

– John C. Bravman –
President, and Professor of Electrical Engineering, Bucknell University
Bing Centennial Professor Emeritus, Materials Science & Engineering, Stanford University
Freeman–Thornton Vice Provost, Emeritus, Stanford University
103 University Avenue, Lewisburg, Pennsylvania 17837

Research Interests & 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

Education

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| 1975 – 1979 | B.S., Materials Science and Engineering, Stanford University |
| 1979 – 1984 | M.S., Ph.D., Materials Science and Engineering, Stanford University |

Professional Career

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| 1979 – 1984 | Research Engineer, Fairchild Semiconductor Research Laboratory, Palo Alto, CA |
| 1985 – 1991 | Assistant Professor, Dept. of Materials Science & Engineering, Stanford University |
| 1991 – 1995 | Associate Professor, Dept. of Materials Science & Engineering, Stanford University |
| 1991 – 1995 | Assoc. Chairman, Dept. of Materials Science & Engineering, Stanford University |
| 1992 – 1993 | Associate Dean for Undergraduate Affairs, School of Engineering, Stanford Univ. |
| 1993 – 2001 | Senior Associate Dean, School of Engineering, Stanford University |
| 1995 – 1997 | Professor, Dept. of Materials Science & Engineering, Stanford University |
| 1997 – 2010 | Bing Centennial Professor, Materials Science & Engineering, Stanford University |
| 1996 – 1999 | Chairman, Dept. of Materials Science & Engineering, Stanford University |
| 1998 – 1999 | Director, Center for Materials Research, Stanford University |
| 1999 – 2010 | Dean of the Freshman/Sophomore College, Stanford University |
| 1999 – 2010 | Freeman Thornton Vice Provost for Undergraduate Education, Stanford University |
| 2001 | Interim Vice Provost for Student Affairs, Stanford University |
| 2001 – 2010 | Professor, by courtesy, Dept. of Electrical Engineering, Stanford University |
| 2010 – present | Bing Centennial Professor of Materials Science and Freeman Thornton Vice Provost for Undergraduate Education, Emeritus, Stanford University |
| 2010 – present | President, and Professor of Electrical Engineering, Bucknell University |
| 2012 – present | Board of Directors, Geisinger Health System Foundation; Chairman, 2017 – 2010 |

Honors and Awards

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| 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's highest award for teaching |

1990	Tau Beta Pi Engineering Honor Society Award for Excellence in Undergraduate Engineering Teaching, Stanford University
1991	Bradley Stoughton Award, ASM International, a national teaching award for scientists under the age of 35.
1992 – 1995	Bing Teaching Fellow, Stanford University
1992	Excellence in Teaching Award, Society of Women Engineers, Stanford Univ.
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 University's highest award for contributions to the university.

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	President, Materials Research Society
1994 – 1995	Conference Organizer, 3 rd 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 th Biennial Conference on National Materials Policy, Washington, D.C.
1998 – 1999	Program Committee, 5 th 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 – 2008	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 – 2013	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
2012 – 2013	Chair, Middle States Association Accreditation Review Panel, Marist College
2012 – present	Member, Board of Directors, Geisinger Health Systems Foundations
2015 – 2016	Chair, Middle States Association Accreditation Review Panel, United States Naval Academy

Stanford University Service

1986 – 1992; 96 – 2010	Freshman Advisor
1991 – 1992	Deans’ 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
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 – 2001	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 Departmental 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
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
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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)
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Professional Society Memberships

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

Patents

“Drug Delivery Systems using Mesoporous Oxide Films,” Dimitrios Pantelidis and John C. Bravman, US Patent 7981441, issued July 19, 2011.

“Bioactive Material Delivery Systems Comprising Sol-Gel Compositions,” Dimitrios Pantelidis, John C. Bravman, Jonathan Rothbard, and Richard Klein, US Patent 8097269, issued January 17, 2012.

Consulting Activities – Technical Advisory

1985 – 1987	Fairchild Semiconductor, Palo Alto, CA. (technical consulting)
1986 – 1992	National Semiconductor, Santa Clara, CA. (technical consulting)
1987 – 1990	Intel Corporation, Santa Clara, CA. (technical consulting)
1992 – 2000	Mayfield Fund, Menlo Park, CA. (technical consulting)
1994 – 2002	Chair, National Advisory Board, Materials Science & Technology Programs, Sandia National Laboratories
1998 – 2003	Mohr, Davidow, Menlo Park, CA. (technical consulting)
2001 – 2005	Reflectivity, Inc., Sunnyvale, CA. (technical consulting)
2003 – 2007	Applied Plasma Lab, Inc., Santa Clara, CA. (Board of Directors)
2004 – 2010	Medlogics, Santa Rosa, CA. (technical consulting)
2005 – 2007	Sharefare, Los Altos, CA. (Technical Advisory Board)
2006 – 2008	HSH Nordbank, New York, NY. (technical due diligence)
2007	Virgin Fuels, London, U.K. (technical due diligence)

Consulting Activities – Patents/Intellectual Property, Trade Secret, Product Liability

