

# James F. Drake

## I. Education

Ph.D.                   UCLA (Physics), 1975  
M.S.                    UCLA (Physics), 1972  
B.S.                    UCLA, 1969

## II. Positions Held

2014–present        University of Maryland,  
College Park, MD  
Department of Physics  
and Institute for Physical Science  
and Technology  
Distinguished University Professor

2013–Present        University of Maryland,  
College Park, MD  
Joint Space Institute  
Director

2000–2002         University of Maryland,  
College Park, MD  
Center for Scientific Computation  
and Mathematical Modeling  
Interim Director

1994–1995         Max Planck Institut fur Plasmaphysik  
Garching, Germany  
Humboldt Foundation Research Awardee

1990–2014         University of Maryland,  
College Park, MD  
Department of Physics  
and Institute for Physical Science  
and Technology  
Professor

1987–1990         University of Maryland,  
College Park, MD  
Associate Professor

1985–1987         University of Maryland,  
College Park, MD  
Senior Research Scientist

1979–1985         University of Maryland,  
College Park, MD  
Senior Research Associate

1978–1979         University of Maryland,  
College Park, MD

	Research Associate
1975–1976	UCLA, Adjunct Assistant Professor
1975–1978	UCLA, Assistant Research Physicist
1972–1975	UCLA, Research Assistant
1970–1972	UCLA, Teaching Assistant
1969–1973	UCLA, Chancellor’s Teaching Fellow

### **III. Memberships**

Phi Beta Kappa  
Sigma Xi  
American Physical Society  
American Geophysical Union

### **IV. Honors**

E. Lee Kinsey Award, UCLA, 1969 (most outstanding graduating senior)  
Chancellor’s Teaching Fellowship, UCLA, 1969–1973  
Fellow of the American Physical Society, 1986  
Humboldt Foundation Research Award, 1994  
APS Division of Plasma Physics Distinguished Lecturer, 1999  
Chair, Division of Plasma Physics of the American Physical Society (1999-2000).  
Associate of the National Academies  
Popular Writing Award, Solar Physics Division of the American Astronomical Society, 2010.  
APS James Clerk Maxwell Prize for Plasma Physics, 2010  
Editor’s Citation for Excellence in Refereeing, American Geophysical Union, 2010  
Outstanding Referee for Journals of the American Physical Society, 2011.  
Chair, Topical Group on Plasma Astrophysics of the American Physical Society, (2011-2012)  
Fellow of the American Geophysical Union, 2012  
Distinguished University Professor, University of Maryland, College Park, 2014  
NASA Group Achievement Award for the Magnetospheric Multiscale Satellite Mission, 2016

### **V. Selected Professional Services**

Sherwood Theory Executive Committee (1981–1983, 1986–1988).  
Gordon Research Conference on Plasma Physics (Chair, 1981–1983).  
Executive Committee of the Division of Plasma Physics of the American  
Physical Society (1985–1987, 1993–1996).  
Divisional Associate Editor, Physical Review Letters (1986–1990).  
Executive Committee — University Fusion Association (1992–1998, 2005-2008).  
President, University Fusion Association (1995–1997).  
NASA Review Panel on Space Physics Theory Program (Chair, 1995).  
Sherwood Theory Program Committee (Chair, 1997).  
APS DPP Centenary Committee (Chair, 1996-1999).  
Division of Plasma Physics of the American Physical Society (Chair, 1999-2000).

DPP Fellowship Committee (Chair, 1998).  
Fachbeirat, Max-Planck-Institut für Plasmaphysik, Germany (2001-2007).  
Plasma Science Advanced Computing Initiative Advisory Committee (1999-2008).  
NRC Plasma Science Committee (1999-2001)  
National Academy of Sciences Review Panel on the Fusion Energy Sciences Program  
(Chair of Subcommittee on Scientific Progress and Predictability) (1999-2000)  
NRC Committee on Space and Solar Physics (2000-2004)  
Member of the Theory, Modeling and Data Exploration Panel of the  
NRC Decadal Survey of Space and Solar Physics (2000-2002)  
Associate Editor Geophysical Research Letters (2001-2004)  
MST Advisory Committee (2001-2004).  
Councillor, American Physical Society (2003-2006)  
Executive Board, American Physical Society (2005-2006)  
Associate Editor Physics of Plasmas (2006-2011)  
APS Prizes and Awards Committee (Chair, 2006)  
APS Panel on Public Affairs (member, 2008-2010)  
Chair, Subcommittee on Energy and the Environment  
NRC Board on Physics and Astronomy (2009-2012)  
NRC Decadal Survey on Solar and Space Physics (2010-2012)  
Member of the Steering Committee  
Chair of Theory, Modeling and Data Exploitation Working Group  
APS Topical Group on Plasma Astrophysics (Chair, 2011-2012)  
AGU Union Fellows Committee (2013 - 2015)  
Physical Review Letters Visiting Committee (Chair, 2013)

## **VI. Publications in Refereed Journals**

1. J. F. Drake and Y. C. Lee, Temporally Growing Raman Instabilities in an Inhomogeneous Plasma, *Phys. Rev. Lett.* **31**, 1197 (1973).
2. J. F. Drake, P. K. Kaw, Y. C. Lee, G. Schmidt, C. S. Liu, and M. N. Rosenbluth, Parametric Instabilities of Electromagnetic Waves in Plasmas, *Phys. Fluids* **17**, 778 (1974).
3. J. F. Drake, Y. C. Lee, K. Nishikawa, and N. L. Tsintsadze, Breaking of Large Amplitude Waves as a Result of Relativistic Electron-Mass Variation, *Phys. Rev. Lett.* **36**, 196 (1976).
4. J. F. Drake, Y. C. Lee, and N. L. Tsintsadze, Parametric Instabilities in Strongly Relativistic Plane-Polarized Electromagnetic Waves, *Phys. Rev. Lett.* **36**, 31 (1976).
5. J. F. Drake and Y. C. Lee, Relativistic Effects in Resonance Absorption, *Phys. Fluids* **19**, 1997 (1976).
6. J. F. Drake and Y. C. Lee, Kinetic Theory of Tearing Instabilities, *Phys. Fluids* **20**, 134 (1977).

7. J. F. Drake and Y. C. Lee, Nonlinear Evolution of Collisionless and Semi-collisional Tearing Modes, *Phys. Rev. Lett.* **39**, 453 (1977).
8. J. F. Drake, Y. C. Lee, L. Chen, P. H. Rutherford, P. K. Kaw, J. Y. Hsu, and C. S. Liu, The Internal M=1 Resistive Mode in High-Temperature Plasma, *Nucl. Fusion Lett.* **18**, 11 (1978).
9. J. F. Drake, Kinetic Theory of M=1 Instabilities, *Phys. Fluids* **21**, 1777 (1978).
10. J. H. Irby, J. F. Drake, and H. R. Griem, Observation and Interpretation of Magnetic Field Line Reconnection and Tearing in a Theta Pinch, *Phys. Rev. Lett.* **42**, 228 (1979).
11. D. D'Ippolito, J. F. Drake, and Y. C. Lee, Linear Stability of High-m, Drifting-Tearing Modes, *Phys. Fluids* **23**, 771 (1980).
12. J. D. Huba, J. F. Drake, and N. T. Gladd, The Lower Hybrid Drift Instability in Field Reversed Plasma, *Phys. Fluids* **23**, 552 (1980).
13. P. L. Pritchett, J. F. Drake, and Y. C. Lee, Linear Analysis of the Double Tearing Mode, *Phys. Fluids* **23**, 1368 (1980).
14. Y. C. Lee, J. W. Van-Dam, J. F. Drake, A. T. Lin, P. L. Pritchett, D. A. D'Ippolito, P. D. Liewer, and C. S. Liu, Kinetic Theory of Ballooning Instabilities and Studies of Tearing Instabilities, Plasma Physics and Controlled Nuclear Fusion Research, Int'l. Atomic Energy Agency, Vienna, CN-37-W-5 (1978).
15. J. F. Drake, N. T. Gladd, C. S. Liu, and C. L. Chang, Microtearing Modes and Transport in Tokamaks, *Phys. Rev. Lett.* **44**, 994 (1980).
16. N. T. Gladd, J. F. Drake, C. L. Chang, and C. S. Liu, Electron-Temperature-Gradient-Driven Microtearing Mode, *Phys. Fluids* **23**, 1182 (1980).
17. C. L. Chang, J. F. Drake, N. T. Gladd, and C. S. Liu, Unstable Drift Waves in a Sheared Magnetic Field, *Phys. Fluids* **23**, 1998 (1980).
18. J. F. Drake and T. T. Lee, Irreversibility and Transport in the Lower Hybrid Drift Instability, *Phys. Fluids* **24**, 1115 (1981).
19. K. Molvig, S. P. Hirshman, A. B. Rechester, R. B. White, M. N. Rosenbluth, J. F. Drake, N. T. Gladd, A. B. Hassam, C. S. Liu, and C. L. Chang, Theory of Stochastic Magnetic Fluctuations and Anomalous Electron Thermal Conductivity in Tokamaks, Plasma Physics and Controlled Nuclear Fusion Research, Int'l. Atomic Energy Agency, Vienna, CN-38-C-2 (1980).
20. J. F. Drake, N. T. Gladd, and J. D. Huba, Magnetic Field Diffusion and Dissipation in Reversed Field Plasmas, *Phys. Fluids* **24**, 78 (1981).

21. J. F. Drake and A. B. Hassam, Collisional Drift Waves in a Plasma with Electron Temperature Inhomogeneity, *Phys. Fluids* **24**, 1262 (1981).
22. J. D. Huba, J. F. Drake, and N. T. Gladd, On the Role of the Lower Hybrid Drift Instability in Substorm Dynamics, *J. Geophys. Res.* **86**, 5881 (1981).
23. J. F. Drake and R. J. Kleva, Collisional Shear Alfvén Waves in Sheared Magnetic fields, *Phys. Fluids* **24**, 1499 (1981).
24. J. D. Huba and J. F. Drake, Physical Mechanism of Wave-Particle Resonance in an Inhomogeneous Magnetic Field: Linear Theory, *Phys. Fluids* **24**, 1650 (1981).
25. J. F. Drake, T. M. Antonsen, Jr., A. B. Hassam, and N. T. Gladd, Stabilization of the Tearing Mode in High Temperature Plasma, *Plasma Physics and Controlled Nuclear Fusion Research*, Int'l. Atomic Energy Agency, Vienna, CN-41-P-2 (1982).
26. J. F. Drake and J. D. Huba, Physical Mechanism of Wave-Particle Resonances in an Inhomogeneous Magnetic Field: Nonlinear Theory, to be published in *Phys. Fluids* (1982).
27. A. B. Hassam and J. F. Drake, Rippling Instability, *Phys. Fluids* **26**, 133 (1983).
28. J. D. Huba and J. F. Drake, Physical Mechanism of Wave-Particle Resonances in a Curved Magnetic Field, *Phys. Fluids* **25**, 1207 (1982).
29. J. D. Huba, N. T. Gladd, and J. F. Drake, The Lower Hybrid Drift Instability in Non-Antiparallel Reversed Field Plasmas, *J. Geophys. Res.* **87**, 1697 (1982).
30. J. F. Drake, J. D. Huba, and N. T. Gladd, On the Stabilization of the Lower-Hybrid-Drift Instability in Finite  $\beta$  Plasmas, *Phys. Fluids* **26**, 2247 (1983).
31. J. F. Drake, P. N. Guzdar, and J. D. Huba, Saturation of the Lower-Hybrid-Drift Instability by Mode Coupling, *Phys. Fluids* **26**, 601 (1983).
32. J. F. Drake, T. M. Antonsen, Jr., A. B. Hassam, and N. T. Gladd, Stabilization of the Tearing Mode in High Temperature Plasma, *Phys. Fluids* **26**, 2509 (1983).
33. J. F. Drake, P. N. Guzdar, A. B. Hassam, and J. D. Huba, Saturation of the Lower-Hybrid-Drift Instability by Mode Coupling, *Phys. Fluids* **27**, 1148 (1983).
34. J. F. Drake and T. M. Antonsen, Jr., Nonlinear Reduced Fluid Equations for Toroidal Plasmas, *Phys. Fluids* **27**, 898 (1984).
35. R. G. Kleva, J. F. Drake, and A. Bondeson, Coherent Destabilization of Tearing Modes, *Phys. Fluids* **27**, 769 (1984).

