

Guruswami Ravichandran

John E. Goode, Jr. Professor

Aeronautics and Mechanical Engineering
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EDUCATION

Ph. D.	1986	Solid Mechanics and Structures	Brown University
		<i>Minors: Materials Science and Applied Mathematics</i>	
		<i>Thesis: "Dynamic Fracture under Plane Wave Loading"</i>	
		<i>Advisor: R. J. Clifton</i>	
Sc. M.	1984	Applied Mathematics	Brown University
Sc. M.	1983	Solid Mechanics and Structures	Brown University
B. E. (Honors)	1981	Mechanical Engineering	Regional Engineering College University of Madras

EMPLOYMENT

California Institute of Technology, Division of Engineering and Applied Science

John E. Goode, Jr. Professor of Aeronautics and Mechanical Engineering, 2005-Present

Professor of Aeronautics and Mechanical Engineering, 2000-2005

Professor of Aeronautics, 1999-2000

Associate Professor of Aeronautics, 1995-'99

Assistant Professor of Aeronautics, 1990-'95

University of California, San Diego

Assistant Professor, Department of Applied Mechanics and Engineering Sciences, 1987-'90

Research Fellow, Aeronautics, *California Institute of Technology*, 1986-'87

Research Assistant, Division of Engineering, *Brown University*, 1981-'86

TEACHING EXPERIENCE

Division of Engineering and Applied Science, California Institute of Technology,

1990-Present

Undergraduate Course in Mechanics of Materials

Graduate Courses in Mechanics of Structures and Solids, Experimental Methods, Mechanics and Materials Aspects of Fracture Mechanics, Plasticity, and Dynamic Behavior of Materials

Department of Applied Mechanics and Engineering Sciences, University of California, San Diego, 1987-'90

Undergraduate Courses in Engineering Graphics, Advanced Solid Mechanics, Experimental Techniques, and Mechanical Engineering Laboratory
Graduate Courses and Lecture Series in Mechanical Behavior of Materials, Stress Waves in Solids, Dynamic Behavior of Materials and Dynamic Fracture

HONORS AND AWARDS

Aditya Birla Chair Visiting Professor, Indian Institute of Science, Bangalore, India, 2007
Doctor Honoris Causa (Dhc), Paul Verlaine University, Metz, France, 2006
Keynote Lecture, First JTU-TIT Workshop on Innovation of Creative Engineering, Xian, China, 2005
John E. Goode, Jr. Endowed Professorship, California Institute of Technology, 2005
Chair in International Cooperation Visiting Professor, Tokyo Institute of Technology, 2005
B. J. Lazan Award, Society of Experimental Mechanics, 2005
Best Paper Award in Adaptive Structures and Material Systems, American Society of Mechanical Engineers (ASME), 2005
Senior Visiting Scientist (Directeur de Recherche Associe), CNRS, Ecole Polytechnique, France, 2001-
'02
Keynote Lecture, Joint JSME-ASME Conference on Materials and Processing, Honolulu, Hawaii, 2002
Southwest Mechanics Distinguished Lecturer, 2001
Fellow, American Society of Mechanical Engineers (ASME), 2000
Invited Professor, University de Metz, France, 1999, 2000, 2001, 2004, 2006
Honors Lecturer, University of Rhode Island, 1998
Alumni Seminar Day Speaker, California Institute of Technology, 1993
Presidential Young Investigator Award, National Science Foundation, 1991
Most Outstanding Professor Award, University of California, San Diego, 1988
Elected to Sigma Xi (Scientific Honor Society), 1983
Merit Scholar, Regional Engineering College, Tirichy, India, 1976-'81
National Merit Certificate, Government of India, 1975

SOCIETY MEMBERSHIPS

American Society of Mechanical Engineers
Society for Experimental Mechanics
American Academy of Mechanics

