# Jim M. Raines

| | | |
|---|---|---|
| **Employment** | 2018-present | Associate Research Scientist, Dept. of Climate and Space Sciences and Engineering, University of Michigan |
| | 2013-2018 | Assistant Research Scientist, Dept. of Climate and Space Sciences and Engineering, University of Michigan |
| | 2005-2013 | Lead Mission Operations Engineer, University of Michigan Space Physics Research Laboratory. |
| | 1999-2005 | Programmer/Analyst II, University of Michigan Space Physics Research Laboratory. |
| | 1996-9 | High School Science Teacher, Lincoln Community Schools. |
| **Education** | 2013 | Ph.D., Atmospheric, Oceanic and Space Sciences, University of Michigan. Dissertation: "MESSENGER investigations of the plasma environment at Mercury." |
| | 1994 | M.S. Chemistry, Carnegie Mellon University. Research focused on theoretical, simulation and computational aspects of nuclear magnetic resonance spectroscopy. |
| | 1990 | B.S. Biochemistry, Clemson University. Coursework and research focused on molecular genetics. |
| **Awards** | 2011 | NASA Group Achievement Award, MESSENGER Mission, Orbital mission |
| | 2009 | NASA Graduate Student Research Program fellowship |
| | 2008 | NASA Group Achievement Award, MESSENGER Mission, First Mercury flyby since Mariner 10 |
| | 2006 | NASA Group Achievement Award, UARS Mission |
| | 2005 | ESA Achievement Award, Ulysses Mission |

**Key Experience**

- Co-I: *BepiColombo*, SERENA instrument suite, 2019-present.
- Deputy PI: *Interstellar Mapping and Acceleration Probe (IMAP),* Solar wind and Pickup Ion Composition Energy Spectrometer (SPICES), 2018-present.
- Co-I and Instrument Scientist: *Solar Orbiter*, Heavy Ion Sensor, 2012-present.
- Instrument Scientist: *MESSENGER,* Fast Imaging Plasma Spectrometer (2005-2016)
- Operations Lead: *MESSENGER,* Fast Imaging Plasma Spectrometer (2002-2005); *ACE*, SWICS and SWIMS instruments (2000-present); *Wind*, SMS instrument suite (2000-present).

**Summary of skills and accomplishments**

**Science:** Research has focused on understanding of heavy ions in Mercury's space environment. Accomplishments include first observation of solar wind with MESSENGER, first confirmation of Mercury's Earth-like plasma sheet and, first observation of non-adiabatic ion behavior at Mercury and first explanation of high-energy ions in Mercury's cusp. Contributed expertise on Mercury magnetosphere and plasma data analysis to numerous MESSENGER team publications. Shifting focus to solar wind plasma composition with Solar Orbiter mission after its launch on 9 February 2020.

**Management and Leadership:** *SPICES:* Co-leading the full engineering team as the hardware is designed and tested as Deputy Principal Investigator. *Solar Orbiter/HIS*: Leading instrument operations team, tasked with ensuring collection of optimal science data and delivering that data to the public. Lead ground software development team. *MESSENGER/FIPS:* Managed day-to-day operation of instrument team from first data acquisition (2005), through Mercury orbital insertion (2011) and into present orbital science mission. Accomplishments: Planned and operated FIPS instrument in cruise and Mercury orbit. Developed and produced over 10 public science data products along with detailed documentation, and delivered them to the Planetary Data System (PDS). Managed team of software engineers, scientists and students in production, validation and delivery of *ACE/SWICS* and *ACE/SWIMS* public science data from 2008-2012.

**Relevant technical expertise:** *SPICES:* Contributing expertise to ion optical and instrument hardware designs, and resulting impacts on science capabilities. Worked with PI to define science requirements and performance specifications. *Solar Orbiter/HIS*: Lead writing of detailed specifications for acquisition and handling of data in on-board flight software as well as science capabilities and data collection strategies. *MESSENGER/FIPS:* Lead development of instrument software model, including physical and geometric effects of measurement process and time-dependent variation due to spacecraft motion. Developed method for recovery of plasma parameters from observed data through use of software model. Modeled 3D velocity distribution functions and analyzed relation to measured data. Analyzed calibration data. *ACE/SWICS:* Lead development of data inversion system, with overlap removal and probabilistic assignment of measurements to individual ion species. Work included implementation C++ code, testing/revision of statistical and physics forward models, calibration/efficiency analysis, and extensive analysis of method performance and scientific validity. Delivered resulting dataset to ACE Science Center, over 20 data series in 3 time resolutions spanning 10 years. *Wind/SMS*: Lead development of telemetry decoding, as well instrument health monitoring software.

## Students Mentored

*Doctoral*
Sarah A. Spitzer, 2018-present.
Austin N. Glass, 2017-present.
Patrick J. Tracy, 2011-2016, graduated December 2016.
Ryan M. Dewey, 2015-present.

*Undergraduate, Undergraduate Research Opportunities Program*

Bishop Taverner, 2018-2019, "Search for asymmetry in ion composition in dawn – dusk orbits at Mercury."
Brian Chan, 2017-2018, "Developing a Computer Algorithm to Identify High-Energy Protons in Mercury's Dayside Magnetosphere."
Kayla Kornoelje, 2017-2018, "Identifying High-Eerngy Protons in Mercury's Dayside Magnetosphere"
Audrey Pierce, 2016-2017, "Identifying High-Energy Protons in Mercury's Dayside Magnetosphere"
Natalie Staudacher, 2015-2016, "Heavy Ion Transport through Mercury's Magnetotail"
Patrick Lawton, 2015-2016, "Heavy Ion Transport through Mercury's Magnetotail"
Austin Glass, 2015-2016, "Analyzing Mercury's Foreshock"
Hannah Fan, 2014-2015, "Identifying Mercury's Northern Magnetospheric Cusps"
Daniel Bennet, 2014-2015, "Developing a Computer Algorithm to Analyze Energy – Time Dispersions of Protons in Mercury's Northern Magnetospheric Cusp"
Zachary Meves, 2013-2014, "Analyzing Heavy Lunar Pick-up Ions in Wind/STICS Data"
Jessica Reid, 2013-2014, "Identifying Mercury's Northern Magnetospheric Cusps"

*Undergraduate, Research Experience for Undergraduates (NSF)*
Kristin Brady, Whitman University (WA), Summer 2018
Christopher Bert, Univ. of Massachusetts, Summer 2014
Christine De Zeeuw, Hope College, Summer 2014
Jake Morrison, Montana State University, Summer 2013
Kayla MacLennan, University of Michigan, Summer 2011
Vincent Russo, Eastern Michigan University, Summer 2010
Patrick Tracy, University of Minnesota, Summer 2010
Aron Dodger, Eastern Michigan University, Summer 2008

*Undergraduate, paid research associates*
Bishop Taverner, 2019 – present
Lucas Marmorale, May 2018 – April 2019
Vishnu Saravanan, Sept 2018 – December 2018
Alana Cardenas-O'Toole, May 2018 – April 2019
Sindhu Selvaraju Jayakala, February 2018 – June 2018
Natalie Staudacher, May 2016 – May 2019.
Austin Glass, May 2016 – August 2017
Kathryn L. Wallace, May 2016 – December 2016
Zachary Meves, May 2015 – December 2015
Kayla MacLennan, September 2011 – May 2013
Aron Dodger, Summer 2009

## **Public Outreach**

Contributed to UM CoE press release, Solar Orbiter mission to track the sun's active regions, improve space weather prediction, 29 Jan 2020, https://news.umich.edu/solar-orbiter-mission-to-track-the-suns-active-regions-improve-space-weather-prediction/.

Quoted by BBC World concerning MESSENGER spacecraft surface impact, 30 Apr 2015, http://www.bbc.com/news/science-environment-32510911

Quoted by USA Today concerning MESSENGER spacecraft surface impact, 30 Apr 2015. http://www.usatoday.com/story/news/2015/04/30/mercury-messenger-satellite-spacecraft/26616163/

Contributed to UM CoE press release, "Six things you didn't know about MESSENGER's Mercury crash", 28 Apr 2015, http://www.engin.umich.edu/college/about/news/stories/2015/april/six-things-you-didnt-know-about-messengers-crash

Contributed to UM CoE Mconnex video, "From Michigan to Mercury", 16 Apr 2015, http://www.engin.umich.edu/college/about/news/stories/2015/april/from-michigan-to-mercury

## Service

1. G.R.E.A.T workshop panelist, Climate and Space Sciences and Engineering Dept., April 4, 2019.
2. Dissertation Jury for Sae Aizawa, Tohoku University (Sendai, Japan) & Sorbonne University (Paris, France), February 15, 2019, Sendai, Japan
3. Conference Organizing Committee and Session Chair, "Mercury: Current and Future Science of the Innermost Planet", May 1-3, 2018, Columbia, MD.
4. Referee, Icarus, 2016
5. Referee, Journal of Geophysical Research: Space Physics, 2014 - 2019
6. Referee, Planetary and Space Sciences, 2014 - 2015
7. Reviewer, NASA Proposal Review Panel: NASA Earth and Space Science Fellowship, 2014
8. Reviewer, NASA Proposal Review Panel: Heliospheric Guest Investigator, 2014
9. Reviewer, NASA Proposal Review Panel: Discovery Data Analysis, 2014
10. Reviewer, NSF Proposal Review Panel: Solar, Heliospheric, and Interplanetary Environment, 2014
11. Referee, Annales Geophysica, 2013
12. Reviewer, NSF Proposal Review Panel: Solar-Terrestrial Program, 2013

## Teaching

5. Guest lecture, "Charged Particle Instrumentation", SPACE 595 (Magnetospheres), Winter 2019.
4. Co-taught, SPACE 590 (Space Systems Projects), Winter 2019
3. Guest lecture, "An Overview of the MESSENGER Mission", SPACE 310, Fall 2018.
2. Taught, SPACE 590 (Space Systems Projects), Fall 2018.
1. Guest lecture, "Charged Particle Instrumentation", SPACE 595, Fall 2014.

