

Michael Thouless

Background

Education

- 1984 Ph. D. (University of California, Berkeley)
- 1982 M. S. (University of California, Berkeley)
- 1981 B. A. 1st Class Honours (Cambridge University)
M. A. taken in June 1985

Professional Qualifications

- 2012 Chartered Engineer (UK) #596378

Positions

University of Michigan

- 2015- Janine Johnson Weins Professor of Engineering
- 2014- Arthur F. Thurnau Professor
- 2000- Professor of Mechanical Engineering
- 2000- Professor of Materials Science & Engineering
- 1995-2000 Associate Professor of Mechanical Engineering & Applied Mechanics
- 1999-2000 Associate Professor of Materials Science & Engineering

Administrative duties at UM

- 2019-2023 Associate Chair, Department of Mechanical Engineering
- 2009-2010 SACUA Chair / Chair of Faculty Senate
- 2008-2009 SACUA vice-Chair / vice-Chair of Faculty Senate
- 1997-1999 Undergraduate Program Director (Mechanical Engineering)

Other permanent positions

- 1988-1994 Research Staff Member,
IBM Research Division, Yorktown Heights, NY
- 1985-1988 Assistant Research Engineer
Department of Materials Science, University of California, Santa Barbara, CA
- 1984-1985 Assistant Research Engineer
Department of Materials Science & Mineral Engineering, University of California, Berkeley, CA

Visiting Positions

- 5/24 Guest Professor, Wind Energy Department, Danish Technical University, Risø, Denmark
- 5/23-6/23 Guest Professor, Wind Energy Department, Danish Technical University, Risø, Denmark
- 6/22 Guest Professor, Wind Energy Department, Danish Technical University, Risø, Denmark
- 9/17-7/18 Engineering Department, Cambridge University, Cambridge, UK
(Overseas Fellow, Churchill College)
- 6/13-7/13 Guest Professor, Wind Energy Department, Danish Technical University, Risø, Denmark
- 6/14-7/14 Guest Professor, Wind Energy Department, Danish Technical University, Risø, Denmark
- 1/11-8/11 Engineering Department, Cambridge University, Cambridge, UK
(Overseas Fellow, Churchill College)
- 7/10 Risø National Laboratory for Sustainable Energy, Risø, Denmark
- 7/02-12/02 Engineering Department, Cambridge University, Cambridge, UK
(Visiting scholar, Pembroke College)
- 6/95-7/95 Ford Research Laboratory, Ford Motor Company, Dearborn, MI
- 9/94-11/94 Dept. of Engineering Mechanics, Tsinghua University, Beijing, China

Honors and Awards

External

- 2023 3M Excellence in Adhesion Award (Adhesion Society)
- 2021 Nadai Medal (ASME)
- 2021 Honorary doctorate: *Doctor Technices (honoris causa)* (Danish Technical University)
- 2021-2022 Otto Mønsted Guest Professorship, Danish Technical University (Denmark)
- 2017-18 Overseas Fellow, Churchill College, Cambridge University
- 2015 Archie Higdon Distinguished Educator Award (ASEE)
- 2013-2014 Otto Mønsted Guest Professorship, Danish Technical University (Denmark)
- 2012 Fellow, Institute of Materials, Minerals and Mining (UK)
- 2011 Overseas Fellow, Churchill College, Cambridge University
- 2009 Higher doctorate: Sc.D. (University of Cambridge)
- 2007 Fellow, ASME
- 2003 Listed as a "Highly-cited researcher" in materials science category by ISI
- 1997 *NAE Frontiers of Engineering* attendee
- 1996 CAREER Award, National Science Foundation
- 1990 R. F. Bunshah Award, American Vacuum Society (Metallurgical Division)