PROFESSIONAL ACTIVITIES

Member-at-Large, Executive Board, Society of Experimental Mechanics, 2006-'08
Associate Technical Editor, *ASME Journal of Engineering Materials and Technology*, 1997-2000
Associate Technical Editor, *Experimental Mechanics*, 1997-2000
Editorial Board Member, *Mechanics*, 1997-2002
Chairman, ASME AMD Technical Committee on Fracture and Failure Mechanics, 1995-'97
Treasurer, American Academy of Mechanics (AAM), 1988-'90
Faculty Advisor, American Society of Mechanical Engineers (ASME) Student Chapter,

University of California, San Diego, 1988-'90

Reviewed papers for the following journals:

Journal of the Mechanics and Physics of Solids, Journal of Applied Mechanics, International Journal for Solids and Structures, Mechanics of Materials, International Journal of Fracture, Journal of Engineering Materials and Technology, Journal of Composites Science and Technology, Journal of Composite Materials, Journal of Composites Engineering, Journal of Time-Dependent Materials, Experimental Mechanics, International Journal of Plasticity, Journal of Pressure Vessels and Technology, AIAA Journal, Journal of Spacecraft, Journal of Applied Physics, Acta Metallurgica et Materialia, Scripta Metallurgica et Materialia, Metallurgical Transactions A, Materials Science and Engineering, Journal of the American Ceramic Society, SIAM Journal of Applied Mathematics, Engineering Fracture Mechanics, Journal of Elasticity

Reviewed technical manuscripts of prospective books for Cambridge University Press and John Wiley

Reviewed proposals for National Science Foundation, U. S. Army Research Office, International Science Foundation, National Research Council, Institute of Geophysics and Planetary Physics (IGPP) and LLNL Materials Institute, URI Transportation Center.

Panel Member, Individual Investigator Awards and Equipment Grants, Mechanics and Materials Program, Division of Civil and Mechanical Systems, National Science Foundation

Member, Executive Committee and Scientific Papers Committee, 20th International Symposium on Shock Waves (ISSW), Pasadena, CA, July 1995

Organizer, Caltech/JPL workshop on Survivable Penetrators for Space Applications, 1995

Organized symposiums: Dynamic Response of Ceramics at the 29th SES Annual Technical meeting, UCSD, La Jolla, CA, 1992; Dynamic Behavior of Advanced Materials at the 12th US National Congress of Applied Mechanics, Seattle, WA; 1994 (with A. Shukla); Dynamic Failure Mechanics at the 31st SES Annual Technical Meeting, Texas A&M University, College Station, TX, 1994 (with A. J. Rosakis); Mechanics and Materials Aspects of Dynamic Failure at the ASME Winter Annual Meeting, Chicago, IL, 1994; Rupture Dynamics, ASME AMD/MD Summer Meeting, Johns Hopkins University, Baltimore, MD, 1996 (with P. H. Geubelle); ONR/ARO Symposium to honor R. J. Clifton on Dynamic Deformation and Failure Mechanics of Materials, Caltech, 1997 (with A. J. Rosakis, M. Ortiz, Y. D. S. Rajapakse and K. Iyer); International Symposium on Meso-Mechanical Aspects of Strength and Fracture, Caltech, 1998; Adiabatic Shear Banding and Dynamic Failure, ASME AMD/MD Summer Meeting, Virginia Tech, 1999 (with A. M. Rajendran); Prager Medalist L. B. Freund Symposium on Dynamic Failure Mechanics and Thin Films, SES Annual Technical Meeting, University of South Carolina, Columbia, SC, 2000 (with A. J. Rosakis); ICF-10 Symposium on High-Strain-Rate Failure, Honolulu, Hawaii, 2001; ONR/Elsevier Symposium to honor L. B. Freund on Dynamic Failure and Thin Film Mechanics, Caltech, 2003 (with A. J. Rosakis and S. Suresh); Dynamic Deformation and Failure Mechanics, SEM, Charlotte, NC, 2003 (with A. J. Rosakis and W. Chen); Dynamic Behavior of Materials, ICM-9, Geneva, Switzerland, 2003; Solid and Structural Mechanics Symposium on the occasion of the 75th Anniversary of GALCIT, Pasadena, 2003; W.

