

the MEngineer

UNIVERSITY OF WASHINGTON
COLLEGE of ENGINEERING
A Community of Innovators

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to Lead College** ____ 7

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100 Years and Countless Reasons to Celebrate

"The Centennial events offer a terrific way to reconnect with ME classmates and faculty. We are excited about the program. See you in September!"

CENTENNIAL CHAIRS
SALLY AND WARREN JEWELL ('78)



What a century to behold! Historians of the future will surely stand in awe of its advances in technology and engineering. From slide rules to calculators and digital computers ... diesel power to nuclear generators and fuel cells ... biplanes to man on the Moon and rovers on Mars—a new world emerged.

Join classmates and colleagues for a fascinating look back and glimpse forward. Be proud of mechanical engineering's central role in these advances and the contributions of UW ME alumni and faculty. Reminisce and celebrate with us. Your invitation will arrive by mail by early July, but save the date now. ■

Centennial Celebration Highlights

Friday, September 15, 2006

8 AM **Registration and Coffee**

9 AM **Traditions and Innovations**

HUB Auditorium

Favorite professors will lead a lively discussion and video presentation on how we progressed from the early days of the ME Department to the space race and the digital revolution, with a look beyond.

Noon **Centennial Luncheon**

HUB West Ballroom

Keynote: Donald E. Petersen (BSME '46), retired chairman and CEO, Ford Motor Company

2 PM **Lab and Classroom Explorations**

Visit the ME Building for an informal open house, displays and demonstrations, and a chance to talk with faculty and students about current research.

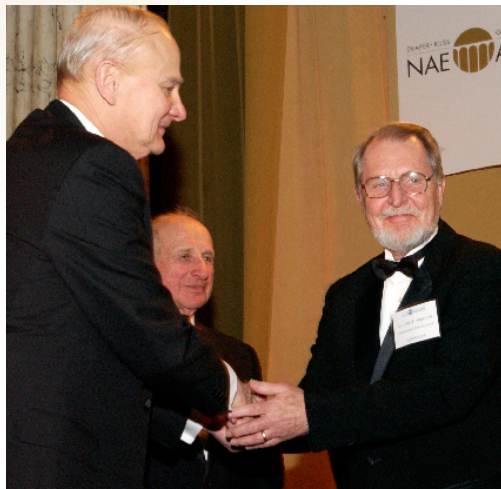
6:30 **Celebration on the Sound**

Bell Harbor Conference Center, Pier 66

Enjoy a stunning setting and festive finale to the day with cocktail hour, dinner, and program. Bring your spouse or guest for a memorable evening and more visiting with classmates.

For more information and to register online starting June 1:

www.me.washington.edu/centennial



Jens Jorgensen Receives the NAE's Gordon Prize

Dr. William Wulf (left), president of the National Academy of Engineering, and prize founder Bernard Gordon (center) congratulate Professor Jens Jorgensen at the February 21 gala awards dinner in Washington, D.C.

Story on page 7.

Chair's Corner



Mark Tuttle

Matthew O'Donnell assumes the deanship of the College of Engineering on September 1. I am delighted to welcome Professor O'Donnell to Seattle and to the University of Washington.

O'Donnell was also named professor of bioengineering and adjunct professor of mechanical engineering. His research will complement the studies of ME faculty, in particular those of Per Reinhall, Randy Ching, David Nuckley, and Dayong Gao. Hence, the ME Department has not only gained a new dean but also a new research colleague. I look forward to working with Matt in the months to come. Read more about Matt on page 7.

Recall that the search for a new dean began in February 2005, when former Dean Denice Denton left the UW to pursue a new challenge as chancellor of the University of California–Santa Cruz. Mani Soma has served as acting dean since that time. Mani performed superbly in this role, and I extend my congratu-

lations and thanks for his effective leadership over the past 13 months.

