Xi Chen

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Personal

- Date and place of birth: July 1976, Suzhou, P. R. China.

Working Experience

- Associate Professor, Department of Earth and Environmental Engineering, Columbia University, July 2009-present.
- Associate Professor, Department of Civil Engineering and Engineering Mechanics, Columbia University, Jan 2007-June 2009.
- Assistant Professor, Department of Civil Engineering and Engineering Mechanics, Columbia University, July 2003-Dec 2006.
- Postdoctoral Research Fellow, Harvard University, May 2001-June 2003. Advisor: Professor John W. Hutchinson.

Education

- Ph.D., Solid Mechanics, Division of Engineering and Applied Sciences, Harvard University, May 2001. Advisor: Professor John W. Hutchinson.

  Thesis Title: Foreign Object Damage and Fatigue Cracking.
- S.M., Engineering Science, Division of Engineering and Applied Sciences, Harvard University, May 1998. Advisor: Professors John W. Hutchinson and Anthony G. Evans.
- M.E., Engineering Mechanics, Department of Engineering Mechanics, Tsinghua University, June 1997. Advisor: Professor Keh-Chih Hwang.

  Thesis Title: Study of micromechanics constitutive relations for ferroelectric single crystal with domain switching.
- B.E., Engineering Mechanics, Department of Engineering Mechanics, Xi'an Jiaotong University, June 1994.

Research Interests

- Engineering Mechanics: Using multi-scale, multi-phase and multi-physics modeling and experimental approaches, to investigate engineering mechanics frontiers in novel materials addressing challenges in energy and environment, nanomechanics, and mechanobiology, and to achieve an understanding of the underlying mechanical behaviors of advanced materials.

Awards and Honors

- Outstanding Oversea Young Investigator Award, National Science Foundation of China, 2009.
- Presidential Early Career Award for Scientists and Engineers (PECASE), nominated by NSF, received from President George W. Bush in Whitehouse in December 2008 (for fiscal year 2007). Quote "In recognition for his outstanding research involving mismatch damages in thin-films and nano-scale self-assembly; and for his elaborate education and outreach activities, including summer programs for under-represented high school students."
- NSF CAREER Award, 2007 (for fiscal year 2006).
- Dean's Discretion Fund for the most productive faculty in engineering, 2006.
- NSF Summer Institute Fellowship in nanomechanics, 2006.
- Excellent Master Thesis, 1st Award, Tsinghua University, 1997.
- Excellent Bachelor Thesis, 1st Award, Xi'an Jiaotong University, 1994.

Awards and Honors Obtained by Graduate Students

- Founders Prize, American Academy of Mechanics (arguably one of the highest honor for graduate student in mechanics in US), by Ling Liu, 2008.
- Mindlin Scholar, by Yuye Tang, 2008.
- Mindlin Scholar (highest honor for graduate student in the Department of Civil Engineering and Engineering Mechanics at Columbia University), by Manhong Zhao, 2007.

Other Special Recognitions

- Work on mechanical self-assembly as a possible new way of fabrication is reported by Royal Society of Chemistry (07/20/2009) as a featured highlight on Chemical technology news, at

http://www.rsc.org/Publishing/ChemTech/Volume/2009/09/buckling_microgears.asp. Quote in the news "It's a new way of thinking about how we use materials to build gears". Xi Chen is the corresponding author of the paper. This work is also highlighted by the popular website of NewScientist at http://www.newscientist.com/article/dn17507-mismatched-materials-produce-selfassembling-gears.html, with quote "this is the first demonstration of building gears with this type of self-assembly", by Popsci at http://www.popsci.com/scitech/article/2009-07/scientists-design-versatile-self-assembling-nanogears, by Today's Machining World at http://www.todaysmachiningworld.com/, by Technologijos at http://www.technologijos.lt/n/mokslas/fizika/straipsnis-8453/straipsnis?name=straipsnis-8453&l=2&p=1. The work is also highlighted on the website of Soft Matter.

- Work on mechanics vs. morphogenesis is reported by Nature (11/18/2008) as a feature news story at http://www.nature.com/news/2008/081117/full/news.2008.1236.html. Xi Chen is the corresponding author of the paper. The work is also reported as a headline news of Chinese Academy of Sciences on 12/04/2008, as well as a headline news of the website of Chinese Science News. The work is also highlighted by National Science Foundation, and LiveScience, A Research in Action.
- Work selected by Faculty 1000 of Biology (August 2008) as "one of the most interesting papers in biology". The quote was received as "This article presents a very novel and promising method to couple elastic models of membranes and membrane proteins through finite element and elastic network representations. Such coupling provides a mechanism for probing the effects of membrane mechanical loading (e.g. tension, shear, bending etc.) on membrane proteins. In this particular study, the authors outline the methodology and present initial results for the MscL mechanosensitive ion channel. The methodology is particularly compelling in the way it elegantly combines simple linear elastic models of proteins with similarly reduced elastic models of lipid bilayers." Xi Chen is the first author and corresponding author of that paper.
- Work reported as headline news of Chinese Academy of Sciences from Jan 24th to Jan 27th 2008; the paper referred in the report (*Physical Review Letters*, 2008, 100: 036102) was mainly carried out by the Chen group, and Xi Chen is the corresponding author.
- Work on gas effect on nanofluidic behavior was highlighted by Nature Nanotechnology at http://www.nature.com/nnano/reshigh/2007/0207/full/nnano.2007.61.html
- Associate Editor, *Mechanics Research Communications*, 2007-present.
- Chair, Technical Committee, *Multifunctional Materials*, Division of Materials, ASME.
- Nomination for the Packard Fellowship by the President of Columbia University, 2006.

Courses Taught

- E8320 Viscoelasticity and Plasticity, first year doctoral student class; average enrollment about 5.
- E6315 Elasticity, first year doctoral student class; average enrollment about 5.
- E4113 Advanced Mechanics of Solids, first year graduate class; average enrollment about 15.
- E3113 Mechanics of Solids, junior class; average enrollment about 120.
- E3114 Experimental Mechanics of Materials (Mechanical behavior of materials), junior class; average enrollment about 45.

Industrial Experience

- Consultant for Rockwell International, 2001-2003.

- Consultant for Timken Bearing, Summer 1999.

