CURRICULUM VITAE
January 2010

1. **Rodney J. Clifton**
Professor of Engineering
Rush C. Hawkins University Professor
Division of Engineering

2. **Education:**

B.S. (Civil Engineering) University of Nebraska, 1959
M.S. (Civil Engineering) Carnegie Institute of Technology, 1961
Ph.D. (Civil Engineering) Carnegie Institute of Technology, 1964

3. **Professional Appointments:**

1959-1960	Paxton and Vierling Steel Co., Omaha, Nebraska
Summers -- 1961-63	Graduate School, research assistant and supervisor of National Sciences Foundation Program for High School Students and Teachers at Carnegie Institute of Technology
Jan. 1964 - June 1965	Interdisciplinary Fellow, Division of Engineering, Brown University
July 1965 - Aug. 1966	Assistant Professor of Engineering (Research), Brown University
Feb. 1967	Registered Professional Engineer, Rhode Island
Sept. 1966 - June 1968	Assistant Professor of Engineering, Brown University
July 1968 - June 1971	Associate Professor of Engineering, Brown University
1969 - Aug. 1971	Consultant, General Motors Technical Center, Warren, Michigan
July 1971 -	Professor of Engineering, Brown University
Sept. 1971 - Aug. 1972	National Science Foundation Science Faculty Fellow University of Southampton, England
June 1973 - 1998	Consultant, Terra Tek, Inc., Salt Lake City, Utah
August 1974 - June 1979	Chairman, Executive Committee, Division of Engineering, Brown University.
July 1979 - June 1980	Sabbatical Leave, Department of Materials Science, Stanford University, Visiting Professor of Materials Science and Engineering

August 1979 - June 1980 Visiting Professsor of Materials Science and Engineering, Stanford University

Oct. 1979 - Dec. 1983 Consultant, Sandia Laboratories, Albuquerque, NM

Sept. 1983-85 Technical Advisory Committee, New Mexico Institute of Mining and Technology

Feb. l985 - Dec. 1998 Board of Directors, Terra Tek, Inc., Salt Lake City, Utah

July 1988 - Rush C. Hawkins University Professor

1992 - 1994 Consultant, Brookhaven National Laboratory

1992 - 1997 Board of Governors, Institute for Mechanics and Materials

July 1998 - June2003 Dean of Engineering

2003 - 2005 Visiting Scientist, Langer Lab, Dep't of Chemical Engineering, MIT

July 2008 - Interim Dean of Engineering

4a. **Publications:**

1. "Analysis of Composite Beam Bridges by Orthotropic Plate Theory," Journal of Struct. Div., ASCE, August 1963 (with Vilis Vitols and Tung Au).

2. "Analysis of Orthotropic Plate Bridges," Journal of Struct. Div., ASCE, October 1963 (with Jerry C.L. Chang and Tung Au).

3. "An Analysis of Longitudinal Elastic-Plastic Pulse Propagation," Journal of Applied Mechanics, Vol. 33, Trans. A.S.M.E., pp. 248-255, June 1966 (with S.R. Bodner).

4. "An Experimental Investigation of Elastic-Plastic Pulse Propagation in Aluminum Rods," Journal of Applied Mechanics, Vol. 34, 1967, pp. 91-99.

5. "A Difference Method for Plane Problems in Dynamic Elasticity," Quarterly of Applied Mathematics, Vol. 25, 1967, pp. 96-116.

6. "An Analysis of Combined Longitudinal and Torsional Plastic Waves in a Thin-Walled Tube," Proceedings, 5th U.S. National Congress of Applied Mechanics, University of Minnesota, pp. 465-480, June 1966.

7. "A Difference Method for the Dynamic Elastic-Plastic Equations Under Conditions of Plane Strain," (abstract only). Proceedings, 5th US National Congress of Applied Mechanics, University of Minnesota, p. 546, June l966.

8. "The Numerical Solution of a Problem in the Propagation of Plastic Waves of Combined Stress," Technical Report No. 4 under contract DA-3l-124-ARO-D 358, Division of Applied Mathematics, Brown University, July 1967 (with D.L. Vitiello).

9. "Stress Wave Produced Cleavage of Zinc Monocrystals and Investigation of the Associated Deformation by Optical Microscopy and X-ray Diffraction," Technical Report No. 6 under contract NSF-GP-2010, Division of Applied Mathematics, Brown University, May 1967 (with L.R. Oliver, R.W. Armstrong and H. Kolsky).

10. "Cleavage of Zinc Single Crystals Induced by Stress Waves," Nature, Vol. 216, No. 5118, December 2, 1967, p. 910 (with L.R. Oliver, R.W. Armstrong, and H. Kolsky).

11. "Snap-Buckling of a Pre-Stressed Shallow Arch," Proceedings of the ASCE Joint Specialty Conference on Optimization and Non-linear Problems, held in Chicago, Illinois, April 1968, pp. 53-56.

12. "An Experimental Study of Combined Longitudinal and Torsional Plastic Waves in a Thin-Walled Tube," Proceedings, l2th International Congress of Applied Mechanics, Stanford University, August 1968 (with J. Lipkin).

13. "High-Speed Testing of Armor Materials," in National Academy of Sciences, National Research Council report on The Development of Lightweight Armor, September 1968, pp. 77-89.

14. "Elastic-Plastic Boundaries in Combined Longitudinal and Torsional Plastic Wave Propagation," Journal of Applied Mechanics, Vol. 35, 1968, pp. 782-786.

15. "The Elastic-Plastic Boundary in One-Dimensional Wave Propagation," Journal of Applied Mechanics, Vol. 35, 1968, pp. 8l2-814 (with T.C.T. Ting).

16. "Initial Thrust Effects in Snap-Buckling of Shallow Arches," Journal of Engineering Mechanics Division, ASCE, December 1970, pp. 1157-1170.

17. "Plastic Waves of Combined Stresses due to Longitudinal Impact of a Pre-Torqued Tube, Part I: Experimental Results," Journal of Applied Mechanics, Vol. 37, l970, pp. 1107-1112 (with J. Lipkin).

18. "Plastic Waves of Combined Stresses due to Longitudinal Impact of a Pre-Torqued Tube, Part II: Comparison of Theory with Experiment," Journal of Applied Mechanics, Vol. 37, l970, pp. 1113-1120 (with J. Lipkin).

19. "On the Analysis of the Laser Velocity-Interferometer," Journal of Applied Physics, Vol. 4l, l970, pp. 5335-5337.

20. "On the Analysis of Elastic/Visco-Plastic Waves of Finite Uniaxial Strain," Shock Waves and the Mechanical Properties of Solids, edited by J.Burke and V. Weiss, Syracuse University Press, 197l, pp. 73-119.

21. "Thermal Buckling of Shallow Bimetallic Two Hinged Arches," (discussion of a paper by B. Vahidi and N.C. Huang) Journal of Applied Mechanics, Vol. 37, l970, pp. 1199-1202.

22. "Dislocation Velocity for Combined Viscous Glide and Thermally Activated Jumps Past Dispersed Local Obstacles," Technical Report No. 3 on contract DASD05-69-C-0290 with Brown University, 1970.

23. "On the Equivalence of $F^e F^p$ and $F^p F^e$," Journal of Applied Mechanics, Vol. 39, l972, pp. 287-289.

24. "Normal Impact of an Infinite Elastic-Plastic Beam by a Semi-Infinite Elastic Rod," International Journal of Solids & Structures, Vol. 8, l972, pp. 4l-67 (with S. Ranganath).

25. "Waves in a Thin-Walled Tube Due to Sudden Release of a Radial Ring Pressure," Journal of the Acoustical Society of America, Vol. 50, l97l, pp. 230-240 (with Jamie C. Hsu).

26. "A Second Order Accurate Difference Method for Systems of Hyperbolic Partial Differential Equations," Computer Methods in Applied Mechanics and Engineering, Vol. 1, 1972, pp. 173-188 (with S. Ranganath).

27. "Solutions of Wave Problems in Inelastic Materials," in Dynamics of Inelastic Materials (P. Perzyna, ed.), Polish Academy of Sciences, Summer Course held in Jablonna, Poland, May 8-13, 1972, pp. 175-254.

28. "Guided Interfacial Waves with Applications to Cochlear Mechanics," Institute of Sound and Vibration Research Memorandum, No. 466, Southampton University, England, August 1972.

29. "Plastic Waves: Theory and Experiment," Mechanics Today, Vol. 1, edited by S. Nemat-Nasser, Pergamon Press, Inc., l973, pp. 102-168.

30. "Plastic Waves in a Rate Sensitive Material Part I: Waves of Uniaxial Stress," J. Mech. Phys. Solids, Vol. 22, 1974, pp. 253-255 (with J.C.C. Hsu).

31. "Plastic Waves in a Rate Sensitive Material Part II: Waves of Combined Stress," J. Mech. Phys. Solids, Vol. 22, l974, pp. 255-266 (with J.C.C. Hsu).

32. "Finite Deflection Dynamics of Elastic Beams," Int'l. J. Solids and Structures, Vol. 10, l974, pp. 557-568 (with S. Ranganath).

33. "On the Uniqueness of Plane Elastodynamics Solutions for Running Cracks," J. of Elasticity, Vol. 4, l974, pp. 293-299 (with L.B. Freund).

34. "Asymptotic Solutions for Wave Propagation in Elastic and Viscoelastic Bilaminates," Proceedings of the 14th Midwestern Mechanics Conference, Vol. 8, l975, pp. 399-417 (with C. C. Chen).

35. "The Oblique Plate Impact Experiment," Experimental Mechanics, Vol. 16, No. 4, pp. 127-132, 1976 (with A.S. Abou-Sayed and L. Hermann).

36. "Some Recent Developments in Plate Impact Experiments," Proceedings of Symposium on Shock Waves in Solids, ASME Applied Mechanics Conference, June l976, pp. 27-40.

