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PICMET '03



Dear PICMET Guests: It is a great pleasure for us to welcome you to PICMET '03.

Profound changes have taken place in the world since the last PICMET was held two years ago. The world was reshaped when a technology product, a jetliner, was used as a weapon on September 11, 2001. The world was reshaped when the Internet bubble collapsed and brought the telecommunications industry to a tailspin. The world was reshaped when we observed, in two wars, that the deciding factor in military conflicts was the superiority of information technology and computerized military intelligence. The world was reshaped when biotechnology became the primary weapon to fight the SARS epidemic throughout the world.

Technology has been the focal point in reshaping the world in all of these situations; causing problems in some cases and providing solutions in some others, depending on how we have managed it. It is clear that we are in an era with the opportunity to manage technology to reshape the world for the betterment of

humankind. It is up to us to make it happen.

We hope that the discussions, the cross-fertilization of ideas, the sharing of knowledge, and the networking that will take place during PICMET '03, will indeed help to reshape the world for the betterment of humankind.

PICMET, in its 12th year now, is the largest conference on technology management in the world. Despite the economic and political uncertainties, along with the recent SARS epidemic that frightened the world this year, the global response to PICMET '03 has been extremely enthusiastic. There are 129 sessions with about 400 presentations in this year's conference. The papers have been received from authors representing about 200 universities and 100 industrial corporations, research institutes and government agencies in more than 40 countries. They have all been subjected to a double-blind review process. Approximately 80% of the presentations are research papers indicated with an [R] preceding their title in this bulletin, and 20% are industry applications indicated with an [A].

Literally hundreds of people participated in planning and organizing PICMET '03. The Board of Directors, the Advisory Council, the Regional Coordinators, the Organizing Committee, and particularly the "Core Team," which is made up of our students in the Department of Engineering and Technology Management at Portland State University, took on major responsibilities. Finally, several public and private organizations saw the value of PICMET '03 and supported it. We acknowledge the individuals and organizations which supported PICMET, and extend our deep gratitude and thanks to every one of them. We also hope that the ever-increasing enthusiasm of all these people has resulted in a conference that will be a truly rewarding experience for our guests.

PICMET '03 has three publications: This *Bulletin* gives a synopsis of the conference with up to 200-word abstract of each presentation; the *Proceedings* includes all of the presentations in full length; and the book *Technology Management for Reshaping the World* contains 51 papers that best represent the technology management field as it exists today.

The papers scheduled for presentation at PICMET '03 are clustered into 38 major tracks, which are listed alphabetically below.

Collaborations in Technology Mgmt.	Intellectual Property	Supply Chain Management
Competitiveness in Technology Management	International Issues in Technology Mgmt.	Technological Changes
Cultural Issues	Knowledge Management	Technology Assessment and Evaluation
Decision Making in Technology Management	Management of Technical Workforce	Technology Commercialization
E-Business	Manufacturing Management	Technology Diffusion
Entrepreneurship/Intrapreneurship	New Product Development	Technology Management Education
Environmental Issues in Technology Management	Productivity Management	Technology Management Framework
Healthcare Industry	Project/Program Management	Technology Management Perspectives on Terrorism
Historical Perspectives	R&D Management	Technology Marketing
Information Technology (IT) Management	Resource Management	Technology Planning and Forecasting
Innovation Management	Science and Technology Policy	Technology Roadmapping
	Semiconductor Industry	Technology Transfer
	Software Process Management	Telecommunications
	Strategic Management of Technology	

We are pleased to hear from the participants that every PICMET is better than the previous one in terms of its content, quality and the impact it is making on the technology management field. We believe PICMET '03 will have a major impact on the growth of the field and will contribute significantly to research, education and implementation of Technology Management. We hope you will find it beneficial and enjoyable. All of us at PICMET wish you a productive week, with active participation in the technical activities as well as networking opportunities throughout the Conference.

Sincerely,

Dundar F. Kocaoglu
President and CEO

OFFICE OF THE GOVERNOR
STATE OF OREGON



PROCLAMATION

WHEREAS: The engineering and technology sector of the economy of the State of Oregon is essential to the State's continued economic growth; and

WHEREAS: The effective management of engineering and technological processes, programs, and projects is necessary to assure the fullest benefits; and

WHEREAS: The field of engineering and technology management is international in scope and constantly changing; and

WHEREAS: The Engineering Management Program at Portland State University in cooperation with the AeA Oregon Council, INFORMS Technology Management Society, and the Japan Society for Science Policy and Research Management have convened the Portland International Conference on Management of Engineering and Technology, July 20 through July 24, 2003 to provide a forum for the exchange of information and ideas among practitioners in this important field.

NOW

THEREFORE: I, Theodore R. Kulongoski, Governor of the State of Oregon, hereby proclaim July 20 – 24, 2003 to be

Technology Management Week

In Oregon and encourage all Oregonians to join in the observance.

IN WITNESS WHEREOF, I hereunto set my hand and cause the Great Seal of the State of Oregon to be affixed. Done at the Capitol in the City of Salem in the State of Oregon on this day, June 3, 2003.



Handwritten signature of Theodore R. Kulongoski.

Theodore R. Kulongoski, Governor

Handwritten signature of Bill Bradbury.

Bill Bradbury, Secretary of State

RON WYDEN
OREGON

518 Hart Senate Building
Washington, DC
20510-3703
(202) 224-5244

web site:
<http://wyden.senate.gov/>

United States Senate

WASHINGTON, DC 20510-3703

June 25, 2003

Dear Conferees:

Welcome to the 2003 Portland International Conference on Management of Engineering and Technology. As Oregon's Senior United States Senator, it is my pleasure to welcome you to Oregon and to thank you for serving as a conferee for this important event.

Committees:

Budget
Commerce, Science
& Transportation
Energy & Natural Resources
Environment & Public Works
Select Committee on
Intelligence
Special Committee on Aging

Oregon State Offices:

700 NE Multnomah St
Suite 450
Portland, OR 97232
(503) 326-7525

151 West 7th Ave
Suite 435
Eugene, OR 97401
(541) 431-0229

Sac Annex Building
105 Fir St
Suite 201
La Grande, OR 97850
(541) 962-7691

U.S. Courthouse
310 West 6th St
Room 118
Medford, OR 97501
(541) 858-5122

The Jamison Building
131 NW Hawthorne Ave
Suite 107
Bend, OR 97701
(541) 330-9142

707 13th St, SE
Suite 285
Salem, OR 97301
(503) 589-4555

Technology is rapidly changing every aspect of our lives. From the cars we drive, to the work we do, to the food we eat; the world around us seems to be changing in fundamental ways almost daily. And while technological innovation in a host of areas is critically important to our future prosperity, it is imperative that public and private-sector leaders work together to ensure these advancements are managed effectively. During this conference, you will hear some of the world's leading experts from industrial corporations, government agencies, and academia discuss strategies to effectively develop and manage new technological innovations.

Here in Oregon, we are working collaboratively to grow innovative technologies. Most recently, public and private-sector leaders have developed a partnership designed to bring substantial nanotechnology research and development assets to our state. Nanotechnology will soon impact virtually every sector of the economy and has the potential to generate an economic and social revolution. I authored a bill in the U.S. Senate to advance the nanotechnology research and development effort nationally, and Oregon's business and university communities have joined together to develop a comprehensive plan for growing this industry locally. Collaborative partnerships like these will help leaders to effectively manage resulting technological innovations for the betterment of their economy and their community.

