

Dated April, 2020

Michael Shay

(302) 831 - 2677

---

Department of Physics & Astronomy, 217 Sharp Lab, University of Delaware, Newark, DE 19716, shay@udel.edu

**Birth date** April 18, 1970

**Education** **Ph.D., Plasma Physics, 1998**  
University of Maryland College Park, MD 20742  
Graduate Advisor: James Drake

**B.A., Physics, with Honors, 1992**  
Grinnell College Grinnell, IA 50112

**Work History**

Professor 2014 to present	Department of Physics & Astronomy University of Delaware
Associate Professor 2010 to present	Department of Physics & Astronomy University of Delaware
Assistant Professor 2005 to 2010	Department of Physics & Astronomy University of Delaware
Assistant Research Scientist 2003 to 2005	Institute for Research in Electronics and Applied Physics University of Maryland
Research Associate 1999 to 2003	Institute for Research in Electronics and Applied Physics University of Maryland

**Honors and Awards**

**2015 Fellow, American Physical Society.**  
**2011 Excellence in Scholarship Award:** College of Arts and Sciences, University of Delaware.  
**2008 Francis Alison Society Young Scholars Award:** Given to one assistant professor at the University of Delaware each year to recognize "outstanding academic achievements" at the beginning of his/her academic career.  
**National Science Foundation Faculty Early Career Award,** five years, \$470,000, March, 2007.  
**Research Associateship,** National Research Council, July, 1999.  
**Outstanding Student Paper,** American Geophysical Union, December, 1998.  
**Best TA Award,** Physics Department, University of Maryland, 1994.  
**Phi Beta Kappa,** 1992.

## Refereed Publications (123 total)

- **Google Scholar h-index = 49**,  $\approx 10,500$  citations,  $\approx 85$  citations/article

Source: Google Scholar Profile for Prof. Shay

<https://scholar.google.com/citations?hl=en&user=86X9YxgAAAAJ>

- **Web of Science: h-index = 44**,  $\approx 8000$  citations,  $\approx 65$  citations/article

Note: Copies of these publications are available at:

<http://www.physics.udel.edu/~shay/papers/index.html>

1. Adhikari, S., M. A. Shay, T. N. Parashar, P. Sharma Pyakurel, W. H. Matthaeus, D. Godzieba, J. E. Stawarz, J. P. Eastwood, and J. T. Dahlin, "Reconnection from a Turbulence Perspective," *Physics of Plasmas*, In Press, 2020.
2. Phan, T. D., S. D. Bale, J. P. Eastwood, B. Lavraud, J. F. Drake, M. Oieroset, M. A. Shay, M. Pulupa, M. Stevens, R. J. MacDowall, A. W. Case, D. Larson, J. Kasper, P. Whittlesey, A. Szabo, K. E. Korreck, J. W. Bonnell, T. D. de Wit, K. Goetz, P. R. Harvey, T. S. Horbury, R. Livi, D. Malaspina, K. Paulson, N. E. Raouafi, and M. Velli, "Parker Solar Probe In Situ Observations of Magnetic Reconnection Exhausts during Encounter 1," *The Astrophysical Journal Supplement Series*, Vol. 246,34, 2020, doi:10.3847/1538-4365/ab55ee.
3. Liang, H., P. A. Cassak, S. Servidio, M. A. Shay, J. F. Drake, M. Swisdak, M. R. Argall, J. C. Dorelli, E. E. Scime, W. H. Matthaeus, V. Roytershteyn, and G. L. Delzanno, "Decomposition of Plasma Kinetic Entropy into Position and Velocity Space and the Use of Kinetic Entropy in Particle-in-Cell Simulations," *Physics of Plasmas*, Vol. 26, 082903, 2019, doi:10.1063/1.5098888.
4. Ergun, R. E., S. Hoilijoki, N. Ahmadi, S. J. Schwartz, F. D. Wilder, J. F. Drake, M. Hesse, M. A. Shay, H. Ji, M. Yamada, D. B. Graham, P. A. Cassak, M. Swisdak, J. L. Burch, R. B. Torbert, J. C. Holmes, J. E. Stawarz, K. A. Goodrich, S. Eriksson, R. J. Strangeway, and O. LeContel, "Magnetic Reconnection in Three Dimensions: Modeling and Analysis of Electromagnetic Drift Waves in the Adjacent Current Sheet," *Journal of Geophysical Research*, Vol. 124, p. 10,085, 2019, doi:10.1029/2019JA027275.
5. Sharma Pyakurel, P., M. A. Shay, T. D. Phan, W. H. Matthaeus, J. F. Drake, J. M. Tenborge, C. C. Haggerty, K. Klein, P. A. Cassak, T. N. Parashar, M. Swisdak, and A. Chasapis, "Transition from ion-coupled to electron-only reconnection: Basic physics and implications for plasma turbulence," *Physics of Plasmas*, Vol. 26, 082307, 2019; doi:10.1063/1.5090403
6. Stawarz, J. E., J. P. Eastwood, T. D. Phan, I. L. Gingell, M. A. Shay, J. L. Burch, R. E. Ergun, B. L. Giles, D. J. Gershman, O. Le Contel, P.-A. Lindqvist, C. T. Russell, R. J. Strangeway, R. B. Torbert, M. R. Argall, D. Fischer, W. Magnes, and L. Franci, "Properties of the Turbulence Associated with Electron-only Magnetic Reconnection in Earth's Magnetosheath," *The Astrophysical Journal*, Vol. 877, L37, 2019, doi:10.3847/2041-8213/ab21c8
7. Oieroset, M., T. D. Phan, J. F. Drake, J. P. Eastwood, S. A. Fuselier, R. J. Strangeway, C. Haggerty, M. A. Shay, M. Oka, S. Wang, L.-J. Chen, I. Kacem, B. Lavraud, V. Angelopoulos, J. L. Burch, R. B. Torbert, R. E. Ergun, Y. Khotyaintsev, P. A. Lindqvist, D. J. Gershman, B. L. Giles, C. Pollock, T. E. Moore, C. T. Russell, Y. Saito, L. A. Avanov, W. Paterson, "Reconnection With Magnetic Flux Pileup at The Interface Of Converging Jets At The Magnetopause," *Geophysical Research Letters*, 46, 1937, 2019, doi.org/ 10.1029/2018GL080994
8. Torbert, R. B., J. L. Burch, T. D. Phan, M. Hesse, M. R. Argall, J. Shuster, R. E. Ergun, L. Alm, R. Nakamura, K. J. Genestreti, D. J. Gershman, W. R. Paterson, D. L. Turner, I. Cohen, B. L. Giles, C. J. Pollock, S. Wang, L.-J. Chen, J. E. Stawarz, J. P. Eastwood, K. J. Hwang, C. Farrugia, I. Dors, H. Vaith, C. Mouikis, A. Ardakani, B. H. Mauk, S. A. Fuselier,