Internal

- 2017 CoE "Ted Kennedy Family Faculty Team Excellence Award"
- 2015 Janine Johnson Weins Professor of Engineering
- 2014 Arthur F. Thurnau Professor
- 2013 CoE "Vulcans' Teaching Excellence Award"
- 2012 UM Distinguished Faculty Governance Award
- 2011 CoE "Trudy Huebner Service Excellence Award"
- 2010 ME Department Achievement Award
- 2009 ME ΠΤΣ Professor of the Term (Fall)
- 2005 ME Teaching Incentive Fund Award (ME382)
- 2005 ME ΠΤΣ Professor of the Term (Winter)
- 2004 CoE "David E. Liddle Research Excellence Award"
- 2002 ME Teaching Incentive Fund Award (ME382)
- 2001 ME Teaching Incentive Fund Award (ME395)
- 1997 MEAM ΠΤΣ Professor of the Term (Fall)
- 1997 MEAM Teaching Excellence Award

- 1979-81 Scholar, Churchill College, Cambridge University
- 1979-81 Scholar, Central Electricity Generating Board, UK
- 1978 Entrance Exhibition, Churchill College, Cambridge University

Research

Publications (Total number = 193)

ISI: h-index = 51, citations = 9,600, average = 53 cites/paper
Google: h-index = 61, i10-index = 142, citations = 14,400 with 2 papers cited more than 500 times, 21 papers cited more than 200 times, and an additional 15 papers cited more than 100 times.

For a full list see "<https://public.websites.umich.edu/~thouless/PublicationList.pdf>"

Some significant papers

- M. D. Thouless, A. G. Evans, M. F. Ashby and J. W. Hutchinson, "The Edge Cracking and Spalling of Brittle Plates," *Acta Metallurgica*, **35**, 1333-1341 (1987).
This was the paper that first identified and explained the mechanics of the $K_{II} = 0$ path by which a crack propagates parallel to a free surface. This paper could be viewed as being one of the precursors for a major global resurgence of research in the mechanics of interfaces and thin films.
- M. D. Thouless and A. G. Evans, "Effects of Pull-Out on the Mechanical Properties of Ceramic-Matrix Composites," *Acta Metallurgica*, **36**, 517-522 (1988).
Although there had been previous attempts to incorporate statistical effects on the pull-out of fibers from composites, and how this influenced the toughness, this was the first paper to do this analysis in a complete and rigorous fashion.
- M. D. Thouless, "Crack Spacing in Brittle Films on Elastic Substrates," *Journal of the American Ceramic Society*, **73**, 2144-2146 (1990).
This was the first paper to use fracture mechanics to relate the crack spacing to the geometry and stresses in a coated system. A subsequent paper in 1992 developed this in a more sophisticated fashion, and provided experimental validation in the form of a model system consisting of a high- T_c superconducting film. Later experimental papers by the author in 2014 and 2018 showed how statistics affects the crack spacing, how to control the spacing experimentally, and how to use the energy-release rate associated with channel cracks to monitor crack kinetics.
- M. D. Thouless, "Effect of Surface Diffusion on the Creep of Thin Films and Sintered Arrays of Particles," *Acta Metallurgica et Materialia*, **41**, 1057-1064 (1993).
This paper extended the Mullins' solution for grain-boundary grooving by including the effects of surface diffusion. This analysis illustrated the importance of surface diffusion on relaxation by diffusive creep mechanisms in thin films, since the stresses are biaxial preventing in-plane diffusion. This led to the realization that stress relaxation can be suppressed by passivation layers (and explains the anomalous relaxation of aluminum films). These concepts were explored experimentally in 1993 and 1996.
- Q. D. Yang, M. D. Thouless and S. M. Ward, "Numerical Simulations of Adhesively-Bonded Beams Failing with Extensive Plastic Deformation," *Journal of the Mechanics and Physics of Solids*, **47**, 1337-1353 (1999).
This was the first paper to recognize that the concept of a cohesive-zone could be used as the physical representation of how an entire adhesive layer interacts with the surrounding material, and to determine the characteristic cohesive properties experimentally. We demonstrated the ability of this technique to predict fracture behavior in plastically-deforming structures. This view that a cohesive-zone can represent the physics of a relatively large-scale entity, and is not just a numerical tool, is now common-place in the adhesives community.
- Q. D. Yang and M. D. Thouless, "[Mixed-mode fracture analyses of plastically-deforming adhesive joints](#)," *International Journal of Fracture*, **110**, 175-187 (2001).
We extended the concepts of a cohesive-zone approach to mixed-mode fracture, showing how to measure the mode-I and mode-II cohesive parameters, and to use them in a predictive fashion. It is important to emphasize that we measured parameters in one set of geometry, and demonstrated high-fidelity predictions for the mixed-mode fracture in completely different geometries..
- S. Li, J. Wang and M. D. Thouless, "[The Effects of Shear on Delamination of Beam-Like Geometries](#)," *Journal of the Mechanics and Physics of Solids*, **52**, 193-214 (2004).