36. J. F. Drake, Reconnection in Sheared Magnetic Fields in Space and Astrophysics, in Unstable Current Systems and Plasma Instabilities in Astrophysics, M. Kundu (ed.) (D. Reidel Pub. Co., Dordrecht, Holland, 1984), p. 61.
37. J. F. Drake, Magnetic Reconnection and Anomalous Transport Processes in Magnetic Reconnection in the Magnetosphere, E. W. Hones, Jr. (ed.) (D. Reidel Pub. Co., Dordrecht, Holland, 1984), p. 61.
38. R. G. Kleva and J. F. Drake, Stochastic  $\mathbf{E} \times \mathbf{B}$  Particle Transport, *Phys. Fluids* **27**, 1686 (1984).
39. B. D. Scott, A. B. Hassam and J. F. Drake, Nonlinear Evolution of Drift-Tearing Modes, *Phys. Fluids* **28**, 275 (1984).
40. J. F. Drake and R. G. Kleva, Are Major Disruptions in Tokamaks Caused by Vacuum Bubbles?, *Phys. Rev. Lett.* **53**, 1465 (1984).
41. T. M. Antonsen, J. F. Drake, J. M. Finn, A. B. Hassam, R. G. Kleva, and B. D. Scott, Studies of Major Disruptions and Tearing and Ballooning Modes, in Plasma Physics and Controlled Nuclear Fusion Research, Int'l. Atomic Energy Agency, Vienna, CN-44/E-II-3 (1984).
42. J. F. Drake and T. M. Antonsen, Jr., Analytic Theory of Resistive Ballooning Modes, *Phys. Fluids* **28**, 544 (1985).
43. J. M. Finn and J. F. Drake, Magnetic Curvature Drift Instability, *Phys. Rev. Lett.* **53**, 2308 (1984).
44. R. G. Kleva, J. F. Drake, and A. Bondeson, Nonlinear Destabilization of Tearing Modes: The Effect of Mass Flows, *Phys. Fluids* **28**, 2478 (1985).
45. J. L. Sperling, J. F. Drake, S. T. Zalesak, and J. D. Huba, The Role of Finite Parallel Length on the Stability of Barium Clouds, *J. Geophys. Res.* **89**, 10913 (1984).
46. B. D. Scott, J. F. Drake, and A. B. Hassam, Nonlinear Stability of Drift-Tearing Modes, *Phys. Rev. Lett.* **54**, 1027 (1985).
47. J. F. Drake, J. D. Huba, and S. T. Zalesak, Finite Temperature Stabilization of the Gradient Drift Instability in Barium Clouds, *J. Geophys. Res.* **90**, 5227 (1985).
48. J. K. Lee, M. S. Chu, C. S. Liu, and J. F. Drake, Half-Coalescence Ideal MHD Instability of the  $q=1$  Magnetic Island in Tokamaks, *Phys. Fluids Lett.* **28**, 1585 (1985).
49. R. G. Kleva, J. F. Drake, and D. A. Boyd,  $q=2$  Sawteeth and Major Disruptions in Tokamaks, *Phys. Fluids* **29**, 475 (1986).

50. J. F. Drake and J. D. Huba, Convective Stabilization of Ionospheric Plasma Clouds, *J. Geophys. Res.* **91**, 10, 108 (1986).
51. J. M. Finn and J. F. Drake, Magnetic Curvature Drift Instability, *Phys. Fluids* **29**, 3672 (1986).
52. R. E. Denton, J. F. Drake, R. G. Kleva, and D. A. Boyd, Skin Currents and Sawteeth in Tokamaks, *Phys. Rev. Lett.* **56**, 2477 (1986).
53. J. F. Drake and J. D. Huba, Dynamics of Three-Dimensional Ionospheric Plasma Clouds, *Phys. Rev. Lett.* **58**, 278 (1987).
54. R. E. Denton, J. F. Drake, and R. G. Kleva, Sawteeth and Convection Cells in Tokamaks, *Phys. Fluids* **30**, 1448 (1987).
55. R. G. Kleva, J. F. Drake, and R. E. Denton, The Fast Crash of Sawteeth in Tokamaks, *Phys. Fluids* **30**, 2119 (1987).
56. D. A. Boyd, R. E. Denton, J. Q. Dong, J. F. Drake, P. N. Guzdar, A. B. Hassam, R. G. Kleva, Y. C. Lee, C. S. Liu, and F. J. Stauffer, Sawteeth and Temperature Profiles in Tokamaks, in Plasma Physics and Controlled Nuclear Fusion Research, Int'l. Atomic Energy Agency, Vienna, CN-47/A-VI-4 (1986).
57. J. F. Drake, Marfes: Thermal Condensation in Tokamak Edge Plasmas, *Phys. Fluids* **30**, 2429 (1987).
58. J. F. Drake, L. Sparks, and G. Van Hoven, Radiative Instabilities in a Sheared Magnetic Field, *Phys. Fluids* **31**, 813-822 (1988).
59. R. G. Kleva, J. F. Drake, and R. E. Denton, Density Limit Disruptions in Tokamaks, *Comments on Plasma Physics and Controlled Fusion* **13**, 63-75 (1989).
60. J. F. Drake, M. Mul Brandon, and J. D. Huba, Three-Dimensional Equilibrium and Stability of Ionospheric Plasma Clouds, *Phys. Fluids* **31**, 3412-3424 (1988).
61. J. F. Drake, P. N. Guzdar, and A. B. Hassam, Streamer Formation in Plasma with a Temperature Gradient, *Phys. Rev. Lett.* **61**, 2205-2208 (1988).
62. S. T. Zalesak, J. F. Drake, and J. D. Huba, Dynamics of 3-D Ionospheric Plasma Clouds, *Radio Science* **23**, 591-598 (1988).
63. R. E. Denton, J. F. Drake, and R. G. Kleva, Disruptive Phenomena in Tokamak Plasma, in Plasma Physics and Controlled Nuclear Fusion Research, Int'l. Atomic Energy Agency, Vienna, (1988) pp. 131-144.
64. T. M. Antonsen, A. M. Dimits, J. Q. Dong, J. F. Drake, P. N. Guzdar, A. B. Hassam, and C. S. Liu, Temperature Gradient Modes, Streamers and Anomalous Transport, in Plasma Physics and Controlled Nuclear Fusion Research, Int'l. Atomic Energy Agency, Vienna, CN-50/D-4-7.

65. R. G. Kleva and J. F. Drake, Density Limit Disruptions in Tokamaks, *Phys. Fluids B* **3**, 372 (1991).
66. A. B. Hassam, T. M. Antonsen, J. F. Drake, and P. N. Guzdar, Theory of Ion Temperature Gradient Instabilities: Thresholds and Transport, *Phys. Fluids B* **2**, 1822 (1990).
67. G. Burkhart, J. F. Drake, and J. Chen, Magnetic Reconnection in Collisionless Plasma: Prescribed Fields, *J. Geophys. Res.* **95**, 18, 833 (1990).
68. Y. Mok, J. F. Drake, D. D. Schnack, and G. Van Hoven, Prominence Formation in a Coronal Loop, *ApJ* **359**, 228 (1990).
69. A. M. Dimits, J. F. Drake, A. B. Hassam, and B. Meerson, Formation of Streamers in Plasma with an Ion Temperature Gradient, *Phys. Fluids B* **2**, 2591 (1990).
70. D. McCarthy and J. F. Drake, Nonlinear Behavior of the Radiative Condensation Instability, *Phys. Fluids B* **3**, 22 (1991).
71. A. B. Hassam, J. F. Drake, T. M. Antonsen, and C. S. Liu, Spontaneous Poloidal Spin-Up of Tokamaks and the Transition to H-Mode, *Phys. Rev. Lett.* **66**, 309 (1991).
72. J. F. Drake and R. G. Kleva, Collisionless Reconnection and the Sawteeth Crash, *Phys. Rev. Lett.* **66**, 1458 (1991).
73. S. T. Zalesak, J. F. Drake, and J. D. Huba, Three-Dimensional Simulation Study of Ionospheric Plasma Clouds, *Geophys. Res. Lett.* **17**, 1597 (1990).
74. J. S. Kim, G. Van Hoven, D. D. Schnack, and J. F. Drake, Magnetic Energy Release from a Zero-Net-Current Layer, *J. Plasma Phys.* **45**, 71 (1991).
75. P. N. Guzdar, J. F. Drake, A. M. Dimits, and A. B. Hassam, Transport Barrier in Ion Temperature Gradient Driven Turbulence, *Phys. Fluids B* **3**, 1381 (1991).
76. J. F. Drake, P. N. Guzdar, and A. M. Dimits, 3-D Simulation of  $\nabla T_i$  Driven Turbulence and Transport, *Phys. Fluids B* **3**, 1937 (1991).
77. G. Burkhart, J. F. Drake, and J. Chen, Structure of the Dissipation Region during Magnetic Reconnection in Collisionless Plasma, *J. Geophys. Res.* **96**, 11539 (1991).
78. A. M. Dimits, J. F. Drake, P. N. Guzdar, and A. B. Hassam, Ion-Temperature-Gradient-Driven Turbulence and Transport in a Sheared Magnetic Field, *Phys. Fluids B* **3**, 620 (1991).
79. A. B. Hassam, T. M. Antonsen, A. M. Dimits, J. F. Drake, P. N. Guzdar, Y. T. Lau, and C. S. Liu, Spontaneous Poloidal Spin-Up of Tokamaks and the Transition to H-Mode, in *Plasma Physics and Controlled Nuclear Fusion Research*, Int'l Atomic Energy Agency, Vienna, CN-53/D IV-11.



80. J. F. Drake, J. M. Finn, P. Guzdar, V. Shapiro, V. Shevchenko, F. Waelbroeck, A. B. Hassam, C. S. Liu and R. Sagdeev, Peeling of Convection Cells and the Generation of Sheared Flow, *Phys. Fluids B Lett.* **4**, 488 (1992).
81. J. F. Drake, A. B. Hassam, P. N. Guzdar and C. S. Liu, Loss of Static Equilibrium, Flow Generation and the Development of Turbulence at the Edge of Tokamaks, *Nucl. Fusion Lett.* **32**, 1657 (1992).
82. E. D. Frederickson, K. McGuire, J. F. Drake, R. G. Kleva and the TFTR MHD Group, Phenomenology of High Density Disruptions in the TFTR Tokamak, *Nucl. Fusion Lett.* **33**, 141 (1993).
83. J. F. Drake and G. R. Burkhart, Magnetic Blowout during Collisionless Reconnection, *Geophys. Res. Lett.* **19**, 1077 (1992).
84. R. G. Kleva and J. F. Drake, Enhanced Damping of Alfvén Waves in the Solar Corona by a Turbulent Wave Spectrum, *Astrophys. J.* **395**, 697 (1992).
85. G. Van Hoven, Y. Mok and J. F. Drake, Prominence Condensation and Magnetic Levitation in a Coronal Loop, *Solar Phys.* **140**, 269 (1992).
86. G. R. Burkhart, J. F. Drake, A. B. Dusenbery and T. W. Speiser, A particle model for magnetotail neutral sheet equilibria, *J. Geophys. Res.* **97**, 13799, (1992).
87. D. McCarthy, P. Guzdar, J. Drake, T. Antonsen and A. B. Hassam, Stability of Resistive and Ideal Ballooning Modes in TEXT and DIII-D, *Phys. Fluids B* **8**, 1846 (1992).
88. J. M. Finn, J. F. Drake and P. N. Guzdar, Instability of Fluid Vortices and Generation of Sheared Flow, *Phys. Fluids B* **4**, 2758 (1992).
89. J. F. Drake, T. M. Antonsen, J. M. Finn, P. N. Guzdar, A. B. Hassam, C. S. Liu, D. McCarthy and F. W. Waelbroeck, Tokamak Edge Transport, the L-H Transition and Generation of Velocity Shear Layers, in Plasma Physics and Controlled Nucl. Fusion Res., IAEA, Vienna, CN-56/D-2-5.
90. A. Janos, E. Fredrickson, K. McGuire, J. F. Drake, R. G. Kleva, H. H. Fleischmann and the TFTR group, Disruptions in the TFTR Tokamak, in Plasma Physics and Controlled Nucl. Fusion Res., IAEA, Vienna, CN-56/A-3-15.
91. J. F. Drake, J. M. Finn, P. N. Guzdar, V. Shapiro, V. Shevchenko, F. Waelbroeck, A. B. Hassam, C. S. Liu and R. Sagdeev, Reply to “Comment on ‘Peeling of Convection Cells and the Generation of Sheared Flow’ ”, *Phys. Fluids B* **5**, 658 (1993).
92. J. F. Drake, Y. Mok and G. Van Hoven, Formation Levitation and Stability of Prominences in the Magnetized Solar Atmosphere, *ApJ* **413**, 416 (1993).

93. D. R. McCarthy, J. F. Drake, P. N. Guzdar and A. B. Hassam, Formation of the Shear Layer in Toroidal Edge Plasma, *Phys. Fluids B* **5**, 1188 (1993).
94. P. N. Guzdar, J. F. Drake, D. McCarthy, A. B. Hassam and C. S. Liu, 3-D Fluid Simulations of Nonlinear Drift-Resistive Ballooning Modes in Tokamak Edge Plasma, *Phys. Fluids B* **5**, 3712 (1993).
95. R. G. Kleva, J. F. Drake and F. L. Waelbroeck, Fast Reconnection in High Temperature Plasma, *Phys. Plasmas* **2**, 23 (1995).
96. A. B. Hassam and J. F. Drake, Spontaneous Poloidal Spin-up of Tokamak Plasmas: Reduced Equations, Physical Mechanism and Sonic Regimes, *Phys. Fluids B* **5**, 4022 (1993).
97. D. R. McCarthy, J. F. Drake and P. N. Guzdar, Axi-symmetric Parallel Velocity Shear Instability in the Tokamak Edge Plasma, *Phys. Fluids B* **5**, 2145 (1993).
98. M. E. Mandt, R. E. Denton and J. F. Drake, Transition to Whistler Mediated Magnetic Reconnection, *Geophys. Res. Lett.* **21**, 73 (1994).
99. J. F. Drake, J. Gerber and R. G. Kleva, Turbulence and Transport in the Magnetopause Current Layer, *J. Geophys. Res.* **99**, 11211 (1994).
100. D. Biskamp and J. F. Drake, Dynamics of the Sawtooth Collapse in Tokamak Plasmas, *Phys. Rev. Lett.* **73**, 971 (1994).
101. J. F. Drake, R. G. Kleva, and M. E. Mandt, Structure of Thin Current Layers: Implications for Magnetic Reconnection, *Phys. Rev. Lett.* **73**, 1251 (1994).
102. J. F. Drake, Magnetic Reconnection: A Kinetic Treatment, in Physics of the Magnetopause, B. Sonnerup, M. Thomsen, and P. Song, eds. (AGU Monograph, AGU, Wash. DC, 1995).
103. J. F. Drake, P. N. Guzdar, S. Novakovskii, C. S. Liu, A. Zeiler, and D. Biskamp, The L-H Trigger: A Transition from Resistive Ballooning to Toroidal Drift Wave Transport, in Plasma Physics and Controlled Nucl. Fusion Res., IAEA, Vienna, 1995.
104. D. Biskamp and J. F. Drake, Dynamics of the Sawtooth Collapse in Tokamak Plasmas, in Plasma Physics and Controlled Nucl. Fusion Res., IAEA, Vienna, 1995.
105. Y. T. Lau, J. F. Drake, P. N. Guzdar, and A. B. Hassam, Disintegration of Ion Banana Orbits in Tokamak Edge Plasmas, *Nucl. Fusion Lett.* **35**, 605 (1995).
106. J. F. Drake, A. Zeiler, and D. Biskamp, Nonlinear Self-Sustained Drift-Wave Turbulence, *Phys. Rev. Lett.* **75**, 4222 (1995).