- C. T. Russell, R. J. Strangeway, T. E. Moore, J. F. Drake, M. A. Shay, Y. V. Khotyaintsev, P.-A. Lindqvist, W. Baumjohann, F. D. Wilder, N. Ahmadi, J. C. Dorelli, L. A. Avanov, M. Oka, D. N. Baker, J. F. Fennell, J. B. Blake, A. N. Jaynes, O. Le Contel, S. M. Petrinec, B. Lavraud, and Y. Saito, “Electron-scale dynamics of the diffusion region during symmetric magnetic reconnection in space,” *Science*, 362, 1391, 2018, doi:10.1126/science.aat2998.
9. Parashar, T. N., A. Chasapis, R. Bandyopadhyay, R. Chhiber, W. H. Matthaeus, B. Maruca, M. A. Shay, J. L. Burch, T. E. Moore, B. L. Giles, D. J. Gershman, C. J. Pollock, R. B. Torbert, C. T. Russell, R. J. Strangeway, and V. Roytershteyn, “Kinetic Range Spectral Features of Cross Helicity Using the Magnetospheric Multiscale Spacecraft,” *Physical Review Letters*, 121, 265101, 2018, doi:10.1103/PhysRevLett.121.265101.
  10. Bandyopadhyay, R., A. Chasapis, R. Chhiber, T. N. Parashar, W. H. Matthaeus, M. A. Shay, B. A. Maruca, J. L. Burch, T. E. Moore, C. J. Pollock, B. L. Giles, W. R. Paterson, J. Dorelli, D. J. Gershman, R. B. Torbert, C. T. Russell, and R. J. Strangeway, “Incompressive Energy Transfer in the Earth’s Magnetosheath: Magnetospheric Multiscale Observations,” *The Astrophysical Journal*, 866, 106, 2018, doi:10.3847/1538-4357/aade04.
  11. Maruca, B. A., A. Chasapis, S. P. Gary, R. Bandyopadhyay, R. Chhiber, T. N. Parashar, W. H. Matthaeus, M. A. Shay, J. L. Burch, T. E. Moore, C. J. Pollock, B. J. Giles, W. R. Paterson, J. Dorelli, D. J. Gershman, R. B. Torbert, C. T. Russell, and R. J. Strangeway, “MMS Observations of Beta-dependent Constraints on Ion Temperature Anisotropy in Earth’s Magnetosheath,” *The Astrophysical Journal*, 866, 25, 2018, doi:10.3847/1538-4357/aaddfb.
  12. Parashar, T. N., W. H. Matthaeus, and M. A. Shay, “Dependence of Kinetic Plasma Turbulence on Plasma  $\beta$ ,” *The Astrophysical Journal*, 864, L21, 2018, doi:10.3847/2041-8213/aadb8b.
  13. Eastwood, J. P., R. Mistry, T. D. Phan, S. J. Schwartz, R. E. Ergun, J. F. Drake, M. Øieroset, J. E. Stawarz, M. V. Goldman, C. Haggerty, M. A. Shay, J. L. Burch, D. J. Gershman, B. L. Giles, P. A. Lindqvist, R. B. Torbert, R. J. Strangeway, and C. T. Russell, “Guide Field Reconnection: Exhaust Structure and Heating,” *Geophysical Research Letters*, 45, 4569, 2018, doi:10.1029/2018GL077670.
  14. Haggerty, C. C., M. A. Shay, A. Chasapis, T. D. Phan, J. F. Drake, K. Malakit, P. A. Cassak, and R. Kieokaew, “The reduction of magnetic reconnection outflow jets to sub-Alfvénic speeds,” *Physics of Plasmas*, 25, 102120, 2018, doi:10.1063/1.5050530.
  15. Liu, Y.-H., M. Hesse, P. A. Cassak, M. A. Shay, S. Wang, and L.-J. Chen, “On the Collisionless Asymmetric Magnetic Reconnection Rate,” *Geophysical Research Letters*, Vol. 45, 3311, 2018, doi:10.1002/2017GL076460.
  16. Phan, T. D., J. P. Eastwood, M. A. Shay, J. F. Drake, B. U. Öumlü, Sonnerup, M. Fujimoto, P. A. Cassak, M. Øieroset, J. L. Burch, R. B. Torbert, A. C. Rager, J. C. Dorelli, D. J. Gershman, C. Pollock, P. S. Pyakurel, C. C. Haggerty, Y. Khotyaintsev, B. Lavraud, Y. Saito, M. Oka, R. E. Ergun, A. Retino, O. Le Contel, M. R. Argall, B. L. Giles, T. E. Moore, F. D. Wilder, R. J. Strangeway, C. T. Russell, P. A. Lindqvist, and W. Magnes, “Electron magnetic reconnection without ion coupling in Earth’s turbulent magnetosheath,” *Nature*, Vol. 557, p. 202, 2018, doi:10.1038/s41586-018-0091-5.
  17. Burch, J. L., R. E. Ergun, P. A. Cassak, J. M. Webster, R. B. Torbert, B. L. Giles, J. C. Dorelli, A. C. Rager, K.-J. Hwang, T. D. Phan, K. J. Genestreti, R. C. Allen, L.-J. Chen, S. Wang, D. Gershman, O. Le Contel, C. T. Russell, R. J. Strangeway, F. D. Wilder, D. B. Graham, M. Hesse, J. F. Drake, M. Swisdak, L. M. Price, M. A. Shay, P.-A. Lindqvist, C. J. Pollock, R. E. Denton, and D. L. Newman, “Localized Oscillatory Energy Conversion in Magnetopause Reconnection,” *Geophysical Research Letters*, Vol. 45, p. 1237, 2018, doi:10.1002/2017GL076809.
  18. M. A. Shay, C. C. Haggerty, W. H. Matthaeus, T. N. Parashar, M. Wan, and P. Wu, “Turbulent heating due to magnetic reconnection,” *Physics of Plasmas*, Vol. 25, 012304, 2018, doi:10.1063/1.4993423

19. C. C. Haggerty, T. N. Parashar, W. H. Matthaeus, M. A. Shay, Y. Yang, M. Wan, P. Wu, and S. Servidio, "Exploring the statistics of magnetic reconnection X-points in Kinetic Particle-in-Cell (PIC) Turbulence," *Physics of Plasmas*, 24, 102308, 2017, doi:10.1063/1.5001722.
20. Sharma Pyakurel, P., M. A. Shay, C. C. Haggerty, T. N. Parashar, J. F. Drake, P. A. Cassak, and S. P. Gary, "Super-Alfvénic Propagation and Damping of Reconnection Onset Signatures," *Journal of Geophysical Research (Space Physics)*, Vol. 123, p. 341, 2018, doi:10.1002/2017JA024606.
21. Cassak, P. A., 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," *Journal of Geophysical Research (Space Physics)*, Vol. 122, p. 11, 2017, doi:10.1002/2017JA024555.
22. Cassak, P. A., Y.-H. Liu, and M. A. Shay, "A review of the 0.1 reconnection rate problem," *Journal of Plasma Physics*, Vol. 83, 715830501, 2017, doi:10.1017/S0022377817000666.
23. Shepherd, L. S., 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," *The Astrophysical Journal*, Vol. 848, p. 90, 2017, doi:10.3847/1538-4357/aa9066.
24. M. Øieroset, T. D. Phan, M. A. Shay, C. C. Haggerty, M. Fujimoto, V. Angelopoulos, J. P. Eastwood, and F. S. Mozer, "THEMIS multispacecraft observations of a reconnecting magnetosheath current sheet with symmetric boundary conditions and a large guide field," *Geophysical Research Letters*, Vol. 44, p. 75987606, 2017, doi:10.1002/2017GL074196.
25. Dargent, J., N. Aunai, B. Lavraud, S. Toledo-Redondo, M. A. Shay, P. A. Cassak, and K. Malakit, "Kinetic simulation of asymmetric magnetic reconnection with cold ions," *Journal of Geophysical Research*, 122, 5290, 2017, doi:10.1002/2016JA023831
26. Ek-in, S., K. Malakit, D. Ruffolo, M. A. Shay, P. A. Cassak, "Effects of a Guide Field on the Larmor Electric Field and Upstream Electron Anisotropy in Collisionless Asymmetric Magnetic Reconnection," *Astrophysical Journal*, Vol. 845, p. 113, 2017, <https://doi.org/10.3847/1538-4357/aa7f2c>
27. Ergun, R. E., L.-J. Chen, F. D. Wilder, N. Ahmadi, S. Eriksson, M. E. Usanova, K. A. Goodrich, J. C. Holmes, A. P. Sturmer, D. M. Malaspina, D. L. Newman, R. B. Torbert, M. R. Argall, P.-A. Lindqvist, J. L. Burch, J. M. Webster, J. F. Drake, L. Price, P. A. Cassak, M. Swisdak, M. A. Shay, D. B. Graham, R. J. Strangeway, C. T. Russell, B. L. Giles, J. C. Dorelli, D. Gershman, L. Avanov, M. Hesse, B. Lavraud, O. Le Contel, A. Retino, T. D. Phan, M. V. Goldman, J. E. Stawarz, S. J. Schwartz, J. P. Eastwood, K.-J. Hwang, R. Nakamura, and S. Wang, "Drift waves, intense parallel electric fields, and turbulence associated with asymmetric magnetic reconnection at the magnetopause," *Geophysical Research Letters*, 44, 2978, 2017, DOI:10.1002/2016GL072493.
28. Stawarz, J. E., J. P. Eastwood, A. Varsani, R. E. Ergun, M. A. Shay, R. Nakamura, T. D. Phan, J. L. Burch, D. J. Gershman, B. L. Giles, K. A. Goodrich, Y. V. Khotyaintsev, P.-A. Lindqvist, C. T. Russell, R. J. Strangeway, and R. B. Torbert, "Magnetospheric Multiscale analysis of intense field-aligned Poynting flux near the Earth's plasma sheet boundary," *Geophysical Research Letters*, Vol. 44, p. 7106, 2017, doi:10.1002/2017GL073685.
29. Liu, Y., M. Hesse, F. Guo, W. Daughton, H. Li, P. A. Cassak, and M. A. Shay, "Why does steady-state magnetic reconnection have a maximum local rate of order 0.1?" *Physical Review Letters*, 118, 085101, 2017, DOI: 10.1103/PhysRevLett.118.085101.
30. Mistry, R., J. P. Eastwood, C. C. Haggerty, M. A. Shay, T. D. Phan, H. Hietala, and P. A. Cassak, "Observations of Hall Reconnection Physics Far Downstream of the X Line," *Physical Review Letters*, 117, 185102, 2016, doi:10.1103/PhysRevLett.117.185102.

