The ETM Department’s Commencement will be held on June 11, 2004, at the Hilton Portland and Executive Tower Hotel in downtown Portland (921 SW 6th Ave.). The graduation ceremony will begin at 1:00 pm, and following it there will be a reception with refreshments. Further information will be e-mailed soon to everyone who will be graduating, and it will also be posted soon to the ETM web site (www.etm.pdx.edu).

PICMET (Portland International Conference on Management of Engineering and Technology) has traditionally been held in Portland, Oregon, USA, as a biennial conference in the odd-numbered years. This year, however, a PICMET symposium will be held at the Ritz-Carlton Hotel in Seoul, Korea, on July 31—August 4, 2004. The symposium will be jointly hosted with STEPI (Science and Technology Policy Institute, Korea).

The PICMET ’04 program consists of:

- Workshops by experts on critical issues
- Plenary sessions by global leaders from industrial corporations, academic institutions and government agencies
- Research papers by cutting-edge researchers
- Applications papers by researchers and practitioners working on industry applications
- Panel discussions with interactions between panelists and the audience
- Tutorials on select topics by authorities in the field

Keynote speakers and plenary chairs at PICMET ’04 include:

- Dr. Youngrak Choi, President, STEPI (Science and Technology Policy Institute), Korea
- Mr. Jong-Yong Yun, Vice Chairman and CEO, Samsung Electronics, Korea
- Dr. Kwan Rim, Chairman, SAIT (Samsung Advanced Institute of Technology), Korea
Dr. Seiichi Watanabe, Executive Vice President, Sony Corporation, Japan
Dr. Gunnar Hambraeus, Chairman Scandinavia-Japan Sasakawa Foundation, and former chairman, Royal Academy of Engineering Science, Sweden
Dr. Chun-Yen Chang, President, National Chiao Tung University, Taiwan
Dr. Rosalie Zobel, Director of "Components, Subsystems and Applications" in the Information Society Directorate-General of the European Commission, European Commission, Belgium
Dr. Nam P. Suh, Massachusetts Institute of Technology, United States
Dr. Robert Phaal, University of Cambridge, United Kingdom

About 400 people are expected to participate in the symposium. If you would like more information, please visit the PICMET web page: www.picmet.org

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TECHNOLOGY MANAGEMENT LECTURE SERIES

The Oregon Center for Advanced Technology Education (OCATE) offers free lectures for engineers and technology managers throughout the academic year. For more information, visit the Ocate web site (www.ocate.edu) or call 503 725-2200 for the latest information about Ocate’s Friday Technology Lecture Series.

OCATE is located in the CAPITAL Center, 18640 NW Walker Road at 185th Ave. in Beaverton. From Portland, take Highway 26 west to Exit 64/185th Ave. Turn south onto 185th and travel about 1 mile to Walker Road. The CAPITAL Center is on the southwest corner of the intersection.

Yield Learning and the Sources of Profitability in Semiconductor Manufacturing
by Charles M. Weber, Ph.D.
April 16, 2004  4:00 pm – 5:30 pm

This lecture summarizes three broadly based studies that were conducted at International Sematech and MIT’s Sloan School of Management between 1996 and 2003. The study leads to three high-level conclusions. 1) The ability to accelerate yield learning constitutes the key source of profitability in semiconductor manufacturing. 2) The inability to transfer knowledge under time pressure from individual to individual and from organization to organization appears to be the limiting factor to profitability in semiconductor manufacturing. 3) Designing for the ability to solve problems before they occur constitutes a major source of competitive advantage.

Dr. Charles Weber holds an A.A. degree in physical science from the American College of Switzerland; a B.S. degree in engineering physics from the University of Colorado, Boulder; an M.S. degree in electrical engineering and computer science from the University of California, Davis; an S.M. degree in management of technology from the Massachusetts Institute of Technology and a Ph.D. in management from MIT’s Sloan School. Dr. Weber has 15 years of experience in the semiconductor industry, working at Hewlett-Packard Company. He started as a process engineer in an IC manufacturing facility. He subsequently transferred to HP’s IC process development center, working in electron beam lithography, parametric testing, microelectronic test structures,
From 1996 to 1998 Charles managed the defect detection project at SEMATECH as an HP assignee. In 2002 he joined the Department of Engineering and Technology Management at Portland State University as an assistant professor. Dr. Weber’s research interests are in organizational learning, problem solving, knowledge management, innovation and entrepreneurship. In 2003, his Ph.D. thesis titled “Rapid Learning in High Velocity Environments” was awarded runner up for the INFORMS Best Dissertation Award.