I'd like to thank Portland State University's Engineering and Technology Management Department for hosting this conference and I hope you find today's program to be both insightful and thought provoking. On behalf of the citizens of Oregon, thank you for your contributions to engineering and technology management. We look forward to seeing you again in 2005.

Sincerely,



Ron Wyden
U.S. Senator

DAVID WU
1ST DISTRICT, OREGON

1023 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-3702
TELEPHONE: (202) 225-0855

620 SOUTHWEST MAIN STREET
SUITE 606
PORTLAND, OR 97205
TELEPHONE: (503) 326-2901
(800) 422-4003

<http://www.house.gov/wu>



Congress of the United States
House of Representatives
Washington, DC 20515-3701

May 28, 2003

COMMITTEES:

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21ST CENTURY COMPETITIVENESS

SCIENCE

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CHAIR

CONGRESSIONAL ASIAN PACIFIC
AMERICAN CAUCUS

Dear Friends:

It is my pleasure and honor to welcome you to the State of Oregon and to the 2003 International Conference on Management of Engineering and Technology.

This is my third term representing Oregon's 1st Congressional District, which is home to Oregon's Silicon Forest. The issues you will address during this conference are directly related to the work I do in Congress. As a member of the House Science Committee and the Education and Workforce Committee, I am working to provide children with the best education in the world and to support workforce development so that Oregon and the Nation are able to compete successfully in the ever-changing economy. In addition, the Science Committee focuses on ways to support and enhance new scientific discoveries and technological opportunities. Your participation this week will continue a dialogue among the best and brightest from scholars, businesses, and academic research institutions.

I am a co-sponsor of H.R. 766, the Nanotechnology Research and Development Act of 2002, which passed the U.S House of Representatives on May 7, 2003. This bill prepares the United States to be competitive in nanoscience and nanotechnology by authorizing \$2.36 billion over three years for research and development. In addition, the bill provides a formal structure for coordination of research across agencies and encourages people to pursue degrees in science and engineering.

The organizations - Portland State University, Institute for Operations Research and the Management Sciences, American Electronics Association, Oregon Center for Advanced Technology Education, the Institute of Electrical and Electronic Engineer Oregon Section, and the Japan Society for Science Policy and Research - involved in this conference have helped Oregon become a leader in technology management through collaborative partnerships. Portland State University is located at the center of this growing technology and science based industry. We are also fortunate that Portland State University has a growing research agenda that supports technology-based industries and expertise in areas such as transportation, circuit design and test, cyber-security and nanoscience.

On behalf of the citizens of Oregon and my colleagues in the United States Congress, I would like to thank each one of you for your dedication and hard work on reshaping the technology of the future.

With warm regards,

A handwritten signature in black ink, appearing to be 'David Wu'.

David Wu
Member of Congress



The office of
Vera Katz
Mayor Portland Oregon The City That Works

May 28, 2003

Welcome to the City of Portland:

Portland is a city committed to technology innovation and development. We know that our future is depended on building new markets in high technology where, in partnership with Portland State University, we already have strength. These areas include intelligent transportation, cyber-security, flat screen technologies, bioscience and bio-informatics, environmental sustainability, creative industries, nanotechnology, and more. As you get to know Portland, you will see the products of collaborative ventures between the business community and government in our transportation system, downtown development, environmental preservation, and educational institutions.

I am pleased that the Portland State University's Engineering and Technology Department is leading the 2003 Portland International Conference on Management of Engineering and Technology. This conference, *Technology Management for Reshaping the World*, provides a wonderful opportunity for international leaders to discuss ways that Portland and cities around the world can support technology development to improve the lives of the entire community.

This conference has become a tradition in Portland and I hope that is in part because of the hospitality you receive from the residents of the City of Roses. I encourage you to take some time in your busy schedule to explore and enjoy what Portland has to offer. Ride the Portland Streetcar, visit our farmer's market, go to Oregon's largest university (PSU), view historic preservation through the City's architecture, walk along our riverfront, and enjoy the Northwest cuisine.

I look forward to welcoming you again in 2005!

With warm regards,

Vera Katz
Mayor

VK:tk



1221 SW 4th Avenue, Suite 340
Portland, Oregon 97204-1995
Phone: 503-823-4120 Fax: 503-823-3588
TDD: 503-823-6868 www.ci.portland.or.us/mayor/

THE CITY OF ROSES

Portlandia© by Ray Kaskey Photo by Stewart Harvey

ACKNOWLEDGMENTS

PICMET '03 WAS ORGANIZED BY

Portland State University

Department of Engineering and Technology Management

IN COOPERATION WITH

- IEEE Oregon Section
- AeA Oregon Council
- INFORMS Technology Management Section
- Japan Society for Science Policy and Research Management

CORPORATE SUPPORTERS

- IKON Office Solutions
- In-Focus Systems, Inc.
- OCATE (Oregon Center for Advanced Technology Education)
- POVA (Portland Oregon Visitors Association)
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PICMET '03

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Julia Omelchuck, Graphic Design

Fred Phillips, Oregon Graduate
Institute
Joan Sher, GK Ltd. Travel
Yong-In Shin, Samsung Electronics
Douglas H. Swanson, PSU

PICMET '03

PROGRAM COMMITTEE

The Program Committee consisted of 106 researchers, educators, practitioners and students of technology management from around the world. The members of the Program Committee evaluated the proposals, reviewed the papers, and made recommendations on the appropriateness of each presentation for inclusion in the conference.

Alaa Abunijem	Hannu Jaakkola	And Ozbay
Mike Adams	Sul Kassicieh	Toryos Pandejpong
Tony Bailetti	Stylianos Kavadias	Peerasit Patanakul
Elif Baktir	Diane Keil	Kenneth Pechter
Jean-Claude Balland	Nese Kemerdere	Michele Pfund
Nuri Basoglu	Chaiho Kim	Robert Phaal
Bill Burwell	Jim Koch	Fred Phillips
Brent Capps	Stefan Koruna	Alan Porter
Elias Carayannis	Timothy Kotnour	David Probert
Jin Chen	Michael Kriss	James Ragusa
Michael Cole	Koty Lapid	Krishnamurthy Ramanathan
John Dang	Thomas Lechler	Arnold Reisman
Burton V. Dean	Kiatiporn Lertsathitphong	Martin Rinne
Glenn Dietrich	Moren Levesque	Jamie Rogers
Robert Eder	Alan Lewis	Samar Saha
William Eisenhauer	Ziqi Liao	Halime Sarihan
Alptekin Erkollar	Matthew Liberatore	Liono Setiowijoso
Stacey Ewton	Jeff Liker	Aaron Shenhar
George Farris	James Lill	Ming Shi
Hartmut Feucht	Harold Linstone	Kathryn Stecke
Sebastian Fixson	Jonathan Linton	Harm-Jan Steenhuis
William Flannery	Larry Mallak	Kevin Steensma
Janice Forrester	Robert Martin	Hans Thamhain
Richard Franza	R. Keith Martin	Charles Thompson
Eliezer Geisler	Andrea Masini	Konstantinos Triantis
Hoa Generazio	Robert Mason	Max von Zedtwitz
Nathasit Gerd Sri	Gita Mathur	Wayne Wakeland
Donald Gerwin	Heike Mayer	Steve Walsh
Francis Giang	Sarfraz Mian	Bob Watts
Shawna Grosskopf	Kumiko Miyazaki	Ann White
Robert Harmon	Hwy-Chang Moon	David Wilemon
Al Herman	Katy Murphy	Gerry Williams
Keith Hollingsworth	Steven Nahas	Chuck Yang
Chris Hotchkiss	Sarah Nesland	Deok Soon Yim
Junwong Hwang	Kiyoshi Niwa	Arezou Zarafshan
Boonkiart Iewwongcharoen	Onno Omta	