31. Phan, T. D., M. A. Shay, C. C. Haggerty, J. T. Gosling, J. P. Eastwood, M. Fujimoto, K. Malakit, F. S. Mozer, P. A. Cassak, M. Oieroset, and V. Angelopoulos, "Ion Larmor radius effects near a reconnection X line at the magnetopause: THEMIS observations and simulation comparison," *Geophysical Research Letters*, Vol. 43, 2016, doi:10.1002/2016GL070224.
32. Phan, T. D., J. P. Eastwood, P. A. Cassak, M. Oieroset, J. T. Gosling, D. J. Gershman, F. S. Mozer, M. A. Shay, M. Fujimoto, W. Daughton, J. F. Drake, J. L. Burch, R. B. Torbert, R. E. Ergun, L. J. Chen, S. Wang, C. Pollock, J. C. Dorelli, B. Lavraud, B. L. Giles, T. E. Moore, Y. Saito, L. A. Avanov, W. Paterson, R. J. Strangeway, C. T. Russell, Y. Khotyaintsev, P. A. Lindqvist, M. Oka, F. D. Wilder, "MMS observations of electron-scale filamentary currents in the reconnection exhaust and near the X line," *Geophysics Research Letters*, Vol. 43, p. 6060, 2016, doi:10.1002/2016GL069212
33. Øieroset, M., T. D. Phan, C. Haggerty, M. A. Shay, J. P. Eastwood, D. J. Gershman, J. F. Drake, M. Fujimoto, R. E. Ergun, F. S. Mozer, M. Oka, R. B. Torbert, J. L. Burch, S. Wang, L. J. Chen, M. Swisdak, C. Pollock, J. C. Dorelli, S. A. Fuselier, B. Lavraud, B. L. Giles, Y. Saito, L. A. Avanov, W. Paterson, R. J. Strangeway, C. T. Russell, Y. Khotyaintsev, P. A. Lindqvist, and K. Malakit, "MMS observations of large guide field symmetric reconnection between colliding reconnection jets at the center of a magnetic flux rope at the magnetopause," *Geophysical Research Letters*, 43, 5536, 2016, doi:10.1002/2016GL069166.
34. Ergun, R. E., K. A. Goodrich, F. D. Wilder, J. C. Holmes, J. E. Stawarz, S. Eriksson, A. P. Sturner, D. M. Malaspina, M. E. Usanova, R. B. Torbert, P.-A. Lindqvist, Y. Khotyaintsev, J. L. Burch, R. J. Strangeway, C. T. Russell, C. J. Pollock, B. L. Giles, M. Hesse, L. J. Chen, G. Lapenta, M. V. Goldman, D. L. Newman, S. J. Schwartz, J. P. Eastwood, T. D. Phan, F. S. Mozer, J. Drake, M. A. Shay, P. A. Cassak, R. Nakamura, and G. Marklund, "Magnetospheric Multiscale Satellites Observations of Parallel Electric Fields Associated with Magnetic Reconnection," *Physical Review Letters*, 116, 235102, 2016 doi:10.1103/PhysRevLett.116.235102.
35. Ergun, R. E., J. C. Holmes, K. A. Goodrich, F. D. Wilder, J. E. Stawarz, S. Eriksson, D. L. Newman, S. J. Schwartz, M. V. Goldman, A. P. Sturner, D. M. Malaspina, M. E. Usanova, R. B. Torbert, M. Argall, P.-A. Lindqvist, Y. Khotyaintsev, J. L. Burch, R. J. Strangeway, C. T. Russell, C. J. Pollock, B. L. Giles, J. J. C. Dorelli, L. Avanov, M. Hesse, L. J. Chen, B. Lavraud, O. Le Contel, A. Retino, T. D. Phan, J. P. Eastwood, M. Oieroset, J. Drake, M. A. Shay, P. A. Cassak, R. Nakamura, M. Zhou, M. Ashour-Abdalla, and M. Andre, "Magnetospheric Multiscale observations of large-amplitude, parallel, electrostatic waves associated with magnetic reconnection at the magnetopause," *Geophysical Research Letters*, 43, 5626, 2016 doi:10.1002/2016GL068992.
36. Eriksson, S., F. D. Wilder, R. E. Ergun, S. J. Schwartz, P. A. Cassak, J. L. Burch, L.-J. Chen, R. B. Torbert, T. D. Phan, B. Lavraud, K. A. Goodrich, J. C. Holmes, J. E. Stawarz, A. P. Sturner, D. M. Malaspina, M. E. Usanova, K. J. Trattner, R. J. Strangeway, C. T. Russell, C. J. Pollock, B. L. Giles, M. Hesse, P.-A. Lindqvist, J. F. Drake, M. A. Shay, R. Nakamura, and G. T. Marklund, "Magnetospheric Multiscale Observations of the Electron Diffusion Region of Large Guide Field Magnetic Reconnection," *Physical Review Letters*, 117, 015001, doi:10.1103/PhysRevLett.117.015001, 2016.
37. Burch, J. L. et al., R. B. Torbert, T. D. Phan, L.-J. Chen, T. E. Moore, R. E. Ergun, J. P. Eastwood, D. J. Gershman, P. A. Cassak, M. R. Argall, S. Wang, M. Hesse, C. J. Pollock, B. L. Giles, R. Nakamura, B. H. Mauk, S. A. Fuselier, C. T. Russell, R. J. Strangeway, J. F. Drake, M. A. Shay, Yu. V. Khotyaintsev, P.-A. Lindqvist, G. Marklund, F. D. Wilder, D. T. Young, K. Torkar, J. Goldstein, J. C. Dorelli, L. A. Avanov, M. Oka, D. N. Baker, A. N. Jaynes, K. A. Goodrich, I. J. Cohen, D. L. Turner, J. F. Fennell, J. B. Blake, J. Clemmons, M. Goldman, D. Newman, S. M. Petrinc, K. J. Trattner, B. Lavraud, P. H. Reiff, W. Baumjohann, W. Magnes, M. Steller, W. Lewis, Y. Saito, V. Coffey and M. Chandler, "Electron-scale measurements of magnetic reconnection in space," *Science*, Vol. 352, aaf2939, 2016, doi:10.1126/science.aaf2939

38. Eastwood, J. P., T. D. Phan, P. A. Cassak, D. J. Gershman, C. Haggerty, K. Malakit, M. A. Shay, R. Mistry et al., "Ion-scale secondary flux-ropes generated by magnetopause reconnection as resolved by MMS," *Geophysical Research Letters*, Vol. 43, p. 4716, 2016, doi:10.1002/2016GL068747.
39. Shay, M. A., 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," *Geophysical Research Letters*, Vol. 43, p. 4145, 2016, doi 10.1002/2016GL069034.
40. Haggerty, C. C., M. A. Shay, J. F. Drake, T. D. Phan, and C. T. McHugh, "The competition of electron and ion heating during magnetic reconnection," *Geophysical Research Letters*, Vol. 42, p. 9657, 2015. doi:10.1002/2015GL065961
41. Parashar, T. N., W. H. Matthaeus, M. A. Shay, and M. Wan, "Transition from Kinetic to MHD Behavior in a Collisionless Plasma," *The Astrophysical Journal*, Vol. 811, p. 112, 2015. doi:10.1088/0004-637X/811/2/112
42. Wan, M., W. H. Matthaeus, V. Roytershteyn, H. Karimabadi, T. Parashar, P. Wu, and M. A. Shay, "Intermittent Dissipation and Heating in 3D Kinetic Plasma Turbulence," *Physical Review Letters*, Vol. 114, 175002, 2015. DOI: 10.1103/PhysRevLett.114.175002.
43. Phan, T. D., M. A. Shay, J. P. Eastwood, V. Angelopoulos, M. Oieroset, M. Oka, and M. Fujimoto, "Establishing the Context for Reconnection Diffusion Region Encounters and Strategies for the Capture and Transmission of Diffusion Region Burst Data by MMS," *Space Science Review*, DOI 10.1007/s11214-015-0150-2, Special Issue for MMS Meeting, 2015.
44. Cassak, P. A., R. N. Baylor, R. L. Fermo, M. T. Beidler, M. A. Shay, M. Swisdak, J. F. Drake, and H. Karimabadi, "Fast magnetic reconnection due to anisotropic electron pressure," *Physics of Plasmas*, 22, 020705 (2015); doi: 10.1063/1.4908545
45. Shay, M. A., C. C. Haggerty, T. D. Phan, J. F. Drake, P. A. Cassak, P. Wu, M. Oieroset, M. Swisdak, and K. Malakit (2014), "Electron heating during magnetic reconnection: A simulation scaling study," *Physics of Plasmas*, 21, 122902, doi:10.1063/1.4904203.
46. Phan, T. D., J. F. Drake, M. A. Shay, J. T. Gosling, G. Paschmann, J. P. Eastwood, M. Oieroset, M. Fujimoto, and V. Angelopoulos (2014), "Ion bulk heating in magnetic reconnection exhausts at Earth's magnetopause: Dependence on the inflow Alfvén speed and magnetic shear angle," *Geophysical Research Letters*, 41, 7002, doi:10.1002/2014GL061547.
47. Matthaeus, W. H., S. Oughton, K. T. Osman, S. Servidio, M. Wan, S. P. Gary, M. A. Shay, F. Valentini, V. Roytershteyn, H. Karimabadi, and S. C. Chapman (2014), "Nonlinear and Linear Timescales near Kinetic Scales in Solar Wind Turbulence," *The Astrophysical Journal*, 790, 155, doi:10.1088/0004-637X/790/2/155.
48. Eastwood, J. P., Phan, T. D., Oieroset, M. Shay, M. A., Malakit, K., Swisdak, M. M., Drake, J. F., and A. Masters, "Influence of asymmetries and guide fields on the magnetic reconnection diffusion region in collisionless space plasmas," *Plasma Physics and Controlled Fusion*, Vol. 55, 124001, 2013.
49. Phan, T. D., 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," *Geophysical Research Letters*, Vol. 40, 50917, doi:10.1002/grl.50917, 2013.
50. Wu, P., M. Wan, W. H. Matthaeus, M. A. Shay, M. Swisdak, "von Karman Energy Decay and Heating of Protons and Electrons in a Kinetic Plasma," *Physical Review Letters*, Vol. 111, 121105, 2013.
51. Malakit, K., M. A. Shay, P. A. Cassak, and D. Ruffolo, "A New Electric Field in Asymmetric Magnetic Reconnection," *Physical Review Letters*, Vol. 111, 135001, 2013.

