David B. Williams PhD, ScD
ACADEMIC CV
Monte Ahuja Endowed Dean's Chair
Dean of The College of Engineering
The Ohio State University, Columbus, OH 43210

EDUCATION

Sc.D. Faculty of Physics and Chemistry, Cambridge University, U.K., 2001
Ph.D. Metallurgy and Materials Science, Cambridge University, U.K., 1974
M.A. Materials Science, Cambridge University, U.K., 1974
B.A. Materials Science, First Class Honours, Cambridge University, U.K., 1970

ACADEMIC EXPERIENCE

2015-present Visiting Professor, School of Materials, The University of Manchester, UK
2012-2019 Executive Dean of the Professional Colleges, The Ohio State University
2011-present Dean, The Ohio State University, College of Engineering
2007-2011 President, The University of Alabama in Huntsville
2007-present Harold Chambers Senior Professor Emeritus, Lehigh University
2007 Visiting Scientist, Electron Microscope Unit, University of Sydney, Australia
2006 Consulting Professorship, Harbin Institute of Technology, Harbin, China
2005 Chaikin Research Fellow, University of New South Wales, Sydney, Australia
2000-2006 Vice Provost for Research, Lehigh University
1999 NATO fellowship, ONERA, Chatillon, Paris, France
1994 Visiting Scientist, Max Planck Institut für Metallforschung, Stuttgart, Germany
1993 Visiting Scientist, Los Alamos National Laboratory, Los Alamos, NM
1992-2007 Harold Chambers Senior Professor, Lehigh University
1992-2000 Chair, Department of Materials Science and Engineering, Lehigh University
1989 Visiting Professor, Chalmers University of Technology, Goteborg, Sweden
1986 Visiting Scientist, Electron Microscope Unit, University of Sydney, Australia
1983-2007 Professor, Lehigh University
1983 Visiting Professor, University of New South Wales, Sydney, Australia
1980-1998 Director, Electron Optical Laboratory, Lehigh University
1979-1983 Associate Professor, Lehigh University
1976-1979 Assistant Professor, Lehigh University
1974-1976 Science Research Council Fellow, Cambridge University, U.K.

RESEARCH AND TEACHING INTERESTS

Analytical/transmission/scanning electron microscopy (AEM/TEM/SEM), X-ray/electron energy loss spectrometry, convergent-beam diffraction; applications to interfacial segregation, bonding changes, texture, phase-diagrams in aerospace and power-generation alloys; glass structure.
Engineering/science & technology policy, university-government-industry research partnerships

PUBLICATIONS, PRESENTATIONS AND CONFERENCES

Author/co-author of 4 textbooks and multiple book chapters on EM of materials
Co-editor of 3 textbooks and 6 conference proceedings
Author/co-author of >225 refereed journal and book publications
Author/co-author of >225 abstract/conference publications
Presented > 310 invited talks at universities, research labs and conferences in 30 countries
Google Scholar h–index 44; >14,000 citations

PRINCIPAL HONORS AND AWARDS

Presidential Inauguration Speaker, Mississippi College, 2019
Honorary Member of the Japan Society for the Promotion of Science, 141 Committee, 2015
Honorary (Life) Membership, The Microscopy Society of America, 2014
Honorary (Life) Membership, The Microanalysis Society, 2014
Charles S. Barrett Silver Medal, ASM Rocky Mountain Chapter, 2014
Honorary (Life) Membership, The Minerals, Metals & Materials Society, 2013
Alpha Sigma Mu Honorary Lecture, MS&T 100th Anniversary Meeting, 2013
Henry Clifton Sorby Award, The International Metallographic Society, 2011
First recipient, Duncumb Award for Microanalysis Excellence, The Microanalysis Society, 2007
Commencement Speaker, University of Alabama in Huntsville, 2007
Warren F. Savage Memorial Award (best paper published in the Welding Journal) 2004
Presidential Science Award of the Microanalysis Society, 1997
Commencement Speaker, Founder's Day, Lehigh University, 1996
President, International Union of Microanalysis Societies (IUMAS), 1994-2000
Heinrich Award, of the Microanalysis Society, 1988
Burton Medal of the Electron Microscopy Society of America, 1984

PROFESSIONAL SOCIETY AWARDS AND SERVICE

Aeronautics & Astronautics
Fellow (2018) **The Royal Aeronautical Society** (U.K.**)**
Associate Fellow (2018), **The American Institute of Aeronautics and Astronautics**

Microscopy & Microanalysis
Fellow (2018**) and Life Member (**2014**)**, **The Microanalysis Society**; Director, 1986-89, President 1991-92, Intl. Rep., 1994-00
Fellow, Microscopy Society of America, 2012; Physical Sciences Director, 1997-99
President, **International Union of Microbeam Analysis Societies** (IUMAS)**,** 1994-00
Life Member, **European Microbeam Analysis Society**, 1991
Fellow, **Royal Microscopical Society** (U.K.), 1977

Materials/Science/Engineering
Trustee (2014-2017) **and Fellow (**1988**)**, **ASM International**; Symposium Organizer, World Materials Congress, 1988; Chair, Committee for Engineering Materials Achievement Award, 1998; Advisory Technical Awareness Committee, 1997-00
Fellow, American Association for the Advancement of Science, 2012
American Society for Engineering Education, Deans' Council, 2011-present; Public Policy Committee, 2014-2017
University Materials Council (chairs of MS&E Depts. in US and Canada), 1992-00; Vice Chair, 1998-99, Chair, 1999-00; Federation of Materials Societies, 1995-2000
Fellow (1996**) and Life Member (**2013**)**, **The Minerals, Metals & Materials Society**; Fellow's Committee 1997-00, 2003-06
Fellow, **Institute of Materials** (U.K.) 1986; (now the Institute of Metals, Minerals and Mining); Registered as Chartered Engineer (C. Eng.) of the Council of Engineering Institutions (U.K.)
Member, **Materials Research Society**; 1980-2007, short course organizer and teacher, 1986-89

OTHER PROFESSIONAL ACTIVITIES

CONFERENCES:

International Advisory Committee, Atomic-Level Characterization 2001-19

International Committee, XII Intl. Conf. on EM of Solids, Poland, 2005
Committee, European Microbeam Analysis Society, Sczcyk, Poland, 2002
Co-Chair, IUMAS II, Kona, HI, 2000
Committee, Microscopy of Composite Materials, II, III, Oxford University, 1994, 96
Committee, Keynote Speaker, Intl. Conf. on Aluminum Alloys IV Atlanta, 1994
International Advisory Board, XIII Intl. Cong. for Electron Microscopy, Paris, 1994
Co-Chair of Technical Program, XII Intl. Cong. for Electron Microscopy, Seattle, 1990
Co-Chair, Microbeam Analysis Society AEM Workshop, Lehigh, 1984, Kona, HI, 1987

NATIONAL REVIEW BOARDS

NRC review Panel for NIST Material Measurement Laboratory, 2014
Nominating committee, Presidential Transition Team, National Materials Societies, 2008
Internal review team, Oak Ridge National Laboratory, 2006-2008
DOE-BES Workshop on Next Generation Science for e-Beam Instrumentation, 2007
DOE review board, Oak Ridge National Laboratory SHaRE program, 2006.
DOE review board, Lawrence Berkeley Lab., National Center for EM, 2006
DOE review, Frederick Seitz Lab., University of Illinois, Urbana-Champaign, 2005
NSF Science & Technology Center, site-visit team leader, Univ. of Washington, 2004
DOE review committee, Argonne National Laboratory, EM Center, 2003
NSF Science and Technology Centers, Proposal Review Panel, 2001
DOE review board for EM Facilities, Brookhaven National Laboratory, 1999
DOE review board for EM Facilities, Oak Ridge National Laboratory, 1998
NSF Division of Materials Research, Instrumentation review panel, 1993
Steering Committee of Argonne National Laboratory Electron EM Center, 1984-1987

EDITORSHIPS

Editor, *Acta Materialia*, 2001-2007
Editor, *Journal of Microscopy*, 1989-1995
Associate Editor, *Journal of Microscopy*, 1986-1989
Editorial Board, *Journal of Electron Microscopy Technique*, 1984-1991
Editorial Board, *Journal of Microscopy*, 1984-2005
Key Reader, *Metallurgical Transactions A*, 1980-1988

ACADEMIC LEADERSHIP AT LEHIGH

FACULTY ACADEMIC ADMINISTRATION (EXCLUDING VP RESEARCH)

Chair, Materials Science and Engineering: hired eight faculty, tenured six (three junior, three senior). Four junior professors won NSF NYI or Career Awards and one a Presidential Early Career Award in Science and Engineering. Senior faculty attracted from Columbia, Illinois (Urbana-Champaign), RPI, Stevens, including former MRS and MSA Presidents

Director, Electron Optical Laboratory; external funding for nine instruments (replacement value >$8M) including ~$1.2M from industrial consortium

Principal Lehigh committees: Co-Chair, Presidential Search Committee, Dean of Engineering Search Committee, Provost's Council, Dean's Council, Department Chairs' Committee, University Priorities and Progress Committee, University Research Council

FACULTY RESEARCH (TOTAL FUNDING ~$18 million 1977-2007)

Continuous funding from NSF Division of Materials Research as PI, 1977-2007

DOE funding (co-PI) from 1977-92 and 1995-2000
NASA funding (co-PI) from 1977-94
PI/Co-PI for nine major instrumentation awards from NSF (5), DOE (2) and ONR (2)
Multi-disciplinary proposals with faculty from Colleges of Arts and Science, Education
Created the US's largest (2007), and one of the world's finest, university laboratory for EM of materials (13 instruments, value ~ $10M). (http://www.lehigh.edu/~inmicro/)
Pioneered many aspects of the application of electron microscopy to materials problems
Created the longest running and largest EM professional education program in the world (http://www.lehigh.edu/microscopy/)

