

CURRICULUM VITAE

ROBERT FRANCIS COOK, Ph.D.

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EDUCATION

- Postdoctoral: 1985-1986, Ceramic Sciences, IBM Research, T.J. Watson Research Center, Yorktown Heights, NY.
- Graduate: 1981-1985, Ph.D. School of Physics, University of New South Wales, Australia.
Ph.D. Thesis Topic: “Strength Characterisation of Ceramics using Controlled Indentation Flaws”
- Undergraduate: 1977-1980, B.Sc. (First Class Honors). Physics Department, Monash University, Australia.
Majors: Materials Science and Solid State Physics
Honors Thesis Topic: “Void Formation in Quartz”

EMPLOYMENT

Independent Scientist, Winterville, NC

March 2020 – Present

National Institute of Standards and Technology, Gaithersburg, MD

December 2011 – February, 2020: NIST Fellow

December 2006 – November 2011: Leader, Nanomechanical Properties Group and Deputy Chief, Ceramics Division.

University of Maryland, College Park, MD

August 2005 – November 2006: Senior Research Scientist, Materials Science and Engineering.

Appteric Technologies, Santa Clara, CA

August 2004 – July 2005: Vice-President and Chief Technical Officer.

University of Minnesota, Minneapolis, MN

August 1998 – July 2004: Professor, Chemical Engineering and Materials Science.

IBM Research, Yorktown Heights, NY

January 1996 – May 1998: Research Staff Member, Silicon Technology Department

1995: Senior Manager, Imaging Science and Technology Department

1994: Staff Member, Technical Plans and Controls Department

September 1986 – December 1993: Research Staff Member, Physical Sciences Department

National Bureau of Standards, Gaithersburg, MD

August 1982 – June 1983, July 1984 – November 1984: Guest Worker, Inorganic Materials Division.

HONORS AND AWARDS

- 2017 Journal of Materials Science, Robert W. Cahn Best Paper Prize
- 2016 Journal of Materials Research, Best Paper of the Year
- 2015 NIST Material Measurement Laboratory Accolade for unwavering mentorship of NIST staff members and associates
- 2014 American Ceramic Society, Robert B. Sosman Award
- 2011 United States Department of Commerce, Bronze Medal Award for Superior Service for development and application of a scanning probe measurement method
- 2008 United States Department of Commerce, Silver Medal Award for Scientific Engineering Achievement for development of gold nanoparticle reference materials
- 2002 University of Minnesota, "Favorite Professor" of Materials Science and Engineering Undergraduates
- 1999 American Ceramic Society, Richard M. Fulrath Award
- 1998 IBM, First Plateau Invention Achievement Award
- 1998 American Ceramic Society, Fellow
- 1998-2016 Gordon Research Conference, Thin Film and Small Scale Mechanical Behavior, Chair, 2002; Speaker and Vice-Chair, 2000; Discussion Leader, 1998, 2016
- 1986-2012 Gordon Research Conference, Solid State Studies in Ceramics, Vice-Chair, 2006; Discussion Leader, 1990, 1992, 1999; Speaker, 1986, 1994, 2005, 2012
- 1981-1984 Australia, Commonwealth Postgraduate Research Award

BOOK and BOOK CHAPTERS

1. *Particle Strengths*, R.F. Cook, Wiley, New York (2023).
2. “Theory of Time-Dependent Failure for Fractal Porous Aggregates,” R.F. Cook in *Defects and Processes in the Solid State: Geoscience Applications, The McLaren Volume*. Ed. J.N. Boland and J.D. Fitz Gerald, Elsevier (1993) pp. 229-242.
3. **(Encyclopedia Article)** “Mechanical Properties of Ceramics,” R.F. Cook and G.M. Pharr, in *Materials Science and Technology*, Ed. R.W. Cahn, P. Haasen, and E.J. Kramer, VCH, Weinheim, (1994) pp. 339-407.
4. **(Encyclopedia Article)** “Strength of Ceramics,” R.F. Cook, in *Encyclopedia of Advanced Materials*, Ed. D. Bloor, R.J. Brook, M.C. Flemings, and S. Mahajan, Pergamon Press, Oxford (1994) pp. 2679-2685.
5. “Measurement Science and Technology for Ceramics Innovations,” D.L. Kaiser and R.F. Cook, in *Global Roadmap for Ceramics and Glass Technology*, Ed. S. Freiman, R. Cook, T. Coyle, G. Fischman, J. Hellman, M. Green, L. Hobbs, K. Logan, C. Sideridis, M. Singh, and J. Smith, John Wiley and Sons, Hoboken, NJ (2007) pp. 89-116.
6. “Mechanical Properties of One-Dimensional Nanostructures,” G. Stan and R.F. Cook, in *Scanning Probe Microscopy in Nanoscience and Nanotechnology*, Ed. B. Bhushan, Springer-Verlag, Heidelberg (2010) pp. 571-611.
7. “Indentation and Adhesion at Small Length Scales,” R.F. Cook, in *Handbook of Nanoindentation with Biological Applications*, Ed. M.L. Oyen, Pan Stanford Publishing, Singapore (2010) pp. 23-38.
8. “Mechanics of Adhesion,” R.F. Cook, in *Handbook of Nanoindentation with Biological Applications*, Ed. M.L. Oyen, Pan Stanford Publishing, Singapore (2010) pp. 77-121.
9. “Size measurements of nanoparticles using atomic force microscopy,” J. Grobelny, F.W. DelRio, N. Pradeep, D.-I. Kim, V.A. Hackley, and R.F. Cook, in *Methods in Molecular Medicine, Characterization of Nanoparticles Intended for Drug Delivery*, Ed. S.E. McNeil, Springer (2011), pp. 71-82.
10. “Elastic, Adhesive, and Charge Transport Properties of Self-Assembled Monolayers: A Conducting-Probe Atomic Force Microscopy Study,” F. DelRio and R. Cook, in *Scanning Probe Microscopy in Nanoscience and Nanotechnology*, Vol. 2, Ed. B. Bhushan, Springer-Verlag, (2011) pp. 439-471.

ARCHIVAL PUBLICATIONS

1. "Effect of Machining Damage on the Strength of a Glass-Ceramic," R.F. Cook, B.R. Lawn, T.P. Dabbs and P. Chantikul, *J. Am. Ceram. Soc.* **64** (1981) C121-C122.
2. "Water Bubble Formation in Synthetic Quartz," A.C. McLaren, R.F. Cook, S.T. Hyde and R.C. Tobin, *J. Microsc. Spectrosc. Electron.* **7** (1982) 397-403
3. "Fatigue Analysis of Brittle Materials using Indentation Flaws: II-Case Study on a Glass Ceramic," R.F. Cook, B.R. Lawn and G.R. Anstis, *J. Mat. Sci.* **17** (1982) 1108-1117.
4. "A Comparative Study of the Fatigue Properties of SYNROC and Borosilicate Glass," R.F. Cook, B.R. Lawn, T.P. Dabbs, K.D. Reeve, E.J. Ramm and J.L. Woolfrey, *J. Am. Ceram. Soc.* **65** (1982) C172-C173.
5. "The Mechanisms of the Formation and Growth of Water Bubbles and Associated Dislocation Loops in Synthetic Quartz," A C. McLaren, R.F. Cook, S.T. Hyde and R.C. Tobin, *Phys. Chem. Minerals* **9** (1983) 79-84.
6. "Dynamic Fatigue of Brittle Materials Containing Indentation Line Flaws," B L. Symonds, R.F. Cook and B.R. Lawn, *J. Mat. Sci.* **18** (1983) 1306-1314.
7. "Theory of Fatigue for Brittle Flaws Originating from Residual Stress Concentrations," E.R. Fuller, Jr., B.R. Lawn and R.F. Cook, *J. Am. Ceram. Soc.* **66** (1983) 314-321.
8. "Universal Fatigue Curves for Ceramics using Indentation Flaws," H. Multhopp, R.F. Cook and B. R. Lawn, *J. Mat. Sci. Letters* **2** (1983) 683-684.
9. "Fracture of Ferroelectric Ceramics," R.F. Cook, S.W. Freiman, B.R. Lawn and R.C. Pohanka, *Ferroelectrics* **50** (1983) 267-272.
10. "A Modified Indentation Toughness Technique," R.F. Cook and B.R. Lawn, *J. Am. Ceram. Soc.* **66** (1983) C200-C201.
11. "Controlled Indentation Flaws for Construction of Toughness and Fatigue Master Maps," R.F. Cook and B.R. Lawn, *J. Res. of National Bureau of Standards* **89** (1984) 453-465.
12. "Microstructure-Strength Properties in Ceramics: I-Effect of Crack Size on Toughness," R.F. Cook, B.R. Lawn and C.J. Fairbanks, *J. Am. Ceram. Soc.* **68** (1985) 604-615.
13. "Microstructure-Strength Properties in Ceramics: II-Fatigue Relations," R.F. Cook, B.R. Lawn and C.J. Fairbanks, *J. Am. Ceram. Soc.* **68** (1985) 616-623.
14. "Effect of Microstructure on Reliability Predictions for Glass-Ceramics," R.F. Cook, S.W. Freiman and T.L. Baker, *Mater. Sci. Eng.* **77** (1986) 199-212.
15. "The Effect of Lateral Crack Growth on the Strength of Contact Flaws in Brittle Materials," R.F. Cook and D.H. Roach, *J. Mat. Res.* **1** (1986) 589-600.
16. "Crack Propagation Thresholds: A Measure of Surface Energy," R.F. Cook, *J. Mat. Res.* **1** (1986) 852-860.
17. "Microstructural Effects on Grinding of Alumina and Glass Ceramics," D.B. Marshall, B.R.

- Lawn and R.F. Cook, *J. Am. Ceram. Soc.* **70** (1987) C139-C140.
18. "Crack Resistance By Interfacial Bridging: Its Role in Determining Strength Characteristics," R.F. Cook, C. J. Fairbanks, B.R. Lawn and Y.-W. Mai, *J. Mat. Res.* **2** (1987) 345-356.
 19. "Fracture Toughness Measurements of $\text{YBa}_2\text{Cu}_3\text{O}_8$ Single Crystals," R.F. Cook, T.R. Dinger and D.R. Clarke, *Appl. Phys. Letters* **51** (1987) 454-456.
 20. "Fracture Properties of Polycrystalline $\text{YBa}_2\text{Cu}_3\text{O}_8$," R.F. Cook, T.M. Shaw and P.R. Duncombe, *Adv. Ceram. Mat.* **2** (1987) 606-614.
 21. "Calcium Segregation to Grain Boundaries in Alumina," R.F. Cook and A.G. Schrott, *J. Am. Ceram. Soc.* **71** (1988) 50-58.
 22. "Fracture Stability, R-Curves and Strength Variability," R.F. Cook and D.R. Clarke, *Acta metall.* **36** (1988) 555-562.
 23. "Indentation Induced Amorphization and Conductivity of Silicon and Germanium," D.R. Clarke, C.M. Kroll, P.D. Kirchner, R.F. Cook and B.J. Hockey, *Phys. Rev. Letters* **60** (1988) 2156-2159.
 24. "Effective-Medium Theory for the Fracture of Fractal Porous Media," R.F. Cook, *Phys. Rev. B*, **39** (1989) 2811-2814.
 25. "Influence of Crack Velocity Thresholds on Stabilized Non-Equilibrium Fracture," R.F. Cook, *J. Appl. Phys.* **65** (1989) 1902-1910.
 26. "The Effect of Grain Size on Microstructure and Stress Relaxation in Polycrystalline $\text{YBa}_2\text{Cu}_3\text{O}_8$," T.M. Shaw, S.L. Shinde, D. Dimos, R.F. Cook, P.R. Duncombe and C. Kroll, *J. Mat. Res.* **4** (1989) 248-256.
 27. "Stick-Slip During Fibre Pull-Out," R.F. Cook, M.D. Thouless, D.R. Clarke, and M.C. Kroll, *Scripta metall.* **23** (1989) 1725-1730.
 28. "Instrumentation of a Conventional Hardness Tester for Load-Displacement Measurement During Indentation," G.M. Pharr and R.F. Cook, *J. Mat. Res.* **5** (1990) 847-851.
 29. **(Overview)** "Direct Observation and Analysis of Indentation Cracking in Glasses and Ceramics," R.F. Cook and G.M. Pharr, *J. Am. Ceram. Soc.* **73** (1990) 787-817.
 30. "Force measurement using an a.c. atomic force microscope," W.A. Ducker, R.F. Cook, and D.R. Clarke, *J. Appl. Phys.* **67** (1990) 4045-4052.
 31. "Segregation Effects in the Fracture of Brittle Materials: $\text{Ca-Al}_2\text{O}_3$," R.F. Cook, *Acta metall.* **38** (1990) 1083-1100.
 32. "Stress-Corrosion Cracking in Silicon," M.D. Thouless and R.F. Cook, *Appl. Phys. Letters* **56** (1990) 1962-1964.
 33. "Rapid Measurement of Static and Dynamic Surface Forces," W.A. Ducker and R.F. Cook, *Appl. Phys. Letters* **56** (1990) 2408-2410.