52. Cassak, P. A., J. F. Drake, J. T. Gosling, T.-D. Phan, M. A. Shay, and L. S. Shepherd, "On the Cause of Supra-Arcade Downflows," *Astrophysical Journal Letters*, Vol. 775, L14, 2013.
53. Donato, S., S. Servidio, P. Dmitruk, F. Valentini, A. Greco, P. Veltri, M. Wan, M. A. Shay, P. A. Cassak, and W. H. Matthaeus, "Overview on numerical studies of reconnection and dissipation in the solar wind," *AIP Conference Proceedings, Proceedings of Solar Wind 13*, Vol. 1539, p. 99, 2013.
54. Eastwood, J. P., T. D. Phan, J. F. Drake, M. A. Shay, A. L. Borg, and M. G. G. T. Taylor, "Energy partition in magnetic reconnection in Earth's magnetotail," *Physical Review Letters*, Vol. 110, 225001, 2013.
55. Wu, P., S. Perri, K. Osman, M. Wan, W. H. Matthaeus, M. A. Shay, M. L. Goldstein, H. Karimabadi, and S. Chapman, "Intermittent Heating in Solar Wind and Kinetic Simulations," *Astrophysical Journal Letters*, Vol. 763, p. L30, 2013.
56. Karimabadi, H., V. Roytershteyn, M. Wan, W. H. Matthaeus, W. Daughton, P. Wu, M. Shay, B. Loring, J. Borovsky, E. Leonardis, S. Chapman, and T. K. M. Nakamura, "Coherent structures, intermittent turbulence and dissipation in high-temperature plasmas," *Physics of Plasmas*, Vol. 20, 012303, 2013.
57. Wan, M., W. H. Matthaeus, H. Karimabadi, V. Roytershteyn, M. Shay, P. Wu, W. Daughton, B. Loring, and S. C. Chapman, "Intermittent Dissipation at Kinetic Scales in Collisionless Plasma Turbulence," *Physical Review Letters*, Vol. 109, 195001, 2012.
58. Donato, S., S. Servidio, P. Dmitruk, V. Carbone, M. A. Shay, P. A. Cassak, and W. H. Matthaeus, "Reconnection events in two-dimensional Hall magnetohydrodynamics turbulence," *Physics of Plasmas*, Vol. 19, 092307, 2012.
59. Eastwood, J. P., T. -D. Phan, R. C. Fear, D. G. Sibeck, V. Angelopoulos, M. Oieroset, and M. A. Shay, "Survival of flux transfer event (FTE) flux ropes far along the tail magnetopause," *Journal of Geophysical Research*, Vol. 117, A08222, 2012
60. Wu, P., and M. A. Shay, "Magnetotail dipolarization front and associated ion reflection: particle-in-cell simulations," *Geophysical Research Letters*, Vol. 39, L08107, 2012.
61. Øieroset, M., Phan, T. D., Eastwood, J. P., Fujimoto, M., Daughton, W., Shay, M. A., Angelopoulos, V., Mozer, F. S., McFadden, J. P., Larson, D. E., Glassmeier, K.-H., "Direct Evidence for a Three-Dimensional Magnetic Flux Rope Flanked by Two Active Magnetic Reconnection X Lines at Earth's Magnetopause," *Physical Review Letters*, Vol. 107, 165007, 2011.
62. Wu, P., M. A. Shay, T. D. Phan, M. Øieroset, and M. Oka, "Effect of inflow density on ion diffusion region of magnetic reconnection: Particle-in-cell simulations," *Physics of Plasmas*, Vol. 18, 111204, 2011.
63. Servidio, S., Dmitruk, P., Greco, A., Wan, M., Donato, S., Cassak, P. A., Shay, M. A., Carbone, V., Matthaeus, W. H., "Magnetic reconnection as an element of turbulence," *Nonlinear Processes in Geophysics*, Vol. 18, p. 675, 2011.
64. Parashar, T. N., Servidio, S., Shay, M. A., Breech, B., Matthaeus, W. H., "Effect of driving frequency on excitation of turbulence in a kinetic plasma," *Physics of Plasmas*, Vol. 18, 092302, 2011.
65. Baylor, R. N., P. A. Cassak, S. Christe, I. G. Hannah, S. Krucker, D. J. Mullan, M. A. Shay, H. S. Hudson, and R. P. Lin, "Estimates of densities and filling factors from a cooling time analysis of solar microflares observed with RHESSI," *The Astrophysical Journal*, Vol. 736, 75, 2011.
66. Shay, M. A., J. F. Drake, J. P. Eastwood, and T. D. Phan, "Super-Alfvénic propagation of reconnection signatures and Poynting flux during substorms," *Physical Review Letters*, Vol. 107, 065001, 2011.

67. Cassak, P. A., and M. A. Shay, "Magnetic reconnection for coronal conditions: Reconnection rates, secondary islands, and onset," *Space Science Reviews*, DOI 10.1007/s11214-011-9755-2, 2011
68. Parashar, T. N., S. Servidio, B. Breech, M. A. Shay, and W. H. Matthaeus, "Kinetic Driven Turbulence: Structure in Space and Time," *Physics of Plasmas*, Vol. 17, 102304, 2010.
69. Malakit, K., M. A. Shay, P. A. Cassak, and C. Bard, "Scaling of asymmetric magnetic reconnection: Kinetic particle-in-cell simulations," *Journal of Geophysical Research Letters*, Vol. 115, A10223, 2010.
70. Eastwood, J. P., M. A. Shay, T. D. Phan, and M. Oieroset, "Asymmetry of the ion diffusion region Hall electric and magnetic fields during guide field reconnection: Observations and comparison with simulations," *Physical Review Letters*, Vol. 104, 205001, 2010.
71. Eastwood, J. P., T. D. Phan, M. Oieroset, and M. A. Shay, "Average properties of the magnetic reconnection ion diffusion region in the Earth's magnetotail: 2001-2005 Cluster observations and comparisons with simulations," *Journal of Geophysical Research*, Vol. 115, A08215, 2010.
72. Cassak, P. A., M. A. Shay, and J. F. Drake, "A saddle-node bifurcation model of magnetic reconnection onset," *Physics of Plasmas*, Vol. 17, 062105, 2010.
73. Servidio, S., W. H. Matthaeus, M. A. Shay, P. Dmitruk, P. A. Cassak, and M. Wan, "Statistics of magnetic reconnection in two-dimensional magnetohydrodynamic turbulence," *Physics of Plasmas*, Vol. 17, 032315, 2010.
74. Cassak, P. A., M. A. Shay, and J. F. Drake, "Scaling of Sweet-Parker reconnection with secondary islands," *Physics of Plasmas*, Vol. 16, 120702, 2009.
75. Servidio, S., W. H. Matthaeus, M. A. Shay, P. Dmitruk, P. A. Cassak, and M. Wan, "Statistics of magnetic reconnection in two-dimensional magnetohydrodynamic turbulence," *Proceedings of the Solar Wind 12 Conference*, edited by M. Maksimovic, K. Issautier, N. Meyer-Vernet, M. Moncuquet and F. Pantellini, p. 198, 2010.
76. Parashar, T. N., S. Servidio, M. A. Shay, W. H. Matthaeus, and P. A. Cassak, "Orszag Tang Vortex - Kinetic Study of a Turbulent Plasma," *Proceedings of the Solar Wind 12 Conference*, edited by M. Maksimovic, K. Issautier, N. Meyer-Vernet, M. Moncuquet and F. Pantellini, p. 304, 2010.
77. Cassak, P. A. and M. A. Shay, "Response to Comment on 'Scaling of Asymmetric Magnetic Reconnection: General Theory and Collisional Simulations,'" *Physics of Plasmas*, Vol. 16, 034702, 2009.
78. Servidio, S., W. H. Matthaeus, M. A. Shay, P. A. Cassak, and P. Dmitruk, "Magnetic reconnection in two-dimensional magnetohydrodynamic turbulence," *Physical Review Letters*, Vol. 102, 115003, 2009.
79. Malakit, K., P. A. Cassak, M. A. Shay, and J. F. Drake, "The Hall effect in magnetic reconnection: Hybrid vs. Hall-less hybrid simulations," *Geophysical Research Letters*, Vol. 36, L07107, doi:10.1029/2009GL037538, 2009.
80. Parashar, T. N., M. A. Shay, P. A. Cassak, and W. H. Matthaeus, "Kinetic dissipation and anisotropic heating in a turbulent collisionless plasma," *Physics of Plasmas*, Vol. 16, 032310, 2009.
81. Drake, J. F., P. A. Cassak, M. A. Shay, M. Swisdak, E. Quataert, "A magnetic reconnection mechanism for ion acceleration and abundance enhancements in impulsive flares," *The Astrophysical Journal*, Vol. 700, L16, 2009.
82. Cassak, P. A., and M. A. Shay, "Response to 'Comment on Scaling of Asymmetric Magnetic Reconnection: General Theory and Collisional Simulations,'" *Physics of Plasmas*, Vol. 16, 034702, 2009.



