

Mark J. Kushner

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Academic Experience:

University of Michigan

2008-present George I Haddad Collegiate Professor, Electrical Engineering & Computer Science Dept.
Professor, Nuclear Engineering and Radiological Sciences (NERS) Dept.,
Applied Physics Program, Chemical Engineering Dept.
Director, Michigan Institute for Plasma Science and Engineering
Director, Graduate Certificate Program in Plasma Science and Engineering
Director, Dept. of Energy Center on *Control of Plasma Kinetics* (2009-present)

Eindhoven University of Technology, The Netherlands

2016 – 2020 Distinguished Professor

Iowa State University

2005-2008 Dean, College of Engineering
James Melsa Professor of Engineering, Dept. of Electrical and Computer Engineering
Affiliate: Depts. of Materials Science and Engr., and Chemical and Biological Engr.

University of Illinois at Urbana-Champaign

1999-2004 Founder Professor of Engineering
1991-2004 Professor, Department of Electrical and Computer Engineering
2002-2004 Interim Head of Chemical and Biomolecular Engineering
2001 Interim Head of Electrical and Computer Engineering
2000 Interim Associate Dean of Administrative Affairs, College of Engineering
1994-1995 Assistant Dean of Academic Programs, College of Engineering
Affiliate: Dept. of Material Science and Engineering Dept. Mechanical and Industrial Engr.
Dept. of Nuclear Engineering Dept. of Physics
Dept. Chemical and Biomolecular Engr.
Research Professor, Micro- and Nanotechnology Laboratory
Associate Member, Beckman Institute
1988-1991 Associate Professor, Electrical and Computer Engineering
1986-1988 Assistant Professor, Electrical and Computer Engineering

California Institute of Technology

1979-1980 Weissmann Postdoctoral Research Fellow of Applied Physics
1976-1979 Teaching and Research Assistant, Department of Applied Physics

Education:

PhD Applied Physics, California Institute of Technology, 1979
MS Applied Physics, California Institute of Technology, 1977
BS Nuclear Engineering (Summa Cum Laude), University of California at Los Angeles, 1976
BA Astronomy (Summa Cum Laude), University of California at Los Angeles, 1976

Industrial and National Laboratory Experience:

1983-1986 Principal Research Scientist, and Director of Electron, Atomic, and Molecular Physics, Spectra Technology, Inc., Bellevue, WA
1981-1983 Physicist (Member of Technical Staff), Advanced Lasers and Laser Isotope Separation Programs, Lawrence Livermore National Laboratory, Livermore, CA
1980-1981 Physicist (Member of Technical Staff), Laser Analytical Spectroscopy Division, Sandia National Laboratory, Albuquerque, NM

Consulting Activities (Partial Listing):

E. I. DuPont de Nemours and Company	Applied Microwave Power Concepts, Inc.
Standard Oil Research Laboratories	Spectra Technology, Inc.
Los Alamos National Laboratory	Tetra Inc.
CVC, Inc.	Laser Technics
General Electric R&D Center	Applied Photolysis Technology
Energy and Environmental Res. Corp.	Advanced Micro Devices
Material Research Corporation	Becton-Dickinson and Company
LAM Research Corp.	Applied Materials Corp.
Nixon & Vanderhye P.C.	Mattson Technologies
Smart and Biggar-Fetherstonhaugh &Co..	Frommer, Lawrence & Haug LLP
Finnegan, Henderson, Farabow, Garret, & Dunner	Phoenix Science and Technology
Brinks, Hofer, Gilson and Lione	Heller Ehrman Attorneys
Cravath, Swaine and Moore	3M, Inc.
Sandia National Laboratory	Ngen Partners
PlasmaTherm, Inc.	Martine-Penilla Group LLP
Wilmer-Hale, Inc.	Rothwell Figg IP Professionals

Awards and Honors:

Plasma Chemistry Award, International Society for Plasma Chemistry, 2017
Distinguished Technical Lecture, Department of Nuclear Engineering, North Carolina State Univ., 2017
Bikerman Lecture, Dept. of Chemical and Biomolecular Engineering, Case Western Reserve Univ., 2016.
Doctor Honoris Causa, Eindhoven University of Technology, The Netherlands, 2016
Distinguished Lecturer, American Physical Society Division of Plasma Physics, 2016-17
Charles K. Birdsall Award, Inst. Electrical and Electronic Engineers (IEEE), 2015
National Academy of Engineering, 2011
Will Allis Prize for the Study of Ionized Gases, American Physical Society, 2010
Medard Welch Award, American Vacuum Society (AVS), 2010
Alumni Academic Achievement Award, UCLA School of Engineering, 2009.
Semiconductor Industry Association University Researcher Award, 2008
AVS Distinguished Lecturer, 2001-2003
IEEE Plasma Science and Applications Award, 2000
AVS Plasma Science and Technology Prize, 1999
Tegal Corporation Thinker Award for Plasma Processing Technology, 1997
Semiconductor Research Corporation Technical Excellence Award, 1995
Japanese Society for Advancement of Science Fellow, 1995
SRC Student Symposium, Best-in-Session Award; 2005,2006, 2014
Intl. Symp. Plasma Chemistry Best Paper Award, 2015
Journal of Physics D-Highlights Collection: 2010, 2011, 2012 (2), 2013, 2014
Plasma Sources Science and Technology Highlights Collection: 2014
Fellow, IEEE (1991)
Fellow, Optical Society of America
Fellow, Institute of Physics
Fellow, Intl. Plasma Chemistry Soc. (2011)
Eta Kappa Nu
University of Illinois Honors:
Xerox Junior Faculty Research Award, 1988
Xerox Senior Faculty Research Award, 1991
T. Murphy University of Illinois Scholar, 1991-94
Everitt Award for Undergraduate Instruction, 1990
Burlington Northern Faculty Achievement Award, 1991
Unofficial List of Teachers Rated Excellent by their Students 1987-95,1997, 1999, 2001-4, 2002
Fellow, American Physical Society (1990)
Fellow, American Vacuum Society (1999)
Fellow, Intl. Union Pure & Applied Chemistry
Phi Beta Kappa
Tau Beta Pi
Sigma Xi

Anderson Consulting Award for Excellence in Advising, 1991, 94, 97, 98

Professional Activities and Organizations:

Editorships and Editorial Boards:

Plasma Sources, Science and Technology, Editor-in-Chief, 2007-2013; Editorial Board, 1993-2013, 2015-2017, Guest Editor, Special Issue, "Proceedings NATO ARW on Dusty Plasmas", Aug. 1994
Journal of Physics D, Editorial Board, 2003-2018; Assoc. Editor for Plasmas, 2005-2008
Plasma Chemistry and Plasma Processing, Editorial Board, 2005-2013
Plasma Processes and Polymers, International Advisory Board, 2004-2008
Journal of Applied Physics/Applied Physics Letters, Editorial Board, 2011-2012
Journal of Vacuum Science and Technology A, Editorial Board, 1998-2000
IEEE Transactions on Plasma Science, Associate Editor, 1989-2009
Guest Editor, Special Issue, "RF Discharges for Plasma Processing", April 1986
Co-Guest Editor, Special Issue, "Modeling of Low Temperature Collisional Plasmas", April 1991
Co-Guest Editor, Special Issue, "Proceedings of ICOPS", 2004
Guest Editor, Special Issue, "Images in Plasma Science", February 1996, February 1999, February 2002, April 2005, June 2008, August 2011
Proceedings of the 6th Annual ONR/SDIO Pulse Power Review, Editor, August 1993

Advisory, Organizing and Executive Committee Memberships:

National Research Council:

Panel on Plasma Processing of Materials, 1990-91
Naval Advisory Board on Plasma Processing, 1993-94
Panel on Database Needs in Plasma Processing, Co-Chair, 1994-96
Plasma Science Committee, 1998-2003
Panel on Decadal Study of Plasma Physics, 2005-2007; Chair, Low Temperature Plasmas

National Science Foundation:

Workshop on Plasma Engineering, 1988, 1993
Panel Reviewer for: Research Initiation Awards, 1989, 1994; Presidential Young Investigator Awards, 1994; Small Business Innovative Research Awards, 1996; Plasma Science Initiative, 2002; Nanoscale Interdisciplinary Research Teams, 2004; Combustion and Plasma, 2010.
Organizer of Workshop on *Science Challenges in Low Temperature Plasma Sci. & Engr*, 2016:

Institute of Electrical and Electronic Engineers (IEEE):

Nuclear and Plasma Sciences Society, Membership Committee 1995-96; Executive Committee for Plasma Science and Applications, 1986-89, 2013-2015; Conference on Plasma Science, Program Committee, 1986-88, 1991, 1993-95, 1997-99, 2000-1, 2003-5; Fellowship Committee, 2016
Lasers and Electro-Optics Society, Technical Subcommittee on Gas and UV Lasers, 1989-94; Annual Meeting Program Committee, 1992
Conference on Lasers and Electro-Optics, Program Committee, 1991-93
International Interconnect Technology Conference, Organizing Committee, 1997-99