34. "Lateral Cracks and Microstructural Effects in the Indentation of Y_2O_3 ," R.F. Cook, M.R. Pascucci, and W.H. Rhodes, *J. Am. Ceram. Soc.* **73** (1990) 1873-1878.
35. "Surface Stress Effects on Indentation Fracture Sequences," R. Tandon, D.J. Green, and R.F. Cook, *J. Am. Ceram. Soc.* **73** (1990) 2619-2627.
36. "Lanthanide Gallate Perovskite-Type Substrates for High-Temperature Superconducting Cuprate Films," E.A. Giess, R.L. Sandstrom, W.J. Gallagher, A. Gupta, S.L. Shinde, R.F. Cook, E.I. Cooper, E.J.M. O'Sullivan, J.M. Roldan, A. Segmuller, and J. Angillelo, *IBM J. Res. Develop.* **34** (1990) 916-926.
37. "Alternative Length Scales for Polycrystalline Materials - I. Microstructure Evolution," C.S. Nichols, R.F. Cook, D.R. Clarke, and D.A. Smith, *Acta metall.* **39** (1991) 1657-1665.
38. "Alternative Length Scales for Polycrystalline Materials - II. Cluster Morphology," C.S. Nichols, R.F. Cook, D.R. Clarke, and D.A. Smith, *Acta metall.* **39** (1991) 1667-1675.
39. "Electrical Resistance of Metallic Contacts on Silicon and Germanium during Indentation," G.M. Pharr, W.C. Oliver, R.F. Cook, P.D. Kirchner, M.C. Kroll, T.R. Dinger, and D.R. Clarke, *J. Mat. Res.* **7** (1992) 961-972.
40. "Grain-Size Effects in the Indentation Fracture of MgO," R.F. Cook and E.G. Liniger, *J. Mater. Sci.* **27** (1992) 4751-4761.
41. "Cone Crack Nucleation at Sharp Contacts," R. Tandon and R.F. Cook, *J. Am. Ceram. Soc.* **75** (1992) 2877-2880.
42. "Strength Variability in Brittle Materials with Stabilizing and Destabilizing Resistance Fields," R. Tandon, D.J. Green, and R.F. Cook, *Acta metall.* **41** (1993) 399-408.
43. "Mechanical Behavior of Al_2O_3 -SiC 'Nanocomposites'," J. Zhao, L.C. Stearns, M.P. Harmer, H.M. Chan, G.A. Miller, and R.F. Cook, *J. Am. Ceram. Soc.* **76** (1993) 503-510.
44. "Indentation Crack Initiation and Propagation in Tempered Glass," R. Tandon and R.F. Cook, *J. Am. Ceram. Soc.* **76** (1993) 885-889.
45. **(Invited)** "Kinetics of Indentation Cracking in Glass," R.F. Cook and E.G. Liniger, *J. Am. Ceram. Soc.* **76** (1993) 1096-1106.
46. Reply to "Comment on 'Role of Grain Size in the Strength and R-Curve Properties of Alumina'," B.R. Lawn, L.M. Braun, S.J. Bennison, and R.F. Cook, *J. Am. Ceram. Soc.* **76** (1993) 1900-1901.
47. "A Controlled Flaw Technique for Lifetime Characterization," E.G. Liniger and R.F. Cook, *J. Am. Ceram. Soc.* **76** (1993) 2123-2126.
48. **(Invited)** "Sigmoidal Indentation-Strength Characteristics of Polycrystalline Alumina," R.F. Cook, E.G. Liniger, R.W. Steinbrech, and F. Deuerler, *J. Am. Ceram. Soc.* **77** (1994) 303-314.
49. "Trapped Cracks at Indentations: I, Experiments on Yttria-Tetragonal Zirconia Polycrystals," R.F. Cook, L.M. Braun, and W.R. Cannon, *J. Mater. Sci.* **29** (1994) 2133-2142.

50. "Trapped Cracks at Indentations: II, Fracture Mechanics Model," R.F. Cook and L.M. Braun, *J. Mater. Sci.* **29** (1994) 2192-2204.
51. "Deformation and Fracture By Sharp Rolling Contacts," R.F. Cook, *J. Am. Ceram. Soc.* **77** (1994) 1263-1273.
52. "Indentation Load-Displacement Behavior During Conventional Hardness Testing," R.F. Cook and G.M. Pharr, *J. Hard Mater.* **5** (1994) 179-191.
53. "Indentation Fracture of Polycrystalline Cubic Materials," R.F. Cook, E.G. Liniger, and M.R. Pascucci, *J. Hard Mater.* **5** (1994) 190-212.
54. "Crack Healing and Stress Relaxation in Al₂O₃-SiC 'Nanocomposites'," A.M. Thompson, H.M. Chan, M.P. Harmer, and R.F. Cook, *J. Am. Ceram. Soc.* **78** (1995) 567-571.
55. "Nanoscopically Engineered Organic-Inorganic Hybrids as Low Dielectric Constant, High Modulus Insulating Materials for Microelectronic Applications," J.L. Hedrick, R.D. Miller, D. Yoon, H.-J. Cha, H.R. Brown, S.A. Srinivasan, R. Di Pietro, V. Flores, J.P. Hummel, R.F. Cook, E.G. Liniger, E.E. Simonyi and D.P. Klaus, *ACS Polymer Preprints* **38** (1997) 985-986.
56. **(Invited)** Phase-Separated Inorganic-Organic Hybrids for Microelectronic Applications," R.D. Miller, J.L. Hedrick, D.Y. Yoon, R.F. Cook, and J.P. Hummel, *MRS Bulletin*, **22** (1997) 44-48.
57. "Polymeric Organic-Inorganic Hybrid Nanocomposites: Preparation of Polyimide Modified Poly(silsesquioxane) using Functionalized Poly(amic acid alkyl ester) Precursors," J.L. Hedrick, H.-J. Cha, R.D. Miller, D.Y. Yoon, H.R. Brown, S. Srinivasan, R. Di Pietro, R.F. Cook, J.P. Hummel, D.P. Klaus, E.G. Liniger and E.E. Simonyi, *Macromolecules* **30** (1997) 8512-8515.
58. "Toughness-Curve Behavior of an Alumina-Mullite Composite," A. Khan, H.M. Chan, M.P. Harmer and R.F. Cook, *J. Am. Ceram. Soc.* **81** [10] (1998) 2613-2623.
59. **(Invited)** "Environmentally-Controlled Non-Equilibrium Crack Propagation in Ceramics," R.F. Cook, *Mater. Sci. Eng. A*, **260** (1999) 29-40.
60. "Stress-Corrosion Cracking of Low Dielectric-Constant Spin-On Glass Thin Films," R.F. Cook and E.G. Liniger, *J. Electrochem. Soc.*, **146** (1999) 4439-4448.
61. "Method and Apparatus for Preventing Chip Breakage During Semiconductor Manufacturing Using Wafer Grinding Striation Information," R.L. Mendelson, R.F. Cook, D.F. Diefenderfer and E.G. Liniger, United States Patent, **5,888,838** (March, 1999).
62. "Process for Manufacture of Integrated Circuit Device," C.J. Hawker, W. Volksen, J.L. Hedrick, K. Carter, D.Y. Yoon, R.D. Miller, S. Kim, M.A. Harbison, R.F. Cook and E.G. Liniger, United States Patent, **5,953,627** (September, 1999)
63. "Toughening of an Alumina-Mullite Composite by Unbroken Bridging Elements," A. Khan, H.M. Chan, M.P. Harmer and R.F. Cook, *J. Am. Ceram. Soc.* **83** (2000) 833-840.

64. "Alumina Agglomerate Effects on Toughness-Curve Behavior of Alumina-Mullite Composites," A. Khan, H.M. Chan, M.P. Harmer and R.F. Cook, *J. Am. Ceram. Soc.*, **83** (2000) 3089-3094.
65. "Chip Crack Stop," R.L. Mendelson, R.F. Cook, E.G. Liniger and R.C. Whiteside, United States Patent, **6,022,791** (February, 2000)
66. "Integrated Circuit having Crack Stop for Interlevel Dielectric Layers," R.F. Cook, E. Garcia, N.A. Greco, S.E. Greco and E.N. Levine, United States Patent, **6,091,131** (July, 2000).
67. "Chemical vapor deposition of an aluminum nitride-diamond composite in a Triple Torch Plasma Reactor," M. Asmann, R.F. Cook, J.V. Heberlein and E. Pfender, *J. Mater. Res.*, **16** (2001) 469-477
68. "Technique for Estimating Fracture Resistance of Cultured Neocartilage," M. Oyen-Tiesma and R.F. Cook, *J. Mater. Sci: Mater. in Medicine* **12** (2001) 327-332
69. "Micellar Structure and Mechanical Properties of Block Copolymer Modified Epoxies," J.M. Dean, P.M. Lipic, R.B. Grubbs, R.F. Cook and F.S. Bates, *J. Polym. Sci., Part B: Polym. Phys.* **39** (2001) 2996-3010.
70. "Method and Apparatus for Preventing Chip Breakage During Semiconductor Manufacturing Using Wafer Grinding Striation Information," R.L. Mendelson, R.F. Cook, D.F. Diefenderfer and E.G. Liniger, United States Patent **6,171,873** B1 (January, 2001).
71. "Method for Producing a Crack Stop for Interlevel Dielectric Structures," R.F. Cook, E. Garcia, N.A. Greco, S.E. Greco and E.N. Levine, United States Patent, **6,174,814** B1 (January, 2001).
72. "Process for Manufacture of Integrated Circuit Device," C.J. Hawker, W. Volksen, J.L. Hedrick, J.L. Lee, K. Carter, D.Y. Yoon, R.D. Miller, M.A. Harbison, R.F. Cook and E.G. Liniger, United States Patent **6,177,360** (January, 2001).
73. "Mechanical Strength Die Sorting," R.F. Cook, R.L. Mendelson, E.G. Liniger and D.R. Sanders, United States Patent **6,222,145** (April, 2001).
74. "Method and System for Dicing Wafers, and Semiconductor Structures Incorporating the Products Thereof," T.G. Ference, R.L. Mendelson, R.F. Cook, E.G. Liniger, D.W. Brouillete and W.J. Howell, United States Patent **6,271,102** B1 (August, 2001)
75. "Interim Oxidation of Silsesquioxane Dielectric for Dual Damascene Process," R.F. Cook, S.E. Greco, J.P. Hummel, J. Liu, V.J. McGahay, R. Mih and K. Srivastava, United States Patent, **6,329,280** B1 (December, 2001).
76. **(Invited)** "Mechanisms Active During Fracture Under Constraint," R.F. Cook and Z. Suo, *MRS Bulletin* **27** (2002) 45-51.
77. "Stress-Hysteresis During Thermal Cycling of Plasma-Enhanced Chemical Vapor Deposited Silicon Oxide Films," J. Thurn and R.F. Cook, *J. Appl. Phys.* **91** (2002) 1988-1992.
78. "Structure, Electrical, and Mechanical Properties Development During Curing of Low-k

- Hydrogen Silsesquioxane Films,” Y. Toivola, J. Thurn, and R.F. Cook, *J. Electrochem. Soc.* **149** (2002) F9-F17.
79. “A Simplified Area Function for Sharp Indenter Tips in Depth-Sensing Indentation,” J. Thurn and R.F. Cook, *J. Mater. Res.* **17** (2002) 1143-1146.
 80. “Stable Dielectric Fracture at Interconnects from Electromigration Stresses,” J. Thurn and R.F. Cook, *Acta Mater.* **50** (2002) 2627-2637.
 81. “Depth-Sensing Indentation at Macroscopic Dimensions,” J. Thurn, D.J. Morris and R.F. Cook, *J. Mater. Res.* **17** (2002) 2679-2690.
 82. **(Invited)** “Application of a physically-consistent theory of brittle fracture,” J. Thurn and R.F. Cook, *Phil. Mag. A* **82** (2002) 3151-3162.
 83. “In Situ Formation of Protective Layer on Silsesquioxane Dielectric for Dual Damascene Process,” R.F. Cook, S.E. Greco, J.P. Hummel, J. Liu, V.J. McGahay, R. Mih and K. Srivastava, United States Patent, **6,348,736** (February, 2002).
 84. “Interim Oxidation of Silsesquioxane Dielectric for Dual Damascene Process,” R.F. Cook, S.E. Greco, J.P. Hummel, J. Liu, V.J. McGahay, R. Mih and K. Srivastava, United States Patent, **6,479,884 B2** (November, 2002).
 85. “Load-Displacement Behavior during Sharp Indentation of Viscous-Elastic-Plastic Materials,” M. L. Oyen and R.F. Cook, *J. Mater. Res.* **18** (2003) 139-150.
 86. “Adhesion between Immiscible Polymers Correlated with Interfacial Entanglements,” P.J. Cole, R.F. Cook and C.W. Macosko, *Macromolecules* **36** (2003) 2808-2815.
 87. “The effects of inter-surface cohesive forces on linear and penny-shaped cracks,” J. Thurn and R.F. Cook, *International J. Fracture* **119** (2003) 103-124.
 88. “Mechanical Properties of Block Copolymer Vesicle and Micelle Modified Epoxies,” J.M. Dean, R.B. Grubbs, W. Saad, R.F. Cook and F.S. Bates, *J. Polym. Sci., Part B: Polym. Phys.* **41** (2003) 2444-2456.
 89. “Influence of Deposition Conditions on Mechanical Properties of LPCVD Low-Stress Silicon Nitride Films,” Y.A. Toivola, J. Thurn, R.F. Cook, K.G. Roberts and G. Cibuzar, *J. Appl. Phys.*, **94** (2003) 6915-6922.
 90. “Semiconductor structure and package including a chip having chamfered edges,” D.W. Brouillette, R.F. Cook, T.G. Ference, W.J. Howell, E.G. Liniger and R.L. Mendelson, United States Patent, **6,600,213** (July 2003)
 91. “Controlling Crack Propagation,” R.F. Cook, *Nature Materials*, **3** (2004) 15-16.
 92. “Four-point Bend Adhesion Measurements of Copper and Permalloy Systems,” M.P. Hughey, D.J. Morris, R.F. Cook, S.P. Bozeman, B.L. Kelly, S.L.N. Chakravarty, D.P. Harkens and L.C. Stearns, *Engin. Fracture Mech.* **71/2** (2004) 245-261.
 93. “Indentation-induced deformation at ultramicroscopic and macroscopic contacts,” J. Thurn and R.F. Cook, *J. Mater. Res.* **19** (2004) 124-130.

94. "Sharp probes of varying acuity: instrumented indentation and fracture behavior," D.J. Morris, S.B. Myers and R.F. Cook, *J. Mater. Res.* **19** (2004)165-175.
95. "Depth-Sensing Indentation Response of Ordered Silica Foam" Y. Toivola, A. Stein and R.F. Cook, *J. Mater. Res.* **19** (2004) 260-271.
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216. “High-throughput bend-strengths of ultra-small polysilicon MEMS components,” R.F. Cook, B.L. Boyce, L.H. Friedman, and F.W. DelRio, *Appl. Phys. Letters* **118** (2021) 201601.
217. “Edge chipping at small scales and strengths of diced components,” R.F. Cook *Zenodo*. <http://doi.org/10.5281/zenodo.4924668> (2021).
218. “Deformation and fracture of hydrogel spheres in diametral compression,” M.R. Islam, R.F. Cook, and M.L. Oyen. *Zenodo* <https://doi.org/10.5281/zenodo.8021380> (2023).
219. “Fracture mechanics of placental release and abruption,” R.F. Cook and M.L. Oyen. *Zenodo* <https://doi.org/10.5281/zenodo.8021588> (2023).