83. Servidio, S., W. H. Matthaeus, M. A. Shay, P. A. Cassak, and P. Dmitruk, "Magnetic reconnection in two-dimensional magnetohydrodynamic turbulence," *Physical Review Letters*, Vol. 102, 115003, 2009.
84. Drake, J. F., M. Swisdak, T. D. Phan, P. A. Cassak, M. A. Shay, S. T. Lepri, R. P. Lin, E. Quartaert, T. H. Zurbuchen, "Ion heating resulting from pickup in magnetic reconnection exhausts," *Journal of Geophysical Research*, Vol. 114, A05111, doi:10.1029/2008JA013701, 2009.
85. Cassak, P. A. and M. A. Shay, "Structure of the dissipation region in fluid simulations of asymmetric magnetic reconnection," *Physics of Plasmas*, Vol. 16, 055704, 2009.
86. Cassak, P. A., and M. A. Shay, "The scaling of asymmetric hall magnetic reconnection," *Geophysical Research Letters*, Vol. 35, L19102, 2008.
87. Drake, J. F., M. A. Shay, and M. Swisdak, "The Hall fields and fast magnetic reconnection," *Physics of Plasmas*, Vol. 15, 042306, 2008.
88. Cassak, P. A., D. J. Mullan, and M. A. Shay, "From Solar and Stellar Flares to Coronal Heating: Theory and Observations of How Magnetic Reconnection Regulates Coronal Conditions," *The Astrophysical Journal*, Vol. 676, L69, 2008.
89. Phan, T. D., J. F. Drake, M. A. Shay, F. S. Mozer, and J. P. Eastwood, "Evidence for an elongated ( $> 60$  ion skin depths) electron diffusion region during fast magnetic reconnection," *Physical Review Letters*, Vol. 99, 255002, 2007.
90. Cassak, P. A., and M. A. Shay, "Scaling of asymmetric magnetic reconnection: General theory and collisional simulations," *Physics of Plasmas*, Vol. 14, 102114, 2007.
91. Shay, M. A., J. F. Drake, M. Swisdak, "Two-scale structure of the electron dissipation region during collisionless magnetic reconnection," *Physical Review Letters*, Vol. 99, 155002, 2007.
92. Drake, J. F. and M. A. Shay, "Fundamentals of Collisionless Reconnection," in *Reconnection of Magnetic Fields: Magnetohydrodynamic and Collisionless Theory and Observations*, edited by J. Birn and E. Priest, p. 87, Cambridge University Press, 2007.
93. Eastwood, J. T., F. S. Mozer, M. A. Shay, M. Fujimoto, A. Retino, M. Hesse, A. Balogh, E. A. Lucek, and I. Dandouras, "Multipoint observations of the Hall electromagnetic field and secondary island formation during magnetic reconnection," *Journal of Geophysical Research*, Vol. 112, A06235, doi:10.1029/2006JA012158, 2007.
94. Cassak, P. A., J. F. Drake, M. A. Shay, and B. Eckhardt, "Onset of fast magnetic reconnection," *Physical Review Letters*, Vol. 98, 215001, 2007.
95. Cassak, P. A., J. F. Drake, and M. A. Shay, "Catastrophic onset of fast magnetic reconnection with a guide field," *Physics of Plasmas*, Vol. 14, 054502, 2007.
96. Shay, M. A., J. F. Drake, and B. Dorland, "Equation free projective integration: A multiscale method applied to a plasma ion acoustic wave," *Journal of Computational Physics*, Vol. 226, p. 571, 2007.
97. Shay, M. and M. J. Wiltberger, "Magnetospheric dynamics – Models and observations at multiple scales," *Advances in Space Research*, Vol. 38, 1571, 2006.
98. Drake, J. F., M. Swisdak, H. Che, and M. A. Shay, "Electron acceleration from contracting magnetic islands during reconnection," *Nature*, Vol. 443, p. 553, doi:10.1038/nature05116, 2006.
99. Cassak, P. A., J. F. Drake, and M. A. Shay, "A model for spontaneous onset of fast magnetic reconnection," *The Astrophysical Journal*, Vol. 644, L145, 2006.
100. Sullivan, B. P., B. N. Rogers, and M. A. Shay, "The scaling of forced collisionless reconnection," *Physics of Plasmas*, Vol. 12, 122312, 2005.

101. Shay, M. A., and M. Swisdak, "Reply to Comment on 'Three-Species Collisionless Reconnection: Effect of  $O^+$  on Magnetotail Reconnection,'" *Physical Review Letters*, Vol. 95, 099501, 2005.
102. Cassak, P. A., M. A. Shay, and J. F. Drake, "A catastrophe model for fast magnetic reconnection onset," *Physical Review Letters*, Vol. 95, 235002, 2005.
103. Drake, J. F., M. A. Shay, W. Thongthai, and M. Swisdak, "Production of energetic electrons during magnetic reconnection," *Physical Review Letters*, Vol. 94, 095001, 2005.
104. Swisdak, M., J. F. Drake, J. G. McIlhargey, and M. A. Shay, "The transition from anti-parallel to component magnetic reconnection," *Journal of Geophysical Research*, Vol. 110, A05210, 2005.
105. Jemella, B. D., J. F. Drake, and M. A. Shay, "Singular structure of magnetic islands resulting from reconnection," *Physics of Plasmas*, Vol. 11, No. 12, p. 5668, 2004.
106. Shay, M. A., M. Swisdak, "Three species collisionless reconnection: Effect of  $O^+$  on magnetotail reconnection," *Physical Review Letters*, Vol. 93, No. 17, 175001, 2004.
107. C. C. Goodrich, A. L. Sussman, Lyon, J. G., M. A. Shay, P. Cassak, "The CISM code coupling strategy," *Journal of Atmospheric and Solar-Terrestrial Physics*, Vol. 66, p. 1469, 2004.
108. M. A. Shay, Drake, J. F., M. Swisdak, B. N. Rogers, "The scaling of embedded collisionless reconnection," *Phys. Plasmas*, Vol. 11, p. 2199, 2004.
109. Ohtani, S., M. A. Shay, T. Mukai, "The temporal structure of the fast convective flow in the plasma sheet: Comparison between observations and two-fluid simulations," *J. Geophys. Res.*, 109, A03210, doi:10.1029/2003JA010002, 2004.
110. Jemella, B. D., M. A. Shay, J. F. Drake, B. N. Rogers, "Impact of frustrated singularities on magnetic island evolution," *Phys. Rev. Lett.*, Vol. 91, 125002, 2003.
111. Swisdak, M., B. N. Rogers, J. F. Drake, M. A. Shay, "Diamagnetic suppression of component magnetic reconnection at the magnetopause," *J. Geophys. Res.*, Vol. 108, 1218, doi:10.1029/2002JA009726, 2003.
112. M. A. Shay, J. F. Drake, M. Swisdak, Dorland, W., B. N. Rogers, "Inherently three dimensional magnetic reconnection: a mechanism for bursty bulk flows?" *Geophys. Res. Lett.*, Vol. 30, 1345, doi:10.1029/2002GL016267, 2003.
113. J. F. Drake, M. Swisdak, C. Cattell, M. A. Shay, Rogers, B. N., and A. Zeiler, "Formation of electron holes and particle energization during magnetic reconnection," *Science*, Vol. 299, p. 873, 2003.
114. A. Zeiler, D. Biskamp, J. F. Drake, B. N. Rogers, Shay, M. A., M. Scholer, "Three-dimensional particle simulations of collisionless magnetic reconnection," *J. Geophys. Res.*, Vol. 107, Number A9, 1230, doi:10.1029/2001JA000287, 2002.
115. Rogers, B. N., R. E. Denton, J. F. Drake, M. A. Shay, "The Role of Dispersive Waves in Collisionless Magnetic Reconnection," *Phys. Rev. Lett.*, Vol. 87, Number 19, 195004, 2001.
116. Shay, M. A., J. F. Drake, B. N. Rogers, R. E. Denton, "Alfvénic collisionless magnetic reconnection and the Hall term," *J. Geophys. Res.*, 106, 3759, 2001.
117. M. Swisdak and M. Shay, "Comment on 'Creation of magnetic energy in the solar atmosphere,'" *Physical Review Letters*, Vol. 86, p. 1662, 2001.
118. J. Birn, J. F. Drake, M. A. Shay, B. N. Rogers, R. E. Denton, M. Hesse, M. Kuznetsova, Z. W. Ma, A. Bhattacharjee, Otto, A., P. L. Pritchett, "Geospace Environmental Model (GEM) Magnetic Reconnection Challenge," *J. Geophys. Res.*, 106, 3715, 2001.
119. Rogers, B. N., J. F. Drake, M. A. Shay, "The onset of turbulence in 3D collisionless magnetic reconnection," *Geophys. Res. Lett.*, 27, 3157, 2000.

120. Shay, M. A., J. F. Drake, B. N. Rogers, R. E. Denton, "The scaling of collisionless, magnetic reconnection for large systems," *Geophys. Res. Lett.*, *26*, 2163, 1999.
121. Shay, M. A., J. F. Drake, "The role of electron dissipation on the rate of collisionless magnetic reconnection," *Geophys. Res. Lett.*, *25*, 3759, 1998.
122. Shay, M. A., J. F. Drake, R. E. Denton, D. Biskamp, "Structure of the dissipation region during collisionless magnetic reconnection," *J. Geophys. Res.*, *103*, 9165, 1998.
123. W. B. Case and M. A. Shay, "On the interesting behavior of a gimbal-mounted gyroscope," *American Journal of Physics*, Vol. 60, p. 503, 1992.

## Invited Presentations

1. "Link between turbulence properties and reconnection dynamics in the Earth's magnetosheath," MMS Yosemite Conference, Yosemite Valley, CA, Feb., 2019
2. "Simulations of electron reconnection in sheath turbulence," MMS Austria Meeting, Austria, October, 2018
3. "Magnetic Reconnection during Turbulence and the role it plays in dissipation and heating," 17th Annual International Astrophysics Conference, Santa Fe, NM, March, 2018
4. "The role of reconnection in turbulent heating," MMS Science Working Group Meeting, Portland, Maine, 2017
5. "Partition and Transport of Energy Due to Magnetic Reconnection: Kinetic View," SHINE conference, Manoir Saint Sauveur, Canada, 2017
6. "3D Guide Field Asymmetric Reconnection," Toulouse Reconnection Conference, Toulouse, France, 2017
7. "3D Guide Field Asymmetric Reconnection: Comparison to Dec. 8, 2015 MMS Event," MMS Conference, Key West, 2017
8. "Turbulence and Reconnection," ARCETRI Turbulence Conference, Florence, Italy, October, 2016
9. "Reconnection Heating," MR2016 Meeting, Napa, CA "Reconnection Heating", March, 2016
10. "Electron Heating," MMS Science Working Group, Florida, March, 2015
11. "What MMS will teach us about reconnection," Triennial Earth-Sun Summit, Indianapolis, IN, May, 2015
12. "Electron and Ion Heating Partition," International Space Science Institute Working Group Meeting, Bern, Switzerland, June, 2015
13. "The competition of electron and ion heating," APL conference on flow bursts, Baltimore, September, 2015
14. "The shoulder of the electric field. Implications for finding the diffusion region," MMS Working group on reconnection, San Antonio, November, 2015
15. "Heating due to magnetic reconnection in turbulence," Fall AGU Meeting, San Francisco, CA, December, 2015
16. "Plasma Heating During Reconnection," ISSI conference on Heating in Reconnection, Bern, Switzerland, 2014
17. "Scaling of Electron Heating During Magnetic Reconnection," MMS Science working group, Iowa City, IA, 2014
18. "Magnetic Reconnection at the Dawn of the MMS Era," Tutorial Plenary Presentation, Geospace Environmental Modeling Meeting, Snowmass, CO, June, 2013.
19. "Electron Heating in Reconnection: PIC Simulations, Princeton Mini-Workshop on Magnetic Reconnection," Princeton Plasma Physics Laboratory, Princeton, NJ, October, 2012.

