuller received the Bingham Medal from the Society of Rheology in 1997. In addition, he served as president of the Society of Rheology and is a fellow of the American Physical Society.

The methods originating from the laboratory of Gerald Fuller have found wide application to problems involving polymeric liquids (melts, solutions, copolymers, and blends), surfactant liquids, suspensions, liquid crystals, and most recently, fluid-fluid interfaces. These methods also enjoy wide acceptance in industry and academia and are in use in laboratories throughout the world. Furthermore, they form the basis for the commercial optical rheometers currently available. These techniques and the fundamental principles underlying these measurements are described in his book Optical Rheometry (Oxford University Press). He is currently under contract with the same publisher to produce an additional book summarising advances in interfacial rheometry titled Complex Fluid Interfaces.

Fuller was a postdoctoral scholar at the Sadron Institute, Strasbourg, France, and has been a visiting professor at AT&T Bell Laboratories, Leuven University, Leuven, Belgium; EPFL, Lausanne, Switzerland; Ecole des Mines de Paris, Nice, France; University of Strasbourg, Strasbourg, France; and Kings College, London.
John Carberry '63 Delivers 10th Raymond G. Thorpe Lecture

John Carberry, director of environmental technology for DuPont, delivered the 10th Raymond G. Thorpe Lecture in the School of Chemical and Biomolecular Engineering. His talk, "Industry and the Environment: Changing Paradigms," was given on Thursday, October 30, 2003, in Olin Hall on the Cornell campus.

At DuPont, Carberry is responsible for providing technical analysis of existing and emerging environmental issues. Since 1988, he has been involved with initiatives to advance DuPont’s environmental programs through changes in products, recycling of materials, and renewal of processes with an emphasis on reducing waste, combined with affordable, publicly acceptable technologies for the abatement, treatment, and remediation of environmental pollution.

Carberry previously served as chairman of the chemical engineering advisory board at Cornell, as a fellow of the American Institute of Chemical Engineers, and as chairman of the National Academy of Sciences Committee on the Destruction of the Non-Stockpile Chemical Weapons. He also is a founding member of the Green Power Market Development Group and a member of the National Academy of Engineering Committee on Technologies for Sequestering Carbon Dioxide.

He graduated from Cornell in 1963 with an M.S. in chemical engineering. He also holds an M.B.A. from the University of Delaware.

The Raymond G. Thorpe Fund enhances undergraduate education by bringing industrial and academic visitors to the School of Chemical and Biomolecular Engineering. It was established in 1989 by alumni and friends to honor Thorpe on his retirement after 39 years on the faculty.

Chemical and Biomolecular Engineering Advisory Council

The Advisory Council of the School of Chemical and Biomolecular Engineering was created in 1981 to assist in the development and long-range planning for the rapidly growing school. To continue the tradition of excellence in professional programs while expanding graduate research programs, Julian C. Smith, then director of the school, asked representatives from industry and academia to join in giving the school "the guidance from knowledgeable people who have an interest in the quality of our future—and who can help us in charting our directions."

Advisory Council members serve a three-year term and convene once a year, meeting with faculty and students of the School of Chemical and Biomolecular Engineering and administrators of the university and College of Engineering. This year’s meeting was held on October 1 and 2.

Current Members

Rakesh Agrawal  
Air Products Fellow, Air Products and Chemicals, Inc.

Timothy J. Anderson  
Professor, Chemical Engineering Department, and Dean, College of Engineering, University of Florida

Leon B. Arziano  
Visiting Professor, University of New Haven, School of Business

Robert A. Ganz  
Senior Adviser, ExxonMobil Chemical Company

Pablo G. Debenettli  
Class of 1970 Professor, Department of Chemical Engineering, Princeton University

Juan J. de Pablo  
Howard Curtier Distinguished Professor, Department of Chemical Engineering, University of Wisconsin, Madison

George Georgiou  
Joan and Keys Curry/Cullen Trust Endowed Chair in Engineering, Chemical Engineering Department, University of Texas at Austin

Charles A. Gray  
Vice President, Technology, Cabot Corporation

Ann L. Lee  
Vice President, Chemical Technology and Engineering, Merck & Co.

Carol L. Nolan  
Associate Director, Quality Technical Investigations, Amgen

A. Y. (Gus) Nolkin III  
Past President and CEO, Shell US Gas and Power

Dennis C. Priewe  
Gulf Professor of Chemical Engineering, Center for Complex Fluids Engineering, Department of Chemical Engineering, Carnegie Mellon University

Charles M. Shafran  
Vice President, Strategic Planning for Pfizer Global Manufacturing, Pfizer Inc.

