Curriculum Vitae

2023

1. Name: Kyung-Suk Kim Position: Professor
Academic Department: Solid Mechanics Group, School of Engineering, Brown University

2. Education:

Degrees	Field	Year	Institute Conferred
B.S.	Mechanical Engineering,	1974	Seoul National University
M.S.	Fluid Mechanics and Heat Transfer,	1976	Seoul National University
Ph.D.	Solid Mechanics,	1980	Brown University
	Dissertation: Plane wave experiments in dynamic plasticity		

3. Professional Appointments:

1989-present	Professor, Solid Mechanics, Nano and Micro Mechanics Laboratory, School of Engineering, Brown University
2014 –2019	Director of the Center for Advanced Materials Research, Brown University
2013	Simpson Visiting Faculty Fellow, Department of Mechanical Engineering, Northwestern University, Evanston, IL
2008	Distinguished Visiting Scientist, Korea Institute of Science and Technology
2004	Distinguished Visiting Professor, Sung Kyun Kwan University, Korea
2002	Visiting Scholar, Harvard University
1997	Visiting Scientist, UC Santa Barbara
1996	Visiting Scholar, Cambridge University, UK
1987-1988	Visiting Scholar, Harvard University
1986-1989	Associate Professor, Dept. of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign (tenured 1986)
1980-1986	Assistant professor of Theoretical and Applied Mechanics University of Illinois at Urbana-Champaign
1979-1980	Research Fellow, California Institute of Technology

4. Completed Research:

4. a. Books Edited:

- Experiments in Micromechanics of Failure Resistant Materials", AMD-Vol. 130, The American Society of Mechanical Engineers, 151 pages, 1991.
- Experiments in Smart Materials and Structures," AMD-Vol. 181, The American Society of Mechanical Engineers, 147 pages, 1993.
- Fracture and Ductile vs. Brittle Behavior, -Theory, Modelling and Experiment," MRS Proceedings, Vol. 539, Edited by G. E. Beltz, R. L. Blumberg Selinger, K.-S. Kim and M. P. Marder, 1998.

4. b. Chapters in books:

Kim, K.-S. and Phillips, J.W., "Optical methods of caustics," Manual on Experimental Stress Analysis, ed. J.F. Doyle, SEM Inc., 1988.

Mazen Diab, Ruike Zhao and Kyung-Suk Kim, "The Ruga Mechanics," Imechanica, ed. Teng Li and Zhigang Suo, http://imechanica.org/node/17889, 2015.

Kim, Kyung-Suk and Jin, Hanxun and Jiao, Tong and Clifton, Rodney J., "Dynamic Fracture-Toughness Testing of a Hierarchically Nano-Structured Solid," Fracture, Fatigue, Failure and Damage Evolution, Volume 3. Conference Proceedings of the Society for Experimental Mechanics Series. Springer, Cham. https://doi.org/10.1007/978-3-030-60959-7_16, 2021.

Hanxun Jin, Catherine Machnicki, John Hegarty, Rodney J Clifton, Kyung-Suk Kim, "Understanding the Nanoscale Deformation Mechanisms of Polyurea from In Situ AFM Tensile Experiments," Challenges in Mechanics of Time Dependent Materials, Mechanics of Biological Systems and Materials & Micro-and Nanomechanics, Volume 2, Conference Proceedings of the Society for Experimental Mechanics Series. Springer, Cham. https://doi.org/10.1007/978-3-030-86737-9_6, 2022.

4. c. Refereed journal articles:

145. Song, Siyuan; Kothari, Mrityunjay; and Kim, Kyung-Suk, "On Hyperelastic Crease. Journal of the Mechanics and Physics of Solids," 2023, Available at SSRN: https://ssrn.com/abstract=4545600 or http://dx.doi.org/10.2139/ssrn.4545600

144. Jin, Hanxun; Machnicki, Catherine; Hegarty, John; Clifton, Rodney J.; and Kim, Kyung-Suk Kim, "Hierarchical nanophase dissociation: Source of polyurea's dynamic toughness," Soft Matter, Review Revision Process, 2023.

143. Hua Zhu, Zhaochuan Fan, Siyuan Song, Dennis Eggert, Yuzi Liu, Wenwu Shi, Yucheng Yuan, Kyung-Suk Kim, Michael Grünwald, and Ou Chen, "Dual Atomic Coherence in the Self-Assembly of Patchy Heterostructural Nanocrystals," ACS Nano, doi.org/10.1021/acsnano.2c06167, 2022.

142. Kothari, M., Kim, KS. Flexoelectricity-driven periodic buckling in multilayer graphene bonded to compliant substrate. MRS Communications (2022). doi.org/10.1557/s43579-022-00239-9138, 2022.

141. Hanxun Jin, Tong Jiao, Rodney J. Clifton, Kyung-Suk Kim, "Dynamic fracture of a bicontinuously nanostructured copolymer: A deep-learning analysis of big-data-generating experiment," Journal of the Mechanics and Physics of Solids, Volume 164, 104898, doi.org/10.1016/j.jmps.2022.104898, 2022.

140. Jin, H., Machnicki, C., Hegarty, J., Clifton, R.J., Kim, KS., "Understanding the Nanoscale Deformation Mechanisms of Polyurea from In Situ AFM Tensile Experiments," In: Amirkhizi, A., Notbohm, J., Karanjgaokar, N., DelRio, F.W. (eds) Challenges in Mechanics of Time Dependent Materials, Mechanics of Biological Systems and Materials & Micro-and Nanomechanics, Volume 2. Conference Proceedings of the Society for Experimental Mechanics Series. Springer, Cham. doi.org/10.1007/978-3-030-86737-9_6, 2022.

139. Hanxun Jin, Alexander K. Landauer, Kyung-Suk Kim, “Ruga mechanics of soft-orifice closure under external pressure,” Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, Vol. 477, No. 2249, doi.org/10.1098/rspa.2021.0238, 2021.

138. Meng Zhang, Zhaoxia Rao, Kyung-Suk Kim, Yue Qi, Liang Fanga, Kun Sun, Eric Chason, “Molecular dynamics simulation of stress induced by energetic particle bombardment in Mo thin films,” Materialia, Vol. 16, 101043, doi.org/10.1016/j.mtla.2021.101043, 2021.

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136. Zhaoxia Rao, Hanxun Jin, Alison Engwall, Eric Chason, Kyung-Suk Kim, "Determination of stresses in incrementally-deposited films from wafer-curvature measurements," J. Appl. Mech. 87 (10), online JAM-20-1179, doi.org/10.1115/1.4047572, 2020.

135. R. M. McMeeking, M. Ciavarella, G. Cricrì and K.-S. Kim, “The Interaction of Frictional Slip and Adhesion for a Stiff Sphere on a Compliant Substrate,” Journal of Applied Mechanics, No. 031016, vol. 87(3), doi.org/10.1115/1.4045794, 2020.

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131. K.-S. Kim, “Nanoscale fracture and rupture properties of graphene: Five wonders in mechanics of graphene,” Proceedings of ICF 14, (Keynote extended abstract), 2017.

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128. R. Zhao, M. Diab, K.-S. Kim, "The Primary Bilayer Ruga-Phase Diagram II: Irreversibility in Ruga Evolution," Journal of Applied Mechanics, doi:10.1115/1.4033722, 2016.

127. Jong Hyun Jung, Jaehyun Bae, Myoung-Woon Moon, Kyung-Suk Kim, Jisoon Ihm, "Numerical study on sequential period-doubling bifurcations of graphene wrinkles on a soft substrate," Solid State Communications, doi:10.1016/j.ssc.2015.08.020, 2015.

126. R. Zhao, T. Zhang, M. Diab, H. Gao, K-S. Kim, "The Primary Bilayer Ruga-Phase Diagram I: Localizations in Ruga Evolution," Extreme Mechanics Letters, doi:10.1016/j.eml.2015.04.006, 2015.

Discover Top 100 Science Stories in 2014, #30, "New Math for Designer Wrinkles: Equations calculate how a rubbery material deforms under pressure," Shanon Palus, January, 2015.

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112. Jeong-Yun Sun, Shuman Xia, Myoung-Woon Moon, Kyu Hwan Oh and Kyung-Suk Kim, "Folding wrinkles of a thin stiff layer on a soft substrate," Proceedings of the Royal Society A, vol. 468(2140), pp. 932-953, 2012.

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roughness during shallow chemical etching," Proceedings of IUTAM symposium in Abisko, Sweden, 2002.

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J. of Material Science, vol. 19, pp. 1428-1438, 1984.

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4. c-B. Unpublished articles for internal circulation:

C1. Tsai, K.-H. and Kim, K.-S., Stick-Slip in the Thin Film Peel Test, Part II, The Roller Peel Test," 1993.

C2. Kim, K.-S., Stigh, U. and Choi, H., A Study on the Energetic Force of a Point Load, 1994.

4. d. Reports:

1. Dynamic fracture in viscoelastic solids," GALCIT SM81-7, ONR N00014-78-C-0634, (with
W. G. Knauss). ONR Report, 1981.

2. Elasto-plastic analysis of the peel test," TAM Report 472, IBM 441614. 1985.

3. "Mechanics aspect of the design of strong braze joint in ceramic-metal, ceramic-ceramic joining," GTE Report, 1986.

4. Mechanics aspect of the strength of thin film adhesion," (with W. Jiang), IBM 441614-2, 1986.

5. Mechanics of the Strength of Multilayer Packaging: Fracture Mechanics for Multilayer Electronic Packaging," IBM Report, March, 1990

6. Experimental Study on the Strength of Thin Film Strucures," ONR Report, May, 1990

7. DOE-GTE reports. Oakridge National Lab., 1992

8. GTE report, 1993.

9. NSF-MRG Annual Report (Section contributed), 1991, 92, 93, 95

10. ONR Annual Report, 1991, 92, 93, 96

4. e. Conference Presentations with Conference Proceedings:

- Interfacial toughness," with Jiang, W., ASME WAM, Boston, MA, 1987.
- Temperature dependent crack growth in polymeric materials,"ICF 7, Houston, TX, 1988.
- Mixed mode peel test," with Aravas, N. and Kamath, S. M., ASME -ASCE, La Jolla, CA, June
- Mechanics of electronic packaging," ASME WAM, San Francisco, CA, December 1989
- On the Strength of Thin Film Adhesion," International Conference on Mechanics, Physics and Structures of Materials, A Celebration of Aristotle's 23 Centuries, Thessaloniki, Greece, August, 1990.
- Presentations at 1990 MRS and ASME.
- Tsai, K.-H. and Kim, K.-S., A Study of Stick-Slip Behavior in Interface Friction Using Optical Fiber Pull-Out Experiment," SPIE Annual Conference, San Diego, California, July, 1991.
- Kim, K.-S., Experimental Study of Crack Tip Plasticity," SPIE Annual Conference, San Diego, California, July, 1991.
- Yang, M. and Kim, K. -S., Analysis of an Interface crack with one contact and two shear-yield zones," Midwest Mechanics Conference, Rolla, Missouri, September, 1991.