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 See <http://scholar.google.com/citations?user=1xJVvuUAAAAJ> for citation details

Upcoming

220. “Poroelastic indentation relaxation of hydrogels,” R.F. Cook and M.L. Oyen, to be submitted, *Zenodo* (2023).

REVIEWED SYMPOSIUM PROCEEDINGS

1. Controlled Indentation Flaws for Construction of Toughness and Fatigue Master Maps,” R.F. Cook and B.R. Lawn, in *Methods for Assessing the Structural Reliability of Brittle Materials*, Ed. S.W. Freiman and C.M. Hudson, ASTM STP **844**, Philadelphia, PA (1984) pp. 22-42.
2. “Fatigue Properties of Ceramics with Natural and Controlled Flaws: A Study on Alumina,” A.C. Gonzalez, H. Multhopp, R.F. Cook, B.R. Lawn and S.W. Freiman, in *Methods for Assessing the Structural Reliability of Brittle Materials*, Ed. S.W. Freiman and C.M. Hudson, ASTM STP **844**, Philadelphia, PA (1984) pp. 43-56.
3. “Microstructure and the Strength of Ceramics,” C.J. Fairbanks, B.R. Lawn, R.F. Cook, and Y.-W. Mai, in *Fracture Mechanics of Ceramics 8*, Ed. R.C. Bradt, A.G. Evans, D.P.H. Hasselman and F.F. Lange, Plenum, NY (1986) pp. 23-37.
4. “Effect of Changes in Grain Boundary Toughness on the Strength of Alumina,” R.F. Cook, in *Advanced Structural Ceramics*, Ed. P.F. Becher, M.V. Swain and S.Somiya, MRS Symposium Proceedings, Vol. **78**, Pittsburgh, PA (1987) 199-206.
5. “Transient Fracture Resistance in the Weak Toughening Limit,” R.F. Cook, in *Advances in Fracture Research*, Vol. **4**, Ed. K. Salama, K. Ravi-Chandar, D.M.R. Taplin, and P. Rama Rao, Pergamon, Oxford (1989) pp. 2747-2755.
6. “Crack Formation in Brittle Materials by Sharp Contact,” G.M. Pharr, W.C. Oliver, and R.F. Cook, in *Advances in Fracture Research*, Vol. **6**, Ed. K. Salama, K. Ravi-Chandar, D.M.R. Taplin, and P. Rama Rao, Pergamon, Oxford (1989) pp. 3723-3730.
7. “Dislocation Emission from Crack Tips and the Macroscopic Brittle-to-Ductile Transition,” D.R. Clarke and R.F. Cook, in Inst. Phys. Conf. Ser. No. **104**, *Proceedings of the 6th International Symposium of the Structure and Properties of Dislocations in Semiconductors*, (1989) pp.397-407.
8. “The Reliability Study of Laser Trimmed Resistor Components,” Y. Huang, R.F. Cook, and W.F. Smith, in *Proceedings of the 41st Electronic Components and Technology Conference*, IEEE (1991) pp. 323-327.
9. “Alternative Length Scales for Polycrystalline Materials,” C.S. Nichols, R.F. Cook, D.R. Clarke, and D.A. Smith, in *Defects in Materials*, Ed. P.D. Bristowe, J.E. Epperson, J.E. Griffith, and Z. Liliental-Weber, MRS Symposium Proceedings, Vol. **209**, Pittsburgh, PA (1991) pp. 27-32.
10. “Effect of Stress on Trapped Cracks in Y-TZP,” L.M. Braun and R.F. Cook, in *Science and Technology of Zirconia V*, Ed. M.J. Bannister and R.H.J. Hannink, Technomic Press (1993), pp. 386-400.
11. “Toughened, Inorganic-Organic Hybrid Materials for Microelectronic Application,” J.L. Hedrick, S. Srinivasan, H.-J. Cha, D.Y. Yoon, V. Flores, M. Harbison, R. Di Pietro, W. Hinesberg, V. Deline, H.R. Brown, M. Sherwood, E. Paulson, R.D. Miller, R. Cook, E. Liniger, E. Simonyi, D. Klaus, S. Cohen and J. Hummel, in *Low Dielectric Constant*

- Materials II*, Ed. A. Lagendijk, H. Treichel, K.J. Uram and A.C. Jones, MRS Symposium Proceedings, Vol. **443**, Pittsburgh, PA (1997) pp. 47-58.
12. "Stress-Corrosion Cracking of Low Dielectric-Constant Spin-On Glass Thin Films," in *Dielectric Material Integration for Microelectronics*, Ed. W.D. Brown, S.S. Ang, M. Loboda, B. Sammakia, R. Singh and H.S. Rathore. Electrochemical Society (1998) pp. 129-148.
 13. "Properties Development During Curing of Low Dielectric-Constant Spin-On Glasses," R.F. Cook, E.G. Liniger, D.P. Klaus, E.E. Simonyi and S.A. Cohen, in *Low-Dielectric Constant Materials IV*, Ed. C. Chiang, P.S. Ho, T.-M. Lu and J.T. Wetzel, MRS Symposium Proceedings, Vol. **511**, Pittsburgh, PA (1998), 33-38.
 14. "Characterization of Spin-On Glasses by Microindentation," E.E. Simonyi, K.-W. Lee, R.F. Cook, E.G. Liniger and J. Speidell, in *Low-Dielectric Constant Materials IV*, Ed. C. Chiang, P.S. Ho, T.-M. Lu and J.T. Wetzel, MRS Symposium Proceedings, Vol. **511**, Pittsburgh, PA (1998), 157-164.
 15. "Stress-Corrosion Cracking of Spin-On Glass Thin Films," R.F. Cook and E.G. Liniger, in *Low-Dielectric Constant Materials IV*, Ed. C. Chiang, P.S. Ho, T.-M. Lu and J.T. Wetzel, MRS Symposium Proceedings, Vol. **511**, Pittsburgh, PA (1998), 171-176.
 16. "Polymeric Organic-Inorganic Hybrid Nanocomposites: Preparation of Polyimide Modified Poly(silsesquioxane) using Functionalized Poly(amic alkyl ester) Precursors," J.L. Hedrick, R.D. Miller, D.Y. Yoon, H.-J. Cha, H.R. Brown, S. Srinivasan, R. Di Pietro, V. Flores, J.P. Hummel, R.F. Cook, E.G. Liniger, E.E. Simonyi and D.P. Klaus, in *High Performance Polymers*, ACS Symposium Series, Vol. **695** (1998) 371-383.
 17. "Porous organosilicates for on-chip dielectric applications," R D. Miller, R. Beyers, K R. Carter, R F. Cook, M. Harbison, C J. Hawker, J L. Hedrick, V. Lee, E. Liniger, C. Nguyen, J. Remenar, M. Sherwood, M. Trollsas, W. Volksen, D Y. Yoon, in *Low-Dielectric Constant Materials V* Materials Research Society Symposium Proceedings, Vol. **565** (1999) 3-15.
 18. **(Invited)** "Mechanical Properties of Low Dielectric-Constant Organic-Inorganic Hybrids," R.F. Cook, in *Organic/Inorganic Hybrid Materials II*, Ed. L.C. Klein, L.F. Francis, M.R. DeGuire and J.E. Mark, MRS Symposium Proceedings, Vol. **576** Pittsburgh, PA (1999), 301-312.
 19. "Load-Displacement Behavior During Sharp Indentation of Viscous-Elastic-Plastic Materials," M. Oyen-Tiesma, Y.A. Toivola and R.F. Cook, in *Nanoindentation and Nanotribology II*, Ed. S.P. Baker, R.F. Cook, S. G. Corcoran and N.R. Moody. MRS Symposium Proceedings Vol. **649** Pittsburgh, PA (2001) pp. Q1.5.1-6
 20. **(Proceedings Editor)** *Nanoindentation and Nanotribology II*, Editors S.P. Baker, R.F. Cook, S.G. Corcoran and N.R. Moody. MRS Symposium Proceedings Vol. **649** Pittsburgh, PA (2001), Preface p. xi.
 21. "Apatite growth on bioactive glass in artificial saliva," S.E. Efflandt, R.F. Cook and L.F. Francis, in *Biomaterials for Drug Delivery and Tissue Engineering*, MRS Symposium Proceedings Vol. **662** Pittsburgh, PA (2001) pp. LL2.5.1-LL2.5.5.

22. "Stress Hysteresis and Mechanical Characterization of Plasma-Enhanced Chemical Vapor Deposited Dielectrics," J. Thurn, R.F. Cook, M. Kamarajugadda, L.C. Stearns, in *Thin Films: Stresses and Mechanical Properties IX* Ed. C.S. Ozkan, R.C. Cammarata, L.B. Freund and H. Gao, MRS Proceedings Volume **695** Pittsburgh, PA (2002) pp. L3.9.1-6.
23. "Indentation Fracture Toughness Measurements of Low Dielectric Constant Materials," D.J. Morris and R.F. Cook, in *Materials, Technology and Reliability for Advanced Interconnects and Low-k Dielectrics*, Ed. A. McKerrow, J. Leu, O. Kraft and T. Kikkawa, MRS Proceedings Volume **766** Pittsburgh, PA (2003) pp. E9.3.1-6.
24. "Stress Stability of PECVD Silicon Nitride Films During Device Fabrication," M.P. Hughey and R.F. Cook, in *Materials, Technology and Reliability for Advanced Interconnects and Low-k Dielectrics* Ed. A. McKerrow, J. Leu, O. Kraft and T. Kikkawa, MRS Proceedings Volume **766** Pittsburgh, PA (2003) pp. E6.3.1-6.
25. "Issues in Modeling Slitting of Magnetic Tapes," R. Andruet, R.F. Cook and W. Qualls, *Proceedings of 7th International Conference on Web Handling*, Stillwater, OK, June, 2003; also as "Modeling Slitting of Magnetic Tapes," R.H. Andruet, R.F. Cook, and W.R. Qualls, University of Minnesota Supercomputing Institute Research Report *UMSI 2004/23*, February 2004.
26. "Irreversible Tensile Stress Development in PECVD Silicon Nitride Films," M.P. Hughey and R.F. Cook, in: *Thin Films-Stresses and Mechanical Properties X*, Ed. S.G. Corcoran, Y.-C. Joo, N.R. Moody, Z. Suo, MRS Symposium Proceedings Vol. **795** (2004) pp U1.6.1-6.
27. "Toughness and Contact Behavior of Conventional and Low-k Dielectric Thin Films," R.F. Cook, D.J. Morris, and J. Thurn, in: *Thin Films-Stresses and Mechanical Properties X*, Ed. S.G. Corcoran, Y.-C. Joo, N.R. Moody, Z. Suo, MRS Symposium Proceedings Vol. **795** (2004) pp U4.1.1-12.
28. **(Trophy Award: Best of Symposium Proceedings Paper)** "Uniaxial and biaxial mechanical behavior of human amnion," M.L. Oyen, T. Stylianopoulos, V.H. Barocas, R.F. Cook and S.E. Calvin, in *Mechanical Properties of Bioinspired and Biological Materials*, Ed. C. Viney, K. Katti, F.-J. Ulm, C. Hellmich, MRS Symposium Proceedings Vol. **844** (2005) pp. Y5.3.1-6.
29. "Microstructural Control of Indentation Crack Extension Under Externally Applied Stress," R.F. Cook, in *Fracture Mechanics of Ceramics*, **14** Ed. K.W. White, R.C. Bradt, M. Sakai and D. Munz. Plenum Press, (2005) pp. 57-68.
30. "Strength and Fracture Measurements at the Nano Scale," E.R. Fuller, Jr., G.D. Quinn, and R.F. Cook, in *Frontiers of Characterization and Metrology for Nanoelectronics: 2007*, Ed. D.G. Seiler, A.C. Diebold, R. McDonald, C.M. Garner, D. Herr, R.P. Khosla, and E.M. Secula, American Institute of Physics Conference Proceedings **931** (2007) pp. 156-160.
31. "Effects of topography and multi-asperity contacts on nano-scale elastic property measurements by atomic force acoustic microscopy," G. Stan and R.F. Cook, in *Frontiers of Characterization and Metrology for Nanoelectronics: 2007*, Ed. D.G. Seiler, A.C. Diebold, R. McDonald, C.M. Garner, D. Herr, R.P. Khosla, and E.M. Secula, American Institute of

Physics Conference Proceedings **931** (2007) pp. 540-544.

32. "How Baby Plants Avoid Getting Hurt and Blossom into Adulthood: The Story of a Tropical Seed," P.W. Lucas, R. Cook, and T.K. Lowrey, in *Mechanics of Biological and Bio-Inspired Materials*, Ed. C. Viney, K. Katti, C. Hellmich, and U. Wegst, MRS Symposium Proceedings Vol. **975** (2007).
33. "Lateral Force Lever for Precise Atomic Force Microscope Friction Measurements," M.G. Reitsma, R.S. Gates, and R.F. Cook, *Society for Experimental Mechanics Conference Proceedings*, June 2008.
34. "Torsional spring constant measurement of a T-shaped atomic force microscope cantilever," M.G. Reitsma, R.S. Gates, and R.F. Cook, *Society for Experimental Mechanics Conference Proceedings*, June 2009.
35. "Stress-Intensity Factor and Toughness Measurement at the Nanoscale using Confocal Raman Microscopy," R.F. Cook, Y.B. Gerbig, J. Schoenmaker, and S.J. Stranick, *12th International Conference on Fracture Conference Proceedings*, Ottawa, Canada, July, 2009 **5:3758** (Curran Associates, Red Hook, NY).
36. "Fracture toughness measurement of thin nanoporous films on stiff substrates," D.J. Morris and R.F. Cook, *12th International Conference on Fracture Conference Proceedings*, Ottawa, Canada, July, 2009 **6:4156** (Curran Associates, Red Hook, NY).
37. "Theta-like Specimens to Determine Tensile Strength at the Micro Scale," M.S. Gaither, F.W. DelRio, R.S. Gates, E.R. Fuller, and R.F. Cook, MEMS 2010: *23rd International Meeting on Micro Electro Mechanical Systems*, Technical Digest, pp. 540-543.
38. "Advanced nanoscale elastic property characterization by contact-resonance atomic force microscopy," G. Stan and R.F. Cook, *Nanotech Conference & Expo 2010* **1:1**.
39. "Advances in Metrology for the Determination of Young's Modulus for low-k Dielectric Thin Films," S.W. King, G.A. Antonelli, G. Stan, R.F. Cook, and R. Sooryakumar, in *Instrumentation, Metrology, and Standards for Nanomanufacturing, Optics, and Semiconductors VI*, Ed. M.T. Postek, V.A. Coleman, and N.G. Orji, Proceedings of SPIE Volume **8466**, pp. 84660A1-7.
40. "High Confidence Level Calibration for AFM Based Fracture Testing of Nanobeams," S. Grutzik, R. Gates, Y. Gerbig, R. Cook, M.A. Hines, and A. Zehnder in *Experimental and Applied Mechanics*, Volume **4**, Ed. C.E. Ventura, W.C. Crone, and C. Furlong, Proceedings of the 2012 Annual Conference on Experimental and Applied Mechanics (2013) pp 43-49.
41. "Raman spectroscopy-enhanced IIT: In situ analysis of mechanically stressed polycrystalline Si thin films," Y.B. Gerbig, C.A. Michaels, and R.F. Cook, in Proceedings of the SEM 2014 Annual Conference & Exposition on Experimental and Applied Mechanics, Greenville, SC, June 2014.