Patents

- Mechanical self-assembly of gears, pending. IR-M-10-011; patent application in preparation
- A guideline for enhancing energy dissipation performance of nanoporous energy absorption system, pending. IR-M-09-067; patent application in preparation
- Nanoporous energy absorption system, pending. IR-07-083; patent filed

Research Supports

- Development of multiscale simulation methods nano fusion technologies in construction materials for sustainable infrastructures, World Class University Project, KOSEF (Korea), $3,500,000, 04/01/2009-08/31/2013, one of three PIs, part belong to Dr. Chen for research is $1,000,000.
- Novel application of nanoindentation in manufacturing, Sensitron Semiconductor, $60,420, 04/01/2008-09/30/2008, PI.
- The Science Underpinning Mechanical Self-Assembly, NSF CAREER CMS-0643726, 03/01/2007-02/29/2012, $407,395, PI. Dean's matching fund for CAREER, $45,000, PI. Dean's career development grant for productivity, $25,000, PI.
- Measurement of Mechanical Properties of Small Material Structures by Nanoindentation, NSF CMS-0407743, 07/01/2004-06/30/2008, $249,978, PI. REU Supplement of NSF CMS-0407743, 06/01/2005-08/31/2005, $5,000, PI.
- Columbia Nanomechanics Research Center, Columbia University Academic Quality Fund, 07/01/2004-06/30/2006, $279,632, PI.
- Exploratory Research on the Material Integrity of Nanoparticle Thin Films, Columbia University MRSEC Seed Fund, $50,000, 06/01/2004-05/31/2006, PI.
- The Science Underpinning Prime Reliant Coatings, Office of Naval Research Harvard 04-123219, 04/01/04-08/31/05, $35,000, PI.

Other Resources Brought in

- $10,000, Founder Prize of American Academy of Mechanics.
- $10,000, donation gift from Boeing towards education of a graduate student (Baoxing Xu).
- Donation from Intel Americas Inc.: CSIRO UMIS-2000 Micro/nanoindentation system, in addition to a vibration proof stage and sample heating stage ($150,000 value). Upgraded, re-calibrated, and fully functional.

Ph.D.'s Graduated

- Manhong Zhao, Ph.D. 2007. Thesis title: Nanoindentation: science and applications.
- Yuye Tang, Ph.D. 2008. Thesis title: Mechanics of biomolecules: a hierarchical approach.

Current Group Members

- Dr. Yoshiyuki Iso, Adjunct Research Scientist from IHI Japan, 2009-present
- Mr. Ling Liu, Ph.D. student, 2006-present. Presidential fellowship.
- Mr. James A. Mills, part-time Ph.D. student, 2005-present.
- Mr. Jianbing Zhao, Ph.D. student, 2006-present (co-advising with Patricia J. Culligan).

- Mr. Jie Yin, Ph.D. student, 2007-present.
- Mr. Baoxing Xu, Ph.D. student, 2008-present.
- Miss. Bo Sun, Ph.D. student, 2008-present, (under joint doctoral student training program between China-US, co-advising with Ming Su).
- Members to join in Fall 2009 include: Mr. Jun Xu, Mr. Binglei Wang, Mr. Yuan Yan, Mr. Qingwei Fan, Mr. Chen Dong, Mr. Hui Xie, Mr. Hui Fang (all visiting Ph.D. students supported by Chinese Scholarship Council; Xu and Wang are on 2-year term, Fang on 3-month term, and the rest are on 1-year term).

Past Members

- Prof. Xiaoyan Liang, Visiting Scholar, 2008-2009, currently Associate Professor at Beijing Jiaotong University.
- Prof. Chun Yang Yin, Visiting Scholar, 2008-2009, currently Assistant Professor at Universiti Teknologi MARA.
- Prof. Izhak Sheinman, Visiting Professor, 2008. Currently Professor at Technion, Israel.
- Prof. Guoxin Cao, postdoctoral research scientist, 2005-2008. Currently Assistant Professor, University of Nebraska at Lincoln.
- Prof. Weixu Zhang, Ph.D. student, 2007-2008 (under joint doctoral student training program between China-US, co-advising with Tiejun Wang). Currently Assistant Professor, Xi'an Jiaotong University.
- Mr. Zhongguo Sun, Ph.D. student, 2007-2008, (under joint doctoral student training program between China-US, co-advising with Guang Xi). Currently Ph.D. student, Xi'an Jiaotong University.
- Dr. Yuye Tang, Ph.D. 2008. Ph.D. student from 2005-2008. Thesis title: Mechanics of biomolecules: a hierarchical approach. Currently postdoc at University of Minnesota.
- Prof. Qulan Zhou, Senior visiting research scientist, 2006-2008. Currently Associate Professor and Department Vice Chairman, Xi'an Jiaotong University.
- Ms. Na Li, Ph.D. student, 2007-2008, (under joint doctoral student training program between China-US, co-advising with Tongmo Xu and Qulan Zhou). Currently Ph.D. student, Xi'an Jiaotong University.
- Dr. Manhong Zhao, Ph.D. 2007. Ph.D. student from 2004-2007. Thesis title: Nanoindentation: science and applications. Currently senior research scientist at Sensitron Semiconductor, Long Island.
- Prof. Nagahisa Ogasawara, visiting scientist during 2004-2005. Currently Associate Professor, National Defense Academy, Japan.
- Dr. Chengyi Wu, visiting research scientist during 2006-2007.
- Prof. Dongyun Lee, postdoctoral research scientist (joint with ME) during 2004-2007. Currently Assistant Professor, KAIST, Korea.
- Mr. Kipp Edick, undergraduate student, 2004-2006. Currently graduate student at Yale.
- Mr. Matthew Berry, undergraduate student. 2004-2005.
- Mr. Christopher Kovalchick, undergraduate student (Johns Hopkins University). 2004-2005, Currently graduate student at CalTech.
- Mr. Joel Goldman, highschool student (supervised him for Intel Talent Award and Simens Award), 2008. Currently undergraduate student at Penn.

Thesis Committees

- Mr. Manuel Miranda, Ph.D. student, CEEM department.
- Mr. Hongjun Liu, Ph.D. student, ChemE department.
- Mr. Hongqiang Chen, Ph.D. student, ME department.
- Mr. Yongxue Gan, Ph.D. student, ME department.
- Mr. Youneng Wang, Ph.D. student, ME department.
- Mr. Songtao Yang, Ph.D. student, CEEM department.
- Mr. J-J Wang, Ph.D. student, CEEM department.
- Mr. Chao-Kun Chuang, Ph.D. student, CEEM department.

Professional Affiliations

- Member, American Academy of Mechanics (AAM).
- Member, American Society of Mechanical Engineering (ASME).
- Member, American Society of Civil Engineering (ASCE).
- Member, Materials Research Society (MRS).

