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Education

Sc.D. (EE) 1983, Massachusetts Institute of Technology
M.S. (EE) 1979, Massachusetts Institute of Technology
B.S. (EE) 1978, Massachusetts Institute of Technology

Experience

Professor, Applied Physics, Columbia University, 1995 to present
Chairman, Dept. of Applied Physics and Applied Mathematics, 2000 to 2006
Visiting Scientist, Massachusetts Institute of Technology, 1999 to present
Visiting Scientist, General Atomics, San Diego, July 1994 – December 1994
Associate Professor, Dept. of Applied Physics, Columbia University, July 1990 – July 1995
Assistant Professor, Dept. of Applied Physics, Columbia University, August 1985 – July 1990
Instructor, Dept. of Electrical Engineering, M. I. T., February 1984 – June 1984
Research Scientist, Plasma Fusion Center, M. I. T., October 1982 – July 1985

Honors and Awards

Jefferson Science Fellow, National Academies, U.S. Dept. of State, 2006-2007
Certificate of Appreciation, U.S. Dept. of State, 2007
Rose Award for Excellence in Fusion Engineering, Fusion Power Associates, 2000
Fellow, American Physical Society, 1995
Teacher of the Year, 1994, elected by Columbia's School of Engineering Undergraduates
Certificate of Appreciation, U.S. Dept. of Energy, 1989
I.E.E.E. Fortesque Fellowship (1978 – 1979)
Guillemin Prize for undergraduate thesis in Electrical Engineering

University Service

Chairman, Dept. Applied Physics and Applied Mathematics, Columbia University, 2000-2006
Member, Executive Committee, Graduate School Arts and Sciences, 2007 to present
Member, Science and Technology Policy Committee, 2007 to present
Member, Faculty Advisory Committee for NWC Building, 2007 to present
Member, Provost's Tenure Advisory Committee, 2007 to present
Visiting Committee, MIT Department of Nuclear Engineering, 2001-04
President, University Fusion Association, 1997-1998,
Secretary/Treasurer, 1992 - 1996, Executive Committee, 1992-94
Chairman, Selection Committee, National Fusion Energy Undergraduate Fellows, 1994-95, 1997
Faculty Advisor, Tau Beta Pi, Columbia University Chapter, 1989-1999
Selection Committee, Presidential Faculty Teaching Award, 1995
Selection Committee, Presidential Graduate Student Teaching Award, 1996, 1997 (Chair)
Elected University Senator, 1986-88, 1995-98
Member, School of Engineering, Strategic Planning Committee, 1992 to 1993.

Member, School of Engineering Dean of Students Search Committee, 1991 to 1992.

Professional Society Service

Member, Fellowship Committee, American Physical Society, 2006 to 2009
Member, 50th Anniversary Program Committee for APS-DPP, 2007-2008
Chair, APS James Maxwell Prize Selection Committee, 2007; Vice-Chair, 2006
Chairman, Division of Plasma Physics, American Physical Society, 2002-03
Chair-Elect, Vice-Chair, Division of Plasma Physics, American Physical Society, 2001-02
American Physical Society-DPP Program Committee, 1990, 1997, 2001, 2002 (Chair), 2003
American Physical Society-DPP Fellows Selection Committee, 1997, 2001 (Chair), 2005-2007
Member, Program Committee, European Physical Society Meeting, 2003
Member, Executive Committee of the Div. of Plasma Physics of APS, 1989 - 1990