107. S. V. Novakovskii, P. N. Guzdar, J. F. Drake, and C. S. Liu, New Unstable Branch of Drift-Resistive Ballooning Modes in Tokamaks, *Phys. Plasmas* **2**, 781 (1995).
108. S. V. Novakovskii, P. N. Guzdar, J. F. Drake, and C. S. Liu, Resistive Ballooning Modes in the Scrape-off Layer of Tokamak Plasmas, *Phys. Plasmas* **2**, 3764 (1995).
109. D. Biskamp, E. Schwartz, and J. F. Drake, Ion Controlled Collisionless Reconnection, *Phys. Rev. Lett.* **75**, 3850 (1995).
110. D. Biskamp, E. Schwartz, and J. F. Drake, Two-dimensional Electron Magnetohydrodynamic Turbulence, *Phys. Rev. Lett.* **76**, 1264 (1996).
111. T. M. Antonsen, J. F. Drake, P. N. Guzdar, A. B. Hassam, Y. T. Lau, C. S. Liu, and S. V. Novakovskii, Physical Mechanism of Enhanced Stability from Negative Shear in Tokamaks: Implications for Edge Transport and the L-H Transition, *Phys. Plasmas Lett.* **3**, 2221 (1996).
112. Z. Zhu, P. Song, J. F. Drake, C. T. Russell, R. R. Anderson, D. A. Gurnett, K. W. Ogilvie, and R. J. Fizev, The Relationship Between ELF-VLF Waves and Magnetic Shear at the Dayside Magnetopause, *Geophys. Res. Lett.* **23**, 773 (1996).
113. A. Zeiler, D. Biskamp, J. F. Drake, and P. N. Guzdar, 3-D Fluid Simulations of Tokamak Edge Turbulence, *Phys. Plasmas* **3**, 2951 (1996).
114. A. Zeiler, D. Biskamp, and J. F. Drake, 3-D Collisional Drift-Wave Turbulence, Role of Magnetic Shear, *Phys. Plasmas* **3**, 3947 (1996).
115. J. F. Drake, Y. T. Lau, P. N. Guzdar, A. B. Hassam, S. V. Novakovskii, B. Rogers, and A. Zeiler, Local Negative Shear and the Formation of Transport Barriers, *Phys. Rev. Lett.* **77**, 494 (1996).
116. A. Zeiler, J. F. Drake, and D. Biskamp, Electron Temperature Fluctuations in Drift-Resistive Ballooning Turbulence, *Phys. Plasmas* **4**, 991 (1997).
117. A. Zeiler, J. F. Drake, and B. Rogers, Nonlinear Reduced Braginskii Equations with Ion Thermal Dynamics in Toroidal Plasma, *Phys. Plasmas* **4**, 2134 (1997).
118. A. Zeiler, D. Biskamp, J. F. Drake, and B. Rogers, 3-D Plasma Edge Turbulence Including Electron and Ion Temperature Fluctuations, in Plasma Physics and Controlled Nucl. Fusion Res., IAEA, Vienna, 1997.
119. B. N. Rogers, J. F. Drake, Y. T. Lau, P. N. Guzdar, A. B. Hassam, S. V. Novakovskii, and A. Zeiler, Turbulence and the Formation of Transport Barriers in Finite  $\beta$  Plasma, in Plasma Physics and Controlled Nucl. Fusion Res., IAEA, Vienna, 1997.

120. B. N. Rogers and J. F. Drake, Enhancement of Turbulence in Tokamaks by Magnetic Fluctuations, *Phys. Rev. Lett.* **79**, 229 (1997).
121. D. Biskamp, E. Schwarz, and J. F. Drake, Two-fluid theory of collisionless magnetic reconnection, *Phys. Plasmas* **4**, 1002 (1997).
122. J. F. Drake, D. Biskamp, and A. Zeiler, Breakup of the electron current layer during 3-D collisionless magnetic reconnection, *Geophys. Res. Lett.* **24**, 2921 (1997).
123. A. E. Hubbard, R. L. Boivin, J. F. Drake, M. Greenwald, Y. In, J. H. Irby, B. N. Rogers and J. A. Snipes, Local Variables Affecting the H-mode Threshold on Alcator C-Mod, *Plasma Phys. Control. Fusion* **40**, 689 (1998).
124. A. Zeiler, D. Biskamp, J. F. Drake and B. N. Rogers, Transition from resistive ballooning to  $\eta_i$  driven turbulence in tokamaks, *Phys. Plasmas* **5**, 2654 (1998).
125. M. A. Shay, J. F. Drake, R. E. Denton, and D. Biskamp, Structure of the dissipation region during collisionless magnetic reconnection, *J. Geophys. Res.* **103**, 9165 (1998).
126. M. A. Shay and J. F. Drake, The role of electron dissipation on the rate of collisionless magnetic reconnection, *Geophys. Res. Lett.* **25**, 3759 (1998).
127. B. N. Rogers, J. F. Drake and A. Zeiler, Phase Space of Tokamak Edge Turbulence, the L-H Transition, and the Formation of the Edge Pedestal, *Phys. Rev. Lett.* **81**, 4396 (1998).
128. A. Zeiler, J. F. Drake, and B. N. Rogers, Electromagnetic  $\eta_i$  Mode turbulence at the plasma edge, in Plasma Physics and Controlled Nucl. Fusion Res., IAEA, Vienna, 1998.
129. B. N. Rogers, J. F. Drake and A. Zeiler, The Phase Space of Tokamak Edge Turbulence, the L-H Transition and the Structure of the Edge Pedestal, in Plasma Physics and Controlled Nucl. Fusion Res., IAEA, Vienna, 1998.
130. B. N. Rogers and J. F. Drake, Diamagnetic Stabilization of Ideal Ballooning Modes in the Edge Pedestal, *Phys. Plasmas* **6**, 2797 (1999).
131. G. Vetoulis and J. F. Drake, Whistler turbulence at the magnetopause I: Reduced equations and linear theory, *J. Geophys. Res.* **104**, 6919 (1999).
132. D. Biskamp, E. Schwarz, A. Zeiler, A. Celani and J. F. Drake, Electron magnetohydrodynamic turbulence, *Phys. Plasmas* **6**, 751 (1999).
133. M. A. Shay, J. F. Drake, B. N. Rogers and R. E. Denton, The scaling of collisionless magnetic reconnection for large systems, *Geophys. Res. Lett.* **26**, 2163 (1999).

134. A. Zeiler, J. F. Drake, and B. N. Rogers, Magnetic reconnection in toroidal  $\eta_i$  mode turbulence, *Phys. Rev. Lett.* **84**, 99 (2000).
135. B. N. Rogers, J. F. Drake and M. A. Shay, The onset of turbulence in 3-D collisionless magnetic reconnection , *Geophys. Res. Lett.* **27**, 3157 (2000).
136. A. B. Hassam, J. F. Drake, Deepak Goel and D. P. Lathrop, Liquid metal flow encasing a magnetic cavity, *Phys. Plasmas* **7**, 1081 (2000).
137. J. Birn, J. F. Drake, M. A. Shay, B. N. Rogers, R. E. Denton, M. Hesse, M. Kuznetsova, A. W. Ma, A. Bhatttcharjee, A. Otto, and P. L. Pritchett, GEM Magnetic Reconnection Challenge, *J. Geophys. Res.* **106**, 3715, 2001.
138. M. A. Shay, J. F. Drake, B. N. Rogers and R. E. Denton, Alfvénic collisionless magnetic reconnection and the Hall term, *J. Geophys. Res.* **106**, 3751, 2001.
139. B. N. Rogers, R. E. Denton, J. F. Drake and M. A. Shay, The role of Dispersive waves in collisionless magnetic reconnection, *Phys. Rev. Lett.* **87**, 195004, 2001.
140. James F. Drake, Magnetic Explosions in Space, *Nature* **410**, 525, 2001 (Feature News and Views Article solicited by Nature).
141. A. Zeiler, D. Biskamp, J. F. Drake, B. N. Rogers, M. A. Shay, and M. Scholer, Three-dimensional particle simulations of collisionless magnetic reconnection, *J. Geophys. Res.* **107**, 1230, 2002.
142. J. F. Drake, M. Swisdak, C. Cattell, M. A. Shay, B. N. Rogers and A. Zeiler, Formation of electron holes and particle energization during magnetic reconnection, *Science* **299**, 873, 2003.
143. B. N. Rogers, R. E. Denton and J. F. Drake, Signatures of Collisionless Magnetic Reconnection, *J. Geophys. Res.* **108**, 1111, 2003.
144. M. A. Shay, J. F. Drake, M. Swisdak, W. Dorland and B. N. Rogers, Inherently three-dimensional magnetic reconnection: a mechanism for bursty bulk flows?, *Geophys. Res. Lett.* **30**, 1345, 2003.
145. M. Swisdak, B. N. Rogers, J. F. Drake and M. A. Shay, Diamagnetic Suppression of Component Reconnection at the Magnetopause, *J. Geophys. Res.* **108**, 1218, 2003.
146. B. Jemella, M. A. Shay, J. F. Drake and B. N. Rogers, Impact of frustrated singularities on magnetic island growth, *Phys. Rev. Lett.* **91**, 125002, 2003.
147. M. A. Shay, J. F. Drake, M. Swisdak and B. N. Rogers, The scaling of embedded collisionless reconnection, *Phys. Plasmas* **11**, 2199, 2004.
148. B. D. Jemella, J. F. Drake and M. A. Shay, Singular structure of magnetic islands resulting from reconnection, *Phys. Plasmas* **11**, 5668, 2004.

149. G. Gutierrez, O. Pozo, L. I. Reyes, R. Paredes, J. F. Drake and E. Ott, Simple Model for Reverse Buoyancy in a Vibrated Granular System, *Europhys. Lett.* **67**, 369, 2004.
150. M. Sitnov, M. Swisdak, J. F. Drake, P. N. Guzdar and B. N. Rogers, A model of the bifurcated current sheet 2: flapping motions, *Geophys. Res. Lett.* **31**, L09805, 2004.
151. C. Cattell, J. Dombek, J. Wygant, J. F. Drake, M. Swisdak, M. L. Goldstein, W. Keith, A. Fazakerley, M. Andre, E. Lucek, and A. Balogh, Cluster observations of electron holes in association with magnetotail reconnection and comparison to simulations, *J. Geophys. Res.* **110**, A01211, 2005.
152. J. F. Drake, M. Swisdak, W. Thongthai and M. A. Shay, Production of energetic electrons during magnetic reconnection, *Phys. Rev. Lett.* **94**, 095001, 2005.
153. M. Swisdak, J. F. Drake, J. G. McIlhargey, and M. A. Shay, The transition from anti-parallel to component magnetic reconnection, *J. Geophys. Res.* **110**, A05210, 2005.
154. P. Cassak, M. A. Shay and J. F. Drake, A catastrophe model for the onset of fast magnetic reconnection, *Phys. Rev. Lett.* **95**, 235002, 2005 (A Physical Review Focus article was written on this paper).
155. J. F. Drake and M. A. Shay, The fundamentals of collisionless reconnection, in Reconnection of Magnetic Fields: Magnetohydrodynamics and Collisionless Theory and Observations, J. Birn and E. R. Priest, editors, Cambridge University Press (Cambridge, UK), 2006 (book chapter).
156. J. F. Drake, H. Che, M. A. Shay and M. Swisdak, Electron acceleration from contracting magnetic islands during reconnection, *Nature* **443**, 553, 2006.
157. J. F. Drake, M. Swisdak, K. M. Schoeffler, B. N. Rogers and S. Kobayashi, Formation of secondary islands during magnetic reconnection, *Geophys. Res. Lett.* **33**, L13105, 2006.
158. P. Cassak, J. F. Drake and M. A. Shay, On the Onset of fast magnetic reconnection, *Astrophys. J. Lett.* **644**, L145, 2006.
159. M. A. Shay, J. F. Drake, and W. Dorland, Equation free projective integration: A multiscale method applied to a plasma ion acoustic wave, *J. Comp. Phys.* **226**, 571, 2007.
160. P. Cassak, J. F. Drake and M. A. Shay, Catastrophic onset of fast magnetic reconnection with a guide field, *Phys. Plasmas* **14**, 054502, 2007.
161. P. Cassak, J. F. Drake, M. A. Shay and B. Eckhardt, Onset of fast magnetic reconnection, *Phys. Rev. Lett.* **98**, 215001, 2007.