Professional Activities

- Associate Editor, *Mechanics Research Communications*.
- Editorial Board, *International Journal of Applied Mechanics*.
- Editorial Board, *Open Mechanics Journal*.
- Technical Committee Member (Chair, 2008-), *Multifunctional Materials*, *Materials Division*, ASME. 2004-
- Technical Committee Member, *Integrated Structures*, *Applied Mechanics Division*, ASME. 2006-
- Technical Committee Member, *Biomechanics*, *Engineering Mechanics Institute*, ASCE. 2009-
- Technical Committee Member, *Elasticity*, *Engineering Mechanics Institute*, ASCE. 2003-
- Technical Committee Member, *Inelastic Behavior*, *Engineering Mechanics Institute*, ASCE. 2003-

Journal Reviewer

- *Science;*
- *Nature Nanotechnology;*
- *Proceedings of National Academy of Sciences USA;*
- *Journal of the American Chemical Society;*
- *Physical Review Letters;*
- *Applied Physics Letters;*
- *Nano Letters;*
- *Biophysical Journal;*
- *Journal of Physical Chemistry;*
- *ACS Nano*
- *Journal of the Mechanics and Physics of Solids;*
- *Journal of Materials Research;*
- *Lab on a Chip;*
- *Acta Materialia;*
- *Physical Review B;*
- *Critical Reviews JVST;*
- *Experimental Mechanics;*
- *Materials Science and Engineering;*
- *Journal of Applied Physics;*
- *Computational Materials Science;*
- *Carbon;*

- *Physical Chemistry Chemical Physics;*
- *Mechanics Research Communications;*
- *Journal of Biomechanics;*
- *Molecular Simulation;*
- *ASME Journal of Applied Mechanics;*
- *ASCE Journal of Engineering Mechanics;*
- *International Journal of Solids and Structures;*
- *Journal of Nanomaterials;*
- *International Journal of Heat and Fluid Flow;*
- *Journal of Nanoengineering and Nanosystems;*
- *Journal of Nanoscience and Nanotechnology;*
- *Mechanics of Materials;*
- *Soft Matter;*
- *Journal of Elasticity;*
- *Journal of Biomedical Engineering;*
- *Journal of Membrane Science;*
- *Composites Science and Technology;*
- *Journal of Computational Chemistry;*
- *International Journal of Molecular Sciences;*
- *Computer Methods in Applied Mechanics and Engineering;*
- *Journal of Engineering Materials and Technology;*
- *physica status solidi;*
- *Recent Patents on Engineering;*
- *Journal of Materials Design and Applications;*
- *Journal of Composite Materials;*
- *Modeling and Simulation of Materials Science and Engineering;*
- *European Journal of Solid Mechanics;*
- *Thin Solid Films;*
- *Optics and Lasers in Engineering;*
- *Philosophical Magazine Letters;*
- *Journal of Physics;*
- *Applied Physics A;*
- *Journal of Mechanics of Materials and Structures;*
- *International Journal of Fracture;*
- *International Journal of Non-Linear Mechanics;*
- *Polymer;*
- *International Journal of Nanoparticles;*
- *International Journal of Fatigue;*
- *International Journal of Impact Engineering;*
- *Engineering Fracture Mechanics;*
- *Chemical Engineering Journal;*
- *Solid-State Electronics*
- *Solid State Communications;*
- *Surface and Coatings Technology;*
- *Applied Surface Sciences;*
- *Journal of Materials Science;*
- *ASCE Journal of Materials in Civil Engineering;*
- *ASME Journal of Engineering Materials and Technology;*
- *International Journal of Molecular Sciences;*
- *Journal of Engineering and Technology Research;*
- *Journal of Mechanics;*
- *Communications in Nonlinear Science and Numerical Simulation;*
- *Hippocampus;*
- *Journal of Computational and Applied Mathematics;*
- *Journal of Strain Analysis for Engineering Design;*
- *Arabian Journal of Science and Engineering;*
- *Journal of Scientific and Industrial Research;*

Proposal Reviewer

- National Science Foundation (also as panelist), CMMI and DMR

- Army Research Office
- Israel Science Foundation
- Netherlands Organisation for Scientific Research
- Swiss National Science Foundation

Organizing Conference Symposia

- IMECE 2009, Topic: Multifunctional Materials (main organizer)
- IMECE 2009, Symposium: Nanostructured Materials
- IMECE 2009, Symposium: Integrated Structures
- 2009 Joint ASCE-ASME-SES Conference on Mechanics and Materials, Symposium: Nano-, Bio-, Cellular and Multifunctional Materials
- USNCCM10, Symposium: Coarse-grained and Multi-scale Modeling in Molecular and Cellular Biomechanics
- IMECE 2008, Symposium: Nanostructured Materials
- IMECE 2008, Symposium: Integrated Structures
- IMECE 2007, Symposium: Multiphysics of Micro and Nanoscale Materials
- IMECE 2007, Symposium: Materials for energy applications
- Mechanics of Materials 2007, Symposium: Nanomechanics and nanostructured materials
- IMECE 2006, Symposium: Active Nanostructures
- IMECE 2006, Symposium: Multi-field Interactions in Micro/Nano and Organic Materials
- US National Congress of Theoretical and Applied Mechanics 2006, The Mindlin Centennial Symposium with 12 sessions (main organizer)
- Mechanics of Materials 2005 Conference, Symposium: Micromechanics/Nanomechanics with 8 sessions (main organizer)
- IMECE 2004, Symposium: Mechanics on the Nanoscale and Microscale
- IMECE 2004, Symposium: Mechanical integrity and mechanical reliability of electronic materials (main organizer)
- Engineering Mechanics 2004, Symposium: Mechanics of thin films and coatings (main organizer)

Chairing or Co-Chairing Sessions in Conferences

- Nanostructured Materials, *IMECE 2008*, Boston, MA (2008). [2 sessions]
- Integrated Structures, *IMECE 2008*, Boston, MA (2008). [1 session]
- Multiphysics of Micro and Nanoscale Materials, *IMECE 2007*, Seattle, WA (2007). [3 sessions]
- Nanomechanics and nanostructured materials, *Mechanics of Materials*, Austin, TX (2007). [2 sessions]
- Multiphysics of small scale materials, *Mechanics of Materials*, Austin, TX (2007). [3 sessions]
- Active Nanostructures, *IMECE 2006*, Chicago, IL (2006). [2 sessions]
- Multi-field Interactions in Micro/Nano and Organic Materials, *IMECE 2006*, Chicago, IL (2006). [1 session]
- The Mindlin Centennial Symposium, *USNCTAM'06*, Boulder, CO (2006). [3 sessions]

- Micromechanics/Nanomechanics, *Mechanics of Materials 2005 Conference*, Baton Rouge, LA (2005). [4 sessions]
- Mechanical integrity and mechanical reliability of electronic materials, *IMECE 2004*, Anaheim, CA (2004). [2 sessions]
- Mechanics of Small Material Structures, *Engineering Mechanics 2004*, Newark DE (2004). [1 session]
- Durability and Damage Tolerance of Composites symposium, *ASME Congress*, Washington DC (2003). [1 session]
- Mechanics at the Nanoscale and Microscale symposium, *Mechanics and Materials Conference*, Phoenix, AZ (2003). [1 session]

Refereed Journal Publications (* as corresponding author, ^student or postdoc)

H-index: 22; Categorized below (a few interdisciplinary papers may belong to several areas and in the following, each paper is only categorized into one area)