## Invited Presentations

**Raines, J. M.** (2019), Ion Precipitation at Mercury: Flux, Drivers and Implications, Workshop on Surface bounded exospheres and interactions in the inner Solar System, International Space Sciences Institute, Bern, Switzerland.

**Raines, J. M.** (2019), Mercury Magnetosphere: Review and Recent Results, BepiColombo Science Working Team Meeting, ESA Science and Technology Center, Nordwijk, Netherlands.

**Raines, J. M.** (2019), S. T. Lepri, P. J. Tracy, R. M. Dewey and N. Ganushkina, Suprathermal heavy ion plasma composition from Wind: First exploration of a new dataset from STICS, Workshop on Ion Composition in the Sun-Earth System (ICSES), Fort Lewis College, Durango, CO.

**Raines, J. M.,** M. Sarantos, J. M. Jasinski, P. J. Tracy, R. M. Dewey, M. J. Weberg and J. A. Slavin (2019), First *in-situ* observations of exospheric response to CME impact at Mercury, Tohoku University Planetary Sciences Symposium, Sendai, Japan.

**Raines, J. M.,** R. M. Dewey, G.-K. Poh, W.J. Sun, S. M. Imber, and J. A. Slavin (2018), Recent Findings from MESSENGER on the Magnetosphere of Mercury, European Geosciences Union General Assembly, Vienna, Austria.

**Raines, J. M.,** J. A. Slavin, P. J. Tracy, D. J. Gershman, R. M. Dewey, and M. Sarantos (2017), Ion composition and circulation in the magnetosphere of Mercury, Asia Oceania Geosciences Society (AOGS), 14th Annual Meeting, Singapore.

**Raines, J. M.**, D. J. Gershman, T. H. Zurbuchen, J. A. Slavin, H. Korth and B. J. Anderson, Magnetospheric Cusp Structure and Dynamics: MESSENGER FIPS Measurements at Mercury, BepiColumbo SERENA – Hermean Environment Working Group, Key Largo, FL, 2013.

**Raines, J. M.** (2013), MESSENGER Observations of the Plasma Environment at Mercury, Plasma Sources in Planetary Magnetospheres Workshop, International Space Sciences Institute, Bern, Switzerland.

**Raines, J. M.**, D. J. Gershman, T. H. Zurbuchen, G. Gloeckler, J. A. Slavin, B. J. Anderson, H. Korth, D. Schriver, S. M. Krimigis, R. M. Killen, M. Sarantos, A. L. Sprague and R. L. McNutt (2011), The Plasma Environment at Mercury: First Orbital Measurements, Asia Oceana Geosciences Society (AOGS), Taipei, Taiwan.

## Contributed Presentations

**2019**

Aizawa, S., **J. Raines**, N. Terada, D. Delcourt, and N. Andre (2019), MESSENGER observations of planetary ion characteristics within Kelvin-Helmholtz vortices, EPSC-DPS Joint Meeting 2019, 2019, EPSC-DPS2019-1098.

Aizawa, S., **J. M. Raines**, N. Terada, D. Delcourt, and N. Andre (2019), MESSENGER observations of planetary ion characteristics within Kelvin-Helmholtz vortices at Mercury, AGU Fall Meeting Abstracts.

Dewey, R., J. Slavin, **J. Raines**, and W. Sun (2019), MESSENGER observations of statistical flow braking and flux pile-up in Mercury's magnetotail, EPSC-DPS Joint Meeting 2019, 2019, EPSC-DPS2019-976.

Dewey, R. M., J. A. Slavin, **J. M. Raines**, W.-J. Sun and G.-K. Poh (2019), Observations of Flow Braking and Flux Pile-up in Mercury's Magnetotail: Evidence for Current Wedge Formation, AGU Fall Meeting Abstracts.

Dewey, R. M., **J. M.** Raines, W.-J. Sun and J. A. Slavin (2019), Diagnosing Mercury's Magnetotail Asymmetries: Detecting Seasonal Effects of Mercury's Orbit Using MESSENGER Observations, AGU Fall Meeting Abstracts.

Glass, A. N., **J. M. Raines**, X. Jia, V. Tenishev and Y. Shou (2019), Modeling Sodium Energization at Mercury, AGU Fall Meeting Abstracts.

Glass, A. N., P. Tracy and **J. M. Raines** (2019), Research Update: First Identification of Foreshock Plasma Populations at Mercury, AGU Fall Meeting Abstracts.

Jasinski, J. M., T. Cassidy, **J. M. Raines**, N. Murphy, J. A. Slavin (2019), Photoionization as a loss process of the Sodium Exosphere at Mercury: A Seasonal dependence observed by MESSENGER, AGU Fall Meeting Abstracts, San Francisco, CA.

Jia, X., J. Slavin, G. Poh, G. DiBraccio, G. Toth, Y. Chen, **J. Raines**, and T. Gombosi (2019), MESSENGER observations and global simulations of highly compressed magnetosphere events at Mercury, EGU General Assembly Conference Abstracts, 11922.

Jia, X., J. A. Slavin, G.-K. Poh, G. A. DiBraccio, G. Toth, Y. Chen, **J. M. Raines** and T. Gombosi (2019), MESSENGER observations and global simulations of highly compressed magnetosphere events at Mercury, AGU Fall Meeting Abstracts.

Mangano, V., S. Orsini, A. Milillo, C. Plainaki, A. Mura, **J. M. Raines**, E. De Angelis, R. Rispoli, . Lazzarotto, and A. Aronica (2019), Solar perturbations transits in Mercury exosphere, Nuovo Cimento C Geophysics Space Physics C, 42, 49, doi: 10.1393/ncc/i2019-19049-2.

**Raines, J. M**., P. Tracy, N. T. Estell, A. Cardenas-O'Toole, S. T. Lepri and L. Siskind (2019), Suprathermal O6+ behavior associated with interplanetary shocks, AGU Fall Meeting Abstracts, San Francisco, CA.

Romanelli, N., G. A. DiBraccio, D. J. Gershman, G. Le, C. X. Mazelle, K. Meziane, S. A. Boardsen, J. A. Slavin, J. R. Espley, **J. M. Raines** and A. N. Glass (2019), Statistical Study on the Upstream Ultra-low Frequency Waves in Mercury's Foreshock seen by MESSENGER, GU Fall Meeting Abstracts.

Spitzer, S. A., J. A. Gilbert, S. T. Lepri, **J. M. Raines**, and E. Möbius (2019), Determining the Interstellar Wind Longitudinal Inflow Evolution Using Pickup Ions in the Helium Focusing Cone, Solar Heliospheric and INterplanetary Environment (SHINE 2019), 2.

Spitzer, S. A., J. A. Gilbert, S. T. Lepri, **J. M. Raines**, E. Moebius and J. Bower (2019), Determining the Interstellar Wind Longitudinal Inflow Evolution Using Pickup Ions in the Helium Focusing Cone, AGU Fall Meeting Abstracts, San Francisco, CA.

Slavin, J. A., H. R. Middleton, **J. M. Raines**, X. Jia, J. Zhong, W.-J. Sun, S. Livi, S. M. Imber, G.-K. Poh, M. Akhavan-Tafti, J. Â. M. Jasinski, G. A. DiBraccio, C. Dong, R. M. Dewey, and M. L. Mays (2019), MESSENGER Observations of Disappearing Dayside Magnetosphere Events at Mercury, Journal of Geophysical Research (Space Physics), 124, 6613-6635, doi: 10.1029/2019JA026892.

Sun, W.-J., J. A. Slavin, R. M. Dewey, Y. Chen, J. M. Jasinski, **J. M. Raines**, G. A. DiBraccio and X. Jia (2019), Mercury's nightside magnetosphere in response to a Coronal Mass Ejection and a High Speed Stream: MESSENGER observations, AGU Fall Meeting Abstracts.

Wurz, P., D. Gamborino, A. Vorburger, and **J. Raines** (2019), Heavy Ion Composition of Mercury's Magnetosphere, EGU General Assembly Conference Abstracts, 12485.

Zhao, J.-T., G. Zong, W.-J. Sun, J. A. Slavin, X. Zhou, R. M. Dewey, G.-K. Poh, and **J. M. Raines** (2019), Statistical Study of the Force Balance and Structure in the Flux Ropes in Mercury's Magnetotail, AGU Fall Meeting Abstracts.

**2018**

Brady, K. E. and **J. M. Raines** (2018), Solar Wind Effects on Ion Temperature and Density in Mercury's Central Plasma Sheet, AGU Fall Meeting Abstracts, doi:

Dewey, R. M., **J. M. Raines**, J. A. Slavin, W. J. Sun, and G. Poh (2018), MESSENGER observations of fast plasma flows in Mercury's magnetotail, AGU Fall Meeting Abstracts, doi:

Dewey, R. M., J. A. Slavin, and **J. M. Raines** (2018), MESSENGER observations of dipolarizations in Mercury's magnetotail, AGU Fall Meeting Abstracts, doi:

Dewey, R. M., J. A. Slavin, **J. M. Raines**, D. N. Baker, and D. J. Lawrence (2018), Energetic Electron Acceleration, Injection, and Transport in Mercury's Magnetosphere, Mercury: Current and Future Science of the Innermost Planet, 2047, 6073- doi:

Dewey, R., J. Slavin, **J. Raines**, D. Baker, and D. Lawrence (2018), Energetic Electron Acceleration and Injection During Dipolarization Events in Mercury's Magnetotail, EGU General Assembly Conference Abstracts, 20, 10706- doi:

Glass, A. N., P. Tracy, and **J. M. Raines** (2018), First Identification of Foreshock Plasma Populations at Mercury, AGU Fall Meeting Abstracts, doi:

Glass, A. N., P. J. Tracy, and **J. M. Raines** (2018), First Identification of Foreshock Plasma Populations at Mercury, Mercury: Current and Future Science of the Innermost Planet, 2047, 6042- doi:

Jasinski, J. M., **J. M. Raines**, J. A. Slavin, N. Murphy, L. Regoli, T. Cassidy, and D. J. Gershman (2018), Mercury's extended sodium exosphere: pickup ion observations in the solar wind by MESSENGER, AGU Fall Meeting Abstracts, doi:

Jasinski, J. M., **J. M. Raines**, J. A. Slavin, L. R. Regoli, and N. Murphy (2018), Sodium Pick-Up Ion Observations in the Solar Wind Upstream of Mercury, Mercury: Current and Future Science of the Innermost Planet, 2047, 6110- doi:

Livi, S. A., R. L. McNutt Jr., G. C. Ho, F. Allegrini, and **J. M. Raines** (2018), Discovering the Origin of the Solar System, AGU Fall Meeting Abstracts, doi:

Livi, S., K. Ogasawara, G. Ho, R. McNutt, S. Lepri, **J. Raines**, S. Fuselier, F. Allegrini, M. Desai, M. Horanyi, and R. Livi (2018), CODEX: Discovering the Origins of the Solar System, 42nd COSPAR Scientific Assembly, 42, PIR.1-9-18- doi:

Orsini, S., V. Mangano, A. Milillo, C. Plainaki, A. Mura, **J. M. Raines**, M. Laurenza, E. De Angelis, R. Rispoli, F. Lazzarotto, and A. Aronica (2018), Mercury Sodium Exospheric Emission as a Proxy for Solar Perturbations Transit, Mercury: Current and Future Science of the Innermost Planet, 2047, 6010- doi:

Poh, G., K. Clink, W. Sun, J. A. Slavin, X. Jia, **J. M. Raines**, G. A. DiBraccio, and J. R. Espley (2018), Large-Amplitude Oscillatory Motion in Mercury's Cross-tail Current Sheet, AGU Fall Meeting Abstracts, doi:

Poh, G., J. Slavin, X. Jia, S. Imber, **J. Raines**, G. DiBraccio, D. Gershman, and W.-J. Sun (2018), Transport of Mass and Energy in Mercury's Central Plasma Sheet, EGU General Assembly Conference Abstracts, 20, 5508- doi:

**Raines, J. M.** (2018), Planetary Ions at Mercury: Unanswered Questions After MESSENGER, Mercury: Current and Future Science of the Innermost Planet, 2047, 6087- doi:

**Raines, J. M.**, P. Tracy, R. M. Dewey, S. T. Lepri, and N. Y. Ganushkina (2018), Suprathermal heavy ion plasma composition from Wind: A new dataset from STICS, AGU Fall Meeting Abstracts, doi:

**Raines, J. M.**, K. L. Wallace, M. Sarantos, J. M. Jasinksi, P. J. Tracy, R. M. Dewey, M. J. Weberg, and J. A. Slavin (2018), First In-Situ Observations of Exospheric Response to CME

Impact at Mercury, Mercury: Current and Future Science of the Innermost Planet, 2047, 6038- doi:

**Sun, W. J.**, J. A. Slavin, R. M. Dewey, J. M. Raines, S. Fu, Y. Wei, T. Karlsson, G. Poh, X. Jia, D. J. Gershman, Q. Zong, W. Wan, Q. Shi, Z. Pu, and D. Zhao (2018), On the variations of protons during the magnetospheric substorm at Earth and Mercury in the near-tail: A comparative study, AGU Fall Meeting Abstracts.

**2017**

**J. M. Raines**, K. L. Wallace, M. Sarantos, J. M. Jasinski, P. J. Tracy, R. M. Dewey, M. J. Weberg, and J. A. Slavin (2017), First in-situ observations of exospheric response to CME impact at Mercury, American Geophysical Union Fall Meeting, New Orleans, LA.

Dewey, R. M., J. A. Slavin, **J. M. Raines**, D. N. Baker, and D. J. Lawrence (2017), Energetic electron acceleration and injection during dipolarization events in Mercury's magnetotail, AGU Fall Meeting Abstracts, doi:

Dewey, R. M., J. A. Slavin, **J. M. Raines**, S. Imber, D. N. Baker, and D. J. Lawrence (2017), Energetic electron injections and dipolarization events in Mercury's magnetotail: Substorm dynamics, AGU Fall Meeting Abstracts, doi:

Jasinski, J. M., J. A. Slavin, **J. M. Raines**, and G. A. DiBraccio (2017), Mercury's solar wind interaction as characterized by magnetospheric plasma mantle observations with MESSENGER, AGU Fall Meeting Abstracts, doi:

Livi, S. A., S. T. Lepri, **J. M. Raines**, A. Galvin, L. M. Kistler, F. Allegrini, K. Ogasawara, and M. R. Collier (2017), The Heavy Ion Sensor (HIS) Onboard Solar Orbiter (SOLO): Calibration Results and Science Outlook, AGU Fall Meeting Abstracts, doi:

Orsini, S., V. Mangano, A. Milillo, C. Plainaki, A. Mura, S. Massetti, **J. M. Raines**, E. De Angelis, R. Rispoli, F. Lazzarotto, and A. Aronica (2017), Mercury Na exospheric emission related to solar disturbances, European Planetary Science Congress, 11, EPSC2017-847- doi:

Orsini, S., V. Mangano, A. Milillo, C. Plainaki, A. Mura, **J. M. Raines**, M. Laurenza, E. De Angelis, R. Rispoli, F. Lazzarotto, and A. Aronica (2017), Mercury sodium exospheric emission as a proxy for solar perturbations transit, AGU Fall Meeting Abstracts, doi:

**2016**

Dewey, R., J. A. Slavin, D. Baker, **J. Raines**, and D. Lawrence (2016), MESSENGER observations of energetic electron acceleration in Mercury's magnetotail, AAS/Division for Planetary Sciences Meeting Abstracts, 48, 117.02.

Jasinski, J., **J. Raines**, and J. Slavin (2016), Ion observations at Mercury's Magnetospheric Cusp, EGU General Assembly Conference Abstracts, 18, 10818.

Jasinski, J. M., J. A. Slavin, **J. Raines**, and G. DiBraccio (2016), Mercury's Plasma Mantle - a survey of MESSENGER observations, AAS/Division for Planetary Sciences Meeting Abstracts, 48, 524.03.

Poh, G., J. Slavin, X. Jia, **J. Raines**, W.-J. Sun, K. Genestreti, A. Smith, D. Gershman, and B. Anderson (2016), MESSENGER Observations of Asymmetries at Mercury's Magnetotail Current Sheet, EGU General Assembly Conference Abstracts, 18, 2227.

**Raines, J. M.**, J. A. Slavin, P. J. Tracy, D. J. Gershman, T. H. Zurbuchen, R. M. Dewey, and M. Sarantos (2016), Plasma precipitation on Mercury’s nightside and its implications for magnetospheric convection and exosphere generation, AGU Fall Meeting Abstracts.

**2015**

Baker, D. N., R. Dewey, B. J. Anderson, G. Ho, H. Korth, S. Krimigis, D. J. Lawrence, R. L. McNutt Jr., D. Odstrcil, **J. M. Raines**, D. Schriver, J. A. Slavin, and S. C. Solomon (2015), Energetic electron flux enhancements in Mercury's magnetosphere: An integrated view with multi-instrument observations from MESSENGER, EGU General Assembly Conference Abstracts, 17, 2517.

Dewey, R. M., D. N. Baker, J. A. Slavin, **J. M. Raines**, D. J. Lawrence, J. O. Goldsten, P. N. Peplowski, H. Korth, S. M. Krimigis, B. J. Anderson, G. C. Ho, R. L. McNutt Jr., D. Schriver, and S. C. Solomon (2015), Intense energetic-electron flux enhancements in Mercury's magnetosphere: An integrated view with high-resolution observations from MESSENGER, AGU Fall Meeting Abstracts.

Dewey, R., J. A. Slavin, D. Baker, **J. Raines**, and D. Lawrence (2016), MESSENGER observations of energetic electron acceleration in Mercury's magnetotail, AAS/Division for Planetary Sciences Meeting Abstracts, 48, 117.02- doi:

Gershman, D. J., **J. M. Raines**, J. A. Slavin, T. Zurbuchen, B. J. Anderson, H. Korth, G. C. Ho, S. A. Boardsen, T. A. Cassidy, B. Walsh, and S. C. Solomon (2015), Mapping Mercury's magnetic topology with solar energetic electrons, AGU Fall Meeting Abstracts, doi:

Liljeblad, E. I., T. Karlsson, **J. M. Raines**, J. A. Slavin, A. Kullen, T. Sundberg, and T. Zurbuchen (2015), MESSENGER Observations of the Dayside Low-Latitude Boundary Layer in Mercury's Magnetosphere, AGU Fall Meeting Abstracts, doi:

Poh, G., J. Slavin, X. Jia, G. DiBraccio, **J. Raines**, S. Imber, D. Gershman, B. Anderson, H. Korth, R. McNutt, and S. Solomon (2015), MESSENGER Observations of Cusp Plasma Filaments at Mercury, EGU General Assembly Conference Abstracts, 17, 2582.

Schriver, D., P. M. Travnicek, G. C. Ho, R. D. Starr, D. L. Domingue, D. N. Baker, P. Hellinger, S. M. Krimigis, R. L. McNutt Jr., **J. M. Raines**, J. A. Slavin, and S. C. Solomon (2015), Energization and Precipitation of Electrons in Mercury's Magnetosphere, AGU Fall Meeting Abstracts.

Sun, W. J., J. A. Slavin, S. Fu, **J. M. Raines**, Q. G. Zong, G. Poh, X. Jia, T. Sundberg, D. J. Gershman, Z. Pu, T. Zurbuchen, and Q. Shi (2015), MESSENGER Observations of Substorm Activity at Mercury, AGU Fall Meeting Abstracts.