[presented by MY]

- Rice, J. R., Yehuda, B.-Z., and Kim, K.-S., A First Order Perturbation Solution for a Dynamic Planar Crack with a Non-Uniformly Moving Front," American Geophysical Union, December, 1991. [presented by JRR]
- Tsai, K.-H. and Kim, K.-S., Stick-Slip in Thin Film Peeling," ASME Winter Annual Meeting, Atlanta, Georgia, December, 1991.
- Schwartzman, A. F., Choi, H. C. and Kim, K.-S., Experimental Deformation Mechanics of Materials from Their Near-Atomic-Resolution Defect Images," MRS Winter Annual Meeting, Boston, Massachusetts, December 1991. [presented by AFS]
- ONR Workshop, at the University of Maryland, June, 1992.
- Kim, K.-S. Nanoscopic Measurement of Atomic Interplanar Bond Strength for Crystalline Solid Interfaces -I," ASME/ASCE/SES Joint Summer Meeting, Charlottesville, Virginia, June, 1993.
- Kim, K.-S. Stick-Slip Sliding Crack Growth in Fiber-Matrix Interface Fracture," ASME Winter Annual Meeting, New Orleans, Louisiana, November, 1993.
- Kim, K.-S. Micro-and Nano-Mechanical Measurement of Fracture Parameters," ASME Winter Annual Meeting, New Orleans, Louisiana, November, 1993.
- Knauss' 60th Birthday Symposium, Pasadena, California, February, 1994.
- O'Neil, D. A., Selverian, J. H. and Kim, K. -S., Plasticity considerations in probabilistic ceramictometal joint design," The International Gas Turbine and Aeroengine Congress and Exposition, The Hague, Netherlands, June, 1994.
- Kim, K.-S and Bastawros, Laser-Moir Analysis of the Near Crack-Tip Incremental-Plastic-Defor-mation Fields in FCC Copper Single Crystals", IUTAM Conference, Cambridge, England, September, 1995.
- Kim, K.-S. Reliability of Microstructural Integration of Solids," Application of Fracture Mechanics in Electronic packaging and Materials, ASME Winter Annual Meeting, San Francisco, CA, November 1995.
- Kim, K.-S. Constitutive Relation of Interfaces and General Moire Deformation Analysis," ASME/ ASCE/SES Joint Summer Meeting, Baltimore, MD, June, 1996.
- Andrews, E. A. and Kim, K.-S. Particle-Impact Experiment for Studying Dynamic Behavior of Brittle Merials," ASME/ASCE/SES Joint Summer Meeting, Baltimore, MD, June, 1996.
- Andrews, E. A. and Kim, K.-S. Threshold Conditions for Particle Fragmentation under Impact," ASME Winter Annual Meeting, Atlanta, GA, November, 1996.
- Kim, K. -S. Nano-mechanics of defects in Crystalline solids," SEM Spring Annual Meeting, Bellevue, WA, June, 1997.
- Bastawros, A. F. and Kim, K. -S., "Crack-Tip Plasticity" ASME Summer Meeting, Blacksburg, Virginia, during June 28-30, 1999.
- Hurtado, J. A. and Kim K-S., Co-organized two sessions of nano-tribology and the nanomechanics of surfaces and interfaces at the SES meeting in Austin, Texas during October 25 -28, 1999. (two talks)
- Shenoy, V. and Kim, K.-S., "Dynamic Fragmentation (1D)," MRS Fall Meeting, Boston, Nov. 28, 2000.
- Kim, K.-S., "Residual Stress Measurement with SRES," The 2nd International Conference on Experimental Mechanics, Singapore, Nov. 29 to Dec. 1, 2000.
- Kim, K.-S., "Adhesion and friction in nano-meter-scale contact," ASME winter annual meeting, New York, NY, November, 2001.
- Benzerga, A. A., Hong, S. S., Kim, K.-S., Needleman, A. and Van der Giessen, E., "Smaller is softer: an inverse size effect in a cast aluminum alloy," ASME winter annual meeting,

New York, NY, November, 2001.

- Kim, K.-S. Effects of Elastic and Plastic Anisotropies on Crack-Tip Plasticity," Invited Special lecture at the 10th International Congress on Fracture held at Honolulu, Hawaii, December, 2001.
- Kim, K.-S., "Nanotechnology and ME Education," ASME winter annual meeting, New Orleans, LA, November 17 -22, 2002.
- Yu, H., Kim, K.-S. and Cheng, Y. T., "Contact-Induced Dislocation Damage Near a Nano-Grain Coating Layer," ASME winter annual meeting, New Orleans, LA, November 17 - 22, 2002.
- Kim, K.-S., "Evolution of thin-film surface roughness caused by mechanical and chemical loading," APS, Austin, Texas, March 2003.
- Kim, K.-S., "Scale-dependent deformation and field projection in nano-and micro-mechanics of solids," Society for Experimental Mechanics, Charlotte, NC, June 2003.
- Kim, K.-S., "Nano mechanics of solid-surface structures and its applications," U.S.-Korea Conference, Durham, NC, August 14, 2004.
- Kim, K.-S., Frictional behavior of vertically aligned multi-walled carbon nanotube arrays, ASME, October, 2005.
- Kim, K.-S., Near-Surface Dislocation Activities and Contact Micro-Plasticity, ASME, Orlando, October, 2005.
- Kim, K.-S., Nano-indentation of pyramid structures on Gold (100), ASME, Orlando, October, 2005.
- Kim, K.-S., Dry Friction at the Nano- and Micro-Scale, MRS, Boston, November, 2005.
- Jahn R. Torres, Kyung-Suk Kim and Gregory D. Jay, Matthew L. Warman, ADHESIVE FORCE REDUCTION AND MOLECULAR AGGREGATION ON LUBRICIN-COATED CONTACTS, WTC, Washington DC, September, 2005.
- Nano-mechanics of solid surface suspension and imprinting with solid surface nano-structures, Kyung-Suk Kim, MRS, Singapore, January, 2006.
- Size Effects in Surface Plasticity, Kyung-Suk Kim, Symposium on Bridging scales in mechanics, Providence, RI, August, 2006.
- Quantitative Nanofriction Study of Vertically Aligned Multi-Walled Carbon Nanotube Arrays (J. Lou, F. Ding, B.I. Yakobson and K.-S. Kim) at the ASME Annual Meeting, Chicago, IL, November 2006.
- Scale Bridging in Nano and Micro Mechanics of Friction and Wear, (Kyung-Suk Kim, Shuman Xia, Qunyang Li Yue Qi, Thomas A. Perry) at the Nanotribology workshop, Detroit, Michigan, August 24, 2007.
- The strength characterization of Al/Si interfaces with a hybrid nanoindentation/FEM method, (S. M. Xia, Y. Qi, T. A. Perry and K. -S. Kim) American Physical Society March Meeting, New Orleans, Louisiana, March 2008.
- Micromechanics of Multi-Scale Cohesive Zone Models (Shuman Xia, Huck Beng Chew, Soonsung Hong, Kyung-Suk Kim), ASME WAM, Boston MA, November 03, 2008.
- Analysis of large-amplitude thin-film wrinkles on a soft finite-elastic substrate (Kyung-Suk Kim, Myoung-Woon Moon), ASME WAM, Boston MA, November 04, 2008.
- Huck Beng Chew, Kyung-Suk Kim, Dynamic fragmentation of single-wall carbon nanotubes induced by sonication, International Conference on Fracture, Ottawa, Canada, September, 2009.
- C.-K. Wang, H.B. Chew and K.-S. Kim, “Nanometer Scale Mechanical Behavior of Grain Boundaries Characterized by Hybrid Scientific Computation/Experiment,” Invited Talk and Paper, MRS 2010 Fall Meeting, Boston, MA.
- H.-G. Kim, S. W. Kim, J.-W. Yi, K.S. Kumar and K.-S. Kim, “Mechanical Property Measurements of Nanocrystalline Thin Films: Part II. Fracture Toughness,” Oral Presentation, MRS 2010 Fall Meeting, Boston, MA.

- S. W. Kim, J.-W. Yi, H.-G. Kim, K.S. Kumar and K.-S. Kim, "Mechanical Property Measurements of Nanocrystalline Thin Films: Part I. Elastic Modulus," Poster, MRS 2010 Fall Meeting, Boston, MA.
- Kim, K.-S. (Invited Talk) Nanomechanics of cutting carbon nanotubes with sonication, at SES meeting held at Iowa State University.
- K.-S. Kim, "Adhesion controlled by multi-scale interface residual stresses," Invited Talk, honoring Dr. Kash Mittal, ACS, Boston
- H.B. Chew and K.-S. Kim, "Compressive Graphene Fracture in CNT Sonication," honoring Professor RM McMeeking's 60th birthday, NCTAM2010 at Penn State.
- K.-S. Kim, "Folding and roughening of thin solid surface films," New England Workshop on the Mechanics of Materials and Structures (NEW. Mech 2011), October 1, 2011, MIT, Cambridge, MA
- K.-S. Kim, "Mechanics of Nanostructures: Hybrid Analysis of Ion Bombardment; Computation / Experiment / Modeling," ASME Congress 2011 Drucker Medalist (John Rudnicki) Symposium*,* November 15, 2011, Denver, CO.
- Invited talk at the APS March Meeting: Continuum Description of Atomistics for Nanomechanics of Grain Boundary Embrittlement in FCC Metals, Boston, MA, March 1, 2012.
- ***Plenary Lecture*** on "Bio-Mimicking of Extreme-Property Hybrid Structures: Ruga Mechanics" in the International Symposium on Nature-inspired Technology 2013 (ISNIT 2013), at Gangwon-do, Korea, 01/08/2013.
- Conference talk on "Folds and Crease from Wrinkles" in the Focus Session: Wrinkling, at the APS March Meeting, Baltimore, MD, 3/22/2013.
- Invited talk on "Ruga Mechanics of Neo-Hookean Solids with Stratified Elastic Moduli", Continuum Mechanics of Solids and Fluids: A Symposium in Honor of Roger Fosdick, PACAM XIII, Houston TX, 5/23/2013.
- Invited talk on "Surface Instabilities of neo-Hookean solids and Ruga Mechanics," at the International Symposium on New Horizons in Materials Mechanics in celebration of the 70th birthday of Professor Viggo Tvergaard, at Lyngby, Denmark, 6/07/13
- Invited talk on "Search for New Materials with Ruga Mechanics", BIRS Workshop on mathematics and mechanics in the search for new materials, Banff Research Station, Canada, 7/18/2013.
- Invited talk on "Ruga Mechanics and Ruga-Phase Diagrams," the symposium in honor of Prof. Rod Clifton on the occasion of his 75th Birthday in SES 50th Annual Technical Meeting, Providence, RI, 7/29/13.
- Organized plenary talks on the occasion of 50th anniversary of SES, by inviting Leon Cooper and James R. Rice.
- ***Plenary Lecture*** on "Science and Technology in New Bridging Era: Engineering of Self-organized Emergence", DGIF, Daegu, Korea, 11/22/2013.
- Invited talk on "Ruga Mechanics of Crinkles: Search for New Multifunctional Materials", Knauss 80th birthday symposium, Caltech, Pasadena, CA, 12/10/2013.
- Invited talk on "Characterization of Interfacial Sliding Properties at Amorphous Si/Cu Interface due to Li-ion Intercalation by Using Self-Adjusting Liquid Linnik Interferometer," – Fracture and Failure in Bio- Nano- and Energy Systems – 17th U.S. National Congress of Theoretical and Applied Mechanics, Michigan State University, East Lansing, MI, June 16, 2014.
- Invited talk on "Nonlinear Field Projection Method in Nanoscale Structures and Materials," Lallit Anand 65'th Birthday Symposium, 17th U.S. National Congress of Theoretical and Applied Mechanics, Michigan State University, East Lansing, MI, June 16, 2014.