37. "Determination of the Critical-Stress-Intensity Factor K_{Ic} from Internally Pressurized Thick-Walled Vessels," Experimental Mechanics, Vol. l6, No. 6, l976, pp. 233-238 (with E.R. Simonson, A.H. Jones and S.J. Green).

38. "Pressure-Shear Waves in Fused Silica," J. of Applied Phys., Vol. 47, No. 5, 1976, pp. 1762-1770 (with A.S. Abou-Sayed).

39. "Optical Alignment of Impact Faces for Plate Impact Experiments," J. Applied Phys., Vol. 48, No. 3, l977, pp. 1366-1367 (with P. Kumar).

40. "Analysis of Combined Pressure-Shear Waves in an Elastic/Visco-plastic Material," J. Applied Mechanics, Vol. 99, Series E, No. l, l977, pp. 79-84 (with A.S. Abou-Sayed).

41. "Pressure-Shear Waves in 606l-T6 Aluminum Due to Oblique-Plate-Impact," J. Applied Mechanics, Vol. 99, Series E, No. l, 1977, pp. 85-88 (with A.S. Abou-Sayed).

42. "Tests of Torispherical Pressure Vessel Heads Convex to Pressure," Welding Research Council Bulletin, 227, l977, pp. 1-9 (with C.E. Washington and B.W. Costerus).

43. "On the Computation of Plastic Stress-Strain Relations for Polycrystalline Metals," Comp. Meth. in Appl. Mech. and Engin., l0, l977, pp. 141-149 (with J. Guldenpfennig).

44. "A Combined Normal and Transverse Displacement Interferometer with an Application to Impact of Y-Cut Quartz, J. Applied Phys., Vol. 48, No. l0, l977, pp. 4132-4139 (with K.S. Kim and P. Kumar).

45. "In Situ Stress Determination by Hydrofracturing--A Fracture Mechanics Approach," Journal of Geophysical Research 83, 1978, pp. 2851-2862 (with A.S. Abou-Sayed and C.E. Brechtel).

46. "Containment of Massive Hydraulic Fractures," Society of Petroleum Engineers Journal, Vol. l8, No. l, l978, pp. 27-32 (with E.R. Simonson and A.S. Abou-Sayed).

47. "A Star Shaped Flyer for Plate Impact Recovery Experiments," J. Applied Phys., Vol. 48, No. ll, l977, pp. 4850-4852 (with P. Kumar).

48. "Dislocation Configurations Due to Plate Impact," Proc. IUTAM Symposium on High Velocity Deformation of Solids held in Tokyo, Japan, Aug. 24-27, 1977 (with P. Kumar).

49. "An Application of Self-Consistent Slip Models to Plastic Waves of Combined Stress," Proceedings of International Congress of Applied Mechanics, Delft, l976 (with J. Guldenpfennig).

50. "Dislocation Motion and Generation in LiF Single Crystals Subjected to Plate-Impact," J. Appl. Phys., 50(7), l979, pp. 4747-4762 (with P. Kumar).

51. "Pressure-Shear Impact of 606l-T6 Aluminum," J. of App. Mech., 47(1), l980, pp. 11-16 (with K.S. Kim).

52. "Adiabatic Shear Banding," National Academy of Sciences, National Research Council National Materials Advisory Board Report No. 356, Materials Response to Ultra-High Loading Rates, l979, Chap. 8, pp. l29-142.

53. "Nonlinear Waves in Solids," Proceedings of NSF-ARO sponsored Workshop held at University of Illinois at Chicago Circle, March l977 (co-editor with T. Belytschko and T.C.T. Ting).

54. "Plastic Wave Theory--Supported by Experiments?," Conference on Mechanical Properties of Materials at High Rates of Strain, Oxford University, March 28-30, l979; Inst. Phys. Conf. Ser. No. 47: Chapter 2, pp. l74-l86.

55. "On the Computation of the Three-Dimensional Geometry of Hydraulic Fractures," Proceedings of SPE-AIME Symposium on Low-Permeability Gas Reservoirs, Denver, Colorado, May 20-22, l979 (with A.S. Abou-Sayed).

56. "On the Kinetics of a Frank-Read Source," Materials Science and Engineering, 41 (l979) pp. 251-258 (with P.S. Steif).

57. "Dynamic Plastic Deformation for Non-Proportional Loading Paths," Proceedings of Euromech Colloquium ll5, Villard-de-Lans, France, June l9-22, l979.

58. "Plastic Waves of Combined Stress Based on Self-Consistent Slip Models," J. Mech. Phys. Solids, 28, (l980) pp. 20l-219 (with J. Guldenpfennig).

59. "The Nonuniformly Moving Edge Dislocation," J. Mech. Phys. Solids 29, (l98l) pp. 253-262 (with X. Markenscoff).

60. "Elastic Precursor Decay and Radiation from Nonuniformly Moving Dislocations," J. Mech. Phys. Solids 29, (l981) pp. 227-251 (with X. Markenscoff).

61. "A Variational Approach to the Prediction of the Three-Dimensional Geometry of Hydraulic Fractures," Proceedings of the l98l SPE/DOE Low Permeability Symposium held in Denver, Colorado, May 27-29, l98l, pp. 457-465 (with A.S. Abou-Sayed).

62. "Dynamic Stress-Strain Curves at Plastic Shear Strain Rates of $l0^5 s^{-1}$ ", Proceedings of the American Physical Society's l98l Topical Conference on Shock Waves in Condensed Matter held at Stanford Research Institute, June 23-25, 1981 (with C.H. Li).

63. "Re-examination of the Precursor Decay Anomaly," Ibid. 64. "Radiation from Expanding Circular Dislocation Loops and Elastic Precursor Decay," J. Appl. Mechs. 49, 1982, pp. 792-796 (with X. Markenscoff).

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65. "On the Mechanics of Hydraulic Fracturing," Proceedings of the 9th U.S. National Congress of Applied Mechanics, held at Cornell University, l982, pp. 443-451.

66. "Dislocation Motion in MgO Crystals Under Plate Impact," J. Matls. Sci. 19, l984, pp. l428-l438 (with K.S. Kim).

67. “Dislocation Mobility in Fe-3% Si Single Crystals under Plate Impact,” in Proceedings of Third Oxford Conference on the Mechanical Properties of Materials at High Rates of Strain, Oxford, 1984 (with P. Blinot, C.Y. Chiem and P. Kumar).

68. "Dynamic Plastic Response of Metals under Pressure-Shear Impact," Proceedings of the 29th Sagamore Army Materials Research Conference, held at Lake Placid, New York, l982, pp. 1-19 (with A. Gilat and C.H. Li).

69. "Localisation de la Deformation Viscoplastique en Cisaillement Simple: Resultats Exacts en Theorie Non Lineaire," C.R. Acad. Sc. Paris, t. 296, l983, l-4 (with A. Molinari).

70. "A Plate Impact Experiment for Studying Crack Initiation at Loading Rates $\dot{K}_I = 10^8$ MPa $m^{1/2}s^{-1}$," Proceedings of the NSF-ARO Workshop on Dynamic Fracture, held at California Inst. of Tech., February l983 (with G. Ravichandran).

71. "Dynamic Plasticity," 50^{th} Anniversary Issue of the Journal of Applied Mechanics, Vol. 50, December l983, pp. 94l-952.

72. "Pressure-Shear Impact and the Dynamic Plastic Response of Metals," Proceedings of the American Physical Society l983 Topical Conference on Shock Waves in

Condensed Matter, edited by J.R. Asay, G.K. Straub and R.A. Graham, July 1983, pp. 105-111.

73. "Experiments and the Micromechanics of Viscoplasticity," Proceedings of the Symposium Plasticity Today held at Udine, Italy, edited by G. Bianchi and A. Sawczuk, June l983, pp. 105-111.

74. "On Critical Conditions for Shear Band Formation at High Strain Rates," Scripta Met l8, l984, pp. 443-448 (with J. Duffy, K.A. Hartley and T.G. Shawki).

75. "An Analysis of Shear Strain Localization in Thermal, Viscoplastic Materials," Brown University Report No. ARO DAAG 29-8l-K-0121/3, October, l983 (with T.G. Shawki and G. Majda).

76. "Pressure-Shear Waves in 606l-T6 Aluminum and Alpha-Titanium," J. Mechs. Phys. Solids 33, l985, 263-284. (with A. Gilat).

77. "Stress Wave Experiments in Plasticity," International Journal of Plasticity l, l985, 289-302.

78. "Pressure-Shear Plate Impact Testing," Metals Handbook: Mechanical Testing, Vol. 8, 9th Edition, l985, 230-239. (with R.W. Klopp).

79. "Dynamic Plastic Response of OFHC Copper at High Shear Strain Rates," Proceedings of the IUTAM Symposium on Macro- and Micro-Mechanics of High Velocity Deformation and Fracture, held in Tokyo, Japan, August l985 (with S. Huang).

80. "Metal Plasticity," Appl. Mech. Rev. 38, l985, l26l-l263.

81. "Stress Wave Propagation, Dynamic Material Response, and Quantitative Non-destructive Evaluation," Appl. Mech. Rev. 38, l985, l276-l278.

82. "Experimental Mechanics," Appl. Mech. Rev. 38, l985, l279-l28l (with F.P. Chiang)

83. "Recent Advances in the Three Dimensional Simulation of Hydraulic Fracturing," Developments in Mechanics l3, Proceedings of the l9th Midwestern Mechanics Conference held at Ohio State University, September l985, 3ll-3l9.