- M. D. Thouless, "[Shear Forces, Root Rotations, Phase Angles and Delamination of Layered Materials](#)," *Engineering Fracture Mechanics*, **191**, 153-167 (2018).

The role of transverse shear forces on delamination problems (such as the DCB) has generated much approximate analysis since the 1960s. In the first paper we presented a rigorous analysis for the energy-release rate and phase angle for a laminated structure subjected to shear. This work completed a general form for delamination of layered materials from arbitrary loads that had been developed in the late 80's (as a direct result of the first paper in this list). The second paper took this analysis further and pulled all the different perspectives on the topic that had evolved over the years into a single framework.
- J. P. Parmigiani and M. D. Thouless, "[The Roles of Toughness and Cohesive Strength on Crack Deflection](#)," *Journal of the Mechanics and Physics of Solids*, **54**, 266-287 (2006).

A model for crack deflection at interfaces for composites was given by Cook and Gordon in the 1960s. This was based on the concept of interfacial strength. In 1989, Hutchinson and co-workers developed a model based on interfacial toughness. (Independently, I had come up with the same criterion in the same year, but based on an approximate analysis, and only for isotropic systems). Here we show how a cohesive-zone model, which incorporates the concepts of both strength and toughness results in a deflection criterion that is probably more aligned with the strength criterion. A key conclusion of this study is that it should be possible to design interfaces that both deflect cracks and are tough! All one needs is a weak tough interface, such as might be provided by a polymer interface in a ceramic matrix. The classical fracture-mechanics analyses predict that one can only deflect cracks into interfaces that don't dissipate energy efficiently.
- M. D. Thouless, Z. Li, N. J. Douville and S. Takayama, "[Periodic Cracking of Films Supported on Compliant Substrates](#)," *Journal of the Mechanics and Physics of Solids*, **59**, 1927-1937 (2011).

When a stiff film is supported on a compliant substrate, fracture mechanics tells us that cracks in the film will penetrate into the substrate. The calculation of the crack spacing is then complicated by the fact that the crack depth is no longer dictated by the film thickness. In systems with extreme mismatches of moduli, such as metal films on elastomers used in flexible electronics, the crack can penetrate in a controlled fashion orders of magnitude deeper into the substrate than the film thickness.
- R. B. Sills and M. D. Thouless, "The Effect of Cohesive-Law Parameters on Mixed-Mode Fracture," *Engineering Fracture Mechanics*, **109**, 353-368 (2013).
- R. B. Sills and M. D. Thouless, "[Cohesive-Length Scales for Damage and Toughening Mechanisms](#)," *International Journal of Solids and Structures* **55**, 32-43 (2015).

