

# UPDATE

## CIVIL AND ENVIRONMENTAL ENGINEERING

Cornell University

Hollister Hall

Ithaca, NY

2003

### Civil Cinderella

by M.D. Morris '44, '76, P.E.

Meena Aggarwal is a real-life Cinderella. Without a godmother's help, she did it all herself, thus she has no midnight deadline. Meena is a highly motivated, capably accomplished young woman who has made the most of every opportunity that crossed her path. She believes strongly that success is not always measured in money, and knowledge is wasted if it is not applied for the common good.

Today, she signs herself, Meena T. Aggarwal, P.E. When a Cornell student she was Meena Jamnu Tahiliani, CEE '94, born the 4<sup>th</sup> of July 1972 in Memphis, Tennessee. She specialized in structures under academic advisor, Professor John Abel. Rewarding three years of service, the ASCE Student Chapter elected her its President for 1993-1994. That and maintaining a grade point average sufficient to gain the Dean's List and Chi



Meena (CEE '94) and Gaurar (AG '94) Aggarwal

Epsilon would be load enough for most undergrads; then she also won the Robert Garmezy Prize for High Strength Concrete Design. Far from being nerdy, Meena was active in the Indian Students Association and the

(Continued on page 12)

### NEES \$2 million lab

by David Brand, Cornell Chronicle, May 1, 2003

Cornell's CEE is to become a site in an innovative national earthquake research system linking 15 of the nation's leading engineering schools. A \$2.1 million award from the National Science Foundation (NSF) is enabling Cornell to develop a state-of-the-art facility, scheduled to open in October 2004, to test the effects of earthquake-caused damage to the nation's lifelines.

These are the structures, from bridges to pipelines to communications conduits, that form parts of complex networks of vital resources and services.

The Cornell laboratory, a collaboration with Rensselaer Polytechnic Institute (RPI), will become a link in an NSF-funded chain of testing and research sites called the George E. Brown Jr. Network for Earthquake Engineering Simulation (NEES). The facility is under construction in the Winter Lab in Thurston Hall at the School of Civil and Environmental Engineering.

**Harry Stewart**, an associate professor in the school and principal investigator on the NSF award, said the Cornell-RPI lab "will be a national resource as one of the 15 experimental equipment sites in the consortium." It represents, he noted, "a very different way of thinking about how universities work together to share information effectively." The NEES consortium initially is expected to operate from 2004 to 2014.

The Cornell facility will become the national center for calculating the effects of violent earth movements on structures during an earthquake. In particular, soil deformation can rupture underground gas pipelines, water lines and communications conduits. Above ground, seismic movements can severely damage bridge abutments and road surfaces. Three years ago,

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# Word from the Director



John Abel

Photo by C. Harrington/University Photography

This year's edition of *CEE Update* has three foci: the tradition of service activities in the School, progress in our ongoing plans for renovations of our facilities, and new developments among the faculty.

**Service Activities.** The cover article on Meena Tahiliani Aggarwal '94 presents a wonderful example of how one of our graduates has carried forth the tradition of service long fostered by the School of CEE and its student organizations. In most years, our ASCE Student Chapter undertakes one or more service projects that not only provide project experience for the students but also have social and technical value in the community. This year's example is the Gully Bridge project described on page 9. But this academic year has also marked the beginnings of a new service-oriented organization and complex of projects – Engineers Without Frontiers (EWF) – now housed in CEE and the subject of an article also on page 9. Cornell's College of Engineering has many "experiential-learning" projects for undergraduates, such as participation in the Formula SAE and RoboCup competitions, but it is especially here in CEE that such projects also have a social-service impact.

**CEE Facilities.** The other cover article in this issue describes CEE's membership in the NEES collaboratory through an NSF grant for the construction of new earthquake engineering experimental facilities in the George Winter Laboratory. This relates strongly to our continually evolving plans to undertake major renovations to three of our teaching and research laboratories, detailed on pages 12 and 13.

**Faculty Developments.** The School faculty has enthusiastically welcomed the new Dean of the College, W. Kent Fuchs. CEE alumni have probably already read about Kent in the *Cornell Engineering Magazine* or the *Cornell Alumni Magazine* so we have not included separate coverage here. Dean Fuchs has already shown active leadership in strategic and facilities plan-

ning, growth of the engineering faculty, improving diversity, and supporting both traditional departments and new initiatives. Fortunately, the CEE faculty was already at work on a new strategic plan for the School when the new Dean arrived. That plan has recently been finalized, and the key elements are in the box below. CEE alumni interested in a copy of the full plan can contact Debbie Judge, the School's External Affairs Officer, [dk222@cornell.edu](mailto:dk222@cornell.edu).