Mechanics vs. Energy/Environment related Materials and Systems

1. Jianbing Zhao^, Ling Liu^, Patricia J. Culligan and Xi Chen*, Thermal Effect on the Dynamic Infiltration of Water into Single-walled Carbon Nanotubes. *Physical Review E*, revision submitted.
2. Bo Sun，Qulan Zhou, Xi Chen*, Tongmo Xu, Shien Hui, Effect of Particle Size in a Limestone-Hydrochloric Acid Reaction System. *Journal of Hazardous Materials*, under review.
3. Ling Liu^ and Xi Chen*, Effect of Surface Roughness on Thermal Conductivity of Silicon Nanowires. *Journal of Applied Physics*, under review.
4. Ling Liu^, Xi Chen*, Aijie Han, and Yu Qiao, Effects of Anion Size and Concentration on Electrolyte Infiltration into Molecular-sized Nanopores. *New Journal of Physics*, under review.
5. Jianbing Zhao^, Patricia J. Culligan, Yu Qiao and Xi Chen*, Electrolyte solution transport in electropolar nanotube. *Physical Chemistry Chemical Physics*, revision submitted.
6. Hui Fang^, Tiejun Wang and Xi Chen*, Model updating of lattice structures: A substructure potential energy (SPE) approach. *Mechanical Systems and Signal Processing*, under review.
7. Baoxing Xu^, Akio Yonezu, and Xi Chen*, An Indentation Fatigue Strength Law. *Philosophical Magazine Letters*, under review.
8. Joel Goldman^, Chun-Yang Yin^, and Xi Chen*, Increased concrete permeability via controlled hydraulic fatigue technique. *Materials and Structures*, under review.
9. Na Li^, Qulan Zhou^, Dejuan Kong, Xi Chen*, Tongmo Xu and Shien Hui, Mass transfer characteristics in double-contact-flow absorber with liquid column/screen flow type: Modeling and experiment, *Chemical Engineering Science*, revision submitted.
10. Jianbing Zhao^, Patricia J. Culligan and Xi Chen*, Experimental Study on Energy Dissipation of Electrolyte in Nanopores. *Langmuir*, in press.
11. Baoxing Xu^, Xi Chen* and Haim Waisman, Crack propagation toward a desired path by controlling force direction. *Engineering Fracture Mechanics*, in press.
12. Qulan Zhou^, Na Li^, Xi Chen, Tongmo Xu and Shien Hui, Flow Field of Water Drops in Blade Channel: Numerical Analysis of Water Drop Erosion on Turbine Blades, *International Journal of Turbo and Jet Engines*, in press.

13. Akio Yonezu, Baoxing Xu[^] and Xi Chen*, An Experimental Methodology for Characterizing Fracture of Hard Thin Films under Cyclic Contact Loading. *Thin Solid Films*, in press.
14. Jianbing Zhao[^], Yu Qiao, Patricia J. Culligan and Xi Chen*, Confined Liquid Flow in Nanotube: A Numerical Study and Implications for Energy Absorption, *Journal of Theoretical and Computational Nanoscience*, invited paper, cover article, in press.
15. Ling Liu[^], Jianbing Zhao[^], Patricia J. Culligan, Yu Qiao and Xi Chen*, Thermally Responsive Fluid Behaviors in Hydrophobic Nanopores. *Langmuir*, 2009, 25: 11862–11868.
16. Weiyi Lu, Taewan Kim, Aijie Han, Xi Chen and Yu Qiao, Eletrowetting Effect in a Nanoporous Silica, *Langmuir*, 2009, 25: 9463–9466.
17. Ling Liu[^], Jianbing Zhao[^], Chun-Yang Yin[^], Patricia J. Culligan, and Xi Chen*, Mechanisms of Water Infiltration into Conical Hydrophobic Nanopores. *Physical Chemistry Chemical Physics*, 2009, 11: 6520-6524.
18. Ling Liu[^], Xi Chen, Aijie Han, and Yu Qiao, Infiltration of Electrolytes into Molecular-Sized Nanopores, *Physical Review Letters*, 2009, 102: 184501.
19. Ling Liu[^] and Xi Chen*, Nanofluidic Transport in Branching Nanochannels: A Molecular Sieve Based on Y-Junction Nanotubes. *Journal of Physical Chemistry B*, 2009, 113: 6468-6472.
20. Zhongguo Sun[^], Guang Xi and Xi Chen*, Mechanism Study of Deformation and Mass Transfer for Binary Droplet Collisions with Particle Method, *Physics of Fluids*, 2009, 21: 032106.
21. Yu Qiao, Ling Liu[^] and Xi Chen*, Pressurized Liquid in Nanopores: A Modified Laplace-Young Equation, *Nano Letters*, 2009, 9: 984-988.
22. Baoxing Xu[^], Zhufeng Yue, and Xi Chen*, An indentation fatigue depth propagation law. *Scripta Materialia*, 2009, 60: 854-857.
23. Zhongguo Sun[^], Guang Xi and Xi Chen*, Numerical simulation of binary collisions using a modified surface tension model with particle method, *Nuclear Engineering and Design*, 2009, 239: 619-627.
24. Qulan Zhou[^], Qinxin Zhao, Xi Chen*, Tongmo Xu and Shien Hui, A Dimensionless Factor Characterizing the Ignition of Pulverized Coal Flow: Analytical Model, Experimental Verification, and Application. *International Journal of Energy Research*, 2009, 33: 235-254.
25. Weiyi Lu, Aijie Han, Taewan Kim, Venkata K. Punyamurtula, Xi Chen, Yu Qiao, Field-Responsive Ion Transport in Nanopores, *Applied Physics Letters*, 2009, 94: 023106.
26. Taewan Kim, Venkata K. Punyamurtula, Weiyi Lu, Aijie Han, Venkata K. Punyamurtula, Xi Chen and Yu Qiao, Effects of anion concentration on ion-transport pressure in nanopores. *Applied Physics Letters*, 2009, 94: 013105.
27. Zhongguo Sun[^], Guang Xi and Xi Chen*, A Numerical Study of Stir Mixing of Liquids with Particle Method, *Chemical Engineering Science*, 2009, 64: 341-350.
28. Guoxin Cao[^], Yu Qiao, Qulan Zhou[^] and Xi Chen*, Water Infiltration Behaviors in Carbon Nanotubes under Static and Dynamic Loading Conditions, *Molecular Simulation*, invited paper, 2008, 34: 1267-1274.
29. Na Li[^], Qulan Zhou[^], Xi Chen*, Tongmo Xu, Shien Hui and Di Zhang, Liquid Drop Impact on Solid Surface with Application to Water Drop Erosion on Turbine Blades, Part I: Nonlinear wave model and solution of one-dimensional impact, *International Journal of Mechanical Sciences*, 2008, 50: 1526-1542.
30. Qulan Zhou[^], Na Li[^], Xi Chen*, Tongmo Xu, Shien Hui and Di Zhang, Liquid Drop Impact on Solid Surface with Application to Water Drop Erosion on Turbine Blades, Part II:

Axisymmetric solution and erosion analysis, *International Journal of Mechanical Sciences*, 2008, 50: 1543-1558.