During this past winter quarter the department launched a new “ME Leadership Seminar Series.” Nine ME alumni (see sidebar) came to campus to speak to our undergraduate and graduate students and faculty. These alumni completed their degrees in different decades and followed decidedly different career paths. Taken together, the seminars provided a fascinating overview of the current status of the ME discipline and also how it may evolve in the future. The students were enthusiastic, and we plan a new seminar series for winter quarter 2007.

Those of you who live within the greater Puget Sound area should consider attending the 2006 Engineering Open House, scheduled on the UW campus from 9 am to 3 pm on Friday, April 28 and from 10 am to 2 pm on Saturday, April 29. All departments within the college, including ME, participate in the Open House. More than 100 exhibits are geared to persons of all ages, including K-12 and college-age students, high school teachers, and all others interested in learning more about engineering.

Finally, preparations for the Centennial Celebration of the ME Department are well under way! You will find many details of the September 15 celebration at www.washington.edu/centennial. Registration begins June 1. Please plan to join us, not only to renew friendships with classmates and faculty members but also to help launch the ME Department toward a second century of accomplishments and success!

Leadership Seminar Series 2006

ME thanks the following alumni for participating in our first leadership seminar series.

Michael O'Byrne (BSME '61)
Vice President &
General Manager (retired)
Kenworth/PACCAR, Inc.

Sally Jewell (BSME '78)
Chief Executive Officer
Recreational Equipment, Inc.

John Logsdon (BSME '71)
Senior Vice President
Forest Industries
The Harris Group

Tia Benson-Tolle (BSME '86)
Chief
Air Force Research,
Laboratory Materials and
Manufacturing Directorate
Structural Materials Branch

Peter Zieve (PhD '86)
President, ElectroImpact, Inc.

Rick Harbert (BSME '72)
President
RH2 Engineering

Jim Neuburger (BSME '90)
Partner
The Arnold Group
Management Consultancy

Pat Boyle (BSME '90)
Science Teacher
Rainier Beach High School

John Purvis (BSME '59, MSIE '61)
Aviation Safety Consultant
and Senior Founding Partner,
Safety Services International

Mescher Works Toward Universal Broadband Access

Inside the Polymer Optics Laboratory, Professor Ann Mescher picks up a large plastic spool and unwinds a copper-colored thread of a new polymer. This thin thread—no thicker than a few strands of human hair—is a new fiber optic cable that Mescher and her associates have been developing. The fiber not only transmits light but can also convert light from one wavelength to another!

Fiber optics make today's telecommunications technology possible. When transmitting data, a fiber optic cable carries very short pulses of light through the core of the fiber. The light pulses represent a binary sequence which is then translated at the receiving end to produce the words or sounds in a typical email or phone conversation.

"It's not only the fiber optics that make modern telecommunications possible," explains Mescher. "The entire system also includes the modulator devices that are used to create the on and off pulses of light, the laser light source, as well as amplifiers, add and drop filters, multiplexers, and demultiplexers."