American Vacuum Society (AVS) and Intl. Union for Vac. Sci., Technique & Applications (IUVSTA)

Plasma Science and Technology Division, Executive Committee, 1992-94, 1995-98; Head of Education Subcommittee, 1993-94; Chair, 1996-97, Program Committee, 2004-5
Co-Organizer, "Symposium on ULSI and its Plasma Processing Equipment", 1997
Manufacturing Science and Technology Group, Program Committee, 1995-96, 98-2000; Executive Committee, 1994-97; Treasurer, 1994-2000; Chair of Program Committee, 1998-99
IUVSTA Divisional Representative for Plasma Science & Technique, 2010-2013; Member of PST Executive Committee, 2011-13.
Distinguished Lecture Series Committee, 1998-99

International Union for Pure and Applied Chemistry:

Titular Member, Plasma Chemistry Division, 1996-98
Member of Plasma Chemistry Working Group on Databases for Plasma Remediation, 1995-8

American Physical Society:

Gaseous Electronics Conference, Chair, 1996-98; Executive Committee, 1984-86, 1995-99;
Co-Organizer of Workshops – Plasma Kinetics, 2009; Control of Distribution Functions, 2011;
Plasma Sources for Biomedical Applications, 2012.
Division of Material Physics, Focus Session Organizer, 1995
Division of Plasma Physics, Centennial Program Committee, 1997-99; Fellowship Committee,
1998, 2010; Program Committee 1999-2000, 2008, 2011; Executive Committee 2008-10;
Nominating Committee 2009-10
Division of Atomic, Molecular and Optical Physics, Allis Prize Selection Committee, 2011.

Review, Advisory and Search Committees:

Office of Naval Research, Pulse Power Science Advisory Committee, 1989-90
ASEE Review Panel for NIST and ONR Postdoctoral Fellowship Programs, 1990
Sematech Plasma Processing Matrix Committee, 1991
Semi. Industry Assoc./Sematech Equipment Modeling and Design Working Group, 1992,97
AIP Journal of Applied Physics/Applied Physics Letters Review Committee, 1998
University of William and Mary, Dept. of Applied Science External Review Committee, 1999
AIP Journal of Applied Physics Editor Search Committee, 2000
OSA Meggers Award Committee, 2004-2006
X-Division Review Committee, Los Alamos National Laboratory, 1996-2006
DFG (German Research Foundation) “Fundamentals of Complex Plasmas” Review Panel,
Griefswald, Germany, February 2005, 2009, 2013
STW (Technology Foundation, Netherlands), Jury Member, “Building on Transient Plasmas”, 2009
Quantemole Inc., Advisory Board, 2006-15
American Society of Engineering Education, Engineering K-12 Center Advisory Board, 2007-8.
Naval Research Laboratory, Plasma Physics Division External Review Committee, 2013, 2016
Princeton Plasma Physics Laboratory Advisory Committee, 2013-2016
Interuniv. Attraction Poles on Physical Chem. Plasma-Surface Interactions, Belgium, 2013-2015
SFI (Sci. Foundation Ireland) Strategic Research Cluster-Plasma Technol. Nano Mfg., 2010-2015
Center Integrated Comp. & Analysis of Reconnection & Turbulence, U. New Hampshire, 2011-14
Instituto Superior Técnico (IST/UTL) Portugal, Advanced Program in Plasma Science and
Engineering, External Advisory Board, 2013-2016
Department of Energy – Frontiers in Plasma Science Panel, 2015-16

Other Organizing and Program Committees:

SPIE Symposia on Metal Vapor Lasers and Pulsed Power, Organizing Committee, 1989
AIAA, Technical Committee on Plasma Dynamics and Lasers, 1987-89
Power Modulator Symposium, Technical Advisory Committee, 1987-8, 1989-96
NATO ARW on Dusty Plasmas, Organizing Committee, France, 1993
6th SDIO/ONR Pulse Power Meeting, Organizer and Host, 1993
3rd and 4th International Conference on Reactive Plasmas, Advisory Committee, 1996-1998
Coalition on Plasma Science, Steering Committee, 1997
International Conference on Atomic and Molecular Data and Their Applications (ICAMDATA),
International Program Committee, 2001-02
Gordon Research Conference for Plasma Processing Science; Vice-Chair, 1994-96; Program
Committee, 1998-2004; Vice-Chair, 2000-02; Chair, 2002-04.
Intl. Workshop on Microplasmas, Int’l Scientific Committee, 2007, 2009, 2011, 2013, 2015
Dry Process Symposium, Int’l Program Committee, 2006, 2008-2012
1st International Conference on Plasma Medicine, Scientific Program Comm., October 2007.
7th Intl. Meeting on Information Display, Program Committee, Daegu, Korea, August 2007.
DOE Workshop on Low Temperature Plasma Science and Engineering, Co-Chair, March 2008
Intl. Conference on Microelectronics & Plasma Technology, Intl. Advisory Comm., 2008-9, 2011-2