G. Knauss Symposium on Current Trends in Mechanics, Pasadena, 2004 (with K. Ravi-Chandar and K. Liechti); Symposium to honor R. J. Clifton on Mechanics of Materials, Annapolis, Maryland, 2007 (with K. T. Ramesh)

UNIVERSITY AND DEPARTMENTAL ACTIVITIES

California Institute of Technology

Faculty Board, 2005-Present

Nominating Committee, Faculty Board, 2005-'06

Steering Committee, Faculty Board, 2006-'07

Division Advisory Group, Engineering and Applied Science, 2004-2005

Facilities Director, Executive Committee, Center for Science and Engineering of Materials (CSEM), 2004-Present

Undergraduate Option Representative, Mechanical Engineering, 2002-Present

Graduate Admissions Committee, Mechanical Engineering, 2002-Present

Committee for the Undergraduate Curriculum in Engineering and Applied Science, 2002-Present

Chair, Matriculation Committee, 2000

Freshman Admissions Committee, 1997-2000

Patents and Relations with Industry Committee, 1999-2005

Various committees for hiring, tenure and promotion of faculty (Division of Engineering and Applied Science)

Various departmental (GALCIT) committees for:

Admissions, Awards, Machine Shop, Staffing and other activities, 1990-Present

University of California, San Diego

Undergraduate Affairs Committee, Department of AMES, 1987-'89

Graduate Affairs Committee, Department of AMES, 1988-'90

PERSONNEL SPONSORED

Doctoral Students

Weinong Chen* (1995) (Purdue University), Mark Walter* (1995) (Ohio State University)

Jon Hodowany* (1997) (Boeing), Karina Montilla (1997) (Caltech),

Kenji Oguni (2000) (University of Tokyo), Eric Burcsu† (2001) (MIT Lincoln Laboratory),

Shiming Zhuang* (2002) (Kimberly Clark), Jun Lu (2002) (International Rectifiers, Inc),

Rongjing Zhang† (2006), Min Tao (2006) (Intel), Theresa Kidd* (2007) (Northrop-Grumman),

Samantha Daly (2007) (University of Michigan)

Christian Franck, Winston Jackson, Christopher Kovalchick, Sharlotte Kramer,

Benny Poon, Michael Silva, Ling Zheng (current)

**Recipients of the William F. Ballhaus Prize for Outstanding Doctoral Dissertation in Aeronautics*

†*Recipients of the Donald Coles Prize in Aeronautics for the best design of an experiment for doctoral dissertation in Aeronautics*

Engineer's Degree Students

Mullahalli Srinivas (1993) (GE), Nitin Deshpande (1998) (Intel)

Post-Doctoral Scholars

Ghatu Subhash (University of Florida), Wei Tong (SMU), David Owen (Oraxion), Min Zhou (Georgia Tech), Sunil Yadav (Fermi Lab), Sangwook Lee (Boeing), Yann Carin (Peugeot), Murat Vural (Illinois Institute of Technology), Wei Zhang (Rutgers), Doron Shilo (Technion), Yabei Gu (Corning), Abhishek Bhattacharyya (Lehigh), Soonsung Hong (Sandia), Jianheng Zhao (IFP)

Samantha Daly, H. J. Kwon (current)

Visiting Associates

Doo-Hyun Baik (ADD), Atul Chokshi (IISc), S. C. Deevi (ORNL), Arie Venkert (NRCN), Joseph Sariel (NRCN), Louis Hallez (Ecole Polytechnique), Jean-Noel Truchet (Ecole Polytechnique), Jean-Thibault de Besombes (Ecole Polytechnique), Aurlien Miller (Ecole Polytechnique), Alain Molinari (Paul Verlaine University), Nathanael Kriven (Ecole Polytechnique), Daniel Rittel (Technion)

Herzl Chai (Tel Aviv University) (current)

INVITED LECTURES/SEMINARS

Presented more than 150 invited lectures/seminars in academia, industry, and at national and international conferences. Selected recent presentations are listed:

GEM⁴ Summer School, National University of Singapore, 2007

Japan Society of Materials Science, Kyoto, Japan, 2007

Toyo University, Tokyo, Japan, 2007

Symposium on Nano- and Micro-scale Mechanics of Engineering Materials and Biological Systems, Cambridge, Massachusetts, 2006

PUBLICATIONS

Journal Articles

G. Ravichandran and W. G. Knauss, "A Finite Elastostatic Analysis of Bimaterial Interface Cracks," *International Journal of Fracture*, 39, pp. 235-253 (1989)

G. Ravichandran and R. J. Clifton, "Dynamic Fracture Under Plane Wave Loading," *International Journal of Fracture*, 40, pp. 157-201 (1989)

R. Godse, G. Ravichandran and R. J. Clifton, "Micromechanisms of Dynamic Crack Propagation in an AISI-4340 Steel," *Materials Science and Engineering*, A112, pp. 79-88 (1989)

K. T. Ramesh and G. Ravichandran, "Dynamic Behavior of a Boron Carbide-Aluminum Cermet: Experiments and Observations," *Mechanics of Materials*, 10, pp. 19-29 (1990)

- S. Krishnaswamy, A. J. Rosakis and G. Ravichandran, "On the Extent of Dominance of Asymptotic Elastodynamic Crack-tip Fields; Part II: Numerical Investigation of Three Dimensional and Transient Effects," *Journal of Applied Mechanics*, 58, pp. 95-103 (1991)
- A. J. Rosakis, J. J. Mason and G. Ravichandran, "The Conversion of Plastic Work to Heat Around a Dynamically Propagating Crack in Metals," *Journal of Mechanical Behavior of Materials*, 4, p. 375-385 (1992)
- W. Tong and G. Ravichandran, "Dynamic Pore Collapse in Viscoplastic Materials," *Journal of Applied Physics*, 74, pp. 2425-2435 (1993)
- M. V. Srinivas and G. Ravichandran, "Interfacial Crack Propagation in a Thin Viscoelastic Film Bonded to an Elastic Substrate," *International Journal of Fracture*, 65, pp. 31-47 (1994).
- G. Subhash, Y. J. Lee and G. Ravichandran, "Plastic Deformation of CVD Textured Tungsten: Part I. Constitutive Response," *Acta Metallurgica et Materialia*, 42, pp. 319-330 (1994)
- G. Subhash, Y. J. Lee and G. Ravichandran, "Plastic Deformation of CVD Textured Tungsten: Part II. Characterization," *Acta Metallurgica et Materialia*, 42, pp. 331-340 (1994)
- G. Ravichandran and G. Subhash, "Critical Appraisal of Limiting Strain Rates for Testing Ceramics in a Split Hopkinson Pressure Bar," *Journal of the American Ceramic Society*, 77, pp. 263-67 (1994)
- J. J. Mason, A. J. Rosakis and G. Ravichandran, "On the Strain and Strain-Rate Dependence of Plastic Work Converted to Heat: An Experimental Study Using High Speed Infrared Detectors and the Kolsky Bar," *Mechanics of Materials*, 17, pp. 135-145 (1994)
- G. Ravichandran, "Influence of Processing on the High Strain Rate Behavior of Refractory Metals-A Review," *Materials and Manufacturing Processes*, 9, pp. 1031-1046 (1994)
- W. Tong and G. Ravichandran, "Rise Time in Shock Consolidation of Materials," *Applied Physics Letters*, 65, pp. 2783-85 (1994)
- W. Tong and G. Ravichandran, "Effective Elastic Moduli and Characterization of a Particulate-Reinforced Metal Matrix Composite with Damaged Particles," *Composites Science and Technology*, 52, pp. 247-252 (1994)
- W. Chen, G. Subhash and G. Ravichandran, "Evaluation of Ceramic Specimen Geometries Used in a Split Hopkinson Pressure Bar," *Dymat Journal*, 1, pp. 193-210 (1994)
- J. J. Mason, A. J. Rosakis and G. Ravichandran, "Full Field Measurements of the Dynamic Deformation Field Around a Growing Adiabatic Shear Band at the Tip of a Dynamically Loaded Notch," *Journal of the Mechanics and Physics of Solids*, 42, pp. 1679-1698 (1994)
- M. E. Walter and G. Ravichandran, "An Experimental Investigation of Damage Evolution in a Ceramic Matrix Composite," *Journal of Engineering Materials and Technology*, 117, pp. 101-108 (1995)
- W. Tong, G. Ravichandran, T. A. Christman and T. Vreeland, "Processing SiC-Particulate Reinforced Titanium-based Metal Matrix Composites by Shock Wave Consolidation," *Acta Metallurgica et Materialia*, 43, pp. 235-250 (1995)
- G. Ravichandran and C. T. Liu, "Modeling Constitutive Behavior of Particulate Composites Undergoing Damage," *International Journal of Solids and Structures*, 32, 979-990 (1995)
- G. Ravichandran and G. Subhash, "A Micromechanical Model for High-Strain-Rate Behavior of Ceramics," *International Journal of Solids and Structures*, 32, pp. 2627-2646 (1995)