Jefferson W. Tester  
H. P. Meissner Professor of Chemical Engineering, Chemical Engineering Department, Massachusetts Institute of Technology

Matthew V. Tiralii  
Richard A. Austill Professor and Dean, College of Engineering, University of California, Santa Barbara

Robert A. Ware  
Senior Development Engineer, Rohm and Haas Company

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CBE Reunion Does It Again

On a perfect June day, we celebrated Reunion 2004 at Olin Hall with classes 4s and 96. Dean Kent Fuchs and Director Paulette Clancy were available to mingle with our alumni, followed by a talk by Al Center '65.

Next year we look forward to hosting classes 0s and 5s. Plan ahead: come back to Olin and see how things compare with when you were here. We promise a good time for all!

Bernard Horton '57 Honored by American Dairy Products Institute

The American Dairy Products Institute honored Bernard Horton '57 at its annual conference in April for his contribution to the dairy industry during his 36-year career. Horton dedicated his career to leading-edge technologies and products beginning in the aerospace industry (the Boeing Company and Avco Corp.) with the development of the first composite wing structure for commercial jetliners, the first ablative heat shields for ICBM's and the Apollo vehicle, and commercial spin-offs for aerospace materials. He was a member of the team that developed and built the world’s first water pollution control (WPC) plant (in New Zealand), first tandem whey ultrafiltration (UF) and reverse osmosis plant (Crowley Foods), first continuous WPC plant (in France), and several of the earliest milk UF plants, including the first commercial UF yogurt plant. He later became vice president and general manager of Abcor's Membrane Equipment Group.

His own company, Horton International, focuses on advanced separation and conversion processes for whey and milk, markets for new dairy products, and dairy products price forecasting. Horton has been active on the U.S. national committee of IDF for 18 years. He has also been a member of the American Dairy Products Institute technical committee for more than 10 years. He was on the organizing committee for the 1997 and 2001 International Whey conferences and is co-chair of the 2005 conference. He has more than 50 publications on membrane processes, the use of whey, and whey processing.
Alumni Notes

40s
Herbert D. Ted Doan
B.S. '45, Michigan, was featured in the Beta Theta Pi magazine as the spring 2004 quarterly's "Man of Principle." The article names him as "Michigan's elder statesman" and quotes his philosophy: "The way to lead people is to trust people." Doan is lauded by his protégés as "a man who believes in character and doing the right thing." He is chair of the Herbert H. and Grace A. Dow Foundation.

John Drew, B. Chem E., '46, New Jersey, finally closed down Drew Engineering Inc., after 25 years. The company designed 150 distillation plants for solvent recovery and wastewater stripping. Drew states that his Cornell Chem E. education was a great asset in his daily efforts.

50s
Lowell Buckner, B. Chem E., '51, Tennessee, is retired and currently writing family chronicles.

Bernard S. Horton, B. Chem E., '57, Massachusetts, was presented with the American Dairy Products Institute's 2004 Award of Merit for his significant contributions to the dairy industry during his 36-year career.

60s
Lloyd A. Goettler, B. Chem E., '61, Ohio, continues to serve as a faculty member at the University of Akron in the Department of Polymer Engineering.

70s
John T. Thompson, B. Chem E., '76, Indiana, this year became the first African American chairman of the board of governors of the Indianapolis Museum of Art. Thompson believes that everyone should have equal access to art. "We need to do a better job of letting the community know what we have here...and reach out on a regular and consistent basis," he says. Thompson received his MBA at Columbia and then worked in the business world, including the Indianapolis-based Mays Chemical Co.

James M. Hanrahan, B. Chem E., '79, was appointed chairman of Veridium's audit committee. He is currently SVP and CFO of CDI Engineering.

80s
Malcolm D. Noriega, B. Chem E., '84, Massachusetts, sends regards to classmates and professors. He made the transition to software engineering several years ago after what he described as too much "face time" in the unemployment lines.

Sarat RaviPati, B. Chem E., '89, California, a strategic sourcing specialist with Chevron Texaco, negotiates large contracts for the company. She has a three-year-old son and a one-year-old daughter and enjoys life in the Bay Area. She notes that "DOTW days are missed!"

90s
Lisa Perronne, B. Chem E., '96, Wisconsin, recently completed her MBA at the University of Wisconsin Grainor Center for Supply Chain Management. She is currently employed by Gulfand Corp.

Paul Baranello, B. Chem E., '97, California, married Mitsu, his sweetheart from Cornell, on September 28, 2002. He writes that they "liked going to school together so much that, after our wedding, we decided to apply to business school together and get our MBAs." Both were accepted at UCLA and are reportedly having a great time.