FACULTY TEACHING

Taught/co-taught 18 different courses and developed novel teaching programs
Received Doan award for exemplary mentoring three times from the MS&E senior class
First author of leading textbook in TEM of materials (>20,000 copies; used in > 50 US universities and many more worldwide). 1st ed. Plenum 1996; 2nd ed. Springer 2009. Over 20,000 print copies sold, over 1,000,000 chapter downloads
http://www.springer.com/materials/characterization+&+evaluation/book/978-0-387-76500-6
Advised or co-advised 22 MS and 22 PhD students and 15 Post Docs
Developed first remote TEM teaching laboratories over the commodity internet (1996)
First intra-college minor in the College of Engineering and Applied Science (1995)
Created Lehigh's first 5-year BS/MS program (1992)
Built a dedicated undergraduate EM facility for hands-on teaching of SEM and TEM
Five-year BS/MEd degree program between Engineering and Education Colleges
Hired Dr. Helen Chan, the first female post doctoral research associate in the MS&E Department (1983) who became the first female faculty member (1986) and the first female chair of MSE (2006)

GRADUATE STUDENTS ADVISED (*SHARED WITH FACULTY COLLEAGUE)

MS

*Alton D. Romig	1976-1977	Fe-Ni-C phase diagram determination
*Barry A. Bender	1977-1979	Segregation in ceramic oxides
*Rick W. Glitz	1978-1980	Interdiffusion in Ni-Al
Stephen F. Baumann	1978-1980	Precipitation in Cu-Be-X alloys
Joseph R. Michael	1979-1981	Quantification of boundary segregation in Cu
*Ching Hua Chen	1979-1981	Precipitation in NiO-Cr_2O_3
*Sailesh M. Merchant	1979-1981	Precipitation in Al-Ag alloys
*Nicola Stenton	1980-1982	X-ray absorption in thin foils
*Paul M. Novotny	1980-1982	Ordering in mesosiderites
*Janet E. Wood	1980-1982	k-factor determination
Robert Stimson	1981-1983	Precipitation in Al-Li-Zr alloys
*Kathy Benusa	1982-1984	Ordering in FeNi
*Stephen Horvath	1983-1985	Precipitation in Y_2O_3-La_2O
*Janis A. Kowalik	1984-1986	Lamellar plessite in metal meteorites
*Cathy E. Duffield	1987-1989	Metal particles in chondrites
John A. Hunt	1987-1989	Electron energy-loss spectrum imaging
Brian Pelton	1989-1991	SEM of chondrites
Y.C. Feng	1989-1990	Icosahedral phases in Al-Li-Cu
Kathy A. Repa	1990-1996	Cr thin-film standards for AEM
Vicki J. Keast	1994-1995	Segregation of Bi in Cu

*Stephen Claves	1999 -2002	Textures in rolled Al alloys
* Pradyumna Gupta	2002- 2006	Nano-scale ferroelectric domains

PhD

*Alton D. Romig	1977-1979	The Fe-Ni and Fe-Ni-P phase diagram
*Hunlian L. Tsai	1978-1982	Cl segregation in Si/SiO_2 interfaces
*Jag Sankar	1979-1982	Pressure-vessel steel welds
Stephen F. Baumann	1980-1983	Precipitation mechanisms in Al-Li-X alloys
*Rajen Dias	1981-1984	Nuclear pressure vessel welds
Joseph R. Michael	1981-1984	Grain boundary precipitation in Al-Cu
ChangMo Sung	1983-1987	CBED of Al-Li alloys
*Kathy B. Reuter	1984-1986	The low-temperature Fe-Ni/Fe-Ni-P phase diagram
Kenneth S. Vecchio	1985-1988	Precipitation in Al-Li-Cu
*Jing Zhang	1986-1991	Transformations in martensitic Fe-Ni alloys
*Charles E. Bateman	1986-1990	Precipitation in ZrO
Kamal K. Soni	1987-1991	Oxidation of Al-Li alloys
John A. Hunt	1989-1992	Spectrum-imaging applications
Stephen M. Zemyan	1989-1996	Characterization of heavy metal aerosols
*Lina Ma	1990-1994	Fe-Ni-S ternary phase diagram
Ming Wei Tseng	1991-1995	Microchemistry of superalloy-sapphire composites
*C.W. Yang	1992-1995	Cooling rates in metal meteorites
Vicki J. Keast	1995-1998	Bonding changes in Cu-Bi
*Derrick T. Carpenter	1995-1999	Cu segregation in Al
*Faisal Alamgir	1996-2002	Slow-cooled metallic glasses
*S. Claves	2002-2005	Textures in rolled Al alloys
* Rick Noecker	2004-2006	Brittle failure in pressure vessel welds

Post-Doctoral Research Associates/Research Scientists

*L.S. (Jim) Lin	1976-1979	Phases in Fe-Ni meteorites
*Sudhir Mehta	1979-1981	Metal particles in lunar rocks
Helen M. Chan	1983-1985	Chemistry of the Al_3Li phase in Al-Li alloys
Dang Rong (Ron) Liu	1984-1989	Electron Spectroscopy of Al-Li alloys
Andrew J. Strutt	1990-1992	EELS of Cu-Be and Al-Li
Ze Zhang	1991-1992	Icosahedral/decagonal phases in Fe alloys
John A. Hunt	1992-1993	Spectrum imaging
John Bruley	1994-1997	Bonding effects during boundary segregation
Masashi Watanabe	1995-2005	Limits of X-ray microanalysis
*Dennis Winkler	1996-1997	Extended fine structure of ionic glasses
*Yasuo Ito	1997-1999	Extended fine structure of ionic glasses
David Whittle	1997-1999	Boundary segregation in commercial Al alloys
Alan Papworth	1999-2001	Embrittlement of low-alloy steels
John Li	2000-2000	GB segregation in Al and Fe
Chunfel Li	2001-2003	Misorientation mapping

PUBLICATIONS

I. Books Written and Edited

1. **Williams, D. B.**, Practical Analytical Electron Microscopy in Materials Science, 155 pp., Philips Electron Optics Publishing Group, Mahwah, NJ (1984); also published by Verlag Chemie, Deerfield Beach, FL (1984); revised editions published 1987 (Philips), 1990 (Tech Books).

2. **Williams, D. B.** and Joy, D. C., (Eds.) Analytical Electron Microscopy-1984, 378 pp., San Francisco Press, San Francisco, CA (1984).

3. Hobbs, L. W., Westmacott, K. H. and **Williams, D. B.** (Eds.) Materials Problem Solving with the Transmission Electron Microscope, 451 pp., Materials Research Society (Vol. 62), Pittsburgh, PA (1986).

4. Peachey, L. D., and **Williams, D. B.**, (Eds.) Electron Microscopy-1990, Proceedings of the XII International Congress for Electron Microscopy, San Francisco Press, San Francisco, CA (1990)
   Vol. 1, Imaging Sciences, 615 pp.
   Vol. 2, Analytical Sciences, 553 pp.
   Vol. 3, Biological Sciences, 980 pp.
   Vol. 4, Materials Science, 1130 pp.

5. Lyman, C. E., Newbury, D. E., Goldstein, J. I., **Williams, D. B.**, Romig, Jr. A. D., Armstrong, J. T., Echlin, P., Fiori, C. E., Joy, D. C., Lifshin, E., and Peters, K-R., Scanning Electron Microscopy, X-ray Microanalysis, and Analytical Electron Microscopy: A Laboratory Workbook, 407 pp., Plenum Press, New York, NY (1990).

6. **Williams, D. B.**, Pelton, A. R., and Gronsky, R., (Eds.) Images of Materials, 379 pp., Oxford University Press, New York, NY (1991).

7. **Williams, D. B.**, Goldstein, J. I. and Newbury, D. E., (Eds.) X-ray Spectrometry in Electron Beam Instruments, 372 pp., Plenum Press, New York, NY (1995).

8. **Williams D. B.** and Carter, C. B., Transmission Electron Microscopy-A Textbook for Materials Science, 750 pp., Plenum Press, New York, NY (1996).

9. Pond, R. C., Clark, W. A. T., King, A.H. and **Williams, D. B.**, (Eds.) Boundaries & Interfaces In Materials, (The David A. Smith Symposium) 348 pp., TMS, Warrendale, PA, (1998).

10. Thomas, G., Carter, C. B., De Hosson, J. Th. M., Gerberich, W. W., Gronsky, R., Humphreys, C. J., Nix, W. D., Ruhle, M., Seidman, D. and **Williams, D. B.**, (Eds.) Materials Science & Mechanics of Interfaces, Proceedings of Acta Materialia Workshop, Acta Mat, 47 3937-4252, (1999).

11. **Williams D. B.** and Shimizu, R., (Eds.) Microbeam Analysis 2000, Institute of Physics Conference Series 165, 498 pp., The Institute of Physics, Bristol and Philadelphia, PA, (2000).

12. **Williams D. B.** and Carter, C. B., Transmission Electron Microscopy-A Textbook for Materials Science, 2nd edition, 750 pp., Springer, New York, NY (2009).

13. Carter, C. B. and **Williams, D. B**., (Eds.) Transmission Electron Microscopy, Diffraction, Imaging and Spectrometry (A Companion Volume) 520pp, Springer, New York, NY (2016).

II. **Refereed Journal Publications**

1. Hibbert, G., Doig, P., **Williams, D. B.** and Edington, J. W., "The Variation of Plasma Energy Loss with Composition in Dilute Aluminium-Magnesium Solid Solutions" Phil. Mag., 26, 1491-1494 (1972).

2. **Williams, D. B.** and Edington, J. W., "Microanalysis of Al-Li Alloys Containing Fine δ' (Al_3Li) Precipitates" Phil. Mag., 30, 1147-1153 (1974).

3. **Williams, D. B.** and Edington, J. W., "The Precipitation of δ' (Al_3Li) in Dilute Aluminium-Lithium Alloys" Metal Science 9, 529-532 (1975).

4. **Williams, D. B.** and Edington, J. W., "The Discontinuous Precipitation Reaction in Dilute Al-Li Alloys" Acta Metall., 24, 323-332 (1976).

5. **Williams, D. B.** and Edington, J. W., "On the Presence of Amorphous Regions in Splat-Quenched Al-Cu Alloys" J. Mat. Sci., 11, 2146-2148 (1976).

