

**Round Table Group
Consultant Curriculum Vitae**

John C. Bravman, Ph.D.

Expertise

- Integrated Circuit Manufacturing
 - IC Failure Processes and Phenomena
 - Mechanical Behavior of Thin Films
 - High Spatial Resolution Materials Analysis
 - Microelectronic Packaging
 - IP Analysis and Litigation
-

Professional Summary

John C. Bravman is the Bing Centennial Professor , Materials Science and Engineering and, by courtesy, Electrical Engineering, Freeman–Thornton Vice Provost for Undergraduate Education, and Dean of the Freshman-Sophomore Residential College at Stanford University. Professor Bravman joined the Stanford faculty in 1985 after completing his B.S. (1979), M.S. (1982), and Ph.D. (1984) degrees at Stanford. From 1996 to 1999 he was Chairman of his department.

He has worked at the Fairchild Semiconductor Laboratories in Palo Alto, California, and has served as a consultant with several technology, venture capital, and legal firms, including Lockheed, National Semiconductor, Advanced Micro Devices, IBM, Intel, the Mayfield Fund, Mohr Davidow Ventures, Perkins Coie LLP, McDermott, Will & Emory LLP, and Jones Day LLP. He has served the government on many review boards, including the Solid State Sciences Committee, and has served on or chaired the national advisory board of the materials programs at Sandia National Laboratories and the chemical and materials sciences program at Lawrence Livermore National Laboratories. In 1994, he was President of the Materials Research Society.

Professor Bravman teaches and advises undergraduates at all levels and directs doctoral students in the areas of silicon process technology, the mechanical properties of thin films, and transmission electron microscopy. He is co-author of over 170 research publications. He has won nine teaching and advising awards while at Stanford, served as a Resident Fellow, a University Fellow, and has chaired many university committees.

Round Table Group Consultant Curriculum Vitae

Employment History

From: 2012 **Geisinger Health System**

To: Present

Board of Directors

From: 2010 **Bucknell University**

To: Present Lewisburg, PA

President & Professor of Electrical Engineering

From: 1985 **Stanford University**

To: 2010 Palo Alto, CA

Department of Material Science & Engineering

- *2010-Present: Bing Centennial Professor of Materials Science and Freeman Thornton Vice Provost for Undergraduate Education, Emeritus.*
- *2001 –2010: Professor, by courtesy, Dept. of Electrical Engineering, Stanford University.*
- *2001 – Interim Vice Provost for Student Affairs, Stanford University*
- *1999 – 2010: Freeman Thornton Vice Provost for Undergraduate Education*
- *1999 – 2010: Dean of the Freshman/Sophomore College, Stanford University.*
- *1998 – 1999: Director, Center for Materials Research, Stanford University.*
- *1997-2010: Bing Centennial Professor of Materials Science & Engineering*
- *1996 – 1999: Chairman, Dept. of Materials Science & Engineering, Stanford University.*
- *1995 – 1997: Professor, Dept. of Materials Science & Engineering, Stanford University.*
- *1993 – 2001: Senior Associate Dean, School of Engineering, Stanford University.*
- *1992 – 1993: Associate Dean for Undergraduate Affairs, School of Engineering, Stanford Univ.*
- *1991 – 1995: Assc. Chairman, Dept. of Materials Science & Engineering, Stanford University.*
- *1991 – 1995: Associate Professor, Dept. of Materials Science & Engineering, Stanford University.*
- *1985 – 1991: Assistant Professor, Dept. of Materials Science & Engineering, Stanford University*

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From: 1979 **Fairchild Semiconductor**
To: 1984 Palo Alto, CA
Research Engineer, Research Laboratory

Consulting History

From: 2007 **Virgin Fuels**
To: 2007 London, U.K.
Duties: Technical due diligence

From: 2006 **HSH Nordbank**
To: 2008 New York, NY.
Duties: Technical due diligence

From: 2005 **Sharefare**
To: 2007 Los Altos, CA
Duties: Technical Advisory Board

From: 2004 **Medlogics**
To: Present Santa Rosa, CA
Duties: Technical consulting

From: 2003 **Applied Plasma Lab, Inc.**
To: 2007 Santa Clara, CA
Duties: Board of Directors