Here we explore the concept of cohesive-length scales, and show how cohesive-zone models make a connection to classical concepts of LEFM. We have demonstrated how the stresses agree with LEFM a little bit away from the crack tip (as expected), but the partition of energy agree close to the crack tip, not away from it (not previously appreciated). We have also shown how cohesive-zone models resolve the paradoxes associated with a non-zero value of the second Dundurs' parameter, and fracture under compressive crack-tip loads.
- Kevin Golovin, Abhishek Dhyani, M. D. Thouless and Anish Tujeta, "[Low-Interfacial Toughness Materials for Effective Large-Scale Deicing](#)," *Science*, **364**, 371-375 (2019). ([Supplemental Information](#))

Traditionally, the ice community considers the design of ice-resistant coatings from a strength perspective: the focus is on reducing the strength of the interface. Here we introduced the notion that design of ice-resistant coatings can require consideration of the interfacial toughness between

the coating and ice, rather than merely the interfacial strength, and analyzed the problem from a cohesive-zone perspective. We showed that there is a transition in the delamination. When the bonded area is relatively small, strength is the dominant parameter, and the force to delaminate a layer of ice increases with the bonded area. However, there is a transition at larger length scales when the dominant parameter is the interfacial toughness, and the force required to delaminate a layer of ice becomes independent of the bonded area. This is significant, because it represents a paradigm shift for design of larger structures such as wind-turbine blades and airplane wings. We use a cohesive-zone to assess the nature of coatings that might result in low-toughness interfaces, and show it is possible to achieve coatings that have both low cohesive strengths and low toughness. From a mechanics perspective this article provides a nice model experimental demonstration of cohesive models.

Patents

1. Shuichi Takayama, Michael David Thouless, Dongeun Huh, Kristen L. Mills and Nicholas Joseph Douville, "Tunable Elastomeric Nanochannels for Nanofluidic Manipulation," US 8,945,909 B2 (Issued: February 3, 2015)
2. Michael Thouless, Ellen M Arruda, Tanaz Rahimzadeh, Anthony M Waas, "Blast/Impact Frequency Tuning and Mitigation," US 9,958,238 (Issued: May 1, 2018).
3. Michael Thouless, Ellen M Arruda, Tanaz Rahimzadeh, Levon Cimonian, Marie Rice, "Blast/Impact Frequency Tuning and Mitigation," US 10,041,767 (Issued: August 7, 2018).
4. Michael Thouless, Ellen M Arruda, Tanaz Rahimzadeh, Levon Cimonian, Marie Rice, "Blast/Impact Frequency Tuning and Mitigation," US 10,094,641 (Issued: October 9, 2018).
5. Michael Thouless, Ellen M Arruda, Tanaz Rahimzadeh, Anthony M Waas, "Blast/Impact Frequency Tuning and Mitigation," US 10,101,129 (Issued: October 16, 2018).
6. Michael Thouless, Ellen M Arruda, Tanaz Rahimzadeh, Anthony M Waas, "Blast/Impact Frequency Tuning and Mitigation," JP 6426180 (Issued: November 2, 2018).
7. Nicholas A. Kotov, Kevin Cao, Michael D. Thouless, Ellen M. Arruda, Anthony M. Waas, Carlos A. PonsSiepermann, Ryan M. Anderson, "Synthesis and Use of Aramid Nanofibers," US 10,160,833 B2 (Issued: December 25, 2018).
8. Michael Thouless, Ellen M. Arruda, Tanaz Rahimzadeh, Anthony M. Waas, "Blast/Impact Frequency Tuning and Mitigation," EP3069098 B1 (Issued: January 19, 2019).
9. Michael Thouless, Ellen M. Arruda, Tanaz Rahimzadeh, Anthony M. Waas, "Method for Mitigating Stress Waves resulting from a Blast or Impact," EP 3 473 966 A1 (Issued: April 24, 2019).
10. Michael Thouless, Ellen M. Arruda, Tanaz Rahimzadeh, Anthony M. Waas, "Blast/Impact Frequency Tuning And Mitigation," JP 6707117 (Issued: May 21, 2020).
11. Michael Thouless, Ellen M. Arruda, Tanaz Rahimzadeh, Levon Cimonian, Marie Rice, "Blast/Impact Frequency Tuning and Mitigation," JP 6,754,820 (Issued: August 26, 2020).
12. Michael Thouless, Ellen M. Arruda, Tanaz Rahimzadeh, Anthony M. Waas, "Attenuation et Accord de Frequence d'Explosion/d'Impact / Blast/Impact Frequency Tuning and Mitigation," Canadian Patent 2,930,569 (Issued October 26, 2021).
13. Anish Tuteja, Michael Thouless, Kevin Golovin and Abhishek Dhyani, "Anti-icing Surfaces exhibiting Low Interfacial Toughness with Ice," US 11,965,112 B2 (Issued: April 23, 2024)