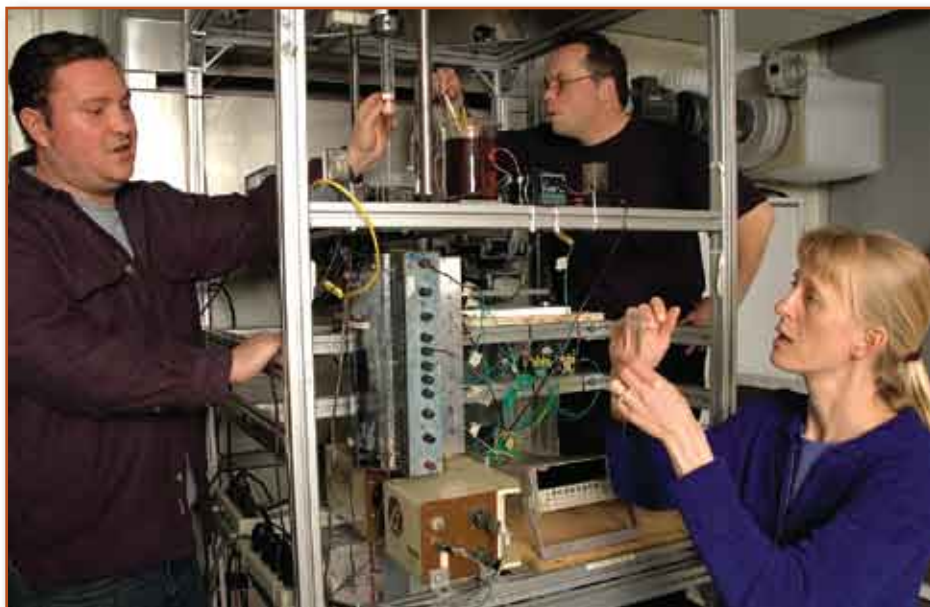
All of these components work together in the system to allow for very rapid transmission and routing of information. However, some of the components operate relatively slowly compared to the very fast transmission of information through fiber optics at the speed of light.

Mescher and her team are working on bottlenecks in the system—seamlessly integrating of all those devices, including the light source, within the fiber itself. Bottlenecks occur wherever electronics are used to manipulate

light. "Ultimately, light will be used to manipulate light, allowing universal broadband access," Mescher says.

As head of the Polymer Optics Laboratory, Mescher and her team experiment by combining traditional polymers with completely new organic materials, which are then

says Mescher. "There's a whole array of possibilities—great possibilities—but our collaboration with other groups ensures that we're working toward optic devices that will have an impact. We strive to communicate effectively and understand the challenges facing our counterparts in organic chemistry, materials science,



Andrew Eidinger, Greg Winchell, and Ann Mescher at work in the Polymer Optics Lab.

used to create a photonic bandgap fiber, a special type of optical fiber. Tiny holes run the length of the fiber, and their particular arrangement can be used to manipulate light in unique ways. By examining the properties of these hybrid polymers in photonic bandgap structures, Mescher's team hopes to develop new integrated fibers and devices with faster overall transmission rates and lower power consumption.

"One of the key strengths of our research group is our collaboration with other scientists and engineers who work with optical technology,"

and electrical engineering."

Mescher received her graduate degree at Ohio State University in 1995 and taught at the University of Massachusetts for a year before coming to the UW in 1996. She teaches courses on thermodynamics, heat transfer, and fluid mechanics in addition to her optical fiber research. Much of her research focuses on heat and mass transfer as applied to the manufacturing process for fiber optics.

Additional information on Mescher's research is found at: depts.washington.edu/polylab/home.html

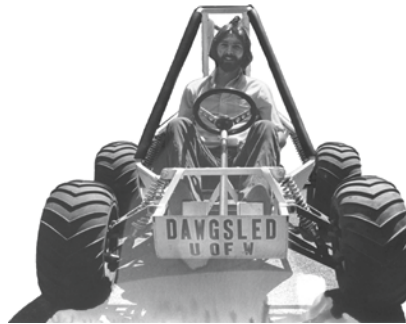
September 15
Centennial Celebration
 Register
 June 1 online
me.washington.edu/centennial

Mechanical Engineering Centennial

CELEBRATING 100 YEARS

Do you know where your student project is?

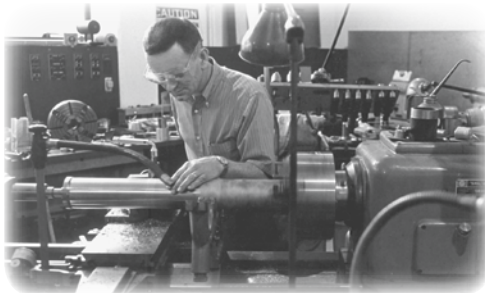
Hiding in your basement or garage? Give it a new lease on life as a table centerpiece at the centennial dinner. To loan your project, call 206.685.6993 or email measstch@u.washington.edu (and also to identify students in photos on these pages).