Other faculty developments are covered in the following few pages. In particular, Christine Shoemaker was selected to fill the Joseph P. Ripley chair, vacated by the retirement last year of our own Richard Dick. We are also pleased to announce the appointment of a new faculty member, Dr. Wilkins Aquino, highlighted in a subsequent article.

This is my last column as Director. After five years in office, I will begin a sabbatic leave on July 1, after which I will return to full-time teaching in spring 2004. Upon the recommendation of a faculty polling and search committee, the Dean has named my successor, Professor Jim Gossett, a superb leader among our faculty who has my best wishes and full support – please read about him on the facing page.

## Vision and Mission Statements

from the 2003 CEE Strategic Plan

The **Vision** of the School of CEE is:

- Undergraduate, professional, and graduate education that inspires students, confers mastery, and promotes ethical behavior
- Research that transforms the art and practice of engineering
- Flexibility in innovation and expertise that meets the growing challenges of human society through technologically advanced, yet sustainable solutions

The **Mission** of the School of CEE is:

- To educate future creators, innovators, and communicators who will employ their grounding in engineering to become leaders in many spheres of society
- To discover and develop new knowledge and sustainable technologies that improve the practice of engineering in service to society
- To serve and improve the University, the engineering profession, and society at large

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Cornell University is an equal opportunity, affirmative action educator and employer.

June 2003

# Gossett new Director

**W. Kent Fuchs**, Dean of Cornell's College of Engineering, announced that on June 30, 2003 **John Abel** will step down as Director of the School of Civil and Environmental Engineering. His successor as the new CEE Director is Professor **James M. Gossett**.

Gossett joined the CEE Faculty in 1976 after receiving his Ph.D. from Stanford University. He was chosen by the Dean for his "vision, leadership, interpersonal skills, emphasis on quality, and focus on excellence in both research and teaching."

In his twenty-seven years at Cornell, Jim has become an intellectual leader of the bioenvironmental engineering discipline in the School. Recently, he served as Coordinator of the Environment Mission Area of CEE, and in this capacity he continued and expanded his outstanding contributions to curricular development while also conducting a world-class research program.

Gossett's research interests are in the general area of applied microbiology — factors influencing biodegradability, microbial kinetics, and understanding the complex interactions occurring in microbial communities. Since 1984, he has conducted investigations concerning biological transformations of chlorinated solvents — common, yet hazardous, groundwater contaminants. The context for these studies has been *in-situ* groundwater remediation — either enhanced or as part of a natural-attenuation objective.

Gossett has authored or co-authored more than 60 scientific publications, and his publications have been cited more than 1,700 times by authors of other scientific papers. Feature articles about his work have appeared in *The Washington Post*, *The New York Times*, *NewsDay*, *Le Figaro*, *Scientific American Explorations*, *Chemical and Engineering News*, and *Civil Engineering*. Gossett has also appeared in numerous broadcast-media reports, including interviews with BBCWorldService, RTL (a German TV network), and CNN, as well as a

segment on CNN's weekly magazine show, *Science & Technology Week*.

Gossett has developed three new courses: CEE 451 (Microbiology for Environmental Engineering); CEE 756 (Environmental Engineering Processes II, a 3-cr. lecture course in biological processes); and CEE 758 (a 2-cr. lab course accompanying CEE 756). CEE 451 is an undergraduate course, offered for the first time in 1998-99, serving students interested in environmental engineering from CEE, BEE (formerly ABEN), and other fields. It focuses on the teaching of microbiology and organic chemistry principles as a basis for solving environmental problems. In course evaluations, students praise Prof. Gossett's approach, which is characterized by a firm grounding in the fundamental principles and with example applications to illustrate their relevance.

Gossett has emerged as one of the leaders among the environmental faculty on issues of curriculum and in his vision for educating environmental engineers. He is currently the CEE co-chairman of the Environmental Engineering Steering Committee that is working with BEE to create jointly a separately accredited B.S. degree in Environmental Engineering and a new, distinct graduate field of Environmental Engineering. (Until now, Environmental Engineering has been only a concentration within the graduate fields of CEE and BEE.)

Jim has always displayed a great commitment and dedication to the Cornell community and to the promotion of collegiality among its faculty. He has willingly taken on numerous administrative assignments in support of the School and the College. Among these are: Associate Director, School of CEE (1986-89, 1991); Coordinator of the Environment Mission Area within the School (1998-2000); and Member of the Local Advisory Council [advising the Provost on research investments and policies in the biological and physical sciences and engineering] (2000-2002).