From: 2001 **Reflectivity, Inc.**
To: 2005 Sunnyvale, CA
Duties: Technical consulting

From: 1998 **Mohr, Davidow Venture Capital Fund**
To: 2003 Menlo Park, CA
Duties: Technical consulting

From: 1994 **Sandia National Laboratories**
To: 2002 NM
Duties: Chair, National Advisory Board, Materials Science & Technology Programs

From: 1992 **Mayfield Fund**
To: 2000 Menlo Park, CA
Duties: Technical consulting

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From: 1987 **Intel Corporation**
To: 1990 Santa Clara, CA
Duties: Technical consulting

From: 1986 **National Semiconductor**
To: 1992 Santa Clara, CA
Duties: Technical consulting

From: 1985 **Fairchild Semiconductor**
To: 1987 Palo Alto, CA
Duties: Technical consulting

Litigation Support Experience

Date: 2012- **WilmerHale**
Case X2Y Attenuators LLC v. Apple, Intel and Hewlett-Packard
Project: Patent litigation, testifying witness
Status: Completed

Date: 2012- **Irell & Manella**
Case Tessera, Inc. v. Sony Corporation
Project: Ongoing
Status: Open

Date: 2012- **Perkins Coie, LLP (Seattle, WA)**
Case Semcon Tech LLC vs. Intel Corporation
Project: Patent litigation, testifying witness
Status: On-going

Date: 2011 **Faegre & Benson**
Case CoorsTek v. Reiber & Reiber
Project: Patent litigation, testifying witness
Status: Completed

Date: 2010-11 **Farella Braun & Martell**
Case Volterra Semiconductor v. Infineon Technologies
Project: Patent litigation, testifying witness
Status: Completed

Date: 2010-11 **Irell & Manella (Los Angeles, CA)**
Case Tessera, Inc. v. Amkor
Project: Patent litigation, testifying witness
Status: Completed

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Date: 2010 -11 **Kirkland & Ellis (Washington, DC)**
Case Spansion v. Samsung
Project: Patent litigation, testifying witness, ITC matter
Status: Complete

Date: 2010- **Fish and Richardson**
Case Spansion v. Samsung
Project: Patent litigation, testifying witness
Status: Completed

Date: 2010- **Perkins Coie, LLP (Seattle, WA)**
Case On Semiconductor v. Hynix Semiconductor, Elpida Memory,
 Nanya Technology and Hittite Microwave
Project: Patent litigation, testifying witness
Status: Completed

Date: 2009-10 **O'Melveny & Myers**
Case Semiconductor Energy Laboratory v. Samsung
 [Case 3:09-CV-0001; US District Court, Western District of
 Wisconsin.
Project: Patent litigation, testifying witness
Status: Completed

Date: 2009 **Thompson & Knight**
Case Qimonda v. LSI
 [Investigation 337-TA-665; US International Trade Commission,
 Washington D.C.]
Project: Patent litigation, testifying witness
Status: Completed

Date: 2009 **Sidley Austin**
Case Samsung v. Pioneer Corporation
Project: Patent litigation, testifying witness
Status: Completed

Date: 2009-10 **Morrison & Foerster**
Case Applied Materials v. Advanced Microfabrication Equipment
Project: Patent litigation, testifying witness
Status: Completed

Date: 2009-11 **Lerner, David, Littenberg, Krumholz & Mentlik**
Case Tessera v, ST Microelectronics
Project: Patent re-examination, consulting expert
Status: Ongoing

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Date:	2008-10	Winston Strawn
Case		<u>S.O.I.TEC (Silicon on Insulator Technologies) v. MEMC</u> Electronic Materials
Project:		Patent litigation, testifying witness
Status:		Completed
Date:	2009-	Kirkland & Ellis (DE)
Case		Spansion v. <u>Samsung</u>
Project:		Patent litigation, testifying witness, ITC matter
Status:		Ongoing
Date:	2009-	Irell & Manella (Los Angeles, CA)
Case		LG Displays v. <u>Chi Mei Optoelectronics</u>
Project:		Patent litigation, testifying witness
Status:		Ongoing
Date:	2008-09	Kirkland & Ellis
Case		On Semiconductor v. <u>Samsung</u>
Project:		Patent litigation, testifying witness
Status:		Completed
Date:	2008-09	Quinn Emanuel Urquhart & Hedges
Case		<u>Samsung v. SanDisk</u>
Project:		Patent litigation, testifying witness
Status:		Completed
Date:	2008	Heller Erhman White & McAuliffe
Case		Reiber et al v. <u>Western Digital et al.</u>
Project:		Patent litigation, testifying witness
Status:		Completed
Date:	2007	Fish & Richardson, P.C.
Case		Toshiba v. <u>Hynix</u>
Project:		Patent infringement before the ITC.
Status:		Completed
Date:	2007- 08	Wolf, Greenfield & Sacks – Boston, MA
Case		Fujitsu v. <u>Nanya</u>
Project:		Patent Litigation, testifying expert
Status:		Completed