Sun, W.-J., J. Slavin, S. Fu, **J. Raines**, Q.-G. Zong, Z. Yao, Z. Pu, Q. Shi, G. Poh, S. Boardsen, S. Imber, T. Sundberg, B. Anderson, H. Korth, and D. Baker (2015), MESSENGER observations of substorm activity in Mercury's near magnetotail, EGU General Assembly Conference Abstracts, 17, 2687.

Tracy, P., J. C. Kasper, T. Zurbuchen, **J. M. Raines**, and J. A. Gilbert (2015), Relative Heating of Heavy Ions Observed at 1 AU with ACE/SWICS, AGU Fall Meeting Abstracts.

Weberg, M. J., **J. M. Raines**, D. J. Gershman, S. T. Lepri, and T. Zurbuchen (2015), Bulk Velocity and Thermal Properties of the Solar Wind in the Inner Heliosphere, AGU Fall Meeting Abstracts.

**2014**

Bisi, M. M., R. A. Fallows, C. Sobey, T. Eftekhari, E. A. Jensen, B. V. Jackson, H. S. Yu, D. J. Gershman, **J. M. Raines**, and D. Odstrcil (2014), Faraday Rotation (FR) and Interplanetary Scintillation (IPS) Case Studies Using the LOw Frequency ARray (LOFAR), AGU Fall Meeting Abstracts.

Dewey, R. M., D. N. Baker, B. J. Anderson, M. Benna, C. L. Johnson, H. Korth, D. J. Gershman, G. C. Ho, W. E. McClintock, D. Odstrcil, L. C. Philpott, **J. M. Raines**, D. Schriver, J. A. Slavin, S. C. Solomon, R. M. Winslow, and T. Zurbuchen (2014), Improving solar wind modeling at Mercury: Incorporating transient solar phenomena into the WSA-ENLIL model, AGU Fall Meeting Abstracts.

DiBraccio, G. A., J. A. Slavin, **J. M. Raines**, D. J. Gershman, P. Tracy, S. A. Boardsen, T. Zurbuchen, B. J. Anderson, H. Korth, R. L. McNutt Jr., and S. C. Solomon (2014), First Observations of Mercury's Plasma Mantle As Seen By MESSENGER, AGU Fall Meeting Abstracts, doi:

DiBraccio, G. A., J. A. Slavin, S. M. Imber, D. J. Gershman, **J. M. Raines**, S. A. Boardsen, B. J. Anderson, H. Korth, T. H. Zurbuchen, R. L. McNutt Jr., and S. C. Solomon (2014), MESSENGER Observations of Magnetic Flux Ropes in Mercury's Plasma Sheet, EGU General Assembly Conference Abstracts, 16, 6821.

Gershman, D. J., **J. M. Raines**, J. A. Slavin, T. Zurbuchen, T. Sundberg, S. A. Boardsen, B. J. Anderson, H. Korth, and S. C. Solomon (2014), Multi-Scale Kelvin-Helmholtz Vortices Along Mercury's Magnetopause, AGU Fall Meeting Abstracts, doi:

Gershman, D. J., **J. M. Raines**, J. A. Slavin, T. H. Zurbuchen, T. Sundberg, S. A. Boardsen, B. J. Anderson, H. Korth, and S. C. Solomon (2014), On the dynamic influence of Na+ in Mercury's magnetotail, EGU General Assembly Conference Abstracts, 16, 7002.

Lepri, S. T., S. A. Livi, A. B. Galvin, L. M. Kistler, **J. M. Raines**, F. Allegrini, M. R. Collier, and T. Zurbuchen (2014), Heavy ion composition in the inner heliosphere: Predictions for Solar Orbiter, AGU Fall Meeting Abstracts.

Middleton, H. R., J. A. Slavin, J. M. Raines, X. Jia, B. J. Anderson, M. L. Mays, and T. Zurbuchen (2014), MESSENGER Disappearing Dayside Magnetosphere Events: Evidence for Severe Dayside Erosion and/or Compression?, AGU Fall Meeting Abstracts.

Poh, G. K., J. A. Slavin, G. A. DiBraccio, X. Jia, **J. M. Raines**, S. M. Imber, B. J. Anderson, H. Korth, D. J. Gershman, T. Zurbuchen, R. L. McNutt Jr., and S. C. Solomon (2014), MESSENGER Observations of Cusp Plasma Filaments at Mercury, AGU Fall Meeting Abstracts.

**Raines, J. M.**, P. Tracy, D. J. Gershman, G. K. Poh, J. A. Slavin, T. Zurbuchen, H. Korth, B. J. Anderson, and S. C. Solomon (2014), MESSENGER's low-altitude plasma observations in Mercury's northern magnetospheric cusp, AGU Fall Meeting Abstracts, doi:

Schriver, D., P. M. Travnicek, B. J. Anderson, M. Ashour-Abdalla, D. N. Baker, M. Benna, S. A. Boardsen, P. Hellinger, G. C. Ho, H. Korth, S. M. Krimigis, R. L. McNutt Jr., **J. M. Raines**, R. L. Richard, J. A. Slavin, R. D. Starr, S. C. Solomon, and T. Zurbuchen (2014), Plasma Transport, Acceleration, and Loss in Mercury's Magnetosphere and Comparison with Other Planetary Magnetospheres, AGU Fall Meeting Abstracts,.

Sun, W.-J., J. Slavin, S. Fu, **J. Raines**, Q.-G. Zong, Z. Yao, Z. Pu, Q. Shi, G. Poh, S. Boardsen, S. Imber, T. Sundberg, B. Anderson, H. Korth, and D. Baker (2015), MESSENGER observations of substorm activity in Mercury's near magnetotail, EGU General Assembly Conference Abstracts, 17, 2687.

Tracy, P., T. Zurbuchen, **J. M. Raines**, P. Shearer, J. C. Kasper, J. A. Gilbert, and B. L. Alterman (2014), Heavy Ion Temperatures As Observed By ACE/Swics, AGU Fall Meeting Abstracts.

Uritsky, V., J. Slavin, S. Boardsen, T. Sundberg, **J. Raines**, D. Gershman, T. Zurbuchen, G. Khazanov, B. Anderson, and H. Korth (2014), Multiscale magnetic turbulence at Mercury, EGU General Assembly Conference Abstracts, 16, 13988.

Winslow, R. M., C. L. Johnson, B. J. Anderson, D. J. Gershman, **J. M. Raines**, R. J. Lillis, H. Korth, J. A. Slavin, S. C. Solomon, and T. Zurbuchen (2014), Regional-Scale Surface Magnetic Fields and Proton Fluxes to Mercury's Surface from Proton-Reflection Magnetometry, AGU Fall Meeting Abstracts.

**2013**

Benna, M., J. A. Slavin, B. J. Anderson, D. N. Baker, H. Korth, **J. M. Raines**, T. Zurbuchen, C. L. Johnson, and S. C. Solomon (2013), Effect of Electromagnetic Induction on the Magnetosphere of Mercury, AGU Fall Meeting Abstracts.

Dewey, R. M., D. N. Baker, B. J. Anderson, M. Benna, C. L. Johnson, H. Korth, D. J. Gershman, G. C. Ho, W. E. McClintock, D. Odstrcil, **J. M. Raines**, D. Schriver, J. A. Slavin, S. C. Solomon, R. M. Winslow, and T. Zurbuchen (2013), WSA-ENLIL Cone Extension: Improving Solar Wind Forcing Parameter Estimates at Mercury, AGU Fall Meeting Abstracts.

DiBraccio, G. A., J. A. Slavin, S. A. Boardsen, B. J. Anderson, H. Korth, T. Zurbuchen, **J. M. Raines**, D. N. Baker, R. L. McNutt, and S. C. Solomon (2013), MESSENGER Observations of Magnetopause Reconnection at Mercury (Invited), AGU Fall Meeting Abstracts.

DiBraccio, G. A., J. A. Slavin, S. M. Imber, D. J. Gershman, **J. M. Raines**, S. A. Boardsen, B. J. Anderson, H. Korth, T. Zurbuchen, R. L. McNutt, and S. C. Solomon (2013), MESSENGER Observations of Plasmoid-type Flux Ropes in Mercury's Magnetotail, AGU Fall Meeting Abstracts.

DiBraccio, G. A., J. A. Slavin, S. M. Imber, D. J. Gershman, **J. M. Raines**, S. A. Boardsen, B. J. Anderson, H. Korth, T. H. Zurbuchen, R. L. McNutt Jr., and S. C. Solomon (2013), MESSENGER Observations of Plasmoid-type Flux Ropes in Mercury's Magnetotail, European Planetary Science Congress 2013, held 8-13 September in London, UK., 8, EPSC2013-681.

Gershman, D. J., J. A. Slavin, J. M. Raines, T. Zurbuchen, B. J. Anderson, H. Korth, D. N. Baker, and S. C. Solomon (2013), Ion composition and kinetics in Mercury's magnetotail (Invited), AGU Fall Meeting Abstracts.

Gershman, D. J., J. A. Slavin, **J. M. Raines**, T. Zurbuchen, B. J. Anderson, H. Korth, D. N. Baker, and S. C. Solomon (2013), Plasma Depletion in a Low-Alfvénic-Mach-Number Magnetosheath: Observations at Mercury, AGU Fall Meeting Abstracts.

Korth, H., B. J. Anderson, **J. M. Raines**, D. J. Gershman, J. A. Slavin, T. Zurbuchen, S. C. Solomon, and R. L. McNutt Jr. (2013), Plasma distribution in Mercury's magnetosphere inferred from MESSENGER Magnetometer and Fast Imaging Plasma Spectrometer observations, AGU Fall Meeting Abstracts.

Poh, G., J. A. Slavin, S. M. Imber, G. A. DiBraccio, X. Jia, B. J. Anderson, H. Korth, D. J. Gershman, **J. M. Raines**, T. Zurbuchen, R. L. McNutt, and S. C. Solomon (2013), MESSENGER Observations of Flux Transfer Events during the Impact of the 23 November 2011 Coronal Mass Ejection onto Mercury's Magnetosphere, AGU Fall Meeting Abstracts.