National and International Professional Experience

Associate Editor, *Physics of Plasmas*, 2003-present
Associate Editor, *Physical Review Letters*, 1995-1998
Member, Plasma Science Committee, National Research Council, 2007-present
Plasma Physics Advisory Committees,
 PPPL NSTX 2004-Present; Chair 2007 to present
 MIT C-Mod 1999-2003, Chair 2002-03;
 HIF-VNL 2002-present;
 VLT 1998-2001; DIII-D 1996-1998; PBX-M 1995-1996.
Chair, U.S. ITER Forum, U. Maryland, May, 2003
Co-Chair, 1999 Fusion Summer Study, Snowmass, CO, July, 1999.
Member, US DOE FESAC Advisory Committees:
 Pathway to DEMO, 2007
 Fusion Priorities, 2003-2004;
 Committee of Visitors, 2003, 2004;
 Integrated Program Planning, 1999-2001;
 Fusion Program and Balance Panel, 1999;
 Fusion Materials Committee, 1997-1998;
 FEAC Alternative Concepts Committee, 1996;
 FEAC Strategic Planning Committee, 1995-96.
Member, DOE Fusion Science Center Selection Panel, 2004
Member NSF Basic Plasma Physics Selection Panel, 2003, 2005
Member, NSF Physics Frontiers Selection Panel, 2001, 2002
Member, U. S. Dept. of Energy, I.A.E.A. Paper Selection Review Panel, 1994, 1990.
Member, Program Committee, 2nd International Workshop on Interrelationship Between Plasma Experiments in Laboratory and Space, 1993
Member, Innovations in Tokamak Improvements and New Fusion Confinement Systems Evaluation Committee, U.S. Dept. of Energy, 1993
Consultant, Fusion Systems, Inc., Maryland, 1991
Member, Executive Committee of the Div. of Plasma Physics of APS, 1989 - 1990
Member, U. S. Dept. of Energy, TFTR D-T Fusion Review Panel, 1990
Member, NSF, Small Business Innovative Research Program Selection Committee, 1990
Consultant, NSF, Selection of Presidential Young Investigator Awards, 1989
Chairman, U. S. Dept. Energy, CDX-U Review Panel, 1989
Consultant, U. S. Congressional O. T. A., Fusion Energy Review Panel, November 1986
Consultant, Plasma Fusion Center, M. I. T., August 1985 – December 1986

Peer-Reviewed Publications

“A Kalman filter for feedback control of rotating external kink instabilities in the presence of noise”. J. M. Hanson, B. De Bono, J. Levesque, M. E. Mauel, A. Maurer, G. A. Navratil, T. S. Pedersen, D. Shiraki, R. James, *Phys Plasmas* **16** (2009).

“Global and local characterization of turbulent and chaotic structures in a dipole-confined plasma.” B. A. Grierson, M. W. Worstell, and M. E. Mauel, *Phys Plasmas* **16** (2009) 055902.

“Confinement Improvement with Magnetic Levitation of Superconducting Dipole,” D. T. Garnier, A. C. Boxer, J. L. Ellsworth, J. Kesner, and M. E. Mauel, *Nuclear Fusion*, **49** (2009).

“Multichannel microwave interferometer for the levitated dipole experiment,” Boxer A, Garnier D, Mauel M, *Rev Sci Instrum*, **80** (2009) 043502.

“A digital control system for external magnetohydrodynamic modes in tokamak plasmas. J. M. Hanson, A. Klien, M. E. Mauel, A. Maurer, G. A. Navratil, T. S. Pedersen, *Rev Sci Instrum* **80** (2009) 043503.

“Feedback suppression of rotating external kink instabilities in the presence of noise.” Hanson J, De Bono B, James R, Levesque J, Mauel M, Maurer D, Navratil G, Pedersen T, Shiraki D, *Phys Plasmas* **15** (2008) 080704

“Control of External Kink Modes Near the Ideal Wall Limit Using Kalman Filtering and Optimal Control Techniques,” D. A. Maurer, J. Bialek, A. H. Boozer, B. Debono, J. M. Hanson, R. James, J. P. Levesque, O. Katsuro-Hopkins, M. E. Mauel, G. A. Navratil, T. S. Pedersen and D. Shiarki, 22nd IAEA Conference of Plasma Physics and Controlled Nuclear Fusion, (2008).

“Experiments and Modeling of External Kink Mode Control Using Modular Internal Feedback Coils,” T. Sunn Pederson, D. A. Maurer, J. Bialek, O. Katsuro-Hopkins, J. Hansen, M. E. Mauel, R. James, A. Klien, Y. Liu, and G. A. Navratil, *Nuclear Fusion* **47** (2007) 1293.

“Stabilization of Low Frequency Instability in a Dipole Plasma,” D. T. Garnier, A. K. Hansen, M. E. Mauel, E. E. Ortiz, A. C. Bozer, J. L. Ellsworth, I. Karim, and J. Kesner, *J. Plasma Phys*, **74** (2008) 737.