INVITED PRESENTATIONS

1. "Fracture and Fatigue Properties of Ceramics," R.F. Cook and B.R. Lawn, Ceramic Materials and Their Use in Defense Technology, An International Workshop, Melbourne, September 1981.
2. "Controlled Indentation Flaws to Study the Fatigue of Brittle Materials," R.F. Cook, University of California, Berkeley, December 1982.
3. "Recent Developments in the Modeling of Machining Damage in Brittle Materials," R.F. Cook, CSIRO Advanced Materials Laboratory, Melbourne, September 1983.
4. "Characterizing Ceramic Strength," R.F. Cook, The Pennsylvania State University, State College, August 1984.
5. "Microstructure and the Strength of Ceramics," R.F. Cook, IBM T.J. Watson Research Center, Yorktown Heights, September 1984.
6. "Fracture Properties of Synroc and Borosilicate Glass," R.F. Cook, Australian Atomic Energy Commission, Sydney, May 1985.
7. "Microstructure and the Strength of Ceramics," R.F. Cook, Ohio State University, Columbus, November 1985.
8. "Microstructural Effects in the Fracture of Brittle Materials," R.F. Cook, Materials Science Seminar, IBM T.J. Watson Research Center, January 1986.
9. "Microstructure - Toughness Relations," R.F. Cook, Materials and Processing Science Symposium, IBM T.J. Watson Research Center, March 1986.
10. "Effect of Calcium Segregation on the Toughness of Alumina," R.F. Cook, National Bureau of Standards, Gaithersburg, June 1986.
11. "Microstructure and Toughness of Ceramics," R.F. Cook, Gordon Research Conference on Ceramic Interfaces, Microstructure and Toughness, August 1986.
12. "What the Fracture Experiment Can Tell us About Surface Energies," R.F. Cook, Physical Sciences Seminar, IBM T.J. Watson Research Center, September 1986.
13. "Microstructure and Toughness of Ceramics," R.F. Cook, Lehigh University, Bethlehem, February 1987.
14. "Microstructure and Toughness of Ceramics," R.F. Cook, DuPont Experimental Station, Wilmington, March 1987.
15. "Microstructure and Toughness of Ceramics: New Implications for Processors and Designers," R.F. Cook, New England Section of The American Ceramic Society, Boston, April 1987.
16. "Microstructure and Ceramic Fracture: The Role of Interface Toughness," R.F. Cook, Fall Meeting of The Metallurgical Society, Cincinnati, October 1987.
17. "Fracture of Fractal Structures," R.F. Cook, Materials Science Seminar, IBM T.J. Watson

Research Center, December 1987.

18. "Fracture in Inhomogeneous Materials," R.F. Cook, Columbia University, New York, February 1988.
19. "Fracture of (Aggregated) Fractal Structures," R.F. Cook, The Pennsylvania State University, State College, PA, February 1988.
20. "Toughening By Interfacial Crack Bridging," R.F. Cook, IBM East Fishkill Facility, March 1988.
21. "An Informal Review of the J-integral in Fracture," M.D. Thouless and R.F. Cook, Materials Science Seminar, IBM T.J. Watson Research Center, May 1988.
22. "An Overview of Current Issues in Fracture and Toughening Mechanisms," R.F. Cook, Annual Meeting of American Ceramic Society, Cincinnati, OH, May, 1988.
23. "Fracture of Inhomogeneous Materials," R.F. Cook, Schlumberger-Doll Research, Ridgefield, CT, May, 1988.
24. "Equilibrium, Surface Energies, and Non-equilibrium Fracture," R.F. Cook, Austceram88, Sydney, Australia, August 1988.
25. "Fracture in Inhomogeneous Materials," R.F. Cook, University of Sydney, Sydney, Australia, August 1988.
26. "Fracture of (Aggregated) Fractal Structures," R.F. Cook, Monash University, Melbourne, Australia, August 1988.
27. "Surface Force Effects in Equilibrium and Kinetic Fracture," R.F. Cook, Melbourne University, Melbourne, Australia, September 1988.
28. "What is the Use of an R-Curve ?" R.F. Cook, Rutgers University, Piscataway, NJ, October 1988.
29. **(Tutorial)** "Physics of Fracture," R.F. Cook, IBM T.J. Watson Research Center, Technical Education Ceramics Tutorial, January, 1989; also at IBM East Fishkill Facility, February, 1989.
30. "Transient Fracture Resistance in the Weak Toughening Limit," R.F. Cook, International Conference on Fracture 7, Houston, TX, March, 1989.
31. "Surface Force Effects in Equilibrium and Kinetic Fracture," R.F. Cook, Rice University, Houston, TX, March, 1989.
32. "Microscopic Interface Properties and Macroscopic Fracture Properties," R.F. Cook and M.D. Thouless, University of Massachusetts, Amherst, MA, April, 1989; also at MRS Symposium on Interfaces between Metals, Polymers and Ceramics, San Diego, CA, April 1989.
33. "Nonequilibrium Crack Growth Models for Time Dependent Failure," R.F. Cook, Michigan State University, Lansing MI, May, 1989.

34. "Segregation Effects in the Strength of Brittle Materials," R.F. Cook, DOE sponsored workshop on Strong Solids, Los Alamos, NM, August, 1989.
35. "Crack Velocity Characteristics and Interatomic Kinetic Processes," R.F. Cook, NIST/ONR sponsored workshop on Fracture Computations, Gaithersburg, MD, September, 1989.
36. "Fibre Pullout, Stick-Slip, and an Attractor," R.F. Cook, University of Pennsylvania, Philadelphia, PA, September, 1989.
37. "Fibre Pullout, Stick-Slip, and an Attractor," R.F. Cook, Rice University, Houston, TX, October, 1989.
38. "Surface Force Effects in Equilibrium and Kinetic Fracture," R.F. Cook, University of Illinois, Urbana, IL, October, 1989.
39. "Fibre Pullout, Stick-Slip, and an Attractor," R.F. Cook, University of Houston, Houston, TX, October, 1989.
40. "Measuring and Modeling Crack Velocities in Glass from 10^{-2} to 10^{-12} m s⁻¹," R.F. Cook, Materials Science Seminar, IBM T.J. Watson Research Center, February 1990.
41. "Dealing with Stress under Sharp Particle Contacts," R.F. Cook, Physical Sciences Seminar, IBM T.J. Watson Research Center, March 1990.
42. "Toughening Processes in Fiber-Reinforced Composites," R.F. Cook, New York State Section of the American Physical Society: Physics of Advanced Materials Systems, Alfred University, Alfred, NY, April 1990.
43. "Fragmentation of Films," R.F. Cook, South Texas Fracture Group, University of Houston, Houston, TX, September, 1990.
44. "Fragmentation of Films," R.F. Cook, University of Houston, Houston, TX, February, 1991.
45. "Fragmentation of Films," R.F. Cook, Rice University, Houston, TX, February, 1991.
46. "Fragmentation of Films," R.F. Cook, LANL sponsored workshop on Dynamics of Microstructures, Los Alamos National Laboratory, NM, February, 1991.
47. "Atomic-Scale Fracture Parameters for Indentation Cracks in Glass," R.F. Cook, The Pennsylvania State University, State College, PA, May, 1991.
48. **(Tutorial)** "Structural Ceramics," R.F. Cook. A series of 6 lectures presented at the International Nathiagali Summer College on Physics and Contemporary Needs, Nathiagali, Pakistan, July, 1991. Extended Abstracts in *Physics and Contemporary Needs* **16**, ed. S.A. Ahmad and J.A.A. Khan, National Book Foundation, Islamabad (1993) pp. 15-23.
49. "Fragmentation Patterns in Tensile Films," R.F. Cook, DARPA sponsored workshop on Mechanical and Electrical Properties of Thin Films, La Jolla, CA, July, 1991.
50. "Fragmentation Patterns in Tensile Films," R.F. Cook, National Institute of Standards and Technology, Gaithersburg, MD, September, 1991.
51. "Toughness Issues for Contacts on Brittle Surfaces," R.F. Cook, NSIC and NSF sponsored

- workshop on “Microtribology-Tribochemistry and Data Storage,” St. Louis, MO, October, 1991.
52. “Use of Surface Stresses in the Failure Prevention of Cordierite Glass-Ceramics,” R.F. Cook, Materials Science Seminar, IBM T.J. Watson Research Center, November, 1991.
 53. **(Tutorial)** “Elasticity and Fracture of Ceramics,” R.F. Cook, IBM East Fishkill Facility, Technical Education Tutorial, November, 1991.
 54. “Kinetics of Indentation Cracking in Glass,” R.F. Cook, Annual Meeting of American Ceramic Society, Minneapolis, MN, April, 1992.
 55. “Strengthening Glass-Ceramics By Surface Compression,” R.F. Cook, The Pennsylvania State University, State College, PA, May, 1992.
 56. “Contact Fracture and Deformation of Slider and Disc Materials,” R.F. Cook, IBM AdStaR, San Jose, CA, October 1992.
 57. “Properties of Whisker-Reinforced Cordierite Glass-Ceramics,” R.F. Cook and K.G. Frase, Pacific Coast Meeting of American Ceramic Society, San Francisco, CA, November, 1992.
 58. “Properties of Whisker-Reinforced Cordierite Glass-Ceramics,” R.F. Cook and K.G. Frase, University of California at Santa Barbara, November, 1992.
 59. “Toughening Glass-Ceramic Electronic Substrates,” R.F. Cook, Materials Science Club of New York, Manhattan, NY, February, 1993.
 60. “Strength of Alumina,” R.F. Cook, International Conference on Science of Alumina, Schloss Ringberg, Germany, March, 1993.
 61. “Stress-Corrosion Cracking of Ceramics,” R.F. Cook, MRS Symposium on Deformation and Failure in Rocks and Ceramics, San Francisco, CA, April, 1993.
 62. “Fracture of Fused Silica,” R.F. Cook, Discussion on Fracture of Silica Glasses, Rennselaer Polytechnic Institute, Troy, NY, July, 1993.
 63. “Stress-Corrosion Cracking of Materials for Microelectronics,” R.F. Cook, Annual Meeting of American Ceramic Society, Indianapolis, IN, April, 1994.
 64. “Effects of Macroscopic Residual Stresses on Fracture,” R.F. Cook, Gordon Research Conference on Architectural Design of Ceramic Structures for Optimum Performance, New Hampton, NH, August, 1994.
 65. “Mechanical Characterization of Electronic Substrate Ceramics,” R.F. Cook, American Ceramic Society Basic Science Division Fall Meeting (in conjunction with Ceramic Manufacturers & Suppliers Workshop & Exhibition), Louisville, KY, September, 1994.
 66. **(Tutorial)** “Increasing the Reliability of Materials for Microelectronics,” R.F. Cook, IBM Charlotte Technical Vitality Symposium, Charlotte, NC, April, 1995.
 67. “Overview of Stress-Corrosion Cracking in Ceramic Materials,” R.F. Cook, Annual Meeting of American Ceramic Society, Cincinnati, OH, May, 1995.