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- Date: 2007- 09 **Baker Botts – New York, NY**
Case Agere v. Sony
Project: Patent Litigation, testifying witness
Status: Completed
- Date: 2007- 08 **Baker Botts – New York, NY**
Case Samsung v. Pioneer Corporation
Project: Patent Litigation, testifying expert
Status: Completed
- Date: 2007-08 **Fish & Richardson, P.C.**
Case Renesas v. Samsung
Project: Patent litigation, testifying witness before ITC
Status Completed
- Date: 2007-08 **Fish & Richardson, P.C.**
Case Applied Materials v. SCC
Project: Patent litigation, testifying witness
Status Completed
- Date: 2006- 07 **Foley & Lardner (Palo Alto, CA)**
Case Kentucky Oil Technology N.V. v Memry Corporation and
 Schlumberger Technology Corporation.
Project: Trade secrets, consultant
Status: Completed
- Date: 2006-11 **Sheppard, Mullin, Richter & Hampton (Los Angeles, CA)**
Case Northrop Grumman
Project: Contract dispute, consultant
Status: Completed
- Date: 2006- 08 **Irell & Manella (Los Angeles, CA)**
Case Tessera, Inc. v. Advanced Micro Devices, Inc., Spansion Inc.,
 Spansion Technology Inc., Spansion LLC, Advanced
 Semiconductor Engineering, Inc., ASE Inc., ChipMOS
 Technologies Inc., ChipMOS USA Inc., Siliconware Precision
 Industries Co. Ltd., Siliconware USA Inc., STMicroelectronics
 N.V., STMicroelectronics, Inc., STATSChipPac Ltd.,
 STATSChipPac, Inc., STATSChipPac (BVI) Limited.
Project: Patent litigation, testifying witness
Status: Completed

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Date: 2006- 08 **Irell & Manella (Los Angeles, CA)**
Case Tessera, Inc. v. Amkor
Project: Patent litigation, consultant
Status: Completed

Date: 2006-07 **Kirkland & Ellis**
Case Ohmi v. Intel, IBM, Samsung and Micron
Project: Patent litigation, testifying witness
Status: Completed

Date: 2006-07 **Kirkland & Ellis**
Case Samsung v. Matsushita
Project: Patent litigation, testifying witness
Status: Completed

Date: 2006 **Kirkland & Ellis**
Case Agere v. Atmel
Project: Patent litigation, testifying witness
Status: Completed

Date: 2006-07 **Perkins Coie, LLP (Seattle, WA)**
Case Ohmi v. Intel, IBM, Samsung and Micron
Project: Patent litigation, testifying witness
Status: Completed

Date: 2006 **Keker & Van Nest (San Francisco, CA)**
Case Sputtered Films Inc. v. Advanced Modular Sputtering
Project: Trade secret litigation, Consultant
Status: Completed

Date: 2005-07 **Keker & Van Nest (San Francisco, CA)**
Case Ohmi v. Intel, Samsung and Micron
Project: Patent litigation; testifying witness
Status: Completed

Date: 2005-06 **Fish & Richardson, P.C.**
Case JDS Uniphase v. Metconnex
Project: Patent litigation, consultant
Status Completed

Date: 2005-06 **Fish & Richardson, P.C.**
Case Toshiba v. Hynix
Project: Patent infringement before the ITC
Status: Completed

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Date: 2005-06 **Townsend Townsend & Crew (San Francisco, CA)**
Case Toshiba v. Hynix
Project: Patent litigation; testifying witness
Status: Completed