1999 – 2000	<p>Robins, Kaplan, Miller and Ciresi</p> <ul style="list-style-type: none"> for Raychem; patent litigation, consultant, 1999 – 2000. [<i>completed</i>]
2001 – present	<p>Perkins Coie</p> <ul style="list-style-type: none"> for Semitool in Semitool vs. Applied Materials, Novellus, and Ebara; patent litigation, testifying witness, 2001 – 2004. [Case CV 01-1066-BR (Applied Materials), Case CV 01-874-BR (Novellus), Case CV 01-873-BR (Ebara); US District Court, District of Oregon.] [<i>completed</i>] for Semitool in Semitool vs. DMS; patent litigation, testifying witness, 2004 – 2005. [Case 01-1391 WHA; US District Court, Northern District of California, San Francisco Division; filed April 9, 2001] [<i>completed</i>] for Micron in Ohmi vs. Intel, IBM, Samsung and Micron; patent litigation, testifying witness, 2006 – 2007. [Case 2-05-CV-209; US District Court, Eastern District of Texas, Marshall Division; filed June 2, 2005.] [<i>completed</i>] for On Semiconductor in On Semiconductor vs. Hynix Semiconductor, Elpida Memory, Nanya Technology, and Hittite Microwave; patent litigation, testifying witness, 2010. [Case 6-09-CV-390; United States District Court for the Eastern District Of Texas.] [<i>completed</i>] for Intel in Semcon Tech LLC vs. Intel Corporation; patent litigation, testifying witness, 2012 – 2013. [Case 12-531-RGA; United States District Court for Delaware.] [<i>completed</i>] for Intel, Global Foundaries, and Micron in Intel Corporation, Global Foundries U.S., Inc., and Micron Technology, Inc., Petitioners, v. Daniel L. Flamm; IPR Petitions on U.S. Patent RE40,264.*
2003 – 2011	<p>Kirkland & Ellis</p> <ul style="list-style-type: none"> for Honeywell Electronic Materials; patent litigation; consultant, 2003. [<i>completed</i>] for Samsung in Ohmi vs. Intel, IBM, Samsung and Micron; patent litigation; testifying witness, 2006 – 2007. [Case 2-05-CV-209; US District Court, Eastern District of Texas, Marshall Division; filed June 2, 2005.] [<i>completed</i>] for Samsung in Samsung vs. Matsushita; patent litigation; testifying witness, 2006 – 2007. [Case 6:06-CV-154 LED; US District Court, Eastern District of Texas, Tyler Division; filed September 15, 2005.] [<i>completed</i>] for Agere Systems in Agere vs. Atmel; patent litigation; testifying witness, 2006. [Case 02-CV-864; US District Court, Eastern District of Pennsylvania] [<i>completed</i>] for Samsung in On Semiconductor vs. Samsung; patent litigation; testifying witness, 2008 – 2009 [Case 07-449 (JJF); US District Court, District of Delaware]; and in Samsung vs. On Semiconductor; patent litigation; testifying witness, 2008 – 2009 [Case 06-720 (JJF); US District Court, District of Delaware]. [<i>completed</i>] for Samsung in Spansion vs. Samsung; patent litigation; testifying witness, 2009 [Investigation 337-TA-664; US International Trade Commission, Washington D.C.] [<i>completed</i>] for Samsung in Spansion vs. Samsung; patent litigation; testifying witness, 2010 – 2011 [Case 08-855 (SLR); US District Court, District of Delaware]. [<i>completed</i>] for Samsung in Spansion vs. Samsung; patent litigation; testifying witness, 2011 – 2011 [Case No. 3:10-CV-685 (WMC); US District Court, Western District of Wisconsin]. [<i>completed</i>]

2003	<p>McDermott, Will & Emery</p> <ul style="list-style-type: none"> for Motorola/Freescale in Motorola vs. Analog Devices; patent litigation, testifying witness, 2003. [Case 1:03-CV-0131; US District Court, Eastern District of Texas, Beaumont Division; filed March 4, 2003.] [<i>completed</i>]
2003 – 2004	<p>Jones Day</p> <ul style="list-style-type: none"> for Motorola/Freescale in Motorola vs. Analog Devices; patent litigation, testifying witness, 2003 – 2004. [Case 1:03-CV-0131; US District Court, Eastern District of Texas, Beaumont Division; filed March 4, 2003.] [<i>completed</i>]
2004 – present	<p>Silicon Valley Expert Witness Group, now part of Thompson Reuters Expert Witness Services</p>
2004 – 2005	<p>Heller Erhman White & McAuliffe</p> <ul style="list-style-type: none"> for Fujitsu in Fujitsu vs. Sumitomo, Amkor, and Cirrus Logic; product liability, testifying witness, 2004 – 2005. [Case 1-03-CV-009885; Superior Court of the State of California, County of Santa Clara; filed November 25, 2003.] [<i>completed</i>] for Western Digital in Reiber et al. vs. Western Digital et al., patent litigation, testifying witness, 2008. [Investigation No. 337-TA-616.] [<i>completed</i>]
2004 – 2005	<p>Paul, Hastings, Janofsky & Walker</p> <ul style="list-style-type: none"> for SMIC in TSMC vs. SMIC; trade secrets, consultant, 2004 – 2005. [Case C-03-5761 MMC; US District Court, Northern District of California.] [<i>completed</i>]
2005 – 2006	<p>Townsend and Townsend and Crew</p> <ul style="list-style-type: none"> for Hynix in Toshiba vs. Hynix; patent litigation, testifying witness, 2005 – 2006. [Case 3:04-CV-04708 VRW; US District Court, Northern District of California; filed September 1, 2006.] [<i>completed</i>]
2005 – 2007	<p>Keker and Van Nest</p> <ul style="list-style-type: none"> for Intel in Ohmi vs. Intel, Samsung and Micron; patent litigation, testifying witness, 2005 – 2007. [Case 2–05CV–209; US District Court, Eastern District of Texas, Marshall Division; filed June 2, 2005.] [<i>completed</i>] for Sputtered Films Inc. in SFI vs. Advanced Modular Sputtering; trade secret litigation, consultant, 2006. [Case 0113-2336; Superior Court of the State of California, Anacapa Division; filed December 23, 2003.] [<i>completed</i>]
2005 – 2015	<p>Fish and Richardson</p> <ul style="list-style-type: none"> for Hynix in Toshiba vs. Hynix; patent litigation, testifying witness, 2005 – 2006. [Investigation 337–TA–552; US International Trade Commission, Washington D.C.] [<i>completed</i>] for Metconnex in JDS Uniphase vs. Metconnex; patent litigation, consultant, 2005 – 2006. [Case 05-5371-AG(SS); US District Court, Central District of California, Southern Division; filed July 25, 2005.] [<i>completed</i>] for Hynix in Toshiba vs. Hynix; patent litigation, testifying witness, 2007 – 2008. [Investigation 337–TA–592; US International Trade Commission, Washington D.C.] [<i>completed</i>] for Samsung in Renesas vs. Samsung; patent litigation, testifying witness, 2007 – 2008. [Investigation 337–TA–595; US International Trade Commission, Washington D.C.] [<i>completed</i>] for Applied Materials, in Applied Materials vs. SSC, patent litigation, testifying witness, 2007 – 2008 [<i>completed</i>]