James M. Gossett

"It's an exciting time to serve as Director. Many opportunities and challenges will visit us in the years ahead."

--Jim

# Faculty Focus

## Shoemaker named

Joseph P. Ripley Professor of Engineering

Professor **Christine A. Shoemaker** has had a distinguished career at Cornell since her appointment in 1972. She was for many years the only female faculty member in the College of Engineering and was the first woman to achieve tenure and full professorship. Throughout this time, she has had a highly significant impact on the College and has been an extraordinary mentor for women students and faculty in engineering. She has outstanding research, teaching, and professional achievements in addition to her record of constructive activism and mentoring. Through these activities, Professor Shoemaker has contributed greatly to the experience of undergraduate and graduate students at Cornell, to the University as a whole, and to her profession nationally and internationally.

Professor Shoemaker's research focuses on optimization and modeling of problems arising in environmental engineering and cost-effective management. She has been a pioneer in the application of optimal control techniques to groundwater remediation, which has been her primary research focus area over the last 8 years. She has produced twenty-one Ph.D. students as a part of this research, including a number of women who have gone on to successful academic careers.

Contributions by Professor Shoemaker to teaching go far beyond her development of innovative formal coursework to include exceptional mentoring as well as outstanding service to foster diversity within Cornell engineering.

Professor Shoemaker is a conscientious teacher who maintains a high level of technical rigor in her classes and who is highly rated for willingness to help students.



*John Abel, Dean Kent Fuchs, Chris Shoemaker*

## Wilkins Aquino

CEE's new Assistant Professor

CEE is delighted to announce that **Wilkins Aquino** will join the CEE faculty as a tenure-track Assistant Professor in early to mid July, 2003.

Aquino graduated in May 2002 with a Ph.D. in Civil Engineering from the University of Illinois at Urbana-Champaign where he obtained his M.S. in 1999. During his graduate studies he worked on seismic rehabilitation of corroded reinforced concrete bridge columns and their long-term durability, modeling of mass and heat transfer in concrete, durability of concrete and advanced composites, and non-linear finite element analysis of reinforced concrete structures. In addition, Aquino worked for two summers as a consultant engineer for Wiss, Janney, Elstner, and Associates in Chicago, IL and for Erwin, Rodriguez, and Associates in San Juan, Puerto Rico.

Currently, he is a senior engineer in the Engineering Mechanics and Infrastructure Division of Simpson Gumpertz & Heger Inc., located in Waltham, MA. He is also a member of ACI 447 "Finite Element Analysis of Reinforced Concrete Structures," ASCE, and EERI.

Aquino's research interests include behavior of reinforced concrete structures subjected to blast loads, non-linear mechanics of solids and structures, modeling of material behavior using artificial intelligence, durability of engineering materials, large-scale testing, and earthquake engineering.

Wilkins will marry his fiancée, **Carmen Rawls**, on August 16, 2003. Carmen has been accepted into the School of Civil and Environmental Engineering's graduate program as a Ph.D. student in Transportation Systems and will begin her program starting in August.



*Wilkins Aquino*

# Faculty Achievements

Faculty photos by N Kountoupes & C. Harrington/University Photography

**John Abel**, at the Annual ASCE View of the Lake Dinner, received the 2003 American Society of Civil Engineer's, Ithaca Section, "Engineer of the Year" Award.

**Wilf Brutsaert** is the 2003 recipient of the Jule G. Charney Award from the American Meteorological Society, "for fundamental and far-reaching contributions to our understanding of the linkages between Earth's atmosphere and land surface."

**Todd Cowen** and **Arnim Meyburg** won the 2002 College of Engineering teaching awards. Todd won the James and Mary Tien, Excellence in Teaching Award and Arnim won the Daniel M. Lazar '29, Excellence in Teaching Award.

**Mircea Grigoriu**, has been named the 2002-03 Chi Epsilon Professor of the Year by the Cornell chapter of the national CEE honorary society. Grigoriu's book, *Stochastic Calculus: Applications in Science and Engineering* (Birkhäuser, 2002) was released and has received outstanding reviews. His book, *Applied non-Gaussian Processes* (Prentice Hall 1995) is scheduled to be translated into Russian by MIR.

**Kenneth Hover** has been selected by the students in the College as the winner of the Tau Beta Pi Teaching Award for 2003.