20. "Magnetic Reconnection Generalized to Turbulent Systems," Workshop on Computational Methods in High Energy Density Plasmas, IPAM, UCLA, Los Angeles, CA, April, 2012.
21. "Kinetic Dissipation in a Turbulent Collisionless Plasma: Hybrid Simulations of Driven Quasi-Steady Turbulence," ARCETRI Meeting on Turbulence, Arcetri, Italy, October, 2011.
22. "Turbulence, Reconnection, and the Solar Wind," Center for Magnetic Self Organization General Meeting, Swarthmore, PA, June, 2010.
23. "Reconnection Signal Propagation Speed and Energy Flux during Substorm Onset: Kinetic PIC Simulations," 10th International Conference on Substorms, San Luis Obispo, California, March, 2010.
24. "The Scaling of Reconnection to Large Scale Systems," Yosemite meeting on Magnetic Reconnection, Yosemite, February, 2010.
25. "Do Kinetic Models Produce Fast Reconnection in Large Systems?" Workshop of the International Space Science Institute: Multi-scale physics in coronal heating and solar wind acceleration from the Sun into the inner heliosphere, Bern Switzerland, January, 2010.
26. "Statistical Properties of Magnetic Reconnection in MHD Turbulence," American Physical Society Division of Plasma Physics meeting, Special conference, November, 2009.
27. "Properties of Magnetic Reconnection in MHD Turbulence," US-Japan Reconnection Conference, Madison, WI, October, 2009.
28. "Kinetic Dissipation in a Turbulent Collisionless Plasma: Hybrid Simulations," Los-Alamos Conference on Turbulence, Santa Fe, NM, October, 2008.
29. "Magnetic Explosions and Their Impact on Space Weather," Francis Alison Young Scholars Award Presentation, University of Delaware, Newark, DE, October, 2008.
30. "The Diffusion Region of Asymmetric Magnetic Reconnection," New England Conference Series, University of New Hampshire, Durham, NH, September, 2008.
31. "Important Kinetic Problems in Collisionless Reconnection," Geospace Environmental Modeling conference (GEM), Midway, Utah, June 2008.
32. "Reconnection rates with kinetic PIC simulations (Guide field=0)," Cambridge Conference on Magnetic Reconnection, St. Michael's, MD, Sept., 2007.
33. "The Structure of the electron dissipation region during collisionless magnetic reconnection," Cambridge Conference on Magnetic Reconnection, St. Michael's, MD, Sept., 2007.
34. "The two-scale structure of the electron dissipation region during collisionless magnetic reconnection," Geospace Environmental Modeling conference (GEM), Midway, Utah, June 2007.
35. "The two-scale structure of the electron dissipation region during collisionless magnetic reconnection," US-Japan Workshop on Reconnection, St. Michael's, Maryland, March, 2007.
36. "Signatures of heavy ion reconnection in the magnetotail: Simulations and satellite observations," Fall AGU meeting, San Francisco, December 2006.
37. "Boundary conditions in collisionless magnetic reconnection," American Physical Society Division of Plasma Physics Meeting, Philadelphia, PA, October, 2006.
38. "The Role of  $O^+$  in Magnetotail Reconnection: Theoretical Considerations," Geospace Environmental Modeling conference (GEM), Snowmass, CO, June 2006.
39. "Equation Free Projective Integration: A Novel Multiscale Modeling Technique Applied to Plasmas," Geospace Environmental Modeling conference (GEM), Snowmass, CO, June, 2006.
40. "Equation Free Projective Integration: A Novel Multiscale Modeling Technique Applied to Plasmas," CalSpace-IGPP International Conference, Palm Spring, CA, March, 2006.
41. "Multi-Species reconnection throughout the Heliosphere," 2005 Joint Assembly, Spring AGU meeting, New Orleans, May 2005.

42. "Equation Free Projective Integration: A novel scheme for modeling multiscale processes in plasmas," 2005 International Sherwood Fusion Theory Conference, Lake Tahoe, Nevada, April, 2005.
43. "Equation free projective integration: A Novel approach to simulating multiscale dynamics," Conference entitled *Numerical Methods for Plasma Astrophysics: From Particle Kinetics to MHD*, Princeton Institute for Computational Science and Engineering, Princeton University, October, 2004.
44. "Three species collisionless reconnection: Effect of  $O^+$  on magnetotail reconnection," part of the *Magnetic Reconnection Theory* program, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, August, 2004.
45. "The many scales of collisionless reconnection in the Earth's magnetosphere," 35th COSPAR scientific assembly, Paris, France, July, 2004.
46. "Numerical Simulations of Collisionless Reconnection," April American Physical Society Meeting, Denver, CO, 2004.
47. "Magnetic Reconnection: Is MHD Adequate?" Conference entitled *Numerical Methods for Plasma Astrophysics: From Particle Kinetics to MHD*, Center for Scientific Computation and Mathematical Modeling, University of Maryland, March, 2004.
48. "The Scaling of Collisionless Reconnection Revisited," Fifth US-Japan Workshop on Magnetic Reconnection, Plasma Merging, and Magnetic Jets, Catalina Island, CA, November, 2003.
49. "Unsolved Problems in Magnetic Reconnection," World Space Congress, 34th Annual COSPAR Meeting, Houston, TX, October, 2002.
50. "Reconnection in the Earth's Plasma Sheet," International Conference on Substorms - 6, Seattle, WA, March, 2002.
51. "Reconnection in the Earth's Plasmasheet," American Geophysical Union Fall Meeting, San Francisco, CA, December, 2001.
52. "Reconnection in the Magnetotail," IGPP Conference on the Nightside Magnetosphere, Yellowstone National Park, Wyoming, September, 2001.
53. "Instabilities in 3D Reconnection," Geospace Environmental Modeling Conference, Snowmass, Colorado, June, 2001.
54. "The Hall term in fast collisionless reconnection," Astrophysical Turbulence Conference, Institute for Theoretical Physics, University of California, Santa Barbara, May, 2000.
55. "The acceleration of relativistic electrons by whistlers during reconnection," Magnetic Reconnection in Space and Laboratory Plasmas, University of Tokyo, Japan, February, 2000.
56. "The physics of collisionless magnetic reconnection," Princeton Seminar Series, Princeton, New Jersey, March 1999.
57. "The physics of collisionless magnetic reconnection," M. A. Shay, The American Physical Society Centennial Meeting, Atlanta, Georgia, March, 1999.
58. "How does whistler physics affect fast, collisionless reconnection in the magnetosphere?" M. A. Shay, Huntsville Modeling Workshop - The New Millennium Magnetosphere, Guntersville, Alabama, 1998.
59. "What controls collisionless reconnection?" M. A. Shay, Geospace Environmental Modeling Conference, Snowmass, Colorado, 1998.

## Selected Contributed Presentations

1. "Link Between Turbulence Proper/ies and Reconnec/on Dynamics," APSDPP Meeting, Fort Lauderdale, FL, Oct., 2019
2. "Statistic of magnetic reconnection in turbulence and its effect on plasma heating," Fall AGU Meeting, Washington, DC, December, 2018
3. "Reconnection in Turbulence," GEM Conference, Portsmouth, Virginia, 2017
4. "Turbulent Reconnection," Fall AGU Meeting, San Francisco, CA, December, 2016
5. "Heating due to magnetic reconnection in turbulence," SHINE Meeting, Vermont, July, 2015
6. "3D Magnetic Reconnection in the Earth's Magnetotail," GEM Meeting, Portsmouth, VA, 2014
7. "Electron Bulk Heating by Reconnection: PIC Simulations," Geospace Environmental Modeling Meeting, Snowmass, CO, June, 2013.
8. "Diffusion Region Structure During Kinetic Asymmetric Reconnection, Magnetospheric Multiscale Meeting on Magnetic Reconnection, San Antonio, TX, March, 2012.
9. "Effect of Inflow Density on Magnetic Reconnection: Particle-in-Cell Simulations," Geospace Environmental Modeling Conference, Santa Fe, NM, June, 2011.
10. "Diffusion Structure During Asymmetric Magnetic Reconnection," Magnetospheric Multiscale Meeting on Magnetic Reconnection, St. Michael's, MD, October, 2010.
11. "The diffusion region of asymmetric magnetic reconnection," American Geophysical Union Fall Meeting, San Francisco, CA, December, 2008.
12. "Anisotropic kinetic dissipation in a collisionless turbulent plasma," American Geophysical Union Fall Meeting, San Francisco, CA, December, 2008.
13. "The impact of Hall physics on magnetic reconnection," American Physics Society Division of Plasma Physics Meeting, Dallas, TX, November, 2008.
14. "Kinetic dissipation and anisotropic heating in a turbulent collisionless plasma," Mini-Conference on the Plasma Physics of the Solar Wind, American Physics Society Division of Plasma Physics Meeting, Dallas, TX, November, 2008.
15. "Two-scale structure of the electron dissipation region during collisionless magnetic reconnection: PIC simulations and Cluster satellite observations," American Physics Society Division of Plasma Physics Meeting, Orlando, FL, November, 2007.
16. "Asymmetric Magnetic Reconnection: General Theory and Collisional Simulations," American Physics Society Division of Plasma Physics Meeting, Orlando, FL, November, 2007.
17. "The dissipation region of magnetic reconnection: Kinetic PIC results for large systems," American Geophysical Union Fall Meeting, San Francisco, CA, December, 2006.
18. "The dissipation region of magnetic reconnection: Kinetic PIC code results for large systems," American Physics Society Division of Plasma Physics Meeting, Philadelphia, PA, November, 2006.
19. "Multiscale modeling techniques for plasmas: 1D scaling results and application to magnetic reconnection," American Geophysical Union Fall Meeting, San Francisco, CA, December, 2005.
20. "Multiscale modeling techniques for plasma: 1D scaling results," American Physics Society Division of Plasma Physics Meeting, Denver, CO, November, 2005.
21. "CISM reconnection: Equation free projective integration," CISM All-Hands meeting, Boston, MA, September, 2005.
22. "Understanding the Onset of Fast Collisionless Reconnection: If Reconnection is so Fast, How do Current Sheets Form?" IUGG 2003 meeting, Sapporo, Japan, July, 2003.