Date: 2004-05 **Paul, Hastings, Janofsky & Walker (San Diego, CA)**
Case TSMC v. SMIC
Project: Trade secrets, consultant
Status: Completed

Date: 2004-05 **Heller, Ehrman, White & McAuliffe LLP**
Case Fujitsu Limited v. Cirrus Logic, et al.
Project: Product liability, testifying witness
Status: Completed

Date: 2004-05 **Perkins Coie, LLP (Seattle, WA)**
Case Semitoool v. DMS
Project: Patent litigation
Status: Completed

Date: 2003-04 **Jones Day, LLP (Dallas, TX)**
Case Motorola v. Analog Devices
Project: Patent litigation, testifying witness
Status: Completed

Date: 2003 **McDermott Will & Emery (Orange County, CA)**
Case Motorola v. Analog Devices
Project: Patent litigation
Status: Completed

Date: 2003 **Kirkland & Ellis, LLP (New York, NY)**
Case Honeywell Electronic Materials
Project: Patent litigation, consultant
Status: Completed

Date: 2001-04 **Perkins Coie, LLP (Seattle, WA)**
Case Semitoool v. Applied Materials, Novellus, Ebara
Project: Patent litigation, testifying witness
Status: Completed

Date: 1999-00 **Robins, Kaplan, Miller & Ciresi, LLP (Atlanta, GA)**
Case Raychem Corporation
Project: Patent litigation, consultant
Status: Completed

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Education

<u>Year</u>	<u>College/University</u>	<u>Degree</u>
1984	Stanford University, Stanford, CA	PhD, Materials Science and Engineering
1982	Stanford University, Stanford, CA	MS, Materials Science and Engineering
1979	Stanford University, Stanford, CA	BS, Materials Science and Engineering

Patents

<u>Patent Number</u>	<u>Issue Date</u>	<u>Title</u>
8,097,269	01/17/2012	Bioactive Material Delivery Systems Comprising Sol-Gel Compositions
7,981,441	07/19/2011	Drug Delivery Systems Using Mesoporous Oxide Films

Honors and Awards

1987	School of Engineering Distinguished Advisor Award, Stanford University
1988	Excellence in Teaching Award, Society of Black Scientists & Engineers
1989	Walter J. Gores Award for Excellence in Teaching, Stanford University
1990	Tau Beta Pi Engineering Honor Society Award for Excellence in Undergraduate Engineering Teaching, Stanford University
1991	Bradley Stoughton Award, ASM International
1992 – 1995	Bing Teaching Fellow, Stanford University
1992	Excellence in Teaching Award, Society of Women Engineers
1994	President, Materials Research Society
1995 – 1997	University Fellow, Stanford University
1997	Bing Centennial Professor, Stanford University
2001	Stanford Associates Award for Service to the Alumni Association
2004	Woody White Award, Materials Research Society.
2010	Kenneth M. Cuthbertson Award for Exceptional Service, Stanford's University's highest award for contributions to the university.

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External Service and Scholarly Activities

1986 – 1987	Symposium Organizer, 1987 Fall Meeting of the Materials Research Society; “Workshop on Specimen Preparation for Transmission Electron Microscopy of Materials”
1987 – 1988	Symposium Organizer, 1988 Fall Meeting of the Materials Research Society; “Thin Films: Stresses and Mechanical Properties”
1988 – 1989	Organizing Committee, International Conference on Materials and Mechanisms of Superconductivity – High Temperature Superconductivity
1988 – 1989	Symposium Organizer, 1989 Meeting of the Electron Microscopy Society of America: “Structure and Reactivity of Metal – Semiconductor Interfaces”
1989 – 1990	Conference Chairman, 1990 Spring Meeting of the Materials Research Society
1989 – 1990	Symposium Organizer, 1990 Spring Meeting of the Materials Research Society: “Laser Ablation for Thin Film Synthesis”
1989 – 1990	Symposium Organizer, 1990 Spring Meeting of the Materials Research Society: “Frontiers of Materials Science”
1990 – 1991	Symposium Organizer, 1991 Fall Meeting of the Materials Research Society; “Thin Films: Stresses and Mechanical Properties III”
1990 – 1991	Symposium Organizer, 1991 Fall Meeting of the Materials Research Society; “Workshop on Specimen Preparation for Transmission Electron Microscopy of Materials III”
1991 – 1993	Council Member, Materials Research Society
1991 – 1992	Symposium Organizer, 1992 Spring Meeting of the Materials Research Society: “Structure and Defects in Electronic Oxides”
1991 – 1996	Technical Editorial Board, Materials Research Society Bulletin
1992	Second Vice President, Materials Research Society
1992 – 1998	Editorial Board, Annual Reviews of Materials Science
1992	Guest Editor, July 1992 Issue of the Materials Research Society Bulletin; “Mechanical Properties of Thin Film Materials”
1993	First Vice President, Materials Research Society
1993 – 1995	Selection Committee, Bradley Stoughton Award, ASM International
1993, 2001	Member, National Advisory Board, Materials Science & Technology Programs, Sandia National Laboratories
1994 – 2002	Chair, National Advisory Board, Materials Science & Technology Programs, Sandia National Laboratories