84. "Calculation of the Visco-plastic Response of Polycrystals from Slip Theory for F.C.C. Single Crystals," (Preprint) 22nd Annual Meeting, Society of Engineering Science, held at Penn State University, October l985 (with T.G. Shawki and J.P. Yang)

85. "The Effects of Dislocation Generation at Surfaces and Subgrain Boundaries on Precursor Decay in High Purity LiF," J. Appl. Phys. 59, l986, l24-148 (with G. Meir).

86. "Pressure-Shear Impact and the Dynamic Viscoplastic Response of Metals," Mechanics of Materials 4, l985, 375-385 (with R.W. Klopp).

87. "A Pressure-Shear Plate Impact Experiment for Studying the Rheology of Lubricants at High Pressures and High Shearing Rates," Journal of Tribology, 109, 1987, 215-222 (with K.T. Ramesh).

88. "Analytical Characterization of Shear Localization in Thermoviscoplastic Materials," Journal of Applied Mechanics, 109, 1987, 806-812 (with A. Molinari).

89. "Dynamic Fracture Under Plane Wave Loading," International Journal of Fracture, 40, 1989, 157-201 (with G. Ravichandran).

90. "Three-Dimensional Fracture-Propagation Models" Chapter 5 in Recent Advances in Hydraulics Fracturing, SPE Monograph, J.L. Gidley, Ed., 1989.

91. "Pressure Near the Tip of a Steadily Advancing Fluid-Filled Crack," (unpublished manuscript) (with M. Kurashige).

92. "Integral Equations for the Problem of a 3dCrack in an Infinite Fluid-Filled Porous Elastic Solid," SPE Production Engineering February 1992, pp. 34-38 (with M. Kurashige).

93. "Temperature Effects on Dislocation Nucleation and Mobility in Shocked Single Crystals of Pure LiF," (unpublished manuscript) (with G. Meir).

94. "Dislocation Mobility in High Purity LiF from 100^{o}K to 300^{o}K", Shock Compression of Condensed Matter, APS, 1985 (with G Meir).

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

96. "Constitutive Models for Plastic Flow at Ultra High Strain Rates," Proceedings of the Symposium on Dynamic Constitutive/Failure Models held at the University of Dayton, May 1988, pp. 28-55.

97. "Shear Band Formation in Thermal Viscoplastic Materials," Mechanical Behavior of Materials, 8, 1989, 13-43 (with T.G. Shawki).

98. "Multiple Fluids, Proppant Transport, and Thermal Effects in Three-Dimensional Simulation of Hydraulic Fracturing," SPE 18198, Proceedings of the 63^{rd} Annual Technical Conference and Exhibition held in Houston, October 1988, pp. 175-188 (with J.J. Wang).

99. "Calculation of the Viscoplastic Response of Polycrystals from Slip Theory for F.C.C. Single Crystals," to appear in International Journal of Plasticity (with T.G. Shawki and Y. Kadioglu).

100. "A Soft Recovery Plate Impact Experiment for Studying Microcracking in Ceramics," Mechanical Behavior of Materials, 10, 1990, pp. 43-58 (with G. Raiser and M. Ortiz).

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104. "High Strain Rate Behavior of Metals," Applied Mechanics Reviews, 43, 1990, pp. S9-S22.

105. "Stress Wave Radiation from a Crack Tip during Dynamic Fracture Initiation," Journal of Applied Mechanics, 59, 1992, pp. 356-365 (with V. Prakash and L.B. Freund).

106. "Experimental and Analytical Investigation of Dynamic Fracture Under Conditions of Plane Strain," to appear in the Proceedings of the 22nd National Symposium on Fracture Mechanics, 1990 (with V. Prakash).

107. "Pressure-Shear Impact Investigation of Strain-Rate History Effects in OFHC Copper," Journal of the Mechanics and Physics of Solids, 40, 1992, pp. 1251-1294 (with W. Tong and S. Huang).

108. "Dynamic Ductile Rupture in a Spheroidized 1045 Steel," Proceedings of Army Symposium on Solid Mechanics, S.C. Chou, editor, 1991, pp. 451-472 (with M. Zhou).

109. "Finite Deformation Analysis of Pressure-Shear Plate Impact Experiments on Elastohydrodynamic Lubricants," Journal of Applied Mechanics 59, 1992, pp. 754-761 (with K.T. Ramesh).

110. "Plane Strain Fracture in Plate Impact," Shock Compression of Condensed Matter-1991, R.D. Dick, J.W. Forbes, D.G. Tasker editors, 1992, pp. 515-518, Elsevier Science Publishers, B.V. (with V. Prakash and L.B. Freund).

111. "Numerical Modeling of Hydraulic Fracturing in Layered Formation with Multiple Elastic Moduli," Rock Mechanics Contributions and Challenges, Proceedings of the 31ST U.S. Symposium. Ed. by Hustrulid, W.A. and Johnson, G.A., 1990 (with J.J. Wang).

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117. "On Pressure-Shear Plate Impact for Studying the Kinetics of Stress-Induced Phase Transformations", J. Materials Science and Engineering. A170, 1993, pp. 125-142 (with J.C. Escobar).

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138. "Stress-Wave Induced Martensitic Phase Transformations," Metallurgical and Materials Applications of Shock-Wave and High-Strain-Rate Phenomena edited by L.E. Murr, K.P. Staudhammer and M.A. Meyers, 1995, Elsevier Science, pp. 451-462 (with J.C. Escobar).

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140. "Pressure-Shear Impact Investigation of the Dynamic Response of Ceramics," ASME AMD-Vol. 219, Advances in Failure Mechanisms in Brittle Materials, R.J. Clifton and H. D. Espinosa, eds., 1996, pp. 59-80.

141. "High Temperature Pressure-Shear Plate Impact Experiments on OFHC Copper," Proceedings, U.S. Army Symposium on Solid Mechanics, held in Myrtle Beach, South Carolina, October 1996 (with K.J. Frutschy).

142. "Dynamic Failure of 4340 VAR Steel in Shear," Proceedings US Army Symposium on Solid Mechanics held in Myrtle Beach, South Carolina, October 1996 (with Z. Zhang).

143. "Longitudinal Elastic Waves in Columns Due to Earthquake Motion," Int'l. J. of Impact Engineering 18, 1996, pp. 889-898 (with T. Nonaka and T. Okazaki).

144. "Plate-Impact Technique for Measuring Dynamic Friction at High Temperatures" J. of Tribology 119, ASME, 1997, pp. 590-593 (with K.J. Frutschy).

145. "Dynamic Constitutive Response of Tantalum at High Strain Rates," *Shock Compression of Condensed Matter—1997*, edited by S.C. Schmidt, D.P. Dandekar and J.W. Forbes, The American Institute of Physics, 1998, pp. 475-478 (with K.E. Duprey).

146. "High-Temperature Pressure-Shear Plate Impact Studies on OFHC Copper and Pure WC," Ibid, pp. 463-466 (with K.J. Frutschy and M. Mello).

147. "Flow Behavior of Soda-Lime Glass at High Pressures and High Shear Rates," Ibid, pp. 517-520 (with S. Sundaram).

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149. "Dynamic Constitutive and Failure Behavior of a Two-Phase Tungsten Composite," J. Appl. Mechs., 64, 1997, 487-494 (with M. Zhou).

150. "The Influence of a Glassy Phase on the High Strain Rate Response of a Ceramic," Mechanics of Materials, 29, 1998, pp. 233-251 (with S. Sundaram).

151. "High-Temperature Pressure-Shear Plate Impact Experiments on OFHC Copper," J. Mechs. Phys. Solids 46, 1998, pp. 1723-1743, (with K.J. Frutschy).

152. "High-Temperature Pressure-Shear Plate Impact Experiments Using Pure Tungsten Carbide Impactors," Experimental Mechanics, 38, 1998, pp. 116-125, (with K.J. Frutschy).

153. "Dislocation Dynamics in Ni3Al: Experiments and Computations," *High Temperature Ordered Intermetallic Alloys VIII*, editors: E.P. George, M.J. Mills and M. Yamaguchi, MRS, Warrendale, PA. -- in print. (with N. Bhate, S. Kumar and R. Phillips).

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155. "Bridging Length Scales in Dynamic Plasticity Simulations," *Shock Compression of Condensed Matter—1999*, edited by M.D. Furnish, L.C. Chhabildas, and R.S. Hixson, The American Institute of Physics, 2000, pp. 19-26 (with N. Bhate).

156. "Stress-Wave-Induced Martensitic Phase Transformations in NiTi," *Ibid*, 2000, pp. 267-270, (with J.C. Escobar and S.-Y. Yang).

157. "Pressure-Shear Response of Thin Tantalum Foils," *Ibid* 2000, pp. 447-450, (with K.E. Duprey).

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160. "Phonon Dispersion Curves and Structural Stability for CuZr Alloy using Determined Parameters of Modified Embedded Atom Method Potential," Pre-Symposium of IUTAM Symposium on Mesoscopic Dynamics in Fracture Processes and Strength of Materials, held at Osaka Prefecture University, Osaka, JAPAN, December 13 2002 (with K. Nakatani, and M.I. Baskes).

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165. Clifton, R.J., Jia, X., Jiao, T., Bull, C. and Hahn, M.S., "Viscoelastic Response of Vocal Fold Tissues and Scaffolds at High Frequencies," Proceedings of IUTAM Symposium on Mechanics of Biological Tissues held in Graz, Austria in July, 2004, Gerhard A. Holzapfel and Ray W. Ogden (Eds.), 2006, pp. 445-455.
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172. Jia, X., Yeo, Y., Clifton, R.J., Jiao, T., Kohane, D.S., Kobler, J.B., Zeitels, S.M., and Langer, R., "Hyaluronic Acid-Based Microgels and Microgel Networks for Vocal Fold Regeneration," *Biomacromolecules* **7,** 2006, 3336-3344.
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176. Grunschel, S.E., and Clifton, R.J., "Pressure-Shear Plate Impact of Aluminum at Elevated Temperatures," *ibid*, 529-532.
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183. Jha, A.K., Hule, R.A., Jiao, T., Teller, S.S., Clifton, R.J., Duncan, R.L., D.J. Pochan, D.J., and Jia, X.Q., "Structural Analysis and Mechanical Characterization of Hyaluronic Acid-Based Doubly Cross-Linked Networks," *Macromolecules* **42,** 2009, 537-546.