- Invited talk on “Scale-bridging experiments and field projections for failure analysis of nanocrystalline materials,” – Bridging Scales in Heterogeneous Materials – The 2014 MRS Fall Meeting, Boston, MA, Dec. 3, 2014.
- A. Landauer; I. Newton; C. Franck; K.S. Kim, "Experimental validation of ruga-phase diagram for primary bilayer systems," Proceedings of the 52nd Society of Engineering Science Meeting 2015, October, 2015.
- Kyung-Suk Kim, Moon-Hyun Cha, Heemin Kwon, Jungsun Seo,"Molecular self-assembly with crinkle-ruga structures in multilayer graphene," Proceedings of ANNIC 2015, October, 2015.
- Mazen Diab, Jahn Torres, Michael Monn, Ruike Zhao, Kyung-Suk Kim, “Hidden, forbidden and inherited spectra of hierarchical wrinkles of a soft material surface,” Proceedings of the 53rd Society of Engineering Science Meeting 2016, October, 2016.
- Ruike Zhao, Mazen Diab, Kyung-Suk Kim, “A Mechanics Study on Surface Ruga Morphologies of Soft Materials,” Proceedings of the 53rd Society of Engineering Science Meeting 2016, October, 2016.
- M. Kothari, M.-H. Cha, K.-S. Kim, “Critical behavior of curvature localization in graphene,” the APS March Meeting, New Orleans, LA, 3/22/2017.
- H. Jin, K.-S. Kim, “Ruga Mechanics of Cylindrical Bilayer Cavity: Post-bifurcation of Surface-film Wrinkling versus Ring Buckling,” Proceedings of the 54th Society of Engineering Science Meeting 2017, July, 26, 2017.
- M. Kothari, M.-H. Cha, K.-S. Kim, “Mechanics of curvature localization in graphene,” Proceedings of the 54th Society of Engineering Science Meeting 2017, July, 26, 2017.
- R. Li, M. Kothari, H. Jin, A. Landauer, K.-S. Kim, “Crinkles of Graphene Nanoplatelets: a Flexoelectricity Application in Nano- and Bio-Device,” US NCTAM, Chicago, June, 5, 2018.
- A. Landauer, K.-S. Kim, H. Jin, Ruga Mechanics of Soft- material Orifices under Far-field Pressure,” US NCTAM, Chicago, June, 5, 2018.
- M.-H. Cha, K.-S. Kim, M. Kothari, “Understanding the Curvature Localization in Multilayer Graphene,” US NCTAM, Chicago, June, 6, 2018.
- M. Kothari, M.-H. Cha, K.-S. Kim, V. Lefevre, “Asymptotic Models of Curvature Localization in Multi-Layer Graphene,” 56th Annual Meeting of the Society of Engineering Science, October 15, 2019.
- M. Kothari, K.-S. Kim, “Graphene Crinkles and Their Potential for Soft-Composites (IMECE Paper # -13536),” ASME 2019 IMECE ECE, November 13, 2019.
- Kim, K.-S., Jin, H., Jiao, T., and Clifton, R.J., “Dynamic Fracture-Toughness Testing of a Hierarchically Nano-Structured Solid,” Fracture, Fatigue, Failure and Damage Evolution, vol. 3, Springer, 2021: Proceedings of SEM, September 15, 2020.
- Hanxun Jin, Catherine Machnicki, John Hegarty, Rodney J Clifton, Kyung-Suk Kim, “Understanding the Nanoscale Deformation Mechanisms of Polyurea from In Situ AFM Tensile Experiments,” Challenges in Mechanics of Time Dependent Materials, Mechanics of Biological Systems and Materials & Micro-and Nanomechanics, vol. 2, Springer, 2022: Proceedings of SEM, June 16, 2021.

4. f. Invited Lectures:

- Elasto-plastic analysis of adhesion test, December 9, 1983 at IBM, Yorktown Heights, NY.
- Sigma Xi invited talk on Ductile peeling and adhesion, November 29, 1984, at GTE, Waltham MA.
- An experimental study on dynamic transient crack growth of crazing polymeric materials, ASME Symposia on Micro and Macro-mechanics of Failure (30 min.), Cincinnati, OH, June

1987.

- Analysis of peel tests for thin film adhesion, Gordon Research Conferences on Science of Adhesion. (60 min.), New Hampton, NH, August 1987.
- Micromechanics of dynamic crack propagation in amorphous materials, Workshop on Dynamic Response of Materials (30 min.), La Jolla, CA, March 1988.
- Mechanics of the peel test for thin film adhesion, MRS Spring Meeting (45 min.), Reno, NV, April 1988.
- On the adhesion test of extensible thin films, Conference on Composites and Interfaces, with Aravas, N. and Loukis, M., (30 min.), New Port, RI, June 1988.
- On the adhesion test for electronic packaging, DARPA-MRC Conference (60 min.), La Jolla, CA, July 1988.
- Adhesion and decohesion of thin films, American Physical Society (36 min.), St. Louis, MO, March 1989.
- Measurement of Mechanical Bulk-and Interface-Properties of Thin Polymeric Films, Materials Research Society, MRS Fall Meeting (45 min), Boston, MA, November, 1990.
- Interface Friction Studies by Fiber-Pullout Experiment, Bulletin of the American Physical Society (36 min), Cincinnati, OH, March, 1991.
- Single crystal crack tip plasticity, ICF, Singapore, 1991.
- Large Plastic Deformation Field Near a Crack Tip in Iron Silicon Single Crystal, IUTAM Proceedings, Hannover, Germany, August, 1991.
- Gordon Conference: Adhesion, New Hampton, NH, August, 1992.
- International Symposium on Adhesion Measurement of Films and Coatings, Cambridge, MA, December, 1992.
- Gordon Research Conference on Science of Adhesion, Nanoscopic Measurement of Atomic Inter-planar Bond Strength for Crystalline Solid Interfaces, New Hampton, New Hampshire, August, 1993.
- Workshop on Mechanics of Interfaces -Scale Bridging; Institute for Mechanics and Materials, La Jolla, CA, September, 1993.
- Annual Meeting of Adhesion Society, A Study of Stick Slip Behavior in Interface Friction and Peeling, Orlando, Florida, February, 1994.
- Frontiers of Electron Microscopy in Materials Science, Quantitative Measurements of Lattice-Static Properties of Crystalline Solids from HRTEM Images, Oakland, California, June, 1994.
- Second Asia-Pacific Symposium on Advances in Engineering Plasticity and its Applications, Beijing, China, June, 1994
- International Symposium on Fracture and Strength of Solids, Xian, China, July, 1994.
- International Conference on Composite Engineering -1 Kink Band Propagation under Compressive Loading in Thick Composites, New Orleans, Louisiana, August, 1994
- Mechanics of Materials; Ceramic Impact, ADD, Korea, June, 1995.
- SEM conference, Nano-Mechanics of Reliability Testing", Williamsburg, VA, October, 1995.
- Institute for Mechanics of Materials; Think Tank, Nanomechanics of Materials, Houston, TX, March, 1996.
- Materials Research Society WAM, Constitutive relation of atomic-scale interface separation, Boston, December, 1996.
- Institute of Theoretical Physics, UCSB, Nanomechanics of Crystalline Defects, Santa Barbara, CA, March, 1997
- Army Research Laboratory, Aberdeen Probing Ground, Micromechanics of Penetration and Fragmentation in Ceramics and Glasses, Aberdeen, MD, April, 1997.
- A Symposium on the Dynamic Deformation and Failure Mechanics of Materials, Micromechanics of Dynamic Comminution and Fragmentation of Ceramics, Caltech, Pasadena, CA, May 1997.
- ASME SAM, NU97, Nanomechanics of decohesion, Northwestern University, Evanston, IL,

July 1997.

- Second Euroconference and International Symposium on Material Instabilities in Deformation and Fracture, Nanomechanics of dislocation-core instabilities, Thessaloniki, Greece, August 31 -September 4, 1997.
- Symposium on multiscale analysis, Fragmentation of brittle solids; scaling with cohesive zone formalism, ASME WAM, Dallas, TX, November 16-21, 1997
- Symposium on Ductile Brittle Transition, Transitions of shear resistance in a single-asperity contact, MRS, Boston, December 3, 1998.
- Applied Mechanics Symposium, Four Presentations on Fragmentation, Fatigue, Penetration and Scaling, ASME WAM, Anaheim, CA, November 16-20, 1998.
- The 1999 MRS Workshop Series, Tribology on the 300th Anniversary of Amontons' Law, San Jose, California during June 20-22, 1999.
- NSF workshop on Nano and Micro-Mechanics of Solids for Emerging Science and Technology, Palo Alto, California, October 7-8, 1999. (one talk)
- Nano and micro-mechanics of deformation and failure for ASME WAM, Nashville, TN, Nov. 14., 1999 (two presentations; one by J. A. Hurtado).
- Hurtado, J. A. and Kim, K.-S., Transition from Nano and Micro Mechanisms of Interfacial Slip in Adhesive Contact, Proceedings of SEM IX International Congress held at Orlando, Florida, June 5-8, 2000.
- Kim, K.-S., Atomic inter-planar responses and frictional behavior of a single-asperity contact, invited paper, Bulletin of the American Physical Society, Vol.45, No.1, p249, 2000.
- Kim, K.-S., From HRR to Multi-Length-Scale Micro-Plasticity, Discussions at the 60th birthday symposium for Hutchinson and Rice, June 15-16, 2000.
- Kim, K.-S., Characterization of Defects in Crystalline Solids at Nanometer Scale, Proceedings of Society for Engineering Science, Columbia, South Carolina, October 23-25, 2000.
- Kim, K.-S., Configuration Instability of a Dislocation Core and Transition from Nano-and Micro-Contact Friction, Invited Special Lecture at the Mardi Gras conference on physics of solids, Louisiana State University, Baton Rouge, February 22-24, 2001.
- Burke, B. and Kim, K.-S., Anisotropic Evolution of Nanometer-Scale Roughness at a Solid/Etchant Interface, symposium on Nano-technology at the SEM annual meeting, Portland, Oregon, June 4-6, 2001.
- Kim, K.-S., From Nano-Friction to Micro-Friction; Multi-Length Study on Dislocation Mediated Slip Processes of Single-Asperity Friction, CECAM conference on tribology held at Lyon, France, August, 2001.
- Yu, H., Kim, K.-S. and Cheng, Y. T., Strength of Surface Nano-Crystalline Layers, National Congress on Theoretical and Applied Mechanics, Blacksburg, VA, June 23 -28, 2002.
- Kim, K.-S., Scale bridging in dislocation-based multi-scale modeling, Multi-Scale Modeling Workshop, NASA, Langley, March 5-6, 2002.
- Kim K.-S., Burke, B. and Shrotriya, P. Roughness Evolution of Anisotropic Solid Surfaces Under Chemical Etching, Symposium for Freund's 60th birthday, Caltech, Pasadena, February, 2003
- Kim, K.-S. Scale-bridging nanomechanics of solids, Department of Energy Workshop, Washington, D.C., September, 2003.
- Kim, K.-S. Scale-bridging nanomechanics of solid defects, National Science Foundation Workshop, Tainan, Taiwan, November, 2003 National Nanotechnology Initiative (NNI) Grand Challenge Workshop; Jan 23; NIST, Gaithersburg, MD. Scale-bridging metrology for nanomechanics, 2004 .
- The 5th Symposium on Nano Composites and Nano Porous Materials; March 18-20; GyeongJu, Korea. Nano-engineering of solid surfaces; applications of nano-scale surface structures, 2004.
- IPRPI workshop on Inverse Problems in Solid Mechanics; March 24; RPI, Troy, NY. A class

of inverse problems in scale-bridging nanomechanics of solids: The field projection methods, 2004.