162. M. Swisdak and J. F. Drake, Orientation of the reconnection X-line, *Geophys. Res. Lett.* **34**, L11106, 2007.
163. M. A. Shay, J. F. Drake and M. Swisdak, Two-scale structure of the electron dissipation region during collisionless reconnection, *Phys. Rev. Lett.* **99**, 155002, 2007.
164. B. N. Rogers, S. Kobayashi, P. Ricci, W. Dorland, J. F. Drake and T. Tatsuno, Gyrokinetic simulations of collisionless magnetic reconnection, *Phys. Plasmas* **14**, 092110, 2007.
165. A. V. Divin, M. I. Sitnov, M. Swisdak and J. F. Drake, Reconnection onset in the magnetotail: particle simulations with open boundary conditions, *Geophys. Res. Lett.* **34**, L09109, 2007.
166. M. Swisdak and J. F. Drake, Orientation of the reconnection X-line, *Geophys. Res. Lett.* **34**, L11106, 2007.
167. J. P. Eastwood, D. A. Brain, J. S. Halekas, J. F. Drake, T. D. Phan, M. Øieroset, D. L. Mitchell, R. P. Lin and M. Acuna, Evidence for collisionless magnetic reconnection at Mars, *Geophys. Res. Lett.* **35**, L02106, 2007.
168. T. D. Phan, J. F. Drake, M. A. Shay, F. S. Mozer and J. P. Eastwood, Evidence for an elongated ( $\approx 60$  ion skin depths) electron diffusion region during fast magnetic reconnection, *Phys. Rev. Lett.* **99**, 255002, 2007.
169. M. Øieroset, T. D. Phan, C. H. Fiarfield, J. Raeder, J. T. Gosling, J. F. Drake and R. P. Lin, The existence and properties of the distant magnetotail during hours of strongly northward interplanetary magnetic field, *J. Geophys. Res.* **113**, A04206, 2008.
170. M. Swisdak, J. F. Drake and M. A. Shay, Development of a Turbulent Outflow during Electron-Positron Magnetic Reconnection, *Astrophys. J.* **680**, 999, 2008.
171. J. F. Drake, M. A. Shay and M. Swisdak, The Hall fields and fast magnetic reconnection, *Phys. Plasmas* **15**, 042306, 2008.
172. J. Egedal, W. Fox, N. Katz, M. Porkolab, M. Øieroset, R. P. Lin, W. Daughton and J. F. Drake, Evidence and theory for trapped electrons in guide field magnetotail reconnection, *J. Geophys. Res.* **113**, A12207, 2008.
173. K. Malakit, P. A. Cassak, M. A. Shay and J. F. Drake, The Hall effect in magnetic reconnection: Hybrid vs. Hall-less hybrid simulations, *Geophys. Res. Lett.* **36**, L07107, 2009.
174. Yi-Hsin Liu, M. Swisdak and J. F. Drake, The Weibel Instability inside the Electron Positron Harris Sheet, *Phys. Plasmas* **16**, 042101, 2009.

175. J. F. Drake, M. Swisdak, T. D. Phan, P. A. Cassak, M. A. Shay, S. T. Lepri, R. P. Lin, E. Quataert, and T. H. Zurbuchen, Ion heating resulting from pickup in magnetic reconnection exhausts, *J. Geophys. Res.* **114**, A05111, 2009.
176. H. Che, J. F. Drake, M. Swisdak and P. H. Yoon, Nonlinear development of streaming instabilities in strongly magnetized plasma, *Phys. Rev. Lett.* **102**, 145004, 2009.
177. J. L. Burch and J. F. Drake, Reconnecting Magnetic Fields, *American Scientist* **97**, 392, 2009.
178. J. Egedal, W. Daughton, J. F. Drake, N. Katz and A. Le, Formation of a localized acceleration potential during magnetic reconnection with a guide field, *Phys. Plasmas* **16**, 050701, 2009.
179. J. F. Drake, P. A. Cassak, M. A. Shay, M. Swisdak and E. Quataert, A magnetic reconnection mechanism for ion acceleration and abundance enhancements in impulsive flares, *ApJ* **700**, L16, 2009.
180. R. L. Fermo, J. F. Drake and M. Swisdak, A statistical model of magnetic islands in a current layer, *Phys. Plasmas Lett.* **17**, 010702, 2010.
181. P. A. Cassak, M. A. Shay and J. F. Drake, Scaling of Sweet-Parker reconnection with secondary islands, *Phys. Plasmas Lett.* **16**, 120702, 2009.
182. P. A. Cassak and J. F. Drake, The impact of microscopic magnetic reconnection on pre-flare energy storage, *ApJ* **707**, L158, 2009.
183. J. F. Drake, M. Opher, M. Swisdak and J. N. Chamoun, A reconnection mechanism for the generation of anomalous cosmic rays, *ApJ* **709**, 963, 2010.
184. M. Swisdak, M. Opher, J. F. Drake and F. Alouani Bibi, The vector direction of the interstellar magnetic field outside the heliosphere, *ApJ* **710**, 1769, 2010.
185. A. Le, J. Egedal, W. Daughton, J. F. Drake, W. Fox, and N. Katz, Magnitude of the Hall fields during magnetic reconnection, *Geophys. Res. Lett.* **37**, L03106, 2010.
186. H. Che, J. F. Drake, M. Swisdak and P. H. Yoon, Electron holes and heating in the electron dissipation region, *Geophys. Res. Lett.* **37**, L11105, 2010.
187. P. A. Cassak, J. F. Drake and M. A. Shay, A saddle-node bifurcation model of magnetic reconnection onset, *Phys. Plasmas* **17**, 062105, 2010.
188. R. Schreier, M. Swisdak, J. F. Drake and P. A. Cassak, Three-dimensional simulations of the orientation and structure of reconnection X-lines, *Phys. Plasmas* **17**, 110704, 2010.



189. T. D. Phan, J. T. Gosling, F. Paschmann, C. Pasma, J. F. Drake, M. Oieroset, D. Larson, R. P. Lin and M. S. Davis, The dependence of magnetic reconnection on plasma  $\beta$  and magnetic shear: evidence from solar wind observations, *ApJ* **719**, L199, 2010.
190. H. Che, J. F. Drake, M. Swisdak, A current filamentation method for breaking magnetic field lines during reconnection, *Nature* **474**, 184, 2011.
191. M. Opher, J. F. Drake, M. Swisdak, K. M. Schoeffler, J. D. Richardson, R. B. Decker and G. Toth, Is the magnetic field in the heliosheath laminar or a turbulent sea of bubbles? *ApJ* **734**, 71, 2011.
192. M. A. Shay, J. F. Drake, J. P. Eastwood, and T. D. Phan, Super-Alfvénic propagation of reconnection signatures and Poynting flux during substorms, *Phys. Rev. Lett.* **107**, 065001, 2011.
193. Yi-Hsin Liu, J. F. Drake and M. Swisdak, The effects of strong temperature anisotropy on the kinetic structure of slow shocks and reconnection exhausts - Part I: PIC simulations, *Phys. Plasmas* **18**, 062110, 2011.
194. Yi-Hsin Liu, J. F. Drake and M. Swisdak, The effects of strong temperature anisotropy on the kinetic structure of slow shocks and reconnection exhausts - Part II: Theory, *Phys. Plasmas* **18**, 092102, 2011.
195. R. L. Fermo, J. F. Drake and M. Swisdak and K. J. Hwang, Comparison of a statistical model for magnetic islands in large current layers with Hall MHD simulations and Cluster FTE observations, *J. Geophys. Res.* **116**, A09226, 2011.
196. F. S. Mozer, M. Wilber and J. F. Drake, Wave associated anomalous drag during magnetic field reconnection, *Phys. Plasmas* **18**, 102902, 2011.
197. K. Knizhnik, M. Swisdak and J. F. Drake, The acceleration of ions in solar flares during magnetic reconnection, *ApJ Lett.* **743**, L35, 2011.
198. Yi-Hsin Liu, J. F. Drake and M. Swisdak, The structure of the magnetic reconnection exhaust boundary, *Phys. Plasmas* **19**, 022110, 2012.
199. K. M. Schoeffler, J. F. Drake and M. Swisdak, The effects of plasma beta and anisotropy instabilities on the dynamics of reconnecting magnetic fields in the heliosheath, *ApJ* **743**, 70, 2011.
200. K. M. Schoeffler, J. F. Drake and M. Swisdak, Scaling of the growth rate of magnetic islands in the heliosheath, *ApJ* **750**, L30, 2012.
201. T. C. Li, J. F. Drake and M. Swisdak, Suppression of energetic electron transport in flares by double layers, *ApJ* **757**, 20, 2012.
202. J. F. Drake and M. Swisdak, Ion heating and acceleration during magnetic reconnection relevant to the corona, *Space Science Reviews* **172**, 277, 2012.

203. R. L. Fermo, J. F. Drake and M. Swisdak, Secondary magnetic islands generated by the Kelvin-Helmholtz instability in a reconnecting current sheet, *Phys. Rev. Lett.* **108**, 255005, 2012.
204. M. Opher, J. F. Drake, M. Velli, R. B. Decker, and G. Toth, Near the boundary of the heliosphere: a flow transition region, *ApJ* **751**, 80, 2012.
205. P. J. Cargill, L. Vlahos, G. Baumann, J. F. Drake and A. Nordlund, Current fragmentation and particle acceleration in solar flares, *Space Science Reviews* **173**, 223, 2012.
206. J. Giacalone, J. F. Drake and J. R. Jokipii, The acceleration mechanism of anomalous cosmic rays, *Space Science Reviews* **173**, 283, 2012.
207. J. D. Richardson, L. F. Burlaga, R. B. Decker, J. F. Drake, N. F. Ness and M. Opher, Magnetic flux conservation in the heliosheath, *ApJ Lett.* **762**, L14, 2013.
208. J. F. Drake, M. Swisdak and R. Fermo, The power-law spectra of energetic particles during multi-island magnetic reconnection, *ApJ Lett.* **763**, L5, 2013.
209. T. D. Phan, G. Paschmann, J. T. Gosling, M. Oieroset, M. Fujimoto, J. F. Drake, and V. Angelopoulos, The dependence of magnetic reconnection on plasma  $\beta$  and magnetic shear: evidence from magnetopause observations, *Geophys. Res. Lett.* **40**, 11, 2013.
210. K. M. Schoeffler, J. F. Drake, M. Swisdak and K. Knizhnik, The Role of Pressure Anisotropy on Particle Acceleration during Magnetic Reconnection, *ApJ* **764**, 126, 2013.
211. P. A. Cassak and J. F. Drake, On phase diagrams of magnetic reconnection, *Phys. Plasmas* **20**, 061207, 2013.
212. H. Che, J. F. Drake, M. Swisdak and M. L. Goldstein, The adiabatic phase mixing and heating of electrons in Buneman turbulence, *Phys. Plasmas* **20**, 061205, 2013.
213. J. P. Eastwood, T. D. Phan, J. F. Drake, M. A. Shay, A. L. Borg, B. Lavraud and M. G. G. T. Taylor, Energy Partition in Magnetic Reconnection in Earth's Magnetotail, *Phys. Rev. Lett.* **110**, 225001, 2013.
214. M. Swisdak, J. F. Drake and M. Opher, A porous, layered heliopause, *ApJ Lett.* **774**, L8, 2013.
215. P. A. Cassak, J. F. Drake, J. T. Gosling, T. D. Phan, M. A. Shay, and L. S. Shepherd, On the cause of supra-arcade downflows in solar flares, *ApJ Lett.* **775**, L14, 2013.

216. T. D. Phan, M. A. Shay, J. T. Gosling, M. Fujimoto, J. F. Drake, G. Paschmann, M. Oieroset, J. P. Eastwood, and V. Angelopoulos, Electron bulk heating in magnetic reconnection at Earth's magnetopause: Dependence on the inflow Alfvén speed and magnetic shear, *Geophys. Res. Lett.* **40**, 11, 2013.
217. M. Opher, C. Prested, D. J. McComas, N. A. Schwadron, and J. F. Drake, Probing the nature of the heliosheath with neutral atom spectra measured by IBEX in the Voyager 1 direction, *ApJ Lett.* **776**, L32, 2013.
218. M. Opher and J. F. Drake, On the rotation of the magnetic field across the heliopause, *ApJ Lett.* **778**, L26, 2013.
219. T. C. Li, J. F. Drake and M. Swisdak, Coronal electron confinement by double layers, *ApJ* **778**, 144, 2013.
220. J. P. Eastwood, T. D. Phan, M. Oieroset, M. A. Shay, K. Malakit, M. Swisdak, J. F. Drake and A. Masters, Influence of asymmetries and guide fields on the magnetic reconnection diffusion region in collisionless space plasmas, *Plasma Phys. Control. Fusion* **55**, 124001, 2013.
221. M. E. Hill, R. B. Decker, L. E. Brown, J. F. Drake, D. C. Hamilton, S. M. Krimigis, and M. Opher, Dependence of Energetic Ion and Electron Intensities on the Proximity to the Magnetically Sectored Heliosheath: Voyager 1 and 2 Observations, *ApJ* **781**, 94, 2014.
222. J. F. Drake, M. Swisdak, P. A. Cassak and T. D. Phan, On the 3-D structure and dissipation of reconnection-driven flow-bursts, *Geophys. Res. Lett.* **41**, 3710, 2014.
223. R. L. Fermo, M. Opher, and J. F. Drake, Magnetic reconnection in the interior of interplanetary coronal mass ejections, *Phys. Rev. Lett.* **113**, 031101, 2014.
224. J. F. Drake and M. Swisdak, The onset of ion heating during magnetic reconnection with a strong guide field, *Phys. Plasmas* **21**, 072903, 2014.
225. J. T. Dahlin, J. F. Drake and M. Swisdak, The mechanisms of electron heating and acceleration during magnetic reconnection, *Phys. Plasmas* **21**, 092304, 2014.
226. T. C. Li, J. F. Drake and M. Swisdak, Dynamics of double layers, ion acceleration and heat flux suppression in solar flares, *ApJ* **793**, 7, 2014.
227. T. D. Phan, J. F. Drake, M. A. Shay, J. T. Gosling, G. Paschmann, J. P. Eastwood, M. Oieroset, M. Fujimoto, and V. Angelopoulos, Ion bulk heating in magnetic reconnection exhausts at Earth's magnetopause: Dependence on the inflow Alfvén speed and magnetic shear angle, *Geophys. Res. Lett.* **41**, 7002, 2014.
228. M. A. Shay, C. C. Haggerty, T. D. Phan, J. F. Drake, P. A. Cassak, P. Wu, M. Oieroset, M. Swisdak, and K. Malakit, Electron heating during magnetic reconnection: A simulation scaling study, *Phys. Plasmas* **21**, 122902, 2014.