- for Samsung in Spansion vs. Samsung; patent litigation, testifying witness, 2010 – present. [Investigation 337-TA-735; US International Trade Commission, Washington D.C.] *[completed]*
- for Invensense in STMicroelectronics vs. Invensense; patent litigation, testifying witness, 2013 – 2014. [Case CV 12-02475 (JSW), US District Court, Northern District of California, San Francisco Division.] *[completed]*
- for Macronix in Spansion vs. Macronix; patent litigation, testifying witness, 2014 – 2015. [Investigation 337-TA-916; US International Trade Commission, Washington D.C.] *[completed]*

2006 – present

Irell & Manella

- for Tessera in Tessera, Inc. vs. Amkor; patent litigation, testifying witness, 2006 – 2008. [International Court of Arbitration of The International Chamber Of Commerce] *[completed]*
- for Tessera in Tessera, Inc. vs. Advanced Micro Devices, Inc., Spansion Inc., Spansion Technology Inc., Spansion LLC, Advanced Semiconductor Engineering, Inc., ASE (US) 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; patent litigation, testifying witness, 2006 – 2008. [Case 4:05-CV-04063 CW]; US District Court, Northern District of California; filed January 31, 2006 (Second Amended Complaint.) *[completed]*
- for Chi Mei Optoelectronics in LG Display vs. Chi Mei Optoelectronics; patent litigation, testifying witness, 2009 – 2011. [Case 06-726, 07-357, 08-355 (D. Dell); US District Court, Delaware.] *[completed]*
- for Tessera in Tessera, Inc. vs. Amkor; patent litigation, testifying witness, 2010 – 2011. [International Court of Arbitration of The International Chamber Of Commerce] *[completed]*
- for Tessera in Tessera, Inc. vs. Sony Corporation, 2012 – 2013. [Case 5:11-CV-04399-EJD, US District Court, Northern District of California.] *[completed]*
- for Tessera in Power Technology Inc. vs. Tessera, Inc. 2012 – 2014. [Case 4:10-CV-00945-CW, US District Court, Northern District of California.] *[completed]*
- for Tessera in Tessera vs. UTAC, 2015 – 16, patent litigation, testifying witness. *[completed]*
- for Tessera, consulting expert, 2016 – 17, patent litigation, testifying witness. *[completed]*

2006 – 2010

Sheppard, Mullin, Richter, & Hampton

- for Northrup Grumman; contract dispute, consultant, 2006 – 2010. *[completed]*

2006 – 2007

Foley & Lardner

- for Schlumberger Technology Corporation in Memry Corporation vs. Kentucky Oil Technology N.V., Peter Besselink, Memory Metals Holland, B.V., and Kentucky Oil Technology N.V. vs. Memry Corporation and Schlumberger Technology Corporation; trade secrets, consultant, 2006 – 2008. [Case 04-CV-03843 RMW (HRL); US District Court, Northern District of California.] *[completed]*

2007 – 2009	<p>Baker Botts</p> <ul style="list-style-type: none"> • for Agere in Agere vs. Sony; patent litigation, testifying witness, 2007 – 2009. [Case 2:06–CV–00079 (TJW); US District Court, Eastern District of Texas, Marshall Division.] [<i>completed</i>] • for Samsung in Samsung vs. Pioneer Corporation; patent litigation, testifying witness, 2007 – 2008. [Case 2:06–CV–384 (DF); US District Court, Eastern District of Texas, Marshall Division.] [<i>completed</i>]
2007 – 2008	<p>Wolf, Greenfield & Sacks</p> <ul style="list-style-type: none"> • for Nanya Technology Corporation in Fujitsu vs. Nanya; patent litigation, testifying witness, 2007 – 2008. [Case 4:06-CV-06-06613 (CW); US District Court, Northern District of California, Oakland Division.] [<i>completed</i>]
2008 – 2009	<p>Quinn Emanuel Urquhart Oliver & Hedges</p> <ul style="list-style-type: none"> • for Samsung in Samsung vs. SanDisk; patent litigation, testifying witness, 2008 – 2009. [<i>completed</i>]
2008 – 2010	<p>Winston & Strawn</p> <ul style="list-style-type: none"> • for S.O.I.TEC Silicon on Insulator Technologies in S.O.I.TEC Silicon on Insulator Technologies vs. MEMC Electronic Materials; patent litigation, testifying witness, 2008 – present. [Case 1:08-cv-292-SLR; US District Court, District of Delaware.] [<i>completed</i>]
2009 – 2011	<p>Lerner, David, Littenberg, Krumholz & Mentlik</p> <ul style="list-style-type: none"> • for Tessera in Tessera vs. ST Microelectronics; patent re–examination, consulting expert, 2009 – 2011. [<i>completed</i>]
2009 – 2013	<p>Morrison & Foerster</p> <ul style="list-style-type: none"> • for Advanced Microfabrication Equipment in Applied Materials vs. Advanced Microfabrication Equipment; patent litigation, testifying witness, 2009. [Case C07–05248 JW (PVT), US District Court, North. District of California, San Jose Division.] [<i>completed</i>] • for Invensense in STMicroelectronics vs. InvenSense; patent litigation, testifying witness, 2013 – 2014. [Case CV 12-02475 (JSW), US District Court, Northern District of California, San Francisco Division.] [<i>completed</i>]
2009	<p>Sidley Austin</p> <ul style="list-style-type: none"> • for Samsung in Samsung vs. Pioneer Corporation; patent litigation, testifying witness, 2009. [Case 2:06–CV–384 (DF); US District Court, Eastern District of Texas, Marshall Division.] [<i>completed</i>]
2009	<p>Thompson & Knight</p> <ul style="list-style-type: none"> • for LSI in Qimonda <i>vs.</i> LSI; patent litigation, testifying witness, 2009. [Investigation 337–TA–665; US International Trade Commission, Washington D.C.] [<i>completed</i>]
2009	<p>O’Melveny & Myers</p> <ul style="list-style-type: none"> • for Samsung in Semiconductor Energy Laboratory <i>vs.</i> Samsung; patent litigation, testifying witness, 2009 – 2010. [Case 3:09–CV–0001; US District Court, Western District of Wisconsin.] [<i>completed</i>]