“Equilibrium Reconstruction of Anisotropic Pressure Profile in the Levitated Dipole Experiment,” I. Karin, M. Mauel, J. Ellsworth, A. Boxer, D. Garnier, A. Hansen, J. Kesner, E. Ortiz, *J. Fusion Energy*, **26** (2007) 99.

“Effects of the Hot Electron Interchange Instability on a Plasma Confined in a Dipolar Magnetic Field,” E. Ortiz, A. Boxer, J. Ellsworth, D. Garnier, A. Hansen, J. Kesner, M. Mauel, *J. Fusion Energy*, **26** (2007) 139.

“Varying Electron Cyclotron Resonance Heating on the Levitated Dipole Experiment,” A. Hansen, A. Boxer, J. Ellsworth, D. Garnier, J. Kesner, M. Mauel, E. Ortiz, *J. Fusion Energy*, **26** (2007) 57.

“Quench detection for the levitated dipole experiment (LDX) charging coil,” P. C. Michael and D. T. Garnier and A. Radovinsky and I. Rodin and V. Ivkin and M. E. Mauel and V. Korsunsky and S. Egorov and A. Zhukovsky and J. Kesner, *IEEE Trans. Appl. Supercond.* **17** (2007) 2482.

“Design and initial operation of the LDX facility,” Garnier, D.T., Hansen, A.K.; Kesner, J.; Mauel, M.E.; Michael, P.C.; Minervini, J.V.; Radovsky, A.; Zhukovsky, A.; Boxer, A.; Ellsworth, J.L.; Karim, I.; Ortiz, E.E. *Fusion Engineering and Design*, **81**, (2006), p 2371-2380

“Production and Study of High-Beta Plasma Confined by a Superconducting Dipole Magnet,” Garnier, A. Hansen, M. Mauel, E. Ortiz, A. Boxer, I. Karin, J. Kesner, S. Mahar, A. Roach, *Physics of Plasmas*, **13** (2006) 056111.

“First integrated test of the superconducting magnet systems for the Levitated Dipole Experiment (LDX)”, Zhukovsky, A., Michael, P.C.; Schultz, J.H.; Smith, B.A.; Minervini, J.V.; Kesner, J.; Radovsky, A.; Garnier, D.; Mauel, M. *Fusion Engineering and Design*, **75-79**, (2005), p 29-32

“Suppression of rotating external kink instabilities using optimized mode control feedback,” A. Klein, D. Maurer, T. Pedersen, M. Mauel, G. A. Navratil, C. Cates, M. Shilov, Y. Liu, N. Stillits and J. Bialek, *Phys. Plasmas*, **12** (2005), 40703.

“Excitation of Centrifugally Driven Interchange Instabilities in a Plasma Confined by a Magnetic Dipole,” B. Levitt, D. Maslovsky, M. Mauel, J. Waksman, *Phys. Plasmas*, **12**, (2005), 55703.

“Observation of Centrifugally Driven Interchange Instabilities in a Plasma Confined by a Magnetic Dipole,” B. Levitt, D. Maslovsky, M. Mauel, *Phys. Rev. Lett.* , **94**, (2005), 175002.

“Dynamics and control of resistive wall modes with magnetic feedback control coils: experiment and theory,” M.E. Mauel, J. Bialek, A.H. Boozer, C. Cates, R. James, O. Katsuro-Hopkins, A. Klein, Y. Liu, D.A. Maurer, D. Maslovsky, G.A. Navratil, T.S. Pedersen, M. Shilov and N. Stillits, *Nuc. Fusion*, **45** (2005) 285.

“Magnetic field perturbations in closed-field-line systems with zero toroidal magnetic field,” D. Ryutov, J. Kesner, M. Mauel, *Phys. Plasmas* **11**, (2004) 2318.

“Dynamical plasma response of resistive wall modes to changing external magnetic perturbations,” M. Shilov, C. Cates, R. James, A. Klein, O. Katsuro-Hopkins, Y. Liu, M. Mauel, D. Maurer, G. A. Navratil, T. Pedersen, and N. Stillits, *Phys. Plasmas* **11**, (2004) 2573.

“Helium Catalyzed D-D Fusion in a Levitated Dipole,” J. Kesner, D. Garnier, A. Hansen, M. Mauel, L. Bromberg, *Nuc. Fusion* **44**, 193 (2004).