How Hewlett-Packard Optimizes the Use of Scarce R&D Resources
by Michael Menke, Ph.D.
April 23, 2004  4:00 pm – 5:30 pm

Despite spending almost $4 billion annually on R&D, HP can’t possibly cover all of its fields of business interest. Therefore, one of HP’s core strategies is to innovate where we can make a difference and partner for the rest. Given this, how can we determine the best places to focus scarce resources where we can generate a superior financial return? One answer is portfolio management. This presentation will explain:

- How we integrate business portfolio management with investment portfolio management
- How we ensure data integrity between planning and investment analysis
- How we evaluate the cost, risk and return of individual investment opportunities
- How we decide where to focus our limited R&D resources
- How we are able to respond quickly and intelligently when budget cuts are unavoidable
- How we are leveraging a common portfolio process across HP
- How we plan to improve and extend portfolio management in the future

Portfolio management is becoming a process that guides decision making and resource allocation at the highest levels of the corporation. A case study will show how HP generates high quality inputs for portfolio management in one of the most risky areas, new business creation.

Dr. Michael Menke is a Business Strategy & Technology Consultant in HP’s Business Innovation and Transformation Services group, where he provides assistance all across HP’s diverse businesses. His areas of expertise include innovation management, R&D management, portfolio management, decision & risk analysis and strategy development. His current assignments include strengthening HP’s already strong process for portfolio management and improving HP’s New Business Creation process. He has also done an extensive review of HP’s Total Innovation Management system. Before joining HP, he was a founding partner of Strategic Decisions Group, a leading consulting firm in the fields of strategy development and portfolio management, where he led their R&D management practice area and helped innovate many of the portfolio management methods in use today. Prior to helping found SDG, he was a senior consultant in SRI International’s Decision Analysis Group working in Europe, Japan and the US.
Managing Intellectual Property - Current Events in IP and Their Impact

by Julie Reed, J.D.
May 7, 2004  12:30 pm – 2:00 pm

Major issues with regard to Intellectual Property are being fought just about every day. The open source fight between IBM and SCO, Microsoft and Eolas in court about browsers, Victoria’s Secret about names...what does it all mean? Julie Reed, of Marger, Johnson and McCollom, will discuss the principles of intellectual property and the key elements of patents, trademarks, trade secrets and copyrights, what they are, from where they come, how you get them and what they can do for you. Julie will discuss current examples and the strategies of managing intellectual property that are behind them.

Julie Reed is a native of Richland, Washington, next to the Hanford Nuclear Reservation. She attended the United States Military Academy at West Point, NY, and Washington State University, Tri-Cities, when it was still part of the Joint Center for Graduate Studies, in Richland. She graduated from Washington State with a Bachelor of Science in Electrical Engineering and then moved to Dallas, Texas, to work as an electrical engineer at Texas Instruments.

After a few years as a digital system design engineer working in military computer systems, Julie joined a program at Texas Instruments to work in the patent department. As part of the program, Texas Instruments sent Julie to law school at Southern Methodist University. She worked in the patent department for about two years before starting law school, becoming a patent agent registered with the United States Patent and Trademark Office in 1991. She graduated from law school in 1995. Before, during and after law school, Julie worked with the digital micromirror technology (DMD), the basis for DLP (digital light processing), eventually becoming the Intellectual Property Strategy Manager for the Digital Imaging division in 1997.

In 1998, Julie left Texas Instruments to become the first in-house patent counsel at Sharp Laboratories of America, in Camas, Washington. After establishing the patent department at Sharp Labs, Julie left Sharp Labs to join Marger, Johnson and McCollom in Portland, Oregon in 2000. In 2003, Julie became a shareholder in the firm.