- W. Tong and G. Ravichandran, "Inertial Effects on Void Growth in Viscoplastic Materials," *Journal of Applied Mechanics*, 62, 633-639 (1995)
- D. J. Benson, W. Tong and G. Ravichandran, "Particle Level Modeling of Dynamic Consolidation of Ti-SiC Powders," *Modeling and Simulation in Materials Science and Engineering*, 3, 771-796 (1995)
- W. Chen and G. Ravichandran, "An Experimental Technique for Imposing Dynamic Multiaxial-Compression with Mechanical Confinement," *Experimental Mechanics*, 36, 155-158 (1996)
- W. Chen and G. Ravichandran, "Static and Dynamic Compressive Behavior of Aluminum Nitride Under Moderate Confinement," *Journal of American Ceramic Society*, 79, 579-584 (1996)
- M. Zhou, A. J. Rosakis and G. Ravichandran, "Dynamically Growing Shear Bands in Impact Loaded Prenotched Plates, Part I: Experimental Investigation," *Journal of the Mechanics and Physics of Solids*, 44, 981-1006 (1996)
- M. Zhou, G. Ravichandran and A. J. Rosakis, "Dynamically Growing Shear Bands in Impact Loaded Prenotched Plates, Part II: Numerical Simulation," *Journal of the Mechanics and Physics of Solids*, 44, 1007-1032 (1996)
- M. E. Walter and G. Ravichandran, "Experimental Simulation of Matrix Cracking and Debonding in a Model Brittle Matrix Composite," *Experimental Mechanics*, 37, 130-135 (1997)
- M. E. Walter, G. Ravichandran and M. Ortiz, "Computational Modeling of Damage Evolution in Fiber Reinforced Ceramic Matrix Composites," *Computational Mechanics*, 20, 192-198 (1997)
- W. Chen and G. Ravichandran, "Dynamic Compressive Failure of a Glass Ceramic Under Lateral Confinement," *Journal of the Mechanics and Physics of Solid*, 45, 1303-1328 (1997)
- T. W. Wright and G. Ravichandran, "Canonical Aspects of Adiabatic Shear Bands," *International Journal of Plasticity*, 13, 309-325 (1997)
- G. Subhash, G. Ravichandran and B. J. Pletka, "Plastic Deformation of Hafnium Under Uniaxial Compression," *Metallurgical Transactions A*, 28, 1479-1487 (1997)
- G. Subhash and G. Ravichandran, "Mechanical Behavior of a Hot-Pressed Aluminum Nitride Under Uniaxial Compression," *Journal of Materials Science*, 33, 1933-1939 (1998)
- G. Ravichandran and C. T. Liu, "Crack-Tip Shielding in Particulate Composites Undergoing Damage," *Engineering Fracture Mechanics*, 59, 713-723 (1998)
- M. Zhou, A. J. Rosakis and G. Ravichandran, "On the Growth of Shear Bands and Failure-Mode Transition in Prenotched Plates-A Comparison of Singly and Doubly Notched Specimens," *International Journal of Plasticity*, 14, 435-451 (1998)
- T. Dummer, J. C. Lasalvia, G. Ravichandran and M. A. Meyers, "Effect of Strain Rate on Plastic Flow and Failure in Polycrystalline Tungsten," *Acta Materialia*, 46, 6267-6290 (1998)
- K. Bhattacharya, M. Ortiz and G. Ravichandran, "Energy-Based Model of Compressive Splitting in Heterogeneous Brittle Solids," *Journal of the Mechanics and Physics of Solids*, 46, 2171-2181 (1998)
- P. R. Guduru, R. P. Singh, G. Ravichandran and A. J. Rosakis, "Dynamic Crack Initiation in Ductile Steels," *Journal of the Mechanics and Physics of Solids*, 46, 1997-2016 (1998)
- D. M. Owen, S. Zhuang, A. J. Rosakis and G. Ravichandran, "Experimental Determination of Dynamic Crack Initiation and Propagation Fracture Toughness in Thin Aluminum Sheets *International Journal of Fracture*, 90, 153-174 (1998)
- Y. J. Lee, G. Subhash and G. Ravichandran, "Constitutive Modeling of Textured Body Centered Cubic (BCC) Polycrystals," *International Journal of Plasticity*, 15, 625-645 (1999)
- J. Hodowany, G. Ravichandran, A. J. Rosakis and P. Rosakis, "Partition of Plastic Work into Heat and Stored Energy in Metals," *Experimental Mechanics*, 40, 113-123 (2000)