6. **Williams, D. B.** and Edington, J. W., "The Production of Electron Transparent Areas by Splat Quenching" J. Mat. Sci., 11, 2151-2153 (1976).

7. **Williams, D. B.** and Edington, J. W., "Microanalysis of Splat-Quenched Al-Cu Alloys" Phil. Mag., 34, 235-242 (1976).

8. **Williams, D. B.** and Edington, J. W., "Microstructural Characteristics of Splat-Quenched Aluminium-Copper Alloys" J. Mat. Sci., 12, 126-130 (1976).

9. **Williams, D. B.** and Edington, J. W., "High Resolution Microanalysis in Materials Science Using Electron Energy Loss Measurements" J. Microsc., 108, 113-145, invited review (1976).

10. Goldstein, J. I. and **Williams, D. B.**, "X-ray Analysis in the TEM/STEM" Scanning Electron Microscopy, ed. O. Johari, IITRI, Chicago, IL 60616, 1, 651-662 (1977).

11. **Williams, D. B.**, Doig, P. and Edington, J. W., "A New Entrance Slit for Möllenstedt Electron Spectrometers" J. Phys. E. (Sci. Instrum.) 10, 593-594 (1977).

12. Lin, L. S., Goldstein, J. I. and **Williams, D. B.**, "Analytical Electron Microscopy Study of the Carlton Iron Meteorite", Geochimica et Cosmochimica Acta, 41, 1861-1874 (1977).

13. **Williams, D. B.** and Edington, J. W., "Reply to Comments on the Microstructure of Rapidly Quenched Al-Cu Alloys" J. Mater. Sci., 13, 1356-1357 (1978).

14. Goldstein, J. I. and **Williams, D. B.**, "Spurious X-rays Produced in the Scanning Transmission Electron Microscope" Scanning Electron Microscopy, ed. O. Johari, AMF O'Hare, IL, 60666, 1, 427-434 (1978).

15. Lin, L. S., Goldstein, J. I. and **Williams, D. B.**, "Analytical Electron Microscopy Study of the Plessite Structure in Four III CD Iron Meteorites" Geochimica et Cosmochimica Acta, 43, 725-737 (1979).

16. **Williams, D. B.** and Goldstein, J. I., "The Use of a Table Top SEM in Undergraduate Teaching" Scanning Electron Microscopy, ed. O. Johari, AMF O'Hare, IL 60666, 1, 221-224 (1979).

17. Bender, B., **Williams, D. B.** and Notis, M. R., "Absorption Effects in STEM Microanalysis of Ceramic Oxides", J. Amer. Ceram. Soc., 63, 149-151 (1980).

18. Mehta, S., Novotny, P. M., **Williams, D. B.** and Goldstein, J. I., "Electron Optical Observations of Ordered Fe-Ni in the Estherville Meteorite", Nature, 284, 151-153 (1980).

19. Bender, B., **Williams, D. B.** and Notis, M. R., "AEM Investigation of Grain Boundary Segregation in Ceramic Oxides", J. Amer. Ceram. Soc., 63, 542-546 (1980).

20. **Williams, D. B.**, "The Application of Electron Optical Techniques to Problems in Metallurgical and Materials Engineering", J. of Metals, 32, 16-25, invited review (1980) (also published in Norelco Reporter, 27, 11-21 (1980)).

21. **Williams, D. B.** and Butler, E. P., "Grain Boundary Discontinuous Precipitation Reactions", International Metals Reviews, 26, 153-183 (1981).

22. Baumann, S. F., Michael, J. R. and **Williams, D. B.**, "Initiation and Growth of the Grain Boundary Discontinuous Precipitation Reaction", Acta Metall., 29, 1343-1355 (1981).

23. Njegic, A. and **Williams, D. B.**, "Precipitation Induced by Ion Beam Thinning", J. Microsc., 123, 293-297 (1981).

24. Baumann, S. F. and **Williams, D. B.**, "A STEM/X-ray Microanalytical Study of the Equilibrium Segregation of Bismuth in Copper", J. Microsc., 123, 299-305 (1981).

25. **Williams, D. B.** and Goldstein, J. I., "Electron Microscope-Based Techniques for Solving Materials Problems", American Laboratory, 13 (12), 35-44 (1981).

26. Sankar, J. and **Williams, D. B.**, "Analytical Electron Microscopy of Pressure Vessel Steel Weldments", Scanning Electron Microscopy, ed. O. Johari, AMF O'Hare, IL 60666, 1, 159-168 (1981).

27. **Williams, D. B.** and Goldstein, J. I., "The Teaching of Electron Microscopy Through Intensive Short Courses", Norelco Reporter, 29, 49-50 (1982).

28. Rez, P. and **Williams, D. B.**, "Electron Microscope/Computer Interactions: An Introduction", Ultramicroscopy, 8, 247-251 (1982).

29. Novotny, P. M., Goldstein, J. I. and **Williams, D. B.**, "Analytical Electron Microscopy Study of Eight Ataxites", Geochimica et Cosmochimica Acta, 46, 2461-2469 (1982).

30. Merchant, S. M., Notis, M. R. and **Williams, D. B.**, "Further Observations on the Formation Mechanisms of Precipitate-Free Zones in an Aged Al-16 wt. pct. Ag Alloy", Metall. Trans., 14A, 1745-1748 (1983).

31. Merchant, S. M., Notis, M. R. and **Williams, D. B.**, "An AEM Investigation of the Formation of Precipitate-Free Zones in an Al-16 wt. pct. Ag Alloy: Determination of Equilibrium and Metastable Solvus Lines", Metall. Trans. 14A, 1825-1831 (1983)

32. Chen, C. H., Notis, M. R. and **Williams, D. B.**, "Precipitation and Solid Solubility in the NiO-Cr_2O_3 System", J. Amer. Ceram. Soc., 66, 566-571 (1983).

33. Michael, J. R. and **Williams, D. B.**, "An Analytical Electron Microscope Study of the Kinetics of the Equilibrium Segregation of Bismuth in Copper", Metall. Trans., 15A, 99-105 (1984).

34. Stenton, N., Notis, M. R. and **Williams, D. B.**, "Quantitative Electron Energy Loss Measurements in the ZrO_2-CaO System", J. Amer. Ceram. Soc., 67, 227-232 (1984).

35. Wood, J. E., **Williams, D. B.** and Goldstein, J. I., "An Experimental and Theoretical Determination of k_{AFe} Factors for Quantitative X-ray Microanalysis in the Analytical Electron Microscope", J. Microsc., 133, 255-274 (1984).

36. Baumann, S. F. and **Williams, D. B.**, "A New Method for the Determination of the Precipitate-Matrix Interfacial Energy", Scripta Metall., 18, 611-616 (1984).

37. Tsai, H. L., Butler, S. R., **Williams, D. B.**, Kraner, H. W. and Jones, K. W., "Cl Incorporation at the Si/SiO_2 Interface During the Oxidation of Si in HCl/O_2 Ambients", Journal of the Electrochemical Society, 131, 411-418 (1984).

38. **Williams, D. B.**, Newbury, D. E., Goldstein, J. I. and Fiori, C. E., "On the Use of Ionization Cross Sections in Analytical Electron Microscopy", J. Microsc., 136, 209-218 (1984).

39. Michael, J. R., Cliff, G. and **Williams, D. B.**, "A Microcomputer-Based Monte Carlo Simulation and Its Application to Grain Boundary Segregation Studies in the Analytical Electron Microscope", Scanning Electron Microscopy, ed. O. Johari, SEM Inc., AMF O'Hare, Chicago, IL 60666, IV, 1697-1705 (1984).

40. Michael, J. R., **Williams, D. B.** and Goldstein, J. I., "Using a Microcomputer to Aid in the Teaching of Beam-Specimen Interactions in Scanning and Transmission Electron Microscopy", Scanning Electron Microscopy, ed. O. Johari, SEM Inc., AMF O'Hare, Chicago, IL 60666, IV, 1723-1729 (1984).

41. Baumann, S. F. and **Williams, D. B.**, "Effects of Capillarity and Coherency on □' (Al_3Li) Precipitation in Dilute Al-Li Alloys at Low Undercoolings", Acta Metall., 33, 1069-1075 (1985).

42. Michael, J. R. and **Williams, D. B.**, "Reply to Comments on "An Analytical Electron Microscopy Study of the Kinetics of the Equilibrium Segregation of Bismuth in Copper"", Metall. Trans., 16A, 689-690 (1985).

43. Baumann, S. F. and **Williams, D. B.**, "Experimental Observations on the Nucleation and Growth of δ' (Al_3Li) in Dilute Al-Li Alloys", Metall. Trans., 16A, 1203-1211 (1985).

44. Chan, H. M. and **Williams, D. B.**, "Quantitative Analysis of Lithium in Al-Li Alloys by Ionization Energy Loss Spectroscopy", Phil. Mag. B, 52, 1019-1032 (1985).

45. Reuter, K. B., **Williams, D. B.**, Goldstein, J. I. and Butler, E. P., "Surface Oxide on FCC Iron-Nickel Alloys", Metall. Trans., 17A, 163-167 (1986).

46. Liu, D-R. and **Williams, D. B.**, "The Electron-Energy-Loss Spectrum of Lithium Metal", Phil. Mag. B, 53, 6, L123-L128 (1986).

47. Liu, D.-R., Rommal, H. E. G. and **Williams, D. B.**, "Preparation of Lithium Specimens for Transmission Electron Microscopy", J. Electron Microscopy Technique, 4, 381-383 (1986).

48. Vecchio, K. S. and **Williams, D. B.**, "Experimental Conditions Affecting Coherent Bremsstrahlung in X-ray Microanalysis", J. Microsc., 147, 15-35 (1987).

49. Michael, J. R. and **Williams, D. B.**, "A Consistent Definition of Probe Size and Spatial Resolution in the Analytical Electron Microscope", J. Microsc., 147, 289-303 (1987).

50. Vecchio, K. S. and **Williams, D. B.**, "Convergent Beam Electron Diffraction Study of Al_3Zr in Al-Zr and Al-Li-Zr Alloys", Acta Metall., 35, 2959-2970 (1987).