“High-speed optical diagnostic that uses interference filters to measure Doppler shifts,” S. Paul, C. Cates, M. Mauel, D. Maurer, G. A. Navratil, R. Paul, T. Pedersen, and M. Shilov, *Rev. Sci. Instr.* **75** (2004) 4077.

“Observation of nonlinear frequency-sweeping suppression with RF diffusion,” D. Maslovsky, B. Levitt, M. E. Mauel, *Phys. Rev. Lett.* **90**, 185001-1 (2003).

“Suppression of nonlinear frequency sweeping of resonant interchange modes in a magnetic dipole with applied radio frequency fields,” D. Maslovsky, B. Levitt, M. E. Mauel, *Phys. Plasmas* **10**, 1549-1555 (2003).

“Measurement of the Global Structure of Interchange Modes Driven by Energetic Electrons Trapped in a Magnetic Dipole,” B. Levitt, D. Maslovsky, M. E. Mauel, *Phys. Plasmas*, **9**, 2507-2517 (2002).

“Advanced technology paths to global climate stability: Energy for a greenhouse planet,” Hoffert, MI, Caldeira, K, Benford, G, Criswell, DR, Green, C, Herzog, H, Jain, AK, Khesghi, HS, Lackner, KS, Lewis, JS, Lightfoot, HD, Manheimer, W, Mankins, JC, Mauel, ME, Perkins, LJ, Schlesinger, ME, Volk, T, Wigley, TML, *Science*, pp. 981-987, **298** (2002)

“Numerical Simulation of Phase-Space Flows in the Collisionless Terrella Experiment,” D. Maslovsky, M. Mauel, B. Levitt, *IEEE Trans. Plasma Science* **30** pp. 8-9 (2002).

“Effect of Magnetic Islands on the Local Plasma Behavior in the HBT-EP Tokamak,” E. D. Taylor, C. Cates, M. E. Mauel, D. A. Maurer, D. Nadle, G. A. Navratil, M. Shilov, *Phys. Plasmas* **9**, 3938 (2002).

“Status of the floating coil of the levitated dipole experiment,” Zhukovsky, A, Garnier, D, Gung, C, Kesner, J, Mauel, M, Michael, P, Minervini, J, Morgan, M, Pedersen, TS, Radovinsky, A, Schultz, J, *IEEE Transactions On Applied Superconductivity*, p. 666-669 **4** (2002).

“Design, fabrication and test of the react and wind, Nb3Sn, LDX floating coil,” Smith, B.A.; Schultz, J.H.; Zhukovsky, A.; Radovinsky, A.; Gung, C.; Michael, P.C.; Minervini, J.V.; Kesner, J.; Garnier, D.; Mauel, M.; Naumovich, G.; Kocher, R., *IEEE Trans. Applied Superconductivity* **11**(2001) 2010.

“High temperature superconducting levitation coil for the Levitated Dipole Experiment (LDX),” Schultz, J.H.; Driscoll, G.; Garnier, D.; Kesner, J.; Mauel, M.; Minervini, J.V.; Smith, B.; Radovinsky, A.; Snitchler, G.; Zhukovsky, A., *IEEE Trans. Applied Superconductivity* **11** (2001) 2004.

“Modeling of active control of external magnetohydrodynamic instabilities,” J. Bialek, A. Boozer, M. E. Mauel, G. A. Navratil, *Phys. Plasmas* **8** (2001) 2170.

“Real-time measurement of toroidal rotation,” Paul, S.F., Cates, C., Mauel, M., Maurer, D., Navratil, G., Shilov, M., *Review of Scientific Instruments* **72** (2001) 966.

“Dipole Equilibrium And Stability,” Kesner, J. and Simakov, A.N. and Garnier, D.T. and Catto, P.J. and Hastie, R.J. and Krasheninnikov, S.I. and Mauel, M.E. and Sunn Pedersen, T. and Ramos, J.J., *Nuclear Fusion*, **41** (2001) pp. 301-8.

“Suppression of resistive wall instabilities with distributed, independently controlled, active feedback coils,” C. Cates, M. Shilov, M. E. Mauel, G. A. Navratil, D. Maurer, D. Nadle, S. Mukherjee, J. Bialek, A. Boozer, *Phys. Plasmas* **7** (2000) 3133.