68. "Stress-Corrosion Cracking in Microelectronic Materials," R.F. Cook, ASMI Hudson Valley Chapter Meeting, Cold Spring, NY, February, 1996.
69. "Thermal Effects in the Failure of Soda-Lime Silicate and Fused Silica Glasses, R.F. Cook, Annual Meeting of American Ceramic Society, Indianapolis, IN, April, 1996.
70. "Stress-Corrosion Cracking in Microelectronic Materials," R.F. Cook, Columbia University, New York, NY, October, 1996.
71. "Increasing the Mechanical Reliability of Electronic Materials," R.F. Cook, Bell Laboratories, Murray Hill, NJ, November, 1996.
72. "Fragmentation During Brittle Fracture of Ceramics, Glass and Films, R.F. Cook and E.G. Liniger, DuPont Experimental Station, Wilmington, DE, December, 1996.
73. "Stress-Corrosion Cracking of Fused Silica," R.F. Cook, Fracture of Silica Glasses Symposium, Bellcore, Morristown, NJ, February, 1997.
74. "Reliability Predictions for Fracture in the Intrinsic Flaw Domain," R.F. Cook, Workshop on The Role of Microstructure in Reliability Prediction in Ceramics, University of Houston, Houston, TX, February, 1997.
75. "A Binary Method for Reliability Assessment," R.F. Cook and E.G. Liniger, Annual Meeting of American Ceramic Society, Cincinnati, OH, May, 1997.
76. "Non-Equilibrium Crack Propagation in Ceramics," R.F. Cook, DOE Panel on Time-Dependent Interfacial Failure, Chestertown, MD, June, 1997.
77. "Increasing the Mechanical Reliability of Electronic Materials," R.F. Cook, University of Pennsylvania, Philadelphia, PA, September, 1997.
78. "Increasing the Mechanical Reliability of Electronic Materials," R.F. Cook, University of Illinois, Urbana-Champaign, IL, September, 1997.
79. "Stress-Corrosion Cracking of Low Dielectric-Constant Spin-On Glass Thin Films," R.F. Cook and E.G. Liniger, Electrochemical Society Meeting, San Diego, CA, May, 1998.
80. "Fragmentation Patterns in Tensile Films (A.K.A. 'Mudcracking')," R.F. Cook, Coating Process Fundamentals Seminar, University of Minnesota, Minneapolis, MN, January, 1999.
81. "Increasing the Mechanical Reliability of Microelectronic Materials," R.F. Cook, 3M Center, St Paul, MN, February, 1999.
82. "The Wet and The Dry—Crack Propagation in Brittle Materials," R.F. Cook, Department of Geology and Geophysics, University of Minnesota, Minneapolis, MN, March, 1999.
83. "Mechanical Properties of Low Dielectric-Constant Organic-Inorganic Hybrids," R.F. Cook, MRS Spring Meeting, San Francisco, CA, April, 1999.
84. "Mechanical Behavior of Microelectronic Materials" R.F. Cook, Rutgers University, Piscataway, NJ, April, 1999.
85. "Increasing the Mechanical Reliability of Microelectronic Materials," R.F. Cook, Fulrath

- Award Lecture, Annual Meeting of American Ceramic Society, Indianapolis, IN, May, 1999.
86. "Thin-Film Stress Development and Adhesion Measurement," R.F. Cook, Seagate Technology, Normandale, MN, May, 1999.
 87. "Toughening Low Dielectric-Constant Spin-On Glasses," Dow Corning, Midland, MI, June, 1999.
 88. "Mechanical Properties of Low Dielectric-Constant Spin-On Glasses," R.F. Cook, Texas Instruments, Dallas, TX, November, 1999.
 89. "Stress Development in Dielectric Thin Films," R.F. Cook, MRS Fall Meeting, Boston, MA, December, 1999.
 90. "Stress-Corrosion Cracking of Microelectronic Materials," The Electrochemical Society, Twin Cities Section meeting, Minneapolis, MN, December, 1999.
 91. "Failure Prevention by Compressive Surface Stresses," R.F. Cook, Department of Aerospace Engineering and Mechanics, University of Minnesota, January 2000.
 92. "Advanced Microelectronic Interconnection Materials," R.F. Cook, Seagate Technology, Normandale, MN, March, 2000.
 93. "Mechanical Properties of Low Dielectric Constant Hydrogen Silsesquioxane (FOX) Thin Films," R.F. Cook, J. Thurn, Y. Toivola and D. Morris, Dow Corning, Midland, MI, March 2000.
 94. "Stable Dielectric Fracture at Interconnects from Electromigration Stresses," R.F. Cook and J. Thurn, MRS Spring Meeting, San Francisco, CA, April 2000.
 95. "Mechanical Characterization of Strain-Rate Sensitive Materials," R.F. Cook, Testing Technology for the New Millennium Symposium, MTS Systems, Inc., Eden Prairie, MN, April, 2000.
 96. "Fracture of Dielectric Thin Films," R.F. Cook, Gordon Research Conference on Thin Film Mechanical Behavior, Plymouth, NH, July 2000
 97. "Stress and Fracture in Thin-Film and Bulk Ceramics," R.F. Cook, B.F. Goodrich, Burnsville, MN, March 2001.
 98. "Application of a Physically-Consistent Theory of Brittle Fracture," R.F. Cook and J. Thurn, International Conference on the Fundamentals of Fracture 6, Cirencester, UK, March 2001.
 99. **(Tutorial)** "Depth-Sensing Indentation (DSI) Testing," R.F. Cook and Y.A. Toivola, Imation, Woodbury, MN, April 2001
 100. "Fracture and Reliability of Low-Dielectric-Constant Thin Films," R.F. Cook, Y. Toivola and J. Thurn, ASME Mechanics and Materials 2001, San Diego, CA, June, 2001.
 101. "Mechanical Stability and Characterization of Dielectric Thin Films," R.F. Cook, J. Thurn, D.J. Morris, Y.A. Toivola and M.P. Hughey, MRS Fall Meeting, Boston, MA, December, 2001.

102. "Time-Dependent Mechanical Properties of Materials at Small Length Scales," R.F. Cook, Monash University, Melbourne, VIC, January 2002.
103. **(Tutorial)** "Measurement of Elastic, Plastic, Viscous and Fracture Properties of Materials by Nanoindentation," R.F. Cook, Nanoprobe Masterclass, University of Minnesota, May 2002.
104. "Mechanical Properties Measurement at Sub-Micrometer Length Scales," R.F. Cook, Novel Techniques and Applications of Materials Testing Workshop, University of Minnesota-MTS, September 2002.
105. "Time-Dependent Mechanical Behavior of Materials at Small Length Scales," R.F. Cook, University of Michigan, February 2003.
106. "Microstructural Control of Indentation Crack Extension under Externally Applied Stress," R.F. Cook, 8th International Symposium on Fracture Mechanics of Ceramics, Houston, TX, February 2003.
107. "Mechanical Stability and Characterization of Dielectric Thin Films," R.F. Cook, Cornell University, Ithaca, NY, September, 2003
108. "Toughness and Contact Behavior of Conventional and Low-*k* Dielectric Thin Films," R.F. Cook, D.J. Morris and J. Thurn, MRS Fall Meeting, Boston, MA, December, 2003.
109. "Predictions of Fracture-Limited Yield and Reliability for Ceramics in Energy Conversion Devices" R.F. Cook, 28th International Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, FL, January 2004.
110. "Crack Geometry Effects in the Fracture of Residually-Stressed Glasses and Ceramics," R.F. Cook and D.J. Morris, Annual Meeting of American Ceramic Society, Indianapolis, IN, April 2004.
111. "Environmental Effects on the Fracture and Reliability of Ceramic Thin Films and Interfaces," R.F. Cook, Annual Meeting of American Ceramic Society, Baltimore, MD, April 2005.
112. "Scale Effects in the Contact Behavior of Ordered Silica Foam," R.F. Cook, Annual Meeting of American Ceramic Society, Baltimore, MD, April 2005.
113. "Nanoindentation Deformation and Fracture of Ceramics and Dielectric Films," R.F. Cook, Gordon Research Conference on Solid State Studies in Ceramics, Tilton, NH, July, 2005
114. "Contact Damage Induced Fracture in Porous and Quasi-Porous Materials," R.F. Cook, MRS Fall Meeting, Boston, MA, December, 2005.
115. "Not Your Father's Hardness Test: Nanoindentation of Brittle Materials", R.F. Cook, Carnegie Mellon University, Pittsburgh, PA, February, 2006.
116. "Not Your Father's Hardness Test: Nanoindentation of Brittle Materials" R.F. Cook, University of Maryland, College Park, MD, March, 2006.
117. "Stress Development in SiN_x Thin Films," R.F. Cook, Novellus Systems, Inc., Tualatin,

OR, March 2006.

118. "Direct Observation of "Ductile" Deformation during Fracture of Adhesive Contacts," R.F. Cook, Harvard University, Cambridge, MA, April, 2006.
119. "Nanoindentation of Polymeric Materials," R.F. Cook, Polymer Interphase Consortium Review meeting, Kingsport, TN, May 2006
120. "Measurement Science and Technology for Ceramics Innovations," D. L. Kaiser and R.F. Cook, First International Congress on Ceramics, Toronto, Canada, June 2006
121. "Nanoindentation behavior and mechanical properties measurement of polymeric materials," R.F. Cook and M. L. Oyen, Nanomech7, Hückelhoven, Germany, September, 2006
122. "Not Your Father's Hardness Test: Nanoindentation of Brittle Materials", R.F. Cook, University of Melbourne, Melbourne, Australia, July 2007.
123. "Not Your Father's Hardness Test: Nanoindentation of Brittle Materials" R.F. Cook, Australian National University, Canberra, Australia, July 2007.
124. "Not Your Father's Hardness Test: Nanoindentation of Brittle Materials", R.F. Cook, University of New South Wales, Sydney, Australia, July 2007.
125. "Nanoscale Elastic Property Measurements using Atomic Force Microscopy: ZnO Nanowires," R.F. Cook and G. Stan, MS&T07, Detroit, MI, September, 2007.
126. "Fundamentals of Crack Growth and their use in Reliability Predictions for Brittle Components," R.F. Cook, MS&T07, Detroit, MI, September, 2007
127. "Measurements and Standards for Advanced Inorganic Materials," D.L. Kaiser and R.F. Cook, Next Generation Materials for Defense 07, Arlington, VA, December, 2007.
128. "Fracture and Toughness Measurements at the Nano Scale," R.F. Cook, NIST, February 2008.
129. "Nanomechanics Measurements and Standards at NIST," R.F. Cook, F.W. DelRio, and D.J. Morris, Robert Bosch, San Jose CA, March 2008
130. "Nanomechanics Measurements and Standards at NIST," R.F. Cook, F.W. DelRio, and D.J. Morris, Qualcomm, San Jose CA, March 2008
131. "Measurements and Standards for Advanced Materials," D.L. Kaiser and R.F. Cook, Next Generation Materials for Defense 08, Arlington, VA, December, 2008.
132. "Stress-Intensity Factor and Toughness Measurement at the Nanoscale using Confocal Raman Microscopy," R.F. Cook, Y.B. Gerbig, J. Schoenmaker, S.J. Stranick, 12th International Conference on Fracture, Ottawa, July 2009.
133. "Mapping Grain-Boundary Elastic Properties in Nanocrystalline Gold," G. Stan and R.F. Cook, MS&T09, Pittsburgh, PA, October, 2009.
134. **(Tutorial)** "Nano 101: Nanoparticle Measurements and Standards," R.F. Cook, Colloids

and Surfaces, Nanoparticles, and Green Technology Conference and Symposium, New York, NY, November 2009.

135. "Molecular Modification of Gold Nanoparticle Surfaces for Biomedical Applications," R.F. Cook, F.W. DelRio, and T.J. Cho, Colloids and Surfaces, Nanoparticles, and Green Technology Conference and Symposium, New York, NY, November 2009.
136. "Measuring and Mapping Mechanical Properties with Nano-Scale Resolution," R.F. Cook, MRS Fall Meeting, Boston, MA, December, 2009.
137. "AFM-based techniques for measuring mechanical properties of compliant materials at the nanoscale," G. Stan and R.F. Cook, ExxonMobil-Asylum Research Workshop on Nanomechanical Characterization of Soft Materials with SPM, Clinton, NJ, April 2010.
138. "Future Directions for Nanoscale Characterization: Quantitative Standards," R.F. Cook, MRS Fall Meeting, Boston, MA, December, 2010.
139. "Nanoscale Measurements and Standards for Biomedical Applications," R.F. Cook, Design of Medical Devices Symposium, Minneapolis, MN, April 2011.
140. "Future Directions for Nanoscale Characterization: Absolute Nanomechanical Properties," R.F. Cook, Seeing at the Nanoscale IX, Santa Barbara, CA, July 2011
141. "What Are the Limits for Probing Nanoscale Mechanical Behavior in Ceramics?" R.F. Cook, Gordon Research Conference on Solid State Studies in Ceramics, South Hadley, MA, August 2012.
142. "Micro- and nano-scale strain mapping in lamellar and isolated domain structures in barium titanate," R.F. Cook, J.A. Howell, and M.D. Vaudin, Center for Dielectric Studies, Spring 2013 Meeting, State College, PA, May 2013.
143. "Multi-Scale Effects in the Strength of Ceramics," R.F. Cook, Sosman Award Lecture, MS&T14, Pittsburgh, PA, October, 2014.
144. "Multi-Scale Effects in the Strength of Ceramics," R.F. Cook, Johns Hopkins University, Baltimore, MD, February 2015.
145. "Brittle Fracture Properties Measurements and Applications in Reliability Predictions," R.F. Cook, Brittle Materials Assurance Prediction Program (BrittMAPP) Meeting, Albuquerque, NM, August 2015.
146. "In situ Raman spectroscopy-based imaging of the spatial distribution of phases induced during instrumented indentation of silicon," R.F. Cook, Y.B. Gerbig, and C.A. Michaels, TMS Meeting, Nashville, TN, February 2016.
147. "Micro- and nano-scale stress and strain mapping of small-scale structures," R.F. Cook, Imperial College, London, UK, June 2016.
148. "Mapping Viscoelastic and Plastic Properties of Polymers and Polymer-Nanotube Composites," R.F. Cook, PSI Consortium meeting, Gaithersburg, MD, October 2017
149. "Applicability of Weibull statistics for micro- and nano-scale silicon components," F.W. DelRio, R.F. Cook, and B. Boyce, Symposium: Fracture: 65 Years after the Weibull Distribution and the Williams Singularity, 2018 TMS Annual Meeting, Phoenix, AZ, March

- 2018.
150. "Nanomechanics of threshold effects in ultra-high strength distributions," Keynote Presentation, R.F. Cook and F.W. DelRio, 19th International Symposium on Micro- and Nanomechanics, Society of Experimental Mechanics Annual Meeting, Greenville, SC, June 2018.
 151. "Strain mapping using EBSD cross correlation and Raman methods" M.D. Vaudin, A.J. Gayle, W.A. Osborn, L.H. Friedman, and R.F. Cook, Microscopy and Microanalysis, Baltimore, MD, June 2018.
 152. "Nano- and micro-scale stress and strain mapping in brittle materials," R.F. Cook, International Materials Symposium, Providence RI, July 2018.
 153. "In situ spectroscopic analysis of the indentation-induced phase transformation of crystalline and amorphous silicon thin films by Raman spectroscopy enhanced indentation technique (RS-IT)," Y. Gerbig, C. Michaels, and R. Cook, MS&T Meeting, Columbus, OH, October 2018.
 154. "Fracture Sequences During Elastic-Plastic Indentation," R.F. Cook, Symposium on Small Scale Mechanical Behavior, College Station, TX, December 2018.