**Anthony Ingraffea**, the Dwight C. Baum Professor of Engineering, and **Katerina Papoulia**, Assistant Professor, have been chosen as Research team members along with Professors Leigh Phoenix, Herbert Hui, and Alan Zehnder of the Department of Theoretical and Applied Mechanics to spearhead a new NASA and Dept. of Defense seven-university research project on new launch vehicles.

**Sang-Soo Jeon**, **Tom O'Rourke**, and **Harry Stewart** have received the 2002 Trevithick Prize from the British Institution of Civil Engineers (ICE) for a distinguished paper chosen over a three-year period from ICE publications. Their paper is entitled, "Geotechnical Aspects of Lifeline Engineering," and was published in *Geotechnical*

*Engineering*, Jan. 2001.

**Tom O'Rourke** was the distinguished invited lecturer Research Highlight Series, at the Directorate of Engineering of the National Science Foundation in Fall 2002. The title of his talk was "Geospatial Modeling for Communities at Risk from Earthquakes."

**Linda Nozick** and **Mark Turnquist** have been recognized with a Performance Excellence Award from Sandia National Laboratories for their contributions to developing decision support software that improves the effectiveness of specialized transportation operations within the U.S. Department of Energy.

**Katerina Papoulia** has been awarded an National Science Foundation Career Award for her proposal entitled "*Glass/polymeric material systems in Civil Infrastructure*." She also received a research grant from the President's Council of Cornell Women for her proposal, "*Linking of Scales in Structural Materials: Local Properties and Global Behavior*."

**Teoman Peköz** is the recipient of the 2003 Shortridge Hardesty Award from ASCE, in recognition of sustained and substantial contributions to the field of structural stability during his career of active teaching and research.

**Christine Shoemaker** has been elected Fellow of the American Geophysical Union.

**Jery Stedinger** received a 2002 McCormick Advising Award for both his coordination of the Introduction to Engineering Program, ENGRG 150, and his dedication and success as an advisor of individual freshman. Jery's exemplary leadership has made a huge impact on literally thousands of College of Engineering and CEE freshmen.

**Dr. Peter J. Murphy**, a member of the CEE faculty in the 1970's, passed away in spring of 2003 at the age of 63.



Katerina Papoulia



Ken Hover



Teoman Peköz



Mark Turnquist

## NEES \$2 million lab

(Continued from page 1)



Photo by Robert Baker/University Photography

Professor Thomas O'Rourke, left, and Associate Professor Harry Stewart pose in the Winter Lab in CEE's Civil Infrastructure Laboratory Complex.

**Thomas O'Rourke**, professor of civil and environmental engineering at Cornell, built a 30-foot-long box filled with 60 tons of sand in which he ruptured steel gas pipelines by subjecting them to the force of the moving soil.

O'Rourke, a co-investigator on the Cornell NEES lab, says that experiment, performed for Tokyo Gas Co.,

was an important factor in winning the NSF award. The new facility, he said, will make it possible to apply displacements that might be expected during earthquakes.

The NEES Consortium was organized in 2000 with contracts to 10 U.S. engineering schools, each assigned a separate aspect of earthquake-engineering research, from large shaking tables to a tsunami wave basin. Cornell's award was one of five under Phase II of NEES. By next year, the 15 labs will be linked by Internet2, the high-speed scientific and educational network, and will have protocols in place for data transfer, data sharing and data mining.

The NSF funding will enable Stewart and his team to design and build an unusual testing facility. The testing structures will be customized for each research group. In addition, modular, reinforced concrete structures are being designed by Cornell postdoctoral researcher **Keith Kesner Ph.D. '03** to form a reaction wall more than 50 feet long and up to 24 feet high. The blocks will be assembled in various configurations to apply different displacements and loads. Other equipment will include four new actuators, machines that push masses, such as tons of soil, with great force. The largest of the actuators will be capable of moving heavy masses up to six feet by applying as much as 100,000 pounds of force. Upgraded hydraulic power supply and electronics also will be installed.

In addition, the laboratory will have its own video-conferencing center and an instructional laboratory. Starting next year, education and outreach also will become a major focus of the new facility.

Although the NSF is funding all equipment purchases and annual maintenance costs, Cornell and the School are making substantial contributions to the facility, Stewart said. This includes funds for building, education and staff, and funds to keep communications and Internet2 connections operating.

**Scott Jones**, the Cornell senior research associate who is managing the NEES facility, stresses that the Cornell laboratory will be open to all researchers, with scheduling carried out at a central consortium office. All data gathered in the Cornell facility will immediately be made available over the high-speed data lines to all members of the consortium. "We are re-defining the way people work together to solve problems," he said.