- ICHMM-04; June 21-26; Chongqing, China; Scale-bridging nanomechanics of solids: Field projection methods, Plenary talk, 2004.
- ICHMM-04; June 21-26; Chongqing, China; A Discussion on Nanmechanics (Keynote), 2004.
- ICHMM-04; June 21-26; Chongqing, China; Contact Mechanics of Nano and Micro Solid-Surface Structures(Keynote), 2004.
- NSF Workshop on Nanomechanics; July 14-17, Pacific Grove, CA, Scale Bridging Nano-Mechanics
  of Solids: Field Projection Method, 2004.
- Nano-Korea 2004; August 24; Seoul, Korea, Nanomechanics and engineering of solid surface nanostructures (Keynote Speech), 2004.
- Hyundai Heavy Industry; August 25; Ulsan, Korea Bio-Inspired Multi-Scale Engineering of Mechanical Systems, 2004.
- Brown Enterprise Forum; September 23; Providence, RI Multi-Scale Engineering of Nano and Micro Structures, 2004.
- Knauss Symposium; November 15; Pasadena, CA From Stick-slip to Amontons-Coulomb Friction: Some Experimental Observations at Micron and Nanometer Scales, 2004.
- ***Ho-Am Prize Speech***, Opportunities in nano and micro mechanics of solids, SKKU, June, 2005.
- Four Lectures on Nano and Micro Mechanics of Solids, NUS, Singapore, July, 2006.
- Two Lectures on Nano Tribology, NUS, Singapore, January, 2007.
- ***Plenary Lecture***, Beyond New Frontier: New Bridging - Scale Bridging in Nanotechnology, at the annual meeting of KOFST held during July 15-16, 2008, at Daejeon, Korea.
- Gordon Conference, 2008, Colby College, Waterville, ME, Micromechanics of Friction: Effects of Nanometer-scale Roughness and Scale Bridging, July 8, 2008.
- Two Lectures on Nanotechnology and Environmental Science, Natural Science Museum, Kong Ju, Korea, October, 2008.
- ***Keynote speech*** on Computational Material Science, Annual Meeting, Korean Institute of Metals and Materials, Song Do, Korea, November, 2008.
- ***Plenary-Keynote Lecture*** on Hybrid Multi Scale Experiments and High Performance Computing for Cross Scale Engineering of Nano and Microstructures, Singapore, November, 2009.
- Discussion leader for Recent Progress in Geomechanics by J.R. Rice, at Future Directions in Mechanics and Material Research symposium held by KAUST at Thuwal, Kingdom of Saudia Arabia in honor of Professor John W. Hutchinson.
- H. B. Chew and K.-S. Kim, "A New Mode of Graphene Fracture Operated in cutting SWCNTs" Oral Presentation, New England Workshop on the Mechanics of Materials and Structures held by Harvard University at Cambridge, MA.
- KIMM-Brown international convergence-technology collaboratory (I-CTC) opened, signing MOU. The first KIMM-Brown workshop was held at B&H 190.
- H.-M. Wu, K.-S. Kim, Y. Qi and S. Harris, "In Situ Observation of Deformation in a LG Battery during Charging and Discharging." GM Workshop, Warren, Michigan.
- Kim, K.-S. Nano-contact Strength of FCC gold in Compression and Shear, Invited Talk, ECCM2010, Paris.
- K.-S. Kim, Future Directions in Mechanics of Materials, Symposium on Mechanics in Geo Physical and Materials Sciences in Honor of Professor James R. Rice, January 22, 2011, Caltech, Pasadena, CA.
- Kim, K.-S., Conservation Integrals applied to Inverse Problems in Mechanics of Nanostructures, International Colloquium on Current Problems in Solid Mechanics in Honor of Professor H. D. Bui, July 5, 2011, Ecole des Mines Paris Tech, Paris, France.

- Invited Talk at the International Symposium on Current Problems in Solid Mechanics in Honor of Professor R. J. Clifton: Dynamic Behavior of Materials at the Nanometer Scale, Symi, Greece, June 26, 2012.
- ***Engineering Science Medal Lecture***: Nano and Micromechanics of Solids analyzed by Hybrid Methods (Conjecture Driven Experiments), Atlanta GA, October 11, 2012.
- "Role of interferometry in mechanics: From optical to atomic lattice interferometry", for M Ferst Awrad ceremony for R. J. Clifton, Georgia Tech, Atlanta, GA,10/25/2013.
- "Dislocation Emission at Grain Boundaries Studied by Nonlinear Field Projection," Symposium on New Developments in Defects Mechanics (NSF Workshop), La Jolla, CA, January 18-19, 2014.
- "Cascade instabilities of ruga formation in soft-material boundary layers," IAS 2014, Cachan, France, June 6, 2014.
- "Nonlinear inverse analyses of buckling and fracture in nano structured thin films," AmeriMech 2014, Austin, Texas, Dec. 12, 2014.
- "Mechanics of hierarchically rough surfaces: scale dependence in ruga mechanics and friction," Symposium on The Application of Mechanics to Geophysics supported by the National Science Foundation & the Green Foundation, UCSD, La Jolla, CA, 01/17-18/2015.
- "Study on deformation-crinkle properties of multilayer graphene," Prager Medal Symposium, SES, College Station, TX, 10/27/2015.
- "Molecular self-assembly with crinkle-ruga structures in multilayer graphene," Nanomedicine and Nanobiotechnology Symposium, Applied Nanotechnology and Nanoscience International Conference, Paris, France, 11/06/2015.
- "Atomic force microscope interferometry (AFMI) for studies of 2D materials," Drucker Medal Symposium, ASME, Houston, TX, 11/15/2015.
- "Challenging stability problems in advanced flexible/soft materials and structures," Rosakis Symposium, September 17, 2016.
- "Renormalization scaling of friction and fracture with hierarchical multiscale mechanisms," The 53rd Society of Engineering Science Meeting 2016, October, 2016.
- "The Advancement of Ruga Mechanics and Its Applications in Molecular Engineering," The ASME-IMECE Annual Winter Meeting 2016, November, 2016.
- ***Plenary Lecture***, "Micromechanics of Adhesion at Broad Scales: From Molecular to Continuum Adhesion," Adhesion Society, February 28, 2017.
- ***Invited Lecture,*** "Electro-Mechanical Instability of Layered Nanostructures," Workshop on Mechanics in Scientific Discovery, Florence, Italy, June 9, 2017.
- ***Keynote Lecture***, "Recent Progress in Nanomechanics of graphene and its Applications," ICF 14, Rhodes, Greece, June 22, 2017.
- ***Invited Lecture***, "Recent Progress in Nanomechanics of graphene and its Applications," Clifton Symposium, Northwestern University, Evanston, IL, August 4, 2017.
- ***Invited Talk***, "A new subcritical nanostructure of graphene: crinkle-ruga structure and its novel properties," MRS Spring Meeting, Phoenix, Arizona, April 4, 2018.
- ***Keynote Lecture***, "Graphene Nanotechnology for Molecular Informatics: The Graphene Moleculography," NANO 2018, Hong Kong, June 26, 2018.
- ***ESMC Invited Talk***, "Subcritical graphene ruga structure: crinkle the molecular zipper," ESMC 2018, Bologna, Italy, July 3, 2018.
- ***Invited Lecture***, "Hidden, forbidden and inherited spectrum of roughness caused by multilayer deformation instabilities near a free surface," CECAM Workshop, Lausanne, Switzerland, July 25, 2018.
- ***SES Invited Talk***, ***"***Analytical solution of crease-ruga instability in a soft material," Prager Medal Symposium in Honor of Professor Lallit Anand, SES Conference, Madrid, Spain, October 10, 2018
- ***Invited Lecture***, "Two Useful Subcritical Ruga Structures in Soft or 2D Materials: Crease &

Crinkle," W.G. Knauss Symposium, Caltech, Pasadena, CA, December 21, 2018.

- ***William M. Murray Lecture***, "Pushing the Boundaries of Experimental Mechanics at a Small World (Moire Interferometry & Moire Spectroscopy)," Society for Experimental Mechanics 2019 Annual Conference, June 14, 2019.
- ***Keynote Lecture***, "Study of Dynamic Nano-Phase Toughening in a Copolymer, the Polyurea," 56th Annual Meeting of the Society of Engineering Science, October 13, 2019.
- ***Keynote Lecture***, "Singularity-Growth-Instability and Symmetry-Breaking Characteristics of Crease," 56th Annual Meeting of the Society of Engineering Science, October 14, 2019.
- ***Invited Lecture***, "Ruga Mechanics of Graphene Crinkles for Molecule/Nanoparticle Self-Assembly," Prager Medal Symposium, Society of Engineering Science, October 15, 2019.
- ***Plenary Lecture***, "Digital Image Correlation at a Small World of Nano Science and Technology," iDICs 2019 Annual Conference, October 16, 2019.
- ***Invited Lecture***, "Pressure- and rate-dependent plastic flow of nano-phase segregated polyurea copolymer (IMECE Paper # -13559)," Drucker Medal Symposium, ASME 2019 IMECE, November 12, 2019.
- ***Keynote Lecture***, "Lattice moire characteristics and electromechanical properties of multilayer graphene," Symposium MS02: MRS 2019, December 3, 2019.
- ***Invited Lecture***, "Deformation and failure mechanisms of multiphase random nanostructures: Mechanics of self-organization and fragmentation applied to failure waves," J. R. Rice Symposium, Harvard University, Cambridge, MA, virtual. June 8, 2021.