“The feedback phase instability in the HBT-EP tokamak,” D.L. Nadle, C. Cates, H. Dahi, M.E. Mauel, D. Maurer, S. Mukherjee, G.A. Navratil, M. Shilov, E.D. Taylor, *Nuclear Fusion* **40** (2000) 1714.

“Active Feedback Control Of The Wall Stabilized External Kink Mode,” G. A. Navratil, J. Bialek, A. Boozer, C. Cates, H. Dahi, M. E. Mauel, D. Maurer, S. Mukherjee, M. Shilov, Plasma Physics and Controlled Fusion Research 2000 (IAEA, 2000).

“Review of the fusion materials research program,” Harkness, S.D.; Baker, C.C.; Abdou, M.A.; Davis, J.W.; Hogan, W.; Kulcinski, G.L.; Mauel, M.; McHargue, C.; Odette, R.; Petti, D.A.; Shewmon, P.; Zweben, S.J., *J. Fusion Energy* **19** (2000) 45.

“Nonstationary signal analysis of magnetic islands in plasmas,” E. D. Taylor, C. Cates, M. E. Mauel, D. A. Maurer, D. Nadle, G. A. Navratil, M. Shilov, *Rev. Sci. Instr.* **70**, (1999).

“MHD Stability in a Levitated Dipole,” D. Garnier, J. Kesner, M. Mauel, *Phys. Plasmas* **6** (1999) 3431.

“The Levitated Dipole Experiment (LDX) magnet system,” Schultz, J.H. and Kesner, J. and Minervini, J.V. and Radovinsky, A. and Pourrahimi, S. and Smith, B. and Thomas, P. and Wang, P.W. and Zhukovsky, A. and Myatt, R.L. and Kochan, S. and Mauel, M. and Garnier, D., *IEEE Transactions on Applied Superconductivity* **9** (1999) 378.

“Stabilization of Kink Instabilities by Eddy Currents in a Segmented Wall and Comparison with Ideal MHD Theory,” A. M. Garofalo, E. Eisner, T. H. Ivers, R. Kombargi, M. E. Mauel, D. Maurer, D. Nadle, G. A. Navratil, M. K. Vijaya Sankar, E. Taylor and Q. Xiao, *Nuclear Fusion*, **38**, (1998), pp.1029-42.

“Active control of 2/1 magnetic islands in a tokamak”, G. A. Navratil, C. Cates, M. E. Mauel, D. Maurer, D. Nadle, E. Taylor, and Q. Xiao, W. A. Reass and G. A. Wurden, *Physics of Plasmas*, **5**, (1998), pp.1855-63.

“Deuterium-tritium plasmas in novel regimes in the Tokamak Fusion Test Reactor,” M. Bell, et al., *Phys. Plasmas*, **4**, p. 1714-24 (1997).

“Review of D-T results from TFTR”, R. Hawryluk, et al., *Fusion Technology*, **30**, p. 648-59 (1997).

“Laboratory observations of wave-induced radial transport within an "artificial radiation belt", M. Mauel, *Journal de Physique IV (Colloque)*, **7**, no.C4, p. 307-18, (1997).

“Observation of Wall Stabilization and Active Control of low-n Magnetohydrodynamic Instabilities in a Tokamak,” T. H. Ivers, E. Eisner, A. Garofalo, M. E. Mauel, D. Maurer, D. Nadle, G. A. Navratil, M. K. V. Sankar, M. Su, E. Taylor, Q. Xiao, R. R. Bartsh, W. A. Reass, and G. A. Wurden, *Phys. Plasmas* **3** (1996) 1926.

“Observation of wave-induced chaotic radial transport in a laboratory terrella experiment,” H. P. Warren, M. E. Mauel, D. Brennan, and S. Taromina, *Phys. Plasmas* **3** (1996) 2143.

“Rotational and magnetic shear stabilization of magnetohydrodynamic modes and turbulence in DIII-D high-performance discharges,” L. L. Lao, K. H. Burrell, T. S. Casper, V. S. Chan, et al, *Phys. Plasmas* **3** (1996) 1951.

“Demonstration of high-performance negative central magnetic shear discharges in the DIII-D tokamak,” B. W. Rice, K. H. Burrell, L. L. Lao, *Phys. of Plasmas* **3** (1996) 1983.