- P. Rosakis, A. J. Rosakis, G. Ravichandran and J. Hodowany, "A Thermodynamic Internal Variable Model for the Partition of Plastic Work into Heat and Stored Energy in Metals," *Journal of the Mechanics and Physics of Solids*, 48, 581-607 (2000)
- A. J. Rosakis and G. Ravichandran, "Dynamic Failure Mechanics," *International Journal of Solids and Structures*, 37, pp. 331-348 (2000)
- W. Chen and G. Ravichandran, "Failure Mode Transition in Ceramics Under Dynamic Loading," *International Journal of Fracture*, 101, 141-159 (2000)
- A. Venkert, P. R. Guduru and G. Ravichandran, "Mechanisms of Dynamic Failure in High Strength Ductile Steels," *Metallurgical and Materials Transactions A*, 31, 1147-1154 (2000)
- E. Burcsu, G. Ravichandran and K. Bhattacharya, "Large Strain Electrostrictive Actuation in Barium Titanate," *Applied Physics Letters*, 77, 1698-1700 (2000)
- A. T. Zehnder, P. R. Guduru, A. J. Rosakis and G. Ravichandran, "Million Frames per Second Infrared Imaging System," *Review of Scientific Instruments*, 71, 3762-3768 (2000)
- K. Oguni, C. Y. Tan and G. Ravichandran, "Failure Mode Transition in Unidirectional E-Glass/Vinylester Composites under Multiaxial Compression," *Journal of Composite Materials*, 34, 2081-2097 (2000)
- K. Oguni and G. Ravichandran, "An Energy-Based Model of Longitudinal Splitting in Unidirectional Fiber Reinforced Composites," *Journal of Applied Mechanics*, 67, 437-443 (2000)
- K. Oguni and G. Ravichandran, "Dynamic Compressive Behavior of Unidirectional E-Glass/Vinylester Composites," *Journal of Materials Science*, 36, 831-838 (2001)
- K. Oguni and G. Ravichandran, "A Micromechanical Model for Failure of Unidirectional Fiber Reinforced Composites," *International Journal of Solids and Structures*, 38, 7215-7233 (2001)
- R. Vaidyanathan, M. Dao, G. Ravichandran and S. Suresh, "Study of mechanical deformation in bulk metallic glass through instrumented indentation," *Acta Materialia*, 49, 3781-3789 (2001)
- P. R. Guduru, G. Ravichandran and A. J. Rosakis, "Observations of transient high temperature vertical microstructures in solids during adiabatic shear banding," *Physical Review E*, 6403, 36128 (2001)
- P. R. Guduru, A. T. Zehnder, A. J. Rosakis and G. Ravichandran, "Dynamic full field measurements of crack tip temperatures," *Engineering Fracture Mechanics*, 68, 1535-1556 (2001)
- S. Yadav, E. A. Repetto, G. Ravichandran and M. Ortiz, "A computational study of the influence of thermal softening on ballistic penetration in metals," *International Journal of Impact Engineering*, 25, 787-803 (2001)
- P. R. Guduru, A. J. Rosakis and G. Ravichandran, "Dynamic shear bands: an investigation using high speed optical and infrared diagnostics," *Mechanics of Materials*, 33, 371-402 (2001)
- A. Venkert, P. R. Guduru and G. Ravichandran, "Effect of loading rate on fracture morphology in a high strength ductile steel," *Journal of Engineering Materials and Technology*, 123, 261- 267 (2001)
- D. Rittel, G. Ravichandran and S. Lee, "Large strain constitutive behavior of OFHC copper over a wide range of strain rates using the shear compression specimen," *Mechanics of Materials*, 34, 627-642 (2002)
- S. Zhuang, J. Lu and G. Ravichandran, "Shock wave response of a zirconium-based bulk metallic glass and its composite," *Applied Physics Letters*, 80, 4522-4524 (2002)
- D. Rittel, S. Lee and G. Ravichandran "A shear-compression specimen for large strain testing," *Experimental Mechanics*, 42, 58-64 (2002)
- S. Yadav and G. Ravichandran, "Penetration resistance of laminated ceramic/polymer structures," *International Journal of Impact Engineering*, 28, 557-574 (2003)