4. g. Invited Seminar Lectures:

- University of Dayton, 1982
- On thin films and moire microscopy: SUNY, Stony Brook and Binghamton; May 1991. IBM,
- Yorktown Heights and Endicott, NY.; June, 1991
- Fiber pull-out experiment: Exxon Research Center, Annandale, NJ; May 1991.
- Micromechanics of Solids: KAIST, Seoul, Korea, July, 1991.
- Micromechanics for Electronic Packaging: SAMSUNG, Kiheung, KOREA, July, 1991.
- Oakridge National Lab, Feb., 1992.
- University of Minnesota, Minneapolis, May, 1992.
- University of Texas, Austin, 1984
- State University of New York, Stony Brook, 1985
- Brown University, 1986
- University of Pennsylvania, 1986, 1988
- Harvard University, 1987
- MIT, 1987
- University of California, Santa Barbara, 1988
- University of California, Berkeley, 1988
- California Institute of Technology, 1989
- Army Materials Research Laboratory, Watertown, MA, 1989
- University of Rhode Island, 1990
- University of Massachusetts, Amherst, 1990
- Virginia Institute of Technology, 1990
- University of Wisconsin, Madison, May, 1992.
- Cornell University, Ithaca, NY, October, 1992.
- University of Texas, Austin, November, 1992.
- Harvard University, Cambridge, MA, December, 1992.
- Northwestern University, Evanston, IL, May, 1993.
- Case Western University, Cleveland, OH, October, 1994.

- Pusan National University, Pusan, Korea, June, 1995.
- Korea Advanced Institute of Science and Technology, Taejon, Korea, June, 1995.
- Korea Advanced Institute of Science and Technology, Seoul, Korea, June, 1995.
- Leichester University, Leichester, United Kingdom, March, 1996.
- University of Michigan, Ann Arbor, Michigan, March, 1996.
- Cambridge University, Cambridge, United Kingdom, April, 1996.
- Yale University, New Haven, Connecticut, September, 1996.
- University of Illinois, Urbana-Champaign, Illinois, October, 1996.
- University of California, Santa Barbara, June, 1997
- Korea Advanced Institute of Science and Technology, Taejon, Korea, August, 1997.
- Georgia Institute of Technology, Atlanta, GA, March, 1998.
- MIT, Cambridge, MA, April, 1998.
- Midwest Mechanics Seminar Speaker of year 2000; Tour A: Notre Dame, IIT, UIUC and Purdue University during November 2-5, 1999.
- Midwest Mechanics Seminar Speaker of year 2000; Tour B: Michigan, MSU, NWU, Wisconsin, and Minnesota during April 3-7, 2000.
- Ford Motors, Micro-mechanics of deformation and failure of cast aluminum alloys A356 and EPA319," February 23, 2000.
- Caltech, Length-scale effects in friction and etching problems of solid surfaces," February 29, 2000.
- Stanford University, Length-scale effects in friction and etching problems of solid surfaces," March 2, 2000.
- Boston University, October 20, 2000.
- Northeastern University, From Nano-Friction to Micro-Friction: Multi-Length-Scale Study," February, 2001.
- NSF Workshop at Northwestern University, Experimental Mechanics for Nano-technology," March, 2001.
- Princeton University, PMI Lecture Series, Contact, Adhesion and Friction at Small-Length Scale, December, 2001.
- Korea Institute of Science and Technology Evaluation and Planning (nano-fabrication and nanotechnology), January, 2002.
- Korea Institute of Science and Technology, January, 2002.
- Seoul National University, January, 2002.
- NASA (scale bridging in dislocation-based multi-scale modeling), March, 2002.
- Pohang Institute of Science and Technology, March, 2002.
- Korea Institute of Metals and Machinery (mechanics of nano-fabrication, March, 2002.
- Hyundai Motors (control of thermal stresses), March, 2002.
- Max Planck Institute, Stuttgart, Germany (nano-tribology), April 29, 2002.
- Danish Technical University (nano-mechanics of adhesion and crack-tip plasticity), April 30, 2002.
- Harvard University, Dynamic fragmentation of solids," May 13, 2002.
- Sungkyunkwan [Sam-Sung] University (education and research in nano-mechanics of solids), May, 2002.
- Korea Advanced Institute of Science and Technology, May 2002.
- Yale University*, October 2002.
- University of Michigan*, November 2002.
- University of Connecticut*, November 2002.
  *(scale-dependent deformation and field projection in nano-and micro-mechanics of solids)
- Johns Hopkins University (Scale-dependent deformation and field projection in nano-and micro-mechanics of solids), February, 2003.
- Korea Institute of Science and Technology, (Nanomechanics for nano-fabrication), June, 2003.

- Samsung (Micro-and Nano-mechanics of electronic devices), July, 2003.
- City College of New York (Scale-bridging nanomechanics of solid defects), September, 2003.
- Southwest Mechanics Seminar Series; UT Arlington (2/9), Austin (2/10), A&M (2/11), Tulane (2/13) Scale-bridging nanomechanics of solids: Field projection methods, 2004.
- Mechanics of interfaces between soft materials, SKKU, January, 2005.
- Samsung Advanced Institute of Technology, June, 2005.
- Inaugural seminar for the Nano Science and Technology at the University of Texas, Austin, October, 2005.
- Four Lectures on Nano and Micro Mechanics of Solids, NUS, Singapore, 2006.
- Two Lectures on Nano Tribology, NUS, Singapore, January, 2007
- KAIST and KIST, Seoul & Daejeon, Korea, March, 2007
- Harvard University, April, 2007
- Washington University, June, 2007
- SungKyunKwan University, December, 2007
- Seoul National University, 2007
- University of Michigan, Aeronautics Department, February, 2008
- University of Minnesota, Department of Aeronautics and Mechanics, February, 2008
- KIST, Scientific Computing Center, August, 2008.
- Seoul National University, Center for Theoretical Physics, October, 2008.
- KAIST, Department of Mechanical Engineering, December, 2008
- KIMM, Institute Seminar, December, 2008.
- UIUC, ME-Aero Seminar, September, 2009.
- Brown University, IMNI seminar, November, 2009.
- Rice University, ME-MS seminar, January, 2010.
- Harvard University, Materials Science Seminar, March, 2010.
- U. Penn Engineering Seminar Series, MEAM, March, 2011.
- Seoul National University, Physics Seminar, June, 2011.
- National University of Singapore, ME Seminar, June, 2011.
- IHPC, Singapore, Computational Mechanics Seminar, June, 2011.
- University of Rhode Island, Seminar Series - Mechanical, Industrial and Systems Engineering, October, 2011.
- Invited talk for Mechanics Seminar Series at the University of Washington: Nano- structural Evolution Near FCC Solid Surfaces and Interfaces, Seattle, WA, March 27, 2012.
- Invited talk for Theoretical and Applied Mechanics Seminar Series at Northwestern University: Hybrid Analysis of Nanostructural Evolution Near FCC Metal Surfaces and Interfaces, Evanston, IL, April, 5, 2012.
- IMNI seminar: Mechanics of Self-Organizing Structures on Solid Surfaces and Interfaces: Ruga Mechanics, Brown University, May 1, 2012.
- Kwan-Ak Distinguished Alumni Award Lecture: Recent Progress in Nano- & Micro-mechanics for Emerging Technology, Seoul National University, July 9, 2012.
- Drapers Lab Lunch Invited Seminar: Scalable fabrication of high quality graphene and CNT structures, Cambridge, MA, December 6, 2012.
- SNU, Korea, Computational Mechanics for graphene folding, January 2013.
- KIMM, Korea, Ruga mechanics of meta materials, January 2013.
- KIST, Korea, Ruga Mechanics of functional materials, January, 2013.
- Iowa State University, Search for New Multi-functional Materials with Ruga Mechanics, Ames, IA, 9/19/2013.
- ***Simpson Memorial Faculty Fellow Lecture***: "Search for New Multifunctional Materials with Ruga Mechanics and AFM Interferometry", Northwestern University, Evanston, IL. 10/7/2013.
- IHPC, Singapore, Ruga Mechanics, November, 2013.
- SNU, Korea, Ruga Mechanics, December 2013.

- KAIST, Korea, Ruga Mechanics, December, 2013.
- ***J. L. Nowinski Distinguished Lecture***: "Ruga Mechanics of Nanostructures for Multifunctional Flexible Composites," University of Delaware, Newark, DE, March 21, 2014.
- IMNI Tutorial, "Folding controlled Materials," Brown University, Providence, November 14, 2014
- Materials and Nanotechnology Invited Seminar, "Ruga Mechanics of Folding Atomic-Layer Nanostructures," North Dakota State University, Fargo, ND, October 20, 2014.
- "Study of molecular and nanoscale self-organization by crinkle-ruga structures of 2D materials," MechSE UIUC Seminar, UIUC, Urbana, IL, 10/13/2015.
- "Study of molecular adsorption along crinkle-rugae of graphene by atomic lattice Interferometry (ALI)," LSM Seminar, Rutgers, January 21, 2016.
- "Molecular engineering with graphene-ruga structures at the bottom: atomic lattice Interferometry (ALI)," MMEC Seminar, MIT, April 5, 2016.
- "Wonders of graphene crinkle as novel bio-molecular zipper for 'from genomics to phenomics'," Mechanics of Materials Seminar Series, UCSD, 10/23/2017.
- "Renormalization from molecular friction to geological fault friction," Geophysics Seminar, Scripps Institution, UCSD, 10/24/2017.
- "Graphene atomic-lattice interferometry for molecular bio-informatics: The graphene moleculography," University of Houston, 3/8/2018.
- "Critical curvature localization in graphene used for molecular informatics: The graphene moleculography," Ecole Polytechnique, Paris, 3/22/2018.
- "Mechanics of graphene crinkle ruga for molecular informatics," Tsinghua University, Beijing, China, 6/20/2018,
- "Recent Progress in Ruga Mechanics and Its Applications," Institute of Mechanics, Chinese Academy of Science, Beijing, China, 6/21/2018.
- "Criticality of ruga structures and their novel applications," (Wang Ren Lecture), Peking University, Beijing, China, 6/22/2018.
- "Study of molecular self-assembly with graphene ruga structures and AFM interferometry," Center for Materials Processing and Tribology, Purdue University, 10/4/2018.
- "Critical RugaStructures for Molecular Self-Assembly and Adhesion/Friction Control in Soft Materials," Johns Hopkins University, Baltimore MD, February 7, 2019.
- "Understanding dynamic fracture of polyurea and its dynamic interfacial decohesion behavior," ONR, Arlington VA, February 15.
- "Deformation and Failure under Extreme Shock-Wave Propagation (Revisit on Phase-Transformation-Induced Failure)," Caltech, Pasadena CA, June 7, 2019.
- "Scale Effects in Friction at Broad Scales: Roughness Scaling Experiment," UCSD, La Jolla CA, June 25, 2019.
- "Architecture of Multifunctional Nanostructures," Tufts ME Colloquium**,** Tufts University, Medford, Massachusetts, February 13, 2020.

4. h. Invention and Patent:

- Transverse Displacement Interferometer, 1976, with R. J. Clifton
- Stress Intensity Factor Tracer, 1984
- Large-Deformation Laser Moire Microscope, 1989, with T. W. Shield
- Ceramic-Metal Composite Article and Joining Method, U.S.Pat-5,108,025; 4/28/92.
- Computational Fourier Transform Moire (CFTM) Analyzer, 1993
- Field Projection Method, 1996
- Surface Roughness Evolution Spectroscopy, 1999
- Multiple Asperity Indentation Specroscopy, 2002
- Absolute and real-time curvature sensor insensitive to tilt and vibration Patent Disclosure,

Brown University, 4/21/2003. with Wang, J. and Shrotriya, P.