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1994	President, Materials Research Society
1994 – 1995	Conference Organizer, 3rd International Workshop on Stress Induced Phenomena, Stanford, CA
1995 – 1998	Solid States Sciences Committee of the National Research Council
1996 – 1999	Awards Committee, ASM International
1996 – 1999	Chair, Program Development Subcommittee, Materials Research Society
1996 – 1999	Member, Electronics and Photonics Program National Advisory Board, Sandia National Laboratories
1997 – 1998	Symposium Organizer, 1998 Spring Meeting of the Materials Research Society, “Materials Reliability in Microelectronics VIII”
1997 – 1998	Conference Organizer, 15 Biennial Conference on National Materials Policy, Washington, D.C.
1998 – 1999	Program Committee, 5th International Workshop on Stress Induced Phenomena, Stuttgart, Germany
1998 – 1999	Chair, Long Range Planning Committee, Materials Research Society
1998 – 2001	Member, Editorial Board, Applied Physics Reviews
1998 – 2006	Associate Editor, Annual Reviews of Materials Science
2000 – 2004	Chair, Program Committee, Materials Research Society
2001	Member, Middle States Association Accreditation Review Panel, Cornell University
2001	Member, Middle States Association Accreditation Review Panel, University of Pennsylvania
2002 – present	Visiting Committee, Massachusetts Institute of Technology
2002 – 2006	Member, Director’s Review Board, Chemistry and Materials Science, Lawrence Livermore National Laboratory
2005 – 2009	Board of Directors, LEAD Program for Underserved Youth.
2006 – 2010	Member, Advisory Board, Journal of Engineering Education
2010 – present	Member, Board of Directors, Council of Higher Education Accreditation
2010 – present	Member, Selection Committee for the Clare Booth Luce Awards, Henry Luce Foundation
2011 – 2012	Chair, Publications Review Committee, Materials Research Society

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STANFORD UNIVERSITY SERVICE

1986 – 1992; 96 –10 Freshman Advisor
1991 – 1992 Dean’s Advisory Group, Libraries & Information Resources
1991 Faculty Advisor, Freshman Alcohol Responsibility & Management Program
1991 – 1995 Committee on Residential Computing
1991 – 1997 Steering Committee, Continuing Education Program
1992 Faculty Expenditure Certification Process Task Force
1992 – 1995 Faculty Resident Fellow, Yost House Undergraduate Residence
1992 Search Committee, Director of Environmental Health and Safety
1992 – 1996 Chair, University Committee on Health and Safety
1993 – 1999 Chair, C-AAA Subcommittee on University and Departmental Honors
1993 Search Committee, Director of Residential Education
1993 – 1997 Faculty Senate of the Academic Council
1993 – 1999 Steering Committee, Center for Teaching and Learning
1993 – 1994 President’s Commission on Undergraduate Education at Stanford;
Chair of Subcommittee on Technology in Teaching and Learning
1993 – 1995 C-ASIS Subc. on Distributed Information & Computing Environment
1994 – 1995 President’s Commission on Technology in Teaching and Learning
1994 – 1997 Board of Directors, Faculty Club
1994 – 2003 C-AAA Subcommittee on Academic Standing
1995 – 2004 Faculty Member, Stanford Sophomore College
1995 Search Committee, Dean of Students
1995 – 1996 Faculty Senate Committee on Committees
1995 – 1997 Design Committee for Cultures, Ideas & Values Program
1996 Search Committee, Director of Career Planning and Placement Center
1996 – 1998 Stanford University Board of Trustees Committee on Development
1996 – 1999 Writing Advisory Board
1996 – 2010 University Undergraduate Advisory Council
1996 – 1997 Residences Task Force
1996 – 1999 Executive Committee, Center for Materials Research
1997 Search Committee, Dean of Admissions & Financial Aid
1997 – 1999 Residence Programs Implementation Group
1998 – 2001 Stanford University Board of Trustees Committee on Nominations
1998 – 1999 Director, Center for Materials Research
1999 Elected Chair, Faculty Senate of the Academic Council
1999 – 2010 Dean of the Freshman/Sophomore College
1999 – 2010 Freeman–Thornton Vice Provost for Undergraduate Education