PICMET '03

PICMET '03 CORE TEAM

A 28-person Core Team implemented a large number of projects involved in the planning and organizing of PICMET '03. Members of the Core Team were Masters or Ph.D. students in Portland State University's Department of Engineering and Technology Management (ETM). The project teams worked on multiple projects that were being undertaken simultaneously. The project managers and project team members were assigned to new projects when their projects were completed. The Core Team met every week to discuss the progress in each project, to evaluate the project schedules and outcomes, and to modify the strategies, as needed. It was not unusual for the Core Team members to work until the early hours of the morning in order to meet their schedules. The Core Team approach made it possible not only to get the work done for PICMET, but also to give the ETM students the opportunity to manage complex projects with tight schedules in a real life situation.

PROJECT MANAGERS AND TEAM MEMBERS

Priya Ajgaonkar	Pierre Gohier	Elvan Ozar
Audrey Alvear	Jonathan Ho	And Ozbay
Roda Batarseh	Supachart Iamratanakul	Steven Nahas
Ferhan Cebi	Boonkiart Iewwongcharoen	Halime Inceler Sarihan
Hongyi Chen	Onur Kaplan	Seiji Shinriki
Christophe Chung-Sine	Nese Kemerdere	Sabin Srivannaboon
Ferry Cosmedy	Seda Kose	Iwan Sudrajat
Sarka Dluhosova	Shawn LaBelle	Wichan Wannalertsri
Dave Fenwick	Kiatiporn Lertsathitphong	Ada Yu
Diane Ferington	Juan Ospina	

ADVISORY COUNCIL

The International Advisory Council provides advice and counsel on the strategic directions of PICMET and the identification of the critical issues of technology management that are addressed at the conference. The members are listed below.

Dr. Daniel Berg Professor and former President, RPI, USA	Dr. Gunnar Hambraeus Royal Swedish Academy of Engineering, Sweden	Dr. Graham Mitchell Director, Wharton Program in Technological Innovation, University of Pennsylvania, USA
Dr. Frederick Betz Professor, University of Maryland, USA	Dr. Kathryn J. Jackson Executive Vice President, TVA, USA	Dr. Kwan Rim Chairman, Samsung Advanced Institute of Technology, Korea
Dr. Joseph Bordogna Deputy Director, NSF, USA	Mr. Richard I. Knight Former President and COO, SARIF, Inc., USA	Dr. Frederick A. Rossini Former Provost, George Mason University, USA
Dr. Joseph W. Cox Distinguished Service Professor, Oregon University System, USA	Dr. Jay Lee Distinguished Professor University of Wisconsin, Milwaukee, USA	Mr. Terry Rost President, The Franchise Group, USA
Dr. Robert D. Dryden Dean of Engineering and Computer Science, Portland State University, USA	Mr. Thomas H. Lipscomb Chairman, The Center for the Digital Future, USA	Dr. Seiichi Watanabe Corporate Executive Vice President, Sony Corp., Japan
Mr. Les Fahey President, Fahey Ventures, USA	Dr. Tom Long CEO, PriMotive Corp., USA	Dr. Rosalie Zobel The European Commission, Belgium
	Mr. John McDougall CEO, Alberta Research Council, Canada	

LTM AWARDS

LEADERSHIP IN TECHNOLOGY MANAGEMENT AWARDS

PICMET recognizes and honors individuals who have provided leadership in managing technology by establishing a vision, providing a strategic direction, and facilitating the implementation strategies for that vision.

Dr. Andrew S. Grove, CEO of Intel, was the first recipient of the LTM award at PICMET '91.

Norman Augustine, Chairman of Lockheed-Martin, was the PICMET '97 recipient.

Jack Welch, CEO of General Electric, received the award in the "industry" category; and Dr. Richard M. Cyert, President of Carnegie Mellon University, received it posthumously in the "academic" category at PICMET '99.

Three awards were given at PICMET '01. Dr. Modesto A. Madique, President of Florida International University, was the recipient in the "academic" category; Carleton S. Fiorina, Chairman and CEO of Hewlett-Packard Co., in the "industry" category; and Donna Shirley, former manager of the Mars Exploration Program, in the "government" category.

Three awards will again be given at PICMET '03:

- Mr. Jong-Yong Yun, Vice Chairman and CEO of Samsung Electronics, Inc. (Korea), will be honored for the industry category
 - Dr. Joseph Bordogna, Deputy Director of NSF (USA), for the government category
 - Dr. Chun-Yen Chang, President of National Chiao Tung University, Taiwan, for the academic category.
- Brief background information on the 2003 recipients is given below.

Jong-Yong Yun, Vice Chairman and CEO, Samsung Electronics Co., Ltd., Korea

Mr. Yun is the Vice Chairman and CEO of Samsung Electronics Co., Ltd. in Korea. He received his degree in Electrical Engineering from Seoul National University and joined the Samsung Group in 1966, and continually rose through the ranks of the company. He became Electronics Group Vice President in 1988 and completed the MIT Sloan School Senior Executive Program the same year. After serving as president and CEO of several business groups and Samsung companies, he became the President and CEO of Samsung Electronics Co. in 1996, and was promoted to his current position of CEO and Vice Chairman in 1999.

In his CEO's message to Samsung's customers and shareholders in 2002, Mr. Yun articulated his views and strategies for his company by saying "The 21st century marks a new starting point for Samsung Electronics' second 30 years of doing business. Keep your eye on us as we emerge as the leader in the digital convergence revolution and a world-class company that is recognized around the globe."

Mr. Yun's philosophy in guiding Samsung Electronics Co. to greatness is reflected in his many, often-quoted statements, including:

"Determination and a 'go for it' attitude can turn crisis into unlimited opportunities."

"Management must be an ongoing process of innovation. Process innovation starts with change, and change must start with the reform of consciousness."

"Technology is the lifeblood of the electronics industry — 'technology' is the only currency that will beget technology."

Among the many awards bestowed upon Mr. Yun are the Korean government's Bronze and Gold Medals for contributions to industry (1990 and 1992), Seoul National University's Honorable Engineering Alum award (1995), IIE's "Outstanding Achievement in Management" award (1998), Korea Management Association's "Most Successful CEO in Korea" Award (1999), *Business Week's* "Top 25 Managers of the Year" listing (2000), and *Fortune Magazine's* "Asia's Businessman of the year award (2000). Most recently Mr. Yun was featured on the cover of *Business Week* in June 2003.