51. **Williams, D. B.**, Levi-Setti, R., Chabala, J. M. and Newbury, D. E., "High Spatial Resolution Secondary Ion Imaging and Secondary Ion Mass Spectrometry of Aluminum-Lithium Alloys", J. Microsc., 148, 241-252 (1987).

52. Reuter, K. B., **Williams, D. B.** and Goldstein, J. I., "Low Temperature Phase Transformations in the Metallic Phases of Meteorites", Geochimica et Cosmochimica Acta, 52, 617-626 (1988).

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V. Patents

1. Mizia, Ronald E., Shaber, Eric L., DuPont, John N., Robino, Charles V. and **Williams, David B**., "Neutron Absorbing Alloys" US 6,370,180 BI, May 4, (2004).

VI. Invited Talks at Conferences and Professional-Society Meetings

1. "Analytical Transmission Electron Microscopy", American Society for Metals Meeting, "Modern Metallographic Techniques and Their Applications", Cleveland, OH, April 10, 1978.

2. "Artifacts Encountered in Energy Dispersive X-ray Spectrometry in the Analytical Electron Microscope" NBS Workshop on EDS, Gaithersburg, MD, April 24, 1979.

3. "Microstructural Characteristics of Al-Li Alloys", 1st Intl. Conf on Al-Li alloys, Stone Mountain, GA, April 24, 1979.

4. "X-ray Microanalysis of Thin Specimens", Quantitative Microanalysis with High Spatial Resolution, University of Manchester/UMIST, Manchester, UK, March 25, 1981.

5. "Phase Transformations and Analytical Methods", 3rd Annual Kraner Award Symposium, Lehigh Valley Chapter of the American Ceramic Society, Bethlehem, PA, October 6, 1981.

6. "Considerations of the Current Potential and Limits of Analytical Electron Microscopy", 38th EMSA Meeting, Reno NV, August 4, 1980.

7. "Interfacial Solute Segregation Observed Using X-ray Microanalysis in the TEM/STEM", 38th EMSA Meeting, Reno, NV, August 7, 1980.

8. "Initiation of the Grain Boundary Discontinuous Reactions", Solid-Solid Phase Transformations, Carnegie Mellon University, Pittsburgh, PA, August 12, 1981.

9. "Chemical Analysis at High Resolution", Materials Research Society Annual Meeting, Boston, MA, November 16, 1981.

10. "Fundamentals of Analytical Electron Microscopy", Eastern Analytical Symposium, New York, NY, November 18, 1981.

11. "Absorption Effects in Quantitative Thin Film X-ray Microanalysis", Metropolitan Section of the Microbeam Analysis Society, Paramus, NJ, December 2, 1981.

12. "Quantification of Energy Dispersive X-ray Spectra from Thin Foil Specimens", Microbeam Analysis Society Meeting Washington, DC, August 1982.

13. "Interfacial Segregation in Metals, Ceramics and Semiconductors", The Metropolitan Section of the Microbeam Analysis Society, Paramus, NJ, October 19, 1982.

14. "Spectroscopy in the Transmission Electron Microscope", Lehigh Valley Section of the American Spectroscopic Society", Reading, PA, November 19, 1982.

15. "An Overview of Analytical Electron Microscopy", Electron Microscopy of Materials, MRS Meeting, Boston, MA, November 29, 1983.

16. "Analytical Electron Microscopy", Southern California MAS Group Meeting, La Jolla, CA, February 2, 1985.

17. "Recent Advances in Analytical Electron Microscopy", lst Japan AEM Conference, Tokyo, May 1985.

18. "Quantitative Chemical Analysis with the Transmission Electron Microscope", Gordon Conference on Analytical Chemistry, August 12, 1985.

19. "Quantitative High Resolution Microanalysis of Materials in the Analytical Electron Microscope", lst Beijing Conference and Exhibition on Instrumental Analysis, September 1985.

20. "Application of Analytical Electron Microscopy to Advanced Materials", Lehigh Valley Chapter of ASM, December 5, 1985.

21. "Analysis in a Modern TEM", Australian X-ray Analysis Association, University of New South Wales, Australia, February 11, 1986.

22. "Analytical Electron Microscopy", The Pittsburgh Conference on Analytical Chemistry, Atlantic City, NJ, March 13, 1986.

23. "X-ray Energy Dispersive Spectrometry in the Analytical Electron Microscope", Frontiers of Electron Microscopy in Materials Science Conference, Argonne National Laboratory, Argonne, IL, April 21, 1986.

24. "Effect of Accelerating Voltage and Electron Source Brightness on the Spatial Resolution of X-ray Microanalysis", Intermediate Voltage Microscopy and its Application to Materials Science, National Research Council of Canada, Ottawa, Canada, May 26, 1986.

25. "Principles and Application of Quantitative X-ray Energy Dispersive Spectrometry in the Analytical Electron Microscope", XIth Int. Cong. on Electron Microscopy, Kyoto, Japan, August 31, 1986.

26. "The Application of Analytical Electron Microscopy to Materials", 1st Beijing Symposium on

Electron Microscopy, The Chinese Electron Microscope Society, September 10, 1986.

27. “ Analytical Electron Microscopy”, Washington Area MAS Meeting, National Bureau of Standards, Gaithersburg, MD, December 2, 1986.

28. "Analytical Electron Microscopy”, Minnesota Electron Microscopy Society, Minneapolis, MN, March 12, 1987.

29. "Analytical Electron Microscopy”, Metropolitan MAS Meeting, Paramus, NJ, March 25, 1987.

30. "The Search for Lithium Using Analytical Electron Microscopy”, New England Society for Electron Microscopy, May 8, 1987.

31. "Electron Energy Loss Spectrometry”, North Carolina Society for Electron Microscopy and Microanalysis, Research Triangle, Raleigh, NC, May 27, 1987.

32. “Quantitative X-ray Microanalysis in the Analytical Electron Microscope”, 2nd Beijing Conf. and Exhibition on Instrumentation and Analysis, Beijing, China, September 1987.

33. “Towards the Limits of Microanalysis in the Analytical Electron Microscope”, Electron Microscopy and Analysis 1987 (Analytical Electron Microscopy Workshop) University of Manchester/UMIST, UK, September 6, 1987.

34. "Specimen Preparation for Analytical Electron Microscopy”, North Carolina Society for Electron Microscopy and Microanalysis, Atlantic Beach, North Carolina, September 26, 1987.

35. “Prospects for Trace Analysis in the AEM” Accuracy in Trace Analysis, NBS, Gaithersburg, MD, September 30, 1987.

36. “Progress in X-ray Microanalysis in the Analytical Electron Microscope”, Electron Microscopy Society of Southern Africa, University of the Witwatersrand, Johannesburg, South Africa, December 3, 1987.

37. “Quantitative X-ray Microanalysis in the AEM” NBS Workshop on Electron Probe Quantitation” NBS Gaithersburg, MD, May 1988.

38. Measurement of Solute Segregation to Grain Boundaries in the AEM: A Review”,.46th EMSA Meeting, Milwaukee, WI, August 9, 1988.

39. "Studies of Interfacial Segregation in the Analytical Electron", VIII Congreso Nacional de Fisica de Superficies e Interfaces, Guajuanato, Mexico, August 24, 1988.

40. "Diffraction Contrast (Without Equations)”, Metropolitan Section of the Microbeam Analysis Society”, Paramus, NJ, October 10, 1988.

41. "Microanalysis for Lithium”, Philadelphia Electron Microscopy Society, Philadelphia, PA, December 12, 1988.

42. “Microchemical Characterization of Alloys Containing Lithium and Beryllium”, 5th

Scandinavian Symposium on Materials Science, Copenhagen, Denmark, May 1989.

43. “Some Practical Aspects of CBED Applications in Materials Science”, 47th EMSA Meeting, San Antonio, TX, August 8, 1989.

44. "Alloys from Heaven: Iron-Nickel Meteorites”, Materials Science Club of New York, December 7, 1989.

45. "Applications of Analytical Electron Microscopy in Materials Science”, Fort Wayne Chapter of ASM International, Fort Wayne, OH, February 12, 1990.

46. "Spectrum Imaging: The Full Picture”, Metropolitan Section of Microbeam Analysis Society, Lehigh University, May 29, 1992.

47. “The Future of Electron Energy-Loss Spectrometry in the Analytical Electron Microscope”, 5th Asia-Pacific Electron Microscopy Meeting, Beijing, China, August 5, 1992.

48. “The Quantitative Analysis of Thin Specimens”, XIII International Congress on X-ray Optics and Microanalysis, University of Manchester/UMIST, Manchester, UK, September 2, 1992.

49. “Applications of Electron Energy-Loss Spectrum imaging” EUREM, ’92, Granada, Spain, September 10, 1992.

50. “Recent Advances in Analytical Electron Microscopy and its Application to Materials Science”, NIRIM Intl. Symposium on Advanced Materials, Tsukuba Japan, March 14, 1994.

51. Characterizing an Energy-Dispersive Spectrometer on an Analytical Electron Microscope" X-ray Spectrometry in Electron Beam Instruments, MAS, Loyola Marymount University, Los Angeles CA, July 14, 1994.

52. “Energy-Dispersive Spectrometry - Quantification and Imaging” Atti XX Congresso di Microscopica Elettronica, Rimini, Universita di Bologna, September 12, 1995.

53. “Electron Energy-Loss Spectrometry (EELS) Imaging” Atti XX Congresso di Microscopica Elettronica, Rimini, Universita di Bologna, September 14, 1995.

54. “Analytical Electron Microscopy of Interfaces” 6th Beijing Conference and Exhibition on Instrumentation and Analysis, Beijing, October 1995.

55. “AEM the State of the Art” 1st IUMAS Meeting, Sydney University Sydney Australia, February 5, 1996.

56. "Applications of the Transmission Electron Microscope" Oak Ridge Chapter of ASM International, Oak Ridge, TN, April 25, 1996.

57. “(Under)graduate Teaching Using Internet Access to Electron Microscopes” Microscopy and Microanalysis, Minneapolis, MN, August 13, 1996.