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2000	Co-Chair, Search Committee, Dean of Admissions & Financial Aid
2000 – 2001	Provost's Task Force, University Needs Assessment
2000 – 2003	Strategic Planning Board, Cantor Center for the Visual Arts
2001	Search Committee, Dean of Humanities and Sciences
2001	Chair, Search Committee, Vice Provost for Student Affairs
2001	Interim Vice Provost for Student Affairs
2004 – 2005	Co-Chair, Search Committee, Dean of Admissions & Financial Aid
2004 – 2007	Dean of Potter College
2005 – 2006	Search Committee, Director of Athletics
2006	Co-Chair, Stanford Task Force Evaluating Education in the Residences
2006 – 2007	Search Committee, University Registrar
2006 – 2010	Co-Chair, WASC Reaccreditation Steering Committee

STANFORD SCHOOL OF ENGINEERING SERVICE

1986 – 1990	EE – ICL Faculty Search Committees (Silicon Processing; Sensors)
1986 – 1992	Radiation Safety Committee
1987 – 1992	School of Engineering Committee on Computers
1991 – 1992	Member of Undergraduate Council
1991 – 2006	Faculty Advisor, Tau Beta Pi Engineering Honor Society
1992 – 1993	MSE – EE Faculty Search Committee (Magnetic Materials & Devices)
1992 – 1994	MSE – Chem. E. Faculty Search Committee (Comput. Materials Science)
1992 – 1993	Associate Dean for Undergraduate Affairs
1992 – 2009	Faculty Advisor, Stanford Solar Car Project
1993 – 2001	Senior Associate Dean for Student Affairs

STANFORD DEPARTMENT SERVICE

1986 – 1987	Student Faculty Liaison Committee, Dept. of Materials Science
1986 – 1987	Industrial Affiliates Program Committee, Dept. of Materials Science
1986 – 1990	Advanced Degree Committee, Dept. of Materials Science
1986 – 1990	Curriculum Committee, Dept. of Materials Science
1986 – 1991	Project Director, X-ray Diffraction Lab., Dept. of Materials Science
1986 – 1991	Chair, Computer Committee, Dept. of Materials Science
1987 – 1991	Chair, Space and Building Committee, Dept. of Materials Science

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1990 – 1995 Chair, Financial Aids Committee, Dept. of Materials Science
1991 – 1995 Associate Chairman, Dept. of Materials Science and Engineering
1996 – 1999 Chairman, Department of Materials Science & Engineering

REFEREE

Journals: Journal of Applied Physics, Applied Physics Letters, Journal of Materials Science, Journal of the Electrochemical Society, Physical Review B, IEEE Electron Device Letters, Journal of Materials Research, Physical Review Letters, Journal of Engineering Education

Agencies: National Science Foundation, Electric Power Research Institute, Air Force Office of Scientific Research, Department of Energy, Army Research Labs, Science and Engineering Research Council (Singapore)

INVITED PRESENTATIONS AT CONFERENCES, WORKSHOPS, etc.