“Observations of enhanced core confinement in negative magnetic shear discharges with an L mode edge on DIII-D,” Rice, B.W.; Lazarus, E.A.; et al., *Nuc. Fusion* **36** (1996) 1271.

“Enhanced Confinement and Stability in DIII-D Discharges with Reversed Magnetic Shear,” E. J. Strait, L. L. Lao, M. E. Mauel, B. W. Rice, T. S. Taylor, K. H. Burrell, M. S. Chu, E. A. Lazarus, T. H. Osborne, S. J. Thompson, and A. D. Turnbull, *Phys. Rev. Lett.* **75** (1995) 4421.

“Wave-Induced Chaotic Radial Transport of Energetic Electrons in a Laboratory Terrella Experiment”, H. P. Warren and M. E. Mauel, *Phys. Plasmas* **2** (1995) 4185.

“Overview of DT Results from TFTR,” M. G. Bell, K. M. McGuire, *et al.*, *Nuc. Fusion* **35** (1995) 1429.

“Wall Stabilization of High Beta Plasmas in DIII-D,” T. S. Taylor, E. J. Strait, L. L. Lao, M. E. Mauel, A. D. Turnbull, K. H. Burrell, M. S. Chu, J. Ferron, R. H. Groebner, R. J. La Haye, T. H. Jensen, D. J. Lightly, R. L. Miller, B. W. Rice, R. T. Snider, S. J. Thompson, and D. Wróblewski, *Phys. Plasmas* **2** (1995) 2390.

“Effect of Toroidal Plasma Flow and Flow Shear on Global MHD Modes,” M. S. Chu, J. M. Greene, T. H. Jensen, R. L. Miller, A. Bondeson, R. Johnson, and M. E. Mauel, *Phys. Plasmas* **2** (1995) 2236.

“Deuterium-tritium high confinement (H-mode) studies in the Tokamak Fusion Test Reactor,” C. E. Bush, S. A. Sabbagh, S. J. Zweben, *et al.*, *Phys. Plasmas* **2** (1995) 2366.

“Observation of Chaotic Particle Transport Induced by Drift-Resonant Fluctuations in a Magnetic Dipole Field,” H. P. Warren and M. E. Mauel, *Phys. Rev. Letters* **74** (1995) 1351.

“Initial High Beta Operation of the HBT-EP Tokamak,” M. K. Vijaya Sankar, N. Eisner, A. Garofalo, D. Gates, T. Ivers, R. Kombargi, M. E. Mauel, D. Mauer, D. Nadle, G. A. Navratil, Q. Xiao, *J. Fusion Energy*, **12** (1993) p. 303.

“High Poloidal Beta Long Pulse Experiments in the Tokamak Fusion Test Reactor,” J. Kesner, M. E. Mauel, G. A. Navratil, S. A. Sabbagh, M. Bell, R. Budny, C. Bush, E. Fredrickson, B. Grek, A. Janos, D. Johnson, D. Mansfield, D. McCune, K. McGuire, A. Ramsey, E. Synakowski, G. Taylor, M. Zarnstorff, S. H. Batha, F. M. Levinton, *Physics of Fluids B*, **5** (1993) p 2525.

“Achieving High Fusion Reactivity in High Poloidal Beta Discharges in TFTR,” M. E. Mauel, G. A. Navratil, S. A. Sabbagh, *et al.*, *Plasma Physics and Controlled Fusion Research 1992* (IAEA, Würzburg, 1992).

“Observation of Ballooning Modes in High-Temperature Tokamak Plasmas,” Y. Nagayama, S. A. Sabbagh, J. Manickam, E. D. Fredrickson, M. Bell, R. V. Budny, A. Cavallo, A. C. Janos, M. E. Mauel, K. M. McGuire, G. A. Navratil, G. Taylor, and M. Yamada, *Phys. Rev. Letters* **69** (1992) 2376.

“A fluid description for the discharge equilibrium of a divergent ECR plasma source,” G. Guan, M. E. Mauel, W. M. Holber, and J. B. O. Caughman, *Phys. of Fluids B*, **4** (1992) 4177.