2010 – 2011	<p>Farella, Braun & Martell</p> <ul style="list-style-type: none"> for Volterra Semiconductor in Volterra <i>vs.</i> Infineon Technologies; patent litigation, testifying witness, 2010 – 2011. [Case No. CV-08-5129 (JCS); US District Court, Northern District of California, San Francisco Division.] <i>[completed]</i>
2011	<p>Faegre & Benson</p> <ul style="list-style-type: none"> for CoorsTek in CoorsTek <i>vs.</i> Reiber & Reiber; patent litigation, testifying witness, 2011. [Case 08-CV-1133-KMT-CBS; US District Court, District of Colorado.] <i>[completed]</i>
2012 – present	<p>WilmerHale</p> <ul style="list-style-type: none"> for Apple, Intel, and Hewlett-Packard, in X2Y Attenuators LLC v. Apple, Intel and Hewlett-Packard, patent litigation, testifying witness, 2012. [ITC Investigation No. 337-781.] <i>[completed]</i> for Intel, in Zond LLC v. Intel, patent litigation, testifying witness, 2013 – 2014. [Case No. CV-1:13-11570-JLT; US District Court.] <i>[completed]</i> for Gillette, in Gillette v. Zond, LLC, testifying witness, 2015. [Patent 8,125,155; Case Nos. IPR 2014-00477 and 00479.] <i>[completed]</i> for Gillette, in Gillette v. Zond, LLC, testifying witness, 2015. [Patent 6,896,775; Case Nos. IPR 2014-00578 and 00604.] <i>[completed]</i> for Gillette, in Gillette v. Zond, LLC, testifying witness, 2015. [Patent 6,896,773; Case Nos. IPR 2014-00580 and 00726.] <i>[completed]</i> for Gillette and TSMC, in Gillette, Fujitsu Semiconductor Limited, Advanced Micro Devices, Renesas Electronics Corporation, Renesas Electronics America, Global Foundries U.S., Global Foundries Dresden Module One LLC & Co. KG, Global Foundries Dresden Module Two LLC & Co. KG, Toshiba America Electronic Components, Toshiba America, Toshiba America Information Systems, and Toshiba Corporation v. Zond, LLC, testifying witness, 2015. [Patent 7,808,184 ; Case Nos. IPR 2014-00799 and 00803.] <i>[completed]</i> for Apple in Apple <i>vs.</i> Ericsson; patent litigation, 2015. [ITC Investigation No. 337-953.] <i>[completed]</i> for Intel in DSS <i>vs.</i> Intel Corporation; patent litigation, 2015. [Case No. CV-6:15-130; US District Court.] * for Intel in DSS <i>vs.</i> Intel Corporation; patent litigation, 2015. [Patent 5,965,924; Case Nos. IPR 2015-TBD and Patent 6,784,552; Case Nos. IPR 2015-TBD.] *
2015 – present	<p>Latham & Watkins</p> <ul style="list-style-type: none"> for NVIDIA, in Samsung v. NVIDIA, patent litigation, testifying witness, 2015. [Case No. CV-3:14-757; US District Court.] <i>[completed]</i>
2015 – present	<p>Desmarais</p> <ul style="list-style-type: none"> consulting expert.
2015 – 2016	<p>Troutman Sanders</p> <ul style="list-style-type: none"> for Soitec in Silicon Genesis <i>vs.</i> Soitec; patent litigation, testifying witness, 2015-16. [Investigation 337-TA-966; US International Trade Com., Washington D.C.] <i>[completed]</i>
2016 – present	<p>Covington</p> <ul style="list-style-type: none"> for Tessera, in Tessera v. Broadcom; patent litigation, testifying witness, 2016-17 [Investigation 337-TA-1010; US International Trade Com., Washington D.C.] <i>[completed]</i>

Note: The designation “[*completed*]” at the end of an entry indicates that Dr. Bravman’s involvement in the matter has ended no later than the publication date of this document. Matters indicated with a * remain active as of that date.