How And How Not to Lead Microprocessor Development

by Bob Colwell, Ph.D.
May 21, 2004  12:30 pm – 2:00 pm

Large pioneering microprocessor development efforts closely resemble NASA’s Apollo moon landing program of the 1960’s, much as Intel executive management would prefer to reduce them to simple increments from existing methods. In the thick of battle, slaying the dragons as they arise is all project leaders have time for. With the benefit of several years of hindsight, however, it is clearer which project management techniques and tactics worked, and which others did not. This talk will sketch out the major phases from Intel's extremely successful 1990's P6 project, drawing special attention to the universal lessons that underlie all such engineering efforts.

From the earliest project concepts to the vagaries of production, this talk will use real-world experiences and issues to illuminate the weird universe where high-tech product development meets human designers and even more human project leaders.
Bob Colwell was Intel’s chief IA32 microprocessor architect from 1992-2000, and managed the IA32 Arch group at Intel’s Hillsboro, Oregon facility through the P6 and Pentium 4 projects. He was named an Intel Fellow in 1996. Previously, Colwell was a CPU architect at VLIW pioneer Multiflow Computer, a hardware design engineer at workstation vendor Perq Systems, and a member of technical staff at Bell Labs. He has published many technical papers and journal articles, is inventor or co-inventor on 45+ patents, and has participated in numerous panel sessions and invited talks. He is currently an independent consultant. Colwell holds the BSEE degree from the University of Pittsburgh, and the MSEE and PhD from Carnegie Mellon University.

**Digital Photography and the Dynamics of Innovation**  
by Jim Utterback, Ph.D.  
May 21, 2004  4:00 pm – 5:30 pm

The emergence and adoption of digital still photography has been predicted and promised for several decades and may be disruptive to traditional silver halide photography while creating new market-expanding opportunities. It is a current example of innovation and technological discontinuity, and one that has enough history to permit analysis. It poses a real potential disruptive threat to the incumbent players, some of which have succumbed while others apparently succeeded. This paper discusses the emergence of a dominant design in digital still photography, market diffusion, patterns of entry and exit firms, and the strategies for success employed by leading participants.

Professor Jim Utterback is David J. McGrath jr. Professor of Management and Innovation at the Massachusetts Institute of Technology. Since receiving the Ph.D. in 1968 from the MIT Sloan School of Management, Prof. Utterback has held faculty positions at Indiana University, the Harvard Business School, and Chalmers Technical University as well as MIT. From 1983 through 1988, he served as Director of Industrial Liaison at MIT. His research has focused on the process of technological innovation in firms in the United States and in other countries. He is author of Mastering the Dynamics of Innovation, published by Harvard Business School Press in 1994. Recent publications include contributions to Management Science, Research Policy, Strategic Management Journal, Technological Forecasting and Social Change and The Sloan Management Review.

Professor Utterback’s teaching focus is on the dynamics of product and process development, emerging and disruptive technologies, and understanding the varied roles of firms as predators and prey when new technologies emerge. His current research focuses on the sustained growth of newly formed technology based firms in the United States, Sweden and the United Kingdom.

Professor Utterback is one of the founding faculty and currently chair of the Management of Technology Program, which is the first area of study at the MIT in which a degree was awarded jointly by the Schools of Management and Engineering. He is also one of the founders of the Leaders for Manufacturing Program, which awards dual degrees in engineering and in management and is currently developing a similar program in Biomedical Enterprise.

Professor Utterback received the D.Sc. (Hon) from Chalmers University in Gothenburg, Sweden, and was recently elected a foreign member of the Royal Swedish Academy of Engineering Sciences.
Outsourcing Technical Management
by David Reed, MPhil
May 28, 2004  12:30 pm – 2:00 pm

Outsourcing continues to be problematic, not least because fundamental
learning about this subject fails to be applied systematically and
because software development and functions are inherently difficult to
manage. Unfortunately, complexities are not removed in outsourced
situations where additional problems come into play, for example, the
supplier's capabilities, whether the application or function is right for an
outsourcing solution, and whether the contract is robust but flexible
enough to allow for outsourcing to take place. Objectives need to be
realistic, and factors such as whether the internal management is mature
and capable enough in this field, and the impact of prohibitive switching
costs on behavior once an outsourcing deal has been signed, all have to
be taken into account.