1. March, 1985 “High Resolution Microstructural Studies of VLSI Interfaces,” Electronic Materials Symposium, Northern California Section, AIME, Santa Clara, CA.
2. October, 1985 “Microstructural Characterization of LPCVD Tungsten Interfaces,” Second Annual Workshop on Tungsten & Other Refractory Metals, Albuquerque, NM.
3. January, 1986 “High Resolution Microstructural Studies of Semiconductor Materials,” 1986 Annual Meeting of the Society of Photo–Optical Instrumentation Engineers, Los Angeles, CA.
4. February, 1987 “High Resolution Microstructural Studies of Semiconductor Materials,” Golden Gate Materials Technology Conference, San Francisco, CA.
5. June, 1987 “Structural Characterization of Silicon – LPCVD Tungsten Interfaces,” 13th Western Regional Meeting for Electron Microscopy and Microbeam Analysis, Concord, CA.
6. July, 1987 “TEM Studies of Semiconductor Materials,” Annual Meeting of the International Metallographic Society, Monterey, CA.
7. September, 1987 “Synthesis and Properties of Superconducting Perovskites,” Regional Meeting of the Materials Research Society, Univ. of Washington, Seattle, WA.
8. January, 1988 “TEM Studies of VLSI Materials,” Northern California American Vacuum Society Thin Film Microanalysis Seminar, San Jose, CA.

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9. January, 1988 “Synthesis and Properties of Superconducting Perovskites,”
1988 Annual Meeting of The Metallurgical Society, Phoenix,
AZ.
10. April, 1988 “Morphology and Microstructure of LPCVD Tungsten
Films,” 1988 Spring Meeting of the Materials Research
Society, Reno, NV.
11. September, 1989 “High Resolution Electron Microscopy of Semiconductor
Interfaces,” 12th Brazilian Congress on Electron Microscopy,
Rio de Janeiro, Brazil.
12. April, 1990 “Beam Deflection Techniques for Studying Thin Film
Mechanical Behavior,” 1990 Spring Meeting of the Materials
Research Society, San Francisco, CA.
13. June, 1991 “Mechanical Testing of Thin Films,” 6th International
Conference on Solid State Sensors and Actuators,” San
Francisco, CA.
14. November, 1991 “Mechanical Properties of Thin Film Aluminum,” American
Vacuum Society Annual Meeting, Seattle, WA.
15. March, 1992 “Mechanical Testing of Thin Film Media,” The Metallurgical
Society Annual Meeting, San Diego, CA.
16. April, 1992 “Mechanical Testing of Thin Film Materials,” 1992 Spring
Meeting of the Materials Research Society, San Francisco,
CA.
17. March, 1993 “X-ray Determination of Strains, Stresses and Relaxation in
Interconnection Metallizations,” Second International
Workshop on Stress Induced Phenomena in Metallizations,
Austin, TX.
18. June, 1994 “Microstructure and Stresses in Sputtered Copper Films,”
Symposium on Micromechanisms in Stressed Conductor
Lines and Thin Films, Ringberg, Germany.
19. December, 1994 “In-situ Electromigration Testing of Aluminum
Metallizations,” 1994 Fall Meeting of the Materials Research
Society, Boston, MA.
20. April, 1995 “Development of High Voltage SEM for In-situ
Electromigration Testing,” 1995 Spring Meeting of the
Materials Research Society, San Francisco, CA.
21. May, 1995 “Development of High Voltage SEM for In-situ
Electromigration Testing,” 1995 Meeting, European
Materials Research Society, Strasbourg, France.

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- 22. September, 1998 “In-Situ High Voltage Scanning Electron Microscopy for Electromigration Studies,” 14th Quadrennial International Conference on Electron Microscopy, Cancun, Mexico.
- 23. June, 2001 “Micromechanical Testing of Free Standing Thin Films for MEMS Applications,” 2001 Mechanics and Materials Conference, San Diego. (Keynote)
- 24. June, 2001 “In-Situ Dynamic Studies of Electromigration in Copper Metallizations,” 2001 Mechanics and Materials Conference, San Diego. (Keynote)
- 25. December, 2001 “Micromechanical Testing of Free Standing Thin Films for MEMS Applications,” 2001 Fall Meeting of the Materials Research Society, Boston, MA.

INVITED PRESENTATIONS AT UNIVERSITIES, CORPORATIONS, ETC.