Doctoral Students of Prof. John C. Bravman

	Name	Dissertation Title	Completion Date
1.	David C. Paine	A Microstructural Study of LPCVD Tungsten Thin Films for Use as a Contact Material to Silicon.	September 1988
2.	Ming Bing Chang	Deep Level Related Studies in GaAs with the Constant Capacitance Voltage Transient Technique.	October 1989
3.	Soonil Hong	Free Standing Multilayer Thin Film Microstructures for Electronic Systems.	December 1990
4.	Bruce M. Lairson	Critical Currents and Flux Creep in YBa ₂ Cu ₃ O _{7-x} Superconducting Thin Films.	August 1991
5.	Paul L. Meissner	Barrier Height Reduction and Interface Chemistry in Pd-Ge Based Contacts to GaAs.	August 1991
6.	Ramnath Venkatraman	Plasticity and Flow Stresses in Al Thin Films on Silicon.	May 1992
7.	Stephen K. Streiffer	Nucleation and Growth of YBa ₂ Cu ₃ O _{7-x} Films on Lattice-Matched and Mismatched Substrates.	November 1992
8.	Paul R. Besser	X-ray Determination of Thermal Strains, Stresses, and Relaxation in Passivated Al Lines During Thermal Cycling	August 1993
9.	Thomas N. Marieb	In-Situ Observations of Void Nucleation and Growth in Passivated Metal Lines	January 1994
10.	Richard Vinci	Thermal Stresses and Strains in Copper Films and Interconnect Structures	August 1994
11.	Cynthia Lee	Diffusion of Implanted Dopants in GaAs/AlGaAs.	December 1994
12.	Eden Zielinski	The Influence of Strain Energy on Abnormal Grain Growth in Copper Thin Films	August 1995
13.	Yaser M. Haddara	Transient Diffusion of Dopants in Gallium Arsenide	March 1997
14.	Charlie Yu	High Temperature Mechanical Properties of Thin Films used in VLSI Fabrication	August 1997
15.	Samantha Lee	The Effects of Passivation on Electromigration Behavior in Aluminum Interconnects	August 1998
16.	Jonathan Doan	In-Situ Studies of Electromigration in Thin Films	December 1998
17.	Guido Cornella	Monotonic and Cyclic Testing of Thin Film Materials	December 1998
18.	Seok Hee Lee	Electromigration in Cu Thin Films	December 2000

19.	Nicole Meier	Electromigration in Cu Thin Films	March 2002
20.	Dimitrios Pantelidis	Mechanisms of Adhesion of Organic/Inorganic Interfaces Reinforced by Silane Coupling Agents and Self-Assembling Mesoporous Oxide Thin Films	June 2003
21.	Ping Zhang	Thin Film Mechanical Behavior	May 2003
22.	Bryan Valek	Thin Film Mechanical Behavior	March 2003
23.	Maura Jenkins	Selection and Use of Silane Adhesion Promoters in Microelectronic Packaging	June 2003
24.	Gaurav Verma	Laser Silicidation for Deep Submicron MOSFETs	August 2003

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 Parasites,” 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.
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.
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.
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 T_c 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 T_c 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," Linköping University, Sweden
48. August 1997 "How to be an Effective Engineering Educator," Uppsala 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 University
 - 53. November 1998 “A New Method for Studying Electromigration in IC Interconnects,” Lawrence Berkeley Laboratory, Advanced Light Source Colloquium Series.
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Archival Refereed Journals

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).
6. "Damage Calculation and Measurement for GaAs Amorphized by Si-Implantation," W.G. Opyd, J.F. Gibbons, J.C. Bravman and M.A. Parker, *Applied Physics Letters*, 49, 974–976 (1986).
7. "Observations of Beta-tungsten deposited by Low Pressure Chemical Vapor Deposition," D. C. Paine, J.C. Bravman and C. Y. Yang, *Applied Physics Letters*, 50, 498–500 (1987).
8. "The Mechanical Deflection of Cantilever Microbeams: A New Technique for Testing the Mechanical Properties of Thin Films," T. P. Weihs, S. Hong, J.C. Bravman and W.D. Nix, *Journal of Materials Research*, 3, 931–942 (1988).
9. "Molecular Beam Epitaxy of Layered Dy–Ba–Cu–O Compounds," D. G. Schlom, J. N. Eckstein, E. S. Hellman, S.K. Streiffer, J. S. Harris, M. R. Beasley, J.C. Bravman, T. H. Geballe, C. Webb, K. von Dessonneck and F. Turner, *Applied Physics Letters*, 53, 1660–1662. (1988).
10. "Microstructural Characterization of YBa₂Cu₃O_{7-d} Thin Films on SrTiO₃ Using Four Axis X-ray Diffraction," J. Sizemore, R. Barton, A. Marshall and J.C. Bravman, *IEEE Transactions on Magnetics*, 25 (2), 2245–2249 (1989).
11. "Determination of High Field Enhanced Emission Rates with the Constant Capacitance–Voltage Transient Technique," M.B. Chang, H. Tomokage, J.J. Shiao, R. H. Bube, and J.C. Bravman, *Journal of Applied Physics*, 65, 2734–2738 (1989).
12. "Phase Characterization of Dysprosium Barium Copper Oxide Thin Films Grown on Strontium Titanate by Molecular Beam Epitaxy," E. S. Hellman, D. G. Schlom, A. F. Marshall, S.K. Streiffer, J. S. Harris, M. R. Beasley, J.C. Bravman and T. H. Geballe, *Journal of Materials Research*, 4, 476–95 (1989).
13. "Elimination of Current Dissipation in High Transition Temperature Superconductors," J.Z. Sun, B. Lairson, C.B. Eom, J.C. Bravman and T.H. Geballe, *Science*, 247, 307–309 (1990).
14. "Microwave Properties of Highly Oriented YBa₂Cu₃O_{7-δ} Thin films," A. Inam, X.D. Wu, L. Nazar, M.S. Hegde, C.T. Rogers, T. Venkatesan, R.W. Simon, K. Daly, H. Padamsee, J. Kirchgessner, D. Moffat, D. Rubin, Q.S. Shu, D. Kalolitis, A. Fathy, V. Pendrick, R. Brown, B. Brycki, E. Belohoubek, L. Drabek, G. Gruner, R. Hammond, F. Gamble, B.M. Lairson and J.C. Bravman, *Applied Physics Letters*, 56, 1178–80 (1990).
15. "Reduction of Magnetization Decay Rate in High T_c Superconductors," B. Lairson, J.Z. Sun, J.C. Bravman and T.H. Geballe, *Physical Review B*, 42, 1008–1011 (1990).
16. "Measuring Stiffnesses and Residual Stresses of Silicon Nitride Thin Films," S. Hong, T.P. Weihs, J.C. Bravman and W.D. Nix, *Journal of Electronic Materials*, 19, 903–909 (1990).
17. "Molecular Beam Epitaxial Growth of Layered Bi–Sr–Ca–Cu–O Compounds," D. G. Schlom, A. F. Marshall, J.T. Sizemore, Z.J. Chen, J. N. Eckstein, I. Bozovic, K.E. von Dessonneck, J.S.