229. M. Opher, J. F. Drake, B. Zieger and T. I. Gombosi, Magnetized jets driven by the sun: the structure of the heliosphere revisited, *ApJ Lett.* **200**, L28, 2015.
230. H. Hietala, J. F. Drake, T. D. Phan, J. P. Eastwood and J. P. McFadden, Ion temperature anisotropy across reconnection exhaust jets, *Geophys. Res. Lett.* **42**, 7239, 2015 (doi:10.1002/2015GL065168).
231. J. F. Drake, O. V. Agapitov, and F. S. Mozer, The development of a bursty precipitation front with intense localized parallel electric fields driven by whistler waves, *Geophys. Res. Lett.* **42**, 2015 (doi:10.1002/2015GL063528).
232. J. F. Drake, M. Swisdak and M. Opher, A model of the heliosphere with jets, *ApJ Lett.* **808**, L44, 2015.
233. F. S. Mozer, O. V. Agapitov, A. Artemyev, J. F. Drake, V. Krasnoselskikh, S. Lejosne, and I. Vasko, Time domain structures: What and where they are, what they do, and how they are made, *Geophys. Res. Lett.* **42**, doi:10.1002/2015GL063946, 2015.
234. J. T. Dahlin, J. F. Drake and M. Swisdak, Electron Acceleration in 3D Magnetic Reconnection with a Guide Field, *Phys. Plasmas Lett.* **22**, 100704, 2015).
235. H. Hietala, J. F. Drake, T. D. Phan, J. P. Eastwood and J. P. McFadden, Ion temperature anisotropy across a magnetotail reconnection jet, *Geophys. Res. Lett.* **42**, doi:10.1002/2015GL065168, 2015.
236. C. E. Doss, C. M. Komar, P. A. Cassak, F. D. Wilder, S. Eriksson, and J. F. Drake, Asymmetric magnetic reconnection with a flow shear and applications to the magnetopause. *J. Geophys. Res.* **120**, 7748, 2015.
237. C. C. Haggerty, M. A. Shay, J. F. Drake, T. D. Phan and C. T. McHugh, The competition of electron and ion heating during magnetic reconnection, *Geophys. Res. Lett.* **42**, doi:10.1002/2015GL065961, 2015.
238. S. K. Vines, S. A. Fuselier, K. J. Trattner, S. M. Petrinec, and J. F. Drake, Ion acceleration dependence on magnetic shear angle in dayside magnetopause reconnection, *J. Geophys. Res. Space Phys.* **120**, 7255, doi:10.1002/2015JA021464, 2015.
239. L. Price, M. Swisdak, J. F. Drake, P. A. Cassak, J. T. Dahlin and R. E. Ergun, The Effects of Turbulence on Three-Dimensional Magnetic Reconnection at the Magnetopause, *Geophys. Res. Lett.* **43**, doi:10.1002/2016GL069578, 2016.
240. M. A. Shay, T. D. Phan, C. C. Haggerty, M. Fujimoto, J. F. Drake, K. Malakit, P. A. Cassak and M. Swisdak, Kinetic signatures of the region surrounding the X line in asymmetric (magnetopause) reconnection, *Geophys. Res. Lett.* , doi:10.1002/2016GL069034, 2016.

241. M. Opher, J. F. Drake, B. Zieger, M. Swisdak and G. Toth, Magnetized jets driven by the sun: the structure of the heliosphere revisited - Updates, *Phys. Plasmas* **23**, doi:10.1063/1.4943526, 2016.
242. G. T. Roberg-Clark, J. F. Drake, Christopher S. Reynolds and M. Swisdak, Suppression of thermal conduction in high  $\beta$  plasma, *ApJ Lett.* **830**, L9, 2016.
243. J. L. Burch, et al., Electron scale measurements of reconnection in space, *Science*, 10.1126/science.aaf2939, 2016.
244. J. D. Richardson, L. F. Burlaga, J. F. Drake, M. E. Hill, and M. Opher, VOYAGER OBSERVATIONS OF MAGNETIC SECTORS AND HELIOSPHERIC CURRENT SHEET CROSSINGS IN THE OUTER HELIOSPHERE, *ApJ* **831**, 115, 2016.
245. M. Oieroset et al., MMS observations of large guide field symmetric reconnection between colliding reconnection jets at the center of a magnetic flux rope at the magnetopause, *Geophys. Res. Lett.* **43**, 5536, doi:10.1002/2016GL069166, 2016.
246. J. T. Dahlin, J. F. Drake and M. Swisdak, Parallel electric fields are inefficient drivers of energetic electrons in magnetic reconnection, *Phys. Plasmas* **23**, 120704, 2016, doi:10.1063/1.4972082.
247. S. Eriksson, et al., Magnetospheric Multiscale Observations of the Electron Diffusion Region of Large Guide Field Magnetic Reconnection, *Phys. Rev. Lett.* **117**, 015001, 2016.
248. S. D. Bale et al., The FIELDS Instrument Suite for Solar Probe Plus, *Space Science Rev.* **204**, 49, 2016.
249. R. E. Ergun et al., Magnetospheric Multiscale Satellites Observations of Parallel Electric Fields Associated with Magnetic Reconnection, *Phys. Rev. Lett.* **116**, 235102, 2016.
250. M. Hesse, N. Aunai, J. Birn, P. Cassak, R. E. Denton, J. F. Drake, T. Gombosi, M. Hoshino, W. Matthaeus, D. Sibeck, and S. Zenitani, Theory and Modeling for the Magnetospheric Multiscale Mission, *Space, Sci. Rev.* **199**, 577, 2016.
251. R. E. Ergun et al., Magnetospheric Multiscale observations of large-amplitude, parallel, electrostatic waves associated with magnetic reconnection at the magnetopause, *Geophys. Res. Lett.* **43**, 5626, doi:10.1002/2016GL068992, 2016.
252. I. Y. Vasko, O. V. Agapitov, F. S. Mozer, A. V. Artemyev, and J. F. Drake, Electron holes in inhomogeneous magnetic field: Electron heating and electron hole evolution, *Phys. Plasmas* **23**, 052306, 2016.
253. J. F. Drake, M. Swisdak, M. Opher and J. D. Richardson, The formation of magnetic depletions and flux annihilation due to reconnection in the heliosheath, *ApJ*, **837**, 159, 2017.

254. J. T. Dahlin, J. F. Drake and M. Swisdak, The role of three-dimensional transport in driving enhanced electron acceleration during magnetic reconnection, *Phys. Plasmas* **24**, 092110, 2017.
255. L. Price, M. Swisdak, J. F. Drake, J. L. Burch, P. A. Cassak and R. E. Ergun, Turbulence Associated with Magnetopause Reconnection, *J. Geophys. Res.*, *J. Geophys. Res. :Space Phys.* **122**, doi/10.1002/2017JA024227, 2017.
256. M. Opher, J. F. Drake, M. Swisdak, B. Zieger and G. Toth, The Twist of the Draped Interstellar Magnetic Field Ahead of the Heliopause: A Magnetic Reconnection Driven Rotational Discontinuity, *ApJ Lett.* **839**, L12, 2017.
257. R. E. Ergun, et al., Drift waves, intense parallel electric fields, and turbulence associated with asymmetric magnetic reconnection at the magnetopause, *Geophys. Res. Lett.* **44**, 2978, 2017.
258. L. S. Shepherd, P. A. Cassak, J. F. Drake, J. T. Gosling, T. D. Phan, and M. A. Shay, Structure of Exhausts in Magnetic Reconnection with an X-line of Finite Extent, *ApJ* **848**, 90, 2017.
259. G. T. Roberg-Clark, J. F. Drake, C. S. Reynolds and M. Swisdak, Suppression of Electron Thermal Conduction by Whistler Turbulence in a Sustained Thermal Gradient, *Phys. Rev. Lett.* **120**, 035101, 2018.
260. P. A. Cassak, K. J. Genestreti, J. L. Burch, T. D. Phan, M. A. Shay, M. Swisdak, J. F. Drake, L. Price, S. Eriksson, R. E. Ergun, B. J. Anderson, V. G. Merkin, and C. M. Komar, The Effect of a Guide Field on Local Energy Conversion During Asymmetric Magnetic Reconnection: Particle-in-Cell Simulations, *J. Geophys. Res. : Space Phys.* **122**, 11523, 2017, doi:10.1002/2017JA024555.
261. T. D. Phan, J. P. Eastwood, M. A. Shay, J. F. Drake, B. U. . Sonnerup, et al, Electron Magnetic Reconnection Without Ion Coupling in Earths Turbulent Magnetosheath, *Nature* **557**, 202, 2018.
262. R. B. Torbert, et al, Electron-Scale Dynamics of the Diffusion Region during Symmetric Magnetic Reconnection in Space, *Science* **362**, 1391,2018.
263. O. Agapitov, J. F. Drake, I. Vasko, F. S. Mozer, A. Artemyev, V. Krasnosel'skikh, V. Angelopoulos, J. Wygant, G. D. Reeves, Nonlinear electrostatic steepening of whistler waves: the guiding factors and dynamics in inhomogeneous systems, *Geophys. Res. Lett.* **45**, DOI:10.1002/2017GL076957, 2018.
264. J. F. Drake, H. Arnold, M. Swisdak and J. T. Dahlin, A computational model for exploring particle acceleration dduring reconnection in macroscale systems, *Phys. Plasmas* **26**, 012901, 2019, doi:10.1063/1.5058140.
265. G. T. Roberg-Clark, J. F. Drake, M. Swisdak, and C. S. Reynolds, Wave Generation and Heat Flux Suppression in Astrophysical Plasma Systems, *ApJ* **867**, 154, 2018.

266. Colby C. Haggerty, Michael A. Shay, Alexandros Chasapis, Tai D. Phan, James F. Drake, Kittipat Malakit, Paul A. Cassak, and Rungployphan Kieokaew, The reduction of magnetic reconnection outflow jets to sub-Alfvénic speeds, *Phys. Plasmas* **25**, 102120, 2018, doi: 10.1063/1.5050530.
267. M. Ieroset, T. D. Phan, J. F. Drake, J. P. Eastwood, S. A. Fuselier, *et al.*, Reconnection with magnetic flux pileup at the interface of converging jets at the magnetopause, *Geophys. Res. Lett.*, in press, 2019.
268. J. P. Eastwood, *et al.*, Guide Field Reconnection: Exhaust Structure and Heating, *Geophys. Res. Lett.* **45**, 4569, 2018, doi:10.1029/2018GL077670.
269. M. Kornbleuth, M. Opher, A. T. Michael, and J. F. Drake, Globally Distributed Energetic Neutral Atom Maps for the Croissant Heliosphere, *ApJ* **865**, 84, 2018.
270. M. Swisdak, J. F. Drake, L. Price, J. L. Burch, P. A. Cassak, and T. D. Phan, Localized and Intense Energy Conversion in the Diffusion Region of Asymmetric Magnetic Reconnection, *Geophys. Res. Lett.* **45**, 5260, 2018, doi:10.1029/2017GL076862.
271. M. Opher, A. Loeb, J. F. Drake and G. Toth, A predicted small and round heliosphere, *Nature Astronomy*, submitted, 2018.
272. J. L. Burch, *et al.*, Localized Oscillatory Energy Conversion in Magnetopause Reconnection, *Geophys. Res. Lett.* **45**, 1237, 2018, doi:10.1002/2017GL076809.

## **VII. Invited Talks at National and International Meetings**

1. J. F. Drake (with Y. C. Lee), Kinetic Theory of Tearing Instabilities, Sherwood Theory Meeting, San Diego, CA, 1977.
2. J. F. Drake, Kinetic Theory of Tearing and  $M=1$  Instabilities, *Bull. Am. Phys. Soc.* **22**, 1105, 1977.
3. J. F. Drake (with P. Pritchett and Y. C. Lee), Nonlinear Evolution of Tearing Instabilities, Sherwood Theory Meeting, Gatlinburg, TN, 1978.
4. J. F. Drake, The Resistive Tearing Instability, American Astronomical Society — Solar Physics Division, Ann Arbor, MI, 1978.
5. J. F. Drake, Tearing Modes and Magnetic Reconnection in the Reversed Field Theta Pinch, *Bull. Am. Phys. Soc.* **23**, 782, 1978.
6. J. F. Drake (with C. S. Liu), Energy Cascade in Drift-Tearing Modes, Sherwood Theory Meeting, Mt. Pocono, PA, 1979.
7. J. F. Drake, Magnetic Fluctuations and Transport in Tokamaks, Gordon Research Conf. on Plasma Physics, Ventura, CA, 1980.