### New Staff for NEES Project



**David Ash** is the Information Technology Specialist for the NEES project. He is responsible for the development, implementation, and maintenance of the NEES network located in the Civil Infrastructure Lab Complex's Winter Laboratory. This includes tele-presence systems, related workstations, the

NEES website, and all other things technical under NEES. He enjoys troubleshooting technical issues.

**Brett Shelton** is the Equipment Technician for the NEES Project. He is assisting in the design, setup and documentation of experiments in the Civil Infrastructure Laboratory Complex's Winter Lab. Brett is responsible for the automation and calibration of the data acquisition systems for the experiments and labview programming. He is also an avid mountain cyclist.



# Service Happenings

## Engineers Without Frontiers

excerpts from ASCE News, April 2003

EFW is a national service organization that partners with developing communities to foster cultural, educational, and technical exchange to build a more sustainable world.

**Asst. Prof. Rachel Davidson** and **Sr. Research Associate John Mbwana** advise the Cornell chapter. In the spring of 2003, they also offered a 2-cr. course, CEE 402.

Davidson says the mix of hands-on learning and social awareness "can be very good for the field of engineering. It makes it clear how engineers can make the world a better place and also the connection between the number crunching and the final product."

In the EFW course, the students perform what Davidson calls "engineering-based community service programs." They work in teams with either faculty member or practicing professional engineer project supervisors and with members of a community organization.

The students create a proposal, then do the planning, scheduling, and budgeting needed to bring the project to fruition. "That kind of project formulation is something they don't often get in a regular engineering curriculum, but it's very much a part of the real engineering world," Davidson says.

In this semester's projects, one team of students determined how a local library can be made more accessible to people with poor vision. A second team created a design tool to be used by Water for People, a nonprofit international organization that works to provide water systems in developing countries.

Twenty-four students are enrolled in the course. Students may sign up for as many as 4 semesters, and Davidson says they are encouraged to do so in order to provide project continuity and commitment.

Start-up funding for the projects was generously donated by the Advisory Council of the School of Civil and Environmental Engineering.

## Gully Plastic Bridge

**Jenny Grubb '03**, design engineer, and **Jenn Preston '03**, construction engineer, designed, funded, and built an environmentally safe and extremely durable plastic bridge for the **Level Green Institute**.

These volunteers from CEE designed and built a 35-foot span pedestrian bridge with an eye-appealing bend and pleasing tan color. All the bridge's members are fiberglass-reinforced, recycled plastic lumber. Stainless steel and aluminum fasteners connect the plastic members, and the footings are concrete.

The bridge crosses an 8 to 30 ft. deep gully. This gully divides 10 acres of former farmland now owned by Level Green Institute, a newly formed group to help foster campus and community relationships through projects focusing on the environment, the arts, and collaborative education. The Gully Bridge is one of its first projects and will open up a side of the land that has been inaccessible.

**Prof. Tony Ingraffea**, Cornell Dwight C. Baum Professor of Engineering is the faculty adviser and **Dan Walker**, Town of Ithaca Director of Engineering, is the engineer of record for the project. **Patricia Haines** represents Level Green. Other volunteers providing manpower, assistance, and funds include participating Cornell undergraduate students, **Chi Epsilon**, the **School of Civil and Environmental Engineering**, **Malcom G. McLaren '73**, **Turner Construction Co.**, **Simpson Gumpertz & Heger, Inc.**, Profs. **Petru Petrina** and **Dick White**. **Anthony Conte** from **American Ecoboard, Inc.** supplied advice and plastic lumber at a discount.

All materials used in the bridge construction have minimal impact on the environment, are maintenance free, and greatly resist deterioration.



Jenn Preston and Jenny Grubb at the Ribbon Cutting



Rachel Davidson



John Mbwana

# ASCE Happenings

## Concrete Canoe

Following a three-year hiatus, the Cornell Concrete Canoe team resurfaced this year with *Icebreaker*, the most recent entry



(Left to right): Rick Jones '03, Alice Parrington '06, Drew Lebowitz '05, Dale Meck '04, Robbyn Jadney '05, Tim Bond (advisor), Stephen Song '05, Andrea Hektor '06, not shown: Lindsey Ehinger '05, Kawika Nakoa '06

in the National Concrete Canoe Competition. The 10-person team worked to design and build a reinforced canoe that would be light enough to float even when submerged, yet sturdy enough to support up to four paddlers in the various races. Starting in October, they evaluated materials and methods to choose the adequate concrete mix, reinforcement, and hull design. The team also wrote a technical paper and prepared a formal presentation as part of the competition.