CONTRIBUTED PRESENTATIONS

1. "Use of Controlled Flaws for Obtaining Lifetime Data," R.F. Cook and B.R. Lawn, ASTM Symposium on Methods for Assessing the Structural Reliability of Brittle Materials, San Francisco, December 1982.
2. "Effect of Temperature on the Strength of Barium-Titanate," R.F. Cook, S.W. Freiman, B.R. Lawn and H. Multhopp, American Ceramic Society Annual Meeting, Chicago, April 1983.
3. "Recent Developments in the Use of Indentation Techniques for Measuring Fracture Toughness," R.F. Cook and B.R. Lawn, American Ceramic Society Annual Meeting, Chicago, April 1983.
4. "Linear Flaws and Machining Damage in Glass," R.F. Cook and B.R. Lawn, American Ceramic Society Annual Meeting, Chicago, April 1983.
5. "Fracture of Ferroelectric Ceramics," R.F. Cook, S.W. Freiman, B.R. Lawn and R.C. Pohanka, International Symposium on Applications of Ferroelectrics, NBS, June 1983.
6. "A Study of Microstructural Effects in Ceramics using Controlled Indentation Flaws, B.R. Lawn, S.W. Freiman and R.F. Cook, American Ceramic Society Annual Meeting, Pittsburgh, April 1984.
7. "Microstructure and Strength," R.F. Cook, Gordon Research Conference on Fracture Processes in Polyphase and Composite Ceramics, August 1984.
8. "Microstructure and Ceramic Strength," R.F. Cook, B.R. Lawn and C.J. Fairbanks, American Ceramic Society Annual Meeting, Cincinnati, April 1985.
9. "The Effect of Lateral Cracks on Contact Flaw Strength," R.F. Cook, American Ceramic Society Annual Meeting, Cincinnati, April 1985.
10. "Effect of Calcium Segregation on the Toughness of Alumina," R.F. Cook, American Ceramic Society Basic Science Meeting, New Orleans, November 1986.
11. "Contact Damage By Conical Rollers," R.F. Cook and M.V. Swain, American Ceramic Society Basic Science Meeting, New Orleans, November 1986.
12. "Effect of Changes in Grain Boundary Toughness on the Strength of Alumina," R.F. Cook, MRS Symposium on Advances in Structural Ceramics, Boston, December, 1986.
13. "Crack Propagation Thresholds in Brittle Materials," R.F. Cook, American Physical Society Annual Meeting, New York, March 1987.
14. "Interfacial Chemistry in the Fracture of ZnO/PAA Composites," K.G. Frase and R.F. Cook, American Ceramic Society Annual Meeting, Pittsburgh, April 1987.
15. "The Weak Toughening Limit in the Description of Brittle Fracture," R.F. Cook, American Physical Society Annual Meeting, New Orleans, LA, March 1988.
16. "Fracture of Fractal Structures," R.F. Cook, American Physical Society Annual Meeting, New Orleans, LA, March 1988.

17. "Fracture, Stability, and Strength Variability: The Relationship Between R-Curve Slope and Weibull Modulus," R.F. Cook and D.R. Clarke, Annual Meeting of American Ceramic Society, Cincinnati, OH, May, 1988.
18. "Towards a Universal Relationship for Crack Velocity Kinetics in Ceramics," R.F. Cook, D.R. Clarke and G.Y. Onoda, Annual Meeting of American Ceramic Society, Cincinnati, OH, May, 1988.
19. "The Escape from the Threshold," R.F. Cook, Annual Meeting of American Ceramic Society, Cincinnati, OH, May, 1988.
20. "Toughness and Strength Variations in Ca-Doped Alumina," R.F. Cook, Austceram88, Sydney, Australia, August 1988.
21. "Fracture of Fractal Materials," R.F. Cook, Austceram88, Sydney, Australia, August 1988.
22. "Effective-Medium Theory for the Fracture of Fractal Porous Media," R.F. Cook, MRS Symposium on Fractal Aspects of Materials: Disordered Systems, Boston, MA, December, 1988. Extended Abstract in Fractal Aspects of Materials: Disordered Systems, MRS, Pittsburgh, PA (1988) pp. 47-49.
23. "Nonequilibrium Fracture in Brittle Materials," R.F. Cook, Third International Conference on the Fundamentals of Fracture, Irsee, FRG, June, 1989.
24. "Breakdown-Resistance Relations for Inhomogeneous Media," R.F. Cook, DOE sponsored workshop on Interpenetrating Phase Composites, Snowmass, CO, July, 1989.
25. "Stick-Slip During Fiber Pullout," R.F. Cook, M.D. Thouless, and D.R. Clarke, MRS Symposium on Interfaces in Composite Materials, Boston, MA, December, 1989.
26. "Rapid Measurement of Static and Dynamic Surface Forces, W.A. Ducker and R.F. Cook, American Physical Society Annual Meeting, Anaheim, CA, March 1990.
27. "Measurement of Non-Equilibrium Crack Velocity Parameters," R.F. Cook, and E.G. Liniger, American Physical Society Annual Meeting, Anaheim, CA, March 1990.
28. "Force Measurement Using an a.c. Atomic Force Microscope," W.A. Ducker, R.F. Cook, and D.R. Clarke, Annual Meeting of American Ceramic Society, Dallas, TX, May, 1990.
29. "Direct Observation of Indentation Cracking in Brittle Materials," G.M. Pharr and R.F. Cook, Annual Meeting of American Ceramic Society, Dallas, TX, May, 1990.
30. "Microstructural Effects in the Fracture of Y_2O_3 ," M.R. Pascucci and R.F. Cook, Annual Meeting of American Ceramic Society, Dallas, TX, May, 1990.
31. "Surface Stress Effects on Indentation Fracture Sequences," R. Tandon, D.J. Green, and R.F. Cook, Annual Meeting of American Ceramic Society, Dallas, TX, May, 1990.
32. "Indentations, Thresholds, and Crack Length Variability in Y-TZP," L.M. Braun, W.R. Cannon, and R.F. Cook, Annual Meeting of American Ceramic Society, Dallas, TX, May, 1990.

33. "Threshold Effects in the Indentation Fracture of Y-TZP: I, Toughness Variability," R.F. Cook and L.M. Braun, American Ceramic Society Annual Meeting, Minneapolis, MN, April, 1992.
34. "Threshold Effects in the Indentation Fracture of Y-TZP: II, Fracture Mechanics Model," L.M. Braun and R.F. Cook, American Ceramic Society Annual Meeting, Minneapolis, MN, April, 1992.
35. "Cone Crack Initiation Under Vickers Indentation in Silicate Glasses," R. Tandon and R.F. Cook, American Ceramic Society Annual Meeting, Minneapolis, MN, April, 1992.
36. "Mechanical Behavior of Al₂O₃-SiC 'Nanocomposites'," J. Zhao, L.C. Stearns, M.P. Harmer, H.M. Chan, and R.F. Cook, American Ceramic Society Annual Meeting, Minneapolis, MN, April, 1992.
37. "Properties of Whisker-Reinforced Cordierite Glass-Ceramics," R.F. Cook and K.G. Frase, Gordon Research Conference on Solid State Studies in Ceramics, 1992.
38. "Stress-Corrosion Cracking of Ceramics," R.F. Cook, American Ceramic Society Annual Meeting, Cincinnati, OH, April, 1993.
39. "Effect of Stress on Trapped Cracks in Y-TZP," L.M. Braun and R.F. Cook, American Ceramic Society Annual Meeting, Cincinnati, OH, April, 1993.
40. "Stress Relaxation of Conductors for Microelectronics," A.D. Westwood, R.F. Cook and E.G. Liniger, MRS Fall Meeting, Boston, MA, December, 1993.
41. "Stress Relaxation of Copper, Aluminum and Aluminum Alloys," A.D. Westwood, R.F. Cook, E.G. Liniger and C.V. Noyan, MRS Spring Meeting, San Francisco, CA, April, 1994.
42. "Mechanical and Thermal Studies on AlN and Al₂O₃ Substrate Materials," A.D. Westwood, E.G. Liniger and R.F. Cook, American Ceramic Society Annual Meeting, Indianapolis, IN, April, 1994.
43. "Is it Stress or Corrosion that Controls Stress-Corrosion Kinetics in Ceramics?" R.F. Cook, American Ceramic Society Fall Meeting, San Antonio TX, November, 1996.
44. "Dynamic Fragmentation Patterns in Flexed Ceramic Discs," R.F. Cook and E.G. Liniger, American Ceramic Society Fall Meeting, San Antonio TX, November, 1996.
45. "Indentation Crack Extension in Non-Ideal (Real) Materials," R.F. Cook, E.G. Liniger, L.M. Braun, R. Tandon and D.J. Green, American Ceramic Society Annual Meeting, Cincinnati, OH, May, 1997.
46. "Toughness-Curve-Derived Intrinsic Strength Enhancement in a Model Alumina-Mullite Composite," A. Khan, H.M. Chan, M.P. Harmer and R.F. Cook, American Ceramic Society Annual Meeting, Cincinnati, OH, May, 1997.
47. "Non-equilibrium Crack Growth in Materials in Corrosive Environments," R.F. Cook, Fifth International Conference on the Fundamentals of Fracture, Gaithersburg, MD August, 1997. Extended Abstract in Institute of Mechanics and Materials Report No. **97-13** University of California San Diego (1997) pp. 108-109.

48. "Properties Development During Curing of Low Dielectric-Constant Spin-On Glasses," R.F. Cook, E.G. Liniger, D.P. Klaus, E.E. Simonyi and S.A. Cohen, MRS Spring Meeting, San Francisco, CA, April, 1998.
49. "Stress-Corrosion Cracking of Spin-On Glass Thin Films," R.F. Cook and E.G. Liniger, MRS Spring Meeting, San Francisco, CA, April, 1998.
50. "Characterization of Spin-On Glasses by Microindentation," E.E. Simonyi, K.-W. Lee, R.F. Cook, E.G. Liniger and J. Speidell, MRS Spring Meeting, San Francisco, CA, April, 1998.
51. "Thermally-Activated Cracking and Failure of Fused Silica," R.F. Cook, American Ceramic Society Annual Meeting, Cincinnati, OH, May, 1998.
52. "A Fingerprint for Fragmentation Patterns using Geometry and Topology," R.F. Cook and E. G. Liniger, American Ceramic Society Annual Meeting, Cincinnati, OH, May, 1998.
53. "Crystallographic Effects in the Fragmentation of Silicon," R.F. Cook and E. G. Liniger, American Ceramic Society Annual Meeting, Cincinnati, OH, May, 1998.
54. "Increased Mechanical Reliability of Ceramic Multilayer Structures," R.F. Cook, American Ceramic Society Minnesota Section Meeting, Minneapolis, MN, November, 1998.
55. "Stress and Strain Development in Thin Films," American Ceramic Society Minnesota Section Ceramic Thin Films Workshop, Minneapolis, MN, March, 1999.
56. "Reliability of Materials Containing Thin Surface-Stressed Layers," R.F. Cook, American Ceramic Society Annual Meeting, Indianapolis, IN May, 1999.
57. "3-D Finite Element Model of Thermal Stress Development," J. Thurn and R.F. Cook, CIE Coating Process Fundamentals Program Review, University of Minnesota, Minneapolis, MN, May, 1999.
58. "Development and Characterization of Spin-On Glass Thin Films," R.F. Cook, CIE Coating Process Fundamentals Program Review, University of Minnesota, Minneapolis, MN, May, 1999.
59. "Designing Stress Profiles for Longer Lifetimes and Greater Strength: Mutually Compatible Goals?" D.J. Morris and R.F. Cook, Gordon Research Conference on Solid State Studies in Ceramics, August, 1999.
60. "Excluded Crack Profiles Applied to Adhesive Elastic Contacts," J. Thurn and R.F. Cook, Coating Process Fundamentals Seminar, University of Minnesota, Minneapolis, MN, August, 1999.
61. "Proteoglycans Influence Fracture Behavior of Cultured Neocartilage," M. Oyen-Tiesma, J. Lewis, R. Cook, M. Cunningham, S. Johnson and T. Oegama, Orthopaedic Research Society Meeting, Orlando, FL, March, 2000. Extended Abstract in Trans. 46th ORS.
62. "Effects of Temperature on the Mechanical Reliability of Low Dielectric-Constant Spin-On Glasses," Y.A. Toivola, R.F. Cook and C. Saha, MRS Spring Meeting, San Francisco, CA, April, 2000.

63. "Phase Behavior and Mechanical Properties of Block Copolymer Modified Epoxies," J.M. Dean, P.M. Lipic, R.B. Grubbs, R.F. Cook and F.S. Bates, MRS Spring Meeting, San Francisco, CA, April, 2000.
64. "Physically Consistent Crack Profiles for Silica and Silicon," R.F. Cook and J. Thurn, American Ceramic Society Annual Meeting, St. Louis, MO, May, 2000.
65. "External Crack Profiles Applied to Adhesive Elastic Contacts," J. Thurn, R.F. Cook, L.F. Francis and L.E. Scriven, American Ceramic Society Annual Meeting, St. Louis, MO, May, 2000.
66. "Effects of Flaw Geometry on Strength and Lifetime," D.J. Morris and R.F. Cook, American Ceramic Society Annual Meeting, St. Louis, MO, May, 2000.
67. "Viscoelastic Stress-Relaxation of Cultured Neocartilage," M. Oyen-Tiesma, R. Cook and J. Lewis, Society for Experimental Mechanics International Congress, Orlando, FL, June, 2000.
68. "Fracture and Deformation of Capped Multilayer Dielectric Structures, R.F. Cook, J. Thurn and Y. A. Toivola and C. Saha, Society for Experimental Mechanics International Congress, Orlando, FL, June, 2000.
69. "Load-Displacement Behavior During Sharp Indentation of Viscous-Elastic-Plastic Materials," M. Oyen-Tiesma, Y.A. Toivola and R.F. Cook, MRS Fall Meeting, Boston, MA, November, 2000.
70. "Load-Displacement Behavior During Macro-Indentation," Y.A. Toivola, M.L. Cunningham, D.J. Morris and R.F. Cook, MRS Fall Meeting, Boston, MA, November, 2000.
71. "Mechanical Property Changes in LPCVD Deposited Low-Stress Silicon Nitride Films as Influenced by Stress Tuning of Deposition Parameters," K.G. Roberts, G.T. Cibuzar, J.A. Thurn, Y.A. Toivola and R.F. Cook, MRS Fall Meeting, Boston, MA, November, 2000.
72. "Apatite Growth on Bioactive Glass in Artificial Saliva," S.E. Efflandt, R.F. Cook and L.F. Francis, MRS Fall Meeting, Boston, MA, November, 2000.
73. **(Tutorial)** "Mechanical Characterization of Dielectrics for VLSI Interconnection Structures," R.F. Cook, J. Thurn, Y.A. Toivola and D.J. Morris, MRS Spring Meeting, San Francisco, CA, April, 2001.
74. "Deformation and Fracture at Nano-Contacts on Nano-Porous Materials," R.F. Cook and D.J. Morris, Society for Experimental Mechanics Annual Conference, Portland, OR, June 2001.
75. "Solution-Mediated Stress-Relaxation of an Artificial Cartilage," M. Oyen-Tiesma and R.F. Cook, Society for Experimental Mechanics Annual Conference, Portland, OR, June 2001.
76. "Microstructural Control of Fracture in an Artificial Tissue," M. Oyen-Tiesma and R.F. Cook, Society for Experimental Mechanics Annual Conference, Portland, OR, June 2001.
77. "A Viscous-Elastic-Plastic Model for Time-Dependent Indentation," M. Oyen-Tiesma, Y.A. Toivola and R.F. Cook, Nano Indenter Users Group Meeting, Las Vegas, NV, July 2001.
78. "A Simplified Area Function for Sharp Indenter Tips during Depth-Sensing Indentation,"

R.F. Cook, J. Thurn, and D. Morris, Nano Indenter Users Group Meeting, Las Vegas, NV, July 2001.