Dan Birch, B. Chem E., '98, California, left HP San Diego after five years to attend law school at the University of Pennsylvania.

00s
Yiwen Zhang, B. Chem E., '01, Massachusetts, completed her M. Eng. in materials science at MIT this year. She says that, to her surprise, "some of the classes were easier than at Cornell."

Brendanarbucke, MS '00, Massachusetts, and his wife, Rebekah, welcomed their second child, Caleb, in May 2004. Brendan left Intel in 2003 and is now working for the Rogers Corporation.

Weiwei Luo, Ph.D. '02, has joined Corning Inc. as a research scientist. She and her husband have two sons (aged three and one).

Seema (Anita) Sinha, B. Chem E., '02, M. Eng., Chem E., '03, Connecticut, has just finished her first year of law school at the University of Connecticut and writes, "I really like school so far. I do miss Cornell, though, and think of all of you often." She writes that law school courses are "definitely easier than Cornell Engineering classes! I definitely think that Cornell Engineering prepares students for any other kind of academic challenge."

Luis Baez, Ph.D. '96, Massachusetts, is now working for Intel. He and his Cornell sweetheart married in 1999. They have two children, Luis, four, and Ana, one.

Mandy Ma, B.S. '02, M. Eng., '03, California, now works for AMG and is excited to be living in California.

Nidhi Mehta, B. Chem E., '01, Pennsylvania, started at the University of Pittsburgh's School of Medicine this fall after three years at Merck. She spent her past summer in Mumbai visiting family and getting involved in a community service organization that educates Indian youth on the impact, prevention, and treatment of HIV/AIDS.

In Memoriam
Bryce I. MacDonald Jr., '45, Asheville, N.C., passed away Monday, March 8, 2004, at his home.


Class of 2004 Destinations

Fourteen members of the class accepted employment at 12 different companies. The largest employers were L'Oréal USA (2) and Schlumberger (2). The average starting salary was $54,940. These recent graduates are employed in the following areas: consulting/engineering (3), consumer products (3), petroleum products (3), pharmaceuticals (3), biotechnology (2), and government service (1).

Only four students were seeking employment at the end of June. This is a lower percentage (9 percent) compared with that of the past two years, when approximately 30 percent of the class sought jobs. Of the students who obtained employment, 43 percent received one other offer. This is the largest number of offers reported since the class of 2000.
Profile: Class of 2004

On Sunday, May 30, 46 bachelor of science degrees in chemical engineering as well as one in an independent major were awarded during our school's diploma ceremony. Approximately 416 students, family, friends, and faculty attended the ceremony and buffet lunch that afternoon. Each design group—ethanol from corn, iso-octene, and ethylene to styrene—was recognized for the presentations it completed in our senior capstone course Chemical Process Design.

Of the Class of 2004, 25 are continuing their studies in graduate school: 12 have begun chemical engineering Ph.D. programs, 11 have joined our M.Eng. program, one entered a chemical engineering M.Eng program at another college, and one is attending law school.


Not pictured: Jason Chandler, Kel Kushi, Pete Makowensky
In this issue two of our alumni reflect on their careers and offer advice for our current students.

Gus Noojin '69

I had the pleasure of meeting Gus Noojin a few years ago when he visited Cornell. At that time he was president and CEO of Shell US Gas & Power and served as a director of Shell Petroleum. We spoke briefly about several pressing initiatives in the CBE school as well as in the College of Engineering. I instantly felt Mr. Noojin's interest and commitment to many college initiatives.

Soon after our meeting, Noojin was asked to serve on the School of Chemical and Biomolecular Engineering Advisory Council. He has an abundance of industry experience and wisdom, which has enabled him to be a valuable council member and CBE alumnus.

Noojin retired on June 30, 2004, after 35 years of service with Shell. In his last position, he was responsible for Shell's downstream gas interests in the United States, including gas transmission, liquefied natural gas (LNG), and power generation. In addition, he served as chairman of the board of Coral Energy Holding LLC, was director of Tenaska Gateway Partners, LTD, and was responsible for Shell's investment in Enterprise Products Partners L.P. Recently, he was most active in developing Shell's LNG business in the United States.

During his career Noojin spearheaded major transformations in several of Shell's U.S. businesses. Before heading Shell Gas & Power, he was president of Shell Oil Products and led the negotiations for the acquisition of Texaco's refining, marketing, and transportation interests in the United States. Before leading Oil Products, Noojin served on the Chemicals Executive Committee and was responsible for the divestment of the Epoxy Resins and Elastomers Businesses.

