TRAILBLAZERS
Many notable figures in materials industry and education hold degrees from the Department of Materials Science & Engineering. Here are just a few outstanding examples of alumni achievement.

Stephen T. Ching (BS Ceramic Engr 1972)
Stephen Ching is president and VP of Engineering at Isolink Inc. and co-founded the company in 1987. Isolink is the leading supplier of optoelectronic radiation-tolerant components worldwide, providing products and services to military, aerospace, hybrid, industrial, medical and telecommunications markets. The company pioneered the miniaturization of some of the most advanced optoelectronic components. Before founding Isolink, Mr. Ching worked for Fairchild Semiconductors Linear Integrated Circuits and Hewlett-Packard Optoelectronics Division.

Tom H. Delimitros (BS Ceramic Engr 1963, MS Ceramic Engr 1966)
2001 MSE DISTINGUISHED SERVICE AWARD; 1993 COLLEGE OF ENGINEERING AWARD FOR DISTINGUISHED SERVICE
Tom Delimitros was a founding general partner of three Advanced Material Technologies Venture Funds from 1989 to 2011. Currently, he pursues his interest in venture funding through Delimitros Investments, his personal investment vehicle, and serves on the boards of Photodetek Inc. and TIR Group Inc., among others. Mr. Delimitros was recently re-appointed board member of the University of Washington Foundation Board, representing the College of Engineering through 2015. He currently serves as chairman of the MSE External Advisory Board. Previously, he helped lead the MSE Initiative, raising $2.5 million to build Mueller Hall and equip the new labs, and established the Tom H. Delimitros fellowship for MSE.

Bonnie J. Dunbar (BS Ceramic Engr 1971, MS Ceramic Engr 1975)
1995 ENGINEERING ALUMNI ACHIEVEMENT AWARD; 1999 MSE DISTINGUISHED SERVICE AWARD; 2004-UW ALUMNA SUMMA LAUDE DIGNATA; 2012 COLLEGE OF ENGINEERING DIAMOND AWARD FOR DISTINGUISHED SERVICE
A veteran of five space missions as a NASA Mission Specialist Astronaut, Bonnie Dunbar flew aboard the Space Shuttles Atlantis, Challenger, Columbia and Endewor. Previously she served as a NASA mission controller, and held research and engineering positions at Boeing, Hewlett Laboratories in the UK and Rockwell International. After retiring from NASA in 2005, Dr. Dunbar served as president and CEO of the Museum of Flight (MOF) in Seattle until 2010. Currently, she is director of Higher Education and STEM at The Boeing Company. She is a member of the National Academy of Engineering, a Fellow of several technical societies, and has received numerous awards and honors.

Larry E. McKnight (BS Metallurgical Engr 1960)
2011 MSE DISTINGUISHED SERVICE AWARD
Larry McKnight’s successful career as a consulting metallurgist and corrosion engineer has spanned over 50 years. After working for Boeing, Eagle-Picture Corporation and Testing Engineers, Mr. McKnight went on to own three companies: Mtek Laboratories, JM Laboratories and, most recently, McKnight Laboratory, founded in 1993. Corporate clients of his consulting business include CALTRANS, Toyota Racing & Development and Boeing. He frequently serves as a forensic analyst for litigation and has taught classes at Chapman College, Cal Poly Pomona and Long Beach State College.

Mansour Moinpour (BS Metallurgical Engr 1981, PhD Metallurgical Eng 1987)
2009 MSE DISTINGUISHED SERVICE AWARD
Mansour Moinpour is principal engineer and materials engineering manager at Intel's Fabricated Materials division, focused on Integrated Circuits (IC) materials development activities and materials enabling, both internally and in collaboration with universities and research consortia. Previously he worked for Thin Films and Diffusion division at Intel Flash Memory Development division. He has over 170 technical papers to his credit and holds 16 patents with several more pending. Dr. Moinpour is a member of the MSE External Advisory Board. He is also a member of technical advisory board of several industrial research consortia.

Larry A. Watters (BS Metallurgical Engr 1972)
2010 MSE DISTINGUISHED SERVICE AWARD
A founding member of Taggart Global LLC, Larry Watters has served as managing director for the company since 1993. From its roots as a small startup company, Taggart has grown into a business with over $400 million in operating revenue, providing solutions for clients in the coal production, power generation, steel making, and material handling sectors. With over 35 years’ experience in the coal preparation industry, Mr. Watters is currently and previous chair of the Society for Mining, Metallurgy and Exploration - American Institute of Mining, Metallurgical and Petroleum Engineers (SME-AIME), as well as a board member of the International Coal Preparation Congress and the Coal Preparation Society of America.

Stephen T. Ching is president and VP of Engineering at Isolink Inc. and co-founded the company in 1987. Isolink is the leading supplier of optoelectronic radiation-tolerant components worldwide, providing products and services to military, aerospace, hybrid, industrial, medical and telecommunications markets. The company pioneered the miniaturization of some of the most advanced optoelectronic components. Before founding Isolink, Mr. Ching worked for Fairchild Semiconductors Linear Integrated Circuits and Hewlett-Packard Optoelectronics Division.