58. “Investigations of the Bonding Changes Associated with Grain Boundary Embrittlement”

Interfacial Engineering for Optimized Properties, MRS, Boston, MA, December 5, 1996.

59. "Fine Structure of Characteristic Edges in EELS of Materials" New Direction in Transmission Electron Microscopy and Nano-Characterization of Materials, HVEM Laboratory, Kyushu University, Fukuoka, Japan, March 20, 1997.

60. "Chemical Mapping in the AEM" EMAS '97, Torquay, UK, May 15, 1997.

61. "The Current State and the Future of Analytical Electron Microscopy", Volkswagen Stiftung Seminar, Weinbeul, Germany, August 27, 1997.

62. "Measurement of Cu Distribution in an Al-4 wt.% Cu Thin Film by AEM" Boundaries & Interfaces in Materials: The David A. Smith Symposium, TMS/ASM meeting, Indianapolis, September 17, 1997.

63. "Interface Analysis in the VG HB 603 300 keV STEM" Frontiers of Electron Microcopy in Materials Science, Kloster Irsee, Germany, April 23, 1998.

64. "Progress Towards Atomic Resolution X-ray Microanalysis" TARA Meeting, Port Ludlow, WA, September 7, 1998.

65. "Nanometer-Scale Microanalysis of Interfaces in Thin Films" Atomic-Level Characterizations for New Materials and Devices, JSPS Committee on Microbeam Analysis, Maui, HI, November 26, 1998.

66. "X-ray Microanalysis at the Atomic Level" 33rd Annual Meeting of the Israel Society for Microscopy, Bar Ilian University, Tel Aviv, Israel, June 5, 1999.

67. "High Resolution X-ray Microanalysis in the Transmission Electron Microscope" X Conference on Electron Microscopy of Solids, Jagiellonian University, Warsaw, Poland, September, 20, 1999.

68. "Single Atom Detection by X-ray Microanalysis in the AEM" XVII Congresso da Sociedade de Micorcopia e Microanalise, Santos, Brasil, Outubro 13, 1999.

69. "Tailoring Grain-Boundary Segregation to Control Mechanical Properties" Interfacial Engineering for Optimized Properties II, MRS meeting, Boston MA, December 1,1999.

70. "X-ray Mapping of Multicomponent Steels" Advances in Problem Solving with electron Microscopy" MRS Meeting, Boston, MA December 2, 1999.

71. "The Future of Electron Microscopy" Northern California Microscopy Society, Berkeley, CA, December 9, 1999.

72. "Longer Life Through Grain Boundary Chemistry" TMS/ASM Mohawk Valley Section, Schenectady, NY, April 25, 2000.

73. "High Resolution X-ray Mapping in the STEM" Frontiers of Electron Microscopy in Materials Science" Shimano, Japan, November 15, 2000.

74. “Analytical Electron Microscopy Studies of the Brittle Failure of Materials” NIRIM Tsukuba Japan, March 5, 2001

75. “Darwin Goes to College: Materials Research and Education in the Internet Age”, Plenary Presentation, ICMAT 2001, MRS, Singapore, July 1, 2001.

76. “Quantitative Characterization of the Composition, Thickness and Orientation of Thin Foils in the AEM” ICMAT, Singapore, July 3, 2001.

77. “Microstructure and Microchemistry of Iron Meteorites; - the Lifetime Contributions of Joe Goldstein” Ernst Abbe Award, Eastern Analytical Symposium, Atlantic City, NJ, October 2, 2001.

78. “Quantitative Microanalysis with High Spatial Resolution: Application of FEG–STEM XEDS Microanalysis to the Characterization of Complex Microstructures in Irradiated Low Alloy Steel” ALC ‘01 Nara, Japan, November 13, 2001.

79. “High Resolution Chemical and Structural Mapping in the STEM” XI Conference on Electron Microscopy of Solids, Krynica, Poland, May 21, 2002.

80. “Quantitative X-ray Microanalysis and Imaging of Thin Foils: A Tutorial” EMAS 2002, 5th Regional Workshop, Szczyrk, Poland, May 24, 2002.

81. “Nanochemical and Nanostructural Studies of the Brittle Failure of Materials” Microstructural Design of Advanced Materials: A Celebration of Professor G. Thomas' Seventieth Birthday, TMS meeting, Columbus, OH, October 20, 2002.

82. “Combined Elemental and Orientation Imaging of Segregation to Grain Boundaries” NIRIM International Symposium on Advanced Materials, Tsukuba, Japan, March 2, 2003.

83. “Observation of the Diffusion Processes in Annealed Cr/CU/Ni/Au” Terry Mitchell Symposium, TMS meting, San Diego, CA, March 4, 2003.

84. “Effects of Sample Preparation in Analysis: Spectroscopy” Microscopy and Microanalysis, San Antonio, TX, August 5, 2003.

85. “Quantitative Microanalysis and Elemental Imaging in the AEM: a Tutorial”, Atomic-Level Characterization ’03, Kauai, HI, October 5, 2003.

86. “Introduction to Electron Energy-Loss Spectrometry and Basic Theory” EELS Workshop, ACMM ’04, Geelong, Victoria, Australia, January 31, 2004.

87. "Atomic-Level Analytical Electron Microscopy of Diffusional Phase Transformations" TMS Conference on Solid-Solid Phase Transformations, Phoenix AZ, May 29-June 1, 2005.

88. "X-ray Analysis in the AEM with Angstrom-Level Spatial Resolution and Single-Atom Detection" Joe Goldstein 65th Birthday Symposium, Microscopy And Microanalysis, Honolulu HI, August 1-4, 2005.

89. "Issues Regarding Present and Future Characterization of Nanomaterials for Sensors on the Atomic Scale" 7th Global Innovations Symposium: Trends in Materials R&D for Sensor Manufacturing, TMS, San Antonio, TX March 13, 2006.

90. "Atomic-Scale Characterization of Metals and Alloys Using Spherical-Aberration Corrected Scanning Transmission Electron Microscopy" Microscopy and Microanalysis, Chicago, August 3, 2006.

91. "High-Resolution Chemical Analysis of Interfaces" International Workshop on Interfaces in Functional Materials, Bear Creek, PA, October 12, 2006.

92. "Atomic-Scale Characterization of Metals and Alloys Using Spherical-Aberration Corrected Scanning Transmission Electron Microscopy" TMS Annual Meeting, Orlando February 26, 2007.

93. "Progress of X-ray Analysis in Transmission Electron Microscopes from 1977-2007 and Towards the Future" Microscopy and Microanalysis, Fort Lauderdale, FL, August 2, 2007.

94. Progress of X-ray Analysis in Transmission Electron Microscopes from 1977-2007 and Towards the Future" CIASEM, Cuzco, Peru, September 24, 2007.

95. "Reflections on Microscopy and Analysis: From Viewing the Small World to Leading on a Larger Stage" International Metallographic Society, Sorby Lifetime Achievement Award presentation, Microscopy and Microanalysis, Nashville TN, August 8, 2011.

96. "Spectral Data Processing and Quantification for X-ray Analysis of Thin Films in Analytical Electron Microscopes" Bernkastel Focus Meeting, Bernkastel, Germany, May 1, 2013.

97. "STEM X-ray Analysis: Assessing the Past and Prophesying the Future" advances in STEM Workshop (Steve Pennycook 60th Birthday Celebration), Townsend TN, August 2, 2013.

98. "TEM: Now We Can Image and Identify Single Atoms… What's Next?" Microscopy and Microanalysis, Indianapolis, IN, August 2, 2013.

99. "Reflections on Microscopy and Analysis: From Viewing the Small World to Leading on a Larger Stage", Microscopy Society of the Ohio River Valley, October 16, 2013.

100. "Reflections on Microscopy and Analysis: From Viewing the Small World to Leading on a Larger Stage" Alpha Sigma Mu lecture, MS&T, Montreal, Canada, October 28, 2013.

101. "Reflections on Microscopy and Analysis: From Viewing the Small World to Leading on a Larger Stage" C.S. Barrett Silver Medal, ASM Rocky Mountain Chapter, March 6, 2014.

102. "H.G.J. Moseley: The Scientist Who put the Z in ZAF (and k_{AB})" IUMAS-6 Hartford, CT, August 3, 2014.

103. "X-ray and Electron Spectroscopy in the AEM", International Federation of Societies for Microscopy, School for Young Scientists, Prague, Czech Republic, September 7, 2014.

104. "Reflections on Microscopy and Analysis: From Viewing the Small World to Leading on a Larger Stage", ASM Pittsburgh Chapter, March 19, 2015.

105. "University-Industry Relations" Midwest-US Japan Conference, Tokyo, Japan, September 13, 2015.

106. "Forward to the Past: Now We Can Image and Identify Single Atoms, What's Next?", Opening Plenary Presentation, Atomic Level Characterization (ALC) '15, JSPS meeting, Matsue, Japan, October 26, 2015.

107. "Now We Can Image and Identify Single Atoms, What's Next?", ASM Atlanta GA Chapter, March 24, 2016.

108. "Now We Can Image and Identify Single Atoms, What's Next?", ASM Cincinnati OH Chapter, April 26, 2016.

109. "Now We Can Image and Identify Single Atoms, What's Next?", ASM Lehigh Valley PA Chapter, May, 2016.

110. "Unique University-Industry Partnerships", Global Council on Competitiveness, London, November 29, 2016

111. "Now We Can Image and Identify Single Atoms, What's Next", ASM Canton Massillon, OH, Chapter, February 16, 2017.

112. "Now We Can Image and Identify Single Atoms, What's Next?", ASM Central Massachusetts Chapter (Worcester Polytechnic), March 22, 2017.

113. "Now We Can Image and Identify Single Atoms, What's Next?", ASM Portland, OR Chapter (University of Portland), May 16, 2017.

114. "Engineering Leadership", New Chairs Symposium, ASEE Annual Meeting, Columbus OH, June 25, 2017

115. "Connecting your Business with Local Colleges and Universities in STEM", USNWR STEM Conference, San Diego CA, June 2017.

116. "Leadership in an Engineering College", ASEE Annual Conference, New Chairs Workshop, Columbus OH, June 2017.