- S. Zhuang, G. Ravichandran and D. E. Grady, "An Experimental Investigation of Shock Wave Propagation in Periodically Layered Composites," *Journal of the Mechanics and Physics of Solids*, 51, 245-265 (2003)
- M. Vural and G. Ravichandran, "Microstructural aspects and modeling of failure in naturally occurring porous composites," *Mechanics of Materials*, 35, 523-536, (2003)
- J. Lu, G. Ravichandran and W. L. Johnson, "Deformation behavior of the $Zr_{41.2}Ti_{13.8}Cu_{12.5}Ni_{10}Be_{22.5}$ bulk metallic glass over a wide range of strain-rates and temperatures," *Acta Materialia*, 51, 3429-3443 (2003)
- M. Vural and G. Ravichandran, "Dynamic response and energy dissipation characteristics of balsa wood: experiment and analysis," *International Journal of Solids and Structures*, 40, 2147-2170, (2003)
- S. Lee and G. Ravichandran, "An investigation of cracking in brittle solids under dynamic compression using photoelasticity," *Optics and Lasers in Engineering*, 40, 341-352 (2003)
- S. Lee and G. Ravichandran, "Crack initiation in brittle solids under multiaxial compression," *Engineering Fracture Mechanics*, 70, 1645-1658 (2003)
- M. Vural, D. Rittel and G. Ravichandran, "Large strain mechanical behavior of 1018 steel over a wide range of strain rates," *Metallurgical and Materials Transactions A*, 34A, 2873-2885 (2003)
- J. Lu, S. Suresh and G. Ravichandran, "Dynamic indentation for determining the strain rate sensitivity of metals," *Journal of the Mechanics and Physics of Solids*, 51, 1923-1938 (2003)
- K. Bhattacharya and G. Ravichandran, "Ferroelectric perovskites for electromechanical actuation," *Acta Materialia*, 51, 5941-5960 (2003)
- J. Lu and G. Ravichandran "Pressure-dependent flow behavior of $Zr_{41.2}Ti_{13.8}Cu_{12.5}Ni_{10}Be_{22.5}$ bulk metallic glass," *Journal of Materials Research*, 18, 2039-2049 (2003)
- A. Molinari and G. Ravichandran, "Fundamental structure of steady plastic shock waves in metals," *Journal of Applied Physics*, 95, 1718-1732 (2004)
- E. Burcsu, G. Ravichandran and K. Bhattacharya, "Large electrostrictive actuation of barium titanate single crystals," *Journal of the Mechanics and Physics of Solids*, 52, 823-846 (2004)
- M. Vural and G. Ravichandran, "Transverse failure in thick S2-glass/epoxy fiber reinforced composites," *Journal of Composite Materials*, 38, 609-623 2004 (2004)
- D. Shilo, G. Ravichandran and K. Bhattacharya, "Investigation of twin wall structure at the nanometer scale using atomic force microscopy," *Nature Materials*, 3, 453-457 (2004)
- M. Vural and G. Ravichandran, "Failure mode transition and energy dissipation in naturally occurring composites," *Composites Part B - Engineering*, 35, 639-646 (2004)
- J. L. Raphanel, G. Ravichandran and Y. M. Leroy, "Three-dimensional rate-dependent crystal plasticity based on Runge-Kutta algorithms for update and consistent linearization," *International Journal of Solids and Structures*, 41, 5995-6021 (2004)
- A. Bhattacharyya, D. Rittel and G. Ravichandran, "Effect of strain rate on deformation texture in OFHC copper," *Scripta Materialia*, 52, 657-661 (2005)
- A. Molinari and G. Ravichandran, "Constitutive modeling of high-strain-rate deformation in metals based on the evolution of an effective microstructural length," *Mechanics of Materials*, 37, 737-752 (2005)
- A. Molinari and G. Ravichandran, Analysis of shear banding in metallic glasses under bending, *Acta Materialia*, 53, 4087-4095 (2005)
- Y. Gu and G. Ravichandran, "Prediction of incipient shear band trajectories in a thick wall cylinder explosion test," *Experimental Mechanics*, 45, 447-450 (2005)
- A. Bhattacharyya, D. Rittel and G. Ravichandran, "Strain rate effect on the evolution of deformation texture for α -Iron," *Metallurgical and Materials Transactions A*, 37A, 1137-1145 (2006)