23. "Inherently Three Dimensional Magnetic Reconnection: A Mechanism for Bursty Bulk Flows," IUGG 2003 meeting, Sapporo, Japan, July, 2003.
24. "The Three Dimensional Nature of Reconnection," M. A. Shay, J. Drake, B. N. Rogers, M. Swisdak, American Geophysical Union Fall Meeting, San Francisco, CA, December, 2001.
25. "The acceleration of relativistic electrons by whistler during reconnection," M. A. Shay, B. N. Rogers, M. M. Swisdak, J. F. Drake, American Geophysical Union Spring Meeting, Washington, DC, June, 2000.
26. "Slow shocks and ion thermalization during collisionless magnetic reconnection," **poster**, M. A. Shay, J. F. Drake, B. N. Rogers, American Geophysical Union Spring Meeting, Boston, MA, June, 1999.
27. "Development of turbulence during 3-D magnetic reconnection," **poster**, B. N. Rogers, J. F. Drake, M. A. Shay, American Geophysical Union Spring Meeting, Boston, MA, June, 1999.
28. "Fast, collisionless magnetic reconnection in macroscopic systems," M. A. Shay, J. F. Drake, B. N. Rogers, R. E. Denton, American Geophysical Union Fall Meeting, San Francisco, CA, 1998.
29. "Full particle simulations of the electron dynamics during quasi-steady collisionless magnetic reconnection," M. A. Shay, J. F. Drake, American Geophysical Union Spring Meeting, Boston, MA, 1998.
30. "The electron dynamics of collisionless magnetic reconnection," Physics of Magnetic Reconnection and Dynamos - US and Japan Workshop, Princeton, NJ, 1998.
31. "Full particle simulations of the electron dynamics during collisionless, magnetic reconnection," M. A. Shay, J. F. Drake, American Geophysical Union Fall Meeting, San Francisco, CA, 1997.
32. "Hybrid simulations of collisionless reconnection," M. A. Shay, J. F. Drake, R. E. Denton, D. Biskamp, Plasma Simulations: Past, Present, and Future, Los Alamos National Laboratory, New Mexico, 1997.
33. "Current sheet disruption caused by the kinetic kink instability," M. A. Shay, J. F. Drake, P. H. Yoon, American Geophysical Union Spring Meeting, Baltimore, MD, 1996.

### Selected Seminars and Colloquia

1. "Turbulent heating of the low collisionality plasma in our solar system: Are magnetic explosions important?" Colloquium, West Virginia University, October, 2018
2. "Magnetic reconnection during turbulence and the role it plays in dissipation and heating," Princeton Plasma Physics Laboratory, May, 2018
3. "Turbulent Reconnection Heating," Plasmas and Fluids Seminar, University of Delaware, July, 2016.
4. "Heating Due to Magnetic Reconnection," Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, March, 2015
5. "Magnetic Explosions and their Impact on Space Weather," Physics Colloquium, Swarthmore College, Swarthmore, PA, Sept. 2012.
6. "Magnetic Reconnection Generalized to Turbulent Systems," Seminar, Berkeley Space Sciences Lab, August, 2012.
7. "Super-Alfvenic Energy Transport During Magnetic Reconnection, Implications for Substorms," Seminar, Berkeley Space Sciences Lab, July 2010.
8. "Magnetic Reconnection Generalized to Asymmetric and Turbulent Systems," Dartmouth Plasma Seminar, Hanover, NH, November, 2009.
9. "Driving Magnetic Explosions in Complex Space Plasmas," Colloquium, Dept. of Physics and Astronomy, University of Delaware, Newark, DE, Sept. 2009.

10. "The diffusion region of asymmetric magnetic reconnection," Berkeley Space Science Seminar, Space Sciences Laboratory, Berkeley, CA, August, 2008.
11. "The Physics of magnetic reconnection," University of Delaware, Department of Physics & Astronomy Fluids and Plasmas Seminar, Newark, DE, March, 2008.
12. "Equation free projective integration: A case study for interdisciplinary computational science research," Interdisciplinary Computational Science Seminar Series, University of Delaware, Newark, DE, November, 2007.
13. "The structure of the electron dissipation region during collisionless magnetic reconnection," Berkeley Space Science Seminar, Space Sciences Laboratory, Berkeley, CA, August, 2007.
14. "Equation free projective integration: A novel multiscale modeling technique applied to plasmas," Applied Math Seminar, Mathematics Department, University of Delaware, November, 2006.
15. "Equation free projective integration: A novel multiscale modeling technique applied to Plasmas," Space Science Seminar, Physics Department, University of New Hampshire, Durham, NH, April, 2006.



## Teaching

### Classroom Teaching

Note: For student evaluation scores for classroom teaching (“Instructor” and “Course”), the best possible rating is 5.0, and the worst possible rating is 1.0.

- For courses taught Spring 2014 and before, the in-house DPA rating system used a rating system with 1.0 as the best and 5.0 as the worst. In the table below, these ratings have been “flipped” to match the scale used in the current online system. The transformation equation used is  $\text{New} = 6.0 - \text{Old}$ , where Old is the numerical rating in the old system, and New is the rating in the current online system.
- In some cases, multiple sections or courses were combined into a single lecture. For example, PHYS460/660 combines both PHYS460 and PHYS660.

5.0 = excellent, 4.0 = good, 3.0 = average, 2.0 = fair, 1.0 = poor

	Course	DPA Course Number	Number of Students	Evaluation: Instructor	Evaluation: Course
Fall 2019	Laboratory, Space and Astrophysical Plasmas	PHYS835 (graduate)	7	5.0	4.7
Spring 2018	Computational Methods in Physics	PHYS460/660 (both)	460: 13 660: 10	460: 4.8 660: 4.9	460: 4.5 660: 4.7
Fall 2017	Laboratory, Space and Astrophysical Plasmas	PHYS835 (graduate)	7	4.3	4.3
Spring 2017	Computational Methods in Physics	PHYS460/660 (both)	460: 9 660: 2	460: 4.8 660: 5.0	460: 4.4 660: 5.0
Spring 2016	Computational Methods in Physics	PHYS460/660 (both)	460: 4 660: 13	460: 4.5 660: 4.5	460: 4.5 660: 4.3
Fall 2015	Fundamentals of Physics I (honors)	PHYS207 (undergraduate)	19	4.7	4.2
Spring 2015	Computational Methods in Physics	PHYS460/660 (both)	460: 12 660: 10	460: 4.8 660: 4.3	460: 4.7 660: 4.3
Spring 2014	Introductory Physics II	PHYS202 (undergraduate)	124	4.4	3.8
Fall 2013	Plasma Physics I	PHYS835 (graduate)	9	4.8	4.4
Spring 2013	Quantum Mechanics	PHYS610 (both)	9	4.9	5.0
Fall 2012	Introductory Physics II	PHYS202 (undergraduate)	79	4.5	3.8
Spring 2011	Quantum Mechanics	PHYS610 (both)	12	4.9	5.0
Fall 2010	Fundamentals of Physics II	PHYS208 (undergraduate)	141	4.6	4.2
Fall 2009	Electromagnetic Theory	PHYS809 (graduate)	11	4.9	4.8
Spring 2009	Fundamentals of Physics II (regular and honors)	PHYS208010 PHYS208080 (undergraduate)	regular: 46 honors: 6	4.9	4.3

	Course	DPA Course Number	Number of Students	Evaluation: Instructor	Evaluation: Course
Fall 2008	Electromagnetic Theory	PHYS809 (graduate)	12	4.9	4.7
Spring 2008	Fundamentals of Physics II	PHYS208 (undergraduate)	32	5.0	4.5
Fall 2007	Electromagnetic Theory	PHYS809 (graduate)	8	4.9	4.7
Spring 2007	Introduction to Plasma Physics	PHYS867 (graduate)	10	4.9	4.6
Fall 2006	Electromagnetic Theory	PHYS809 (graduate)	13	4.9	4.4
Fall 2005	Fundamentals of Physics II	PHYS208 (undergraduate)	89	4.5	4.0
Average				<b>4.74</b>	<b>4.47</b>

## Research Advising of Post-Doctoral Researchers

### 1. Tulasi Parashar (with Prof. Matthaeus), 2014-2017

- See “Research Advising of Graduate Students” below.