This presentation:
* Focuses on the fundamentals of what should be done and what should
  be avoided, based on actual experience applied in major IT outsourcing
deals
* Presents research findings and case examples included throughout to
  support recommended practices
* Provides a set of outsourcing templates, checklists, and success criteria.

By the end of this talk, practitioners will be able to focus in on the
essential issues that need to be addressed so that the fundamental
structure of their sourcing strategy and its implementation is sound.

David Reed is a senior technologist with 20 years of experience building
complex applications. He has worked extensively with outsourcers managing
an offshore development staff of 125. Through this experience he has developed
relationships with the CTOs and CEOs of major outsourcers and developed
methods, metrics, and templates to aid in a virtual management environment.

David also teaches software engineering, computer architecture, and graduate
database courses for the University of Maryland and Portland State University,
respectively. He has two patents in E-commerce and database technology and is
a Fellow in Wharton Business School's E-Fellow program. Currently, he is an
application architect for Hewlett-Packard designing integrated systems for their
business management function. In this role he is the technical manager for
outsourced applications.

Evolution of Project Management
by David I. Cleland, Ph.D.
May 28, 2004    4:00 pm – 5:30 pm

For centuries a form of project management has been used to create
change - or deal with change in societies. Project management has a rich
heritage. The leaders of antiquity were "managers" managing political
and social institutions to include countries, explorations, wars,
technology, and so forth. The principal challenge faced by these
managers was the need to create change for the better - or to deal with
the change that impacted their society. The point will be made that
project management has evolved over many centuries to come to focus
in the elaboration of the discipline in the 1950s.
A review of some of the major changes driven by projects in antiquity will be presented, along with a suggested classification of these projects. In addition a review of some of the literature in antiquity will be provided.

Dr. David I. Cleland is Professor Emeritus in the School of Engineering, University of Pittsburgh, Pittsburgh, PA. He is a Fellow of the Project Management Institute (PMI) and has received PMI’s Distinguished Contribution to Project Management Award three times. Dr. Cleland has been described as "The Father of Project Management" and has been honored through the establishment of the annual David I. Cleland Excellence in Project Management Literature Award sponsored by PMI. He is the author/editor of 36 books in the fields of Project Management and Engineering Management. His current research interests are in the evolution of project management and the strategic context of projects in the management of enterprises.

Following are the remaining spring term seminars. All seminars will be held on Thursdays at noon in Stephen E. Epler Hall, 1136 SW Montgomery St.

Presenter: C. Neil Berglund
Title: Semiconductor Manufacturing Yield Management and Trends in the Subwavelength Lithography Era
Date/ Time: April 29, 2004, 12 – 1 pm

Description: During 2003 Prof. C. Neil Berglund of PSU and Prof. Rob Leachman of the University of California, Berkeley, carried out a Sematech-funded study of the yield management trends and practices in the semiconductor industry. The motivation for this study was an observation by Sematech that semiconductor yields industry-wide appeared to be getting worse rather than better with each succeeding generation of technology starting at about the 250 nm generation. As the industry moved further into the subwavelength lithography regime, the situation appeared to be worsening. The study included site visits to five state-of-the-art semiconductor fabrication facilities worldwide, and incorporated proprietary yield and yield management data covering the 350 nm generation through the 180 nm generation, with preliminary data from the 150 nm generation, from these five companies. This seminar reviews the results of this study and describes both the yield management best practices and the trends observed. While attendees will get more from this seminar with some knowledge of semiconductor manufacturing, a technical background is not required.