LTM AWARDS

Joseph Bordogna, Deputy Director, NSF, USA

Dr. Bordogna is Deputy Director and Chief Operating Officer of the National Science Foundation.

Complementing his NSF duties, he has chaired committees on Manufacturing and Environmental Technologies within the President's National Science and Technology Council, he was a member of the Federal Government's Technology Reinvestment Project Team (TRP), and he serves on the Partnership for a New Generation of Vehicles Committee (PNGV) and the U.S.-Japan Joint Optoelectronics Project.



Dr. Bordogna received the BSEE and Ph.D. degrees from the University of

Pennsylvania and the S.M. degree from M.I.T. His career includes experience as a line officer in the U.S. Navy, a practicing engineer in industry, a professor at the university, a president of IEEE (Institute of Electrical and Electronics Engineers), and a leader in science and technology policy in the government.

Prior to his appointment at NSF, he served at the University of Pennsylvania as the Alfred Fitler Moore Professor of Engineering, Director of the Moore School of Electrical Engineering, and the Dean of the School of Engineering and Applied Science. It was during his tenure at the University of Pennsylvania that the highly acclaimed "Management and Technology Program" was created by combining the strengths of the School of Engineering and the Wharton School of Management for a unique undergraduate degree.

At NSF, Dr. Bordogna continued with his innovative ideas and creative leadership by leading the development of new programs focused on expanding research horizons into connecting the frontier of science and engineering with service to society, producing a world-class engineering and science workforce, and making sure that every student from kindergarten up through the highest level of education has math and science capabilities.

Among the many honors Dr. Bordogna has received are his Fellow Awards in the American Association for the Advancement of Science (AAAS), the American Society for Engineering Education (ASEE), and the Institute of Electrical and Electronics Engineers (IEEE).

Chun-Yen Chang, President, National Chiao Tung University, Taiwan

Dr. Chun-Yen Chang is the President of National Chiao Tung University in Taiwan. He received his BSEE degree from the National Chen Kung University (NCKU), and MS and Ph.D. degrees from the National Chiao Tung University (NCTU). Prior to his current position, he served as a research fellow at Bell Labs, a professor at NCKU, the dean of research, dean of engineering and dean of Electrical Engineering and Computer Science at NCTU. He also was the founding Director of National Nano-Device Labs in Taiwan.

In addition to his presidency at NCTU, Dr. Chang holds several other positions and affiliations including Foreign Associate of the U.S. National Academy of Engineering, member of Academia Sinica of the Republic of China, National Chair Professor, National Policy Advisor to the Office of the President of the Republic of China, and Science and Technology Advisor to the Executive Yuan of the Republic of China.

Dr. Chang started his research on semiconductors in 1960, and established the first Semiconductor Research Center in the R.O.C. in 1964. Later, he also established the National Nano-Device Research Laboratory for leading-edge research on nano devices.

His research in semiconductor devices and key inventions have made significant contributions to the field. Among his major inventions are the method of low pressure MOCVD using triethyl Gallium, Zn incorporation, boron penetration and nitridation in silicon dioxide, and modulation doped-based transistor.

Dr. Chang has received 26 patents in the U.S. and in Taiwan and has published over 300 papers. He is the author of the book *Made by Taiwan*, promoting the idea of innovation and creativity for the future of Taiwan as a world leader in technology.

STUDENT PAPER AWARD

The number of students doing significant research in the area of Engineering and Technology Management was demonstrated by the 30 nominations received. All nominated papers were excellent, and the selection of the award winner was difficult, but one paper stood out for its contributions.

AUTHOR

Antonie Jetter

ADVISOR

Prof. Dr. Hans-Horst Schröder

UNIVERSITY

**Rheinisch-Westfälische Technische Hochschule
Aachen-Germany**

TITLE OF THE PAPER

**“Educating the Guess: Strategies, Concepts and Tools
for the Fuzzy Front End of Product Development”**

ABSTRACT

Many companies lack efficient management of the early phases of new product development (NPD), the so-called fuzzy front end (FFE). Rather than on structured methods, decision makers rely on “gut-feel” or “guessing.” In an attempt to “educate the guess,” this paper discusses the activities and challenges of the FFE, as well as strategies to manage them successfully. It then briefly presents traditional and recent approaches to front-end management support. Based on the identified strengths and weaknesses of existing front-end solutions, the framework of a new management support system for the FFE is presented. Conceptually, the system is based on psychological findings about the process of action-regulation in complex decision environments. Methodologically, it uses Fuzzy Cognitive Maps (FCM) for modeling and simulation.

Antonie Jetter studied business administration at RWTH Aachen, where she graduated in 1998. She has worked with Siemens AG and a start-up laser company and joined the Department of Technology and Innovation Management at the RWTH Aachen in 1998. She is currently working on her Ph.D. thesis concerned with information acquisition and processing in the early NPD phases. Her present research interests also include knowledge management and small and medium enterprises.



GENERAL INFORMATION

CONFERENCE FOCUS

Technology Management is rapidly emerging as the major challenge of the coming decades. As the technology age moves forward with a high speed characterized by rapid changes, the leaders of technology are distinguishing themselves from those that fall behind, by developing and implementing innovative approaches to managing technology. The line of demarcation between success and failure is getting sharper and sharper. The unmistakable difference between the two is the degree of effectiveness in management of technology. The focus of PICMET '03 is that phenomenon. It addresses all aspects of managing technology with specific emphasis on **its impact on reshaping the world**. PICMET '03 provides an invaluable opportunity for exchange of ideas, information, research results and experiences in development and implementation of technology management concepts. The leading decision makers, scholars and practitioners of technology management from more than forty countries will discuss existing and emerging issues in technology management, and will present multiple perspectives in addressing them.

WHO SHOULD ATTEND

This high-impact conference will set the stage and define the directions of technology management for decades to come. The world's leading experts from academic institutions, industrial corporations and government agencies will participate in the discussions. The conference is essential for:

- Presidents and CEOs of technology-based corporations
- Vice presidents of engineering, R&D and technology in industrial organizations
- R&D managers
- Engineering, manufacturing, operations, quality and marketing managers in technology-based organizations
- Project and product managers
- Information systems managers in industrial and service organizations
- Technology Management researchers
- Government officials responsible for science and technology programs
- Educators in engineering management, technology management, manufacturing management, technology marketing, software management,

information systems management, project management, and technology-focused MBA programs

- Engineering and Technology Management Program Heads
- Students in Engineering Management, Management of Technology and related programs
- Government officials responsible for technology policy
- Engineers and scientists moving from technical specialty to management positions while maintaining their identity in technical fields.

REGISTRATION POLICY

All PICMET attendees, including speakers and session chairs, must register and pay the registration fee to have access to the sessions and other events as specified on the registration. The registration fee allows admittance to all technical sessions, the exhibits area and the social events as specified on the registration form. Name badges must be worn to all PICMET sessions, functions and events. If you attend workshops or the events not covered by the registration fee, you will be required to pay an additional fee.