“On Arnol’d diffusion in a perturbed magnetic dipole field,” H. P. Warren, A. Bhattacharjee, M. E. Mauel, *Geophysical Res. Letters* **19** (1992) 941.

“Operation at the tokamak equilibrium poloidal beta limit in TFTR,” M. E. Mauel, G. A. Navratil, S. A. Sabbagh, *et al.*, *Nuclear Fusion* **32** (1992) 1468.

“A Description of a D-He³ Fusion Reactor Based on a Dipole Magnetic Field,” A. Hasegawa, L. Chen, M. Mauel, H. Warren, S. Murakami, *Fusion Technology* **20**, No. 8 (1992).

“High Poloidal Beta Equilibria in TFTR Limited by a Natural Inboard Poloidal Field Null,” S. A. Sabbagh, R. A. Gross, M. E. Mauel, G. A. Navratil, *et al.*, *Phys. of Fluids B* **3**, 2277 (1991).

“A D-He3 Fusion Reactor Based on a Dipole Magnetic Field,” A. Hasegawa, L. Chen, M. E. Mauel, *Nuclear Fusion* **31** (1991).

“Production and Identification of the Ion-Temperature-Gradient Instability,” A. K. Sen, J. Chen, M. E. Mauel, *Physical Review Letters* **66**, 429 (1991).

“Whistler Instability in an Electron-Cyclotron-Resonance-Heated Mirror-Confined Plasma,” R. C. Garner, M. E. Mauel, S. A. Hokin, R. S. Post, D. L. Smatlak, *Physics of Fluids B* **2**, 242 (1990).

“Energetic Particle Stabilization of Ballooning Modes in Finite Aspect Ratio Tokamaks,” X. -H. Wang, A. Bhattacharjee, M. E. Mauel, J. W. Van Dam, *Physics of Fluids* **31**, 332 (1988).

“Measurement of Large Displacements of the Toroidal Current Centroid Using an External Coil Diagnostic,” H. Y. Che, T. H. Ivers, M. E. Mauel, *Rev. Sci. Instruments* **59**, 1057 (1988).

“Measurement of MHD instabilities in high beta tokamaks,” Mauel, M.E.; Ivers, T.H.; Che, H.Y.; Chen, D.; Gates, D.; Marshall, T.C.; Navratil, G.A.; Wang, J.; Darrow, D.S.; Ono, M., *Plasma Physics and Controlled Fusion Research 1988* (IAEA, Nice, 1988).

“Ballooning Mode Stability of Elongated High Beta Tokamaks,” M. E. Mauel, *Physics of Fluids* **30**, 3843 (1987).

“Warm Electron-Driven Whistler Instability in an Electron-cyclotron-resonance Heated Mirror-confined Plasma,” R. C. Garner, M. E. Mauel, S. A. Hokin, R. S. Post, D. L. Smatlak, *Physical Review Letters* **59**, 1821 (1987).

“The Use of Scaling Laws for the Design of High Beta Tokamaks,” M. E. Mauel, *Nuclear Fusion* **27**, 313 (1987).

“Transition of a Tokamak Plasma from a State with Low-to-high Poloidal Beta,” A. Deniz, T. Marshall, T. Ivers, X. Li, M. E. Mauel, *Physics of Fluids* **29**, 12 (1986).

“Plasma Potential Enhancement by RF Heating near the Ion Cyclotron Frequency,” D. K. Smith, K. Brau, P. Goodrich, J. Irby, M. E. Mauel, B. D. McVey, R. S. Post, E. Sevillano, J. Sullivan, *Physics of Fluids* **29** (40) 1986.

“Tara Diagnostic Set,” E. Sevillano, K. Brau, D. Goodrich, J. Irby, M. Mauel, R. Post, D. Smith, J. Sullivan, *Rev. Sci. Instr.*, **56** (5) 1985.

“Electron Cyclotron Heating in a Pulsed Mirror Experiment,” *Physics of Fluids* **27**, 12 (1984).