31. Aijie Han, Weiyi Lu, Venkata K. Punyamurtula, Xi Chen, Falgun B. Surani, Taewan Kim, and Yu Qiao, Effective viscosity of glycerin in a nanoporous silica gel. *Journal of Applied Physics*, 2008, 104: 124908.
32. Aijie Han, Weiyi Lu, Taewan Kim, Xi Chen, Yu Qiao, Influence of Anions on Liquid Infiltration and Defiltration in a Zeolite Y, *Physical Review E*, 2008, 78: 031408.
33. Xi Chen, Guoxin Cao^, Aijie Han, Venkata K. Punyamurtula, Ling Liu^, Patricia J. Culligan, Taewan Kim and Yu Qiao, Nanoscale Fluid Transport: Size and Rate Effects. *Nano Letters*, 2008, 8: 2988-2992.
34. Aijie Han, Xi Chen and Yu Qiao, Effects of Addition of Electrolyte on Liquid Infiltration in a Hydrophobic Nanoporous Silica Gel, *Langmuir*, 2008, 24: 7044-7047.
35. Guoxin Cao^, Yu Qiao, Qulan Zhou^ and Xi Chen*, Infiltration Behavior of Water in a Carbon Nanotube under External Pressure, *Philosophical Magazine Letters*, 2008, 88: 371-378.
36. Qulan Zhou^, Na Li^, Xi Chen, Akio Yonezu, Tongmo Xu and Shien Hui, Water Drop Erosion on Turbine Blades: Numerical Framework and Applications. *Materials Transactions*, 2008, 49: 1606-1615.
37. Ling Liu^, Yu Qiao and Xi Chen*, Pressure-Driven Water Infiltration into Carbon Nanotube: The Effect of Applied Charges, *Applied Physics Letters*, 2008, 92: 101927. This paper is also included in the *Virtual Journal of Nanoscale Science & Technology*, 2008, Vol. 15. This paper is also included in the *Virtual Journal of Biological Physics Research*, 2008, Vol. 15.
38. Yu Qiao, Guoxin Cao^, and Xi Chen*, Effect of gas molecules on nanofluidic behaviors, *Journal of the American Chemical Society*, 2007, 129: 2355-2359. This work is highlighted by Nature Nanotechnology at http://www.nature.com/nnano/reshigh/2007/0207/full/nnano.2007.61.html
39. Xi Chen, Falgun B. Surani, Xinguo Kong, Venkata K. Punyamurtula, and Yu Qiao, Energy Absorption Performance of a Steel Tube Enhanced by a Nanoporous Material Functionalized Liquid, *Applied Physics Letters*, 2006, 89: 241918.
40. Xi Chen*, CMAS delamination mechanisms in EB-PVD thermal barrier coatings, *Surface and Coatings Technology*, 2006, 200: 3418-3427.
41. Xi Chen*, Foreign object damage on the edge of a thin blade. *Mechanics of Materials*, 2005, 37: 447-457.
42. Xi Chen*, Ming Y. He, I. Spitsberg, Norman A. Fleck, John W. Hutchinson and Anthony G. Evans, Mechanisms governing the high temperature erosion of thermal barrier coatings used in gas turbines, *Wear*, 2004, 256: 735-746.
43. Xi Chen*, John W. Hutchinson and Anthony G. Evans, Simulation of the high temperature impression of thermal barrier coatings with columnar microstructure, *Acta Materialia*, 2004, 52: 565-571.
44. Xi Chen*, John W. Hutchinson, Ming Y. He and Anthony G. Evans, On the propagation and coalescence of delamination cracks in compressed coatings: with applications to thermal barrier coatings, *Acta Materialia*, 2003, 51: 2017-2030.
45. Brad L. Boyce, Xi Chen, Jan O. Peters, John W. Hutchinson and Robert O. Ritchie, Mechanical relaxation of localized residual stress associated with foreign object damage. *Materials Science and Engineering A*, 2003, 349: 48-58.

46. Xi Chen*, R. Wang, Nan Yao, Anthony G. Evans, John W. Hutchinson and Robert W. Bruce, Foreign object damage in a thermal barrier system: mechanisms and simulations. *Materials Science and Engineering A*, 2003, 352: 221-231.

Mechanobiology

47. Jie Yin^ and Xi Chen*, Elastic buckling of gradient thin films on compliant substrates. *Physical Review B*, under review.
48. Baoxing Xu^ and Xi Chen*, The role of stress on the formation and selection of human hair curly pattern. *Journal of Biomechanical Engineering*, under review.
49. Jie Yin^, Greg Gerling, and Xi Chen*, Mechanical Modeling of Wrinkled Fingertip Immersed in Water. *Acta Biomaterialia*, revision submitted.
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18. Yong Xiang, Xi Chen and Joost J. Vlassak, Measuring the mechanical properties of freestanding aluminum and copper films using the bulge test technique. *Materials Research Society Symposium Proceedings*, 2001, 695: 491-496.
19. Xi Chen* and Joost J. Vlassak, A finite element study on the nanoindentation of thin films. *Materials Research Society Symposium Proceedings*, 2000, 649: 131-136.
20. Dai-Ning Fang, Xi Chen, Wei Lu and Keh-Chih Hwang, Micromechanical modeling of electromechanical coupled fields and constitutive equations. In: *Mechanical Properties of Advanced Engineering Materials, Proceedings Of the third International Symposium on*

Microstructures and Mechanical Properties of New Engineering Materials, Tsu, Japan, 6-10 August 1997, Mie University Press, 583-590.

21. Xi Chen*, Dai-Ning Fang and Keh-Chih Hwang, Electroelastic Green's functions for piezoelectric composites and their applications in piezoelectric micromechanics. In: *Proceedings of the Celebration Symposium on Technology Advance in Mechanics*, Press of Tsinghua University, 1997, Vol. III: 1268-1271.
22. Dai-Ning Fang, Xi Chen, Wei Lu and Hang Qi, Study of coupled ferroelastic and ferroelectric fields in ferroelectrics, *Advances in Solid Mechanics*, 1997, 1: 38-46.
23. Xi Chen, Dai-Ning Fang and Keh-Chih Hwang, Micromechanics constitutive researches for ferroelectric single crystal with domain switching. In: *Progress in Advanced Materials and Mechanics*, *ICAM'96*, 1996, 1: 465-470.