Portland Hilton

GENERAL INFORMATION

SESSION AND PAPER DESIGNATIONS

Sessions are identified by a four-digit code as follows:

First digit shows the day	M: Monday T: Tuesday W: Wednesday H: Thursday
Second digit shows the time	A: 08:00-09:30 B: 10:00-11:30 C: 11:45-13:15 D: 13:30-15:00 E: 15:30-17:00
Third and fourth digits show the room	01: Pavilion East 02: Pavilion West 03: Broadway I 04: Broadway II 05: Broadway III 06: Broadway IV 07: Forum 08: Council 09: Directors 10: Studio 11: Executive 12: Senate 13: Cabinet

Presentations in each session are given consecutive numbers following the session number. For example, paper TD-05.2 is the second paper on Tuesday at 13:30 – 15:00 in Broadway III.

E-MAIL CENTERS

Computers with Internet connections will be provided on the Plaza Level in the Plaza Foyer to give you the opportunity to check your e-mail and to send messages. For those of you with laptop computers and Wi-Fi (802.11b), we will have wireless access in a designated area on the Plaza Level.

AUDIO/VISUAL EQUIPMENT

Each session is equipped with an overhead projector, a flipchart and screen, and an LCD projector. The Plaza Suite on the Plaza Level is designated as the Authors Room. If you need information about anything else concerning the conference, volunteers in the registration area will try to help you.

PICMET VOLUNTEERS

PICMET Volunteers wearing white polo shirts with the PICMET logo will assist the participants throughout the

conference. If you need help in locating the room where your session will be held, finding a replacement bulb for the projector, or making a last-minute change in your transparencies, for example, you can contact the PICMET Volunteers. They will do their best to help you. If you need information about anything else concerning the conference, a volunteer in the registration area will try to help you.

PRESENTATION GUIDELINES

The Sessions: The sessions are 90 minutes long and include two, three, or four papers. Depending on the number of papers in the session, the time should be divided equally for each presentation, allowing about five minutes after each one for questions.

GUIDELINES FOR SESSION CHAIRS

If you are chairing a session, please follow the guidelines below:

- Contact the speaker before your session starts.
- Check the equipment in the room. If something does not work or if anything else is needed, contact the PICMET Volunteer responsible for your room.
- Introduce each speaker.
- Coordinate the time allocated to each speaker so that each has about equal time, allowing about five minutes for questions from the audience.
- Fill out the Session Summary Form and leave it on the table in the room. (The form will be given to the session chair by the PICMET Volunteer at the beginning of the session.)

GUIDELINES FOR SPEAKERS

If you are presenting a paper, please follow the guidelines below:

- Introduce yourself to your session chair, and provide him/her with a brief background statement that he/she can use in introducing you to the audience.
- Divide the 90 minutes by the number of papers in your session so that every speaker in the session has approximately the same length of time.
- Allow about five minutes for questions from the audience after your presentation.

HILTON BUSINESS CENTER

The hotel has a fully equipped business office on the Lobby Level of the hotel. A wide range of services are available from 8:00 a.m. to 4:30 p.m., Monday through Friday. Fax and copy services are available through the Front Office after 5:00 p.m. and on weekends.

THE CITY OF ROSES

The following information about Portland is provided compliments of Portland Guide: Discovering Oregon, Published Quarterly by Skies America Publishing Company.

GETTING AROUND PORTLAND

Portland's public transportation is made up of the MAX (Metropolitan Area Express) train, Tri-Met buses, and the Portland Streetcar. All are free within the downtown area and across the Willamette River as far as the Lloyd Center stop. This area is known as Fareless Square. Outside Fareless Square, fares range from \$1.25 to \$1.65, less for seniors, the disabled and youths. Tickets are interchangeable and can be purchased aboard buses or from ticket machines along the MAX line.

CLIMATE

The temperature in Portland varies between 56°F (13°C) in the evening to 80°F+ (27°+) during the day in July. The generally low humidity makes summer months very pleasant and comfortable. You may need a sweater or light jacket in the evening.

ATTRACTIONS

THE BREWERS FESTIVAL

Along with several nicknames such as the City of Roses, God's Country, and Stumptown, Portland is also known as the Microbrewery Capital of the World. Celebrating its 16th year, the Oregon Brewers Festival will be held at Tom McCall Waterfront Park on July 25-27. The Park is located on the west bank of the Willamette River, which is across street from the Portland Marriott Downtown. Local restaurants, 72 independent brewers, and live music will be featured throughout the weekend. Beer lovers have been coming to Portland from all over the world since 1988 for this annual event. If you like ales, bocks, porters, stouts, pilsners or barley wines, you won't want to miss this event. The main entrance is at Oak Street and Naito Parkway. Admission: Free, but a 2003 souvenir mug for \$3.00 is required for tasting, and tokens are required for beer. Tokens cost \$1 each: 4 tokens buys a 14-ounce mug of beer; 1 token buys a 3-ounce taster. Hours: Noon – 9:00 p.m. Friday and Saturday; noon – 7:00 p.m. Sunday.

PIONEER COURTHOUSE SQUARE

Bricks and ambiance are the two main ingredients that make up Pioneer Courthouse Square. Bordered by 6th and Broadway and Yamhill and Morrison, this people-watching common place is host to not only year-round events, but also to everyday brown-baggers and those

wanting simply to rest and take in their surroundings. Starbuck's and Powell's Travel Bookstore also can be found on this popular property recognized locally as Portland's living room.

OMSI

Situated on the east bank of the Willamette River, the Oregon Museum of Science and Industry (OMSI) is the fifth-largest science museum in the country. Among OMSI's many attractions are six exhibit halls, the multi-storied OMNIMAX Theater and the Murdock Sky Theater. Visitors can play computer games, explore new technologies and even beam a message into space. The current featured exhibit is Moneyville—through a variety of fun hands-on activities, explore the history, science, and culture behind money and come away with valuable math and economic skills you can use every day. Call for hours and admission prices. 1945 SE Water Ave., (503) 797-4000.

TOM MCCALL WATERFRONT PARK

It's hard to believe this three-mile stretch along the Willamette River was once a busy expressway. Rather than impatient motorists, the park is now occupied with new types of movers—joggers, bikers and rollerbladers, as well as pedestrians in the mood for nothing more energetic than a stroll. Bordered by Front Ave. (Bill Naito Pkwy.), Tom McCall Waterfront Park is taken up during the warmer months with cultural and musical events, as well as overheated folks hoping to cool off in the Salmon Street Springs Fountain at the end of SW Salmon St. A Cruise along the Willamette on the Portland Spirit (conveniently docked by Salmon Street Springs Fountain) is another way to cool down while seeing Portland from a different vantage point.

PORTLAND ART MUSEUM

The Portland Art Museum lays claim to an impressive painting collection which includes the works of such masters as Renoir and Monet. The museum also houses permanent collections of Native-American, Asian, Pre-Columbian and West African art, as well as English silver and modern sculpture. Current exhibitions include "The Shape of Color: Joan Miró's Painted Sculpture," displaying Miró's humorous and colorful bronze sculptures cast from plants, trees, shells, farm tools, machinery and even trash; and "2003 Oregon Biennial," which surveys trends and directions in contemporary art throughout Oregon. Hours: Sunday, noon – 5:00 p.m.; Tuesday, Wednesday and Saturday, 10:00 am – 5:00 p.m.; Thursday and Friday, 10:00 a.m. – 8:00 p.m. Discount tickets available at the PICMET hospitality desk. 1219 SW Park Ave., (503) 226-2811.