117. "University/Industry/Government; Partnering in Cutting-Edge Technology", US Mid-West- Japan Governors' Conference, Tokyo, Japan, September 25, 2017.

118. "Leadership in Different Spheres", TMS Student Leadership Symposium, Phoenix AZ, March 13, 2018.

119. "Remote Multi-Student Teaching of Complex Scientific Instrumentation" 9th North American Materials Education Symposium, University of Michigan, August 16, 2018

VII Invited Seminars at Universities and Research Laboratories.

1. "Age Hardening", Carpenter Technology, Reading, PA, April 21, 1978.

2. "Discontinuous Precipitation in Cu-Be", Brush-Wellman Engineering Materials, Cleveland, OH, June 21, 1979.

3. "Capabilities of the TEM/STEM", Exxon R&D Laboratories, Linden, NJ, February 1, 1980.

4. "Applications and Limitations of the Analytical Electron Microscope", Materials and Molecular Research Division, Lawrence Berkeley Laboratories, Berkeley, CA, February 22, 1980.

5. "Applications and Limitations of the Analytical Electron Microscope", Department of Materials Science and Engineering, Cornell University, Ithaca, NY, May 2, 1980.

6. "Analytical Electron Microscopy", Pfizer, Inc., Easton, PA, September 9, 1980.

7. "Microanalysis in the Scanning Transmission Electron Microscope, "Metals and Ceramics Division, Oak Ridge National Laboratory, Oak Ridge, TN, September 26, 1980.

8. "Al-Li-X Alloys for Aerospace Applications", General Electric Corporate R&D Laboratories, Schenectady, NY, November 21, 1980.

9. "X-ray Analysis in the Electron Microscope", General Electric Corporate R&D Laboratories, Schenectady, NY, November 21, 1980.

10. "STEM/X-ray Microanalysis of Weld Metals", Sandia National Laboratories, Albuquerque, NM, January 29, 1981.

11. "Al-Li-X: The Next Generation of Aerospace Alloys", Department of Materials Science and Mineral Engineering, University of California, Berkeley, CA, February 2, 1981.

12. "Weld Metal Studies in the Analytical Electron Microscope", EPRI, Palo Alto, CA, May 28, 1981.

13. "Analytical Electron Microscopy", Lockheed Missiles and Space Company, Palo Alto, CA, May 29, 1981.

14. "Al-Li-X Alloys", Naval Surface Weapons Research Center, White Oak, MD, June 26, 1981.

15. "Quantitative Microanalysis in the Scanning Transmission Electron Microscope", Department of Materials Science and Engineering, The Pennsylvania State University, May 7, 1982.

16. "Aspects of Electron Microscopy and Analysis", U.S. Arradcom, Dover, NJ, May 20, 1982.

17. "Studies of Solute Segregation to Interfaces Using Analytical Electron Microscopy", Department of Metallurgical Engineering, The Ohio State University, October 15, 1982.

18. "Quantitative Chemical Analysis of Metals and Materials with High Spatial Resolution", School of Metallurgy, University of New South Wales, Kensington, N.S.W., Australia, March 25, 1983.

19. "Analytical Electron Microscopy", Department of Chemical and Materials Engineering, University of Auckland, Auckland, New Zealand, April 19, 1983.

20. "Analytical Electron Microscopy", Department of Mechanical Engineering, University of Canterbury, Christchurch, New Zealand, April 29, 1983.

21. "Metallurgical Applications of Analytical Electron Microscopy", Australian Institute of Metals, Sydney, Australia, May 11, 1983.

22. Electron Energy Loss and X-ray Energy Dispersive Spectrometry in the Analytical Electron Microscope", The Electron Microscope Unit, University of Sydney, Sydney, Australia, May 24, 1983.

23. "Metallurgical Applications of Analytical Electron Microscopy", Department of Metallurgy, University of Wollongong, Wollongong, N.S.W., Australia, June 2, 1983.

24. "Quantitative High Resolution Microanalysis in the Transmission Electron Microscope", Commonwealth Scientific and Industrial Research Organization: Solid State Physics Group, Sydney, Australia, June 7, 1983.

25. "Quantitative Studies of Elemental Segregation Using Analytical Electron Microscopy", Department of Physics, University of Newcastle, Newcastle, N.S.W., Australia, June 9, 1983.

26. "Quantitative Chemical Analysis in the Analytical Electron Microscope", Department of Materials Engineering, Monash University, Clayton, Victoria, Australia, June 17, 1983.

27. "Interfacial Segregation Phenomena in Metals and Ceramics", Department of Materials Science and Engineering, The Pennsylvania State University, September 8, 1983.

28. "Quantitative Microanalysis of Materials in the Analytical Electron Microscope", Department of Mechanics and Materials Science, The State University of New Jersey, Rutgers, September 22, 1983.

29. "X-ray Analysis in the Electron Microscope", Kennametal Inc. Greensburg, PA, November 9, 1983.

30. "Analytical Electron Microscopy and Phase Transformations", Department of Metallurgy and Materials Science, University of Cambridge, England, December 9, 1983.

31. "X-ray Microanalysis in the Transmission Electron Microscope", Department of Materials Science and Engineering, Cornell University, Ithaca, NY, April 26, 1984.

32. "Analytical Electron Microscopy as Applied to Materials Science", Metals and Ceramics Division Seminar on Analytical Electron Microscopy, Wright-Patterson AFB, Dayton, OH, May 21, 1984.

33. "Analytical Electron Microscopy of Ceramics", Nippon Steel Corporation, Central R&D Laboratories, Kawasaki, Japan, December 13, 1984.

34. "The Study of Aluminum-Lithium Alloys Using Analytical Electron Microscopy", Alcoa Technical Center, Alcoa Center, PA, January 7, 1985.

35. "Analytical Electron Microscopy of Lightweight Metals and Ceramics", Department of Metallurgy and Materials Science, Case Western Reserve University, Cleveland, OH, April 2, 1985.

36. "Quantitative Light Element Analysis with High Spatial Resolution", School of Materials Engineering, Purdue University, W. Lafayette, IN, September 9, 1985.

37. "Analytical Electron Microscopy of Low Atomic Number Materials", Department of Metallurgy, Kyushu University, Fukuoka, Japan, September 24, 1985.

38. "Analytical Electron Microscopy of Low Atomic Number Materials", Department of Physics, Osaka University, Osaka, Japan, September 25, 1985.

39. "Recent Developments in Analytical Electron Microscopy", Tokyo University, Tokyo, Japan, September 27, 1985.

40. "Analytical Electron Microscopy of Lightweight Metals and Ceramics", Materials Division, Argonne National Laboratory, Argonne, IL, November 1, 1985.

41. "Fundamental Limitations of Chemical Analysis in the AEM", Department of Metallurgical and Materials Engineering, University of Pittsburgh, Pittsburgh, PA, November 28, 1985.

42. "High Resolution Microanalysis in the Transmission Electron Microscope", The Metal Science Club of New York, New York City, NY, October 2, 1986.

43. "Microanalysis in the Electron Microscope", The Grumman Aerospace Corporation, Bethpage, NY, December 16, 1986.

44. "Quantitative Light Element Analysis with High Spatial Resolution", Lockheed Missiles and Space Co., Palo Alto, CA, February 4, 1987.

45. "Quantitative Microanalysis in the TEM", Department of Materials Science and Engineering, Stanford University, Palo Alto, CA, February 6, 1987.
46. "Analytical Electron Microscopy", Kodak Research Laboratories, Rochester, NY, March 9-10, 1987.

47. "Microstructure and Microchemistry of Aluminum-Lithium Alloys", Materials and Metallurgy Department, University of Delaware, Newark, DE, April 16, 1987.

48. "Imaging in the SEM", Naval Ship Systems Engineering, Philadelphia, PA, May 18, 1987.

49. "Microscopy and Microanalysis of Aluminum-Lithium Alloys", North Carolina State University, Raleigh, NC, May 28, 1987.

50. "Aluminum-Lithium Alloys", Pontificia Universidade Catolica do Rio de Janeiro, Brasil, September 4, 1987.

51. "Microscopy and Microanalysis of Cu-Be and Al-Li Alloys", NGK Corporation, Reading, PA, October 29, 1987.

52. "Recent Advances, Artifacts and Shortfalls of Analytical Electron Microscopy for Thin Foil Metallic Specimens", National Institute for Materials Research, Pretoria, S. Africa, December 1, 1987.

53. "Microstructure and Microanalysis of Iron-Nickel Meteorites", Department of Physics, University of the Witwatersrand, Johannesburg, S. Africa, December 4, 1987.

54. "Progress in X-ray Microanalysis in the Analytical Electron Microscope", Department of Physics, University of Port Elizabeth, S. Africa, December 8, 1987.

55. "Microstructure and Microanalysis of Aluminium-Lithium Alloys", Department of Chemical Engineering, University of Capetown, S. Africa, December 11, 1987.

56. "Microstructures and Microanalysis of Aluminum-Lithium Alloys", Department of Metallurgical Engineering, Carnegie Mellon University, Pittsburgh, PA, January 19, 1988.

57. "Microanalysis of Lithium in Aluminium - Lithium Alloys", Electron Microscope Unit. University of Sydney, Sydney, Australia, February 29, 1988.

58. "Microanalytical Studies of Iron-Nickel Meteorites", Electron Microscope Unit, University of Sydney, Sydney, Australia, February 29, 1988.

59. "Microanalysis of Aluminum Lithium Alloys", Alcoa Technical Center, Alcoa Center, PA, April 27, 1988.

60. "Microanalysis of Lithium: From Manic Depression to Icosahedral Phases", IBM, Thomas J. Watson Research Center, Yorktown Heights, NY, October 5, 1988.

61. "Microstructure and Microanalysis of Aluminum-Lithium Alloys", Center for Materials Science, Chalmers University of Technology, Göteborg, Sweden, March 16, 1989.

62. "Segregation Studies in the Analytical Electron Microscope", Center for Materials Science, Chalmers University of Technology, Göteborg, Sweden, March 16, 1989.

