

May 2023

**Mark J. Kushner**

University of Michigan

Electrical Engineering and Computer Science Department

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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 Dept.,

Applied Physics Program, Chemical Engineering Dept.

Member, Science and Technology Policy Program

Director, Michigan Institute for Plasma Science and Engineering

Director, Graduate Certificate Program in Plasma Science and Engineering

Director, Dept. of Energy Center: *Control of Plasma Kinetics* (2009-2021)

Director, Dept. of Energy Center: *Plasma Interactions Complex Surfaces*, (2019- )

*Eindhoven University of Technology, The Netherlands*, Distinguished Professor, 2016-20

*Instituto Superior Técnico (Lisbon University), Portugal*, Distinguished Visiting Professor, 2018

*University of Rochester Laboratory for Laser Energetics*, Visiting Distinguished Scientist, 2021-

*Iowa State University*

2005-2008 Dean, College of Engineering

James Melsa Professor of Engineering, Dept. of Electrical & Computer Engr.

Affiliate: Depts. of Materials Science & Engr., and Chemical & 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 Engr. 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 Engr. (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, & Dunn	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 Materials Science Hall of Fame Prize, Japan Society for Promotion of Science, 2020.  
Distinguished Speaker, UC Riverside, Mechanical Engineering Department, 2020.  
International Conf. on Phenomena in Ionized Gases von Engle and Franklin Prize, 2019.  
Stephen S. Attwood Award, College of Engineering, University of Michigan, 2018  
Distinguished Visiting Professor, Instituto Superior Técnico (Lisbon University), 2018  
Plasma Chemistry Award, International Society for Plasma Chemistry, 2017  
Distinguished Technical Lecture, Dept. Nuclear Engineering, North Carolina State Univ., 2017  
Bikerman Lecture, Dept. of Chemical & Biomol. Engr., 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



Advisory, Organizing and Executive Committee Memberships:

National Academies of Science, Engineering, Medicine/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 2010, 2005-2007; Chair, Low Temp. Plasmas  
Panel on Decadal Study of Plasma Physics 2020, Co-Chair, 2018-2021.

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  
Workshop Organizer and Report Editor, *Science Challenges in Low Temperature Plasma Science & Engineering*, 2016  
Workshop on Plasma Science User Facilities, Co-Chair, Low Temperature Plasmas, 2019.  
Engineering Research Visioning Alliance, Standing Council, 2021-2024.

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; International Committee 2020.  
Lasers and Electro-Optics Society, Technical Subcommittee 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  
Distinguished Lecture Series Committee, 1998-99

International Union for Pure and Applied Chemistry:

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

American Physical Society:

Gaseous Electronics Conference, Chair, 1996-98; Exec. Comm., 1984-6, 1995-99; 2020-22  
Co-Organizer Workshops – Plasma Kinetics, 2009; Distribution Functions, 2011, 2020;  
Plasma Sources for Biomedical Applications, 2012; Hershkowitz Memorial, 2021;  
Plasma Science for Microelectronics Fabrication  
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 & 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 & Design Working Group, 1992, 97  
AIP Journal of Applied Physics/Applied Physics Letters Review Committee, 1998  
Uni. 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, 2006-23  
American Soc. of Engr. Education, Engineering K-12 Center Advisory Board, 2007-8.  
Princeton Plasma Physics Laboratory Advisory Committee, 2013-2016  
Interuniv. Attraction Poles Physical Chem. Plasma-Surface Interactions, Belgium, 2013-15  
Sci. Foundation Ireland) Strategic Research Cluster-Plasma Technol. Nano Mfg., 2010-15  
Center Integrated Comp. & Analysis of Reconnection, U. New Hampshire, 2011-14  
Instituto Superior Técnico (IST/UTL) Portugal, Advanced Program in Plasma Science and Engineering, External Advisory Board, 2013-2023  
Department of Energy – Frontiers in Plasma Science Panel, 2015-16  
York University Department of Physics Review Committee, York, UK, 2017  
UCLA Plasma Science Institute, External Review Committee, 2019.  
NSF EPSCoR CPU2AL (Connecting the Plasma Universe to Plasma Technology in Alabama), External Advisory Committee, 2019-2022.  
Missile Defense Agency Oversight Board for DPALS, 2020-2022  
Sandia National Laboratory Plasma Research Facility Advisory Board, 2022-3  
Naval Research Lab., Plasma Physics Division External Review Committee, 2013, 2016, 2022 (Chair)