Who is this Dawgled driver of 1978?



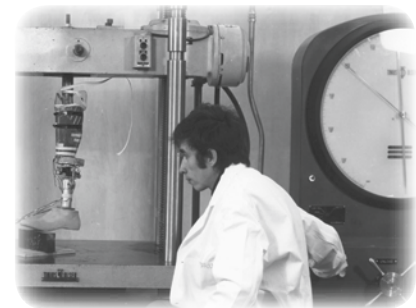
The new Mechanical Engineering Building



Machinist Henry Epp in the late 50s or early 60s.



Prof. Colin Sandwith (BSME '61) tests a powered wheelchair as Prof. Bill Chalk and a student observe (mid-1970s).



A grad student (Who is he?) conducts biomechanic tests with a 120-kip universal test frame (1977).

New ME Building completed in 1958.

Wayne Quinton (BSME '59) worked with UW physicians to develop the shunt that achieved a major medical breakthrough in 1960 by enabling long-term kidney dialysis.

ME grants its first PhD degree in 1963.

Inspired by Dr. Robert Rushmer (UW Medicine and Bioengineering), faculty in the 1970s began applying principles of ME to solve biomedical problems.

Industrial Engineering spins off from ME to become a separate program in 1985.

Milestones in UW Mechanical Engineering

1957

1960

Space Race

1970

Oil Crisis

1980

Cold War Winds Down

Advances & Noted Innovations in Mechanical Engineering

1957–1958

Boeing 707 Rollout

The Renton plant rolls out first production 707 on October 28. Pan American World Airways took delivery in mid-1958 and the first commercial jet service began in October.



1965–1975

Finite Element Analysis Expands

Increase in computing power and declining costs made FEM practical for wide-spread use in product analysis and design.

1969

First Moon Walk

Apollo 11's lunar module landed on July 20 and Neil Armstrong took "one small step for man, one giant leap for mankind."



1972

Modern Artificial Hip Successfully Tested

British surgeon John Charnley applied engineering principles to orthopedics to design a hip joint of metal and polyethylene, which revolutionized joint replacement.

1972

Calculators Displace Slide Rules

The HP-35 and HP-45 "pocket calculators" hit the marketplace and begin the decline of the slide rule.



The Second Fifty Years 1957~2006



g opened in 1958.



Professors Joe Garbini (left) and Jens Jorgensen in the manufacturing systems lab (1987).



Prof. Bruce Adee (right) has advised the submarine teams since 1989. Do you know these 1990 students?

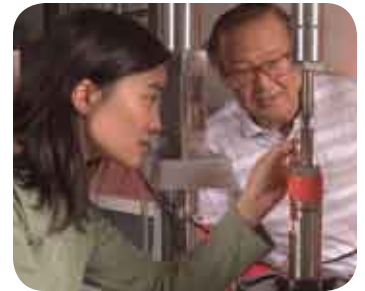


Prof. Dale Calkins (standing, far left) advised the 1990 SAE team. Can you identify any of these students?

ME Today



Prof. Joyce Cooper researches the resource and environmental impacts of fuel cells.



Prof. Minoru Taya and his research team are developing "smart" windows for Boeing's new 787 jet.

Integrated Learning Factory opens in the mid-1990s.

Modern SAE car and submarine projects established in 1989.

Composites Center established in 2004 with FAA and Boeing funding. Interdisciplinary team is developing new structural materials for transport aircraft.

ME gains its first endowed chair in 2004, the James B. Morrison Chair.

1990 World Wide Web 2000 2006

1990 Hubble Space Telescope

Deployed into orbit by a Space Shuttle crew, it is stabilized in three axes and has grapple fixtures and handholds to allow servicing.