Noojin and his wife, Sandy, plan to remain in the Houston area. In addition to golf and travel, he plans to expand his role with not-for-profit organizations and take on a corporate board position. He also hopes to spend more time giving back to Cornell University.

So here's "Up Close and Personal" with Gus Noojin.

Felicia: You rose from an entry-level position with Shell to become president of their energy business with an undergraduate degree in chemical engineering from Cornell. What qualities did you think were important for students to succeed in this field?

Gus: Although I didn't pursue an advanced degree, I never stopped learning. The energy business has seen tremendous change during my 35 years with Shell. Adapting to these changes, whether technical, social, or political, has been stimulating for me. Second, the ability to deal with people at all levels and across cultures has been vital. My formula is simple: treat people with respect and they will respond accordingly. While delivering results consistently is key to progressing in any company, I think I was also in the right place at the right time once or twice.

What skills or "book knowledge" learned at Cornell sustained you most during your professional career? Were there specific chemical engineering classes that you think were particularly useful in terms of theory and practice in your industrial career?

The most valuable skill I learned at Cornell was problem solving. The basic approaches I learned to solve engineering problems were readily extended to commercial or organizational issues. Especially helpful for me was the ability to break a complex problem down into manageable parts. Prof. Thorpe's Mass and Energy Balance class comes to mind as the seminal problem solving experience for me.

What professor stands out most in your mind and why?

This is a difficult one. I'd have to say Prof. Scheel was the top teacher I had. Although he obviously had extensive depth in his field, he had a way of communicating with students on their level in order to teach the basics. He also had a gentle way of checking to be sure his students understood and could apply the material he presented.

What hobbies or extracurricular activities did you enjoy most during your time at Cornell?

As the readers will appreciate, Cornell chemical engineering students don't have much spare time. My only significant extracurricular activity was my fraternity (ΣAE), where I held several offices, including president my senior year. This experience was the perfect complement to my academic work. I learned a lot about organizations and leadership from the experience. I still have many good friends from the fraternity whom I have kept in contact with over the years.

The College of Engineering is about to begin a research initiative centered on energy and a sustainable environment. Given your frontline experience with the energy business, what hopes and challenges do you see for such an initiative? In what ways can the unique educational background of chemical engineers best be leveraged in this initiative?

As a veteran of the energy industry, I am delighted to see Cornell take this initiative. It is one of the most important and complex issues of our time. The main challenge is to see if it is the right focus. There are many problems that could be worked on, but which ones could really make a difference in a few decades? Industry has the ability and the incentive to solve some of the problems, so which problems are best suited for academic research? Another challenge will be for Cornell to differentiate itself from other institutions working in the field. In short, the challenge is for Cornell to do the best work in the right areas.

The social and political dimensions of the sustainable energy issues are as challenging as the technical dimension. My hope is that Cornell can find ways to build bridges between the various dimensions of the issue.

In your business, you had to interact with federal agencies, reconciling Washington's energy policies and technical engineering challenges. How might an engineering undergraduate learn more about the workings of government, an aspect of professional life that we rarely incorporate into our curriculum?

This is a great question. I learned this mostly on the job. For an undergraduate, a summer job with a legislator, a lobbying organization, or a regulatory agency would be good if you can find one. There are also a number of nongovernmental institutions in Washington that offer programs to learn how the federal government works in practice. This might also be possibilities for summer jobs.

What advice would you give to the Class of 2005 in choosing a career with an energy company?

I would advise students to check out their assumptions about the energy industry. I find most students view the energy industry as an unattractive place to work—low tech, stagnant, environmentally and socially insensitive. In my experience, nothing could be further from the truth, and the facts, I believe, bear this out if you take time to learn. The industry has huge problems to solve and is talent hungry right now. This spells opportunity. As far as a specific company is concerned, look at the people you would work with. It is likely they will reflect the culture of the company. If you can see yourself working with these people, chances are you'll like the company.

Is there any additional information you would like to share with our students?

Make the most of your Cornell experience—it is a rare opportunity. The things I learned at Cornell—inside and outside the classroom—have served me well.

—Felicia Kornegay
Padmasree Warrior M.Eng '84

I conducted a phone interview with Ms. Padmasree Warrior on a rainy Friday afternoon. Often I wonder how a person will respond during a busy workday, and Warrior was like a ray of sunshine on an otherwise gloomy afternoon. She was very down to earth and welcoming. I hope you enjoy “Up Close and Personal” with Padmasree Warrior as much as I did.