4b. **Invited Lectures and Research Seminars (since l977)**

Lecture at Symposium on in Situ Stress Measuring Techniques, Salt Lake City, June l977 (Topic: New Concepts in In Situ Stress Measurement).

Invited Lecture at International Union of Theoretical and Applied Mechanics Symposium on High Velocity Deformation of Solids, Tokyo, August 977 (Topic: Dislocation Configurations due to Plate Impact).

Research Seminar at University of Illinois Chicago Circle, November 1977 (Topic: Plane Wave Experiments in Dynamic Plasticity).

Research Seminar at University of Illinois at Urbana-Champaign, November l977 (Topic: Plane Wave Experiments in Dynamic Plasticity).

Research Seminar at University of Minnesota, November l977 (Topic: Fracture Mechanics Aspects of Hydraulic Fracturing and In Situ Stress Measurement).

Invited Lecture on "Stable-Crack Growth Methods for Measuring K" at Fracture Mechanics Workshop of SESA Fall Meeting, Indianapolis, Indiana, October 23, l978.

Invited Lecture on "Pressure-Shear Impact of 606l-T6 Aluminum," at l5th Annual Meeting of Society of Engineering Science (SES), Gainesville, Florida, December 4-6, 1978.

Invited Keynote Lecture, "Plastic Wave Theory--Supported by Experiments?," Conference on Mechanical Properties of Materials at High Rates of Strain, Oxford University, March 28-30, l979.

Research Seminar, "Pressure-Shear Waves," Aberdeen Ballistic Research Center, Aberdeen, Maryland, May 11, l979.

Invited Keynote Lecture, "Pressure-Shear Waves," American Physical Society Topical Conference on Shock Waves in Condensed Matter, Pullman, Washington, June 11-19, 1979.

Invited Paper, "Dynamic Plastic Deformation for Non-Proportional Loading Paths," Euromech Colloquium ll5, Villard-de-Lans, France, June 19-22, 1979.

Research Seminar, "Plate Impact Recovery Experiments on Single Crystals," University of Nantes, France, June 27, l979.

Research Seminar, "Dynamics of Dislocations in LiF and Mg0 through Plate Impact Experiments," Mechanical Properties Seminar, Stanford University, October l6, l979.

Research Seminar, "Some Recent Developments in Plate Impact Experiments and Their Interpretation," Solid Mechanics Seminar, Stanford University, November l, l979.

Invited Lecture, "Pressure-Shear Waves as a Means for Determining Dynamic Material Properties," Acoustical Society of America Meeting, Salt Lake City, Utah, November 27, l979.

Research Seminar at Lawrence Livermore Laboratory, January l980 (topic: Some Recent Results in Plate Impact Experiments and Their Interpretation.

Research Seminar at Sandia Laboratory, February 1980 (topic: Dislocation Dynamics and the Precursor Decay Anomaly).

Research Seminar at Stanford Research Institute, April l980 (topic: Some Recent Results in Plate Impact Experiments and Their Interpretation).

Research Seminar at California Institute of Technology, May l980 (topic: Dislocation Dynamics and the Precursor Decay Anomaly).

Research Seminar at Brown University, November l980 (topic: Experiments, Dislocation Dynamics and the Precursor Decay Anomaly).

Research Seminar at Brown University, November l980 (topic: Analysis of Dynamic Shear Band Formation in Rate Dependent Materials with Thermal Conductivity).

Invited Paper at l7th Annual Meeting of the Society of Engineering Science, December l980 (topic: Dislocation Dynamics, Plate Impact Experiments and the Precursor Decay Anomaly).

Invited talk at ARO Workshop on Computational Aspects of Penetration Mechanics, Aberdeen, Maryland, April l982 (topic: Comparison of Theory and Experiment for Pressure-Shear Waves).

Invited talk at 9th U.S. National Congress of Applied Mechanics, Cornell University, June l982 (topic: On the Mechanics of Hydraulic Fracturing).

Invited talk at Sagamore Conference on Material Behavior Under High Stress and Ultrahigh Loading Rates, Lake Placid, New York, July l982 (topic: Dynamic Plastic Response of Metals Under Pressure-Shear Loading).

Invited talk at Sandia Laboratories, Albuquerue, New Mexico, August l982 (topic: Recent Developments in Plate Impact Experiments at Brown University).

Invited talk at a Workshop on Viscoplasticity held at Los Alamos, New Mexico, September l982 (topic: Physical Mechanisms of Plastic Deformation at High Strain Rates).

Invited Research Seminar at the University of Delaware, October l982 (topic: Pressure-Shear Impact and the Dynamic Plastic Response of Metals).

Invited Research Seminar at Northwestern University, December l982 (topic: The Mechanics of Hydraulic Fracturing).

Research Seminars in Southwest Mechanics Lecture Series, January l983 (lectures at Southwest Research Institute, Louisiana State University, University of Houston and University of Texas at Arlington), (topic: Pressure-Shear Plate Impact Experiments).

Research Seminar at Brown University, May l983 (topic: Numerical Simulation of Hydraulic Fracturing).

Invited talk at the AIME Meeting, Atlanta, Georgia, March l983 (tTopic: Dynamic Plastic Response of Metals Under Pressure-Shear Impact).

Invited paper at the NSF-ARO Workshop on Dynamic Fracture, California Institute of Technology, February 1983 (topic: A Plate Impact Experiment for Studying Crack Initiation at Loading Rates K = 10 MPa ms).

Invited General Lecture at the Symposium on Plasticity Today, CISM, Udine, Italy, June l983 (topic: Experiments and the Micromechanics of Viscoplasticity).

Invited Plenary Lecture at the APS Topical Conference on Shock Waves in Condensed Matter, Santa Fe, New Mexico, July l983 (topic: Pressure-Shear Impact and the Dynamic Plastic Response of Metals).

Invited talk at the S.E.S. Annual Meeting, University of Delaware, August l983 (topic: On the Formulation of Constitutive Equations for Dynamic Plasticity).

Research Seminar at the Naval Surface Weapons Center, Silver Spring, Maryland, February l985 (topic: On the Formation of Shear Bands at High Strain Rates)

Invited Speaker, l9th Midwestern Mechanics Conference, Ohio State University, September l985 (topic: Recent Advances in Three-Dimensional Simulation of Hydraulic Fracturing)

Invited Speaker, at Fracture Height Growth Seminar sponsored by the Denver Chapter of the Society of Petroleum Engineers, Denver, Colorado, October l985 (topic: Modelling of Hydraulic Fractures)

Invited Speaker, ASME Winter Annual Meeting, Miami, Florida, November l985 (topic: Formation and Growth of Shear Bands at High Strain Rates)

Research Seminar at Rensselaer Polytechnic Institute, February 1986 (topic: Mechanical Response of Metals and Lubricants at High Pressures and High Shearing Rates).

Research Seminar at University of Utah, April 1986 (topic: Mechanical Response of Metals and Lubricants at High Pressures and High Shearing Rates).

Prager Medal Lecture at Annual Meeting of Society of Engineering Science, August 1986 (topic: High Shear Rate Response of Solids and Lubricants).

Invited Speaker at Annual Meeting of Society of Engineering Science, August 1986 (topic: Dynamic Fracture under Plane Wave Loading).

Research Seminar at United Technologies Research Center, November 1986 (topic: Plastic Response of Metals at High Shear Rates).

Research Seminar at Georgia Tech, November 1986 (topic: The Response of Solids and Lubricants at High Shearing Rates).

Invited Speaker at the Second International Conference on Constitutive Laws for Engineering Materials, Tucson, Arizona, January 1987 (topic: An Overview of Strain-Rate Sensitivity at High Strain Rates).

Invited Speaker at a Symposium on Plasticity Foundations and Future Directions, Gainesville, Florida, January 1987 (topic: Hardening of OFHC Cu at Strain Rates of 10^{-} - $10^{}$ s).

Midwest Mechanics Seminar Speaker (talks at Univ. of Michigan, Michigan State Univ., Univ. of Wisconsin, Univ. of Minnesota, Univ. of Notre Dame, Illinois Inst. of Tech., Univ. of Illinois, Purdue Univ.) February 1987 (topic: Investigation of the Deformation and Failure of Materials at Very High Strain Rates).

Invited Mechanics Speaker, Peoples Republic of China, April 1987 (Forty hours of lectures at Changsha Institute of Technology, Southwest Institute for Fluid Physics (Chengdu), Research Institute for Modern Chemical Research (Xien), Beijing Institute of Technology, Beijing University, Tsinghua University (Beijing), Institute of Applied Physics and Computational Mathematics (Beijing) (topics: Dislocation Dynamics, Dynamic Plasticity, Dynamic Fracture, Hydraulic Fracturing, Shear Bands).

Invited Speaker at ASME Symposium on Micro and Macromechanics of Failure, Cincinnati, Ohio, June 1987 (topic: Dynamic Fracture Under Plane Wave Loading).

Research Seminar at Ballistic Research Laboratory, Aberdeen, Maryland, August 1987 (topic: Deformation and Failure of Metals at Very High Strain Rates - A Status Report).

Research Seminar at Exxon Research and Engineering, Linden, New Jersey, October 1987 (topic: On Measuring and Modelling the Response of Lubricants at High Pressures and High Shear Rates).

Research Seminar at the University of Connecticut, November 1987 (topic: Dislocation Dynamics and the Dynamic Plastic Response of Crystals).