The Upstate New York Regional Conference was hosted by RPI. Amidst miserable weather, the team donned wetsuits and hit the water, commandeering the *Icebreaker* through the five different races. Although they faced stiff competition, Cornell's canoe proved to be a strong all-around boat, and garnered a 3rd-place win.

Despite their relative inexperience, this year's team proved that they have what it takes to compete. They are excited about next year, particularly the several freshman on the team. With newfound experience and bolstered by the trophy they will enter a canoe again next year, ultimately hoping qualify for the National Competition. This year the ice has been broken.

## Steel Bridge Team

The Steel Bridge Competition is a contest where teams are required to design, fabricate and build, under timed construction, a bridge entirely made of steel. The bridge is required to be split into pieces that are not larger than 3 feet by 6 inches by 6 inches. This year's bridge was required to have two separate spans, one 14 feet long and one 7 feet long. Once the bridge is constructed, it is loaded with 2500 lbs and then deflection tests are done on the middle of each span. Cornell's bridge weighed 176.3 lbs, and deflected only 3/4" total across the two spans. The team of 8 builders put the entire bridge (a total of 25 pieces) together in 3 minutes and 8 seconds.

The student participants were **David Marcus '03, Joseph Moody MEng (C) '03, Jeffrey Chan '04, Audrina Chua '04, Ellen Robinson '04, Yossef Bronsnick '04, Joseph Schuster '06, Jim Ruvolo '04, David Cloutier '04**. The team had help from **Professor Teoman Pekoz** and especially from **Lee Virtue, Tim Bond** and **Paul Charles**.



### David Ford Speaker

At the Annual ASCE student chapter View of the Lake Dinner enthusiastic guests enjoyed a dinner and were greatly honored that the guest speaker was David Ford, PhD, PE, from David Ford Consulting Engineers of Sacramento, California. The title of his speech was "WOO-HOO! Important Lessons for Civil Engineers from *THE SIMPSONS*."



# Aumni News

**Kenneth E. Arnold, BCE '64**, has been selected as the 2003 Houston Area "Engineer of the Year." Various Houston engineering organizations selected Ken based on his outstanding educational, professional, technical, civic, and humanitarian achievements and contributions.

**David P. Billington**, a member of the CEE Advisory Council, received the NSF Director's Award for Distinguished Teaching Scholars on June 3<sup>rd</sup>.

**Ciprian Crainiceanu** and **Christopher Behr ME(C) '01**, graduate students of **Professor Jerry Stedinger** and David Ruppert (ORIE), were recognized for best overall student presentation of their paper, "Bayes Analysis of Pathogen Risk in Natural Water Supplies," at the Albany Chapter of ASA, School of Public Health conference.

**Gregory R. Doelp MS '84** has been promoted to an Associate at Simpson Gumpertz & Heger (SGH). Greg has over 17 years of building technology experience.

SGH moved to new offices. SGH has 10 conference rooms and they named them after engineers that contributed significantly to the profession and society, and are not living. One of the rooms is named after **Professor Peter Gergely** who instructed **Donald Dusenberry '73** and **James Parker MS(C) '85**, both Principals of SGH. SGH has generously supported the Peter Gergely Seminar Endowment.

**Charles W. Dolan, Ph.D. '89** has been appointed as the first H.T. Person Chair in Engineering at the University of Wyoming, College of Engineering.

This year's winner of the 2003 George Winter Graduate Traveling Fellowship is **Zehra Cagnan**, a Ph.D. Student in Structural Engineering.

**Thomas K. Caughey, M.E. '52** was the recipient of the 2002 Theodore von Karman Medal from ASCE for his pioneering developments and sustained leadership in developing tools for dealing with challenging

problems in engineering science.

**Teresa B. Culver, Ph.D. '91** was one of several winners of the 2002 Walter L. Huber Civil Engineering Research Prize from ASCE, for her research on the simulation and management of water quality. **Barbara Minsker, Ph.D. '95**, is one of the recipients of the ASCE 2003 Huber Civil Engineering Research Prizes. Teresa and Barbara were Ph.D. students of **Professor Christine Shoemaker**.

**Patrick Lynett '02**, a Ph.D. student of **Professor Phil Liu** and an Assistant Professor at Texas A&M, is the winner of the ASME Ocean, Offshore, and Arctic Engineering Division's 2001-2002 Best Graduate Student Paper Competition at the Doctoral level for the paper entitled, "A Multi-Layer Approach to Modeling Water Waves from Very Deep Water to the Shoreline."