- ❖ Diamagnetic Lateral Force Calibrator for AFM, 2005, with Q. Li and A. Rydberg
- ❖ Tunable inverse pendulum vibration isolation system, with Allan Rydberg, United States Patent, Patent Number 7,543,791: issued on June 9, 2009.
- ❖ Atomic lattice interferometer, Patent Disclosure, Brown University, September, 2011.
- ❖ Self-compensating liquid-medium Linnik interferometer, Patent Disclosure filed, 2014.
- ❖ Device and method for measuring distribution of atomic resolution deformation, with BK Jang, J Kim, HJ Lee, C Wang, United States Patent, Patent Number 9,003,561: issued on April 7, 2015.
- ❖ System and method for measuring distribution of deformation using atomic force, with BK Jang, J Kim, HJ Lee, C Wang, Republic of Korea Patent: revision filed on December 1, 2015.

5. Research in Progress:

(i) Graphene crinkle ruga mechanics for biomolecular studies for molecular sequencing for public health studies, (ii) Mechano-chemistry of artificial atom packing for future manufacturing of quantum devices and energy materials, (iii) Mechanics of soft robotics with ruga mechanics for biomedical applications for public health studies, (iv) Phase transitions in superstructures of binary nano-phases for designing high strength soft materials for DoD applications, (v) In-situ testing of nanostructures with AFM and ICM.

[1] Graphene crinkle ruga mechanics for biomolecular studies for molecular sequencing for public health studies

[2] Mechano-chemistry of artificial atom packing for future manufacturing of quantum devices and energy materials

[3] Mechanics of soft robotics with ruga mechanics for biomedical applications for public health studies

[4] Phase transitions in superstructures of binary nano-phases for designing high strength soft materials for DoD applications

[5] In-situ testing of nanostructures with AFM and ICM

Nano and micromechics research on

[6] The Search for Noble Multifunctional-Nanocrystal Architectures (NSF)

[7] Enabling Advanced Electrode Architecture Through Printing Technique (DOE)

[8] Fundamental Study of Material Strength under High Rates of Strain (ONR)

2022 Plan:

Nano and Micromechanics for Epigenetic Engineering with Graphene Crinkles (NSF/MOM new proposal)

Scale-Bridging Mechanics of Flexible Neuromorphic Super-Structures (NSF/BRITE new proposal)

Additive Self-assembly Manufacturing of Novel Nanostructued Materials (NSF/MRSEC new proposal)

Ruga mechanics: Finish historical solution of subcritical crease criterion for soft material's folding instability.

6. Service:

6. A. University:

- Exhibition and Tour Committee, TAM, Univ. Ill. UC, 1981-84
- Head Search Committee for the Department of Theoretical and Applied Mechanics,

Engineering

- Joint Machine Shop Committee of Engineering and Physics, Brown University, 1990-93.
- Freshmen advisor, 2003
- Curriculum Committee, TAM, Univ. Ill. UC, 1984
- Dean's ac hoc Committee on Materials Science and Engineering, Engineering college, UIUC, 1986
- Engineering College, UIUC, 1988-89
- Solid Mechanics Seminar Chairman, Brown University, 1990-91
- Engineering Mechanics Concentration Advisor. 1991-93
- Promotion Committee For Professor J. Blume, 1991-92
- Fluid Mechanics Faculty Search Committee, 1992-93
- Mechanical Engineering Concentration Advisor, 1993-5
- Engineering Executive Committee (Solid Mechanics Representative), 1993-5
- Materials Science Committee, 1995-96
- MRSEC Steering Committee, 1996-98
- MRSEC IRG Coordinator, 1996-98
- Freshmen advisor, 1998-99
- Co-chairman of solid-mechanics faculty search committee, 1998
- Advisory Committee on University Planning, 1999-00
- Library Committee, Division of Engineering, 1999-00
- Faculty Dean Search Committee, 2000
- Promotion Committee of Prof. David Paine, 2000-01
- Graduate representative of the mechanics of solids and structures, 2002-03
- Engineering Executive Committee (Solid Mechanics Representative), 2003-06
- Grievance Committee (alternate) of the University, 2003-05
- Faculty Search Committee, Solid Mechanics Program, 2006-2008
- Committee for Assistant Professor Pradeep Guduru's promotion, 2007-2008
- Freshmen advisor, 2003-now (sabbatical 2008 fall semester)
- Mechanical Engineering Concentration Advisor, 2006-2008, 2009-
- Interviewer for undergraduate applicants from the East Bay, 2007-
- Brown Engineering Alumni Medal Committee, 2007-2010
- Applied Science Building Committee, 2010-2011
- Graduate representative of Solid Mechanics, 2010-12
- Faculty search committee, Solid Mechanics, 2010-12
- Hibbitt Fellow Search Committee, Solid Mechanics Chair, 2015
- SOE- LSDC Committee, 2015
- Director, Center for Advanced Materials Research, IMNI, 2014 –
- EEC representative for Solid Mechanics, 2012 –2016
- Solid Mechanics Seminar Series Organizer, 2016
- Help hosting Ban Ki-moon for Stephen A. Ogden Jr. '60 Memorial Lecture on International Affairs, 2018
- IMNI Steering Committee, 2017, 18, 19, 20
- Faculty Search Committee, 2017, 19, 20, 21
- Honors Program Committee, 2017, 18, 19, 20,21
- EEC representative for Solid Mechanics, 2022 –now

6. B. Professional Activities:

- Member, American Society of Mechanical Engineers, 1980
- Session Chairman for Applied Mechanics Conference of ASME and ASCE, Cincinnati, June 1987
- Session Chairman for Experimental Mechanics Conference of SEM, Boston, May 1989
- Session Chairman for Applied Mechanics Conference of ASME and ASCE, La Jolla, CA, June 1989
- Session Chairman for ASME WAM, San Francisco, CA, December 1989
- Organizer of a Session in the National Congress on Theoretical and Applied Mechanics, with J. W. Hutchinson, May 1990
- Member, American Physical Society, 1986
- Member, Materials Research Society, 1986-1992
- Secretary of Central Midwest Chapter of KSEA, 1984
- Experimental Mechanics Committee, ASME, 1988
- Chairman, Experimental Mechanics Committee, Applied Mechanics Division, ASME, 1991-93
- Organized three sessions of the conference on Micromechanics of Failure Resistant Materials," Winter Annual Meeting, ASME, Atlanta, GA, December, 1991
- Session Chairman, International Congress on Fracture, Singapore, August, 1991
- Session Chairman, Winter Annual Meeting, ASME, Atlanta, GA, December 1991.
- Organizing Committee of the National Congress on Theoretical and Applied Mechanics, XII, May 1992-94
- Session Chairman, Winter Annual Meeting, ASME, New Orleans, LA, November 1993.
- Session Chairman, Second Asia-Pacific Symposium on Advances in Engineering Plasticity and its Applications, Beijing, China, June, 1994
- Session Chairman, International Symposium on Fracture and Strength of Solids, Xian, China, July, 1994
- Session Chairman, International Conference on Composite Engineering -1 Kink Band Propagation under Compressive Loading in Thick Composites," New Orleans, Louisiana, August, 1994
- Discussion Leader, International Conference on the Mechanics and Physics of Functionally Graded Materials, Davos, Switzerland, August, 1995
- Session Chairman, Winter Annual Meeting, ASME, San Francisco, CA, November, 1995
- Session Chairman, Winter Annual Meeting, MRS, Boston, MA, December, 1996
- Organizing a session in MRS WAM, Boston, MA, December, 1998
- Organizing an NSF Workshop on Nanomechanincs, Palo Alto, CA, 1999
- Co-organizing a session in SES Meeting, Austin, TX, October, 1999
- Organizing two sessions in ASME WAM, Nashville, TN, November, 1999
- NSF Panel Review, January 2000
- Scientific Committee, IUTAM, Abisco -Kiruna, Sweden, July 31 -August 4, 2000
- International Advisory Board of the 4th International Conference on Fracture and Strength of Solids, Pohang, Korea, August 16-18, 2000.
- International Advisory Committee of the 2nd International Conference on Experimental Mechanics, Singapore, Nov. 29 to Dec. 1, 2000.
- NSF workshop on nano-technology, Northwestern University, March, 2001
- Organized a symposium on nanotechnology with K. P. Chong for SEM, Portland, Oregon, June, 2001
- Technical Advisory Board, Society for Experimental Mechanics, August 2001
- Associate Editor of Experimental Mechanics, 2001
- Nanotechnology Forum, KISTEP, January, 2002
- IUTAM mini symposium chairman, 2003-2004.
- Distinguished Visiting Professor of Sung Kyun Kwan University

- Advisory Board of SAINT, 2005 - 2008
- Advisory Board of College of Engineering, Seoul National University, 2006 – 2008
- Distinguished Visiting Scientist, Korea Institute of Science and Technology, 2008
- Advisory Board of Korea Institute of Metals and Machinery, 2008 – 2012
- Board member of the Korea-US Science Cooperation, 2012 – 2014
- Board member of the Society of Engineering Science, 2012 – 2015
- Advisory Board of Dae-Gu Institute of Science and Technology, 2012 – 2017
- Editorial Board, Journal of Applied Mechanics, 2015 –2018
- Board member of USNCTAM, 2015 – 2019
- Representative of SES to USNCTAM, National Academies, 2015-2019
- Editorial Board, Acta Mechanica Sinica, 2013 –
- Drucker Medal Committee, ASME, 2017 –
- Technical Committee of Fracture and Fatigue, ASME, 2017 –
- Editorial Board, Nano Materials Science, January 1, 2019 –

6. C. Other Services:

Review papers, books and proposals

Acta Metallurgica, International Journal of Engineering Science International Journal of Fracture Journal of Engineering Materials and Technology, ASME Journal of Applied Mechanics, ASME Journal of Aircraft Engineering, AIAA, Journal of Elasticity Journal of Piping and High Pressure Vessels, Experimental Mechanics, ZAMP, Research Board, University of Illinois National Science Foundation John Wiley and Sons, Inc., Publisher Harper and Row, Publishers, Inc. ASME Proceedings, Experiments in Micromechanics of Failure Resistant Materials Journal of Adhesion Journal of Adhesion Science and Technology Research Progress, Review of Scientific Instruments, The Journal of Mechanics and Physics of Solids, International Journal of Solids and Structures, Carbon, Proceedings of Royal Society, Acta Materialia, Transactions of Tribology, PNAS, Nature, Nature Materials, Nano Letters, Philosophical Magazine, Journal of Euro Mechanics, Nature Physics, Nature Communications, Applied Physics Letters, Extreme Mechanics Letters

Review panel, NRC, AFOSR, two times in 1998

Review panel, DoE, 2004, 2005.

Review Panel, NINN, 2008

Review panel, Okinawa Institute of Science and Technology, Japan, 2018.