Presenter: Melissa Appleyard and J. Alexander Liddle, Lawrence
Title: The Innovator’s Non-Dilemma: The Case of Next-Generation Lithography
Date/ Time: May 6, 2004, 12 – 1 pm

Description: This paper focuses on the leadership of incumbents when an industry encounters a technological discontinuity. Confronted with a discontinuity in their manufacturing capabilities involving the lithography production module, leading firms in the semiconductor industry have initiated next-generation lithography projects, characterized by an unprecedented level of cooperation. Previous studies have emphasized how entrants might displace incumbents when
incumbents focus too narrowly on satisfying the needs of present customers, rather than pursuing innovation that will ensure market leadership in subsequent rounds of competition. This paper distinguishes between this “dilemma” faced by incumbents and cases where the incumbents spearhead innovation on the technology frontier thus enabling future product generations. After establishing the case for discontinuous innovation led by incumbents, this research then analyzes how the innovators manage four areas of uncertainty: leadership, preemption, performance, and industry adoption. The implications of cooperative R&D in overcoming these uncertainties are examined for firms and consumers alike. Case studies of three next-generation lithography projects illuminate these forces that underlie incumbent-led cooperative R&D.

Largest PSU Gift Ever Goes to CECS

At a public announcement ceremony on March 18, 2004, PSU President Daniel O. Bernstine and Dr. Fariborz Maseeh, founder and president of The Massiah Foundation, announced the largest gift in Portland State University’s history—$8 million from the Foundation to the College of Engineering and Computer Science. With this gift, the College will become the Fariborz Maseeh College of Engineering and Computer Science. (The complete article: www.pdx.edu/cecs/news/2369)
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<th>Faculty Publication</th>
<th>A paper by ETM Professor Charles M. Weber, “Yield Learning and the sources of profitability in semiconductor manufacturing and process development,” has been accepted for publication in a future issue of <em>IEEE Transactions on Semiconductor Process Development</em>.</th>
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<td>Ph.D. Student Receives Award</td>
<td>Ph.D. student And Ozbay attended the &quot;5th Conference on Management Sciences&quot; in Istanbul, Turkey, in early March 2004, where he was one of six students selected to present his student project titled &quot;Application of a Management Framework for Cross-Organizational Software Projects.&quot; During the conference, the audience was asked to evaluate the student project presentations on different categories such as usage of technology, content, applicability, etc. Based on these evaluations, And was awarded the best project award. Congratulations, And!</td>
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<td>ETM Student Places 3rd in Competition</td>
<td>Congratulations to ETM master’s student Onur Kaplan for placing 3rd in the Capsim Foundation Fall 2003 Business Simulation Game competition by generating $100,953,367 million in cumulative profit. Ten PSU ETM student teams competed among the 288 teams worldwide in the challenge. Three of the ETM student teams were among the 37 semifinalists.</td>
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<td>DEA Research Group Exhibit at Fair</td>
<td>ETM Professor Tim Anderson and ETM students Lane Inman, David Loewi, and Supachart Iamratanakul, as well as Stephen Gance from PSU’s Instructional and Research Services, participated in PSU’s “2004 Teaching &amp; Learning with Technology Fair” on April 8, 2004. The research group was interested in adopting a tool for exchange of information including files, calendars, and other functions. Three distinct systems representing different tradeoffs were used to create prototypes for the group to examine their relative merits. The systems used were YahooGroups, WebCT, and XOOPS. The presentation demonstrated each of the three systems, the desired characteristics, and the criteria used in selecting the final system. While each of the platforms is of minimal or no cost, they each represent very different sets of tradeoffs, strengths and weaknesses. A special interest group is being formed that will include PSU faculty, staff, students, and others from as far away as Kansas and Atlanta to investigate and share resources regarding applications of data envelopment analysis (DEA) for quantitative benchmarking. There will be a web site available soon providing members with access to resources. Please contact Dr. Tim Anderson at <a href="mailto:ti@etm.pdx.edu">ti@etm.pdx.edu</a> if you would like more information.</td>
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<td><strong>Ph.D. Student Weds</strong></td>
<td>Congratulations to ETM Ph.D. student Audrey Alvear, who was married in Costa Rica on March 13, 2004, to Jacob Refstrup.</td>
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<td>Audrey Alvear and Jacob Refstrup</td>
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| **Alumni News** | **Wendy Christensen** (MSEM ’03) had her second child, Emma Catherine, on November 14, 2003. Wendy is now back working at Freightliner, LLC, in Portland.  

**Yonca Daim** (MSEM ’00) works for Intel as a Business Development Manager in the IT Flex Services, which is responsible for enabling Intel growth by creating internal business solutions that improve Intel efficiency and productivity. She has recently received a promotion—congratulations, Yonca!  