**Raines, J. M.**, D. J. Gershman, J. A. Slavin, T. Zurbuchen, H. Korth, B. J. Anderson, and S. C. Solomon (2013), MESSENGER observations of proton precipitation in Mercury's northern magnetospheric cusp, AGU Fall Meeting Abstracts, doi:

Sarantos, M., M. Benna, **J. M. Raines**, J. A. Slavin, R. M. Killen, T. Zurbuchen, and S. C. Solomon (2013), Simulations of the Na+/O+ ratio observed by MESSENGER and implications for oxygen-bearing volatiles in Mercury's exosphere, AGU Fall Meeting Abstracts, doi:

Schriver, D., P. M. Travnicek, B. J. Anderson, M. Ashour-Abdalla, D. N. Baker, M. Benna, S. A. Boardsen, P. Hellinger, G. C. Ho, H. Korth, S. M. Krimigis, R. L. McNutt Jr., **J. M. Raines**, R. L. Richard, J. A. Slavin, S. C. Solomon, R. D. Starr, and T. Zurbuchen (2013), What Happened to the High-Energy (> 100 keV) Particles at Mercury?, AGU Fall Meeting Abstracts, doi:

Shearer, P., M. K. Jawed, **J. M. Raines**, S. T. Lepri, J. A. Gilbert, R. von Steiger, and T. Zurbuchen (2013), A Rigorous Statistical Approach to Determine Solar Wind Composition from ACE/SWICS Data, and New Ne/O Ratios, AGU Fall Meeting Abstracts.

Tenishev, V., M. R. Combi, X. Jia, M. Rubin, and **J. Raines** (2013), Kinetic modeling of the sodium distribution in the Hermean surface-bound exosphere, AAS/Division for Planetary Sciences Meeting Abstracts, 45, 114.02.

Travnicek, P. M., D. Hercik, D. Schriver, P. Hellinger, B. J. Anderson, **J. M. Raines**, J. A. Slavin, and T. H. Zurbuchen (2013), Mercury's plasma belt under different Interplanetary Magnetic Field: hybrid simulations results compared to in-situ measurements, EGU General Assembly Conference Abstracts, 15, EGU2013-7237.

Uritsky, V. M., J. A. Slavin, G. A. Collinson, T. Sundberg, S. A. Boardsen, **J. M. Raines**, and D. J. Gershman (2013), Active current sheets at Mercury and across the solar system, AGU Fall Meeting Abstracts.

Winslow, R. M., C. L. Johnson, B. J. Anderson, D. J. Gershman, **J. M. Raines**, R. J. Lillis, H. Korth, J. A. Slavin, and S. C. Solomon (2013), First application of proton reflection magnetometry with MESSENGER to estimate Mercury's surface magnetic field strength (Invited), AGU Fall Meeting Abstracts.

**Publications (H index: 25)**

**2020**

86. Glass, A. N., **J. M. Raines**, X. Jia, V. Tenishev and Y. Shou (2020), Modeling Sodium Energization at Mercury, *in preparation*.

85. **Raines, J. M.** , N. M. Staudacher, P. J. Tracy, R. M. Dewey, C. M. Bert, M. Sarantos, D. J. Gershman and J. A. Slavin (2020), Proton precipitation in Mercury's northern magnetospheric cusp, *in preparation.*

**2019**

84. Chen, Y., G. Tóth, X. Jia, J. A. Slavin, W. Sun, S. Markidis, T. I. Gombosi, and J. M. Raines (2019), Studying Dawn-Dusk Asymmetries of Mercury's Magnetotail Using MHD-EPIC Simulations, Journal of Geophysical Research (Space Physics), 124, 8954-8973, doi: 10.1029/2019JA026840.

83. Jia, X., J. A. Slavin, G. Poh, G. A. DiBraccio, G. Toth, Y. Chen, J. M. Raines, and T. I. Gombosi (2019), MESSENGER Observations and Global Simulations of Highly Compressed Magnetosphere Events at Mercury, Journal of Geophysical Research (Space Physics), 124, 229-247, doi: 10.1029/2018JA026166.

82. Wurz, P., D. Gamborino, A. Vorburger, and **J. M. Raines** (2019), Heavy Ion Composition of Mercury's Magnetosphere, Journal of Geophysical Research (Space Physics), 124, 2603-2612, doi: 10.1029/2018JA026319.

81. Slavin, J. A., S. M. Imber and **J. M. Raines**, Chapter 9.1. A Dungey Cycle in the Life of Mercury's Magnetosphere, submitted to AGU Books, "AGU Volume II: Magnetospheres in the Solar System".
80. Korth, H., B. J. Anderson, C. L. Johnson , J. A. Slavin, **J. M. Raines** and T. H. Zurbuchen, Structure and configuration of Mercury's Magnetosphere, in "Mercury: The View After MESSENGER", ed. By Solomon, S. C., L. R. Nittler and B. J. Anderson, Cambridge, 2019.
79. Zhao, J. T., W.-J. Sun, Q. G. Zong, J. A. Slavin, X. Z. Zhou, R. M. Dewey, G. K. Poh, and J. M. Raines (2019), A Statistical Study of the Force Balance and Structure in the Flux Ropes in Mercury's Magnetotail, Journal of Geophysical Research (Space Physics), 124, 5143-5157, doi: 10.1029/2018JA026329.
78. Zhong, J., Q. G. Zong, Y. Wei, J. A. Slavin, X. Cao, Z. Y. Pu, X. G. Wang, S. Y. Fu, J. M. Raines, and W. X. Wan (2019), MESSENGER Observations of Giant Plasmoids in Mercury's Magnetotail, The Astrophysical Journal, 886, L32, doi: 10.3847/2041-8213/ab5650.

**2018**

77. Dewey, R. M., **J. M. Raines**, W. Sun, J. A. Slavin, and G. Poh (2018), MESSENGER Observations of Fast Plasma Flows in Mercury's Magnetotail, Geophysical Research Letters, 45, 10- doi: 10.1029/2018GL079056.
76. Jia, X., J. A. Slavin, G. Poh, G. A. DiBraccio, G. Toth, Y. Chen, **J. M. Raines**, and T. I. Gombosi (2018), MESSENGER Observations and Global Simulations of Highly Compressed Magnetosphere Events at Mercury, Journal of Geophysical Research (Space Physics), 124, 229-247, doi: 10.1029/2018JA026166.
75. Orsini, S., V. Mangano, A. Milillo, C. Plainaki, A. Mura, **J. M. Raines**, E. De Angelis, R. Rispoli, F. Lazzarotto, and A. Aronica (2018), Mercury sodium exospheric emission as a proxy for solar perturbations transit, Nature Scientific Reports, (2018) 8:928, DOI:10.1038/s41598-018-19163-x.
74. Poh, G., J. A. Slavin, X. Jia, W.-J. Sun, **J. M. Raines**, S. M. Imber, G. A. DiBraccio, and D. J. Gershman (2018), Transport of Mass and Energy in Mercury's Plasma Sheet, Geophysical Research Letters, 45, 12- doi: 10.1029/2018GL080601.
73. Sun, W. J., J. A. Slavin, R. M. Dewey, **J. M. Raines**, S. Y. Fu, Y. Wei, T. Karlsson, G. K. Poh, X. Jia, D. J. Gershman, Q. G. Zong, W. X. Wan, Q. Q. Shi, Z. Y. Pu, and D. Zhao (2018), A Comparative Study of the Proton Properties of Magnetospheric Substorms at Earth and Mercury in the Near Magnetotail, Geophysical Research Letters, 45, 7933-7941, doi: 10.1029/2018GL079181.
72. Zhong, J., Y. Wei, Z. Y. Pu, X. G. Wang, W. X. Wan, J. A. Slavin, X. Cao, **J. M. Raines**, H. Zhang, C. J. Xiao, A. M. Du, R. S. Wang, R. M. Dewey, L. H. Chai, Z. J. Rong, and Y. Li (2018), MESSENGER Observations of Rapid and Impulsive Magnetic Reconnection in Mercury's Magnetotail, The Astrophysical Journal, 860, L20- doi: 10.3847/2041-8213/aaca92.

**2017**

71 .Dewey, R. M., J. A. Slavin, **J. M. Raines**, D. N. Baker, and D. J. Lawrence (2017), Energetic Electron Acceleration and Injection During Dipolarization Events in Mercury's Magnetotail, Journal of Geophysical Research (Space Physics), 122, 12- doi: 10.1002/2017JA024617.
70. Jasinski, J. M., J. A. Slavin, **J. M. Raines**, and G. A. DiBraccio (2017), Mercury's Solar Wind Interaction as Characterized by Magnetospheric Plasma Mantle Observations With

MESSENGER, Journal of Geophysical Research (Space Physics), 122, 12- doi: 10.1002/2017JA024594.