Other Publications and Invited Presentations

Published DOE-FESAC Advisory Committee Reports:

“Report of the second fusion energy sciences committee of visitors,” Freidberg, Jeffrey P.; Batchelor, Donald; Coderre, Jeffrey; Driscoll, Fred; Glendinning, Gail; Greenfield, Charles; Hammer, David;

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Over 30 invited and plenary lectures including:

“Levitated Magnet Brings Physics of Space to the Laboratory,” 50th Anniversary Meeting of the APS0-DPP, Dalla, 2008

“Improved Confinement During Magnetic Levitation in LDX,” Independent Activities Lecture, MIT, 2009

“Clean Energy: Crossing the Divide,” CERA Executive Conference; East Meets West: New Frontiers of Energy Security, Istanbul, Turkey 2007

“Fusion Energy; Progress towards an Unlimited Energy Source,” U.S. Department of State, Washington, DC, 2007.

“The Levitated Dipole Experiment for Plasma Confinement,” XII Seminario Enzo Levi, Sociedad Mexicana de Fisica, 2005

“Fusion Energy in a Non CO2 Emitting Energy Portfolio,” AAAS Annual Meeting, Washington, DC, 2005

“Experiments with a Supported Dipole,” Innovative Confinement Concepts Workshop, Seattle, WA, 2004

“The Dipole Fusion Concept” and “Interchange Bubbles,” at the IPP, Griefswald, Germany, 2002.

“The Search for Optimum Confinement Configurations for Fusion Applications,” at the APS Centennial Meeting, Atlanta, GA, 1999.

“Achieving High Fusion Reactivity in High Poloidal Beta Discharges in TFTR” at the 14th International Conference on Plasma Physics and Controlled Nuclear Fusion, Würzburg, Germany, October, 1992.

Serial Journal Abstracts, and Research Reports:

Over 200 Serial Journal Abstracts, and Research Reports.

Thesis Supervision:

- 2 Undergraduate Thesis Projects (MIT)
- 17 Ph.D. Students Graduated (Columbia)
- 4 Ph.D. Students presently under supervision (Columbia)

Postdoctoral Supervision:

H. Warren, T. Ivers, V. Sankar, D. Garner, A. Hansen, D. Maurer, T. Pederson, M. Shilov, B. Grierson

Courses taught:

Courses include “Introduction to Digital Electronics”, “Electrodynamics”, “Introduction to Computational Physics and Mathematics”, “Applied Physics Laboratory”, “Introduction to Plasma Physics”, “Special Topics in Applied Mathematics”, “Introduction to FORTRAN”, “Programming Methods for Scientists and Engineers”, “Introduction to Nuclear Science”, “Physics of Plasmas”

Short Biography

MICHAEL MAUEL was educated at MIT receiving his B.S. (1978) and his Sc.D. (1983) with a research specialty in plasma physics. While at MIT, he was awarded the Fortesque Fellowship from the IEEE and the Guillemin Prize. Following post-doctoral research at MIT he joined the faculty of Columbia University in 1985 where he is currently Professor of Applied Physics and Chair of the Department of Applied Physics and Applied Mathematics. At Columbia, his research focused on high temperature plasma physics, and he was awarded a Certificate of Appreciation by the U.S. Department of Energy in 1989 for his work in fusion energy. Dr. Mauel collaborated extensively with the TFTR research team at the Princeton Plasma Physics Laboratory where he participated in advanced tokamak experiments and in the world's first high-power D-T fusion experiments. He was a visiting scientist at DIII-D fusion experiment at General Atomics in 1994, investigating high-pressure "wall mode" instabilities and co-discovering techniques to generate internal transport barriers. At Columbia University, he built experimental programs in plasma processing in collaboration with IBM and in laboratory space physics with the support of NASA, NSF, and the AFOSR. He also co-directs the new Levitated Dipole Experiment, a joint research project of Columbia University and MIT that uses high-field superconducting magnets to explore the application of magnetospheric physics to the confinement of high-pressure plasma in the laboratory. In 1994, Mauel was named Teacher of the Year at Columbia's Fu Foundation School of Engineering and Applied Science, and, in 2000, he received the Rose Prize for Excellence in Fusion Engineering from the Fusion Power Association. During the 2006-2007 academic year, Mauel served in the Office of International Energy and Commodity Policy at U.S. Department of State as a Jefferson Science Fellow. Dr. Mauel is a fellow of the APS, and he just recently completed his service as Chair of the APS Division of Plasma Physics. He has served as member and chair of numerous physics and policy advisory committees addressing issues concerning fusion energy science, plasma physics research and education.