Recent invited talks

1. "Delamination from corners," *Annual meeting of the Society for Engineering Science*, invited talk in honor of Fleck, Minneapolis, MN (Oct 9-11, 2023).
2. "Time-dependent fracture in polymer systems," keynote lecture at Suo birthday symposium *Annual meeting of the Society for Engineering Science*, Minneapolis, MN (Oct 9-11, 2023).
3. "Mechanics of fracture in polymers," Session to honor the retirement of A. F. Yee, *American Chemical Society Fall Meeting*, San Francisco, CA (Aug 13-17, 2023).

4. "Beyond Griffith and Irwin: Cohesive Lengths and fracture," Adhesion Excellence Award Lecture, *46th Annual Meeting of the Adhesion Society*, Orlando, FL (Feb 19-Feb 22, 2022).
5. "Length Scales in Interfacial Fracture," Plenary Nadai Award lecture *IMECE 2021 (virtual)* (Nov 1-Nov 4, 2021).
6. M. D. Thouless, "Strength, toughness and length scales for adhesion" *2020 American Chemical Society Midland Section, Fall Scientific Meeting (virtual)* (October 10, 2020)
7. M. D. Thouless, "Strength, toughness and length scales for interfacial fracture," Plenary Lecture, *The 16th Pan American Congress of Applied Mechanics (PACAM-XVI)*, Ann Arbor, MI, May 19-23, 2019.
8. M. D. Thouless, "Cohesive-Length Scales and Mixed-Mode Fracture," invited talk, symposium to honor Norman Fleck, *European Solid Mechanics Conference (ESMC)*, Bologna, Italy, July 2-6, 2018.
9. M. D. Thouless, "Cohesive-length scales and fracture," Keynote Lecture, *41st Annual Meeting of the Adhesion Society*, San Diego, CA (Feb 25-March 1, 2018).

Contributed talks

Approximately 100

Recent seminars

- 2025 Aeronautical and Astronautical Eng. Dept, University of Southampton (Southampton, UK)
 2024 ME Department, University of Toronto (.Toronto, Canada)
 2023 Adhesion & Sealant Council webinar - virtual
 ME Department, University of Waterloo - virtual (Waterloo, Canada)
 Dept. of Mech. & Aero. Eng., University of Miami (Miami, FL)
 2019 DOW (Midland, MI)
 BME Dept., Georgia Tech (Atlanta, GA)

Teaching

PhD Students (chaired or co-chaired)