63. "Alloys from Heaven", Department of Physics, Chalmers University of Technology, Göteborg, Sweden, May 12, 1989.

64. "Analytical Electron Microscopy", Sandvik Steel Company, Sandviken, Sweden, May 29, 1989.

65. "Aluminum-Lithium Alloy Developments", Volvo Flygmotor, Trollhatten, Sweden, May 30, 1989.

66. "Quantitative Chemical Analysis in the Transmission Electron Microscope", AT&T Bell Laboratories, Allentown, PA, November 7, 1989.

67. "Microanalytical Studies of Phase Transformations", Department of Materials Science and Engineering, Georgia Tech, Atlanta, GA, November 14, 1989.

68. "Microanalysis of Materials at Intermediate Voltages", Rockwell International Science Center, Thousand Oaks, CA, February 19, 1990.

69. "Microanalysis for Lithium in Aluminum-Lithium Alloys", Raychem Corporation, Metals Division, Menlo Park, CA, February 20, 1990.

70. " Why Should You Use An Analytical Electron Microscope?" Ford Motor Company, Scientific Research Laboratories, Dearborn, MI, May 3, 1990.

71. "Microstructure and Microanalysis of Aluminum-Lithium Alloys", Sandia National Laboratories, Albuquerque, NM, August 2, 1990.

72. "Microstructure and Microanalysis of Aluminum-Lithium Alloys", Department of Materials Science and Engineering, University of Pennsylvania, Philadelphia, PA, September 11, 1990.

73. "Electron Detectors", Department of Materials Science and Engineering, Cornell University, Ithaca, NY, September 20, 1990.

74. " Electron Microscopy and Microanalysis", Department of Geological Sciences, Lehigh University, Bethlehem, PA, October 4, 1990.

75. "X-ray Detectors", Department of Materials Science and Engineering, Cornell University, Ithaca, NY, November 8, 1990.

76. "Analytical Electron Microscopy", Chandler Medical Center, University of Kentucky, Lexington, KY, January, 14, 1991.

77. "Electron Microscopy at Lehigh: a Progress Report", Department of Materials Science and Engineering, Lehigh University, Bethlehem, PA, January 29, 1991.

78. "How To Get Quantitative Data from Electron Energy-Loss Spectra", Gatan Incorporated, Pleasanton, CA, February 14, 1991.

79. "Electron Energy-Loss Spectrometers and Spectra", Department of Materials Science and Engineering, Cornell University, Ithaca, NY, February 26, 1991.

80. "Aluminum-Lithium Alloys: Microstructure and Microanalysis", Inco Research Center, Huntington, W. VA, March 26, 1991.

81. " Analytical Electron Microscopy", Department of Materials Technology, Brunel University, West London, U.K., May 1, 1991.

82. "Microanalysis of Lithium: A Treatment for Manic Depression?" Department of Physics,

University of Bristol, U.K., November 1, 1991.

83. "Quantitative Microanalysis Using Electron Energy-Loss Spectrometry", Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MI, January 27, 1992.

84. " Microanalysis of Lithium: A Treatment for Manic Depression", Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MI, January 28, 1992.

85. "Spectrum Imaging: The Full Picture", Electron Microscope Unit, University of Sydney, Sydney, Australia, February 18, 1992.

86. "Applications of Electron Energy-Loss Spectrometry", Electron Microscope Unit, University of Sydney, Sydney, Australia, February 18, 1992.

87. "Transmission and Analytical Electron Microscopy", Scientific Design Company, Inc., Little Ferry, N.J., June 26, 1992.

88. "Spectrum Imaging: The Full Picture", Los Alamos National Laboratory, Los Alamos, NM, July 16, 1992.

89. "Light Element Microanalysis and Imaging", Department of Physics, Dundee University, Dundee, Scotland, August 31, 1992.

90. "Microanalysis of Lithium: A Treatment for Manic Depression", Lehigh University Student Materials Society, Bethlehem, PA, September 22, 1992.

91. "Microscopy of Meteorites", Los Alamos National Laboratory, Los Alamos, NM, February 18, 1993.

92. "Spectrum Imaging: The Full Picture", Department of Materials Science and Engineering, Stevens Institute of Technology, Hoboken, NJ, March 10, 1993.

93. "Electron Energy-Loss Spectrometry: Potential Advantages and Practical Limitations", Los Alamos National Laboratories, Los Alamos, NM, July 6, 1993.

94. "Quantitative X-ray Spectrometry in the Analytical Electron Microscope", Los Alamos National Laboratories, Los Alamos, NM, July 29, 1993.

95. "Microscopy and Microanalysis of Al-Li Alloys", Naval Research Laboratories, Washington, D.C., March 30, 1994.

96. "Spectrum Imaging: The Full Picture", Department of Materials Science and Engineering, The Ohio State University, Columbus, OH, May 20, 1994.

97. "Spectrum Imaging: The Full Picture", Max Planck Institut fur Metallforschung, Stuttgart, Germany, July 11, 1994.

98. “Microscopy of Aluminum Lithium alloys" Northwestern University, Department of Materials Science and Engineering, Evanston, IL, February 21, 1995.

99. "Microanalysis of Interfaces" Center for Materials Sciences, Los Alamos National Laboratories (opening of new microscopy facility) Los Alamos, NM, April 12, 1995.

100. "Electron Energy Loss Studies of Interfaces" Shanghai Jiao Tong University, Department of Materials Science and Engineering" Shanghai, China, October 23, 1995.

101. "Electron Energy Loss Studies of Interfaces" Beijing Electron Microscopy Laboratory of the Chinese Academy of Sciences, Beijing, China, October 25, 1995.

102. "Alloys from Heaven” High School Student Seminar, University of Sydney, Australia, February 8, 1996.

103. "Transmission Electron Microscopy - Applications in Materials Science and Engineering" Department of Mechanical Engineering, Lehigh University, Bethlehem, PA, March 1, 1996.

104. "Capabilities of the VG HB 603 Advanced Analytical Electron Microscope" Westinghouse Bettis Nuclear Research Laboratories, Pittsburgh, PA, March 11, 1996.

105. “Interfacial Segregation Studies in the Transmission Electron Microscope" Westinghouse Corporate R&D Laboratories, Pittsburgh, PA, March 12, 1996.

106. "Characterization of Interfaces in the TEM" High Temperature Materials Division, ORNL, Oak Ridge, TN, April 26, 1996.

107. "X-ray Microanalysis in the TEM" Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, May 22, 1996.

108. "The Lehigh University Center for Imaging and Analysis" MRC Workshop, Lehigh University, Bethlehem, PA, September 11, 1996.

109. "The Federation of Materials Societies" University Materials Council, Cincinnati, OH, October 6, 1996.

110. "Characterization of Interfaces in the TEM" Department of Materials Science and Engineering, University of Florida, Gainesville, FL, October 15, 1996.

111. "The Lehigh University Center for Imaging and Analysis" Specialty Minerals, Easton PA, December, 6 1996

112. "Electron Microscopy and Microanalysis" Scientific Design Company, Inc., Little Ferry, NJ, December 12, 1996.

113. "Characterization of Interfaces in the TEM" Dupont CR&D, Wilmington DE, February 6, 1997.

114. "Characterization of Interfaces in the TEM" Department of Physics, Okayama University, Okayama, Japan, March 25, 1997

115. “Quantitative Analysis of Solute Segregation to Interfaces” Max Planck Institut fur Metallforschung, Stuttgart, Germany, August 25,1997.

116. "Characterization of Interfaces in the TEM" Department of Materials Science and Engineering, The Ohio State University, Columbus, OH, Sept. 19, 1997.

117. “Characterization of Interfaces in the TEM” Department of Materials Science and Engineering, Stanford University, Palo Alto, CA, October 10, 1997.

118. “Characterization of Interfaces in the TEM” Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, November 10, 1997.

119. “Quantitative Characterization of Interfaces in the STEM” Sandia National Laboratories Albuquerque, NM, December 12, 1997.

120. “High Spatial Resolution X-ray Mapping” Center For Materials Science, Los Alamos National Laboratory, Los Alamos, NM, December 15, 1997.

121. “Characterization of Interfaces in the Transmission Electron Microscope” Department of Ceramics, Rutgers University, Piscataway, NJ, April 14, 1998.

122. “TEM Education” Department of Materials Science and Engineering, Carnegie-Mellon University, Pittsburgh, PA, September 25, 1998.

123. “Characterization of Grain Boundaries in the Transmission Electron Microscope” Department of Materials, University of Oxford, UK, December 4, 1998.

124. “Can Analytical Electron Microscopy Tell Us Why Materials Break?” Department of Materials Science and Engineering, Lehigh University, Bethlehem, PA, January 26, 1999.

125. “X-ray Mapping of Grain Boundary Segregation in Aluminum Alloys” ALCOA Technical Center, ALCOA Center, PA, May 26, 1999

126. “Characterization of Interfaces in the Transmission Electron Microscope” Department of Materials Engineering, Technion, Haifa, Israel, June 3, 1999.

127. “Characterization of Interfaces in the Transmission Electron Microscope” Faculty of Engineering Sciences, Ben Gurion University of the Negev, Beer-Sheva, Israel, June 7, 1999.

128. “Atomic Resolution X-ray Microanalysis” Ecole Polytechnique, Paris, France, June 30, 1999.

129. “Characterization of Interfaces in the Transmission Electron Microscope” ONERA, Chatillon, Paris, France, July 8, 1999.

130. "Characterization of Grain Boundaries in the Transmission Electron Microscope" Institute of Mining and Metallurgy, Cracow, Poland, September 17, 1999

131. "The Effect of Grain Boundary Chemistry on the Brittle Failure of Metals and Alloys" Department of Materials Science and Engineering, Pontificia Universidade Catolica do Rio de Janeiro, Brasil, October 21, 1999.

132. "The Role of Grain Boundary Chemistry in the Brittle Failure of Materials" Department of Materials Science and Mineral Engineering, University of California, Berkeley, CA, December 10, 1999.

133. "Grain Boundary Segregation" Department of Solid State and Materials Chemistry, Eindhoven University of Technology, Eindhoven, The Netherlands, January 18, 2000.

