

**Thomson Reuters Expert Witness Services  
Consultant Curriculum Vitae**

**John C. Bravman, Ph.D.**

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**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
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**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.

# Thomson Reuters Expert Witness Services 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*

## Thomson Reuters Expert Witness Services Consultant Curriculum Vitae

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

## **Thomson Reuters Expert Witness Services Consultant Curriculum Vitae**

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

## **Thomson Reuters Expert Witness Services Consultant Curriculum Vitae**

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

## Thomson Reuters Expert Witness Services Consultant Curriculum Vitae

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

## Thomson Reuters Expert Witness Services Consultant Curriculum Vitae

- 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

## Thomson Reuters Expert Witness Services Consultant Curriculum Vitae

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

## **Thomson Reuters Expert Witness Services Consultant Curriculum Vitae**

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.

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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.



## **Thomson Reuters Expert Witness Services Consultant Curriculum Vitae**

- 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.

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1. “TEM Studies of the Polycrystalline Silicon – Silicon Dioxide Interface,” J.C. Bravman and R. Sinclair, Thin Solid Films, 104, 153–61 (1983).
2. “Observation of Rapid Field Aided Diffusion of Silver in Metal Oxide Semiconductor Structures,” J.D. McBrayer, R.M. Swanson, T.W. Sigmon and J.C. Bravman, Applied Physics Letters, 43, 653–54 (1983).
3. “The Preparation of Cross-section Specimens for Transmission Electron Microscopy,” J.C. Bravman and R. Sinclair, Journal of Electron Microscopy Technique, 1, 52–61 (1984).
4. “Structure and Morphology of Polycrystalline Silicon – Single Crystal Silicon Interfaces,” J.C. Bravman, G.L. Patton and J.D. Plummer, Journal of Applied Physics, 57, 2279–82 (1985).
5. “Physics, Technology and Modeling of Polysilicon Emitter Contacts for VLSI Bipolar Transistors,” G.L. Patton, J.C. Bravman and J.D. Plummer, IEEE Transactions on Electron Devices, ED–33, 1754–68 (1986).
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