- Harris and J.C. Bravman, *Journal of Crystal Growth*, 102, 361–375 (1990).
18. “Mechanical Properties and Microstructural Characterization of Al–0.5% Cu Thin Films,” R. Venkatraman, J.C. Bravman, P.W. Davies, P.A. Flinn, D.B. Fraser and W.D. Nix, *Journal of Electronic Materials*, 19, 1231–7 (1990).
 19. “The Microstructure of Fe and Ag Thin Films Grown by Molecular Beam Epitaxy on GaAs (001),” C.J. Chien, R.F.C. Farrow and J.C. Bravman, *Journal of Applied Physics*, 68, 4343–5 (1990).
 20. “Vortex Pinning by Twin Boundaries in YBa₂Cu₃O_{7–d} Thin Films,” B.M. Lairson, S.K. Streiffer and J.C. Bravman, *Physical Review B*, 42, 10067–74 (1990).
 21. “Magnetic ordering in strain-controlled epitaxial rare-earth films,” R. F. C. Farrow, S. S. P. Parkin, W. Bennett, A. Segmuller, J. Chien, and J. C. Bravman, *Journal of Applied Physics*, 67, 5733 (1990).
 22. “Growth of YBa₂Cu₃O_{7–d} Thin Films on Vicinal MgO Surfaces,” S.K. Streiffer, B.M. Lairson and J.C. Bravman, *Applied Physics Letters*, 57, 2501–3 (1990).
 23. “Synthesis and Properties of YBa₂Cu₃O_{7–d} Thin Films Grown In-Situ by 90° Off-Axis Single Magnetron Sputtering,” C.B. Eom, J.Z. Sun, S.K. Streiffer, A.F. Marshall, B.M. Lairson, K. Yamamoto, S.M. Anlage, J.C. Bravman, T. H. Geballe, S.S. Laderman and R. C. Taber, *Physica C*, 171, 354–82 (1990).
 24. “Role of Atomic Oxygen produced by ECR Plasma in the Oxidation of YBa₂Cu₃O_{7–d} Thin Films studied by In-situ Resistivity Measurements,” K. Yamamoto, B.M. Lairson, C.B. Eom, R. H. Hammond, J.C. Bravman and T.H. Geballe, *Applied Physics Letters*, 57, 1936–8 (1990).
 25. “Thermal Activation of Vortex Motion in YBa₂Cu₃O_{7–d} Films at Low Temperatures,” B.M. Lairson, J.Z. Sun, T.H. Geballe, M. R. Beasley and J.C. Bravman, *Physical Review B*, 43, 10405–12 (1991).
 26. “Magnetic Relaxation, J–E Characteristics and Possible Dissipation Mechanisms for High T_c Superconducting Films of YBa₂Cu₃O_{7–d},” J.Z. Sun, C.B. Eom, B.M. Lairson, J.C. Bravman and T. H. Geballe, *Physical Review B*, 43, 3002–8 (1991).
 27. “Oxidation Kinetics of YBa₂Cu₃O_{7–d} Thin Films in the Presence of Atomic Oxygen and Molecular Oxygen by In-situ Resistivity Measurements,” K. Yamamoto, B.M. Lairson, J.C. Bravman and T.H. Geballe, *Journal of Applied Physics*, 69, 7189–7201 (1991).
 28. “Microstructure of Ultrathin Films of YBa₂Cu₃O_{7–d} on MgO,” S.K. Streiffer, B.M. Lairson, C.B. Eom, J.C. Bravman and T. H. Geballe, *Physical Review B*, 43, 13007–13018 (1991).
 29. “Thickness Dependence of the Twin Density in YBa₂Cu₃O_{7–d} Thin Films Sputtered onto MgO Substrates,” S.K. Streiffer, E.M. Zielinski, B.M. Lairson, and J.C. Bravman, *Applied Physics Letters*, 58, 2171–3 (1991).
 30. “The Effect of Laser Reflowing on the Variation of Stress with Thermal Cycling in Aluminum Thin Films,” R. Venkatraman, S. Chen and J.C. Bravman, *Journal of Vacuum Science and Technology A*, 9, 2536–42 (1991).
 31. “Separation of Film Thickness and Grain Boundary Strengthening Effects in Al Thin Films on Si,” R. Venkatraman and J.C. Bravman, *Journal of Materials Research*, 7, 2040–2048 (1992).
 32. “Limits on the use of tunneling to describe the Pd–Ge ohmic contact to GaAs,” A. Herrera-Gómez, P. L. Meissner, J. C. Bravman and W. E. Spicer, *Journal of Vacuum Science and Technology A*, 10, 1029 (1992).
 33. “Nucleation and Growth Mechanisms of a,b–Axis Oriented YBa₂Cu₃O_{7–d} Films on LaAlO₃,” S.K. Streiffer, B.M. Lairson, E.M. Zielinski, and J.C. Bravman, *Physical Review B*, 47, 11431–38 (1993).
 34. “Finite-Element Modeling and X-ray Determination of Stress in Passivated Al Lines During Thermal Cycling,” P.R. Besser, A. Sauter-Mack, D. Fraser, and J.C. Bravman, *Journal of the Electrochemical Society*, 140, 1769–73 (1993).
 35. “An X-ray Method for Direct Determination of the Stress State and Strain Relaxation in Micro-scale Passivated Metallization Lines During Thermal Cycling,” P.R. Besser, S. Brennan, and J.C. Bravman, *Journal of Materials Research*, 9, 13–24 (1994).