134. "Single Atom Detection in the AEM" Department of Solid State and Materials Chemistry, Eindhoven University of Technology, Eindhoven, The Netherlands, January 20, 2000.

135. "Single Atom Detection in the AEM?" GE CR&D, Schenectady, NY, April 24, 2000

136. "High Resolution X-ray Microanalysis in the STEM" Max Planck Institut fur Metallforschung, Stuttgart, Germany, September 18, 2000.

137. "Quantitative X-ray Microanalysis in the STEM" Max Planck Institut fur Metallforschung, Stuttgart, Germany, September 19, 2000.

138. "Electron Microscopy of Small Particles" Scientific Design Inc. Little Ferry NJ, October 20, 2000

139. "Longer Life Through Grain Boundary Chemistry" Department of Materials Science and Engineering, Northwestern University, Evanston IL, October 31, 2000.

140. "Longer Life Through Grain Boundary Chemistry" Faculty of Science, National University of Singapore, Singapore, November 9, 2000.

141. "Analytical Electron Microscopy Studies of Brittle Failure in Metals" NIRIM, Tsukuba, Japan, March 7, 2001.

142. "Longer Life Through Grain Boundary Chemistry" Department of Materials Science and Engineering, Georgia Tech., Atlanta, GA, March 14, 2001.

143. "Quantitative Chemical Imaging in the Transmission Electron Microscope" Department of Materials Engineering, Drexel University, Philadelphia, PA, November 26, 2001.

144. High Resolution Chemical and Structural Mapping in the STEM" CSIRO Manufacturing Science and Technology, Adelaide, South Australia, February 7, 2002.

145. "Is the TEM Obsolescent" Electron Microscope Unit, Sydney University, Sydney, NSW Australia, February 12, 2002.

146. The Analytical Transmission Electron Microscope" FLAVS meeting, University of Central Florida, Orlando, FL, March 12, 2002.

147. "Atomic Level Quantitative X-ray Microanalysis in the AEM" ExxonMobil Corporate R&D, Annandale, NJ, March 18, 2002.

148. "Brittle Failure at Grain Boundaries" Institute for Problems of Materials Science, Kiev, Ukraine, May 16, 2002.

149. "Analytical Electron Microscopy Methods" National Technical University, Kiev, Ukraine, May 17, 2002.

150. "Can Analytical Electron Microscopy Tell Us Why Materials Break?" Department of Physics and Astronomy, University of Glasgow, Scotland, May 30, 2002.

151. "Can Analytical Electron Microscopy Tell Us Why Materials Break?" Department of Materials Science and Engineering, The Ohio State University, Columbus, OH, October 25, 2002.

152. "Nanometer-scale Imaging and Analysis of Brittle Failure" School of Nanoscience and Engineering, SUNY Albany, NY, January 22, 2003.

153. "Nanometer-scale Imaging and Analysis of Brittle Failure" Sandia National Laboratories, Albuquerque, NM, January 31, 2003.

154. "Nanometer-scale Analysis of Grain–Boundary Segregation in Metals and Alloys" Rockwell Science, Thousand Oaks, CA, August 27, 2003.

155. "Nanometer-scale Analysis of Grain–Boundary Segregation in Metals and Alloys" Department of Materials Science and Engineering, University of California, Santa Barbara, CA, August 28, 2003.

156. "Nanometer-scale Analysis of Grain–Boundary Segregation in Metals and Alloys" Lawrence Livermore National Laboratory, Livermore, CA, August 29, 2003.

157. "Nanometer-scale Analysis of Grain–Boundary Segregation in Metals and Alloys" Center for Imaging and Mesoscale Structures, Harvard University, Cambridge, MA, December 2, 2003.

158. "Nanometer-scale Analysis of Grain Boundary Segregation in Metals and Alloys", Department of Physics, University of South Florida, Tampa, FL, January 16, 2004.

159. "Nanometer-scale Analysis of Grain–Boundary Segregation in Metals and Alloys" School of Physics and Materials Engineering, Monash University, Clayton, Victoria Australia, February 6, 2004

160. "Nanometer-scale Analysis of Grain–Boundary Segregation in Metals and Alloys" Electron Microscopy Unit, Sydney University, Sydney, Australia, February 9, 2004.

161. "TEM Techniques for the Understanding of Grain-Boundary Chemistry" Department of Physics, Portland State University, Portland, OR, February 13, 2004.

162. "Analytical Electron Microscopy Studies of Grain Boundaries" Department of Materials Science and Engineering, McMaster University, Hamilton, Ontario, Canada, May 6, 2004.

163. "Angstrom-resolution and Single–atom Detection with Cs-corrected X-ray Analysis in the Analytical Electron Microscope" Harald Rose 70th birthday Symposium, Lawrence Berkeley Laboratories, Berkeley, CA, February 14, 2005.

164. "Nanometer-scale Analysis of Grain–Boundary Segregation in Metals and Alloys" Department of Mechanical and Aerospace Engineering, University of California at San Diego, San Diego, CA, April 18, 2005.

165. "Nanometer-scale Analysis of Grain-Boundary Segregation in Metals and Alloys" School of Materials Science and Engineering, University of New South Wales, Kensington, Australia, July 6, 2005.

166. "Lehigh University Materials Characterization Facilities" Knolls Atomic Power Laboratory, Schenectady, NY, July 25, 2005.

167. " X-ray Microanalysis of Grain-boundary Segregation in Spherical-aberration Corrected STEMs" Department of Physics, Arizona State University, Tempe, AZ, February 7, 2006.

168. "Materials Analysis with Aberration-corrected Electron Microscopes" Department of Materials Science and Engineering, Northwestern University, Evanston, IL, April 11, 2006.

169. " X-ray Microanalysis of Grain-boundary Segregation in Spherical-aberration Corrected STEMs" Max-Planck Institut für Metallforschung, Stuttgart, Germany, May 29, 2006.

170. "Recent Progress on X-ray Analysis for Sub-nanometer Materials Characterization in the Analytical Electron Microscope" Kavli Institute, Cornell University, Ithaca, NY, July 17, 2006.

171. "Materials Analysis with Electron Microscopy" ASM Boston Chapter, Sauveur Lecture Boston Chapter, ASMI, MIT Faculty Club, Cambridge, MA, September 21, 2006.

172. "Research at Lehigh" Harbin Institute of Technology, Harbin, China, September 26, 2006

173. "Atomic-Level Characterization of Materials by X-Ray Analysis in Analytical Electron Microscopes" Harbin Institute of Technology, Harbin, China, September 28, 2006.

174. "Grain Boundary Brittle Failure" Harbin Institute of Technology, Harbin, China, September 28, 2006.

175. "How to Publish Papers in High Impact Factor Journals Such as Acta Materialia" Harbin Institute of Technology, Harbin, China, September 29, 2006

176. "Grain Boundary Brittle Failure: New Electron Microscopy Studies of an Old Problem"

Research Institute for Electron Microscopy, Graz University of Technology, Graz, Austria, November 3, 2006.

177. "Grain Boundary Brittle Failure: Nanoscale Insights into a Macroscopic Problem" Institute of Materials Physics, University of Vienna, Vienna, Austria, November 6, 2006.

178. "Analytical Microscopy Studies of Nanometer-scale Compositional Segregation in Materials" St. Gobain Research, Aubervilliers, Paris, France, December 8, 2006.

179. "Grain Boundary Brittle Failure: Nanoscale Insights into a Macroscopic Problem", Department of Materials Science and Engineering, University of Maryland, College Park, MD, April 27, 2007.

180. "Atomic-Level Characterization of Materials by Electron Microscopy" Department of Chemistry, University of Alabama in Huntsville, Huntsville, AL, November 2007.

181. "Analytical Microscopy Studies of Nanometer-scale Compositional Segregation in Materials" Department of Materials Science and Engineering, The University of Alabama, Tuscaloosa, AL, April 2008.

182. "Analytical Electron Microscopy – a lifetime perspective" 50th anniversary of The Electron Microscope Unit, The University of Sydney, Sydney, Australia, December 5, 2008.

183. "Grain Boundary Brittle Failure: Nanoscale Insights into a Macroscopic Problem" Department of Materials Science and Engineering, The University of Illinois, Urbana-Champaign, IL, March 2009.

184. "Leadership During a Crisis" The Air War College, Maxwell Air Force Base, Montgomery, AL, December 12, 2010

185. "Reflections on Microscopy and Analysis: From Viewing the Small World to Leading on a Larger Stage" Department of Materials Science and Engineering, The Ohio State University, Columbus, OH, February 3, 2011.

186. "Reflections on Microscopy and Analysis: From Viewing the Small World to Leading on a Larger Stage" Department of Materials Science and Engineering, Case Western Reserve University, Cleveland, OH, February 7, 2011.

187. "Reflections on Microscopy and Analysis: From Viewing the Small World to Leading on a Larger Stage" Department of Materials Science and Engineering, University of California, Santa Barbara, CA, March, 2, 2011.

188. "TEM: Now We Can Image and Identify Single Atoms… What's Next?" Keynote Talk, Molecular Foundry and National Center for Electron Microscopy users' meeting, Lawrence Berkeley Laboratory, Berkeley, CA, September 25, 2014.

189. "TEM: Now We Can Image and Identify Single Atoms… What's Next?" Department of Materials Science and Engineering, Shanghai Jiao-Tong University, December 3, 2014.

190. "Engineering Research at Ohio State", IBM Research, Beijing, China, December 5, 2014.

191. "Reflections on Microscopy and Analysis: From Viewing the Small World to Leading on a Larger Stage" Department of Electrical Engineering, University of Notre Dame, IN, March, 27, 2015.

192. "Introduction to Transmission Electron Microscopy" The Timken Company, Canton OH, October 14, 2015.

193. "TEM: Now We Can Image and Identify Single Atoms… What's Next?" Department of Materials Science and Engineering, Rice University, Houston, TX, January 21, 2016.

194. "TEM: Now We Can Image and Identify Single Atoms… What's Next?" Distinguished Lecture, Department of Materials Science and Engineering, University of Central Florida, Orlando, FL, May 6, 2016.