### 2. Pin Wu, 2010-2014

- Currently a STFC Daphne Jackson Fellow (Science and Technology Facilities Council of the UK), Queen’s University, Belfast, United Kingdom
- Also currently a Visiting Scientist, Max Planck Institute for Nuclear Physics, Heidelberg, Germany

### 3. Paul Cassak, 2007-2008

- Currently a full professor, Dept. of Physics and Astronomy, West Virginia University
- Fellow of the American Physical Society, September 2018
- West Virginia University Benedum Distinguished Scholar in Physical Sciences and Technology, March 2018
- West Virginia University Eberly College of Arts and Sciences Outstanding Public Service Award, November 2017
- West Virginia University Honors College Nath Outstanding Teacher Award, April 2016
- James B. Macelwane Medal, American Geophysical Union, 2015
- Fellow of the American Geophysical Union, December 2015
- West Virginia University Eberly College of Arts and Sciences Outstanding Teacher Award, April 2014
- West Virginia University Eberly College of Arts and Sciences Outstanding Researcher Award, April 2012
- National Science Foundation Faculty Early Career Award, September 2010
- Fred L. Scarf Award for outstanding PhD dissertation, American Geophysical Union, December 2008
- Outstanding Student Paper Award, American Geophysical Union, May 2006

## Research Advising of Graduate Students (Ph.D. program)

1. **Sam Fordin**, 2019 - present
2. **Subash Adkhikari**, 2018 - present
  - Award for Best Graduate Student Poster, GEM Conference, June 2019
3. **Prayash Sharma Pyakurel**, PhD in 2019
  - Currently a post-doctoral researcher with Dr. Tai Phan at Space Sciences Lab, Berkeley
4. **Colby Haggerty**, PhD in 2016
  - Currently a post-doctoral researcher with Dr. Damiano Caprioli at the University of Chicago.
  - Currently has offer for tenure-track assistant professor position at Institute for Astronomy, University of Hawaii at Manoa.
  - Daicar-Bata Prizes: University of Delaware Department of Physics and Astronomy for highest GPA (2014) and runner-up for best peer-reviewed publication (2016).
  - GEM Student tutorial award (2014)
  - Delaware NASA Space Grant Graduate Fellowship (2014)
5. **John Meyer**, PhD in 2015
  - Co-Founder of Foolhardy Softworks (software company).
6. **Kittipat Malakit**, PhD in 2012
  - Currently a lecturer (equivalent to associate professor) in Department of Physics, Thammasat University, Pathum Thani, Thailand. Also, Vice-head of the department for academic affairs, and Director of the masters degree program in Physics.
7. **Tulasi Parashar**, PhD in 2011
  - Currently a Lecture in Physics (equivalent to associate professor) at Victoria University of Wellington, New Zealand
  - NASA post-doctoral fellowship (2012)

## Research Advising of Undergraduate Students

1. Jennifer Fanelle (2017-2019)
2. Daniel Godzieba (2018)
3. Will Ransom (2017 - 2018)
4. Christian McHugh (2014-2015)
5. Kieokaew Rungployphan (2014-2015)
6. Matthew Bihler, Summer 2011.
7. William J. Matthaeus (co-Advisor with Dr. Bill Matthaeus), Spring and Summer, 2009.
8. Adam Blomberg: Summer, 2007 to Spring, 2008: Supervised Adam Blomberg on his senior thesis, which allowed Adam to graduate “with distinction.”
9. Chris Bard: Summer, 2007, Summer, 2008, and Summer, 2009.

## Summer Research Advising of High School Students

Summer research internships through a partnership with *Delaware Futures*, a nonprofit organization that provides services in order to empower at-risk minority high school students in the Wilmington, DE area: <http://www.delawarefutures.org>

1. James Butcher, 2017 and 2018
2. Alexis Cope, 2015
3. Lisa Arnold, 2014
4. Munzer Suliman: Summer, 2013
5. Alexis Lacen: Summer, 2011
6. Darnell Patton: Summer, 2007

## Service Activity    Departmental Activities

1. **Computer Committee (Chair)**, 2010-present
2. **Graduate Review Committee (Chair)**, 2013 - present
3. **Graduate Studies**, 2012 - present
4. **Bartol Advisory Committee**, 2008-2012, 2014 - present
5. **Undergraduate Academic Advisor (typically 10-20 students annually)**, 2013 - present
6. **Departmental Holiday Party**, 2006 - present
7. **Promotion and Tenure**, 2011 - present
8. **Astronomy and Space Physics Seminar**, 2008-2011, 2013-2018
9. **Committee to Review Chair of DPA**, 2017
10. **Hiring Committee: Astroparticle Faculty Position**, 2017
11. **Hiring Committee: Space Physic Faculty Position (Chair)**, 2015 - 2016
12. **Ad-hoc DPA Vision Task Force**, 2012-2013.
13. **Graduate Review Committee**, 2012-2013
14. **Undergraduate Studies Committee**, 2009-2010
15. **Fluids and Plasmas Seminar, Chair.**, 2006-2009
16. **Undergraduate Recruitment Committee, Chair**, 2007-2012
17. **Ad-hoc DPA education assessment committee**, 2008-2009
18. **Ad-hoc Committee on Merit and Evaluation Procedures**, 2006-2007
19. **Graduate Admissions and Recruitment**, 2006-2011
20. **Computer Committee**, 2006-2010
21. **Colloquium Committee**, 2006-2009

## Campus-Wide Activities

1. **Space Grant Associate Director**, 2013-present, Advisory panel of the Space Grant Consortium. Established in 1991, this program is funded by NASA in order to train students and researchers in the state of Delaware in the areas of science, technology, engineering, mathematics, and geography.
2. **Hiring Committee: Chair of Math Dept.**, 2014 - 2015.
3. **Interdisciplinary Computational Science Hiring Committee**, 2009-2011. Committee for faculty hire in computational sciences. Resulted in hire of Prof. Ed Lyman.
4. **Research Computing Task Force**, 2009-2011, a committee formed by Dr. Mark Barteau to take a comprehensive and strategic look at the best way to meet the University of Delaware's future research computing needs and opportunities.
5. **Ad-hoc Computational Science Center Certificate Committee**, 2008, committee to lay the groundwork for creating a computational science certificate at UDEL.
6. **Ad-hoc UDSIS GRADIS committee**, 2008-2010, Committee to give recommendations from the faculty on how GRADIS (graduate admissions web server) can be improved.
7. **Ad-hoc Computational Science Center Committee**, 2007, Developed a white-paper for a new multi-disciplinary computational science center with five other faculty. This white paper was submitted to President Harker's strategic committee.

## Professional Activities

### Research Leadership Roles

1. **APS Topical Group in Astrophysical Plasmas Fellows Selection Committee**, Selects nominees for fellowship in the American Physical Society, 2018.
2. **SHINE Steering Committee**, Coordinates annual National Science Foundation SHINE meeting, 2014 - 2018
3. **Panel Member**, Solar Wind-Magnetosphere Interactions panel, National Academy of Sciences/National Research Council: **A Decadal Strategy for Solar and Space Physics (Heliophysics)**, 2010 - 2012.  
Identifies the most compelling science challenges in the field of Space Weather and makes recommendations for the next decade of research.

### Professional Committees

1. **GEM Reconnection Working Group**, 2017 - present
2. **Fall AGU SPecial Session on Reconnection and Turbulence**, AGU Meeting, 2018, San Francisco.
3. **SHINE Turbulence Session Organizer**, 2017 SHINE Meeting, Saint-Sauveur, Quebec.
4. **SHINE Session Organizer**, SHINE Meeting, 2016, Santa Fe, NM.
5. **Fall AGU Special Session on Reconnection**, 2015, San Francisco, CA.
6. **SHINE Session Organizer**, SHINE Meeting, 2015, Vermont.
7. **Fall AGU Special Session on Reconnection**, 2014, San Francisco, CA.
8. **SHINE Session Organizer**, SHINE Meeting, 2014, Telluride, CO.
9. **APSDPP Program Committee**: (2005, 2009, 2012). American Physical Society Division of Plasma Physics program committee, which chooses invited talks for the annual meeting.
10. **APS Publications Committee**: (2008-2013). American Physical Society Division of Plasma Physics Publications Committee. Provides feedback on scientific publications from the plasma physics community.
11. **GEM Reconnection Focus Group**: (2010-2012). Geospace Environmental Modeling meeting.
12. **Joint GEM-SHINE Workshop Working Group**: (2008). Planned the overlap sessions for the joint GEM-SHINE meeting in Zermatt, Utah, June, 2008.
13. **Co-chair GEM GGCM Campaign**: (2006-2012). Co-chair of Working Group 2 of the Geospace Environmental Modeling (GEM) global geospace general circulation model (GGCM) campaign. This working group is focused on modules of the GGCM and novel techniques which may help better simulate the magnetosphere/ionosphere system.
14. **IAGA Special Session**: (2005). Co-convenor of the special session: "Magnetic Reconnection: Conditions and Mechanisms," at the IAGA 2005 Scientific Assembly, Toulouse, France in July, 2005.

### Editorial

- **Guest Editor**, with M. Wiltberger, **Magnetospheric dynamics – Models and observations at multiple scales**, *Advances in Space Research*, Conference proceedings, COSPAR 2004 International Meeting.

### **Peer Reviewing**

- **Research Journals:** Nature, Physical Review Letters, Geophysical Research Letters, Journal of Geophysical Research, Astrophysical Journal, and Physics of Plasmas.
- **Grant Proposals:** National Science Foundation, NASA, and Department of Energy.
- **Review Panels:** National Science Foundation, NASA