Research Seminar at Army Materials Technology Laboratory, Watertown, MA, February 1988 (topic: Some Recent Developments in Plate Impact Experiments and Analysis of Shear Strain Localization).

Research Seminar at University of Tennessee, March 1988 (topic: Dynamic Fracture: Plane Wave Experiments and Computations).

Research Seminar at State University of New York at Stony Brook, May 1988 (topic: Dynamic Plastic Deformation of Metals).

Invited Lecture at Summer ASME-SES Meeting held at Berkeley, CA, June 1988 (topic: New Plate Impact Experiments for Studying Microcracking in Ceramics).

Research Seminar at University of Rhode Island, September 1988 (topic: Dynamic Fracture: Plane Wave Experiments and Computations).

General Lecture, National Congress of Applied Mechanics, 1990.

Invited Lecture, Institute for Mathematics and its Applications, Univ. of Minnesota, 1990 (topic: Shear Waves and Phase Transformations).

Invited Lecture, International Conference on Mechanics, Physics, and Structures of Materials, Thessalonica, Greece, 1990 (topic: Dislocation Structures and High Rate Deformation of Pure Metals).

Invited Lecture, Workshop on Shear Bands, Center for Nonlinear Analysis, Department of Mathematics, Carnegie Mellon University, March 1992. (topic: An Update on Experimental Investigations of Shear-Strain Localization at High Strain Rates).

Invited Lecture, Workshop on Micromechanical Effects in Shock Compression, Los Alamos National Laboratory, May 1992 (topic: Microstructural Observations and the Dynamic Plastic Response of LiF and OFHC Copper).

Invited Seminar, RAFAEL, State of Israel, Ministry of Defense, Haifa, ISRAEL, August 1992 (topic: Plate Impact Experiments for Dynamic Fracture in Plane Strain).

Keynote Lecture, International Symposium on Impact Engineering, Sendai, JAPAN, November 1992 (topic: Pressure-Shear Impact and the High Strain Rate Response of Materials).

Symposium Short Course Lecture, Kyoto, JAPAN, November 1992 (topic: Plate Impact Studies of Plastic Deformation and Fracture: A Review and Suggestions for Future Research).

Invited talk, Society of Engineering Science, Annual Meeting, September 1992. (topic: Plate Impact Response of Ceramics and Glasses).

Invited talk, Society of Engineering Science Annual Meeting, September 1992 (topic: Reflections on Jacques Duffy's Contributions to the Understanding of Shear Bands).

Research Seminar, Picatinny Arsenal, Picatinny, NJ, July 1992 (topic: Shear Band Formation in Tungsten Heavy Alloys).

Invited talk, ONR Workshop on Underwater Explosion Effects on Structures and Shock Mitigation, September 1992 (topic: Mechanical Behavior of Materials at Very High Strain Rates).

Research Seminar, Johns Hopkins University, March 1993 (topic: Basic Studies of Friction, Fracture, and Plastic Flow by Means of Plate Impact).

Invited talk, ARO Workshop on Dynamic Behavior of Brittle Materials, July 1993 (topic: Time-Resolved Friction Measurements in Pressure-Shear Plate Impact).

Invited talk,.Workshop on Continuum Iissues in Phase Transformations and Other Recent Developments in Solid Mechanics, Woodstock, Vermont, August 1993 (topic: "Stress-Induced Phase Transformation in Plate Impact").

Invited talk, Workshop on Martensite, University of Minnesota, September 1993 (topic: "Pressure-Shear Plate Impact Study of the Kinetics of Martensitic Phase Transformations").

Keynote Lecture, IUTAM Symposium on Nonlinear Waves in Solids, Victoria, British Columbia, CANADA, August 1993 (topic: Analysis of Failure Waves in Glasses).

Invited talk, ONR Workshop on Active Materials, October 1993 (topic: Pressure-Shear Plate Impact Study of Phase Transformations in a Shape Memory Alloy).

Research Seminar, Yale University, October 1993 (topic: Recent Results on Shearing Resistance, Failure Waves, and Phase Transformations in Plate Impact Experiments).

Invited talk, Symposium on the Dynamic Failure Mechanics of Modern Materials, Cal. Tech., February 1994 (topic: Dynamic Fracture Under Conditions of Plane Strain).

Invited lectures, A week of lectures at China National Petroleum Corporation, Langfang, P.R.C., February 26-March 3, 1994, sponsored by United Nations (topic: Simulation of Tight Reservoirs Through Hydraulic Fracturing).

Invited talk, Workshop on Basic Phenomena in Plasticity, Center for Nonlinear Analysis Carnegie Mellon University, March 1994. (topic: Steps Toward a Physical Theory of Plasticity).

Invited talk, Cincinnati Milacron, April 1994 (topic: Dynamic Friction in High-Speed Machining).

Invited Research Seminar, Case Western Reserve University, April 1994 (topic: Recent Results on Shearing and Phase Transformation in Plate Impact Experiments).

Invited talk, Alcoa Technical Center, Monroeville, PA, April 1994 (topic: Steps Toward a Physical Theory of Plasticity)

Invited research seminar, Dartmouth College, May 1994 (topic: Dynamic Shearing Response of Metals, Lubricants and Interfaces).

Invited talk, AFOSR Workshop on Integrated Theory and Numerics for Design Applications, Fort Walton Beach, FL, June 1994 (topic: Plastic Deformation and Shear Band Formation at High Strain Rates).

Invited talk, Institute for Mechanics and Materials Workshop on Scale Effects and the Stability of Structured Media, UCSD, June 1994 (topic: Dislocation Structures and Shear Band Formation).

Invited talk, ARO Workshop on Tungsten Alloys, Picatinny Arsenal, NJ, July 1994 (topic: Model Development for Dynamic Response of Materials).

Invited lecture, IMM Summer School: The Mechanics - Materials Linkage, UCSD, August 1994 (topic: Dynamic Plasticity).

Contributed talk, 12th U.S. Nat'l. Cong. of Applied Mechanics, Seattle, WA, August 1994 (topic: Plastic Flow of Refractory Metals at High Strain Rates).

Contributed talk, International Conference on Tungsten and Refractory Metals, Washington, DC, October 1994 (topic: Plastic Flow of Tantalum at High Strain Rates).

Invited talk, ONR Workshop on Adaptive Quiet Structures with Active Materials, Washington, DC, October 1994 (topic Kinetics of Stress-Induced Phase Transformations in Pressure-Shear Plate Impact).

Invited talks, ASME Winter Annual Meeting, Chicago, IL, November 1994 (topics: (I) Pressure-Shear Impact Investigation of Dynamic Fragmentation and Flow of Ceramics; (II) Dynamic Fracture Under Conditions of Plane Strain; (III) Kinetics of Stress-Induced Martensitic Phase Transformations)

Invited talk, Tantalum Workshop at ASTM Symposium on Ta,Mo, and Ti in Ballistic Applications, Phoenix, AZ, November 1994 (topic: Plastic Flow of Tantalum at High Strain Rates).

Keynote lecture, 1997 Society for Experimental Mechanics Spring Conference, Bellevue, WA, June 1997 (William M. Murray Lecture: Plate Impact Experiments for Investigating the Mechanical Behavior of Materials).

Invited talk, Plasticity '97, Juneau, AL, July 1997 (topic: Some Recent Advances in Pressure-Shear Plate Impact).

Contributed talk, APS Topical Conference on Shock Compression of Condensed Matter, Amherst, MA, July 1997 (topic: Effect of Shear on Failure Waves in Shocked Soda Lime Glass).

Invited Seminar, Cornell University, October 1997 (topic: Dynamic Shearing Resistance of Materials).

Invited talk, ASME Winter Annual Meeting, Dallas, TX, November 1997 (topic: Pressure-Shear Impact and the High Temperature Response of Metals).

Keynote speaker, Conference on Integration of Material, Process and Product Design, Champion, PA, October 1998 (topic: Plasticity -- Then, Now, and into the Next Millenium)

Invited lecture, Ripperger Lecturer, University of Texas - Austin, April 1999 (topic: On the Determination of the Inelastic Response of Materials from Stress Wave Experiments - Ripperger and Watson Re-visited)

Invited Plenary Lecture, APS Topical Group on Shock Waves in Condensed Matter, June, 1999 (topic: Bridging Length Scales in Dynamic Plasticity Simulations)

Timoshenko Medal speech, ASME Annual Meeting, Oralando, FL, November 2000 (topic: Remarks for the good of the Mechanics Community)

Invited lecture, University of Maryland, Baltimore, February 2001 (topic: Deformation of Metals at High Strain Rates – What's New?)