Oral Presentations at Conferences/Workshops/Seminars (◊ abstract published)

1. Can indentation measure unique material elastoplastic properties?, *ASME Congress*, Orlando, FL (2009).◊
2. Electrolyte infiltration and transport in nanochannels and the implication for energy dissipation, *ASME Congress*, Orlando, FL (2009).◊
3. Mechanics of morphogenesis of some natural and biological systems, *ASME Congress*, Orlando, FL (2009).◊
4. A molecular sieve based on branching nanochannels, *ASME Congress*, Orlando, FL (2009).◊
5. Controlled Crack Arrest in Brittle Thin Films: The Effect of Embedded Voids, *ASME Congress*, Orlando, FL (2009).◊
6. Mechanical self-assembly by buckling on curved substrates: a new microfabrication technique inspired by biological systems, *ASME Congress*, Orlando, FL (2009).◊
7. Nanofluidic energy conversion*, Department of Earth and Environmental Engineering, *Columbia University*, New York, NY (2009).
8. Energy Conversion using Nanoporous Materials and Functional Liquids: The Next-Generation Nanocomposite Materials for Protection, Actuation, and Energy Harvesting, underpinned by Fundamental Mechanics of Nanofluids, School of Aerospace Engineering, *Georgia Institute of Technology*, Atlanta, GA (2009).
9. Fundamental Mechanics Issues Addressing Several Challenges in Biology and Energy, Department of Chemistry, *The University of Wisconsin at Madison*, Madison, WI (2009).
10. Mechanisms of Gating of Mechanosensitive Channels of Large Conductance, Department of Mechanical Engineering, *University of Delaware*, Newark, DE (2009).
11. Mechanisms of Gating of Mechanosensitive Channels of Large Conductance, Department of Mechanical and Aerospace Engineering, *University of California at San Diego*, La Jolla, CA (2009).
12. Measuring elastoplastic properties of thin films using nanoindentation, *ASME Congress*, Boston, MA (2008).◊
13. Fruit Morphogenesis: Implications from Stress-Driven Buckling Patterns in Spheroidal Core/Shell Structures, *ASME Congress*, Boston, MA (2008).◊
14. Fundamentals of nanofluidics with applications to nanoscale energetics, *ASME Congress*, Boston, MA (2008).◊

15. Mechanisms of Gating of Mechanosensitive Channels of Large Conductance, Department of Mechanical Engineering, *University of California at Santa Barbara*, Santa Barbara, CA (2008).
16. Gating Mechanisms Mechanosensitive Channels of Large Conductance (MscL), International Conference of the Engineering Mechanics Institute '08, Minneapolis, MN (2008).
17. Mechanisms of Gating of Mechanosensitive Channels of Large Conductance, Department of Structural Engineering, *University of California at San Diego*, La Jolla, CA (2008).
18. Science and prospects of using nanoporous materials for energy absorption, invited talk, *MRS Fall Meeting*, Boston, MA (2007).◊
19. Can nanoindentation measure unique elastoplastic properties?, *MRS Fall Meeting*, Boston, MA (2007).◊
20. Gating mechanisms of mechanosensitive channels of large conductance, *ASME Congress*, Seattle, WA (2007).◊
21. Pressure-induced infiltration at nanoscale: fundamental mechanisms and applications in energy absorption, *ASME Congress*, Seattle, WA (2007).◊
22. Can nanoindentation measure unique elastoplastic properties of materials?, *ASME Congress*, Seattle, WA (2007).◊
23. Size Dependence and Orientation Dependence of Elastic Properties of ZnO Nanofilms, *ASME Congress*, Seattle, WA (2007).◊
24. Mechanisms of Gating of Mechanosensitive Channels of Large Conductance, Department of Civil and Environmental Engineering, *Duke University*, Durham, NC (2007).
25. Nanoporous Energy Absorption System: Science and Applications, NanoOpto site visit, MRSEC, Columbia University, New York, NY (2007)
26. Mechanisms of Gating of Mechanosensitive Channels of Large Conductance, Beckman Institute and Department of Physics, *University of Illinois at Urbana-Champaign*, Urbana, IL (2007).
27. A Molecular Dynamics-Decorated Finite Element Method (MDeFEM) Framework for Simulating the Gating of Mechanosensitive Channels, Mechanics and Materials 2007, Austin, TX (2007)◊
28. Measuring elastoplastic properties of thin films by using nanoindentation, Mechanics and Materials 2007, Austin, TX (2007)◊
29. Can nanoindentation measure unique elastoplastic properties of materials?, Mechanics and Materials 2007, Austin, TX (2007)◊
30. Nanoporous Energy Absorption System and Gas-Liquid Interaction in Nanoenvironments, Mechanics and Materials 2007, Austin, TX (2007)◊
31. Nanoporous Energy Absorption System (NEAS), Livingston site visit, MRSEC, Columbia University, New York, NY (2007)
32. Mechanisms of Gating of Mechanosensitive Channels of Large Conductance, School of Engineering and Applied Sciences, *Harvard University*, Cambridge, MA (2007)
33. Mechanisms of Gating of Mechanosensitive Channels of Large Conductance, Department of Mechanical Engineering, *California Institute of Technology*, Pasadena, CA (2007)
34. Mechanisms of Gating of Mechanosensitive Channels of Large Conductance, Department of Theoretical and Applied Mechanics, *Cornell University*, Ithaca, NY (2007)
35. Mechanisms of Gating of Mechanosensitive Channels of Large Conductance, CNRC Seminar, *Columbia University*, New York, NY (2007)
36. Nanoporous Energy Absorption System (NEAS), Corning Inc., Corning, NY (2007)

37. Nanoporous Energy Absorption System (NEAS), Lux Capital site visit, MRSEC, Columbia University, New York, NY (2007)
38. Determine unique material elastoplastic properties by indentation, Invited keynote lecture, Cocoa Beach Conference of American Ceramic Society, Daytona, FL (2007)◊
39. Nanoporous Energy Absorption System (NEAS) with Potential Applications as Damping Elements, Packaging Materials, Healthcare Products, Protective and Sound Proof Coatings, Multifunctional Energy Harvesting, Conversion, and Actuation Materials, Corning site visit, MRSEC, Columbia University, New York, NY (2006)
40. Nanoporous Energy Absorption System (NEAS) with Potential Applications as Damping Elements and Sound Proof Coatings in Aircrafts and Vehicles, Boeing site visit, MRSEC, Columbia University, New York, NY (2006)
41. Buckling of single-walled carbon nanotubes, *ASME Congress*, Chicago, IL (2006).◊
42. Confined liquid behavior in nanochannels, *ASME Congress*, Chicago, IL (2006).◊
43. Mechanical properties of carbon nanotubes in axial and radial directions, *ASME Congress*, Chicago, IL (2006).◊
44. Strain sensing with single-walled carbon nanotubes, *ASME Congress*, Chicago, IL (2006).◊
45. Some recent studies on the mechanics of carbon nanotubes, Department of Mechanical Engineering, *Cooper Union*, New York, NY (2006).
46. A finite element study on the mechanosensitive channels, *USNCTAM'06*, Boulder, CO (2006).◊
47. On the Thermal-Mechanical Properties of Single-Wall Carbon Nanotubes, *USNCTAM'06*, Boulder, CO (2006).◊
48. Some recent studies on the mechanics of carbon nanotubes, Division of Engineering, *Brown University*, Providence, RI (2006).
49. Some recent studies on the mechanics of carbon nanotubes, Department of Mechanical Engineering, *SUNY Stony Brook*, Stony Brook, NY (2006).
50. Mechanisms of Nanoindentation on Single-Walled Carbon Nanotubes, *ASME Congress*, Orlando, FL (2005).◊
51. Mechanical properties of self-assembled colloidosome capsules, *ASME Congress*, Orlando, FL (2005).◊
52. A novel technique of measuring mechanical properties of porous low-k dielectric thin films by means of nanoindentation, *Mechanics of Materials Conference*, Baton Rouge, LA (2005).◊
53. On the determination of mechanical properties and residual stress from indentation, *Mechanics of Materials Conference*, Baton Rouge, LA (2005).◊
54. Interface between Solid Mechanics and Physics/Chemistry: Some Recent Studies on the Mechanics governing Novel Small Material Structures, Department of Civil Engineering and Engineering Mechanics, *Columbia University*, New York, NY (2005).
55. Mechanics of Indentation Lateral Cracking, *MRS Meeting*, Boston, MA (2004).◊
56. Indentation Damage in Brittle Solids: the Lateral Crack system, *ASME Congress*, Anaheim, CA (2004).◊
57. CMAS Delamination Mechanisms in Thermal Barrier Coatings, *ASME Congress*, Anaheim, CA (2004).◊