1992 Energy Efficiency Standards Set for Commercial Buildings

U.S. Energy Policy act requires minimum standards based on research and guidelines developed by ASHRAE and led by ME alumnus Rod Kirkwood.

1995 CAD Design for Aircraft

Boeing debuts the twin-engine 777, the first U.S. commercial aircraft produced entirely by computer-aided design and engineering.



Photos: 707 & 777, Boeing, Inc.; Moon & Hubble, NASA

Department Leadership



Morris E. Childs



David T. Pratt



Ashley F. Emery

1905-47	Everett Owen Eastwood
1947-63	Bryan Towne McMinn
1963-73	Charles J. Kippenhan
1969-70	Dean McFeron
1973-80	Morris E. Childs
1980-81	Howard G. Merchant
1981-86	David T. Pratt
1985-94	Richard C. Corlett
1994-97	Ashley F. Emery
1997-99	James J. Riley
1999-03	William R. D. Wilson
2003-04	Bruce H. Ade
2004-	Mark E. Tuttle

Photos of all the chairs are on the centennial website at: www.me.washington.edu/centennial. Select "100 Years of ME" and then "ME Chairs."

The Scheumann's ME Family Tree Has 100-Year Roots in Gas Works Park

The Scheumann family marks a centennial this year—100 years since patriarch Theodore Scheumann arrived in Seattle in 1906 to build the gas works at Lake Union. A Purdue mechanical engineering graduate, he also launched a four-generation family line of mechanical engineers.

Theodore's son, Rodger Van (Rod) Scheumann, stands second from the right in the top row of the UW ME Class of 1930 photo in the centennial section of the last issue of *the MEssenger*. The line continues through Richard (Dick) Scheumann (BS '57) and his daughter Robin Scheumann Baker (BS '80).

"This size of this equipment is amazing compared to what we build today, especially the generators and compressors," Dick notes of the now iconic structures at Gas Works Park.

Gas Works may be the most visually prominent family legacy, but Rod and

Dick had their hands in construction work from Arizona to Alaska and throughout the Northwest.

A lack of jobs in Seattle during the Depression sent Rod to California. He founded a construction company and took on projects in "out of the way places," including building a bridge over the McCloud River required by the construction of Shasta Dam.

"We lived in a little shack in the woods up a steep, unpaved road and had to pull our car up with a tractor. It was great fun," Dick recalls.

The family returned to Seattle in 1942, and when Dick entered the UW he took to heart his father's advice that "engineering won't hurt you."

"I've passed that advice along to a lot of young people," Dick says. "School was tough and all I did was study, but ME was the golden key to my career."



Dick Scheumann ('57) and Robin Scheumann Baker ('80).

After a stint in the Air Force he joined his father's company and helped build METRO sewage tunnels and pumping stations in the 1960s cleanup of Lake Washington. When his father retired in 1985 he ran the business under the name Constructors Pacific.

Projects in Alaska ranged from a powerhouse and tunnel near Juneau (12 feet of snow the first winter) to building a runway in Barrow near the Arctic Ocean. That required round-the-clock work in the short, chilly summer.

He counts more than 100 projects all over the West during his career, and also developed and patented a tunneling machine used on projects worldwide.

Now retired, Dick serves on the UW Medicine Board of Trustees.

Robin says she chose engineering "on her own," but genes must play a role because she always liked math, science, and getting tangible results. Her career path led to Hewlett Packard in Boise as a production engineer and in Silicon Valley as a production engineering supervisor. After returning to Seattle with her husband (also an engineer), Robin has been raising four children, now aged 9 to 21, and all talented in math and science. Perhaps one will carry on the family's engineering lineage.

Wouldn't Theodore be proud of his descendants and of Gas Works Park! ■

Catching Up at Decade Reunions

Pre-centennial events, organized by decade, reunited alumni from the 1940s through 1990s for reminiscing and updates on ME today.