W-C. Chiu (1999); J. Du (1999); Q. Yang (2000) - *Prof. & ME Chair University of Miami*; M. S. Kafkalidis (2002) - *Engineering at Boeing Corp*; M. N. Cavalli (2003) - *Professor & Assoc. Dean at WMU (former Chair of ME and Assoc. Dean, UND)*; S. Li (2004) - *Manager at SK Hynix in China*; J. P. Parmigiani (2006) - *Assoc. Research Prof, Oregon State University*; C. Sun (2007) - *Engineer with General Electric*; D. Lee (2008) - *Software Developer, ANSYS*; K. L. Mills (2008) - *Associate Professor, MANE, Rensselaer Polytechnic Institute*; R. R. Collino (2010) - *Staff scientist LANL*; K. Cao (2013) - *Engineer at Intel, OR*; J. Huang (2014) - *Researcher at Yale, CT*; T. Rahimzadeh (2016) - *Engineer, General Motors, MI*; Z. Hu (2016) - *Engineer*; C. M. Seubert (2016) - *Researcher, Ford, MI*; H. Wang (2017) - *Engineer - Amazon*; F. Meng (2018) - *Engineering at Exponent in Shanghai*; J. M. Gorman (2019) - *Researcher - US Army Tank Automotive Command*; M.C. Rice-Sasmal (2020); K. Hong (2020) *Engineer, Global Foundries, NY*; D. Wang (MSE 2020) *Product Engineer, LAM Research, CA*; J. Joe (2021) *Post-doc ORNL*; I. Gupta (2021) *Lecturer, University of Southampton (UK)*; R. Watkins (2023) *Engineer ERIM*, M. Yang (ME), A. Madanchi (ME)

MS Students (chaired)

M. N. Cavalli (2000) - *Professor & Assoc. Dean at WMU (former Chair of ME and Assoc. Dean, UND)*; K. L. Mills (2002) - *Associate Professor, MANE, Rensselaer Polytechnic Institute*; R. B. Sills (2010) - *Associate Professor, ME, Rutgers University*.

Post-docs (other than own PhD students)

B. Zhou - 2006 (*now doing research in industry*); K. Salmonsson -2009 (*now teaching in Sweden*)

Classes taught

ME382 Mechanical Behavior of Materials

Required undergraduate class developed by me, replacing ME281

F2023 (76); F2021 (68); W2020 (31); F2018 (76); F2015 (98); W2015 (81); W2014 (65); W2013 (32); W2012 (37); F2008 (74); F2007 (74); W2007 (44); W2006 (49); W2005 (37); F2001 (68); W2001 (88); W2000 (77); W2000 (55)

ME 281 Mechanical Properties of Materials

Previous required class

F1998 (27); F1996 (71); W1996 (42); W1995 (46)

ME211 Introduction to Solid Mechanics

Required undergraduate class

F2021 (73); F2020 (220); W 2016 (50); F2014 (98); F2013 (105); F2011 (77); W2008 (64); W2002 (98); W1999 (36);

ME499 Introduction to Solid Mechanics

An experimental version of ME211 taught over two semesters

W2017 (15); F2016 (18); W2016 (24); F2015 (25)

ME395 Junior Laboratory

Required undergraduate laboratory co-developed by me, replacing ME396

W2019 (172); F2012 (109); W2009 (139); F2006 (90); F2004 (78); F2003 (77); W2003 (121); F2000 (101)

ME396 Mechanical Sciences Laboratory

Previous version of the required undergraduate laboratory

F1997 (103); F1996 (66); W1996 (44)

ME516/MSE516 Mechanical Properties of Thin Films and Layered Materials

A graduate class on fracture developed by me on my research interests

W2024(18); W2021(20); F2016 (15); F2012 (21); F2009 (22); W2008 (12); F2005 (19); F2003 (24); F2000 (14)

ME586: F1997 (17)

ME599: F1995 (17)

ME577 Materials in Manufacturing and Design

A graduate class on materials selection developed by me

F2018 (15); F2014 (17); W2012 (21); W2009 (21); F2006 (18); W2004 (13); F2001 (37);

ME557: F1999 (33); F1998 (48)

Short Courses and Workshops

- ME211 “Introduction to Solid Mechanics,” Shanghai Jiaotong University, Shanghai, China, May-June 2001 (62).
- Short course on “Fracture Mechanics and Adhesion,” Eastman Kodak Company, Rochester, NY, October 1997 (≈40)
- Lecture on “Thin Film Mechanics, ” 5th Summer School of the Institute for Mechanics and Materials, Washington, DC, August 1997, (25)
- Lecture on “Application of Fracture Mechanics for Coating and Adhesive Fracture” Short Course on “Coating and Adhesive Adhesion: Theory, Application & Durability,” Organized by Inst. of Matls. Science at SUNY New Paltz, Orlando, FL, May 1997, (25)
- Informal graduate course on “Mechanical Properties of Films” Tsinghua University, Beijing, China, September 1994 - November 1994, (≈20 graduate students and professors)