36. "Elastic Strain Gradients and X-ray Line Broadening Effects as a Function of Temperature in Aluminum Thin Films on Silicon," R. Venkatarman, P.R. Besser, S. Brennan and J.C. Bravman, *Journal of Materials Research*, 9, 328-35 (1994).
37. "Understanding and Electrochemical Control of $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ Thin Film Epitaxy on Yttrium Stabilized Zirconia," J.L. MacManus-Driscoll, T.H. Geballe, and J.C. Bravman, *Journal of Applied Physics*, 75, 412-422 (1994).
38. "Effect of Ion Energy on the Diffusion of Si Implanted into GaAs," C.C. Lee, M.D. Deal, K.S. Jones, H.G. Robinson, and J.C. Bravman, *Journal of the Electrochemical Society*, 141, 2245-2249 (1994).
39. "Eliminating Dopant Diffusion after Ion Implantation by Surface Etching," C.C. Lee, M. E. Deal and J.C. Bravman, *Applied Physics Letters*, 64, 3302-3304 (1994).
40. "Observation of Voids Induced by Mechanical Stress and Electromigration in Passivated Al Lines Deposited at Different Purity Levels," T. Marieb, J.C. Bravman, P. Flinn, D. S. Gardner, and M. Madden, *Applied Physics Letters*, 64, 2424-6 (1994).
41. "The Effects of Silver and Lead on the Phase Stability of the Bi-2212 and Bi-2223 Phases Above and Below the Solidus Temperature," J.L. MacManus-Driscoll, J.C. Bravman, R. J. Savoy, G. Gorman and R.B. Beyers, *Journal of the American Ceramic Society*, 77, 2305-13 (1994).
42. "Effects of Barrier Layer and Annealing on Abnormal Grain Growth in Copper Thin Films," E.M. Zielinski, R.P. Vinci, and J.C. Bravman, *Journal of Applied Physics*, 76, 4516-23 (1994).
43. "Studies of Structural Disorder in $\text{ReBa}_2\text{Cu}_3\text{O}_{7-x}$ Thin Films as a Function of Rare Earth Ionic Radius and Film Deposition Conditions," J.L. MacManus-Driscoll, J.A. Alonso, P. Wang, T.H. Geballe and J.C. Bravman, *Physica C*, 232, 288-308 (1994).
44. "Phase Equilibria and Melt Processing of $\text{Bi}_2\text{Sr}_2\text{Ca}_1\text{Cu}_2\text{O}_{8+x}$ Tapes at Reduced Oxygen Partial Pressures, J.L. MacManus-Driscoll, P. Wang, J.C. Bravman and R.B. Beyers, *Applied Physics Letters*, 65, 2872-4 (1994).
45. "The Influence of Strain Energy on Abnormal Grain Growth in Copper Thin Films," E.M. Zielinski, R.P. Vinci, and J.C. Bravman, *Applied Physics Letters*, 67, 1078 - 1080 (1995).
46. "Transport Characterization of Calcium-Doped YBCO Thin Films," J.T. Kucera and J.C. Bravman, *Physical Review B*, 51, 8582-90 (1995).
47. "Thermal Strain and Stress in Copper Thin Films," R.P. Vinci, E.M. Zielinski, J.C. Bravman, *Thin Solid Films*, 262, 142-153 (1995). (Invited Review)
48. "Effects of Barrier Layer and Processing Conditions on Thin Film Cu Microstructure," E.M. Zielinski, R.P. Vinci, J.C. Bravman, *Journal of Electronic Materials*, 24, 1485-1492 (1995).
49. "Observations of Electromigration Induced Void Nucleation and Growth in Polycrystalline and Near-bamboo Passivated Al Lines," T. Marieb, P. Flinn, J.C. Bravman, D. Gardner, M. Madden, *Journal of Applied Physics*, 78, 1026-32 (1995).
50. "Diffusion of Implanted Be in $\text{Al}_x\text{Ga}_{1-x}\text{As}$ as a Function of Al Concentration and Anneal Temperature," C.C. Lee, M. Deal and J.C. Bravman, *Applied Physics Letters*, 66, 355-7 (1995).
51. "Phase Equilibria in the Y-Ba-Cu-O System and Melt Processing of Ag Clad $\text{Y}_1\text{Ba}_2\text{Cu}_3\text{O}_{7-x}$ Tapes at Reduced Oxygen Partial Pressures," J.L. MacManus-Driscoll, J.C. Bravman and R.B. Beyers, *Physica C*, 241, 401-13 (1995).
52. "Pseudo-Quaternary Phase Relations Near $\text{Bi}_2\text{Sr}_2\text{Ca}_1\text{Cu}_2\text{O}_{8+x}$ in Reduced Oxygen Pressures," J.L. MacManus-Driscoll, J.C. Bravman and R.B. Beyers, *Physica C*, 251, 71-88 (1995).
53. "Modeling Diffusion in Gallium Arsenide: Recent Work," Y.M. Haddara, C.C. Lee, J.C. Hu, M.D. Deal & J.C. Bravman, *MRS Bulletin*, 20, #4, 41-50 (1995).
54. "Measurement and Interpretation of Strain Relaxation in Passivated Al-0.5%Cu Lines," P.R. Besser, T.N. Marieb, P.A. Flinn, and J.C. Bravman, *Journal of Materials Research*, 11, 184-193 (1996).
55. "The Effect of Encapsulant Material on the Diffusion of Beryllium in Molecular Beam Epitaxially Grown Gallium Arsenide," Y.M. Haddara, M.D. Deal and J.C. Bravman, *Applied Physics Letters*, 68, 1939-41 (1996).