Invited lecture, Los Alamos National Lab, Los Alamos, NM, June 2002 (topic: Stress-Wave-Induced Martensitic Phase Transformations in NiTi Polycrystals)

Invited lecture, Los Alamos National Lab, Los Alamos, NM, June 2002 (topic: Pressure-Shear Impact Measurements of the Dynamic Shearing Resistance of Materials – an Update)

Invited lecture, LiquidMetal Technologies, Lake Forest, CA, June 2002 (topic: Dynamic Response of Bulk Amorphous Metal Rods Reinforced with Refractory Metal Wires)

Invited lecture, Taiwanese-American Conference, Los Angeles, CA, June 2002 (topic: Research Directions: Multidisciplinary Understanding and Collaboration)

Invited lecture, Los Alamos National Lab, Los Alamos, NM, June 2002 (topic: Dislocation Mobility in Aluminum)

Invited lecture, D.C. Drucker Memorial Symposium, U. Florida, Gainesville, October 2002 (topic: Dislocation Dynamics and the High Rate Deformation of Metals)

Invited lecture, Symposium held at Cal Tech to recognize Ben Freund on his 60^{th} birthday, January 2003 (topic: Propagation of a Shear Band from a Crack Tip)

Invited lecture, SUNY at Stonybrook, February 2003 (topic: Mechanics of Materials at Nanosecond Time Scales)

MRSEC Research Seminar, Brown University, April 2003 (topic: Mechanics of Materials at Nanosecond Time Scales)

ONR Workshop Presentation, US Navy Surface Warfare Center, April 2003 (topic: Pressure and Strain-Rate Sensitivity of Shearing Resistance of Hysol® Epoxy)

Invited lecture, U. Ill at Urbana-Champaign, September 2003 (topic: Mechanics of Materials at Nanosecond Time Scales)

Invited lecture, IUTAM Symposium on Mechanics of Biological Tissue, Graz, Austria, July, 2004 (topic: Viscoelastic Response of Vocal Fold Tissues and Scaffolds at High Frequencies)

Invited lecture (jointly with Xinqiao Jia of MIT), Biomedical Engineering Seminar, Brown University, September, 2004 (topic: Tissue Engineering for Vocal Fold Regeneration)

James F. Bell Lecture, Johns Hopkins University, November 2004 (topic: Torsional Wave Experiments to Guide Tissue Engineering for Vocal Fold Regeneration)

Vocal Fold Project Review Presentation, Massachusetts General Hospital, September and October 2004 (topic: Tissue Engineering for Vocal Fold Regeneration)

ONR Workshop Presentation, US Army Natick Soldier Center, April 2004 (topic: Isentropic Compression of Elastomers)

ONR Workshop Presentation, MIT, November 2004 (topic: High Strain Rate Response of Elastomers)

ONR Workshop Presentation, Airlie, Virginia, September 2005 (topic: High Rate Deformation and Fracture of Elastomers)

Invited lecture, University of California at Los Angeles, October 2005 (topic: High Strain Rate Response of Materials)

Invited talk, National University of Singapore, January 2006 (topic: Shear Band Propagation from a Crack Tip Subjected to Mode II Loading)

Invited talk, US National Congress of Theoretical and Applied Mechanics, July 2006 (topic: Deformation and Failure of an Elastomer at Very High Strain Rates)

ONR Workshop Presentation, St. Michaels, Maryland, August 2006 (topic: Deformation and Failure of an Elastomer at Very High Strain Rates)

Research Seminar, University of California at San Diego, November 2006 (topic: Mechanical Response of an Elastomer and of Biological Tissues at High Rates of Deformation)

Penner Lecture, University of California at San Diego, November 2006 (topic: Overcoming Inertia: Measuring Material Response at High Rates of Deformation)

Invited Lecture, Architectural Institute of Japan, Tokyo, Japan, November 2006 (topic: Deformation and Failure of Structural Materials at High Strain Rates)

Invited Lecture, Society of Materials Science of Japan, Kyoto, Japan, November 2006 (topic: Deformation and Failure of Materials at High Strain Rates)

Invited Lecture, University of Delaware, September 2007 (topic: Measurement of the Viscoelastic Properties of Biological Tissues at High Frequencies)

ONR Workshop Presentation, West Bethesda, Maryland, October 2007 (topic: Pressure-Shear Measurements of the Very High Strain Rate Response of Elastomers)

Invited Speaker, Society of Engineering Science Annual Meeting, October 2008 (topic: Hydrogels for Vocal Folds Repair)

Invited Lecture, Lawrence Livermore National Labs, August 2009 (topic: Pressure-Shear Plate Impact and the Response of Materials at High Strain Rates)

Keynote Speaker, Plasticity '09, St. Thomas, USVI, January 2009 (topic: Pressure-Shear Plate Impact and the Response of Materials at High Strain Rates and High Temperatures)

4c. **Patents**

U.S. Patent No. 7387032, "Method and apparatus for measuring the viscoelastic response of vocal fold tissues and scaffolds across a frequency range," issued June, 2008 (with Christopher Bull and Tong Jiao).

5. **Service (since 1974)**

University:

Engineering Concentration Committee - 1974-77

Advisory Committee on Continuing Education Programs - 1974-1979

Chairman, Executive Committee, Division of Engineering - 1974-79

Physical Sciences Council - l974-79.

Executive Committee, Center for Biomedical Engineering - 1974-79

Executive Committee, Computer Science Program - 1976-79

Engineering Committee on Curriculum and Counseling - 1976-79

Materials Research Laboratory Advisory Committee - l979-1982

Director, Central Facility for Mechanical Testing - l980-1986

Brown-Tougaloo Committee - 1977-79

Graduate Council, Vice Chairman - 1980-1982

Faculty Committee on Awards and Benefits - l983 - l985

Staffing Plan Task Force, for Sciences and Engineering, l985

Graduate Committee, Division of Engineering - l982 - 1986

Executive Committee, Materials Research Laboratory - l983 - 1987

University Research Council - 1987 - 1991

CONFRAT - 1987 - 1989

Campus Advisory Committee for Presidential Search,
Vice-Chair, Dec. 1987 - Sept.1988

Director, NSF Materials Research Group 1989 - 1996

Provost Search Committee, Chair, 1990

University Research Committee, 1987-1991

Chair of Sub-Committee on Indirect Costs, 1991

Affirmative Action Monitoring Committee, 1991 - 1992

University ad hoc Grievance Committee on Intellectual Property, 1992 - 1993

University Library Committee, 1994-1997

Director, NSF Materials Research Science and Engineering Center, 1996-1998

Dean of Engineering, 1998-2003

Chair of ad hoc Committee on Tuition Charges for Research Assistants, 2003 --- 2004

Barrett Hazeltine Professorship Search Committee, 2003 --- 2004

Member of ad hoc Patent and Invention Advisory Committee, 2004

Member of ad hoc Inquiry Panel on Scientific Misconduct, 2004

Chair, Tenure Review Committee for Thomas Powers, 2005-2006

Faculty Committee on the Capital Campaign, 2005 -- 2007 (Chair, 2005-2007)

Barrett Hazeltine Professorship Search Committee, 2006 -2007

Reviewer, Major Research Instrumentation Proposals, 2006

President Simmons Cabinet 2008 –

President Simmons Executive Committee –

Professional:

Associate Editor, Journal of Applied Mechanics - 1981 - 1988

Society of Engineering Science, President - 1982-83.

Editorial Advisor, J. Mechs. Phys. Solids - 1982-present

Member, National Research Council Committee on Material Response to Ultra High Loading Rates - 1977

Panelist, National Committee for Rock Mechanics Workshop on Rock Mechanics Problems that Limit Resource Recovery and Development - 1977

Committee for Dynamics of Continuous Media, National Research Council

Committee on Recommendations for U.S. Army Basic Scientific Research - 1976-79

Co-Organizer, NSF Workshop on Nonlinear Waves in Solids - 1977

Board of Directors, Society of Engineering Science - 1977-1983

Panel Member for Review of NSF Research Initiation Grants

Panel Member for Review of NSF Specialized Research Equipment Grants

Reviewer of proposals for several agencies, including National Science Foundation, Energy Research and Development Administration, and Army Research Office

Reviewer of papers for several journals, including J. Applied Mechanics, Int'l J. Solids & Structures, J. Mech. and Phys. Solids, Experimental Mechanics, and Q. Appl. Math., and J. Appl. Phys.

Member, ASME Committee on Research Directions in Solid Mechanics - l984 - l985.

Member, DOE Panel on Solid Mechanics, Structural Mechanics and Dynamics - l985.

Member, Board of Governors, Institute for Mechanics and Materials, UCSD, 1992-1998

Vice-Chair, Mechanical Engineering Peer Committee, National Academy of Engineering, 1995

Member, Armor and Armaments Panel, Army Research Laboratory, 2001 – 2006

Chair, Visiting Committee, Graduate Program in Engineering Science and Mechanics, Virginia Polytechnic Institute and State University, 2005

Member, External Review Committee, Engineering Programs, Yale University, 2006.

Chair, Rhode Island EPSCoR Committee, 2006.

Chair, Review Team for Caltech's MSC Center for the Predictive Modeling and Simulation of High-Energy Density Dynamic Response of Materials, 2008.

6. **Honorary Societies, Fellowships, Honors, Research Grants**

Member of honorary societies: Phi Kappa Phi, Pi Mu Epsilon, Sigma Tau, Sigma Xi
National Defense Education Act Fellow - 1960-63
National Science Foundation Science Faculty Fellow - 1971-72
Fellow, American Academy of Mechanics (elected in l980)
Melville Medal, American Society of Mechanical Engineers - l98l (with K.S. Kim)
Prager Medal, Society of Engineering Science - l986
Best Paper Award, Tribology Division of ASME - 1987 (with K.T. Ramesh)
Member, National Academy of Engineering – (elected in 1989)
Distinguished Alumni Award, Carnegie Mellon University - 1992
Murray Medal, Society for Experimental Mecanics – 1997
Fellow, American Society of Mechanical Engineers ─ 1999
Timoshenko Medal, American Society of Mechanical Engineers ─ 2000
Distinguished Civil Engineering Alumnus Award, University of Nebraska ─ 2001
Member, American Academy of Arts and Sciences (elected in 2005)

Research Grants (Since l973)

Brown Materials Research Laboratory, "Anelastic Waves in Metals and Polymers" (July l, l973 - June 30, l974). Amount: $l9,000

Brown Materials Research Laboratory, "Plate Impact Experiments on LiF" (July l, l976 - June 30, l977). Amount: $22,974

National Science Foundation, "Fundamental Studies in Dynamic Plasticity by Means of Plane Wave Experiment" (February l, l976 - January 3l, l979) Amount: $200,348

Army Research Office, "Plastic Deformation and Fracture of Steel Under Dynamic Loading" (Co-P.I. with J. Duffy) (December l5, l976 - February l5, l980). Amount $l44,000