Service

Service at University of Michigan

University

- Faculty Senate ad-hoc Rules Committee (2021)
- Faculty Senate Electronic Meetings and Accessibility Task Force (2020)
- CRLT Faculty Advisory Board (2013-2015)
- Advisory Board on Intercollegiate Athletics (*ex officio*) (2009-2010)
- Athletics Performance Committee (*ex officio*) (2009-2010)
- Provost's Faculty Budget Advisory Committee (2008-2010)
- General Counsel's Advisory Committee (2008-2009)
- Development Advisory Committee (2007-2008)
- Research Policies Committee (2007-2008)
- Senate Advisory Committee on University Affairs (2007-2010)
- Committee for President's Interdisciplinary Faculty Initiative (2008)
- Vice-Provost's task force on web evaluations (2006-2007)
- Senate Assembly (2004-2010)
- Academic Affairs Advisory Committee (2004-2007)
- Administrator Evaluation Committee (2004-2007)
- Faculty advisor to University of Michigan Fencing Club (1995-2014)
- Faculty Mentor in Peer Mentorship program (1995-1998)

College of Engineering

- Promotion Committee for Prof. M. Banu (chair) (2020-2021)
- *Ad-hoc* committee for Endowed Chairs (2019)
- Promotion Committee for Prof. N. Dasgupta (chair) (2019-2020)
- *Ad-hoc* committee for CoE-Cambridge collaboration (2017-2019)
- Nominating Committee (Chair) (2016-2017)
- Executive Committee (2013-2016)
- Materials Science Chair Search Advisory Committee (2012-2013)
- Library Advisory Committee (2012-2015)
- Promotion Committee for Prof. W. Lu (2012-2013)
- Promotion Committee for Prof. D. Brei (2011-2012)
- Materials Science Internal Review Committee (2009-2010)
- Promotion Committee for Prof. A. Kuo (chair) (2007-2008)
- Promotion Committee for Prof. R. S. Goldman. (2007)
- Mechanical Engineering Internal Review Committee (2006-2007)
- Promotion Committee for Prof. A. Kuo (chair) (2005-2006)
- Promotion Committee for Prof. E.M Arruda (2004-2005)
- Promotion Committee for Prof. X. Pan (2003-4)
- Re-appointment Committee for Prof. K. Garikapati (2002-2003)
- Minority Engineering Program Office Review Committee (1998)
- Curriculum 2000 advisory committee (1999)
- Re-appointment Committee for Prof. L. Lin (1998-1999)

Rackham Graduate School

- Faculty Recognition Awards Committee (2019-2020)
- Executive Board for Rackham School of Graduate Studies (2000-2003)
- Ph.D. in Music Education sub-committee of Rackham (2003)

- Distributed learning sub-committee of Rackham (2001)
- Rackham Pre-doctoral Faculty Selection Committee (1997)

Department of Mechanical Engineering

- Undergraduate Program Committee (2023-2024)
- Strategic Planning Committee (2019-2021)
- Lecturer Search Committee (chair) (2019-2020)
- Faculty Search Committee (chair) (2018-2019)
- Faculty Search Committee (2016-2017)
- Graduate Program Committee (2011-2013)
- Advisory Committee (1999-2005; 2006-2009)
- ME395 course leader (2008-2010)
- Area Coordinator (Materials and Solid Mechanics) (2001-2008)
- ME382 course leader (2001-2008)
- Planning Committee (1997-1999)
- Undergraduate Committee (chair) (1997-1999)
- Graduate Committee (1996-1998)
- Curriculum Committee (1996-1997)
- Honors and Awards Committee (1995-1997; 2006)
- Faculty Search Committee (for design area) (1997)
- Faculty Search Committee (for fluids area) (1996-1997)