Tom H. Delimitros was a founding general partner of three Advanced Material Technologies Venture Funds from 1989 to 2011. Currently, he pursues his interest in venture funding through Delimitros Investments, his personal investment vehicle, and serves on the boards of Photodetek Inc. and TIR Group Inc., among others. Mr. Delimitros was recently re-appointed board member of the University of Washington Foundation Board, representing the College of Engineering through 2015. He currently serves as chairman of the MSE External Advisory Board. Previously, he helped lead the MSE Initiative, raising $2.5 million to build Mueller Hall and equip the new labs, and established the Tom H. Delimitros fellowship for MSE.

Bonnie J. Dunbar flew aboard the Space Shuttles Atlantis, Challenger, Columbia and Endewor. Previously she served as a NASA mission controller, and held research and engineering positions at Boeing, Hewlett Laboratories in the UK and Rockwell International. After retiring from NASA in 2005, Dr. Dunbar served as president and CEO of the Museum of Flight (MOF) in Seattle until 2010. Currently, she is director of Higher Education and STEM at The Boeing Company. She is a member of the National Academy of Engineering, a Fellow of several technical societies, and has received numerous awards and honors.

Larry E. McKnight’s successful career as a consulting metallurgist and corrosion engineer has spanned over 50 years. After working for Boeing, Eagle-Picture Corporation and Testing Engineers, Mr. McKnight went on to own three companies: Mtek Laboratories, JM Laboratories and, most recently, McKnight Laboratory, founded in 1993. Corporate clients of his consulting business include CALTRANS, Toyota Racing & Development and Boeing. He frequently serves as a forensic analyst for litigation and has taught classes at Chapman College, Cal Poly Pomona and Long Beach State College.

Mansour Moinpour is principal engineer and materials engineering manager at Intel's Fabricated Materials division, focused on Integrated Circuits (IC) materials development activities and materials enabling, both internally and in collaboration with universities and research consortia. Previously he worked for Thin Films and Diffusion division at Intel Flash Memory Development division. He has over 170 technical papers to his credit and holds 16 patents with several more pending. Dr. Moinpour is a member of the MSE External Advisory Board. He is also a member of technical advisory board of several industrial research consortia.

Larry A. Watters has served as managing director for the company since 1993. From its roots as a small startup company, Taggart has grown into a business with over $400 million in operating revenue, providing solutions for clients in the coal production, power generation, steel making, and material handling sectors. With over 35 years’ experience in the coal preparation industry, Mr. Watters is currently and previous chair of the Society for Mining, Metallurgy and Exploration - American Institute of Mining, Metallurgical and Petroleum Engineers (SME-AIME), as well as a board member of the International Coal Preparation Congress and the Coal Preparation Society of America.

Materials Science and engineering is an interdisciplinary field all about crossing boundaries. We explore the scientific fundamentals of materials, their design and their processing for real world applications. We apply the basic principles of chemistry and physics to understand the structure and properties of materials and we design processes to manipulate materials to meet the needs of modern technology.”

ALEX K-Y JEN, BOEING/JOHNSON CHAIR AND PROFESSOR, MATERIALS SCIENCE & ENGINEERING

Advancing our world. It’s the Washington Way.

The world is in the middle of a materials revolution. Advances in materials have preceded almost every technological leap since the beginning of civilization and engineered materials are crucial to the continued vitality of countless industries. The University of Washington’s Materials Science & Engineering department is at the heart of this revolution preparing our students and conducting research to meet the needs of modern technology.

MSE Education
Preparing students for successful careers is our highest priority. Our graduates find employment in aerospace, automotive, biomedical, chemical, construction, electronics, energy and numerous other fields.

Degree Programs
• Bachelor of Science (BS) - Prepares students for graduate work or careers in industry, government and academia
• Combined BS/MS Program - Direct route to the MS degree for well-qualified undergraduate students
• Master of Science (MS) in Materials Science & Engineering Research-oriented program that prepares students for challenging and stimulating opportunities in industry and government, or for further graduate studies toward a PhD
• Master of Science (MS) - Non-thesis program
• Doctor of Philosophy (PhD) - Trains engineers for leadership roles in academia, industry and research institutions
Undergraduate Learning

Program Features
We offer an ABET-accredited Bachelor of Science (BS) program. The department has graduated the highest number of undergraduate students per faculty member among materials-related peer departments nationwide. We offer undergraduate students a highly personal and experience-driven learning environment. Unique aspects of our program include:

- Active student professional organizations
- A diverse student body
- Small class size
- Hands-on, team-based learning
- Undergraduate research projects
- A combined BS/MS program for well-qualified undergraduate students

Excellence
Our undergraduate students win a variety of awards and scholarships, including several NSF undergraduate research fellowships, UWEB scholarships, UW Mary Gates Scholars, Husky Promise scholarships, SAMPE scholarships, a NASA Space Grant, a National Defense Medal and regular first-place finishes in national bridge- and wing-building and ceramic mug drop competitions.