NSF Energy Related Traineeships (Participating faculty: B. Caswell, L.B. Freund, J. Rice, D. Simons, T. Tullis (2 three-year traineeships - l976-79). Amount: $42,000

Brown Materials Research Laboratory, "Plate Impact Experiments on LiF" (July l, l977 - June 30, l978). Amount: $25,000

Terra Tek, Inc., "Computer Time for Generating Time Dependent Solutions of Hydraulic Fracture Propagation" (February l, l977-). Amount: $3,000

Brown Materials Research Laboratory, "Dislocation Dynamics and Plate Impact Experiments," (July l, l978 - June 30, l980). Amount: $40,000

National Science Foundation, "Fundamental Studies in Dynamic Plasticity by means of Plane Wave Experiments," (October l, l979 - April 30, l983). Amount: $282,569

Army Research Office, "An Investigation of Inhomogeneous Inelastic Deformations through Plate Impact Experiments and Mathematical Modelling of Propagating Localized Deformations," (October l, l980 - September 30, l983). Amount: $l65,000

Brown Materials Research Laboratory, "Dislocation Dynamics in Plate Impact Experiments," (July l, l980 - June 30, l98l). Amount: $36,000

Army Research Office, "Critical Conditions for Failure in Materials Subjected to High Rates of Loading," (August l5, l98l - October l5, l984). (Co-investigators: R.J. Asaro, J. Duffy, L.B. Freund, A. Needleman). Amount: $l,l00,000

Brown Materials Research Laboratory, "Dislocation Dynamics and Shear Strain Localization," (July l, l982 - June 30, l983). Amount: $45,000

National Science Foundation, "Time Dependent Plasticity: Theory, Experiment and Computation," (May l, l983 - October 3l, l985). Amount: $199,999

Brown Materials Research Laboratory, "Dynamic Plastic Deformation of Crystals," (July l, l983 - June 30, l984). Amount: $49,397

Army Research Office, "Critical Conditions for Failure in Materials Subjected to High Rates of Loading," (December l, l984 - October 3l, l987). (Co-investigators: R.J. Asaro, J. Duffy, L.B. Freund, A. Needleman). Amount $1,140,000.

National Science Foundation, "Rheology of Lubricants at High Pressures and High Shear Rates," (November l, l985 - April 30, l986). Amount: $34,448.

Brown Materials Research Laboratory, "Plastic Deformation and Fracture at High Strain Rates," (July l, l985 - April 30, l987). Amount: $97,438.

National Science Foundation, "Theoretical and Experimental Investigation of the Inelasticity and Failure of Ceramics," (with M. Ortiz) (March 15, 1987 - March 14, 1990) Amount: $368,026.

Office of Naval Research, "Fundamental Studies in Dynamic Plasticity," (February 1, 1987 - January 31, 1990) Amount: $424,255.

Army Research Office, "Microstructural Mechanisms of Dynamic Ductile Fracture and Implications for Structural Failure," (with R.J. Asaro, J. Blume, J. Duffy, L.B. Freund, and S. Nutt) (December 1, 1987 - November 30, 1990) Amount: $1,122,767.

Brown Materials Research Group, "Viscoplastic Response at High Strain Rates," (May 1, 1987 - April 30, 1988) Amount: $47,205.

ONR, “Kinetics of Stress-Induced Phase Transformations,” 9/1/91 - 9/1/94, $368.830, 1.0 month effort, per year.

ARO, “Investigation of Dynamic Material Response for Model Development,” 1/15/91 - 01/14/94, $323,173, 0.5 month effort per year.

NSF, “Development of Computational and Experimental Capability for the Simulation of High Speed Machining,” 10/15/90-09/30/94, $1,053,692. (with J. Duffy, A. Needleman, and M. Ortiz); 1.0 month effort per year.

NSF, “Micro-Mechanics of Failure Resistant Materials,” 3/1/90 -2/28/93, $2,634,600. (P.I., with 10 faculty from Solid Mechanics and Material Science.)

NSF, “Micro- and Nano-Mechanics of Failure Resistant Materials” 7/1/93-3/30/96, $2,557,000. (P.I., with 10 faculty from solid Mechanics and Material Science).

ARO, “Dynamic Behavior of Brittle Materials,” (with L.B. Freund, K.S. Kim, S. Nutt, M. Ortiz and S. Suresh) 8/1/92-7/31/97, $2,000,000. 1.0 month effort per year.

ARO, “Research Training in Dynamic Response of Materials,” 6/93 - 5/96, $120,000.

ARO, “Plastic Flow and Shear Banding in Refractory Metals and Martensitic Steels at Very High Shearing Rates,” 8/1/94 - 7/31/97, $452,078., 1.0 month effort per year.

SUMITOMO, “Research on High Rate Deformation of Metals (Gift) $20,000.

NSF, MRSEC on “Micro- and Nano-Mechanics of Materials,” 9/1/96 - 4/30/2001, at $1,150,000 per year (P.I., with 11 faculty from Solid Mechanics and Materials Science.

ONR, "Kinetics of High Rate Martensitic Tranformations in Ni-Ti," 6/1/96 - 8/31/96, $20,000.

ONR, "Characterization of High Strain Rate Response of Steel Welds," 6/1/97 - 9/30/03, $736,475, 1.0 month effort per year.

ARO(DURIP), "High-Speed, Real-Time Measurement Instrumentation for High-Strain-Rate Behavior of Brittle Ceramics Subjected to High Velocity Impact," 6/1/95 - 11/30/97, $150,000 (with K.-S. Kim).

NSF, Infrastructure Award (with Clyde Briant and K. Sharvan Kumar).

ARO, "High Rate Deformation of Metals at High Temperatures," 8/01/98 - 11/30/01, $414,000, 1.0 month effort per year.

ALCOA, Unrestricted grant for research on the dynamic plastic response of metals (1999-2000), $20,000.

AMORPHOUS TECHNOLOGIES, INC. Subcontract on ARO/SBIR on "Development of Highly Reinforced Amorphous Metal Matrix Composites," 6/1/99 - 5/31/01, $75,000.

AMORPHOUS TECHNOLOGIES, INC. Subcontract of DARPA award on "Bulk Amorphous Metals," 9/12/01 - 4/30/04, $105,000.

ONR, "High Strain Rate Properties of Elastomers," 10/1/03 – 2/28/06, $444,674, 2.0 months effort per year.

MGH, "Vocal Fold Tissues," 3/01/05 – 8/31/05, $42,000, 0.25 months effort.

ONR/DURIP, "A Scanning White Light Interference Microscope to Study Adhesion at Metal-Polymer Interfaces," 5/15/04 – 5/14/06, $128,432, 0 months effort (w/ P. Guduru)

ONR, "High Strain Rate Properties of Elastomers," 4/3/06 – 9/30/06, $80,000, 0.45 months effort.

ONR, "High Strain Rate Properties of Elastomers," 10/4/06 – 6/30/10, $475,234, 4.0 months effort.

LLNL, "Shearing Resistance of Al at Temperatures Near Melt," 9/21/06 ─ 9/30/06, $10,000, 0 months effort.

LLNL, "Plasticity at High Pressures and Strain Rates using Oblique-Impact Isentropic-Compression Experiments**,"** 1/2007 ─ 1/2010, $375,000, 3.0 months effort.

VA, "Rebuilding, Regenerating and Restoring Function after Traumatic Limb Loss," 12/04/04 ─ 12/03/06, $46,311, 1.0 months effort.

LLNL, "Analysis and Design for Studying Plasticity at High Pressures and Strain Rates using Oblique-Impact, Isentropic-Compression Experiments," 8/2007 ─ 8/2010, $153,409, 0.2 months effort per year.

NIH, "Tissue Engineering of Vocal Fold Lamina Propria," 6/2007 ─ 6/2012, $555,313, 0.75 months effort per year.

7. **Research in Progress**

Research Projects with one graduate student and one Senior Research Associate on topics in the following areas: phase transformations in iron under pressure-shear plate impact, high strain rate response of elastomers, high frequency response of vocal fold materials (in collaboration with Prof. X. Jia, University of Delaware), high frequency response of heart valve tissues (in collaboration with Dr. Richard A. Hopkins,

formerly of RI Hospital, now at Children's Mercy Hospital Cardiovascular Research Institute, Kansas City, Missouri).

8. **Teaching (since 1978)**

1978-79: Engineering 23 - Surveying
Engineering 136 - Soil Mechanics and Principles of Foundation Engineering (latter 1/3 of course)

1979-80: Sabbatical Leave

1980-81: Engineering 229 - Plasticity
Engineering 32 - Mechanics of Solids and Structures

1981-82: Engineering l3l - Planning and Design of Systems
Engineering 226 - Stress Waves in Solids

1982-83: Engineering 131 - Planning and Design of Systems
Engineering 222 - Mechanics of Solids

1983-84: Engineering 226 - Stress Waves in Solids
Engineering 4 - Dynamics and Vibrations

1984-85: Engineering 131 - Planning and Design of Systems
Engineering 4 - Dynamics and Vibrations

1985-86: Engineering 22l - Foundations of Continuum Mechanics
Engineering 4 - Dynamics and Vibrations

1986-87: Sabbatical Leave

1987-88: Engineering 100 - Projects in Engineering Design
Engineering 4 - Dynamics and Vibrations

1988-89: Engineering 232 - Experimental Mechanics
Engineering 4 - Dynamics

1989-90: Engineering 41 - Materials Science
Engineering 4 - Dynamics

1990-91: Engineering 229 - Plasticity
Engineering 4 - Dynamics and Vibrations

1991-92: Engineering 23 - Surveying
Engineering 131 - Design of Engineering Systems (Projects only)

Engineering 291-A Research Seminar in Solid Mechanics
Engineering 4 - Dynamics and Vibrations