69. Lepri, S. T., **J. M. Raines**, J. A. Gilbert, J. Cutler, M. Panning, and T. H. Zurbuchen (2017), Detecting negative ions on board small satellites, Journal of Geophysical Research (Space Physics), 122, 3961-3971, doi: 10.1002/2016JA023327.
68. Poh, G., J. A. Slavin, X. Jia, J. M. Raines, S. M. Imber, W.-J. Sun, D. J. Gershman, G. A. DiBraccio, K. J. Genestreti, and A. W. Smith (2017), Coupling between Mercury and its nightside magnetosphere: Cross-tail current sheet asymmetry and substorm current wedge formation, Journal of Geophysical Research (Space Physics), 122, 8419-8433, doi: 10.1002/2017JA024266.
67. Poh, G., J. A. Slavin, X. Jia, J. M. Raines, S. M. Imber, W.-J. Sun, D. J. Gershman, G. A. DiBraccio, K. J. Genestreti, and A. W. Smith (2017), Mercury's cross-tail current sheet: Structure, X-line location and stress balance, Geophysical Research Letters, 44, 678-686, doi: 10.1002/2016GL071612.
66. Sun, W. J., J. M. Raines, S. Y. Fu, J. A. Slavin, Y. Wei, G. K. Poh, Z. Y. Pu, Z. H. Yao, Q. G. Zong, and W. X. Wan (2017), MESSENGER observations of the energization and heating of protons in the near-Mercury magnetotail, Geophysical Research Letters, 44, 8149-8158, doi: 10.1002/2017GL074276.
65. Zhao, L., E. Landi, S. T. Lepri, J. A. Gilbert, T. H. Zurbuchen, L. A. Fisk, and J. M. Raines (2017), On the Relation between the In Situ Properties and the Coronal Sources of the Solar Wind, The Astrophysical Journal, 846, 135- doi: 10.3847/1538-4357/aa850c.
64. Zhao, L., E. Landi, S. T. Lepri, M. Kocher, T. H. Zurbuchen, L. A. Fisk, and J. M. Raines (2017), An Anomalous Composition in Slow Solar Wind as a Signature of Magnetic Reconnection in its Source Region, The Astrophysical Journal Supplement Series, 228, 4- doi: 10.3847/1538-4365/228/1/4.

**2016**

63. Baker, D. N., R. M. Dewey, D. J. Lawrence, J. O. Goldsten, P. N. Peplowski, H. Korth, J. A. Slavin, S. M. Krimigis, B. J. Anderson, G. C. Ho, R. L. McNutt, **J. M. Raines**, D. Schriver, and S. C. Solomon (2016), Intense energetic electron flux enhancements in Mercury's magnetosphere: An integrated view with high-resolution observations from MESSENGER, *J. Geophys. Res. (Space Physics)*, 121, 2171-2184, doi: 10.1002/2015JA021778.
62. Gershman, D. J., J. C. Dorelli, G. A. DiBraccio, **J. M. Raines**, J. A. Slavin, G. Poh, and T. H. Zurbuchen (2016), Ion-scale structure in Mercury's magnetopause reconnection diffusion region, Geophysical Research Letters, 43, 5935-5942, doi: 10.1002/2016GL069163.
61. Karlsson, T., E. Liljeblad, A. Kullen, **J. M. Raines**, J. A. Slavin, and T. Sundberg (2016), Isolated magnetic field structures in Mercury's magnetosheath as possible analogues for terrestrial magnetosheath plasmoids and jets, Planetary and Space Science, 129, 61-73, doi: 10.1016/j.pss.2016.06.002.
60. Poh, G., J. A. Slavin, X. Jia, G. A. DiBraccio, **J. M. Raines**, S. M. Imber, D. J. Gershman, W.-J. Sun, B. J. Anderson, H. Korth, T. H. Zurbuchen, R. L. McNutt, and S. C. Solomon (2016), MESSENGER observations of cusp plasma filaments at Mercury, Journal of Geophysical Research (Space Physics), 121, 8260-8285, doi: 10.1002/2016JA022552.
59. Sun, W. J., S. Y. Fu, J. A. Slavin, **J. M. Raines**, Q. G. Zong, G. K. Poh, and T. H. Zurbuchen (2016), Spatial distribution of Mercury's flux ropes and reconnection fronts: MESSENGER

observations, Journal of Geophysical Research (Space Physics), 121, 7590-7607, doi: 10.1002/2016JA022787.

58. Tracy, P. J., J. C. Kasper, **J. M. Raines**, P. Shearer, J. A. Gilbert, and T. H. Zurbuchen (2016), Constraining Solar Wind Heating Processes by Kinetic Properties of Heavy Ions, Physical Review Letters, 116, 255101- doi: 10.1103/PhysRevLett.116.255101.
57. Winslow, R. M., N. Lugaz, N. A. Schwadron, C. J. Farrugia, W. Yu, **J. M. Raines**, M. L. Mays, A. B. Galvin, and T. H. Zurbuchen (2016), Longitudinal conjunction between MESSENGER and STEREO A: Development of ICME complexity through stream interactions, Journal of Geophysical Research (Space Physics), 121, 6092-6106, doi: 10.1002/2015JA022307.

**2015**

56. Boardsen, S. A., E.-H. Kim, **J. M. Raines**, J. A. Slavin, D. J. Gershman, B. J. Anderson, H. Korth, T. Sundberg, D. Schriver, and P. Travnicek (2015), Interpreting ~1 Hz magnetic compressional waves in Mercury's inner magnetosphere in terms of propagating ion-Bernstein waves, Journal of Geophysical Research (Space Physics), 120, 4213-4228, doi: 10.1002/2014JA020910.
55. Dewey, R. M., D. N. Baker, B. J. Anderson, M. Benna, C. L. Johnson, H. Korth, D. J. Gershman, G. C. Ho, W. E. McClintock, D. Odstrcil, L. C. Philpott, **J. M. Raines**, D. Schriver, J. A. Slavin, S. C. Solomon, R. M. Winslow, and T. H. Zurbuchen (2015), Improving solar wind modeling at Mercury: Incorporating transient solar phenomena into the WSA-ENLIL model with the Cone extension, Journal of Geophysical Research (Space Physics), 120, 5667-5685, doi: 10.1002/2015JA021194.
54. DiBraccio, G. A., J. A. Slavin, S. M. Imber, D. J. Gershman, **J. M. Raines**, C. M. Jackman, S. A. Boardsen, B. J. Anderson, H. Korth, T. H. Zurbuchen, R. L. McNutt, and S. C. Solomon (2015), MESSENGER observations of flux ropes in Mercury's magnetotail, Planetary and Space Science, 115, 77-89, doi: 10.1016/j.pss.2014.12.016.
53. Gershman, D. J., **J. M. Raines**, J. A. Slavin, T. H. Zurbuchen, B. J. Anderson, H. Korth, G. C. Ho, S. A. Boardsen, T. A. Cassidy, B. M. Walsh, and S. C. Solomon (2015), MESSENGER observations of solar energetic electrons within Mercury's magnetosphere, Journal of Geophysical Research (Space Physics), 120, 8559-8571, doi: 10.1002/2015JA021610.
52. Gershman, D. J., **J. M. Raines**, J. A. Slavin, T. H. Zurbuchen, T. Sundberg, S. A. Boardsen, B. J. Anderson, H. Korth, and S. C. Solomon (2015), MESSENGER observations of multiscale Kelvin-Helmholtz vortices at Mercury, Journal of Geophysical Research (Space Physics), 120, 4354-4368, doi: 10.1002/2014JA020903.
51. Good, S. W., R. J. Forsyth, **J. M. Raines**, D. J. Gershman, J. A. Slavin, and T. H. Zurbuchen (2015), Radial Evolution of a Magnetic Cloud: MESSENGER, STEREO, and Venus Express Observations, The Astrophysical Journal, 807, 177- doi: 10.1088/0004-637X/807/2/177.
50. Liljeblad, E., T. Karlsson, **J. M. Raines**, J. A. Slavin, A. Kullen, T. Sundberg, and T. H. Zurbuchen (2015), MESSENGER observations of the dayside low-latitude boundary layer in Mercury's magnetosphere, Journal of Geophysical Research (Space Physics), 120, 8387-8400, doi: 10.1002/2015JA021662.
49. **Raines, J. M**., G. A. DiBraccio, T. A. Cassidy, D. C. Delcourt, M. Fujimoto, X. Jia, V. Mangano, A. Milillo, M. Sarantos, J. A. Slavin, and P. Wurz (2015), Plasma Sources in Planetary Magnetospheres: Mercury, Space Science Reviews, 192, 91-144, doi: 10.1007/s11214-015-0193-4.

48. Sun, W.-J., J. A. Slavin, S. Fu, **J. M. Raines**, T. Sundberg, Q.-G. Zong, X. Jia, Q. Shi, X. Shen, G. Poh, Z. Pu, and T. H. Zurbuchen (2015), MESSENGER observations of Alfven and compressional waves during Mercury's substorms, Geophysical Research Letters, 42, 6189-6198, doi: 10.1002/2015GL065452.
47. Sun, W.-J., J. A. Slavin, S. Fu, **J. M. Raines**, Q.-G. Zong, S. M. Imber, Q. Shi, Z. Yao, G. Poh, D. J. Gershman, Z. Pu, T. Sundberg, B. J. Anderson, H. Korth, and D. N. Baker (2015), MESSENGER observations of magnetospheric substorm activity in Mercury's near magnetotail, Geophysical Research Letters, 42, 3692-3699, doi: 10.1002/2015GL064052.
46. Tracy, P. J., J. C. Kasper, T. H. Zurbuchen, **J. M. Raines**, P. Shearer, and J. Gilbert (2015), Thermalization of Heavy Ions in the Solar Wind, *The Astrophysical Journal*, 812, 170- doi: 10.1088/0004-637X/812/2/170.
45. Zhong, J., W. X. Wan, J. A. Slavin, Y. Wei, R. L. Lin, L. H. Chai, **J. M. Raines**, Z. J. Rong, and X. H. Han (2015), Mercury's three-dimensional asymmetric magnetopause, Journal of Geophysical Research (Space Physics), 120, 7658-7671, doi: 10.1002/2015JA021425.
44. Zhong, J., W. X. Wan, Y. Wei, J. A. Slavin, **J. M. Raines**, Z. J. Rong, L. H. Chai, and X. H. Han (2015), Compressibility of Mercury's dayside magnetosphere, *Geophysical Research Letters*, 42, 10- doi: 10.1002/2015GL067063.