Warrior is senior vice president and chief technology officer for Motorola, with responsibility for Motorola Labs, the global software group, and emerging stage businesses. She leads a global team of 4,600 technologists, prioritizing technology programs, creating value from intellectual property, guiding creative research from innovation through early-stage commercialization, and influencing standards and roadmaps. She also serves as a technology advisor to the office of the chairman and to the board's technology and design steering committee.

Before assuming her current position in January 2003, Warrior was corporate vice president and general manager of Motorola's energy systems group and was responsible for profit and loss, sales, marketing, engineering, and manufacturing. She also was general manager of ThoughtWorks, Inc., a wholly owned subsidiary of Motorola, where she led the commercialization evaluation team related to compound semiconductor materials research.

Warrior was previously corporate VP and CTO for Motorola’s Semiconductor Products Sector (SPS). She led SPS’s global research and development organization and was responsible for its technology strategy and embedded systems solutions. A “Motorolan” since 1984, Warrior has held many leadership positions within the company, was appointed vice president in 1999, and was elected a corporate officer in 2000.

Warrior received an M.S. degree in chemical engineering from Cornell University and a B.S. degree in chemical engineering from the Indian Institute of Technology (IIT) in New Delhi, India. She served on the Texas Governor’s Council for Digital Economy and is a member of the Texas Higher Education Board review panel. She was one of six women nationwide selected to receive the “Women Elevating Science and Technology” award from Working Woman magazine in 2001. She received the Immigrant Achievement Award from the American Immigration Law Foundation in 2003 and was selected as a Distinguished Alumni by the Indian Institute of Technology in 2004. She serves as an external director of Ferro Corporation.

Felicia: Please tell us about your career path between graduate school and becoming CEO of an electronics company, Padmasree. At Cornell for I did my master's in polymers science under Dr. Ferdinand Rodrigues, who is now retired. My research was sponsored by Kodak, and I was working on light-sensitive polymers.

When I graduated I joined Motorola in the semiconductor business in photolithography area in IC fabrication. My research had a lot of relevance to the work I did when I started my career. From photolithography I moved to reactive ion etch and then quickly in my career became the manager for advanced process engineering in semiconductor fabrication. From there I moved to research and led the development of RF LDMOS technologies, which are used in power amplifier applications. The program I led was transferred from concept to market in a record nine months. And then that led to the development of RF silicon technology research and development. Next I ran operations for R&D and later took over the most advanced CMOS device development. From there, I became the CTO for Motorola’s semiconductor business. Finally, I made the transition to running a large business and am now back in R&D as CTO of Motorola.

What has been the long-term value of your background in chemical engineering and having an advanced degree?

There was a strong chemical engineering materials science application the first eight to nine years of my career. Everything I did in semiconductor process engineering was based on chemical and material science. Many of the undergraduates and graduate courses I took played an important role in the first few years of my professional career, and then I diversified.

How did you keep sane during graduate school? Did you have any hobbies or extracurricular activities?

Actually, I had a huge base of friends on campus. I lived in Schuyler House, an international residence hall. We had students from many countries such as India, Puerto Rico, Denmark, China, and Malaysia. We had an interesting hobby in which we formed a gourmet cooking club. Five of us in the group took turns cooking each day. It was a great way to eat and socialize. We were all from different disciplines. I remember at least one of us was in sociology, and two of us were engineers. I later found myself stressing over the meals I would prepare. We all considered ourselves gourmet cooks and tried to outdo the others. It became quite competitive but remained fun. One of the people in our group worked at Burt's and used to bring home leftovers, which was always fun, too.

In the time since you graduated, the School of Chemical and Biomolecular Engineering at Cornell has sent a significant fraction of its graduates (B.S. and graduate students) to electronics industries. Do you expect the skill set characteristic of ChE's to remain of value to electronics industries? And how might you envision the school of the future to make our graduates more desirable in the future?

Forward thinking is crucial over the next 10 years or so. Traditionally we think of chemical engineering as petroleum pipes and gas refineries. I see a lot of shifting of the principles. This is not to say we will not be building refineries or gas processing units, but the future will require us to also apply chemical engineering principles at the nano scale—fine particle engineering, new display technologies and so forth. All require fundamentals in chemical engineering. I think the future will be very cross-disciplinary—a combination of principles in tradition chemical engineering, plus biotechnology, plus nano physics, etc.

Have you had to face any special challenges being a woman executive? How was your education, based on your own experiences, what advice would you give young women entering the workplace with ambitions to reach a position as important as your own?