International Workshop on Plasmas with Liquids, Intl. Organizing Committee, 2010
International Plasma Chemistry Society, Board of Directors, 2010-2013
10th Asia-Pacific Conference on Plasma Science and Technology / 23rd Symposium on Plasma Science for Materials, International Advisory Committee, 2010.
22nd International Conference on Numerical Simulation of Plasmas Program Committee, 2011
International Vacuum Congress-19, Intl. Scientific Committee, Plasma Science Chair., 2013
International Conference on Phenomena in Ionized Gases, Int. Scientific Comm., 2011-2015
Lorentz Workshop on Plasmas and Liquids, Co-Chair, 2014

Professional Society Memberships:

Institute of Electrical and Electronics Engineers (Fellow)
Optical Society of America (Fellow)
American Physical Society (Fellow)
American Vacuum Society (Fellow)
Institute of Physics (Fellow)
International Union of Pure and Applied Chemistry (Fellow)
International Plasma Chemistry Society (Fellow)
American Society for Engineering Education
Material Research Society
American Institute of Chemical Engineers

University Service

University of Illinois (Partial List):

Campus: Honorary Degrees Committee (1987-88), Academic Senate (1988-92,96-98), Campus Honors Program Advisor (1990-98), Search Committee for Vice Chancellor for Academic Affairs (1993), Ethics and Graduate Students Workshop (Graduate College, 1994-95); Graduate Student Discipline/Graduate College Grievance Committee (1996-1997); Workshop on Sponsored Research (1997), Chair of Search Committee for Director of Research Technology Management Office (1997), Ad-Hoc Committee on Conflict of Interest from Internet Instruction (1997-98), Academic Integrity Inquiry Team (1998), Campus Budget Oversight Committee (1998-1999), Federal Demonstration Partnership Representative (1998-2001), Strategic Advisory Committee on Policies for Entrepreneurship (1999), Research Policy Committee (1999-2000), Research Technology and Management Advisory Committee (Chair, 1999-2000), Facilities Planning Committee (2000-2001), Search Committee for CCSO Director (2000-1), UIUCnet Enterprise Communications Funding Plan (2000), Faculty Director for CNRS-UIUC Collaborative Research Program (2001-02), Economic Development and the University Assessment Committee (2001-2); MS in Bioinformatics Steering Committee, Chair (2002-4); Chemical Sciences Leadership Council (2002-3); Committee to Review Sponsored Research Agreements (2003), Conflict of Interest Review Committee (1997-2004, Chair 1999-2004), Campus Promotion and Tenure Committee (2003-4), Administrative Review Portal Assessment (2003)

College of Engineering: Dean's Committee on Student Affairs (1991-92), Search Committee for Assoc. Dean for External Affairs (1993), Review Panel for IBM SURS (1993), Forward Planning Committee (1994-97), Strategic Planning Committee for Computers and Networks (1994-96), Women in Engineering Steering Committee (1995-97), Search Committee for Director of Women in Engineering (1995-6), Department Head Evaluation Committee (1997), Annual Meeting on Ethics in Engineering (1995,97), Dean's Retreat on Future Directions (1997), Search Committee for Fisher Chair Professor (1997), Computer Science and Engineering Fellowship Committee (1997,99), College Executive Committee (1997-00, Secretary 1998-99, Vice-Chair 1999-2000), College Administrative Committee (1998-2000, Secretary 1998-99), Promotion and Tenure Committee (1998-99, Chair 1999-2000), Committee on Interdisciplinary Graduate Programs (1998-99), Dean Review Committee (1998-99), Chemical Engineering Faculty Search (1998-2000), Engineering-Physics Liaison (2001-3), Center for Nanoscience and Technology Strategic Planning Committee, Chair (2002); Options Review Committee