8. J. F. Drake, Stochasticity and Transport in the Lower Hybrid Drift Instability, General Meeting of the APS, Phoenix, AZ, March, 1981.
9. J. F. Drake (with T. M. Antonsen and Y. C. Lee), Tearing Modes in Toroidal Geometry, Sherwood Theory Meeting, Santa Fe, NM, 1982.
10. J. F. Drake, Stabilization of the  $m=2$  Tearing Mode in High Temperature Plasma, Bull. Am. Phys. Soc. **27**, 1040, 1982.
11. J. F. Drake (with T. M. Antonsen, Jr.), Nonlinear Reduced Fluid Equations for Toroidal Plasmas, Sherwood Theory Meeting, Arlington, VA, 1983.
12. J. F. Drake, Reconnection in Sheared Magnetic Fields in Space and Solar Plasmas, International Astronomical Union Symposium No. 107, College Park, MD, 1983.
13. J. F. Drake, Tearing Mode and Anomalous Transport Processes, Chapman Conference on Magnetic Reconnection, Los Alamos, NM, 1983.
14. J. F. Drake, Major Disruptions and Tearing and Ballooning Modes, Tenth International Conference on Plasma Physics and Controlled Nuclear Fusion Research, London, U.K., 1984.
15. J. F. Drake, Magnetic Energy Dissipation in Collisionless Plasma, Gordon Research Conf. on Space Plasma Physics, Andover, NH, 1985.
16. J. F. Drake, Sawteeth in Tokamaks, US-USSR Fusion Theory Conference on Edge Physics and Transport in Tokamaks, Moscow, USSR, 1986.
17. J. F. Drake, Sawteeth in Tokamaks, Workshop on Sawtooth Oscillations in CIT, Princeton, NJ, 1986.
18. J. F. Drake, Sawteeth and Temperature Profiles in Tokamaks, Eleventh International Conference on Plasma Physics and Controlled Nuclear Fusion Research, Kyoto, Japan, 1986.
19. J. F. Drake (with P. N. Guzdar), Marfes and Condensation Instabilities in Tokamak Edge Plasma, Sherwood Theory Meeting, San Diego, CA, 1987.
20. J. F. Drake, Sawteeth in Tokamaks, Workshop on Tokamak Ignition Physics, Livermore, CA, 1987.
21. J. F. Drake, Turbulence and Transport by the  $\eta_e$  Instability, U.S.-Japan Workshop and Plasma and Fluid Turbulence, Austin, TX, 1987.
22. J. F. Drake (with R. E. Denton and R. G. Kleva), Disruptive Phenomena in Tokamak Plasma, Twelfth International Conference on Plasma Physics and Controlled Nuclear Fusion Research, Nice, France, 1988.



23. J. F. Drake (with A. Dimits, P. N. Guzdar, and A. B. Hassam), Temperature Gradient Modes, Streamers, and Anomalous Transport, International Conference on Plasma Theory, Lausanne, Switzerland, 1988.
24. J. F. Drake, Critical Comments on Models of Anomalous Transport in Tokamaks, Transport Task Force Meeting, Austin, Texas, 1989.
25. J. F. Drake, Status of the Nonlinear Behavior of the  $\eta_i$  Instability, U.S. Dept. of Energy Review of Anomalous Transport in Tokamaks, Germantown, MD, 1989.
26. J. F. Drake, Basics of Reduced MHD and Tearing Modes, Summer School on Anomalous Transport in Tokamaks, San Diego, CA, 1989.
27. J. F. Drake, Drift-Tearing and Microtearing Modes in Tokamaks, Summer School in Anomalous Transport in Tokamaks, San Diego, CA, 1989.
28. J. F. Drake, Negative Compressibility  $\eta_e$  and  $\eta_i$  Instabilities in Tokamaks, Summer School on Anomalous Transport in Tokamaks, San Diego, CA, 1989.
29. J. F. Drake, Magnetic Reconnection in Collisionless Plasma, Second Huntsville Workshop on Magnetosphere/Ionosphere Plasma Models, Huntsville, AL, 1989.
30. J. F. Drake, Review of Edge Turbulence Theory, Transport Task Force Workshop, San Diego, CA, 1989.
31. J. F. Drake, The Nonlinear Saturation and Transport by the Negative Compressibility  $\eta_i$  Instability, 14th Annual Meeting of the Division of Plasma Physics of the American Physical Society, Anaheim, CA, 1989.
32. J. F. Drake, Density Limit Disruptions in tokamaks, U.S. USSR Workshop on Tearing and Ballooning Modes, Moscow, USSR, 1989.
33. J. F. Drake (with P. N. Guzdar and A. Dimits), 3D  $\nabla T_i$  Driven Turbulence and Transport, Chaos and Turbulence in Fluids and Plasma, College Park, MD, 1990.
34. J. F. Drake (with R. G. Kleva), Collisionless Reconnection and the Sawtooth Crash, Workshop on Sawteeth in Tokamaks, Boston, MA, 1990.
35. J. F. Drake (with G. Burkhart and J. Chen), Structure of the Dissipation Region during Magnetic Reconnection in Collisionless Plasma, Research Trends in Nonlinear Space Plasma Physics, La Jolla, CA, 1991.
36. J. F. Drake, Convection Cell Peeling and the Generation of Sheared Flow, U.S.-Japan Workshop on Edge Turbulence and the Physics of the H-Mode, Madison, WI, 1991.
37. J. F. Drake, Turbulent Structure of the Magnetopause Current Layer, NSF GEM Workshop, Los Angeles, CA, 1991.

38. J. F. Drake, Turbulence and Sheared Flow Generation in Tokamak Edge Plasma, Transport Task Force Workshop, Oak Ridge, TN, 1992.
39. J. F. Drake, Turbulence, Sheared Flow Generation and the L/H Transition, DOE Field Task Workshop, Germantown, MD, 1992.
40. J. F. Drake, The Formation and Levitation of Prominences in the Solar Corona, Spring AGU Meeting, Montreal, Canada, 1992.
41. J. F. Drake (with J. M. Finn, P. Guzdar, A. B. Hassam, D. McCarthy, T. M. Antonsen and C. S. Liu), Tokamak Edge Transport, Sheared Flow and the L-H Transition, Fourteenth Int. Conf. Plasma Phys. Controlled Nucl. Fusion Res., Wurzburg, Germany, 1992.
42. J. F. Drake, Transport in Magnetospheric Boundary Layers, Fall AGU Meeting, San Francisco, CA, 1992.
43. J. F. Drake, Short Scale Structure and Turbulence in the Magnetopause, NSF GEM Workshop on the Magnetopause, Snowmass, CO, 1993.
44. J. F. Drake, Subgrid Modeling in the Global Geomagnetic Circulation Model, NSF GEM Workshop on the Magnetopause, Snowmass, CO, 1993.
45. J. F. Drake, Collisionless Reconnection, NSF GEM Workshop on the Magnetotail/Substorm Campaign, Snowmass, CO, 1993.
46. J. F. Drake, Tearing Modes and Magnetic Reconnection, Summer School on Plasma Fluctuations and Transport, Madison, WI, 1993.
47. J. F. Drake, Interchange, Ballooning and Resistive Ballooning Instabilities, Summer School on Plasma Fluctuations and Transport, Madison, WI, 1993.
48. J. F. Drake, Basics of Drift Waves, Summer School on Plasma Fluctuations and Transport, Madison, WI, 1993.
49. J. F. Drake, Trapped Particles and Instabilities in a Torus, Summer School on Plasma Fluctuations and Transport, Madison, WI, 1993.
50. J. F. Drake, Magnetic Reconnection: A Kinetic Treatment, Chapman Conference on the Physics of the Magnetopause, San Diego, CA, 1994.
51. J. F. Drake, R. G. Kleva and M. E. Mandt, Whistler Driven Turbulence and Transport in the Magnetopause Current Layer, 1993 Magnetopause Workshop, Fairbanks, Alaska, 1993.
52. J. F. Drake, Whistler Driven Turbulence and Transport at the Magnetopause, NSF GEM Workshop, San Francisco, CA, 1993.
53. J. F. Drake, Two Fluid Treatment of Magnetic Reconnection, Second SNS Workshop on Magnetic Reconnection, IT, 1994.

54. J. F. Drake, Resistive Ballooning Modes and the L-H Transition, European Workshop on Plasma Transport, Goeteborg, Sweden, 1994.
55. J. F. Drake (with P. N. Guzdar, S. Novakovskii, C. S. Liu, A. Zeiler and D. Biskamp), Fifteenth Int. Conf. Plasma Phys. Controlled Nucl. Fusion Res., Seville, Spain, 1994.
56. J. F. Drake, Tokamak Edge Turbulence, Workshop on Tokamak Edge Turbulence, Chicago, Illinois, 1995.
57. J. F. Drake, Nonlinear Self-Sustained Drift-Wave Turbulence, Workshop on Computer Simulation of Plasmas, Institute for Theoretical Physics, Santa Barbara, CA, 1995.
58. J. F. Drake, Structure of the Magnetopause Current Layer, Fall AGU Meeting, San Francisco, CA, 1995.
59. J. F. Drake, Base Science and Technology Program, Fusion Energy Advisory Committee, Washington, DC, 1995.
60. J. F. Drake, Local Negative Shear and the Formation of Transport Barriers, Transport Task Force Workshop, Philadelphia, PA, 1996.
61. J. F. Drake, Local Negative Shear and the Formation of Transport Barriers, International Sherwood Theory Conference, Philadelphia, PA, 1996.
62. J. F. Drake, Collisionless Reconnection at the Magnetopause, Spring AGU Meeting, Baltimore, MD, 1996.
63. J. F. Drake, Magnetic Reconnection in Collisionless Plasma, Gordon Research Conference on Space Plasma Physics, NH, 1996.
64. J. F. Drake, Turbulence and the Formation of Transport Barriers in Finite  $\beta$  Plasmas, Sixteenth Int. Conf. Plasma Phys. Controlled Nucl. Fusion Res., Montreal, Canada, 1996.
65. J. F. Drake, Magnetic Reconnection in Collisionless Plasma, Spring AGU Meeting, Baltimore, MD, 1997.
66. J. F. Drake, Solar Lessons from Magnetospheric Physics, International Workshop on High Resolution Observations of the Solar Atmosphere, Gloucester, MA, 1997.
67. J. F. Drake, Theory and Observations of Collisionless Magnetic Reconnection, 1997 International Conference on the Interrelationship Between Experiments in Laboratory and Space Plasmas, Makeaa, Hawaii, 1997.
68. J. F. Drake, Collisionless magnetic reconnection at the magnetopause, Workshop on the Physics of Magnetic Reconnection, Princeton, NJ, 1998.

69. J. F. Drake, The physics of collisionless magnetic reconnection, Cambridge Symposium on Multiscale Phenomena in Space Plasma, Cascais, Portugal, 1998.
70. J. F. Drake, the Physics of collisionless magnetic reconnection, International Congress on Plasma Physics, Prague, Czech Republic, 1998.
71. J. F. Drake, Tokamak edge turbulence and L-H transition, Edge-Plasma Theory and Simulation Workshop, Innsbruck, Austria, 1998.
72. J. F. Drake, Collisionless magnetic reconnection at the magnetopause, Mini-conference on space and astrophysics, New Orleans, LA, 1998.
73. J. F. Drake, Results of the GEM Reconnection Challenge, Fall AGU Meeting, San Francisco, CA, 1998.
74. J. F. Drake, Structure of the outflow region during collisionless magnetic reconnection, Spring ISTP Workshop, NASA Goddard Spaceflight Center, Greenbelt, MD, 1999.
75. J. F. Drake, the Emerging Physics of Magnetic Reconnection, NSF GEM Workshop, Snowmass, CO, 1999.
76. J. F. Drake, The Theory Basis of Anomalous Transport, Snowmass Meeting on the Future of the Fusion Energy Sciences Program, Snowmass, CO, 1999.
77. J. F. Drake, The Emerging Physics of Collisionless Magnetic Reconnection, 1999 International Conference on the Interrelationship Between Experiments in Laboratory and Space Plasmas, Kreuth, Germany, 1999.
78. J. F. Drake, New Developments in the Understanding of 2-D and 3-D Collisionless Magnetic Reconnection, Symposium on Magnetic Reconnection in Space and Laboratory Plasmas, Tokyo, Japan, 2000.
79. J. F. Drake, Structure of the outflow region during collisionless magnetic reconnection, International Solar Terrestrial Physics Meeting, Greenbelt, MD, 2000.
80. J. F. Drake, The physics of magnetic reconnection, 33rd COSPAR Scientific Assembly, Warsaw, Poland, 2000.
81. J. F. Drake, The Emerging Physics of Magnetic Reconnection, First S-RAMP Conference, Sapporo, Japan, 2000.
82. J. F. Drake, Turbulence and Transport at the Magnetopause, First S-RAMP Conference, Sapporo, Japan, 2000.
83. J. F. Drake, Magnetic reconnection and the structure of the low latitude boundary layer, Chapman Conference on the Low Latitude Boundary Layer, New Orleans, 2001.