Obviously there are challenges when the numbers are small in industry, and I'd like to see many more women get into engineering. Once you seek to enter the workforce my advice would be to have confidence in your capabilities. Do not let the fact that there aren't many women become a deterrent. Take opportunities as they present themselves. One can never predict where one will go. I never planned when I started my career that I would be CEO of a major company. One must also become an expert in one area. Ultimately people recognize you for your knowledge. Treat the fact that you are a woman as an advantage rather than a disadvantage.

What advice would you give undergraduate students faced with the choice of an internship or pursuing a graduate degree?

Money or knowledge? That can be a tough one. A graduate degree is definitely beneficial. In addition to the extra education, one obtains a higher level of maturity. In fact, I qualified for my Ph.D. but didn't complete it because I was tempted by the money and decided to work. It's difficult once you start working, especially if your career is progressing well. I would encourage people to continue on to graduate school and finish. Whether it's a master's or a Ph.D.—I don't think there is a lot of difference. You gain the same level of experience and the additional few years in my opinion are worth it. Of course it is a personal decision and it may vary depending on one's situation.

Is there any additional information you might share with our undergraduate students?

One college experience is the time to have the most fun. Be responsible, but enjoy those college years. You truly make some lasting friendships. It's a time when you're learning a lot and exposed to many different things, so take advantage of that.

—Felicia Korngrey
New Business Development Course Offered

The School of Chemical and Biomolecular Engineering has a long history of preparing future leaders in business, as our many alumni who hold high-ranking positions in business and finance can attest. Professor Al Center, our current resident industrial practitioner, saw a need to show students how corporate jobs entail developing technical solutions to business requirements. The course CHEME 572: Managing New Business Development grew out of this perceived need.

During the semester, students are introduced to many business skills, including finance, pricing, strategic and tactical planning, project management, negotiating, and organizational design. The students apply what they have learned to develop implementation strategies for two different venture case studies. The first entails entry into a consumer product market; the second involves assessing a business opportunity based on a new feedstock for an existing company. The students develop a business model and a venture plan and present the results of their efforts to a “board of directors,” seeking approval to proceed with their recommended course of action. The board is composed of persons who were, or still are, senior executives with major corporations.

One unique benefit of this course is that the students receive critiques and advice from five to seven experts, in addition to their instructor, which gives them a valuable and balanced insight into the world of business and how they would fit into that world. The following were among the students’ comments about the value of the board meetings:

- “SWOT analysis did give us a clear picture of where we were in the agreement. It allowed us to see whether a deal was worth doing.”
- “Learning about how to negotiate and understand different negotiating strategies was a... good experience.”
- “I really liked the idea of estimating ballpark figures for costs, sales, salaries, etc. I think this is a really useful tool when working in a business and evaluating plans.”
- “One of the best aspects of the board meeting was the questions that were asked by the board members. Many of these brought to light problems that we wouldn’t think of due to our lack of experience.”
- “Being able to present a business plan in front of a board of directors in such a serious setting was a great experience. I feel that it was conducted in a professional manner, where we were not allowed to get away with mistakes. The board required creative responses to questions that they asked. They also criticized ideas that we had not completely thought out. This is good preparation for post-graduation.”

Student evaluations of the course have been very high and point to the special benefits of alumni sharing their expertise with these young students on the cusp of a professional career.

Recent boards have included people who hold the following positions:

- President of a specialty chemicals company
- President of a chemical marketing consulting company
- Manufacturing director of a pharmaceutical company
- Financial risk manager for a major bank
- CEO of a Middle Eastern refining company
- Compensation manager for a petroleum company
- Crude trader for an oil company
- Manager of a research laboratory
- Logistics manager for a petroleum company

New board members are always welcome. If you’d like to learn more, contact Al Center at ame@cornell.edu.
Students Attend AIChE Conference

The college chapter of the American Institute of Chemical Engineers hosted the 2004 Mid-Atlantic Regional Conference, April 2 through 4. The event was attended by the student chapters of Bucknell University, City College of New York, Cornell University, Drexel University, Johns Hopkins University, Lafayette College, Manhattan College, New Jersey Institute of Technology, Rowan University, Stevens Institute of Technology, University of Buffalo, Villanova University, Virginia Tech, and West Virginia University.

The conference opened with a welcome from Michael Hayes, director of research and graduate studies and professional education at Cornell University’s College of Engineering. The conference began its competition with presentations of top-rated research papers in chemical engineering by undergraduates. The presentations often focused on recent advances in the field.

Next on the agenda was the poster presentation, during which students and professionals discussed their research one-on-one with conference visitors.

Seven college chapters participated in the small chemical-powered car event. This event gave students the opportunity to participate in the team-oriented hands-on design and construction of a car that is powered with a chemical energy source. The car was required to carry a specific load over a given distance and then stop.