- 26. December, 1984 “Transmission Electron Microscopy of Semiconductor Materials,” Department of Materials Science, Oregon Graduate Center.
- 27. January, 1985 “Transmission Electron Microscopy of VLSI Interfaces,” Rockwell International, Semiconductor Products Division, Los Angeles, CA.
- 28. January, 1985 “Transmission Electron Microscopy: A Tool for VLSI Research,” Hewlett Packard Research Laboratories, Palo Alto, CA.
- 29. March, 1985 “Morphological Aspects of Silicon – Silicon Dioxide VLSI Interfaces,” Texas Instruments Central Research Laboratories, Dallas, TX.
- 30. October, 1987 “Transmission Electron Microscopy of Thin Films and Interfaces,” Department of Materials Science and Mineral Engineering, Univ. of California at Berkeley.
- 31. May, 1988 “Progress and Prospects in High Temperature Superconductors,” Raychem Corporation, Redwood City, CA.
- 32. June, 1988 “An Assessment of LPCVD Tungsten for VLSI Metallizations,” XEROX Corp., Palo Alto Research Center, Palo Alto, CA.
- 33. April, 1989 “Transmission Electron Microscopy: A Tool for VLSI Research,” National Semiconductor Corporation, Santa Clara, CA.

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34. September, 1989 “Mechanical Properties of Thin Film Materials,” 12th Brazilian Congress on Electron Microscopy, Rio de Janeiro, Brazil.
35. October, 1989 “Mechanical Properties of Thin Film Materials,” Motorola Corporation, Phoenix, AZ.
36. February, 1991 “Microstructural Studies of Y–Ba–Cu–O High Tc Thin Films,” 1991 Stanford Symposium on Applications of Contemporary Electron Microscopy, Stanford, CA.
37. May, 1991 “Mechanical Testing Techniques for Thin Film Structures,” Microelectronics Center of North Carolina, Research Triangle Park, NC.
38. September, 1991 “Processing and Structure of Y–Ba–Cu–O High Tc Thin Films,” Physical Sciences Colloquium, IBM Almaden Research Center, San Jose, CA.
39. November, 1991 “Mechanical Properties of Thin Films,” Department Colloquium, Materials Science and Engineering, U. C. Berkeley.
40. March, 1992 “Mechanical Testing of Thin Film Media,” Department Colloquium, Materials Science and Engineering, University of Southern California, Los Angeles, CA.
41. November, 1992 “Mechanical Testing Techniques for Thin Film Structures,” Opening Dedication Ceremony, Max Planck Institut, Stuttgart, Germany.
42. November, 1992 “Micron–Scale Mechanical Testing of Films and Layered Media,” Opening Dedication Ceremony, Max Planck Institut für Metallforschung; Stuttgart, Germany.
43. September, 1993 “Modern Techniques for Surface and Interface Analysis,” National Defense Academy, Japan.
44. October, 1993 “X-ray Methods for Determining Strains and Stresses in Thin Films and Interconnection Lines,” AFOSR Workshop on Stress and Reliability in Thin Film and Optical Materials, The Aerospace Corporation, Los Angeles, CA.
45. October, 1995 “Development of High Voltage SEM for In-situ Electromigration Testing,” University of California at Los Angeles.
46. November, 1996 “Development of High Voltage SEM for In-situ Electromigration Testing,” University of Michigan at Ann Arbor.
47. August, 1997 “How to be an Effective Engineering Educator,” Linkoping University, Sweden

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- 48. August, 1997 “How to be an Effective Engineering Educator,” Upsala University, Sweden
- 49. August, 1997 High Voltage Scanning Electron Microscopy for In-situ Electromigration Testing,” Royal Institute of Technology, Sweden
- 50. November, 1997 High Voltage Scanning Electron Microscopy for In-situ Electromigration Testing,” Georgia Institute of Technology.
- 51. February, 1998 “The Future of Engineering Education at Major Research Universities: Course Correction or New Paradigm?”, Symposium on Engineering Education for the 21st Century, Nagoya, Japan.
- 52. March, 1998 “Quantitative Assessments of Electromigration Lifetime,” Lehigh Univ.
- 53. November, 1998 “A New Method for Studying Electromigration in IC Interconnects,” Lawrence Berkeley Laboratory, Advanced Light Source Colloquium Series.

Publications

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Professional Associations and Achievements

- American Physical Society
- American Society of Metals
- Materials Research Society
- Electron Microscopy Society of America
- Institute of Electrical and Electronic Engineers
- The Metallurgical Society of AIME

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