THE CITY OF ROSES



International Rose Test Garden

OREGON HISTORY CENTER

Located in the heart of Portland's Park Blocks, the Oregon History Center's permanent and changing exhibits deal with Oregon and the Pacific Northwest, yesterday, today and tomorrow. The History Center's permanent multimedia exhibit PORTLAND! offers a combination of history and interactive technology for the enjoyment of visitors and residents alike. Call for hours and admission prices. 1200 SW Park Ave., (503) 222-1741.

THE GROTTA

Spread out over 62 beautifully wooded acres, the Grotto serves as both religious shrine and breathtaking garden. Carved into the base of a 110-foot cliff, Our Lady's Grotto enshrines a marble replica of Michelangelo's Pietà. An elevator connects the upper and lower levels of the sanctuary, with the upper level offering sweeping views of the Columbia River and Mt. St. Helens. Call for hours. NE 85th Ave. and Sandy Blvd., (503) 254-7371.

PITTOCK MANSION

One thousand feet above the city of Portland towers the stately Pittock Mansion. This historic 1914 property is an elegant, 22-room estate that sits on 46 acres of manicured grounds. The numerous hiking trails that surround the property are open to the public daily until nightfall. The Fate Lodge Restaurant, once a gardener's cottage, now serves lunch and afternoon tea during the week. Call for hours and admission prices to the mansion. 3229 NW Pittock Dr., (503) 823-3624.

POWELL'S CITY OF BOOKS

To avid readers, Powell's is Mecca. More than just a bookstore, Powell's is a Portland institution. The largest independently owned bookstore in the country, Powell's has more than one million volumes and covers a city block. For the easily confused (as well as many of the regulars), Powell's map helps guide browsers from one room to the next. Call for hours. 1005 W. Burnside, (503) 228-4651.

SATURDAY MARKET

In the great tradition of open-air markets, Portland's Saturday Market first assembled some 20 years ago beneath the Burnside Bridge, and has since become one of Portland's most frequented attractions. This weekend exhibition is filled with handmade items, food and sporadic entertainment. It runs every weekend from March through Christmas. It is open weekends, admission is free. Call (503) 222-6072 for hours.

PORTLAND CLASSICAL CHINESE GARDEN

The garden is one of Portland's newest attractions. Located in Portland's Old Town/Chinatown, the "Garden of Awakening Orchids" is a collaboration with Portland's Chinese sister city, Suzhou. Inside the walled city block is a mix of pavilions, rocks, plants and walkways surrounding an 8,000-square-foot pond. Admission: Adults \$7.00, Seniors (62+) \$6.00, Students \$5.50, Children under 5 free. Hours: 9:00 am – 6:00 pm, The Garden is located between NW 2nd and 3rd and NW Everett and Flanders in Old Town/Chinatown, (503) 228-8131.

WASHINGTON PARK

Washington Park is not only one of Portland's most beautiful sights, it also contains many of the city's favorite haunts. Lying within the park's expansive boundaries are not only the requisite children's play area, tennis courts and picnic areas, but such wonderful surprises as Metro Washington Park Zoo, Japanese Garden, World Forestry Center, Hoyt Arboretum and the International Rose Test Gardens. Read on for more information on these attractions.

THE CITY OF ROSES

OREGON ZOO

This award-winning, 64-acre zoo is home to more than 875 animals representing more than 200 species. Among the zoo's many highlights is its African savannah exhibit which spotlights black rhinoceroses, giraffes, impalas, birds and zebras. The zoo's Asian elephant breeding program is world renowned. Its much-loved Packy, born in 1962, was, at the time, the first Asian elephant born in the Western Hemisphere in 44 years. Call for hours and admission prices. 4001 SW Canyon Rd., (503) 226-1561 or (503) 226-ROAR.

JAPANESE GARDEN

Portland's Japanese Garden is considered one of the most beautiful and authentic Japanese gardens outside of Japan. Five gardens make up these gorgeous grounds—the traditional Flat Garden (Hira-niwa), the serene Strolling Pond Garden (Chisen Kaiyui-Shiki), the Tea Garden (Rojiniwa) which includes a ceremonial tea house, the Sand and Stone Garden (Seki-Tei), and a miniature Natural Garden (Shukeiyen). Call for hours and admission prices. 611 SW Kingston Ave., (503) 223-1321.

SHOPPING

SHOPPING PORTLAND'S DOWNTOWN

Portland's downtown area is just plain fun to shop. While all roads lead to Damascus, at times it seems all shops open to Pioneer Courthouse Square—or some other equally delightful Portland landmark. A shopping trip in Portland is not just a nearly always successful mission, but a sightseeing excursion as well. Here are just a few of Portland's downtown shopping staples.

At Meier & Frank, shoppers can update their wardrobe, buy a mattress and matching bedroom set, check out the gourmet kitchen gadgets, and pick out that stereo system for the kid's birthday or fine china for that friend's wedding. 621 SW 5th Ave. (and branches at most of the major malls), (503) 223-0512.

Nordstrom is famed for its emphasis on service and its upscale yet not stuffy fashion. Clothing offerings for men, women and children run the gamut from tres chic to tres trendy. 701 SW Broadway (and most major malls), (503) 224-6666.

If you're looking for elegance—understated or otherwise—Saks Fifth Avenue is the place to shop. American and European designer wear for both men and women is spread over two levels, as is Saks' own line of clothing. SW Fourth and Fifth Aves., (503) 226-3200.

PORTLAND'S MALL SCENE

A mall is not a mall is not a mall—something Portland recognized early on. Shoppers will find a measure of eclecticism within the following area malls:

Pioneer Place is four airy levels of glass, greenery and fountains. Saks Fifth Avenue anchors Pioneer Place's 80 specialty shops. 700 SW Fifth Ave., (503) 228-5800.

Nestled in the John's Landing area along the Willamette River, the Water Tower offers a collection of specialty shops and restaurants in quaint surroundings. 5331 SW Macadam Ave., (503) 228-9431.

Just this side of the Columbia River is Jantzen Beach Center. Recently renovated, it offers wonderful surprises including a 1921 C.S. Parker carousel. 1405 Jantzen Beach Center, (503) 289-5555.

The nation's first major mall, Lloyd Center offers some 200 specialty shops in addition to familiar anchors. An ice rink offers entertainment. Bordered by Multnomah and Broadway, 9th and 15th Streets, (503) 282-2511.

Washington Square pulls shoppers into its many specialty shops with the help of several popular anchor stores. 9585 SW Washington Square Rd., off Hwy. 217, (503) 639-8860.

Clackamas Town Center's 185 specialty shops and popular anchors are offset by an ice rink. 12000 SE 82nd, (503) 653-6913.

Woodburn Company Stores, Oregon's newest and largest outlet center, features shops including Banana Republic Factory Store, Calvin Klein, Eddie Bauer, Great Outdoor Clothing Company, and Polo Ralph Lauren Factory Store to name a few. This outlet mall has replaced Multnomah Falls as the most visited tourist site in Oregon. 1220 N. Pacific Hwy., Woodburn, Oregon.

GALLERIES

The Pearl District, loosely bordered by W. Burnside and NW Hoyt, and NW 13th and NW Park, represents a good share of the gallery arena and comes to serious life on First Thursday each month with after-hours gallery scensters.