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  
6<sup>th</sup> SDIO/ONR Pulse Power Meeting, Organizer and Host, 1993  
3<sup>rd</sup>, 4<sup>th</sup> 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  
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, 2007-2015  
 Dry Process Symposium, Int'l Program Committee, 2006, 2008-2012  
 1<sup>st</sup> International Conf. on Plasma Medicine, Scientific Program Comm., October 2007.  
 7<sup>th</sup> Intl. Meeting on Information Display, Program Comm. Daegu, Korea, August 2007.  
 DOE Workshop on Low Temperature Plasma Science and Engr., Co-Chair, March 2008  
 Intl. Conf. on Microelectronics & Plasma Technol., 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  
 10<sup>th</sup> Asia-Pacific Conference on Plasma Science and Technology / 23<sup>rd</sup> Symposium on Plasma Science for Materials, International Advisory Committee, 2010.  
 22<sup>nd</sup> International Conf. on Numerical Simulation of Plasmas Program Committee, 2011  
 Intl. Vacuum Congress-19, Intl. Scientific Committee, Plasma Science Chair., 2013  
 Intl. Conference on Phenomena in Ionized Gases, Int. Scientific Comm., 2011-2017  
 Lorentz Workshop on Plasmas and Liquids, Co-Chair, 2014  
 Intl. Conference on Data Driven Plasma Science, Executive Scientific Committee, 2018-19  
 International Low Temperature Plasma Community (ILTPC), Co-Founder and newsletter editor, 2020-23  
 Coalition for Plasma Science, Board Member, 2021-22  
 Online Low Temperature Plasma Seminar Oversight Committee, 2020-2022  
 International Online Plasma Seminar, Organizing Committee, 2020-2022  
 DOE Fusion Energy Sciences *Basic Research Needs Workshop on Plasma Science for Microelectronics Nanofabrication*, Gaithersburg, Md, 2022. Co-Organizer and Editor.  
 US Low Temperature Plasma Summer School, Co-Founder and organizer, 2022-23

Professional Society Memberships:

Institute of Electrical and Electronics Engineers (Life 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 , Director of Center for Transportation Research & Education, 2006.

Search Committee, Director of Ames Laboratory, 2007.

BioBased Products and Renewable Fuels Steering Committee, 2006-8.

Adv. Board, Language & Culture for Professions, World Cultures & 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 (2008-23); Chair Program Committee, Graduate Certificate in Plasma Science and Engineering (2009-23); Senate Financial Affairs Advisory Committee (2011-14, 2016-19); 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 (2012-2023); Russel Lectureship Selection Committee (2016-18), Senate Advisory Committee on External Relations and Communications (2016-17,18-19), STC Review Team (2017); Science, Technology and Public Policy Advisory Committee (Chair, 2017-18), Rackham Pre-Doctoral Fellowship Committee (2020-23), Senate Advisory Committee on Government Relations (2022-3),  
*College of Engineering:* Nucl. Engr. Radiological Sciences (NERS) Faculty Review Committee (2008-9); NERS Chair Search Committee (2009-10); Casebook (Promotion and Tenure) Committees: Atmospheric, Oceanic and Space Science (2010-23), NERS (2010-12, 14-15, 18-19), Chem. Eng. (2012-13, 2021-23), EECS (2016-17,21-22), CEE(2018-19); Strategic Planning (2010); NAE Faculty Committee, (2011-2021); NextProf Workshop (2012); Bicentennial Support Committee (2012-13); ADVANCE Advisory Committee (2013-2019); Center Proposal Enhancement Program (2012-2017); Senior Hire Committee (2012-13); Research Advisory Committee (2012-2016); Faculty Launch Committees (2013-16, chair 2014-15, 2020); IT Futures Committee (2014), IT Advisory Committee (2015-21), Faculty Diversity Advisory Committee (2015-16), Chem. Engr. Chair Search Committee (2016-17), Named Professorship Committee (2017), Associate Dean For Research Advisory Group (2020-21), Federal Initiatives Committee (2021-2)  
*Division of Electrical and Computer Engineering:* Faculty Search Committee (Chair 2009-2014, 2018-2019, member 2016-18, Chair 2018-19, 2020-22); 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), ECE DCO Liason (2017-20, 21-22), Inclusive Department (2018-20), Honors and Awards (2020-23)

**Graduate Student, Post-Doctoral and Scientist Supervision:**

20 MS Theses, 45 PhD Theses, 21 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:**

386 Refereed Journal Articles, 202 Invited Conference Presentations, 717 Contributed



Conference Presentations, 214 Invited Symposia, Seminar, Summer School, Briefings and Short Course Presentations, 19 NRC/NAS Reports, DOE, NSF Trade and Popular Publications, 13 Public Lectures, 8 patents/registrations

Google Metrics (14 May 2023): 25,696 Citations, h-index = 82, i10-index=332  
<https://scholar.google.com/citations?user=HXAFMosAAAAJ&hl=en>