79. "Stress Hysteresis and Mechanical Characterization of Plasma-Enhanced Chemical Vapor Deposited Dielectrics," J. Thurn, R.F. Cook, M. Kamarajugadda and L.C. Stearns, MRS Fall Meeting, Boston, MA, December, 2001.
80. "Structural Changes in a Collagenous Soft Tissue during Mechanical and Thermal Treatment," M. Oyen-Tiesma, R.F. Cook, J.C. Bischoff, MRS Fall Meeting, Boston, MA, December, 2001.
81. "Thermomechanical Characterization of Sputtered Alumina Mechanical Barrier Coatings for Magnetic Read-Write Heads," J. Thurn and R.F. Cook, American Ceramic Society Annual Meeting, St. Louis, MO, May, 2002.
82. "Fracture Toughness Measurement of Low- k Dielectric Films," D.J. Morris and R.F. Cook, Sematech Ultra Low k Workshop, San Francisco, CA, June 2002.
83. "Stress Hysteresis and Mechanical Characterization of PECVD Dielectrics," R.F. Cook, J. Thurn, M. Kamarajugadda and L.C. Stearns, American Ceramic Society Fall Meeting, Seattle, WA, October, 2002.
84. "Biaxial Puncture Strength of Human Fetal Membrane Tissues," S. Calvin, M. Oyen and R. Cook, Society for Maternal-Fetal Medicine Annual Meeting, San Francisco, CA, February 2003. Abstract 197 in *Am. J. Obstet. and Gynecol.* **187** (2002).
85. "Indentation Fracture Toughness Measurements of Low Dielectric Constant Materials," D.J. Morris and R.F. Cook, MRS Spring Meeting, San Francisco, CA, April, 2003.
86. "Stress Stability of PECVD Silicon Nitride Films During Device Fabrication," M.P. Hughey and R.F. Cook, MRS Spring Meeting, San Francisco, CA, April, 2003.
87. "Effect of Microstructure on Mechanical Reliability of Nanoporous Organosilicate Thin Films," S. Kim, K. Char, Y. Toivola, R.F. Cook, J.-K. Lee, D. Y. Yoon, H.-W. Rhee, Y. Jin, and S. Y. Kim, MRS Spring Meeting, San Francisco, CA, April, 2003.
88. "Issues in Modeling Slitting of Magnetic Tapes," R. Andruet, R.F. Cook and W. Qualls and, 7th International Conference on Web Handling, Stillwater, OK, June, 2003.
89. "Nanoindentation Behavior and Contact Properties of Gems and Minerals," M.E. Broz, R.F. Cook and D.L. Whitney, MRS Fall Meeting, Boston, MA, December, 2003.
90. "Irreversible Tensile Stress Development in PECVD Silicon Nitride Films," M.P. Hughey and R.F. Cook, MRS Fall Meeting, Boston, MA, December, 2003.
91. "Fracture Toughness of Silicate Garnets: Applications and Preliminary Data," M.E. Broz, R.F. Cook and D.L. Whitney, AGU Annual Meeting, San Francisco, CA, December, 2003.
92. "Stress Stability and Thermo-Mechanical Properties of Reactively Sputtered Alumina Films," M.P. Hughey and R.F. Cook, Annual Meeting of American Ceramic Society, Indianapolis, IN, April 2004.

93. "The relationship between Mohs hardness and material properties of common minerals," M.E. Broz, R.F. Cook, and D.L. Whitney, GSA Annual Meeting, San Francisco, CA, November, 2004.
94. "Uniaxial and biaxial mechanical behavior of human amnion," M.L. Oyen, T. Stylianopoulos, V.H. Barocas, R.F. Cook and S.E. Calvin, MRS Fall Meeting, Boston, MA, December, 2004
95. "Nanoindentation Behavior of Minerals and Ceramics," R.F. Cook, M.E. Broz and D.L. Whitney and D.J. Morris, Annual Meeting of American Ceramic Society, Baltimore, MD, April 2005
96. "Direct Observation of "Ductile" Deformation during Fracture of Adhesive Contacts," R.F. Cook, J. Grobelny, D.-I. Kim and N. Pradeep, MS&T06, Cincinnati, OH, October, 2006.
97. "Nanoindentation Fracture and Toughness Estimation," R.F. Cook, and D.J. Morris MS&T06, Cincinnati, OH, October, 2006.
98. "Quantitative Measurement of Capillary Condensation Effects at Nanoscale Contacts," D.-I. Kim, J. Grobelny, N. Pradeep, and R.F. Cook, 2006 STLE/ASME Joint Tribology Conference, San Antonio, TX, October 2006.
99. "Atomic Force Microscopy Imaging and Force-Distance Analysis of Nanoparticles," N. Pradeep, J. Grobelny, D.-H. Tsai, D.-I. Kim, M. Zachariah, and R.F. Cook, 3rd International Congress of Nanotechnology (ICNT 2006), San Francisco, CA, October 2006.
100. "How Baby Plants Avoid Getting Hurt and Blossom into Adulthood: The Story of a Tropical Seed," P.W. Lucas, T.K. Lowrey, and R.F. Cook, MRS Fall Meeting, Boston, MA, December, 2006.
101. "Stress Imaging in Indented Si Wafers by Confocal Raman Microscopy," J. Schoenmaker, R. Cook, L. Novotny, and S.J. Stranick, American Physical Society Annual Meeting, Denver, CO, March 2007.
102. "Strength and Fracture Measurements at the Nano Scale," E.R. Fuller, Jr., G.D. Quinn, and R.F. Cook, 2007 International Conference on Frontiers of Characterization and Metrology for Nanoelectronics, Gaithersburg, MD, March 2007
103. "Elastic Property Measurements on Nano-Scale Structures," G. Stan and R. Cook, 2007 International Conference on Frontiers of Characterization and Metrology for Nanoelectronics, Gaithersburg, MD, March 2007
104. "New NIST Reference Material RM 8475: Carbon, Metal Catalyst, and Carbon Nanotubes," M.T. Postek, R. Cook, and R. Cavanagh, NSTI Nanotech2007, Santa Clara, CA, May 2007.
105. "Nanoindentation Fracture and Toughness Estimation," R.F. Cook and D.J. Morris, Materials and Austceram 2007, Sydney, Australia, July 2007
106. "Development of Standard Reference Data for Instrumented Indentation Testing," L.-S. Lum, D.J. Morris, and R. Cook, MS&T07, Detroit, MI, September, 2007

107. "Lateral Force Cantilever for Precise AFM Friction Measurements," M.G. Reitsma, R.S. Gates, and R.F. Cook, MRS Fall Meeting, Boston, MA, December, 2007
108. "Nanoscale Stress and Toughness Measurement using Confocal Raman Spectroscopy," R.F. Cook, Y.B. Gerbig, M.D. Vaudin, J. Schoenmaker, and S.J. Stranick, MRS Spring Meeting, San Francisco, CA, March, 2008
109. "Nanoscale mapping of elastic modulus on granular topographies by contact-resonance atomic force microscopy," G. Stan and R.F. Cook, MRS Spring Meeting, San Francisco, CA, March, 2008
110. "Lateral Force Lever for Precise Atomic Force Microscope Friction Measurements," M.G. Reitsma, R.S. Gates, and R.F. Cook, Society for Experimental Mechanics Annual Conference, Orlando, FL, June 2008.
111. "Measuring Strain at the 10^{-4} level with EBSD cross-correlation techniques," M.D. Vaudin, Y.B. Gerbig, J. Schoenmaker, S.J. Stranick, and R.F. Cook, Microbeam Analysis Society, EBSD Topical Workshop, Madison, WI, May, 2008
112. "Contact-resonance atomic force microscopy for nanoscale elastic property measurements: spectroscopy and imaging," G. Stan and R.F. Cook, 10th International Scanning Probe Microscopy Conference, Seattle, WA, June, 2008
113. "Tribological metrology at the micro-nanoscale: A device for calibrated contact force measurements using atomic force microscopy," M.G. Reitsma, R.S. Gates, E.R. Fuller, R.F. Cook, MRS Fall Meeting, Boston, MA, December, 2008
114. "Measuring Strain at the 10^{-4} Level with Great Spatial Resolution," M.D. Vaudin, S.J. Stranick, Y.B. Gerbig, R.F. Cook, MRS Fall Meeting, Boston, MA, December, 2008
115. "New Test-Specimen Geometries for MEMS-Scale Measurement of Tensile and Bending Strength," M.S. Gaither, F.W. DelRio, G.D. Quinn, R.S. Gates, R.F. Cook, MRS Fall Meeting, Boston, MA, December, 2008
116. "Stress imaging of deformation and crack defects in silicon by confocal Raman spectroscopy," Y.B. Gerbig, R.F. Cook, M.D. Vaudin, J. Schoenmaker, and S.J. Stranick, MRS Fall Meeting, Boston, MA, December, 2008
117. "Size dependence of the elastic modulus of nanowires and nanotubes measured by contact-resonance atomic force microscopy," G. Stan and R.F. Cook, MRS Spring Meeting, San Francisco, CA, April, 2009
118. "Mechanical and electrical properties of alkanethiol self-assembled monolayers on gold surfaces," F.W. DelRio, C. Jaye, D.A. Fischer, and R.F. Cook, MRS Spring Meeting, San Francisco, CA, April, 2009
119. "Deformation, strain, and stress mapping with nano-scale spatial resolution using diffraction, spectroscopy, and scanned probe microscopy," R.P. Koseski, M.D. Vaudin, S.J. Stranick, G. Stan, and R.F. Cook, MRS Spring Meeting, San Francisco, CA, April, 2009

120. "Development of Wafer- and Die-Scale Standards for Deformation, Strain, and Stress," R.F. Cook, S.J. Stranick, M.D. Vaudin, and D.M. Owen, MRS Spring Meeting, San Francisco, CA, April, 2009
121. "Cantilever-based force measurement tools for micro- and nano-tribology," M.G. Reitsma, R.S. Gates, R.F. Cook, and J.R. Pratt, Society for Experimental Mechanics Annual Conference, Albuquerque, NM, June 2009
122. "Fracture toughness measurement of thin nanoporous films on stiff substrates," D.J. Morris and R.F. Cook, 12th International Conference on Fracture, Ottawa, July 2009.
123. "High Resolution Surface Morphology Measurements using EBSD Cross-Correlation Techniques and AFM," M.D. Vaudin, G. Stan, Y.B. Gerbig and R.F. Cook, Microscopy and Microanalysis 2009, Richmond, VA, July, 2009
124. "Elastic modulus of low- k dielectric films measured by contact-resonance frequency versus force spectroscopy," G. Stan, S.W. King, and R.F. Cook, MRS Fall Meeting, Boston, MA, December, 2009.
125. "Theta-like Specimens to Determine Tensile Strength at the Micro Scale ," M.S. Gaither, F.W. DelRio, R.S. Gates, E.R. Fuller and R.F. Cook, 23rd International Meeting on Micro Electro Mechanical Systems, MEMS 2010, Hong Kong, China, January 2010.
126. "Theta-like Specimens to Determine Tensile Strength at the Micro Scale ," M. Gaither, F. DelRio, G. Quinn, R. Gates, and R. Cook, TMS Annual Meeting, Seattle, WA, February, 2010.
127. "Elastic property characterization of oxidized Si nanowires by contact-resonance atomic force microscopy," G. Stan and R.F. Cook, American Physical Society Annual Meeting, Portland, OR, March 2010.
128. "Advanced nanoscale elastic property characterization by contact-resonance atomic force microscopy," G. Stan and R.F. Cook, Nanotech 2010, Anaheim, CA, June 2010.
129. "Structure effects on the bending strength of Si nanowires," G. Stan, S. Krylyuk, A. Davydov, I. Levin, and R. Cook, TMS Annual Meeting, San Diego, CA, February 2011
130. "Effects of Cryogenic Deep Reactive Ion Etching on the Strength of Micro-Scale Theta Specimens," M.S. Gaither, F.W. DelRio, R.S. Gates, and R.F. Cook, SEM Annual Conference and Exposition, Uncasville, CT, June 2011
131. "Ultrahigh Fracture Strength of Si Nanowires under Bending," G. Stan, S. Krylyuk, A.V. Davydov, I. Levin, and R.F. Cook, MRS Fall Meeting, Boston, MA, November 2011.
132. "In-situ Raman Analysis of Indentation-Induced Phase Transformations in Silicon Thin Films," Y. Gerbig, C. Michaels, A. Forster, and R. Cook, MRS Fall Meeting, Boston, MA, November 2011.
133. "Deformation and Fracture of Single-Crystal Silicon Theta-like Specimens," F. DelRio, M. Gaither, R. Gates and R. Cook; MRS Fall Meeting, Boston, MA, November 2011.