58. Interface between Solid Mechanics and Physics/Chemistry: Some Recent Studies on the Mechanics governing Novel Small Material Structures, Department of Chemistry, *The University of Wisconsin at Madison*, Madison, WI (2004).
59. Nanoindentation on Thin Films and Lateral Cracking, CNRC Seminar, *Columbia University*, New York, NY (2004).
60. Mechanisms Controlling the Failure of Thermal Barrier Coatings, Department of Civil and Environmental Engineering, *MIT*, Cambridge, MA (2004).
61. Mechanisms Controlling the Failure of Thermal Barrier Coatings, Department of Mechanical Engineering, *The City College of New York*, New York, NY (2004).
62. Substrate Effect on the Nanoindentation of Thin Films, Engineering Mechanics Conference, Newark, DE (2004).◊
63. Thin Film Herringbone Buckling Patterns, *MRS Fall Meeting*, Boston, MA (2003).◊
64. Failure Mechanisms of Thermal Barrier Coatings at High Temperature, *ASME Congress*, Washington DC (2003).◊
65. On the Propagation and Coalescence of Delamination Cracks in Compressed Coatings, *ASME Congress*, Washington DC (2003).◊
66. Self-Assembly of Ordered Structures in Thin Films by Elastic Buckling, *Mechanics and Materials Conference*, Phoenix, AZ (2003).◊
67. Mechanisms Controlling the Failure of Thermal Barrier Coatings, Department of Mechanical Engineering and Applied Mechanics, *University of Pennsylvania*, Philadelphia, PA (2003).
68. Mechanisms Controlling the Failure of Thermal Barrier Coatings, Department of Civil Engineering and Engineering Mechanics, *Columbia University*, New York, NY (2003).
69. Mechanisms Controlling the Failure of Thermal Barrier Coatings, Department of Aerospace Engineering, *Texas A&M University*, College Station, TX (2003).
70. On the Mechanics of Foreign Object Damage, Department of Mechanical and Aerospace Engineering, *University of Florida*, Gainesville, FL (2002).
71. On the Mechanics of Foreign Object Damage, Department of Mechanical Engineering, *Tulane University*, New Orleans, LA (2002).
72. The Mechanics of Foreign Object Damage with Application to Turbine Engine Blades and Thermal Barrier Coatings, *US National Congress of Theoretical and Applied Mechanics 14*, Blacksburg, VA (2002).◊
73. On the Mechanics of Foreign Object Damage, School of Aerospace Engineering, *Georgia Institute of Technology*, Atlanta, GA (2002).
74. On the Mechanics of Foreign Object Damage, Department of Materials Science and Engineering, *MIT*, Cambridge, MA (2002).
75. On the Mechanics of Foreign Object Damage, Department of Mechanical Engineering, *SUNY at Buffalo*, Buffalo, NY (2002).
76. On the Mechanics of Foreign Object Damage, Department of Mechanical and Industrial Engineering, *University of Illinois at Urbana-Champaign*, Champaign, IL (2002).
77. On the Mechanics of Foreign Object Damage, Department of Civil and Environmental Engineering, *Princeton University*, Princeton, NJ (2002).
78. Foreign Object Damage and Fatigue Cracking, Department of Mechanical Engineering, *University of Delaware*, Newark, DE (2002).
79. Foreign Object Damage and Fatigue Cracking, Department of Mechanical Engineering, *University of Connecticut*, Storrs, CT (2001).

80. Foreign Object Damage and Fatigue Cracking, Department of Materials Science and Engineering, *University of Tennessee*, Knoxville, TN (2001).
81. Foreign Object Damage and Fatigue Cracking, *Saint-Gobain R&D Center*, Northboro, MA (2001).
82. Foreign Object Damage and Fatigue Cracking, Department of Mechanical Engineering, *University of Rhode Island*, Kingston, RI (2001).
83. Foreign Object Damage and Fatigue Cracking, *Rockwell Science Center*, Thousand Oaks, CA (2001).
84. Foreign Object Damage and Fatigue Cracking, Department of Engineering, *Colorado School of Mines*, Golden, CO (2001).
85. Foreign Object Damage and Fatigue Cracking, Department of Mechanical Engineering, *University of Iowa*, Iowa City, IA (2001).
86. Foreign Object Damage and Fatigue Cracking, Department of Mechanical Engineering, *New Jersey Institute of Technology*, Newark, NJ (2001).
87. Foreign Object Damage and Fatigue Cracking, *ABAQUS*, Pawtucket, RI (2001).
88. A Finite Element Study on the Nanoindentation of Thin Films, *MRS Fall Meeting*, Boston, MA (2000).◊
89. Nanoindentation Hardness of Thin Films, Division of Engineering and Applied Sciences, *Harvard University*, Cambridge, MA (2000).
90. Foreign Object Damage and Fracture, Division of Engineering and Applied Sciences, *Harvard University*, Cambridge, MA (2000).
91. The Influence of Foreign Object Damage on Fatigue Cracking, *Special Symposium Dedicated for the 60th Birthday of Professor John Willis*, *ICTAM2000*, Chicago, IL (2000).◊

Presentations Given by Group Members or Collaborators (◊ abstract published)

92. Extracting Mechanical Properties of Low-k Dielectric Materials with Nanoindentation, MRS Fall Meeting, Boston, MA (2008).
93. Microindentation measurement of thin film elastic and plastic properties, *JSME Mechanics and Materials 2008*, Kusatsu, Japan, (2008).◊
94. Substrate effect and the use of substrate effect in determination of thin film elastoplastic properties: FEM analyses, *JSME 2008 Congress*, Yokohama, Japan, (2008).◊
95. Evaluation of thin film elastoplastic properties using nanoindentation, *JSME 2008 Congress*, Yokohama, Japan, (2008).◊
96. Toward a mechanistic understanding of mechanosensation with atomistic and continuum models, invited talk, 234th ACS National Meeting, Boston, MA (2007)◊
97. Plastic flow and deformation behavior associated with friction stir welding nanocomposites. International Symposium on Plasticity 2007, Anchorage, AK (2007)◊
98. Aspects of cracks induced due to indentation testing of multilayered functional coatings, Mechanics and Materials 2007, Austin, TX (2007)◊
99. Determine unique material elastoplastic properties by indentation (presentation given by student in department seminar), Department of Civil Engineering and Engineering Mechanics, *Columbia University*, New York, NY (2007).
100. Numerical Simulations of Gating of Mechanosensitive Channels, *APS March Meeting*, Denver, CO (2007).◊