Graduate Learning

Program Features
- Educational and research opportunities in processing, characterization and properties of all classes of materials
- Thesis or dissertation research opportunities for leading-edge, interdisciplinary work
- Research and teaching assistantships, stipends and fellowships

Excellence
Among the many fellowships awarded to MSE graduate students by the department of Materials Science & Engineering and the College of Engineering are: Ford, Intel, Bank of America, Delimitros, Wagstaff, Williams, IGERT, ARCS, GSFEI and Nanotechnology.

Faculty

Composition
- 14 core faculty members
- 5 research faculty members
- 6 adjunct faculty members
- 9 affiliate faculty members
- 26 postdoctoral researchers

Achievements
In recent years our faculty members earned the following honors:
- 2012 MRS Fellow
- 2012 AFOSR Young Investigator Award
- 2012 ASM Albert Easton White Distinguished Teacher Award
- 2012 NSF Career Awards (2)
- 2011 DARPA Young Faculty Award
- 2011 Washington State Academy of Sciences Member
- 2011 American Chemical Society Fellow
- 2011 Kyoto prize for Lifetime Achievement
- 2011 UWCOE Diamond Award for Distinguished Service
- 2010 UWCOE Faculty Innovator for Research
- 2010 Sloan Research Fellowship
- 2010 Fulbright Specialist Program
- 2009 IEEE Distinguished Lecturer
- 2009 American Physical Society Fellow

Research and Innovation

Our students and faculty conduct research in a variety of areas. Many of the research topics are interdisciplinary and involve participation from other engineering, basic science and medical disciplines.

RESEARCH DIRECTIONS

Photonics, Optoelectronics, Biosensing and Nanoscience
Alexa Jem studies molecular, polymeric and bio-macromolecular self-assembly to create the ordered arrangement of organic and inorganic functional materials for photonics, optoelectronics, nanomedicine and nanotechnology, employing the ‘molecular engineering’ approach.

Molecular Biomimetics and Genetically Engineered Materials
Meheret Seti Arega leads an interdisciplinary team of researchers that combine nature’s proven molecular tools with nanoengineered materials to make molecular biomimetics a full-fledged research methodology.

Integrated Nanosciences and Mesoscale Engineering
Kannan Krishnan pursues the systematic exploration and design of fundamental materials properties and phenomena as a function of size, dimensionality and organization, building on established methods in condensed matter physics, solid-state chemistry, metallurgy, ceramics, EE and biology.

Biomaterials: Nanoparticles and Tissue Engineering
Migun Zhang combines the study of biomaterials and materials science to create new horizons for materials research, exploring the interactions between materials and biological systems to develop materials and devices for biological and medical applications.

Combinatorial Materials Exploration
Fumio Ohuchi is working within a new type of materials development strategy called “combinatorial materials exploration” which is rapidly becoming a new paradigm for accelerated materials research by enabling the understanding of complex material systems in a time- and cost-effective manner.

Ceramics & Composites Research
Raj Bordia works at the interface between materials and solid mechanics, with research in processing of ceramics, ceramic matrix composites & multilayered systems; mechanical properties of ceramics & ceramic-matrix composites, and processing & mechanical properties of polymer matrix composites.

Sol-Gel Processing
Guoqiang Ca’s research emphasis is to achieve novel properties for various applications through control of micro- and nanostructures, and atomic engineering of materials through processing and composition design.

Computational Materials
Lucien Brush focuses on mathematical modeling of material behavior during processing to gain understanding of the observed phenomena. Processes involve phase transitions, interfacial phenomena and thin film hydrodynamics.

Molecular Self-Assembly
Christine Luscombe’s research expands the current knowledge of molecular self-assembly processes in the development of functional molecules with novel electronic and photonic properties, ranging from well-defined macromolecules to polymers.

Advanced Materials for Energy Storage and Conversion
Jihui Yang uses various experimental and theoretical techniques to study materials of great fundamental and application interest. Current research is in the design, synthesis, testing, and understanding of advanced thermoelectric materials and Li-ion battery materials for energy conversion and storage.

Nanodevice Fabrication
Marco Rolandi’s emphasis is on transport phenomena at the nanoscale, aiming to improve the processes that allow precise control of the position, size and shape of nanoma—tials in order to reliably fabricate novel materials for the investigation of nanoscale phenomena.

Nanoscale Optoelectronic Materials
Peter Pauzauskis’s central focus is on basic materials science and engineering research into the design, synthesis, and characterization of nanoscale optoelectronic materials with unique compositions and morphologies.

Nanoscale Optoelectronics
Xiaodong Xu is focused on understanding the optical, electronic and quantum properties of novel solid state nanostructures by nanoscale device design, optical spectroscopy, electrical transport, and scanning photocurrent measurements.

CENTERS OF EXCELLENCE
The department is either lead partner or a core member in the following interdisciplinary centers.

- Institute for Advanced Materials and Technology (IAMT)
- Genetically Engineered Materials Science and Engineering Center (GEMSEC)
- Micron Laboratory for Combinatorial Materials Exploration
- Materials and Devices for Information Technology Research (MDITR) Science and Technology Center
- UW Center for Nanotechnology
- Microsystems Science Center