**Ellen M. Rathje, CEE '93** won the 2002 Arthur Casagrande Professional Development Award from ASCE for her outstanding achievements in research, education, and service related to soil dynamics and earthquake engineering.

**Sherif El-Tawil, Ph.D. '96** and **Gregory G. Deierlein '81** won the 2002 ASCE Norman Medal, for their 2-part paper on "Nonlinear Analysis of Mixed Steel-Concrete Frames. I: Element Formulation," and "Nonlinear Analysis of Mixed Steel-Concrete Frames. II: Implementation and Verification," published in the *Journal of Structural Engineering*.



*Kenneth E. Arnold*



*Charles W. Dolan*



*Barbara Minsker*

## Student Awards

The 2003 Fuytes Undergraduate Medal went to **Martin Kistenmacher, '03**

**Rick Jones '03** is the recipient of the ASCE Chapter 2003 John P. Riley '22, Senior Award.

**Jennifer Duthie '03** and **Jennifer Grubb '03** are the recipients of the 2003 Margaret Arronet Corbin '21 prizes.

**Alan Erickson '03** is the recipient of the 2003 Ve-Sing and Tseng Soo Koo Award.

The recipient of the 2003 George Winter Graduate Traveling Fellowship is **Zehra Cagnan**, a Ph.D. student in structural engineering.

# Funding Priorities

The past two editions of *CEE Update* have reported the School's evolving vision for the renovation of instructional and research laboratories. In 2002-03, the new Dean of Engineering, W. Kent Fuchs, enthusiastically endorsed CEE's plans. With the Dean's support, the School is now working through Cornell channels to launch a five-year capital campaign to fund major laboratory renovations.

Cornell CEE has a long tradition of excellent utilization of laboratories in both the curriculum and the creation of new engineering knowledge. This success has earned the School top-ten rankings at both the under-

graduate and graduate levels.

Moreover, some of the developments of laboratory facilities pioneered at Cornell over 40 years ago have influenced the design of more recent facilities at other leading

U. S. universities, but these newer labs at peer institutions have also made further significant advances. In addition, the quality and effectiveness of laboratories are key factors in ABET accreditation of the CEE program.

Most of the existing Cornell CEE laboratories were designed and built in the 1950's and have not been significantly upgraded since. Their layout and physical infrastructure are now outdated and unable to support modern developments in experimental equipment and methods. After over

40 years, the existing systems (electrical, mechanical, air handling, etc.) are reaching the end of their useful lives. Moreover, the laboratories do not meet modern accessibility requirements nor do they adequately provide the means to meet environmental-health requirements, especially for work with the new materials that are central to much of the CEE instructional and research programs. It is therefore proposed to undertake significant renovation to three of the CEE laboratories that provide opportunities for undergraduate and graduate students in structural engineering, geotechnical engineering, environmental engineering, and fluid mechanics to conduct hands-on research, testing, learning exercises, and class or service project work.

The renovation plans for these laboratories will allow Cornell to remain at the forefront of CEE education and research and to recruit the best undergraduate and graduate students. Based on outstanding experience with the Environmental Engineering instructional lab that has already been renovated, a number of common themes energize these laboratory renovation plans:

- Combining physical experimentation with computer simulation,
- Incorporating new instructional technologies, including distance-learning and remote observation and operation,
- Acquiring and housing innovative research equipment and related fixtures,
- Sharing of space and equipment among instruction, research, extension (industrial testing), and service projects, and
- Encouraging joint use with other department in Cornell engineering.

Many undergraduates, graduate students, industry guests, and faculty will utilize these renovated laboratories. They will be highly visible as the state-of-the-art teaching and research laboratories for this increasingly vital program in the College of Engineering.

The total fundraising objective for the



*Civil Infrastructure Laboratory Complex  
Winter Laboratory Rendering*



Civil Infrastructure Projects Laboratory instructional area Architect's Rendering

CEE laboratory renovations is \$9.1 million, of which \$2.1 million has already been raised.