101. Some recent studies on the mechanics of carbon nanotubes (presentation given by postdoc in department seminar), Department of Civil Engineering and Engineering Mechanics, *Columbia University*, New York, NY (2007).
102. Uniqueness of determining elastoplastic properties of materials using indentation, *JSME 2007 Congress*, Suita, Japan, (2007).◊
103. Water drop erosion on turbine blades (presentation given by postdoc in department seminar), Department of Civil Engineering and Engineering Mechanics, *Columbia University*, New York, NY (2007).
104. Plane-strain bulge test for nanocrystalline copper nanoscale films, MRS Fall Meeting, Boston, MA (2006).◊
105. On Residual Stress and Mechanical Properties from the Load-Displacement Curves of Conical Microindentation, *ASME Congress*, Chicago, IL (2006).◊
106. Mechanical Properties of Gold Single Crystal Nanowires, *ASME Congress*, Chicago, IL (2006).◊
107. Solid-liquid interaction in confining nanoenvironment and its application for smart structures, *USNCTAM'06*, Boulder, CO (2006).◊
108. On internal cone cracks induced by instrumented indentation of brittle materials, *Greater Philadelphia AIAA/ASME 2nd Annual Aerospace/Mechanical Engineering Mini-Symposium*, Plymoth Meeting, PA (2006).◊
109. Coefficients of substrate effect in thin film indentation, *The 19th Computational Mechanics Conference of JSME*, Nagoya, Japan, (2006).◊
110. Finite element studies of mechanical property extraction from indentation test. *The 19th Computational Mechanics Conference of JSME*, Nagoya, Japan, (2006).◊
111. Critical penetration depth for nano/micro indentation test to determine elastic-plastic film properties deposited on hard substrates. *8th biennial ASME Conference on engineering systems design and analysis*, Turin, Italy (2006).◊
112. Measure mechanical properties of thin films with sharp indenters. *Annual Conference of Japanese Experimental Mechanics Society*, Aichi, Japan (2006).◊
113. Indentation on thin films deposited on silicon substrate. *55th Conference of Japanese Materials Research Society*, 2006, Niigata, Japan (2006).◊
114. Numerical study on extrapolating mechanical properties of thin films with sharp indenters. *JSME Annual Conference Mechanics and Materials*, Shizuoka, Japan (2006).◊
115. On the Thermal-Mechanical Properties of Single-Walled Carbon Nanotubes, *ASME Congress*, Orlando, FL (2005).◊
116. Study of Instrumented Indentation Induced Cracking, *ASME Congress*, Orlando, FL (2005).◊
117. Nanomechanical testing of gold single crystals, *ASME Congress*, Orlando, FL (2005).◊
118. Mechanical Properties of Free Standing Single Crystal Gold Nanowires, *MRS Meeting*, Boston, MA (2005).◊
119. Structure and Properties of Electrocodeposited Cu-Al2O3 Nanocomposite Thin Films, *Mechanics of Materials Conference*, Baton Rouge, LA (2005).◊
120. Determination of Residual Stress and Mechanical Properties by Indentation, *ASME Congress*, Anaheim, CA (2004).◊
121. Mechanical Properties of Nanoporous Organosilicate Glass (OSG) Thin Films, *ASME Congress*, Anaheim, CA (2004).◊

122. Microcantilevered Deformation and Finite-Element Modeling of Novel Self-Assembled Structures, *American Physics Society Spring Meeting*, Austin, TX (2003).◊
123. Crack coalescence in thermal barrier systems, *MURI Workshop on TBC*, Santa Barbara, CA (2003).
124. The mechanical behavior of Cu thin films, *Frontiers in Materials and Nanosciences Workshop*, Cambridge, MA (2002).
125. Measuring the mechanical properties of freestanding aluminum and copper films using the bulge test technique, *MRS Fall Meeting*, Boston, MA (2001).◊

Posters

1. Mechanics vs. Morphogenesis, *NSF CMMI Grantee Conference*, Honolulu, HI (2009).
2. Gating of mechanosensitive channels of large conductance, *NSF CMMI Grantee Conference*, Knoxville, TN (2008).
3. Uniqueness of indentation test, *NSF CMMI Grantee Conference*, Knoxville, TN (2008).
4. A Molecular Dynamics-Decorated Finite Element Method (MDeFEM) Framework for Simulating the Gating of Mechanosensitive Channels, *MRS Meeting*, Boston, MA (2006).
5. Thermomechanical Properties of Single-Walled Carbon Nanotubes, *MRS Meeting*, Boston, MA (2006).
6. Mechanical Properties of Free Standing Nanoporous Gold Nanowires, *MRS Meeting*, Boston, MA (2005).
7. Mechanisms of Nanoindentation on Single-Walled Carbon Nanotubes, *MRS Meeting*, Boston, MA (2005).
8. Thermal vibration and thermal contraction of single-walled carbon nanotubes, *MRS Meeting*, Boston, MA (2005).
9. Mechanics of indentation induced lateral cracking, *MURI Workshop on TBC*, Santa Barbara, CA (2005).
10. CMAS delamination mechanisms in thermal barrier coatings, *MURI Workshop on TBC*, Santa Barbara, CA (2005).
11. Simulation of the high temperature impression of thermal barrier coatings with columnar microstructure, *MURI Workshop on TBC*, Santa Barbara, CA (2004).
12. Mechanisms governing the high temperature erosion of thermal barrier coatings used in gas turbines, *MURI Workshop on TBC*, Santa Barbara, CA (2004).
13. Mechanical properties of electroplated Cu thin films, *Harvard University MRSEC symposium 2003*, Cambridge, MA (2003).
14. On the propagation and coalescence of delamination cracks in thermal barrier systems, *MURI Workshop on TBC*, Santa Barbara, CA (2003).
15. Mechanisms governing the high temperature erosion of thermal barrier coatings, *MURI Workshop on TBC*, Santa Barbara, CA (2003).
16. Foreign object damage in a thermal barrier system, *MURI Workshop on TBC*, Santa Barbara, CA (2003).
17. Mechanical properties of electroplated Cu thin films, *Gordon Conference*, Waterville, ME (2002).
18. Mechanisms and simulations of impact damage on thermal barrier coatings, *Gordon Conference*, Waterville, ME (2002).
19. The Mechanical properties of electroplated Cu thin films, *MRSEC 2002*, Cambridge, MA (2002).

20. Normal and shear stress state in thermal barrier coating due to foreign object damage, *MURI Workshop on TBC*, Atlantic City, NJ (2001).