Department of Materials Science & Engineering

- Undergraduate Committee (2000-2006)
- Departmental Seminar Series (W-2001)

Service to government or professional organizations

Editorial

Editorial Board: *Journal of Materials: Design and Applications* (2011-2016)

Associate Editor: *Journal of the American Ceramic Society* (1990-2006)

Engineering Fracture Mechanics (2023- present)

Reviewer: Numerous journals in materials & mechanics

Governmental

Reviewer of proposals for various US governmental agencies

College of Reviewers for Canada Chairs

Reviewer for NSERC proposals (Canada)

Reviewer of ESPRC proposals (UK)

Conferences

International Advisory / Scientific Committees

- *2nd International Conference on Materials Design and Applications 2018 (MDA2018)* Porto, Portugal (5 July - 6 July 2018).
- *1st International Conference on Materials Design and Applications 2016 (MDA2016)* Porto, Portugal (30 June - 1 July 2016).
- *International Conference of Fracture (13)*, Beijing, China (June 2013).
- *International Conference on Wind Energy: Materials, Engineering and Policies*, BITS Hyderabad, India (Nov 2012).
- *International Workshop on Future Wind Blade Technologies*, IIT Delhi, New Delhi, India (8th - 9th

- Oct 2012).
- 32nd Risø International Symposium on Materials Science, Risø, Denmark (Sept 2011).

Organizing Committees:

- *Engineering Foundation Conference on Mechanical Properties of Films, Coatings and Interfacial Composites*: Il Ciocco, Italy (June 1999).

Symposium Organizer:

- "Tony Evans Memorial Symposium," *ICF-13*, Beijing, China (June 2013).
- "Cohesive-Zone Modeling," *World Congress on Computational Mechanics* (July 2006, Los Angeles, CA).
- "Fracture, Fatigue and Mechanical Reliability," *American Ceramic Society, Annual Meeting* (April 1994, Indianapolis, IN).
- "Frictional Effects at Interfaces," *First Meeting of Pac-Rim Ceramic Societies* (November 1993, Honolulu, HI).

Program Committees:

- Annual Meeting, *American Vacuum Society - Thin Films Division* (October 1992, Chicago, IL).

Committees for Professional Societies

- Selection Committee: Nadai Award - ASME (2021-2024).
- Selection Committee: 3M Award - Adhesion Society (2006).
- Executive Committee: AAUP University of Michigan chapter (2005-2009)
- Executive Board: Academic Freedom Fund Lecture (2006-2009)

Other Universities

- Opponent: doctor techniques (a higher doctorate) defence at Technical University of Denmark, Lyngby (November 2010)
- Fakultetsopponent: PhD defence at Chalmers University, Sweden (June 2008)
- External Examiner: PhD defence at Cambridge University, UK (March 2019)
PhD defence at Cambridge University, UK (March 2011)
PhD defence at Eindhoven University of Technology, Netherlands (May 2011)
PhD defence at Technical University of Denmark, Risø (October 2015)
- External Review: Graduate Program, Department of Mechanical Engineering, University of Miami, FL (April 2017)
- Reviewer for tenure / promotion cases at universities in the US, Canada, Singapore, Ireland, Saudi Arabia

Other activities

- Invited presentation "The role of the faculty in the governance of UM" at the UM meeting of Chinese University Presidents, (May 2012).
- Invited presentation "The role of the faculty in the governance of UM" at the UM meeting of Chinese University Presidents, (May 2010).
- Invited participant at workshop on "An Investigation of the Locus of Peer Review for Publication," Center for Studies in Higher Education (CSHE) at UC Berkeley (April 2010).
- Invited participant at conference on "The changing mission of doctoral education in preparing the citizen scholar," organized by UM Rackham Graduate School and Woodrow Wilson National Fellowship Foundation, (June 2002)