Galleries can also be found in fairly concentrated numbers in the Skidmore District (roughly between Front and Fourth Aves. from SW Oak to NW Glisan St.) and the city's downtown core. Not to be overlooked are galleries throughout the metro area as well.

Compliments of Portland Guide: Discovering Oregon, Published Quarterly by Skies America Publishing Company.

SOCIAL EVENTS

To facilitate the informal interaction of the participants, several social events have been scheduled during PICMET '03.

ICE BREAKER BUFFET

DATE: SUNDAY, JULY 20
TIME: 19:00 – 22:00
LOCATION: HILTON PAVILION
DRESS: INFORMAL

Meet other conference attendees, renew old acquaintances and begin new friendships and collaborations at this opening reception/buffet in the Hilton's Pavilion. Included in registration fee.*

DINNER IN THE PARK BLOCKS

DATE: MONDAY, JULY 21
TIME: 19:00 – 22:00
LOCATION: PARK BLOCKS
(ONE BLOCK WEST OF THE HILTON)
DRESS: CASUAL

Located just one block from the Hilton, the Park Blocks are one of downtown Portland's prized possessions. Enjoy the "Taste of Portland" selection of dinner items, served buffet style, while you mingle and enjoy the outdoors. The Lions of Batucada, a marching percussion ensemble playing the syncopated, African-influenced dance music of Brazil, will perform. If it rains, we will hold this event in the Hilton's Pavilion. Included in registration fee.*

AWARDS BANQUET

DATE: TUESDAY, JULY 22
TIME: 19:00 – 22:00
LOCATION: HILTON PAVILION
DRESS: BUSINESS ATTIRE

This is the premier social event of the conference. The PICMET '03 "Leadership in Technology Management" and the "Best Student Paper" awards will be presented at the banquet. Included in registration fee.*

*The one-day registration fee does not include any of the social events. The Student registration fee includes the Sunday evening reception but not the Monday or Tuesday evening events. Tickets for these events may be purchased at the registration desk.

IEEE EMS — OREGON CHAPTER MEETING AND DESSERT RECEPTION

DATE: WEDNESDAY, JULY 23
TIME: 19:00 – 22:00
LOCATION: HILTON PAVILION

Strategic Project Leadership—Focusing Projects on Business Success

Dr. Aaron J. Shenhar, Professor of Management, Stevens Institute of Technology, Hoboken, NJ, USA

Strategic Project Leadership is a new approach to project management that is focusing projects on creating competitive advantage and winning in the marketplace. This approach is being implemented by leading organizations with a great level of success. Strategic Project Leadership is based on the realization that project management is evolving, and it will be completely different than it has been in the last 50 years. In the more traditional approach, project managers and teams were typically focused on getting



the job done, and meeting time and budget goals. Strategic Project Leadership, or SPL, provides a modern view. It suggests that projects are done for business results, and that just 'getting the job done' is not enough. This lecture will provide a mindset, a framework, and a practical, step-by-step approach on how to connect project management to

business results and how to turn projects into powerful competitive weapons. The presentation will conclude by discussing the transformation process of an organization from the traditional approach to the strategic approach, and by presenting the business results of companies that are using this approach.

This optional event is not included in the PICMET registration fees. Tickets can be purchased at the registration desk for \$35 each.

PICMET Attendees: \$25

IEEE Oregon Section members: \$25

GUEST PROGRAM

PICMET '03 participants who are bringing guests (a spouse, friend or relative, for example) can register them for the Guest Program. The fee includes:

Admission to evening social events, Sunday, July 20 – Tuesday, July 22

Continental breakfast, 08:30 – 10:00, Monday, July 21 through Thursday, July 24. Take in the spectacular view of Portland while enjoying continental breakfast in Alexander's Lounge on the 23rd floor of the Hilton. On Monday, July 21, a volunteer from the Portland Oregon Visitors Association will be at the breakfast to welcome everyone and to describe some of the many things to see and do in Portland.

DAILY EXCURSIONS (wear your walking shoes)

MONDAY, JULY 21, 2003

Portland Walking Tour "Best of Portland"

10:00 – 13:00

This walk features all the best that Portland has to offer, including a plethora of artwork, bridges, architecture, parks, and fountains. You will learn the history of the fur trade, the Oregon Trail, and hear stories about early Portland as we stroll around downtown, the Cultural district, and Historic Yamhill.

While we walk along the riverfront, your guide will show you why Portland is known worldwide as Bridgetown.

This tour also features the stop that everyone loves—the world's smallest city park. Other sites along the way include:

- Bronze drinking fountains from 1912
- Two weather machines
- Over 30 public art pieces (including Portlandia)
- A controversial marble statue with a unique nickname
- The 1985 City Hall building
- A fountain that changes every 15 minutes
- A park that was for women only
- A free electric car charging station
- And a lot more!

TUESDAY, JULY 22, 2003

Portland Classical Chinese Garden

11:00 – 13:00 (tour at noon)

The group will take a short ride on MAX (Portland's light rail) to Old Town/Chinatown to visit one of Portland's newest must-see sites. Lan Su Yuan, "Garden

of Awakening Orchids," opened in September 2000 and is a collaboration with Portland's Chinese sister city of Suzhou, a city renowned for its gardens. The garden encompasses a full city block and contains a lovely combination of pavilions, rocks, plants, and walkways surrounded by an 8,000-square-foot pond. Architects and artisans from China who designed and constructed the Garden crafted every aspect of the Garden to convey artistic effect and symbolic importance.

WEDNESDAY, JULY 23, 2003

Pearl District

10:00 – 13:00

A short ride on Portland's recently completed Central City Streetcar will take PICMET guests to Portland's Pearl District, which used to be a seedy warehouse district but has undergone a revitalization in recent years and is now an upscale district chock-full of trendy loft apartments, art galleries, specialty shops, and international restaurants. We will check out the shopping opportunities, peek into some art galleries, have lunch (lunch is optional—it is not included in the "Guest" registration), and end the excursion with a visit to the gem of the Pearl District, Powell's City of Books, the largest independent bookstore in the world. Powell's has an incredible collection of new, used, and rare books, and even if you do not want to buy any, you will enjoy just looking around.

THURSDAY, JULY 24, 2003

Portland International Rose Test Garden

10:00 – 12:00

A trip to Portland, the City of Roses, would not be complete without a visit to the Portland International Rose Test Garden located in Washington Park. Guests will board MAX (Portland's light rail) for a short ride to Portland's West Hills for a wander through one of the most visited and cherished sites in the city. The garden is the oldest official, continuously operated public rose test garden in the United States. Although July is not the peak time for roses, there will be some varieties in bloom. The grounds (just over 5 acres) are gorgeous, and the incredible view of the city from the park makes this trip worth doing.

For those who would like to stay the afternoon, the Japanese Garden and Oregon Zoo, among other sites, are also located in Washington Park. A free bus will pick you up and drop you off at these or several other areas of interest in Washington Park. Please visit the Washington Park web site for further information at www.parks.ci.portland.or.us/Parks/Washington.htm.