Scenes from reunions for classes from the 1960s (left), 1970s (right), and the group photo of faculty and alums from the 1980s. For more photos and names, visit the ME centennial website.



Academic Spotlight

Jens Jorgensen Shares NAE Gordon Prize

Professor Emeritus Jens E. Jorgensen and four collaborators were awarded one of engineering's highest honors, the National Academy of Engineering's Bernard M. Gordon Prize for Innovation in Engineering and Technology Education, in a ceremony in Washington, D.C., on February 21, 2006. The awardees each received a gold medal and shared a \$500,000 prize.

The award recognizes the creation of the Learning Factory, where multidisciplinary student teams develop engineering leadership skills by working with industry to solve real-world problems.

The goal is to give students firsthand experience in design, manufacturing and business.



L to R: Lueny Morrell, Jens Jorgensen, Allen Soyster, and Bernard Gordon.

A coalition of the UW, Pennsylvania State University, and the University of Puerto Rico–Mayagüez created the Learning Factory with funding from the National Science Foundation. Professor Jorgensen led facilities development at all three partner universities. He guided the successful integration of the Learning Factory into the engineering curriculum at UW and directed the UW Learning Factory until retiring in 2000.

The Learning Factory provides students with an integrated facility where they can go from concept to design to prototype development. It includes conferencing facilities for linking with off-site teams, computer facilities,

and state-of-the-art equipment for manufacturing prototype parts.

Since its original introduction at the three partner institutions, Learning Factory concepts and course materials have spread to other universities in the United States and Latin America. Across the partnership over 10,000 students have worked on more than 1,200 Learning Factory design projects involving over 200 industrial partners.

Matthew O'Donnell Named Dean of Engineering

Matthew O'Donnell, chair of the Biomedical Engineering Department at the University of Michigan, will become dean of the College of Engineering on September 1. In addition to his appointment as dean, he will hold appointments as professor of bioengineering and adjunct professor of mechanical engineering. His research focuses on imaging technologies in biomedicine, an interest he shares with mechanical engineering faculty.

O'Donnell's background and experience is strongly interdisciplinary. His Ph.D. is in solid state physics, and he has held academic appointments in electrical engineering and computer science and in biomedical

engineering. "More fields within engineering are becoming more interdisciplinary and are developing important collaborations with other areas of science," said UW President Mark Emmert. "O'Donnell is just the right leader at this critical time for the university to expand its programs... and, to borrow a phrase, re-engineer engineering. We're excited about the future and Matt O'Donnell."

O'Donnell sees this appointment as "a once in a lifetime opportunity." He sees the college as having "made tremendous progress in the last decade," and welcomes the challenge of leading the college to become one of the truly premier engineering schools in the country.



Matthew O'Donnell

For information on O'Donnell, visit www.engr.washington.edu/dean/.

Academic Spotlight

Minoru Taya Awarded MURI Project



Minoru Taya

Professor Minoru Taya, Research Assistant Professor Chunye Xu, and three UW colleagues have been awarded a five-year, \$6 million Multidisciplinary University Research Initiative grant by the Air Force Office of Scientific Research. They will develop a set of energy harvesting materials based on polymer-based photovoltaics and thermoelectric materials, and energy storage systems based on polymer-based batteries. These systems may power unmanned air vehicles that will fly on solar energy, and also may find application in cabin operations on commercial airplanes.

Kudos to the Taya–Xu team!



Chunye Xu

Welcome Jiangyu Li



Jiangyu Li

Assistant Professor Jiangyu Li joined the faculty this January. His research interest is in multifunction of materials, and his emphasis will be on bringing functionality into the study of the structure of materials. He teaches the mechanics of materials lab class and is developing a graduate level multifunctional materials course. He is exploring

research projects involving conductive composites with The Boeing Company and other corporate partners.

Li completed his undergraduate work in China and earned his PhD from the University of Colorado in 1998. He completed postdoctoral assignments at the University of California–San Diego and at Cal Tech.

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