134. "Indentation and Scratch Device with In Situ Raman and Optical Capabilities," Y. Gerbig, C. Michaels, A. Forster, and R. Cook, MRS Fall Meeting, Boston, MA, November 2011.
135. "Nanoscale Strength of Silicon and Its Interfaces," F.W. DelRio, B.G. Bush, M.S. Gaither, and R.F. Cook, Solid-State Sensors, Actuators and Microsystems Workshop, Hilton Head, SC, June 2012
136. "Elastic and Interfacial Properties of Alkylsilane Self-Assembled Monolayers on Silicon Substrates," B.G. Bush, F.W. DelRio, C. Jaye, D.A. Fischer, and R.F. Cook, ASME International Mechanical Engineering Congress and Exposition, Houston, TX, November 2012
137. "In Situ Raman Analysis of the Indentation Induced Phase Transformation of Crystalline and Amorphous Silicon," Y. Gerbig, C. Michaels, A. Forster, S. Solares, and R. Cook, TMS Annual Meeting and Exhibition, San Antonio, TX, March 2013
138. "Contact Resonance AFM on TiN-Low- κ Dielectric Films and Patterns," G. Stan, L. Friedman, R. Cook, S. King, A. Myers, M. van Veenhuizen, and C. Jezewski, 2013 International Conference on Frontiers of Characterization and Metrology for Nanoelectronics, Gaithersburg, MD, March 2013
139. "Accuracy and Resolution of Nanoscale Strain Measurement Techniques," W. Osborn, L. Freidman, M. Vaudin, S. Stranick, M. Gaither, J.M. Gorham, V. Vartanian, and R. Cook, 2013 International Conference on Frontiers of Characterization and Metrology for Nanoelectronics, Gaithersburg, MD, March 2013
140. "Crystal orientation mapping of domain structures in barium titanate," J.A. Howell, M.D. Vaudin, and R.F. Cook, Center for Dielectric Studies, Spring 2013 Meeting, State College, PA, May 2013.
141. "Bimodal PeakForce tapping-mode AFM," G. Stan, B. Pittenger, N. Erina, C. Su, S.D. Solares, and R.F. Cook, 16th International Conference on Noncontact Atomic Force Microscopy, College Park, MD, August 2013
142. "Mechanical and charge transport properties of self-assembled monolayers," R.F. Cook, F.W. DelRio, and B.G. Bush, 16th International Conference on Noncontact Atomic Force Microscopy, College Park, MD, August 2013
143. "Roughness scaling of deep reactive ion etched silicon surfaces," F.W. DelRio, L.H. Friedman, M.S. Gaither, W.A. Osborn, and R.F. Cook, MRS Fall Meeting, Boston, MA, December 2013.
144. "MEMS Reliability as a Function of Loading Spectrum and Component Geometry," R.F. Cook, F.W. DelRio, M.S. Gaither, R. Kirkpatrick, W.A. Osborn, and F.W. DelRio, MRS Fall Meeting, Boston, MA, December 2013.
145. "Nano-scale Elastic Strain Tensor Mapping in Barium Titanate Domain Structures," R.F. Cook, J.A. Howell, and M.D. Vaudin, MRS Fall Meeting, Boston, MA, December 2013.
146. "Frictional Properties of Native and Functionalized Collagen Thin Films," R.F. Cook, F.W.

- DelRio, B.G. Bush, K.-H. Chung, A.K. Chen, C.R. Anderton, K.Bhadriraju, and A.L. Plant, MRS Fall Meeting, Boston, MA, December 2013.
147. "Measurements of Mechanical Properties of PEG-Based Hydrogels via Colloidal Probe AFM," J.M. Shapiro, B.G. Bush, F.W. DelRio, R.F. Cook, and M.L. Oyen, MRS Fall Meeting, Boston, MA, December 2013.
 148. "Diameter-dependence of elastic properties in ZnO nanowires: Why do the published results have conflicting diameter dependence?" Z. Trautt, L. Friedman, R. Cook, and C. Becker, TMS Annual Meeting and Exhibition, San Diego, CA, February 2014.
 149. "Random buckling of low- k interlayer dielectric walls," L.H. Friedman, G. Stan, I. Levin, H.-J. Yoo, A. Myers, K. Singh, C. Jezewski, B. Miner, S.W. King, and R.F. Cook, MRS Spring Meeting, San Francisco, CA, April 2014.
 150. "Raman spectroscopy-enhanced IIT: In situ analysis of mechanically stressed polycrystalline Si thin films," Y.B. Gerbig, C.A. Michaels, and R.F. Cook, SEM 2014 Annual Conference & Exposition on Experimental and Applied Mechanics, Greenville, SC, June 2014
 151. "Designing High Resolution EBSD Strain Standards using Si_{1-x}Gex films on Si," M.D. Vaudin, W.A. Osborn, L.H. Friedman, J.M. Gorham and R.F. Cook, EBSD 2014, Pittsburgh, PA, June 2014
 152. "In Situ Analysis of Materials under Mechanical Stress: A Novel Instrument for Simultaneous Nanoindentation and Raman Spectroscopy," C.A. Michaels, Y.B. Gerbig and R.F. Cook, 11th GeoRaman International Conference, St. Louis, MO, June 2014
 153. "Frictional Properties of Native and Functionalized Type I Collagen Thin Films," F.W. DelRio, R.F. Cook, B.G. Bush, K.-H. Chung, A.K. Chen, C.R. Anderton, K. Bhadriraju, and A.L. Plant, ASME IMECE, Montreal, Canada, November 2014
 154. "Mechanical Properties of PEG-Based Hydrogels Measured by Colloidal Probe Microscopy," B.G. Bush, J.M. Shapiro, F.W. DelRio, R.F. Cook, and M.L. Oyen, ASME IMECE, Montreal, Canada, November 2014
 155. "Size-dependent Fracture Strength of Single-crystal Si Theta-like Specimens," M. Mclean, W. Osborn, R. Gates, R. Cook, and F. DelRio, ASME IMECE, Montreal, Canada, November 2014
 156. "In situ observation of the spatial distribution of crystalline phases during pressure-induced transformations of indented silicon thin films," Y.B. Gerbig, C.A. Michaels, and R.F. Cook, MRS Fall Meeting, Boston, MA, December 2014.
 157. "Multiple Length-Scale Spherical Indentation of PEG and Alginate-based Hydrogels," J.M. Shapiro, B.G. Bush, F.W. DelRio, R.F. Cook, C.A. Stratakis, M.L. Oyen, Society for Biomaterials Annual Meeting, Charlotte, NC, April 2015.
 158. "Silver Nanoparticle Loaded Textile Test Materials: Impact of Particle size and Textile Type on Nanoparticle Detection and Characterization Using Various Metrological

Techniques,” J.M. Gorham, K.E Murphy, J. Liu, T. Nguyen, R. D. Holbrook, G. Stan, D. Tselenchuk, R.F. Cook, M.R. Winchester, R.I. MacCuspie, V.A. Hackley ACS National Meeting, Boston, MA, August 2015.

159. “Elasticity size effects in ZnO nanowires and subjective definitions of cross-sectional area: An overlooked source of uncertainty,” Z.T. Trautt, L.H. Friedman, C.A. Becker, and R.F. Cook, TMS Meeting, Nashville, TN, February 2016.
160. “Review: Fracture strength of micro- and nano-scale silicon components,” R.F. Cook, F.W. DelRio, B.L. Boyce, TMS Meeting, Nashville, TN, February 2016.
161. “Assessing Electron Backscatter Diffraction and Confocal Raman Microscopy Strain Mapping Using Wedge-indented Si,” M.D. Vaudin, L.H. Friedman, S.J. Stranick, G. Stan, Y.B. Gerbig, W.A. Osborn and R.F. Cook, EBSD, Tuscaloosa, AL, May 2016.
162. Near-theoretical fracture strengths in native and oxidized silicon nanowires,” R.F. Cook, F.W. DelRio, R.M. White, S. Krylyuk, A.V. Davydov, and L.H. Friedman, Annual Technical Meeting of the Society of Engineering Science, College Park, MD, October 2016.

STANDARDS ACTIVITIES

- 2008 “Gold Nanoparticles, “Nominal 10 nm Diameter,” “Nominal 30 nm Diameter,” “Nominal 60 nm Diameter,” NIST Reference Materials® 8011, 8012, 8013.
- 2010 “Titanium Dioxide Powder - Particle Size Distribution,” NIST Reference Material® 8988.
- 2011 “Standard guide for size measurement of nanoparticles using atomic force microscopy,” ASTM International Committee E56 on Nanotechnology, E2859-11.
- 2015 “Preparation of silver nanoparticle loaded cotton threads to facilitate measurement development for textile applications,” J. M. Gorham, K. Murphy, J-Y Liu, D. Tselenchuk, G. Stan, T.M. Nguyen, R.D. Holbrook, M. Winchester, R. MacCuspie, R.F. Cook, V.A. Hackley, NIST Special Publication 1200-8.

PROFESSIONAL SOCIETY ACTIVITIES AND SERVICE

- 2004-Present *Journal of Materials Science*; Editor, 2004-2007; Editorial Advisory Board, 2007-Present; Robert W. Cahn Best Paper Prize Selection Committee, 2011-2016.
- 2000-2016 Materials Research Society: Symposium Organizer, “Nanoindentation and Nanotribology II,” Fall 2000, “Materials, Technology, and Reliability for Advanced Interconnects and Low-*k* Dielectrics,” Spring 2001, “Surface and Interfacial Nanomechanics,” Spring 2007; Fall Meeting Co-Chair (6000 Meeting attendees), 2010; MRS Medal Selection Committee, 2014-2016. *Nanoindentation and Nanotribology II*, Editors S.P. Baker, R.F. Cook, S.G. Corcoran and N.R. Moody. MRS Symposium Proceedings Vol. **649**. Pittsburgh, PA, 2001.
- 1989 International Conference on Fracture: Symposium Organizer, “Ceramics.”
- 1988-1992 American Physical Society: March Meeting Focused Session Organizer, “The Physics and Chemistry of Brittle Fracture,” 1988, “Mechanical Breakdown Processes in Heterogeneous and Other Solids,” 1990; “Fracture Dynamics in Mixed Media,” 1992.
- 1982-Present American Ceramic Society: Member, 1982-present; *Journal of the American Ceramic Society*, Associate Editor, 1986-2001; Annual Meeting Symposium Organizer “Current Issues in Mechanical Behavior of Ceramics,” 1988, “Fracture, Deformation and Mechanical Reliability of Ceramics,” 1993; Ceramographic Exhibition Judge, 1988, 1995; Basic Science Division, Program Chair, 1995-1997, Chair, 2002-2003 (1600 Division members); Board of Directors (9500 Society members), 2004-2007;
- 1985-2020 Reviewer
- Government Agencies: US NSF (Panelist 2004); US DOE (Panel Chair, 1996; Panelist, 1997, 2003, SBIR reviewer, 2010, 2011, 2012, 2013, 2015); US NRC; German Research Foundation; Swiss National Science Foundation
- Journals: Acta Biomater., Acta mater., Acta Physica Polonica A, ACS Appl. Mater. & Interfaces, ACS Nano, J. Adhesion, J. Am. Ceram. Soc., J. Appl. Phys., Appl. Phys. Letters, Ceramics International, J. Coll. Int. Sci., Eng. Fracture Mech., J. Eng. Mech., J. Eur. Ceram. Soc., Extreme Mechanics Letters, Int. J. Fracture, IBM J. Res. Devel., Mater. Chemistry, J. Mater. Res., J. Mater. Sci., Mater. Sci. & Eng., Mater. Today, Meas. Sci. Tech., J. Mech. Behavior of Biomed. Mater., Int. J. Mechanical Sci., J. Microelectromechanical Sys., Microelectronics Reliability, J. Micromechanics and Microengineering, Nanotechnology, PNAS., Nature Materials, J. Non-Crystalline Solids, Phil. Mag., J. Phys. D, Phys. Rev. B, E, Letters, Science, J. Polymer Sci: B, Polymer Physics, Reproductive Sciences, Rev. Sci. Instrum., Scripta mater., Int. J. Solids & Struct., Surf. Coat. Technol., Tribology Lett., J. Vacuum Sci. Tech. *Journal of the Mechanical Behavior of Biomedical Materials*, Top Reviewer (2008)
- Book Publishers: ACerS, Blackwell, Wiley, OUP, Prentice-Hall, Springer

EDUCATION ACTIVITIES AND SERVICE

- 2008-2012 University of Maryland, Department of Materials Science and Engineering, Adjunct Professor
Graduate student advised: Michael Gaither (Ph.D., 2011)
- 2008-2012 Stevens Institute of Technology, Department of Chemical Engineering and Materials Science, External Advisory Board
- 1998-2004 University of Minnesota, Department of Chemical Engineering and Materials Science
Graduate Students advised:
2002, Jeremy Thurn, Ph.D.
2002, Andrea Grant, M.S.
2003, Yvete Toivola, Ph.D.
2004, Dylan Morris, Ph.D.
2005, Micheal Hughey, Ph. D.
Courses taught:
MatS 3600H, 2601: Introduction to Materials Science (Honors)
MatS 4001: Thermodynamics of Materials
MatS 4400: Materials Design
MatS 8004: Mechanical Behavior of Materials (Graduate)
MatS 8002: Thermodynamics and Kinetics of Materials (Graduate)
MatS 8311: Advanced Mechanics of Materials (Contact and Fracture Properties) (Graduate)
Director of Graduate Studies: Materials Science and Engineering, 1999-2002
- 1990-1995 Pennsylvania State University, Department of Materials Science and Engineering, Adjunct Professor
Graduate students external advisor:
1992, Rajan Tandon, Ph.D.
1992, Stephen Newcomb, Ph.D.
- 1990-1991 Rice University, Department of Mechanical Engineering and Materials Science, Visiting Professor
Course taught: MSCI 609: Fracture Mechanics
- 1986-2000 Lehigh University, Department of Materials Science and Engineering, External Advisor
Graduate student external advisor: Charles Russo (Ph.D., 1993)
- 1986-1995 IBM Research
Materials Science Seminar Series Organizer, 1986-1990; Tutorials on Fracture, Yorktown Heights, 1989, East Fishkill, 1989, 1991, Charlotte, 1995.