84. J. F. Drake, Magnetic Reconnection: the mechanism for the dissipation of magnetic energy in the universe (invited plenary talk), April APS Meeting, Washington DC, 2001.
85. J. F. Drake, The emerging physics of magnetic reconnection (Plenary Review Talk), International Sherwood Theory Conference, Santa Fe, NM, 2001.
86. J. F. Drake, Magnetic Reconnection and the Structure of the Low Latitude Boundary Layer, Chapman Conference on the Low Latitude Boundary Layer and its Dynamics Interaction with the Solar Wind and Magnetosphere, New Orleans, LA, 2001.
87. J. F. Drake, Kinetic Treatment of Magnetic Reconnection, APS/DPP Mini-Conference on Magnetic Reconnection in Space and Astrophysical Plasma, Long Beach, CA, 2001.
88. J. F. Drake, Magnetic Reconnection: the mechanism for the dissipation of magnetic energy in the universe (plenary review talk), Symposium in honor of the retirement of Dr. Dieter Biskamp, Garching, Germany, 2001.
89. J. F. Drake, Development of turbulence and anomalous resistivity during magnetic reconnection, APS April Meeting, Albuquerque, NM, 2002.
90. J. F. Drake, Development of Electron Holes and Anomalous Resistivity in 3-D Magnetic Reconnection, Spring Meeting of the American Geophysical Union, Washington DC, 2002.
91. J. F. Drake, Magnetic Reconnection: the mechanism for the dissipation of magnetic energy in the universe (Plenary Review Talk), "A Celebration of High Temperature Plasma Physics" (a symposium in honor of the 50th Anniversary of the Princeton Plasma Physics Laboratory), Princeton, NJ, 2002.
92. J. F. Drake, Collisionless Reconnection: unsolved issues, 34th Scientific Assembly of COSPAR/World Space Congress, Houston, Texas, 2002.
93. J. F. Drake, Energetic particle production during 3-D magnetic reconnection, Workshop on Astrophysical Particle Acceleration in Geospace and Beyond, Chattanooga, TN, 2002.
94. J. F. Drake, Development of Electron Holes and Anomalous Resistivity in 3-D Magnetic Reconnection, Fall Meeting of the American Geophysical Union, San Francisco, CA, 2002.
95. J. F. Drake, Development of fast magnetic reconnection and associated turbulence and anomalous resistivity, Ringberg Workshop on Plasma Astrophysics, Tegernsee, Germany, 2002.
96. J. F. Drake, Magnetic Reconnection, Committee on Space and Solar Physics of the National Research Council, Irvine, CA, 2003.

97. J. F. Drake, Magnetic Reconnection (Plenary Review Talk), Relaxation in Magnetized Plasma, Aix-en-Provence, France, 2003.
98. J. F. Drake, Collisionless Magnetic Reconnection (Plenary Review Talk), International Workshop on Magnetic Reconnection and the Dynamic Sun, St. Andrews, Scotland, 2003.
99. J. F. Drake, Kinetic Structure and Dynamics of Guide Field Magnetic Reconnection (invited review talk, 40 minutes), workshop on Explosive Phenomena in Magnetized Plasma - New Developments in Reconnection Research, Kyoto, Japan, 2004.
100. J. F. Drake, Kinetic Modeling of Magnetic Field Dynamics in Space and Astrophysical Systems (invited review, 30 minutes), CSCAMM-PICSciE workshop on Numerical Methods for Plasma Astrophysics: from Particle Kinetics to MHD, College Park, MD, 2004.
101. J. F. Drake, Collisionless Magnetic Reconnection (invited review, 60 minutes), workshop on Magnetic Reconnection Theory, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, 2004.
102. J. F. Drake, New Developments in Kinetic Reconnection Modeling: Electron Heating (invited talk, 30 minutes), PICSciE-CSCAMM Workshop on Numerical Methods for Plasma Astrophysics, Princeton, NJ, 2004.
103. J. F. Drake, The structure of parallel electric fields and particle acceleration during magnetic reconnection, workshop on thin current sheets, College Park, Maryland, 2004.
104. J. F. Drake, Kinetic Modeling of Magnetic Reconnection in Space and Astrophysical Systems (invited review, 70 minutes), workshop on Large Scale Computation in Astrophysics, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, 2004.
105. J. F. Drake, Production of Energetic Electrons during Magnetic Reconnection (invited talk, 30 minutes), Mini-Conference on Scattering, Acceleration and Propagation of Energetic Particles in Space and Astrophysics, Savannah, GA, 2004.
106. J. F. Drake, Magnetic Reconnection Theory: the MHD Description (invited tutorial, 60 minutes), Center for Multiscale Plasma Dynamics Winter Workshop, UCLA, 2005.
107. J. F. Drake, Magnetic Reconnection Theory: kinetic models and issues (invited tutorial, 60 minutes), Center for Multiscale Plasma Dynamics Winter Workshop, UCLA, 2005.
108. J. F. Drake, Multiscale Issues in Modeling Magnetic Reconnection (invited review, IPAM Meeting on Multiscale Problems in Fusion Plasmas, UCLA, 2005.

109. J. F. Drake, Production of energetic electrons during magnetic reconnection (invited talk, 25 minutes), US-Japan Workshop on Magnetic Reconnection and Particle Acceleration, Awaji-shima, Japan, 2005.
110. J. F. Drake, A Fermi mechanism for the production of energetic electrons during magnetic reconnection (invited talk, 30 minutes), LANL Workshop on Magnetic Reconnection, Santa Fe, NM, 2005.
111. J. F. Drake, A Fermi mechanism for the production of energetic electrons during magnetic reconnection, 47th Annual Meeting of the Division of Plasma Physics of the APS (invited talk, 30 minutes), Denver, CO, 2005.
112. J. F. Drake, A Fermi mechanism for the production of energetic electrons during magnetic reconnection (invited talk, 22 minutes), Fall 2005 Meeting of the American Geophysical Union, San Francisco, CA, 2005.
113. J. F. Drake, Recent Developments in the Modeling of Magnetic Reconnection in the Local Cosmos (invited review, 25 minutes), Fall 2005 Meeting of the American Geophysical Union, San Francisco, CA, 2005.
114. J. F. Drake, Collisionless Magnetic Reconnection (invited tutorial, two 60 minute lectures), Center for Multiscale Plasma Dynamics Winter School, UCLA, 2006.
115. J. F. Drake, A Fermi mechanism for the production of energetic electrons during magnetic reconnection (invited talk, 30 minutes), Workshop on Earth-Sun System Exploration, Kona, Hawaii, 2006.
116. J. F. Drake, Magnetic Reconnection at the Heliopause: theoretical expectations, IGPP 5th International Astrophysics Conference (Invited Review Talk, 30 minutes), Oahu, Hawaii, 2006.
117. J. F. Drake, A Fermi mechanism for the production of energetic electrons during magnetic reconnection (Topical Review Talk, 30 minutes), International Congress on Plasma Physics, Kiev, Ukraine, 2006.
118. J. F. Drake, The Physics of Magnetic Reconnection (Invited Review, 45 minutes), Workshop on the Challenges of Relativistic Jets, Krakow, Poland, 2006.
119. J. F. Drake, A contracting island mechanism for electron acceleration during magnetic reconnection (invited talk, 30 minutes), Workshop on Magnetic Reconnection Theory, Florence, Italy, 2006.
120. J. F. Drake, A Fermi mechanism for electron acceleration during magnetic reconnection (invited talk, 30 minutes), Center for Magnetic Self-Organization General Meeting, Chicago, 2006.
121. J. F. Drake, Acceleration of cosmic rays by turbulence during magnetic reconnection events (invited talk, 30 minutes), 210th Meeting of the American Astronomical Society, Honolulu, Hawaii, 2007.

122. J. F. Drake, A Fermi mechanism for electron acceleration during magnetic reconnection (invited talk, 50 minutes), Workshop on HelioMagnetism, Stanford University, 2007.
123. J. F. Drake, Reconnection and particle acceleration (invited talk, 30 minutes), Living with a Star Workshop, Boulder, CO, 2007.
124. J. F. Drake, Acceleration of electrons during reconnection events (invited talk, 30 minutes), 2007 RHESSI workshop, U. C. Santa Cruz, Santa Cruz, CA, 2007.
125. J. F. Drake, Magnetic reconnection and particle acceleration (invited talk, 20 minutes), Fall 2007 Meeting of the American Geophysical Union, San Francisco, CA, 2007.
126. J. F. Drake, Magnetic reconnection and particle acceleration (invited talk, 30 minutes), US-Japan Workshop on Magnetic Reconnection 2008, Okinawa, Japan, 2008.
127. J. F. Drake, Magnetic reconnection and particle acceleration (invited talk, 30 minutes), 7th Annual IGPP astrophysics conference, Kauai, Hawaii, 2008.
128. J. F. Drake, Magnetic reconnection: dynamics and particle acceleration (invited talk, 40 minutes), Conference on Kinetic Modeling of Astrophysical Plasma, Krakow, Poland, 2008.
129. J. F. Drake, Bistability of collisionless reconnection and spontaneous initiation of reconnection (invited talk, 35 minutes), Workshop on Reconnection in Turbulent Fluid and its Implications, Krakow, Poland, 2008.
130. J. F. Drake, Models for energy and particle acceleration during magnetic reconnection in solar eruptions (invited talk, 30 minutes), 37th COSPAR Scientific Assembly, Montreal, Canada, 2008.
131. J. F. Drake, Ion pickup and acceleration in magnetic reconnection exhausts (invited talk, 30 minutes), 2008 Shine Workshop, Midway, Utah, 2008.
132. J. F. Drake, The multiscale physics of magnetic reconnection (invited review, 30 minutes), Fall 2008 Meeting of the American Geophysical Union, San Francisco, CA, 2008.
133. J. F. Drake, Ion acceleration during magnetic reconnection (invited talk, 30 minutes), International Conference on Modern Challenges in Nonlinear Plasma Physics, Thessaloniki, Greece, 2009.
134. J. F. Drake, Ion acceleration and abundance enhancements in impulsive flares (invited review talk, 30 minutes), 2009 Shine Workshop, Wolfville, NH, 2009.
135. J. F. Drake, A reconnection mechanism for the generation of anomalous cosmic rays (invited talk, 30 minutes), 2009 US-Japan Workshop on Magnetic Reconnection, Madison, Wisconsin, 2009.



136. J. F. Drake, A reconnection mechanism for the generation of anomalous cosmic rays (invited talk, 30 minutes), Mini-conference on Unsteady Reconnection, Atlanta, GA, 2009.
137. J. F. Drake, Particle heating and acceleration in magnetic reconnection (invited review talk, 40 minutes), Magnetic Reconnection: an interdisciplinary workshop, Yosemite, CA, 2010.
138. J. F. Drake, Heating and particle acceleration during magnetic reconnection (invited review talk, 15 minutes), Workshop on Opportunities in Plasma Astrophysics, Princeton, NJ, 2010.
139. J. F. Drake, Reconnection and particle acceleration in the outer heliosphere (invited talk, 25 minutes), 9th Annual International Astrophysics Conference, Maui, Hawaii, 2010.
140. J. F. Drake, Ion acceleration in the outer heliosphere and streamer belt (invited talk, 50 minutes), ISSI workshop on Observations and Theories of Suprathermal Tails and Anomalous Cosmic Rays in the Heliosphere and Heliosheath, Bern, Switzerland, 2010.
141. J. F. Drake, Particle acceleration during magnetic reconnection (invited review talk, 30 minutes), IAU Symposium 274 Advances in Plasma Astrophysics, Giardini-Naxos, Italy, 2010.
142. J. F. Drake, A Multi-island Mechanism for Particle Acceleration during Magnetic Reconnection in Solar Eruptions (invited talk, 15 minutes), 38th Cospar Scientific Assembly, Bremen, Germany, 2010.
143. J. F. Drake, Particle Acceleration during Magnetic Reconnection (invited review talk, 60 minutes), Workshop on Kinetic Reconnection, Isaac Newton Institute for Mathematical Sciences, Cambridge, U. K., 2010.
144. J. F. Drake, Breaking field lines during reconnection: it's anomalous viscosity not anomalous resistivity (invited talk, 40 minutes), Workshop on Kinetic Reconnection, Isaac Newton Institute for Mathematical Sciences, Cambridge, U. K., 2010.
145. J. F. Drake, The physics of magnetic reconnection and associated particle acceleration (Plenary review talk, 60 minutes), 52nd Annual Meeting of the Division of Plasma Physics, Chicago, Illinois, 2010.
146. J. F. Drake, Breaking field lines during reconnection: it's anomalous viscosity not anomalous resistivity (invited talk, 25 minutes), MMS Science Working Group Meeting, St. Michaels, MD, 2010.
147. J. F. Drake, Magnetic Reconnection and Associated Particle Acceleration (Keynote Invited Talk, 60 minutes), Bay Area Center for Heliosphysics Workshop on Reconnection, Berkeley, CA, 2010.