for Industrial and General Engineering, Chair (2003); Coordinator for College of Engineering Reorganization (2003-4); Thurnauer Professorship Selection Committee (Chair, 2003)
Department of Electrical and Computer Engineering Committees: Microelectronics and Quantum Electronics Area (1987-94,98-2004), Qualifying Exam (1987-90, 95-96,98-99), Teaching Evaluation and Awards (1988-90,96-97), Annual Review of Electronics Conference (1989-90, Co-Chair), Computer Resources (1990-3, Chair), Curriculum (1991-93), Curriculum Revision Committee (Chair, 1992), Graduate (1993-96), Physical Electronics Curriculum (1994), Physical Electronics Faculty Recruitment (1994-95,97-98 Chair, 99-2000), Faculty Search and Recruitment (1994-99, 2003-4), ABET (1994-95), Promotion Reevaluation (1997), Advisory (1997-99), Coordinator for Senior Theses (1996-2000), Annual Undergraduate Research Symposium Chair (1997-2000), Search for Grainger Chair Professor (1997); Engineering Open House (1998), Graduate Student Recruitment (1998, 1999-2001), Facilities (2000-2, 2003-4), Promotion and Promotion Review (Chair, 2001-3), New Building Concept Committee (2003)

Iowa State University Major Committee Service (Partial List):

Committee on Energy Efficiency and Conservation, 2008.
Chair, Search Committee for Director of Center for Transportation Research and Education, 2006.
Search Committee for Director of Ames Laboratory, 2007.
BioBased Products and Renewable Fuels Steering Committee, 2006-8.
Advisory Board, Language and Culture for Professions, Dept. World Cultures and Languages, 2006-8
University Budget Model Committee, 2005-06.
Ames Economic Development Corp., 2005-06.
Plant Science Institute Advisory Board, 2005-08.
Iowa Space Grant Consortium Coordinator and Executive Committee, 2005-08.
Pappajohn Center for Entrepreneurship Advisory Board, 2005-07.
Association of American Colleges and Universities, Campus Representative, 2005-06.
ISU Research Foundation, Board of Directors, 2006-8.
Invent Iowa, Advisory Board, 2006-7.
Institute for Combinatorial Discovery, Advisory Board, 2006-8.

University of Michigan (Partial List):

Campus: Director, Michigan Institute for Plasma Science and Engineering (2008-16); Chair Program Committee, Graduate Certificate in Plasma Science and Engineering (2009-16); Senate Financial Affairs Advisory Committee (2011-2014); Senate Development Advisory Committee (2012-2015); M-Cubed Evaluation Committee (2012); Sensitive Data Advisory Committee (2012); Applied Physics Admissions Committee (2013); Faculty Ally ECE Representative (2012-2017); Russel Lectureship Selection Committee (2016-17), Senate Advisory Committee on Financial Affairs (2016-17), Senate Advisory Committee on External Relations and Communications (2016-17)
College of Engineering: NERS Faculty Review Committee (2008-9); NERS Chair Search Committee (2009-10); Casebook (Promotion and Tenure) Committees: Atmospheric, Oceanic and Space Science (2010-16), NERS (2010-12, 14-15), Chem. Eng. (2012-13), EECS (2016-17); Strategic Planning (2010); NAE Faculty Committee, (2011-2017); NextProf Workshop (2012); Bicentennial Support Committee (2012-13); ADVANCE Advisory Committee (2013-2017); Center Proposal Enhancement Program (2012-2017); Senior Hire Committee (2012-13); Research Advisory Committee (2012-2016); Faculty Launch Committees (2013-16, chair 2014-15); IT Futures Committee (2014), IT Advisory Committee (2015-17), Faculty Diversity Advisory Committee (2015-16), Chem. Engr. Chair Search Committee (2016-17)
Division of Electrical and Computer Engineering: Faculty Search Committee (Chair 2009-2014, 2016-17); Executive Committee (2009-11); Curriculum Committee (2011-12); Strategic Planning (2011-12); Faculty Mentoring Committee, Co-Chair (2012-2013); Graduate Advisor-Radiation Laboratory (2014), Undergraduate Advisor (2015-2016)

Graduate Student and Post-Doctoral Supervision:

20 MS Theses, 37 PhD Theses, 15 Post-doctoral fellows and research scientists

Areas of Professional Interest:

Low Temperature Plasmas, Laser Physics and Spectroscopy, Plasma Chemistry, Plasma and Photochemical Materials Processing, Amorphous Thin Films, Pulse Power Plasmas, Environmental and Medical Applications of Plasmas

Publications:

327 Refereed Journal Articles, 169 Invited Conference Presentations, 580 Contributed Conference Presentations, 159 Invited Symposia, Seminar and Short Course Presentations, 15 NRC Reports, DOE, NSF Trade and Popular Publications, 8 patents/registrations/applications

Google Metrics (18 May 2017): 14,790 Citations, h-index = 65, i10-index=254