1992-93: Engineering 229 Plasticity
Engineering 131 - Design of Engineering Systems (Projects only)
Engineering 4 - Dynamics and Vibrations

1993-94: Sem. II Sabbatical Leave

1994-95: Sem. I Engineering 291W - Research Directions in Solid Mechanics
Engineering 291W - Research Directions in Solid Mechanics
Engineering 229 - Plasticity
1995-96: Engineering 131 - Design of Engineering Systems (projects only)
Engineering 23 - Surveying
Engineering 4 - Dynamics and Vibrations

1996-97: Engineering 232 - Experimental Mechanics
Engineering 23 - Surveying
Engineering 137 - Advanced Engineering Mechanics

1997-98 Engineering 131 - Design of Engineering Systems (projects only)
Engineering 23 - Surveying
Engineering 137 - Advanced Engineering Mechanics

1998-99 Engineering 232 - Experimental Mechanics
Engineering 100 - Engineering Projects
Engineering 90 - Managerial Decision Making (only 3 lectures)

2000-01 Engineering 3 Introduction to Engineering and Statics
Engineering 131 - Design of Engineering Systems (projects only)

2001-02 Engineering 3 Introduction to Engineering and Statics
Engineering 131 - Design of Engineering Systems (projects only)

2002-03 Engineering 3 Introduction to Engineering and Statics
Engineering 131 - Design of Engineering Systems (projects only)
2003-04 Engineering 131 - Design of Engineering Systems (introductory lectures only)
Sabbatical Leave, Sem. I
EN121 Biomechanics, Sem. II
EN 193S02, EN 194S02, Sem. I&II
2004-05 Engineering 131 - Design of Engineering Systems (projects only), Sem. I
Sabbatical Leave, Sem. I
EN121 Biomechanics, Sem. II
EN 193S02, EN 194S02, Sem. I&II
2005-06 Engineering 131 - Design of Engineering Systems (projects only), Sem. I
Engineering 229 Plasticity, Sem. I
EN 137 Advanced Engineering Mechanics, Sem. II
EN 193S02, EN 194S02, Sem. I&II

2006-07 AM121/EN 131 - Design of Engineering Systems (projects only), Sem. I
EN 130 Structural Analysis, Sem. II
EN 193S02, EN 194S02, Sem. I&II
2007-08 AM 121/EN 131 - Design of Engineering Systems (projects only), Sem. I
EN 130 Structural Analysis, Sem. II
EN 193S02, EN 194S02, Sem. I&II
2008-09 AM 121/EN 131 - Design of Engineering Systems (projects only), Sem. I
ENGN 1930C, ENGN 1930D, Sem. I&II
2009-10 AM 121/EN 131 - Design of Engineering Systems (projects only), Sem. I
ENGN 1930C, ENGN 1930D, Sem. I&II

Honors Projects (Since 1978)

l978-79: Paul Steif, "On the Kinetics of a Frank-Read Source"

1981-82: Bill Beckman, "Development of a General Purpose PASCAL Program for Solving Linear Programming Problems"

1982-83: Phoebus Rosakis, "Development of a Technique for Making Holographic Gratings"

1996-97: Mark Schnittman, "Ultrasonic Virbrations in Thin Tubes: A Study of an Ultrasonic Atomizing Nozzle"

1996-97: Peter Dingus, “On the Measurement of Earth Tides”

1996-97 Natasha Shekdar, "Design of Concrete Shell Bridges"

1997-98 Teal Bathke, "Impact Dynamics of Baseballs"

1999-2000 Daniel Steingart, "Dynamic Response of Bulk Amorphous Metal Composites"

1999-2001 Odiseas Papadimitriou, "Modeling of Tensile Failure of Bridge Piers During the Great Hanshin-Awaji Earthquake"

2001-2002 Petch Jearaisilawong, “Pressure and Shearing Response of Hysol® Epoxy at High Strain Rate”

2001-2002 Sappinandana Akamphon, “The Experimental and Computational Investigation of a Pedestrian-Friendly Car Bumper”

2004-2005 Spyros Ginosatis, “Production Planning Optimization”

2006-2007 Gideon Sorkin, “Natural Illumination of Gothic Cathedrals,” (co-advised with Sheila Bonde)

2006-2007 Ryan Couto, “Analysis of Impulsive Blast Loading in Bridge Design Engineering,”

Theses Supervised (Since 1978)

June l978: Sc.M., Chin-Ho Li, "On a Plate Impact Technique for High Strain Rate Testing"

June l979: Ph.D., Kyung-Suk Kim, "Plane Wave Experiments in Dynamic Plasticity"

June 1982: Ph.D., Chin-Ho Li, "A Pressure-Shear Experiment for Studying the Dynamic Plastic Response of Metals at Strain Rates of 10^5 s"

June l982: Sc.M., G. Meir, "Surface Damage Effects on Precursor Decay in High Purity LiF"

Aug. l982 Ph.D., A. Gilat, "An Experimental and Numerical Investigation of Pressure-Shear Waves in 606l-T6 Aluminum and Alpha-Titanium"

June l983: Sc.M., G. Ravichandran, "A Plate Impact Experiment for Studying Crack Initiation at Loading Rates K=l0^8 Mpam$^{1/2}$ s^{-1}"

June l983: Sc.M., T.G. Shawki, "Analysis of Shear Strain Localization in Thermal Visco-Plastic Materials"

July 1983: Sc.M., J.P. Yang, "Calculation of Visco-Plastic Response of Polycrystals from Slip Theory for F.C.C. Crystals"

May l985: Sc.M., K.T. Ramesh, "A Technique for Determining the Rheology of Lubricants at High Pressures and High Shear Rates"

May l985: Ph.D., G. Meir, "Dislocation Mobility in Pure LiF underShock Loading"

July l985: Ph.D., T.G. Shawki, "Analysis of Shear Band Formation at High Strain Rates and the Visco-plastic Response of Polycrystals"

Sept. 1986: Ph.D., G. Ravichandran, "Dynamic Fracture Under Plane Wave Loading"

Oct. 1986: Ph.D., R. Klopp, "Plasticity of Aluminum and Iron at High Shear Strain Rate and High Pressure".

Oct. 1987: Ph.D., K.T. Ramesh, "Plate Impact Experiments and Mathematical Modelling of the Rheology of Certain Lubricants".

May 1988: Sc.M., G.F. Raiser, "Plate Impact Experiments for Studying Microcracking in Ceramics"

May 1988: Sc.M., W. Tong, "A Pressure-Shear Plate Impact Experiment for Studying the Effect of Changing Strain Rate on the Plastic Response of Metals"

Nov. 1990 Ph.D., W. Tong, "Pressure-Shear Impact Investigation of Strain-Rate History Effects in OFHC Copper"

May 1991 Sc.M., J. Jarrell, "The Dislocation Structure of OFHC Copper Deformed by High Rate Pressure-Shear"

Dec. 1991 Ph.D., H.D. Espinosa, "Micromechanics of the Dynamic Response of Ceramics and Ceramic Composites" (Supervised with Prof. M. Ortiz)

Oct. 1992 Ph.D., L.P. Grotelueschen "Computer Simulation of Dislocation Dynamics in a Lennard-Jones Crystal Model" (Supervised with Prof. J.H. Weiner).

Dec. 1992 Ph.D., V. Prakash "Plate Impact Investigation of Dynamic Fracture Initiation and Time-Resolved Friction"

May 1993 Ph.D., M. Zhou "Dynamic Shear Localization in a Tungsten Heavy Alloy and Ductile Rupture in a Spheroidized 1045 Steel"

May 1993 Ph.D., H. Mei, "Theoretical and Experimental Study on Plasticity of Aluminum Single Crystals"

May 1993 Ph.D., G.F. Raiser, "Dynamic Failure Resistance of Ceramics and Glasses"

May 1994 Sc.M., S. Sundaram, “Shearing Resistance of Ceramic Powder Under High Pressures and High Shear Rates”

May 1995 Sc.M., K. Frutschy, “Pressure-Shear Plate Impact Experiments for Measurement of Friction at High Temperatures"

May 1996 Ph.D., J. Escobar, “Plate Impact Induced Phase Transformations in Cu-Al-Ni Single Crystals”

May 1997 Sc.M., Z. Zhang, "Dynamic Response of 4340 VAR Steel in Shear"

May 1997 Ph.D., K. Frutschy, "High-Temperature Pressure-Shear Plate Impact Experiments on OFHC Copper and Pure Tungsten Carbide"

May 1997 Sc.M., S.-Y. Yang, "Study of Phase Transformations in Solids Using Statistical Mechanics"

July 1997	Ph.D., S. Sundaram, "Pressure-Shear Plate Impact Studies of Alumina Ceramics and the Influence of an Intergranular Glassy Phase"
May 1998	Sc.M., N. Bhate, "Study of Dislocation Mobility in NiAl" (co-advised with S. Kumar and R. Phillips)
May 1999	Ph.D., K. Duprey, "High Strain Rate Constitutive Response of Thin Tantalum Foils and Tungsten Heavy Alloys"
Dec. 1999	Ph.D., S.-Y. Yang, "Computational Modeling of Stress-Wave-Induced Martensitic Phase Transformations in Cu-Al-Ni and Ni-Ti"
May 2001	Ph.D., N. Bhate, “Computational and Experimental Studies of Dislocation Dynamics,” (co-advised with S. Kumar and R. Phillips)
May 2002	Ph.D., V. Kothnur, “An Experimental and Computational Investigation of Dynamic Ductile Fracture in Stainless Steel AL6XN Welds”
Aug. 2005	Ph.D., Z. Zhang, “Shear Band Propagation from a Crack Tip Subjected to Shear Wave Loading”
Dec. 2008	Ph.D., S. Grunschel, “Pressure-Shear Plate Impact Experiments on High Purity Aluminum at Temperatures Approaching Melt”