148. J. F. Drake, A multi-island mechanism for particle acceleration during magnetic reconnection in solar flares (invited talk, 20 minutes), 2010 RHESSI Workshop, Annapolis, MD, 2010.
149. J. F. Drake, Is the magnetic field in the outer heliosphere laminar? (invited talk, 25 minutes), 10th Annual International Astrophysics Conference, Maui, Hawaii, 2011.
150. J. F. Drake, Magnetic Reconnection and Particle Acceleration in the Outer Heliosphere (Invited talk, 30 minutes), ISSI Workshop on particle acceleration in cosmic plasmas, Bern, Switzerland, 2011.
151. J. F. Drake, The physics of magnetic reconnection and particle acceleration (invited review talk, 45 minutes), 11th International Workshop on the Interrelationship between Plasma Experiments in Laboratory and Space (IPELS), Whistler, BC, CA, 2011.
152. J. F. Drake, The scaling of magnetic reconnection in large systems (invited talk, 20 minutes), Bengt U O Sonnerup Symposium, Dartmouth College, Hanover, NH, 2011.
153. Ion heating acceleration during reconnection (invited talk, 40 minutes), Center for Magnetic Self-Organization General Meeting, University of New Hampshire, Durham, NH, 2011.
154. J. F. Drake, The role of kinetic Alfvén waves on magnetic reconnection (invited talks, 30 minutes), Symposium on Plasma Theory, UC Irvine, Irvine, CA, 2012.
155. J. F. Drake, An overview of magnetic reconnection and associated particle acceleration (invited review, 40 minutes), Workshop on Computational Challenges in Magnetized Plasma, Institute for Pure and Applied Mathematics, UCLA, 2012.
156. J. F. Drake, A magnetic reconnection mechanism for ion acceleration and abundance enhancements in impulsive flares, 11th International Astrophysics Conference, Palm Springs, CA, 2012.
157. J. F. Drake, A magnetic reconnection mechanism for ion acceleration and abundance enhancements in impulsive flares (invited talk, 30 minutes), US-Japan Workshop on Magnetic Reconnection, Princeton, NJ, 2012.
158. J. F. Drake, A magnetic reconnection mechanism for ion acceleration and abundance enhancements in impulsive flares (invited talk, 25 minutes), 39th COSPAR Scientific Assembly, Mysore, India, 2012.
159. J. F. Drake, Magnetic reconnection in the heliosheath and its signatures and consequences (invited talk, 25 minutes), 39th COSPAR Scientific Assembly, Mysore, India, 2012.

160. J. F. Drake, A reconnection mechanism for the generation of anomalous cosmic rays (invited talk, 30 minutes), 39th COSPAR Scientific Assembly, Mysore, India, 2012.
161. J. F. Drake, Magnetic Reconnection and Particle Acceleration – A review (invited review talk, 30 minutes), XXVIII International Astronomical Union General Assembly, Beijing, China, 2012.
162. J. F. Drake, Magnetic reconnection in the heliosheath and its signatures and consequences (invited talk, 30 minutes), XXVIII International Astronomical Union General Assembly, Beijing, China, 2012.
163. J. F. Drake, The structure of the heliopause (invited talk, 40 minutes), ISSI Working Group on the structure of the heliopause, Bern, Switzerland, 2012.
164. J. F. Drake, Particle Acceleration during multi-island magnetic reconnection (invited talk, 20 minutes), Mini-Conference on Flux Ropes and 3D Dynamics, Providence, RI, 2012.
165. J. F. Drake, Magnetic reconnection and particle acceleration (invited review, 30 minutes), JSI Conference on Nature's Particle Accelerators, Annapolis, MD, 2012.
166. J. F. Drake, Magnetic reconnection in the heliosheath and the generation of anomalous cosmic rays (invited talk, 15 minutes), Fall AGU Meeting, San Francisco, CA, 2012.
167. J. F. Drake, Magnetic reconnection and particle acceleration (invited talk, 30 minutes), 12th International Astrophysics Conference, Myrtle Beach, SC, 2013.
168. J. F. Drake, A porous, layered heliopause (invited talk, 45 minutes), Workshop on the Heliopause, International Space Science Institute, Bern, Switzerland.
169. J. F. Drake, The impact of pressure anisotropy on magnetic reconnection and particle acceleration (invited talk, 45 minutes) International Conference on the Stability, Energetics, and Turbulent Transport in Astrophysical, Fusion, and Solar Plasmas: Unifying Theoretical and Computational Tools, Princeton University, NJ, 2013.
170. J. F. Drake, Multi X-line magnetic reconnection and particle acceleration (invited talk, 30 minutes), the 11th International School/Symposium for Space Simulations, National Central University, Taiwan, 2013.
171. J. F. Drake, Magnetic Reconnection: explosions in space and astrophysical plasma (invited review talk, 60 minutes), the 11th International School/Symposium for Space Simulations, National Central University, Taiwan, 2013.

172. J. F. Drake, Magnetic reconnection and particle acceleration (invited talk, 25 minutes), KAVLI@10: Big Questions in Particle Astrophysics and Cosmology, Stanford University, CA, 2013.
173. J. F. Drake, Signatures of magnetic reconnection in the heliosheath (Invited Talk, 30 minutes), International Conference on Astrophysics, Myrtle Beach, Florida, 2014.
174. J. F. Drake, Ion heating in the strong guide field limit (Invited Talk, 40 minutes), International Space Science Institute Working Group on Electron and Ion Heating during Magnetic Reconnection, Bern, Switzerland, 2014.
175. J. F. Drake, Multi X-line magnetic reconnection and particle acceleration (Invited Talk, 30 minutes), US-Japan Workshop on Magnetic Reconnection, Tokyo, Japan, 2014.
176. J. F. Drake, Multi X-line magnetic reconnection and particle acceleration (Invited Talk, 30 minutes), Workshop on Relativistic Plasma Astrophysics, Purdue University, 2014.
177. J. F. Drake, Magnetic Reconnection: progress and outstanding issues (Keynote Review, 40 minutes), Royal Astronomical Society Specialists Meeting on “Magnetic Reconnection: Where Now and Where Next?”, London, UK, 2014.
178. , J. F. Drake, Mechanisms for Particle Acceleration and Heating in Multi-island Magnetic Reconnection, (invited talk, 15 minutes), Fall AGU Meeting, San Francisco, CA, 2014.
179. J. F. Drake, Double Layers, Electron Heat Flux Suppression and Driving the Solar Wind (Invited Talk, 30 minutes), Solar Probe Plus Science Working Group Meeting, Johns Hopkins University Applied Physics Laboratory, Laurel, MD, 2015.
180. J. F. Drake, Magnetic Reconnection: progress and outstanding issues (Keynote Review, 40 minutes), Royal Astronomical Society Specialists Meeting on “Magnetic Reconnection: Where Now and Where Next?”, London, UK, 2014.
181. , J. F. Drake, Mechanisms for Particle Acceleration and Heating in Multi-island Magnetic Reconnection, (invited talk, 15 minutes), Fall AGU Meeting, San Francisco, CA, 2014.
182. J. F. Drake (Invited Talk, 30 minutes), Electron acceleration during reconnection with a guide field: a comparison of 2D and 3D results, MMS Science Working Group Meeting, Cocoa Beach, Florida, 2015.
183. J. F. Drake, An analytic model of the outer heliosphere (Invited Talk, 45 minutes), Workshop on the Outer Heliosphere, International Space Science Institute, Bern, Switzerland, 2015.

184. J. F. Drake, Electron acceleration during reconnection with a guide field: a comparison of 2D and 3D results (Invited Talk, 45 minutes), Working Group on Electron and Ion Heating during Magnetic Reconnection, International Space Science Institute, Bern, Switzerland, 2015.
185. J. F. Drake, Magnetic reconnection and particle acceleration in the corona (Invited Talk, 30 minutes), 14th RHESSI Workshop, Newark, NJ, 2015.
186. J. F. Drake, The emerging understanding of magnetic reconnection through laboratory experiments, theory and modeling and satellite measurements (Invited Review Talk, 30 minutes), IAU General Assembly, Honolulu, Hawaii, 2015.
187. J. F. Drake, Magnetic Reconnection: A tutorial (Invited Tutorial Talk, 30 minutes), Chapman Conference on Magnetospheric Dynamics, Fairbanks, Alaska, 2015.
188. J. F. Drake, Signatures of Magnetic Reconnection in the Heliosheath (Invited Talk, 45 minutes), Workshop on the Outer Heliosphere, International Space Science Institute, Bern, Switzerland, 2015.
189. J. F. Drake, Magnetic Reconnection and Electron Acceleration in Flares (Invited Talk, 30 minutes), Workshop on Solar Eruptive Events, GSFC, Greenbelt, MD, 2015.
190. J. F. Drake, Magnetic Reconnection and Electron Acceleration (Invited Talk, 30 minutes), APS Mid-Atlantic Section Meeting, Morgantown, WVA, 2015.
191. J. F. Drake, Electron and ion heating and acceleration during reconnection (Invited Talk, 30 minutes), Mini-Conference on Plasma Energization Interactions between Fluid and Kinetic Scales, Savannah, GA, 2015.
192. J. F. Drake, A model of the heliosphere with jets (Invited Talk, 15 minutes), AGU Fall Meeting, San Francisco, CA, 2015.
193. J. F. Drake, Electron and ion heating, acceleration and energy partition during magnetic reconnection: a tutorial (Invited Tutorial Review Talk, 45 minutes), 2016 US-Japan Conference on Magnetic Reconnection, Napa, CA, 2016.
194. J. F. Drake, Particle Acceleration during 2D and 3D Magnetic Reconnection (Invited Talk, 25 minutes), Second Purdue Workshop on Relativistic Astrophysics, Purdue University, West Lafayette, IN, 2016.
195. J. F. Drake, Electron Acceleration in 2D and 3D Magnetic Reconnection (Invited Talk, 25 minutes), Astronom 2016: the 11th international conference on numerical modeling of space plasma flows, Monterey, CA, 2016.
196. J. F. Drake, Development of Turbulence during Asymmetric Magnetic Reconnection (Invited Talk, 15 minutes), MMS Science Working Group Meeting, Uppsala, Sweden, 2016.

197. J. F. Drake, The structure and stability of heliospheric jets (Invited Talk, 30 minutes), 15th Annual International Astrophysics Conference, Cape Coral, Florida, 2016.
198. J. F. Drake, Plasma heating and particle acceleration during magnetic reconnection (Invited Tutorial, 60 minutes), International Summer School on Magnetic Reconnection in Space and Laboratory Plasma, Kunming, China, 2016.
199. J. F. Drake, 3D Reconnection at the Magnetopause Relevant to MMS (Invited Talk, 30 minutes), International Summer School on Magnetic Reconnection in Space and Laboratory Plasma, Kunming, China, 2016.
200. J. F. Drake, Mechanisms for particle heating in flares (Invited Talk, 30 minutes), Solar Probe Plus Science Working Group Meeting, Washington DC, 2016.
201. J. F. Drake, Magnetic reconnection, electron acceleration and MMS (Invited Talk, 30 minutes), 20th Anniversary NSF/DOE Plasma Partnership Workshop, Arlington, VA, 2017.
202. J. F. Drake, The structure of turbulence in 3D magnetic reconnection at the magnetopause (Invited Talk, 15 minutes), MMS Science Working Group Meeting, Key West, Florida, 2017.
203. J. F. Drake, Electron and ion heating, acceleration and energy partition during magnetic reconnection (Invited Review Talk, 60 minutes), International Sherwood Theory Meeting, Annapolis, MD, 2017.
204. J. F. Drake, Electron and ion heating, acceleration and energy partition during magnetic reconnection (Invited Talk, 30 minutes), meeting on Advancing Plasma Physics from the Sun to the Earth, Breckenridge, CO, 2017.
205. J. F. Drake, Electron and ion heating, acceleration and energy partition during magnetic reconnection (Invited Plenary Review, 45 minutes), 2017 Shine Workshop, Montreal, CA, 2017.
206. J. F. Drake, Whistler driven dissipation during magnetic reconnection at the magnetopause (Invited Talk, 30 minutes), AGU Chapman Conference on Dayside Magnetosphere Interactions, Chengdu, China, 2017.
207. J. F. Drake (with G. R. Roberg-Clark), Suppression of electron thermal conduction in the high-beta intracluster medium of galaxy clusters (Invited Talk, 25 minutes), Snowcluster 2018: the physics of galaxy clusters, Snowbird, Utah, 2018.
208. J. F. Drake, Mechanisms for electron acceleration in reconnection and implications for exploring energetic particle production in macro-scale systems (Invited Talk, 30 minutes), Third Purdue University Workshop on Relativistic Astrophysics, West Lafayette, Indiana, 2018.

209. J. F. Drake, 3D Simulations of a MMS magnetopause reconnection event with a strong guide field (Invited Talk, 20 minutes), COSPAR Scientific Assembly, Pasadena, CA, 2018.
210. J. F. Drake, Exploring magnetic reconnection with the Parker Solar Probe (Invited Scene Setting Talk, 30 minutes), Shine Meeting, Cocoa Beach, Florida, 2018.
211. J. F. Drake, A new MHD/kinetic model for exploring particle acceleration in macro-scale systems (Invited Talk, 30 minutes), Magnetic Reconnection 2018 Workshop, Princeton University, Princeton, NJ, 2018.
212. J. F. Drake, Training students in plasma astrophysics and scientific computation at the University of Maryland (Invited Talk, 30 minutes), Workshop on Maximizing the Scientific Return of NASA Data, Washington DC, 2018.
213. J. F. Drake, A new MHD/kinetic model for exploring particle acceleration in macro-scale systems (Invited Talk, 30 minutes), Workshop on Particle Acceleration and Transport: from the Sun to Extragalactic Sources, Calabria, Italy, 2018.
214. J. F. Drake, Ion acceleration and the development of turbulence during 3D magnetic reconnection in impulsive flares (Invited Talk, 20 minutes), 2018 Fall AGU Meeting, Washington DC, 2018.
215. J. F. Drake, Ion acceleration in impulsive flares (Invited Talk, 45 minutes), International Space Science Institute Working Group Meeting on the Origins of  $^3\text{He}$ -Rich Solar Energetic Particles, Bern, Switzerland, 2019.
216. J. F. Drake, Energy dissipation and particle acceleration during reconnection (Invited Talk, 30 minutes), MMS Community Science Workshop, Yosemite, CA, 2019.