56. "An Analysis Technique for Extraction of Thin Film Stresses from X-ray Data," G. Cornella, S.H. Lee, W.D. Nix, and J.C. Bravman, *Applied Physics Letters*, 71, 2949-52 (1997).
57. "Transient Diffusion of Beryllium and Silicon in Gallium Arsenide," Y. Haddara and J.C. Bravman, *Annual Reviews of Materials Science*, 28, 185-214 (1998)
58. "Void nucleation on intentionally added defects in Al interconnects," J. C. Doan, S.-H. Lee, J. C. Bravman, P. A. Flinn and T. N. Marieb, *Applied Physics Letters*, 75, 633-35 (1999).
59. "The Evolution of the Resistance of Aluminum Interconnects during Electromigration," J. C. Doan, J. C. Bravman, P. A. Flinn, and T. N. Marieb, *Microelectronics Reliability*, 40, 981-990 (2000).
60. A High-Voltage Scanning Electron Microscopy System for In-Situ Electromigration Testing," J. C. Doan, S.-H. Lee, N. E. Meier, J. C. Bravman, P. A. Flinn, T. N. Marieb and M. C. Madden, *Review of Scientific Instruments*, 71, 2848-2854 (2000).
61. "Stress Relaxation of Free Standing Aluminum Beams for Microelectromechanical Systems Applications," H.-J. Lee, G. Cornella and J. C. Bravman, *Applied Physics Letters*, 76, 3415-17 (2000).
62. "Differential Thermal Budget in Laser Processing: Application to Formation of Titanium Silicide," J. C. Bravman, G. Verma, and S. Talwar, *IEEE Electron Device Letters*, 21, #10, 482-84, (2000).
63. "Effects of Dielectric Materials on Electromigration Failure," J. C. Doan, S. Lee, S.-H. Lee, P. A. Flinn, J. C. Bravman and T. N. Marieb, *Journal of Applied Physics*, 89, 7797-7808 (2001).
64. "Use of angle resolved x-ray photoelectron spectroscopy for determination of depth and thickness of compound layer structures," S. Spruytte, C. Coldren, J. Harris, D. Pantelidis, H.-J. Lee, J. Bravman, and M. Kelly, *Journal of Vacuum Science and Technology A*, 19, 603-608 (2001).
65. "Creating Process Margin in Laser Thermal Processing: Application to Formation of Titanium Silicide," G. Verma, S. Talwar and J. C. Bravman, *Applied Physics Letters*, 78, 925-27 (2001).
66. "Submicron X-Ray Diffraction," A. A. MacDowell, R. S. Celestre, N. Tamura, R. Spolenak, B. Valek, W. L. Brown, J. C. Bravman, H. A. Padmore, B. W. Batterman and J. R. Patel, *Nuclear Instruments & Methods In Physics Research Section A-Accelerators Spectrometers Detectors And Associated Equipment* 467, 936-43 Part 2, (2001)
67. "Miniature Nernstian Oxygen Sensors for Deposition and Growth Environments," E. van Setten, T. M. Gur, D. Blank, J. C. Bravman and M. R. Beasley, *Review of Scientific Instruments*, 73, 156-161 (2002).
68. "Formation of Titanium Silicide on Narrow Gates Using Laser Processing," G. Verma, C. Gelatos, S. Talwar, and J. C. Bravman, *IEEE Transactions on Electron Devices*, 49, #1, 42-48 (2002).
69. "Effect of interface conditions on yield behavior of passivated copper thin films," R. P. Vinci, S. A. Forrest, and J. C. Bravman, *J. Mater. Res.*, 17, 1863 (2002).
70. "Stress-induced and electromigration voiding in aluminum interconnects passivated with silicon nitride," S.-H. Lee, J. C. Bravman, J. C. Doan, S. Lee, P. A. Flinn, and T. N. Marieb, *Journal of Applied Physics*, 91, 3653-57 (2002).
71. "Subcritical debonding of polymer/silica interfaces under monotonic and cyclic loading," J. M. Snodgrass, D. Pantelidis, M. L. Jenkins, J. C. Bravman, and R. H. Dauskardt, *Acta Materialia*, 50 (9), 2395-2411 (2002).
72. "High spatial resolution grain orientation and strain mapping in thin films using polychromatic submicron x-ray diffraction," N. Tamura, A. A. MacDowell, R. S. Celestre, H. A. Padmore, B. Valek, J. C. Bravman, R. Spolenak, W. L. Brown, T. Marieb, H. Fujimoto, B. W. Batterman and J. R. Patel, *Applied Physics Letters*, 80, 3724-26 (2002).
73. "Electromigration-induced plastic deformation in passivated metal lines," B. C. Valek, J. C. Bravman, N. Tamura, A. A. MacDowell, R. S. Celestre, H. A. Padmore, R. Spolenak, W. L. Brown, B. W. Batterman, and J. R. Patel; *Applied Physics Letters*, 81, 4168-70 (2002).
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