Review panel, NSF, 1998 - 2021.

7. Awards and Fellowships:

7. A. Recognition:

- I.S. Steel Fellowship, Seoul National University, 1972 and 1973.
- Magna Cum Laude, Seoul National University, 1974.
- Melville Medal, with R.J. Clifton, American Society of Mechanical Engineers, 1981.
- Instructors Ranked as Excellent by Students, University of Illinois at Urbana-Champaign, 1982, 1983 and 1984.
- Distinguished Invited Speaker, Adhesion Society, 1994
- John Simon Guggenheim Fellowship Award, 1996.

- The 1999 Best JEP Paper Award, with A.-F. Bastawros, ASME, 1999
- Midwest Mechanics Seminar Speaker, 2000
- Elected as Technical Advisory Board, SEM, 2001
- Southwest Mechanics Seminar Speaker, 2003 -04
- Distinguished Visiting Professor, SKKU, Korea, 2004
- Ho-Am Prize in Engineering, 2005.
- Distinguished Visiting Scientist, KIST, Korea, 2008
- Kwan-Ak Distinguished Alumni Award, Seoul National University, 2012
- Engineering Science Medal, SES, 2012
- Simpson Faculty Fellow, Northwestern university, 2013
- Jerzy L. Nowinski Distinguished Lectureship, University of Delaware, 2014
- Top 100 Science Stories in 2014, Discover Magazine, Jan & Feb, 2015
- Teaching with Technology Award, with AF Bower and J Franck, 2015
- Daniel C. Drucker Medal, American Society of Mechanical Engineers, 2016
- Plenary Lecture, Adhesion Society, 2017
- Wang Ren Lecture, Peking University, 2018
- William Murray Lecture, Society of Experimental Mechanics, 2019
- Elected member of Sigma Xi, 2020
- SES Special Symposium, Society of Engineering Science, 2022

7. B. Research Grants and Contracts:

- Caterpillar Excellence Fund (1981), Dynamic Fracture
- Research Board, Univ. Ill. (1981 -85), Dynamic Fracture

- IBM I, II, III and IV (1984-89), Electronic Packaging
- ONR (1987-89), Thin Film Mechanics
- DOE -GTE (1987-89), Mechanics of Brazing

Research Contracts and Grants at Brown University since 1989

- Start Up Fund, Brown University: July 1, 1989 -June 30, 1990.
- Materials Research Group, Brown: July 1, 1989 -June 30, 1990.
- ONR: Experimental Mechanics of Thin Films and Interfaces, Nov. 15, 1989-Sep. 30, 1992. (extended to 12/31/92).
- DoE-GTE: Analytical and Experimental Evaluation of Joining Silicon Nitride to Metal for Heat Engine Applications, May 1, 1990-April 30, 1992.
- NSF: MSS-9017933, Fundamentals of Embedded Optical Fibers in Structural Concrete, 11/15/90-2/28/93.
- NSF-MRG: Micro-Mechanics of Failure-Resistant Materials, Jan. 1, 1989-Dec. 30, 1992.
- ONR: Experimental Mechanics of Thin Films and Interfaces, 1/1/93-12/31/95.
- NSF: MRG/DMR-93, Micro-and Nano-Mechanics of Failure Resistant Materials, 9/1/93-8/31/96.
- NSF: ESC-9202961, Optical Fiber Sensors for In-Situ Temperature and Strain Measurements in Composite Materials, with T. F. Morse and B. Sheldon, 9/15/92-9/14/94.
- NSF: Electon Beam Lithography of Fine Surface Structures with SEM, with A. Nurmikko and J. R. Beresford, 1992-94.
- ARO: High-Speed Real-Time Measurement Instrumentation for High Strain Rate Behavior of Brittle Ceramics subjected to High-Velocity Impact, 1995-1996.
- Hyundai: SAE Formula Car, 1995-1996.
- ARO: DAAL03-92-G-0107, Dynamic Behavior of Brittle Materials, 8/1/92-7/31/98.
- NSF: Materials Research Science and Engineering Center for Micro-and Nano-Mechanics of

Materials, 9/1/96-8/31/2001.

- Ford: Micromechanics of fatigue in Aluminum, 12/1/97-11/31/00.
- IMRE: Micromechanics of thin films, with A. Bower and L.B. Freund, 7/1/97-6/31/98.
- NSF: 9909165, Workshop on Nano and Micromechanics of Solids for Emerging Science and Technology, 10/1/1999-3/31/2001.
- NSF: 0070057, Measurement of microscopic residual stress based on the evolution of surface roughness during shallow chemical etching, 4/1/00-5/31/04.
- NSF: MRSEC, Micro- and Nano-Mechanics of Electronic and Structural Materials, 9/1/00-8/31/05.
- GM: Thrust Leader, Nanocrystalline Material Tribology, GM/Brown CSL, 2001-06.
- NIH: PFM equipment, with Dr. G. Jay, 2001-04.
- NSF: Measurement of microscopic residual stress based on the evolution of surface roughness during shallow chemical etching, 2000-04.
- Hyundai Motors: Research in general area of thermal stresses and strength of solids, 2002-06.
- MRSEC/NSF: Nano and micro mechanics of solid interfaces, 2001-05.
- GM/Brown CRL: nano-crystalline material tribology thrust leader; nano and micro tribology, 2001-06.
- NSF-MRI: A Nanoindenter System to Strengthen Brown's Experimental Capabilities in Mechanics and Physics of Materials from Nano to Geological Scales with P.R. Guduru (Solid Mechanics), B.W. Sheldon (Materials Science), R.F. Cooper (Geological Sciences), G. D. Jay (Biology and Medicine), 2004.
- NSF: 0511961, Nano-mechanics of solid surface suspension and imprinting, 9/1/05-8/31/08.
- MRSEC/NSF: 0520651, Nano and micro mechanics of solid interfaces, 10/1/05-7/31/14.
- GM/Brown CRL: Nano-crystalline material tribology thrust leader; nano and micro tribology, 2005-10.
- NUS: Nano and micromechanics of CNT, 2007-08
- KIST: Scientific Computing and Modeling, 2007-13.
- KIMM: AFM Interferometry & Nano and micromechanics for disaster mitigation, 2009-12.
- NSF: 1000822, GOALI: Stress Evolution and Related Phenomena in Composite Electrodes for Li Ion Batteries, with B.W. Sheldon, et al. 6/1/2010-5/31/2014.
- ONR: Anti-biofouling, 2010-11.
- NSF: 1102432, Workshop: New Frontiers of Solid Mechanics-from Earthquakes to Single Molecules, with H. Gao, 10/1/11-5/31/12/
- GM/Brown CRL: Battery Mechanics, 2010-15.
- IMNI: Ruga mechanics of 2D materials, 2014-15.
- Macrogen: Graphene crinkles for DNA sequencing, 2014-16.
- NSF: 1462785, Discovery of Nanoscale Folding Properties of Atomically Layered Materials, 7/1/15-6/31/18.
- NSF: 1563591, Fundamental Study of Friction with Hierarchically Ruga-controlled Surfaces, 3/1/16 – 2/28/19.
- ONR: N00014-18-1-2513, Toward Understanding the Dynamic Response of Materials under Extreme Loading Conditions, co-PI, 7/1/18-6/30/21.
- NSF: 1934314, The Search for Noble Multifunctional-Nanocrystal Architectures, PI, 9/1/19-8/31/22.
- NSF/XSEDE, Mesoscale-simulation-assisted discovery of dynamic toughening mechanisms of a hierarchically nanostructured copolymer: MSS200013, 10/15/2020-22.
- DOE, Enabling Advanced Electrode Architecture through Printing Technique, (PI: Brian Sheldon) 1980-1787, Award Number: DE-EE0009111.
- ONR, Measurement of Shearing Resistance and Temperature Increase in Solids Subjected To High Rates of Deformation: N00014-22-1-2786: GR5250099 (10/1/22-9/30/25): $400,000.- (Co-PI with R.J. Clifton)

8. Teaching:

8. A. Lectures and Laboratories

1. Undergraduate courses taught at UIUC, 1980-1989:

Statics and Dynamics, Elementary Mechanics of Solids, Mechanical Behavior of Solids (Lecture and Laboratory), Fluid Mechanics, Advanced Mechanics of Deformable Bodies, Experimental Mechanics, Senior Projects.

2. Graduate courses taught at UIUC, 1980-1989:

Experimental Mechanics, Continuum Mechanics, Elasticity I, Elasticity II, Properties of Engineering Materials, Advanced Fracture Mechanics, Linear Elasticity.

3. Courses taught at Brown University since 1989:

Fall, 1989; EN221 Continuum Mechanics
Spring, 1990; EN100 Design and Project

Fall, 1990; EN232 Experimental Mechanics
Spring, 1991; EN 130, Structural Analysis

Fall, 1991; EN 291-A, Research Seminar in Mechanics of Materials
Spring, 1992; EN 130 Structural Analysis

Fall, 1992; EN 232 Experimental Mechanics
Spring, 1993; EN 137 Advanced Mechanics

Fall, 1993; EN 221 Continuum Mechanics
Spring, 1994; EN 137 Advanced Mechanics

Fall, 1994; EN 232 Experimental Mechanics
Fall, 1994; EN 131 Planning and Design of Systems: (project)
Spring, 1995; EN 4 Dynamics and Vibrations : Constructed a New Lab.

Fall, 1995; EN 237 Special Topics in Solids and Structures: Nano and micromechanics of solids
Spring, 1996; Sabbatical Leave

Fall, 1996; EN 81 Fluid Mechanics
Spring, 1997; EN 228 Non-equilibrium Thermomechanics of Defects in Solids

Fall, 1997; EN31 Mechanics of Solids and Structures
Spring, 1998; EN 226 Stress Waves

Fall, 1998; EN31 Mechancis of Solids and Structures

Spring, 1999; EN 238 Advanced Fracture Mechanics

Fall, 1999; EN224 Linear Elasticity
Spring, 2000; EN222 Solid Mechanics

Fall, 2000; EN3 Introduction to Engineering and Statics
EN297 Reading Course: Problems in Anisotropic Elasticity
Spring, 2001, EN232 Experimental Mechanics

Fall, 2001; EN3 Introduction to Engineering and Statics
Spring 2002; Sabbatical

Fall, 2002; EN237 Special Topics in Solid Mechanics; Nano and Micromechanics of Solids
Spring 2003; EN 137 Advanced Mechanics

Fall, 2003; EN31 Mechanics of Solids and Structures
Spring, 2004; EN232 Experimental Mechanics

Fall, 2004; EN31 Mechanics of Solids and Structures
Spring, 2005; EN292 Nanomechanics of solid surfaces

Fall, 2005; EN221 Continuum Mechanics
Spring, 2006; EN4 Dynamics and Vibrations

Fall, 2006; EN224 Linear Elasticity
Spring, 2006; EN4 Dynamics and Vibrations

Fall, 2007; EN291F Nano and Micro Mechanics of Solid Interfaces
Spring, 2008; EN186 Advanced Fluid Dyanamics