TRAVEL AND EXCURSIONS

MT. HOOD AND COLUMBIA GORGE

Treat yourself to a scenic wonderland as you enjoy one of the most outstanding one-day excursions in America. Don't forget to bring your camera and plenty of film. **Mt. Hood** dominates the horizon as you leave the valley and enter the forest-covered slopes of the Cascade Mountains. You'll follow the historic "Barlow Trail" to Government Camp. It is just a few miles to **Timberline Lodge** at the 6,000 foot level of Oregon's highest mountain peak. You'll have time to photograph the sweeping horizon-wide vistas of forest, lakes, and snow-mantled peaks. Depart Mt. Hood for the famous apple and pear orchards of the picturesque **Hood River Valley**. Next is graceful **Multnomah Falls**, cascading in a feathery plume 620 feet to the Gorge floor. Then, follow the old highway to **Crown Point**, where from high above the mighty river, you are treated to a 35 mile long panoramic view. Return to Portland at the conclusion of your tour. (Price of lunch not included)

Tour Length: 8.5 Hours/ USD \$52.00



Multnomah Falls

COLUMBIA GORGE AND MULTNOMAH FALLS

Enjoy a motorcoach tour along the Columbia Gorge Scenic Highway. Experience the wondrous beauty of the mighty Columbia River from the Crown Point Vista House. Stop at Bonneville Dam Visitors Center and Fish Hatchery. See the powerful, yet graceful, Multnomah Falls up close. This is the classic Oregon scenic tour.

Tour Length: 4.5 Hours/ USD \$38.50

PORTLAND CITY TOUR

This tour begins by winding through the streets of downtown, **Old Town** and **Chinatown** while learning the humble beginnings of this now "cosmopolitan" city. It's just a few minutes drive up into the forested West Hills overlooking downtown Portland. In sprawling **Washington Park** you'll visit the world-renowned **International Rose Test Garden**. Next tour through the lovely Arlington Heights residential area and the **Hoyt Arboretum**. Enjoy a scenic ride to the magnificent **Pittock Mansion**, nestled in the West Hills of Portland. Tour this French Renaissance mansion built in 1909. Relish the panoramic view of snow capped peaks of the Cascades, the Willamette River, the Columbia River and Portland from the mansion's grounds. Continue on through the tree-lined streets of the Portland Heights residential area before heading back into downtown.

Tour Length: 3 Hours/ USD \$30.00

PORTLAND ATTRACTIONS

This tour offers a special glimpse at one of America's most attractive cities. A quick drive over to the Willamette's eastern shore brings Portland's modern landmarks, **The Oregon Convention Center** and **The Rose Quarter Sports Complex**. Next, it's the boutiques, galleries, nightspots and restaurant row in Northwest Portland. Then, nature is the star at **The World Forestry Center** and **The Japanese Gardens** — acclaimed to be the most authentic in the United States. Mondays Only, Portland Classical Chinese Garden is substituted for Japanese Gardens.

Tour Length: 3 Hours/ USD \$30.00

DELUXE CITY TOUR

See all of Portland! This complete tour combines Tours 6 (Portland City Tour) and 7 (Portland Attractions) plus a lunch stop in downtown Portland. See Portland at a savings. (Price of lunch not included)

Tour Length: 7 Hours/ USD \$50.00

TRAVEL AND EXCURSIONS

LOST SOULS OF THE SHANGHAI TUNNELS — OLD TOWN / CHINATOWN WALKING TOUR

Stroll with your guide from Cascade Geographic Society through Portland's unique heritage on the approximate 2 and 1/2 hour guided walking tour that encompasses the infamous and the finest, from the **Portland Underground** — the notorious “Shanghai Tunnels” to the reflective “Chinese Classical Garden.” View the Victorian charm of brick and cast-iron front buildings, unique fountains, the city's first opera house, and more. Learn the “real” history and tales of sea captains, crimps, merchants, and unsuspecting shanghai souls earning our Rose City the dubious reputation as the “worst port on the West Coast.” Listen to stories of Erickson's Saloon, which was, during its heyday, the world's largest and finest drinking parlor of its kind. Boasting a 640 foot mahogany bar, nickel beer, a bouncer rightly name Jumbo Riley, Erickson's was the focal point of shanghaiing. Experience the tranquility and beauty of the poetic **Classical Chinese Garden**, the largest of its kind outside China. In the midst of urban bustle, discover a garden of serpentine walkways, a bridged gate, and views that change with every step. Next by way of **Hobo's Restaurant** venture down into the catacombs of the Portland Underground. Discover the remnants of the “skullduggery” when unsuspecting loggers, cowboys, shepherders, and others found themselves dropped through trapdoors, drugged, and sold to sea captains for “blood money.”

Tour Length: 2.5 Hours/ USD \$29.80

NORTHERN OREGON COAST

The awesome coast is yours to enjoy on this picturesque and historical excursion. Traveling westward from Portland, magnificent valleys flourishing with orchards and wineries come into view before entering the towering Douglas fir forests of the Oregon Coast Mountain Range. **Seaside, Oregon**, a favorite vacation spot for Northwesterners, is a charming and bustling coastal resort community. You'll view the **End of the Lewis and Clark Trail Monument**, the site where Lewis and Clark first saw the Pacific Ocean. Enjoy unique specialty shops, fun attractions, or just get some sand in your shoes on the uncrowded beaches. While visiting Seaside you'll also have plenty of time for a leisurely lunch in one of the many fine seafood restaurants.

Your tour continues south on famous Highway 101 through **Cannon Beach**. You will have a spectacular view of Haystack Rock, one of Oregon's most photographed sites. Continue south to the historic Tillamook Bay area, viewing the rugged scenery of the

Oregon coast. You'll visit the interesting **Tillamook Cheese Factory**, one of the Oregon coast's most popular attractions. From there you'll return to Portland, once again crossing the beautiful Oregon Coast Mountain Range. (Price of lunch not included).

Tour Length: 9 Hours/ USD \$52.00

SITE VISITS

Site visits to the following companies will be offered during PICMET '03. Seating is limited, so sign up early (\$40).

INTEL

Group 1 — Monday, July 21, 13:30 – 16:00

Group 2 — Tuesday, July 22, 09:30 – 12:00

Take a close look at the world's dominant microprocessor manufacturer. You will visit Intel's “high mix, low volume motherboard assembly operations with focus on new product introductions,” located in the Portland metropolitan area. Intel's Oregon site employs over 14,000 people and is the largest Intel site in the world (maximum 10 per group).

NIKE, INC.

Tuesday, July 22, 13:30 – 15:30

Portland is the home of Nike, the world's foremost sport products company. You will tour the world headquarters, a dazzling campus that includes a collection of buildings named by sports' best – Michael Jordan, Pete Sampras, Jerry Rice, etc. Note that this 45-minute tour does not include any manufacturing facilities.

TEKTRONIX INC.

Wednesday, July 23, 09:30 – 12:00

See Tektronix's state-of-the-art, computerized manufacturing system capable of creating multiple types of products on a single conveyor-belt assembly line. Combining the flexibility of an individual task process with the efficiency of high-volume electronics manufacturing, Tektronix's new product line can produce five major oscilloscopes through a defined process on a single manufacturing line. Tektronix makes test, measurement, and monitoring solutions for communications, computer, and semiconductor industries worldwide.