- Y. Gu and G. Ravichandran, "Dynamic behavior of selected ceramic powders," *International Journal of Impact Engineering*, 32, 1768-1785 (2006)
- G. Lykatrofitis, A. J. Rosakis and G. Ravichandran, "Particle velocimetry and photoelasticity applied to the study of dynamic sliding along frictionally-held bimaterial interfaces: Techniques and feasibility," *Experimental Mechanics*, 46, 205-216 (2006)
- C. Franck, G. Ravichandran and K. Bhattacharya, "Characterization of domain walls in BaTiO₃ using simultaneous atomic force and piezo response force microscopy," *Applied Physics Letters*, 88, 102907 (1-3) (2006)
- R. Zhang, D. Shilo, G. Ravichandran and K. Bhattacharya, "Mechanical characterization of released thin films by contact loading," *Journal of Applied Mechanics*, 73, 730-736 (2006)
- C. T. Liu and G. Ravichandran, "Influence of confining pressure on the crack growth behavior in a highly filled elastomer," *Journal of Applied Mechanics*, 73, 778-782 (2006)
- G. Lykatrofitis, A. J. Rosakis and G. Ravichandran, "Self-healing pulse-like shear ruptures in the laboratory," *Science*, 313, 1765-1768 (2006)
- D. Rittel, G. Ravichandran and A. Venkert, "The mechanical response of pure iron at high strain rates under dominant shear," *Materials Science and Engineering*, 432, 191-201 (2006)
- L. Y. Jiang, Y. Huang, H. Jiang, G. Ravichandran, H. Gao, K. C. Hwang and B. Liu, "A cohesive law for carbon nanotube/polymer interfaces based on the van der Waals force," *Journal of the Mechanics and Physics of Solids*, 54, 2436-2452 (2006)
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