**2014**

43. Gershman, D. J., L. A. Fisk, G. Gloeckler, **J. M. Raines**, J. A. Slavin, T. H. Zurbuchen, and S. C. Solomon (2014), The Velocity Distribution Of Pickup $He^{+}$ Measured at 0.3 AU by MESSENGER, *The Astrophysical Journal*, 788, 124. doi: 10.1088/0004-637X/788/2/124.
42. Gershman, D. J., J. A. Slavin, **J. M. Raines**, T. H. Zurbuchen, B. J. Anderson, H. Korth, D. N. Baker, and S. C. Solomon (2014), Ion kinetic properties in Mercury's pre-midnight plasma sheet, *Geophysical Research Letters*, 41, 5740-5747, doi: 10.1002/2014GL060468.
41. Korth, H., B. J. Anderson, D. J. Gershman, **J. M. Raines**, J. A. Slavin, T. H. Zurbuchen, S. C. Solomon, and R. L. McNutt (2014), Plasma distribution in Mercury's magnetosphere derived from MESSENGER Magnetometer and Fast Imaging Plasma Spectrometer observations, *Journal of Geophysical Research (Space Physics)*, 119, 2917-2932, doi: 10.1002/2013JA019567.
40. **Raines, J. M.**, D. J. Gershman, J. A. Slavin, T. H. Zurbuchen, H. Korth, B. J. Anderson, and S. C. Solomon (2014), Structure and dynamics of Mercury's magnetospheric cusp: MESSENGER measurements of protons and planetary ions, *Journal of Geophysical Research (Space Physics)*, 119, 6587-6602, doi: 10.1002/2014JA020120.
39. Shearer, P., R. von Steiger, **J. M. Raines**, S. T. Lepri, J. W. Thomas, J. A. Gilbert, E. Landi, and T. H. Zurbuchen (2014), The Solar Wind Neon Abundance Observed with ACE/SWICS and Ulysses/SWICS, *The Astrophysical Journal*, 789, 60- doi: 10.1088/0004-637X/789/1/60.
38. Slavin, J. A., G. A. DiBraccio, D. J. Gershman, S. M. Imber, G. K. Poh, **J. M. Raines**, T. H. Zurbuchen, X. Jia, D. N. Baker, K.-H. Glassmeier, S. A. Livi, S. A. Boardsen, T. A. Cassidy, M. Sarantos, T. Sundberg, A. Masters, C. L. Johnson, R. M. Winslow, B. J. Anderson, H. Korth, R. L. McNutt, and S. C. Solomon (2014), MESSENGER observations of Mercury's dayside magnetosphere under extreme solar wind conditions, *Journal of Geophysical Research (Space Physics),* 119, 8087-8116, doi: 10.1002/2014JA020319.

37. Uritsky, V. M., J. A. Slavin, S. A. Boardsen, T. Sundberg, **J. M. Raines**, D. J. Gershman, G. Collinson, D. Sibeck, G. V. Khazanov, B. J. Anderson, and H. Korth (2014), Active current sheets and candidate hot flow anomalies upstream of Mercury's bow shock, *Journal of Geophysical Research (Space Physics)*, 119, 853-876, doi: 10.1002/2013JA019052.
36. Winslow, R. M., C. L. Johnson, B. J. Anderson, D. J. Gershman, **J. M. Raines**, R. J. Lillis, H. Korth, J. A. Slavin, S. C. Solomon, T. H. Zurbuchen, and M. T. Zuber (2014), Mercury's surface magnetic field determined from proton-reflection magnetometry, *Geophysical Research Letters*, 41, 4463-4470, doi: 10.1002/2014GL060258.

**2013**

35. Baker, D. N., G. Poh, D. Odstrcil, C. N. Arge, M. Benna, C. L. Johnson, H. Korth, D. J. Gershman, G. C. Ho, W. E. McClintock, T. A. Cassidy, A. Merkel, **J. M. Raines**, D. Schriver, J. A. Slavin, S. C. Solomon, P. M. Travnicek, R. M. Winslow, and T. H. Zurbuchen (2013), Solar wind forcing at Mercury: WSA-ENLIL model results, *J Geophys Res-Space*, *118*(1), 45-57, Doi 10.1029/2012ja018064.
34. Dibraccio, G. A., J. A. Slavin, S. A. Boardsen, B. J. Anderson, H. Korth, T. H. Zurbuchen, J. M. Raines, D. N. Baker, R. L. McNutt, and S. C. Solomon (2013), MESSENGER observations of magnetopause structure and dynamics at Mercury, Journal of Geophysical Research (Space Physics), 118, 997-1008, doi: 10.1002/jgra.50123
33. Gershman, D. J., G. Gloeckler, J. A. Gilbert, J. M. Raines, L. A. Fisk, S. C. Solomon, E. C. Stone, and T. H. Zurbuchen (2013), Observations of interstellar helium pickup ions in the inner heliosphere, Journal of Geophysical Research (Space Physics), 118, 1389-1402, doi: 10.1002/jgra.50227.
32. Gershman, D. J., J. A. Slavin, J. M. Raines, T. H. Zurbuchen, B. J. Anderson, H. Korth, D. N. Baker, and S. C. Solomon (2013), Magnetic flux pileup and plasma depletion in Mercury's subsolar magnetosheath, Journal of Geophysical Research (Space Physics), 118, 7181-7199, doi: 10.1002/2013JA019244.
31. **Raines, J.M.**, D.J. Gershman , T.H. Zurbuchen, M. Sarantos, J.A. Slavin, J.A. Gilbert, H. Korth, B.J. Anderson, G. Gloeckler, S.M. Krimigis, D.N. Baker, R.L. McNutt, Jr., S.C. Solomon (2013), Distribution and compositional variations of plasma ions in Mercury's space environment: The first three Mercury years of MESSENGER observations, *J. Geophys. Res.*, *118*, 1604–1619, doi:10.1029/2012JA018073.
30. Reisenfeld, D. B., R. C. Wiens, B. L. Barraclough, J. T. Steinberg, M. Neugebauer, J. Raines, and T. H. Zurbuchen (2013), Solar Wind Conditions and Composition During the Genesis Mission as Measured by in situ Spacecraft, Space Science Reviews, 175, 125-164, doi: 10.1007/s11214-013-9960-2.
29. Sundberg, T., S. A. Boardsen, J. A. Slavin, V. M. Uritsky, B. J. Anderson, H. Korth, D. J. Gershman, J. M. Raines, T. H. Zurbuchen, and S. C. Solomon (2013), Cyclic reformation of a quasi-parallel bow shock at Mercury: MESSENGER observations, Journal of Geophysical Research (Space Physics), 118, 6457-6464, doi: 10.1002/jgra.50602.

**2012**

28. Anderson, B. J., J. A. Slavin, H. Korth, S. A. Boardsen, T. H. Zurbuchen, **J. M. Raines**, G. Gloeckler, R. L. McNutt, and S. C. Solomon (2011a), The dayside magnetospheric boundary layer at Mercury, *Planetary and Space Science*, *59*(15), 2037-2050, Doi 10.1016/J.Pss.2011.01.010.

27. Anderson, B. J., C. L. Johnson, H. Korth, M. E. Purucker, R. M. Winslow, J. A. Slavin, S. C. Solomon, R. L. McNutt, **J. M. Raines**, and T. H. Zurbuchen (2011b), The Global Magnetic Field of Mercury from MESSENGER Orbital Observations, *Science*, *333*(6051), 1859-1862, Doi 10.1126/Science.1211001.

Gershman, D. J., T. H. Zurbuchen, L. A. Fisk, J. A. Gilbert, **J. M. Raines**, B. J. Anderson, C. W. Smith, H. Korth, and S. C. Solomon (2012), Solar wind alpha particles and heavy ions in the inner heliosphere observed with MESSENGER, *J Geophys Res-Space*, *117*, A00m02, Doi 10.1029/2012ja017829.

26. Slavin, J. A., B. J. Anderson, D. N. Baker, M. Benna, S. A. Boardsen, R. E. Gold, G. C. Ho, S. M. Imber, H. Korth, S. M. Krimigis, R. L. McNutt, **J. M. Raines**, M. Sarantos, D. Schriver, S. C. Solomon, P. Travnicek, and T. H. Zurbuchen (2012a), MESSENGER and Mariner 10 flyby observations of magnetotail structure and dynamics at Mercury, *J Geophys Res-Space*, *117*, A01215, Doi 10.1029/2011ja016900.

25. Slavin, J. A., S. M. Imber, S. A. Boardsen, G. A. DiBraccio, T. Sundberg, M. Sarantos, T. Nieves-Chinchilla, A. Szabo, B. J. Anderson, H. Korth, T. H. Zurbuchen, **J. M. Raines**, C. L. Johnson, R. M. Winslow, R. M. Killen, R. L. McNutt, and S. C. Solomon (2012b), MESSENGER observations of a flux-transfer-event shower at Mercury, *J Geophys Res-Space*, *117*, Artn A00m06, Doi 10.1029/2012ja017926.

24. Sundberg, T., S. A. Boardsen, J. A. Slavin, B. J. Anderson, H. Korth, T. H. Zurbuchen, **J. M. Raines**, and S. C. Solomon (2012a), MESSENGER orbital observations of large-amplitude Kelvin-Helmholtz waves at Mercury's magnetopause, *J Geophys Res-Space*, *117*, A04216, Doi 10.1029/2011ja017268.

23. Sundberg, T., J. A. Slavin, S. A. Boardsen, B. J. Anderson, H. Korth, G. C. Ho, D. Schriver, V. M. Uritsky, T. H. Zurbuchen, **J. M. Raines**, D. N. Baker, S. M. Krimigis, R. L. McNutt, and S. C. Solomon (2012b), MESSENGER observations of dipolarization events in Mercury's magnetotail, *J Geophys Res-Space*, *117*, Doi 10.1029/2012ja017756.

**2011**

22. Baker, D. N., D. Odstrcil, B. J. Anderson, C. N. Arge, M. Benna, G. Gloeckler, H. Korth, L. R. Mayer, **J. M. Raines**, D. Schriver, J. A. Slavin, S. C. Solomon, P. M. Travnicek, and T. H. Zurbuchen (2011), The space environment of Mercury at the times of the second and third MESSENGER flybys, *Planetary and Space Science*, *59*(15), 2066-2074, Doi 10.1016/J.Pss.2011.01.018.