The 13,160 square-foot **Civil Infrastructure Laboratory Complex** in Thurston Hall is one of the two CI labs and is the site of the NEES facilities (see separate article, page 1). This laboratory complex is suited to large-scale testing and has been a mainstay of CEE research and instruction over the years. Ten different CEE courses in the structural and geotechnical areas regularly employ facilities in this lab, and that use will undoubtedly increase after renovation. The complex houses the existing **George Winter High-Bay Structural Laboratory**, the proposed **Richard N. White Instructional Facility**, and several other zones or areas still unnamed. Approximately \$3.9 million is needed to fully renovate and modernize this lab complex. This figure is in addition to the \$2.0 million



Environmental Fluids Teaching Laboratory Architect's rendering of the flume area.

of NSF funding for the construction of the new facility. The other 13,160 square foot **Civil Infrastructure Projects Laboratory** on the basement of Hollister Hall already serves for various projects. When modernized, it will serve for instruction in structural engineering, for experimental relatively small-scale projects on the fabrication and testing of such as the annual ASCE concrete-canoe competition, and various community-service projects taken by Engineers Without Borders. This innovative facility will be a part in the CEE instructional program, and service to the community. The completely renovated facility will cost approximately \$1.8 million.

The 3,300 square-foot **Fluids Teaching Lab** in the basement of Hollister Hall, when renovated and modernized for instruction in environmental fluids and hydrologic measurement, water resource engineering for experimental relatively small-scale projects for students to work on fluids projects. The lab will also play an important role in complementing the laboratory studies in the Hydraulics Lab, which entails regional lakes. The budget to renovate this Lab is \$1.8 million.

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# Civil Cinderella

(Continued from page 1)

Society of Women Engineers. Off campus, Tahiliani volunteered at the Greater Ithaca Activities Center, (GIAC) where she ran an Indian Folk Dance class for children 4 to 10 years old, and the year-end assemblies.



Meena (left) dancing with students

Her choice for Freshman Writing Seminar, fall 1990, was "The Culture of Raj – A Study of British Colonialism in India." There she met an interesting and clever young man, Gaurav Aggarwal, Cornell Ag. Econ. (BS '94). He pretended inability to charge books on his Cornell

Card because of "issues" with his bursar's bill: On that ruse he shared her book for the class, and they never stopped sharing. He proposed to her in January 1995 on the fifth anniversary of their first date. They were wed before both extended families in a traditional Hindu ceremony in New Delhi, India. Gaurav is now with KBL Healthcare Ventures after earning his M.D. from Columbia University College of Physicians and Surgeons.

After Meena returned home to Memphis, to gain hands-on experience she went to work in her father's structural engineering firm, Jamnu H. Tahiliani and Associates. In four years she rose to managing structural design of casinos, schools, assisted-living facilities, and churches. Buildable structures designed with the constructor in mind. Marriage took her to New York City where she joined the Thornton-Tomasetti group to work on commercial and residential high-rise buildings; her last is a 50-story NYC office structure on Broadway and 55<sup>th</sup> Street.

For years, Meena had quiet dream of being in education. After reaching a managerial level in engineering, the dream began to tug at her even more. She left a comfortable career at Thornton-Tomasetti and became a volunteer teacher with the Cornell Cooperative Extension's Youth Development Summer Literacy Program in New York City. Meena was encouraged to develop her own curriculum, called "I Build," teaching basic engineering, architectural, and construction

concepts to middle school children. She soon discovered the Salvadori Center, a not-for-profit organization, founded by Dr. Mario Salvadori of Columbia University, author of (among others) "Why Buildings Stand Up." Intended for helping inner city young talents use engineering principles as the platform for project-based middle school education. Meena met with the Center directors and showed them her curriculum. On the spot she was made a Program Officer. Much later she said, "To say I love my job would be an understatement. I am still amazed I was able to find a position that combines my experience in engineering, my love of educating children, and my passion for problem solving. I work with young people who fear math and science. I enjoy the pleasure of sharing approaches that demystify a concept, then apply it to master a hands-on project. The smiles on the faces of students when they say 'I get it! I can do it!' Are my greatest rewards."

But with those early career goals, why Cornell? "Growing up in Tennessee, I hadn't heard of Cornell until my high school adviser gave me list of colleges with strong engineering programs. Cornell seemed to offer me the best civil engineering programs, so I chose it sight unseen. The surprise came in the natural beauty of the campus, and the happy circumstance of finding a soul mate."

"I chose Civil Engineering because of my father's influence. I respected his keen intellect, and gained much from his teaching about structures, simplistic at the start and more complex as I grew older. I seemed destined eventually to teach young people the gradual way my father showed me."

Right now her work is on hold for a year, she is in graduate school at Harvard completing her Master's Degree in Education. That will enable her (after she has her family), "... to run my own charter school one day."

Oh those lucky children!

*M.D. Morris, P.E. '44, '76, an Ithaca-based author and educator, is a Past President of the Cornell Society of Engineers.*