Fall, 2008; Sabbatical
Spring, 2009; EN222 Solid Mechanics

Fall, 2009; EN229 Plasticity
Spring, 2010; EN232 Experimental Mechanics

Fall, 2010; EN175 Advanced Solid Mechanics
Spring, 2011; EN222 Solid Mechanics

Fall, 2011; EN175 Advanced Solid Mechanics
Spring, 2012; ENGN1370 Advanced Dynamics

Fall, 2012; ENGN2240 Linear Elasticity
Spring, 2013; ENGN0040 Dynamics and Vibrations

Fall, 2013;	Sabbatical (Simpson Visiting Faculty Fellow of Northwestern University)
Spring, 2014;	ENGN1300 Structural Analysis
Fall, 2014;	ENGN2240 Linear Elasticity
Spring, 2015;	ENGN0040 Dynamics and Vibrations
Fall, 2015;	ENGN2240 Linear Elasticity
Spring, 2016;	ENGN1300 Structural Analysis
Fall, 2016;	ENGN0237B Stability of Structures and Solids;
Spring, 2017	ENG1300 Structural Analysis, & ENGN2980 Research Topics
Fall, 2017;	ENGN0031 Introduction to Engineering (Honors), & ENGN2980 Research Topics
Spring, 2018;	ENGN2920C: Theory of Heterogeneous Materials (Supervision) & ENGN2980 S23, Research Topics
Fall, 2018;	ENGN0031 Introduction to Engineering (Honors), & ENGN2980 S23, Research Topics
Spring, 2019;	ENGN2320: Experimental Mechanics & ENGN2980 S23, Research Topics
Fall, 2019;	ENGN0031 Introduction to Engineering (Honors), & ENGN2980 S23, Research Topics
Spring 2020;	Sabbatical Leave, but taught ENGN 2980 as a regular weekly online course for Hybrid computational/experimental nanomechanics
Fall 2020;	ENGN237B Mechanics of soft-materials and flexible structures - coarse graining MD simulations & ENGN2980 S23, Research Topics
Spring 2021;	ENGN1370 Advanced Engineering Mechanics
Fall 2021;	ENGN2320 Experimental Mechanics
Spring 2022;	ENGN 1300 Structural Analysis & ENGN 2980 Special Projects, Reading, Research and Design
Fall 2022;	Teaching relief for the sabbatical (2020) teaching & ENGN 2980 Special Projects, Reading, Research and Design
Spring 2023;	ENGN2370B S01 Mechanics of soft-materials and flexible structures for Nano/Micro-Mechanics of Multi-Functional and Bio Materials
Fall 2023;	ENGN 1750 Advanced Mechanics of Solids

8. B. Undergraduate Project Supervised:

David Odeh, Crack Growth and Kinking at the Interface of a Cylindrical Inclusion," Honor Project, 1991/92.
SAE Formula Car Team, Design, Manufacturing and Race Competition of Open W heel Race Cars," 1993-1995.
REU student Kevin Smith, Fatigue properties of cast aluminum," 2000.
REU student Constant Bessahoyo, Image processing for experimental mechanics," 2001.
REU student Constant Bissahoyo, Chemical etching properties of solid surfaces," 2002.
REU student Jessie Simon, "Surface Plasticity," 2003.
REU student Adam Chickay, "Field Projection Method," 2003.
REU student Jessie Simon, "Surface Plasticity," 2004; graduated with DeMise Award.
REU Student, Steven Krumholz, 2005.
REU Student, Matthew Drooyan, 2007.
REU Students, Jessica Vanterpool and Nicola Kissoon, “Mechanics of clamshells”, 2008.
REU Student, Michael Chon, “Mechanics of Lithium ion batteries”, 2009.
REU Student, Oscar Escobedo, “CNT sonication”, 2009.
REU student, Joshua Munoz, “Graphene sonication”, 2010.
REU student, Michael Monn, “Surface wrinkles”, 2011.
REU student, Hester Liu, “AFM Nano-tribology”, 2012.
REU student, Cheng Zhang, “Linnik Interferometry for SEI growth in Li-ion battery, 2012.
REU/UTRA Student, Isabel Newton, "Experimental validation of ruga-phase diagram for primary bilayer systems," 2015.
REU/UTRA Student, Joshua Greene, “Characterization of crinkled multilayer graphene,” 2016.
REU/International Student, Romain Ernault, Ecole Polytechnique, France, Friction on Hierarchical Ruga Structures, 2017.
REU/International Student, Bail Jean-Charles, Ecole Polytechnique, France, Design of Multi-scale Friction Tesster, 2018.
Honor Thesis, Reed Brown, Brown University, Dynamic strength of polymer/metal interfaces, 2018-19.
Honor Thesis, John Hegerty, Brown University, Rate Dependent Strengthening Mechanisms of Nano Structured Copolymers, 2019-20.
REU Student, Maxwell Palisoc, Ruga Mechanics for Soft Robotics, 2021-22.

8. C. Master's Degrees Granted:

Dickerson, K. L., 1983, TAM Dept., University of Illinois at Urbana-Champaign.
Hata, S., 1984, TAM Dept., University of Illinois at Urbana-Champaign.
Dost, E., 1985, TAM Dept., University of Illinois at Urbana-Champaign.
Crone, Wendy C., 1991.
Doyoyo, Reuben B., 1995.
Brian Burke, 2005.
Yisoo Pyon, 2006.
Shuman Xia, 2007.
Hanxun Jin, 2017.
Xincheng Wang, 2021.
Seth_Waag-Swift, 2023. (Co-advised with Brian Sheldon)
Maxwell Palisoc, 2023.

8. D1. PhD Degrees Granted:

- Mettu, R., 1986, Co-advised with J. Nicolson, TAM Dept., University of Illinois at Urbana-Champaign.

- Kamath, S. M., 1987, TAM Dept., University of Illinois at Urbana-Champaign.
- Dickerson, K. L., 1987, TAM Dept., University of Illinois at Urbana-Champaign.
- Yang, Mingfa, 1991, TAM Dept., University of Illinois at Urbana-Champaign.
- Tsai, Kun-Hsieh, 1991, TAM Dept., University of Illinois at Urbana-Champaign.
- Bastawros, Ashraf, 1996. (Harvard → Iowa State University: Professor)
- Andrews, Erik, 1997. (MIT : Deceased)
- Doyoyo, Reuben B., 1999. (MIT → Georgia Tech → South Africa)
- Hong, SoonSung, 2003 (Caltech → Michigan State)
- Qunyang Li, 2008. (U Penn → Tsinghua University: Professor)
- Shuman Xia, 2008. (Caltech → Georgia Tech: Associate Professor)
- Brian Burke, 2009. (Stanley → SharkNinja: Vice President)
- Hsiao-Mei Wu, 2014. (Back to Taiwan: National Lab)
- Chien-Kai Wang, 2014. (Back to Taiwan: Univ. Faculty)
- Jahn Torres, 2015. (U.S. Naval Research Laboratory, Newport, RI)
- Ruike Zhao, 2016. (MIT → Stanford University: Assistant Professor)
- Mritunjay Kothari, 2018. (MIT → Univ, New Hampshire: Assistant Professor)
- Hanxun Jin, 2021 (Caltech: Research Associate)
- Catherine Machnicki, 2023 (Naval Undersea Warfare Center Newport)
- Siyuan Song, 2023 (Brown University: Research Associate)

8. D2. Current supervision of PhD Students:
- Siyuan Song
- Catherine Machnicki

8. D3. Current supervision of MS Students:
- Seth Waag-Swift
- Maxwell Palisoc

8. E2. Past Post Doctoral Research Associates and Visiting Scholars Supported:
- Aravas, Nick., 1984-85, Research Associate, TAM Dept., UIUC.
- Jiang, W., 1985-87, Research Associate, TAM Dept., UIUC.
- Professor Earmme, Y. Y., 1985-86, Visiting Professor from KAIST, TAM Dept., UIUC.
- Professor Ranaweera, M., 1987-88, Visiting Professor from Sri Lanka, TAM Dept., UIUC.
- Shield, T. W., 1988-1990, Research Associate. (Univ Minnesota: Professor)
- Choi, Hyung-Chul, 1988-1991, Research Associate. (Deceased)
- Tsai, Kun-Hsieh, 1991-1993, Research Associate. (Taiwan: Univ. Faculty)
- Vecris, George, 1993 -1994, Research Associate.
- Professor Im, S. Y., 1994-1995, Visiting Scholar from KAIST.
- Picu, R. C., 1996-1997, Research Associate. (RPI: Professor)
- Tan, Honglai, 1997, Research Associate. (University of Aberdeen, U.K.)
- Lee, Y. B., 1997- 1998, Visiting Scholar.
- Juan, Hurtado, 1998-2000, Research Associate. (Simulia: Abaqus)
- Honghui Yu, 2002, Research Associate. (CCNY: Associate Professor)
- Pranav Shirotriya, 2002-2003, Research Associate. (Iowa State University: Professor)
- Junlan Wang, 2002-2003, Research Associate (University of Washington: Professor)
- Yanfei Gao, 2003-2005, Research Associate. (University of Tennessee: Professor)

- Jun, Lou, 2004-2005(GM), Research Associate. (Rice University: Professor)
- Prof. George Adams, 2007, From Northeastern University.
- Prof. Yongbock Lee, 2006-2007, From Hong-Ik university, Korea.
- Prof. Woo-Kyung Sung, 2007-2008, From Pohang University of Science & Technology, Korea
- Prof. Jongwon Kim, 2007-2008, From Seoul National University, Korea
- Dr. Myungwoon Moon, 2007-2008, From KIST, Korea (KIST)
- Dr. Qunyang Li, 2008, Research Associate. (Tsinghua University: Professor)
- Dr. Jinwoo Yi, 2008, Research Associate. (KIST)
- Dr. Shuman Xia, 2009, Research Associate. (Georgia Tech: Associate Professor)
- Prof. Earmme, Y.Y., 2009, From KAIST.
- Sang-Pil Kim, 2009, Visiting Scientist from KIST. (Samsung Electronics)
- Prof. Kim, H.G., 2009, From Seoul National University of Technology.
- Dr. Choi, J.H., 2009-2010, Visiting Scientist from KIST. (KIST)
- Dr. Jin-Woo Yi, 2009-2010, Research Associate. (KIST)
- Huck Beng Chew, 2008-2011, Research Associate. (UIUC: Associate Professor)
- Sangjin Ryu, 2010-2011; Research Associate. (Univ. Nebraska: Associate Professor)
- Sang-Pil Kim, 2012-2013, Research Associate. (Samsung Electronics)
- Moon-Hyun Cha, 2011-2014, Research Associate. (Samsung Electronics)
- Mazen Diab, 2011-2014, Research Associate (U Texas Austin: Senior Res. Assoc.)
- Ruike Zhao, 2016, Research Associate. (Stanford Univ: Assistant Professor)
- Ruizhi Li, 2017-2018, Research Associate. (Beihang Univ: Associate Professor)
- Vicror Lefevre, 2017-2018, Hibbitt Fellow. (Dupont)
- Siyuan Song, 2023-now, Research Associate. Brown University

9. Date of Preparation: August, 2023