On Saturday evening, the banquet dinner, guest address, and awards ceremony took place at the Appel Commons on North Campus. Kathleen Vaeth of Kodak gave the keynote address to over 160 participants. She spoke about chemical engineering and developing new technologies.

The conference wrapped up Sunday with a question-and-answer session on how to host a conference at one’s own college.

Anton Assists CU Team in Formula SAE’s Eighth Victory

Cornell dominated the competition this year in the Formula SAE competition held in Pontiac, Mich., on May 23. This was Cornell’s eighth win as they zoomed by 130 universities from 13 countries. Cornell’s engineering team accelerated past the competition with 926 points out of a possible 1,000 in a series of events that ranged from design evaluation to competitive driving. This was the 17th time Cornell has entered a car since the competition’s inception in 1982. Previously tied with UTA at seven victories apiece, the 2004 team commanded victory over their closest rivals by 468 points this year, sure to make for fierce competition in 2005.

The Society of Automotive Engineers and the Sports Car Club of America sponsored the competition, which challenges students to design and build a race car and drive it in a series of events. The final score is determined by adding points for driving, design, and presentation.

The high point of the competition is a 22-kilometer (about 14 miles) race over a 1-kilometer (1,094 yards) road course at speeds up to 60 mph. Cornell driver Kyle Williams led the first 11 kilometers. Other driving events included an acceleration test, driving around tight circles, and autocross. The teams were judged on several areas, which included design, “business presentation”—pitching designs as if to potential investors—and discussing what the car would cost if it were mass produced. Cornell placed either first or second in all the dynamic events and came in second in design, fourth in cost, and seventh in business presentation.

Cornell first entered the competition in 1987 and has won seven times before this year. Team adviser Professor Al George attributes the team’s many victories to a systems approach. Co-adviser for the team is the School of Chemical and Biomolecular Engineering’s own Brad Anton.

The Cornell team will begin design work early in the fall semester, and complete construction of the frame by the end of the fall term, with the car reaching completion by the spring.

Principal sponsors of the SAE team included General Motors, Heller Industries, and Hunter Industries, as well as 50 other firms that contributed parts and other support.

At left: The school’s conference committee (left to right): front row: Clay Horiuchi ’04, Marianne Herbst ’04, Kelley Garvin ’06, Amara Srinaganathan ’06, Robert “Jack” Salazar ’05; back row: Andy Sokolik ’04, Matt Rizk ’04, Gretchen Pliwinski ’04, Michael Arulagunandan ’04 (conference chair), Jenny Su ’04, Robert Ferris ’04, Dave McClain ’04, Miriam Gladstone ’06, Laura Fabry ’06, Ken Cheng ’04, Carol Julian ’06, Relucia Scarlat ’06, Jose Rivera ’05, Andrea Mazuksi ’06, Peter Makowenskyj ’04, Asha Vajay Marathe ’05.

Kathy Vaeth gives keynote address for the AIChE Mid-Atlantic Regional Conference.

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Awards and Honors

Faculty

Kenneth E. Ackley, who passed away last fall, was posthumously awarded the Outstanding Faculty Award by the Interfraternity Council and the Panhellenic Association (which together represent about 25 percent of the students at Cornell). One faculty member from each college is recognized for this award. This is the third consecutive year that the council/association has chosen a faculty member from Chemical and Biomolecular Engineering to receive the engineering award.

Alfred (AI) Center received the College Teaching Award.

David A. Putnam received the Mr. and Mrs. Richard F. Tucker '50 Excellence in Teaching Award and the Whitaker Biomedical Research Grant, a highly competitive award that recognizes the awardee's potential to become a leader in biomedical engineering research and education. It is only the second time this award has been given to someone on Cornell's Ithaca campus. Putnam was invited to attend the National Academy of Engineering's 10th Annual Symposium on Frontiers of Engineering, which is a forum of approximately 100 selected young engineers and academic/industry leaders assembled to discuss specific and pressing issues in engineering. Additionally, Putnam is the youngest individual to be invited to join the Editorial Advisory Board for the Journal of Controlled Release, the field's leading journal.

Fernando Escobedo was the recipient of the Alfred P. Sloan Foundation Fellowship.

Peter Harriott was honored in the January 2004 AIChE Journal as author of one of the top 100 cited articles in the journal's 50-year history. Harriott's article, which has been cited 227 times, is titled "Mass Transfer to Particles: Part I, Suspended in Agitated Tanks; Part II, Suspended in a Pipeline" (AIChE J. 8:93, 1962).