21. Korth, H., B. J. Anderson, **J. M. Raines**, J. A. Slavin, T. H. Zurbuchen, C. L. Johnson, M. E. Purucker, R. M. Winslow, S. C. Solomon, and R. L. McNutt (2011), Plasma pressure in Mercury's equatorial magnetosphere derived from MESSENGER Magnetometer observations, *Geophysical Research Letters*, *38*, L22201, Doi 10.1029/2011gl049451.

20. **Raines, J. M.**, J. A. Slavin, T. H. Zurbuchen, G. Gloeckler, B. J. Anderson, D. N. Baker, H. Korth, S. M. Krimigis, and R. L. McNutt (2011), MESSENGER observations of the plasma environment near Mercury, *Planetary and Space Science*, *59*(15), 2004-2015, Doi 10.1016/J.Pss.2011.02.004.

19. Schriver, D., P. M. Travnicek, B. J. Anderson, M. Ashour-Abdalla, D. N. Baker, M. Benna, S. A. Boardsen, R. E. Gold, P. Hellinger, G. C. Ho, H. Korth, S. M. Krimigis, R. L. McNutt, **J. M. Raines**, R. L. Richard, J. A. Slavin, S. C. Solomon, R. D. Starr, and T. H. Zurbuchen (2011), Quasi-trapped ion and electron populations at Mercury, *Geophysical Research Letters*, *38*, L23103, Doi 10.1029/2011gl049629.

18. Zurbuchen, T. H., **J. M. Raines**, J. A. Slavin, D. J. Gershman, J. A. Gilbert, G. Gloeckler, B. J. Anderson, D. N. Baker, H. Korth, S. M. Krimigis, M. Sarantos, D. Schriver, R. L. McNutt, and S. C. Solomon (2011), MESSENGER Observations of the Spatial Distribution of Planetary Ions Near Mercury, *Science*, *333*(6051), 1862-1865, Doi 10.1126/Science.1211302.

**2010**

17. Anderson, B. J., M. H. Acuna, H. Korth, J. A. Slavin, H. Uno, C. L. Johnson, M. E. Purucker, S. C. Solomon, **J. M. Raines**, T. H. Zurbuchen, G. Gloeckler, and R. L. McNutt (2010), The Magnetic Field of Mercury, *Space Science Reviews*, *152*(1-4), 307-339, Doi 10.1007/S11214-009-9544-3.
16. Benna, M., B. J. Anderson, D. N. Baker, S. A. Boardsen, G. Gloeckler, R. E. Gold, G. C. Ho, R. M. Killen, H. Korth, S. M. Krimigis, M. E. Purucker, R. L. McNutt**, J. M. Raines**, W. E. McClintock, M. Sarantos, J. A. Slavin, S. C. Solomon, and T. H. Zurbuchen (2010), Modeling of the magnetosphere of Mercury at the time of the first MESSENGER flyby, *Icarus*, *209*(1), 3-10, Doi 10.1016/J.Icarus.2009.11.036.
15. Slavin, J. A., B. J. Anderson, D. N. Baker, M. Benna, S. A. Boardsen, G. Gloeckler, R. E. Gold, G. C. Ho, H. Korth, S. M. Krimigis, R. L. McNutt, L. R. Nittler, **J. M. Raines**, M. Sarantos, D. Schriver, S. C. Solomon, R. D. Starr, P. M. Travnicek, and T. H. Zurbuchen (2010), MESSENGER Observations of Extreme Loading and Unloading of Mercury's Magnetic Tail, *Science*, *329*(5992), 665-668, Doi 10.1126/Science.1188067.

**2009**

14. Baker, D. N., D. Odstrcil, B. J. Anderson, C. N. Arge, M. Benna, G. Gloeckler, **J. M. Raines**, D. Schriver, J. A. Slavin, S. C. Solomon, R. M. Killen, and T. H. Zurbuchen (2009), Space environment of Mercury at the time of the first MESSENGER flyby: Solar wind and interplanetary magnetic field modeling of upstream conditions, *J Geophys Res-Space*, *114*, Artn A10101, Doi 10.1029/2009ja014287.
13. Benna, M., M. H. Acuna, B. J. Anderson, S. Barabash, S. A. Boardsen, G. Gloeckler, R. E. Gold, G. C. Ho, H. Korth, S. M. Krimigis, R. L. McNutt, **J. M. Raines**, M. Sarantos, J. A. Slavin, S. C. Solomon, T. L. L. Zhang, and T. H. Zurbuchen (2009), Modeling the response of the induced magnetosphere of Venus to changing IMF direction using MESSENGER and Venus Express observations, *Geophysical Research Letters*, *36*, L04109, Doi 10.1029/2008gl036718.
12. Slavin, J. A., M. H. Acuna, B. J. Anderson, D. N. Baker, M. Benna, S. A. Boardsen, G. Gloeckler, R. E. Gold, G. C. Ho, H. Korth, S. M. Krimigis, R. L. McNutt, **J. M. Raines**, M. Sarantos, D. Schriver, S. C. Solomon, P. Travnicek, and T. H. Zurbuchen (2009a), MESSENGER Observations of Magnetic Reconnection in Mercury's Magnetosphere, *Science*, *324*(5927), 606-610, Doi 10.1126/Science.1172011.
11. Slavin, J. A., M. H. Acuna, B. J. Anderson, S. Barabash, M. Benna, S. A. Boardsen, M. Fraenz, G. Gloeckler, R. E. Gold, G. C. Ho, H. Korth, S. M. Krimigis, R. L. McNutt, **J. M. Raines**, M. Sarantos, S. C. Solomon, T. Zhang, and T. H. Zurbuchen (2009b), MESSENGER and Venus Express observations of the solar wind interaction with Venus, *Geophysical Research Letters*, *36*, L09106, Doi 10.1029/2009gl037876.
10. Slavin, J. A., B. J. Anderson, T. H. Zurbuchen, D. N. Baker, S. M. Krimigis, M. H. Acuna, M. Benna, S. A. Boardsen, G. Gloeckler, R. E. Gold, G. C. Ho, H. Korth, R. L. McNutt, **J. M. Raines**, M. Sarantos, D. Schriver, S. C. Solomon, and P. Travnicek (2009c), MESSENGER

observations of Mercury's magnetosphere during northward IMF, *Geophysical Research Letters*, *36*, L02101, Doi 10.1029/2008gl036158.

**2008**

9. Slavin, J. A., M. H. Acuna, B. J. Anderson, D. N. Baker, M. Benna, G. Gloeckler, R. E. Gold, G. C. Ho, R. M. Killen, H. Korth, S. M. Krimigis, R. L. McNutt, L. R. Nittler, **J. M. Raines**, D. Schriver, S. C. Solomon, R. D. Starr, P. Travnicek, and T. H. Zurbuchen (2008), Mercury's magnetosphere after MESSENGER's first flyby, *Science*, *321*(5885), 85-89, Doi 10.1126/Science.1159040.
8. Zurbuchen, T. H., **J. M. Raines**, G. Gloeckler, S. M. Krimigis, J. A. Slavin, P. L. Koehn, R. M. Killen, A. L. Sprague, R. L. McNutt, and S. C. Solomon (2008), MESSENGER observations of the composition of Mercury's ionized exosphere and plasma environment, *Science*, *321*(5885), 90-92, Doi 10.1126/Science.1159314.

**2007**

7. Andrews, G. B., T. H. Zurbuchen, B. H. Mauk, H. Malcom, L. A. Fisk, G. Gloeckler, G. C. Ho, J. S. Kelley, P. L. Koehn, T. W. LeFevere, S. S. Livi, R. A. Lundgren, and **J. M. Raines** (2007), The energetic particle and plasma spectrometer instrument on the MESSENGER spacecraft, *Space Science Reviews*, *131*(1-4), 523-556, Doi 10.1007/S11214-007-9272-5.
6. Korreck, K. E., T. H. Zurbuchen, S. T. Lepri, and **J. M. Raines** (2007), Heating of heavy ions by interplanetary coronal mass ejection driven collisionless shocks, *Astrophys J*, *659*(1), 773-779, Doi 10.1086/512360.
5. Reisenfeld, D. B., D. S. Burnett, R. H. Becker, A. G. Grimberg, V. S. Heber, C. M. Hohenberg, A. J. G. Jurewicz, A. Meshik, R. O. Pepin, **J. M. Raines**, D. J. Schlutter, R. Wieler, R. C. Wiens, and T. H. Zurbuchen (2007), Elemental abundances of the bulk solar wind: Analyses from genesis and ACE, *Space Science Reviews*, *130*(1-4), 79-86, Doi 10.1007/S11214-007-9215-1.

**2006**

4. Ko, Y. K., J. C. Raymond, T. H. Zurbuchen, P. Riley, **J. M. Raines**, and L. Strachan (2006), Abundance variation at the vicinity of an active region and the coronal origin of the slow solar wind, *Astrophys J*, *646*(2), 1275-1287, Doi 10.1086/505021.

**2005**

3. **Raines, J. M.**, S. T. Lepri, T. H. Zurbuchen, G. Gloeckler, and L. A. Fisk (2005), Heavy ions in the solar wind: A new dataset from ACE, *Esa Sp Publ*, *592*, 539-542.

**2004**

2. Zurbuchen, T. H., G. Gloeckler, F. Ipavich, **J. Raines**, C. W. Smith, and L. A. Fisk (2004), On the fast coronal mass ejections in October/November 2003: ACE-SWICS results, *Geophysical Research Letters*, *31*(11), L11805, Doi 10.1029/2004gl019461.

**2003**

1. Skinner, W. R., A. R. Marshall, D. A. Gell, and **J. Raines** (2003), The high resolution Doppler imager: Status update 12 years after launch, *Optical Spectroscopic Techniques and*

*Instrumentation for Atmospheric and Space Research V*, *5157*, 231-241, Doi 10.1117/12.504563.