**Cheryl A. Duarte** (MSEM ’03) writes that she is working as a project manager for a company called e-Business International in Beaverton, Oregon. It is a start-up company focusing on providing contract manufacturing services in China. She writes, “The business has been extremely successful and growing. We are now evolving from working on turn-key projects to serving as procurement reps for large companies such as Caterpillar and USAW Wireless. I work closely on a management level with our staff in China, and touch on everything from production planning, operations, training, customer relationship management, and even sales. Since going offshore has been rather popular in the news, we are pretty excited about where we have positioned ourselves.”  

**Tim Dugan** (MSEM ’98), writes that since receiving his ETM degree, he has started his own industrial energy efficiency company and was able to hire his first full-time engineer in 2003. His company does consulting in Oregon, Washington, and Utah.  

**Elvan Ozar** (MSEM ’02), who worked as the ETM Office Manager for about a year after she graduated, is now working for CH2M Hill as a Project Control Specialist with the Northwest Design Group/Project Planning and Control.  

**Toryos Pandejpong** (Ph.D. ’02) is busy teaching at three universities, all in different corners of Bangkok, Thailand. He writes, “I have become
quite a versatile professor, which means that any class that they want me to teach, if they give me time, I can deliver it. So, now I teach management classes in Mahidol University International College, a project evaluation class in Thammasat University, and technology management classes in King Mongkut University of Technology.” In his spare time, Toryos helps with his family’s business, a kindergarten, which is currently expanding to another location.

Building the Future of the ETM Department

Although ETM continues to grow and to develop new programs, resources to fund special projects have become scarce over the last few years. You can help secure a bright future for as a resource for students and for the engineering and technology industry near and far. You can help with financial or in-kind gifts to support special programs, faculty development, scholarships and other department needs not covered by the university budget. All gifts are tax-deductible according to the U.S. IRS code, and must be made in US funds.

If you or your company would like to be part of the ETM family of donors with a gift in any amount, please contact Dundar Kocaoglu (kocaoglu@etm.pdx.edu) for information and account numbers to assure that the gift is properly credited to the Department. We can also talk with you about matching gifts if your organization offers this option.

Faculty (full-time and part-time combined)

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<th>Name</th>
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<tr>
<td>Dundar F. Kocaoglu, Ph.D., P.E.</td>
<td>Chair</td>
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<td>Timothy B. Anderson, Ph.D.</td>
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<td>Erwin “Al” Herman, Ph.D.</td>
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<td>Tom Long, Ph.D.</td>
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<td>Dragan F. Milosevic, Ph.D.</td>
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<td>Kathleen Murphy, J.D.</td>
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<td>Julie Reed, J.D.</td>
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<td>Lioni Setiowijoso, M.S.</td>
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<td>Stephen Singam, Ph.D.</td>
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<td>Charles M. Weber, Ph.D.</td>
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Engineering Management Advisory Committee (EMAC)

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<td>Tom Long, Ph.D., Network Elements, Inc.</td>
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<td>Eileen Boerger, Quality Logic</td>
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<td>David J. Brown, Tektronix, Inc.</td>
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<td>Jon Clemens, Ph.D., Sharp Labs</td>
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<td>Carmen Egido, Ph.D., Intel</td>
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<td>Darrell Cross, Columbia Machine, Inc.</td>
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<td>Don Grant, Credence</td>
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<td>David Hoffman, Celerity Energy</td>
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<td>Ron Khormaei, Ph.D., H-P</td>
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<td>Dick Knight, Retired Executive</td>
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<td>John Matlock, Ph.D., Komatsu America</td>
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<td>Nawzad Othman, OTAK</td>
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<td>William Reiersgaard, Retired Executive</td>
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<td>Craig Wessel, Business Journal</td>
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Note from the Editor

We want to hear from ETM alumni! Please write me and let me know what you are doing in your professional and personal lives. We will be expanding the alumni notes section in future issues and will share any information and photos that you send our way. Please send your news to ann@etm.pdx.edu. Please include your ETM degree and date of graduation. –Ann White, Editor