Matthew DeLisa received a NYSTAR James D. Watson Young Investigator Award.

Michael L. Shuler received the Warren K. Lewis Award from AIChE in November 2003 for his contributions to chemical engineering education.

Paul Steen was honored as a Senior Guest Scientist (Forschungszentrum Karlsruhe, Germany) for 2003–2004. In addition, he received the Wiedereinladung Award from the Alexander von Humboldt Foundation.

Abraham Stroock was the recipient of the Office of Naval Research Young Investigator Award for 2004.
2003-2004 Academic Year Student Awards and Honors

American Institute of Chemical Engineers, Otther Award for Academic Excellence
Eric Margeleffsky '04
Established by the professional organization to recognize undergraduate academic excellence

American Institute of Chemical Engineers, Twin Tiers Outstanding Scholar Award
Fanny Huang '04
Established by the professional organization to recognize outstanding scholarship and leadership in campus, community, and professional activities

American Institute of Chemists Scholar
Andrew Sokolik '04
Established by the professional organization to recognize undergraduate ability, leadership, character, and scholastic achievement

Dow Chemical, Ferdinand Rodriguez Outstanding Student Award
Matt Riek '04
Established by the company to honor Professor Rodriguez and recognize achievement in academics and in the professional community

Dow Chemical, George F. Scheele Outstanding Junior Award
David McClain '04
Established by the company in memory of Professor George Scheele, former associate director of the school, to recognize academic excellence and achievement in campus and professional activities

Fred H. Rhodes Scholarship
Coleman Carroll
Bettina John
Jung Hun Lee
Yong Min Lee
Robert Nwaokoroko
Todd Schroeder
Dujhsuan Waraho
Tobias Wheeler
Established by family and alumni in memory of Professor Fred Rhodes, founder of the school, to provide financial assistance to Ph.D. candidates

H. N. Scholarship
John Dingee
Conor Foley
Robert Kuczenski
Jeanne Panels
Brian Pasquini
Tao Qian
Joseph Woody
Matthew Zimmer
Junfang Zong
Established by alumni to provide financial assistance to graduate students

Merck Engineering and Technology Fellowship
Eric Margeleffsky '04
Established by the company to recognize undergraduate scholarship and technical excellence

Merrill Presidential Scholar
Eric Margeleffsky '04
Recognizing Professor Danaca, a university program that recognizes outstanding seniors and their academic mentors

Outstanding Service to the School
Robert Ferris '04
Recognizes outstanding service to the undergraduate community

Outstanding Teaching Assistant of the Year
Keith Nieves
Chosen by the undergraduates for outstanding teaching by a graduate assistant

Proctor and Gamble Technical Excellence Award
Eric Margeleffsky '04
Established by the company to recognize undergraduate technical presentation skills

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Help us today with our dreams for tomorrow.

Improving undergraduate education
- Endow the Industrial Practitioner Program ($100,000).
- Create an experiential learning center to coordinate our efforts in learning outside the classroom ($200,000).

Enriching the graduate experience
- Provide prizes for new graduate students to reward outstanding achievements in the areas of polymers, biomolecular engineering, computational science, or complex fluids ($2,500 each).

Fastening the diversity of our faculty and student body
- Sponsor the research efforts of a woman or minority faculty member ($50,000).
- Enable us to aggressively target women and minority faculty and graduate students to come to Cornell ($400,000 faculty, $25,000 students).
- Provide funds to promote retention and career advancement of women, minority, and international undergraduate students ($5,000 per student).

Reinvigorating our facilities
- Help us upgrade our teaching laboratories ($30,000).

Partner with faculty research
- Support one of our new faculty in the areas of drug delivery, genomics, or microfluidics ($25,000).
- Build the Director's Working Capital fund to initiate new research efforts and encourage exploratory research.
- Buy one or more of the 32 nodes needed to create a computing cluster for shared research initiatives ($1,500 each; $48,000 total).

Honor our inspirational teachers
- Support the Ray Thorpe lecture series, which brings an inspirational teacher, usually an alum, back to Cornell to share their experiences in the workplace ($10,000).
- Support the Julian Smith distinguished lecturer series, which brings a world-class researcher to Cornell to explain how cutting-edge research benefits communities at large ($10,000).

Giving Opportunities

Annual Support for the School of Chemical and Biomolecular Engineering

Please indicate your contribution by checking the appropriate box.

- $25,000
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- $5,000
- $1,000
- $500
- Other $

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$ Other

Make check payable to Cornell University School of Chemical and Biomolecular Engineering. Prepaid envelope is enclosed.

Thank you for your gift!