

Jim M. Raines

Employment	2022-present	Associate Professor, Dept. of Climate and Space Sciences and Engineering, University of Michigan
	2018-2022	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
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	2021	Kenneth M. Reese Outstanding Research Scientist Award, University of Michigan
	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

- PI, Space Weather Faraday Cup (SWFC) technology development, NASA, 2021-present
- PI, SWICS and SWIMS instruments, *Advanced Composition Explorer*, 2021-present
- PI of NASA grants in programs *Discovery Data Analysis* (2015-2023) and *Heliophysics Guest Investigator* (2014-2019).
- PI of teams proposing to NASA PRISM (2021, \$40M) and SIMPLEx (2015, \$5.5M) lunar mission programs.

- Deputy PI, Solar Wind and Pickup Ion Composition Energy Spectrometer, IMAP Phase A 2018-2020 & Phase B development 2020-present.
- Co-I, Instrument Scientist (Operations Lead), Heavy Ion Sensor, *Solar Orbiter*, 2013-present
- Instrument Scientist and Operations Lead, Fast Imaging Plasma Spectrometer, *MESSENGER*, 2002-2016; SMS Suite, *Wind*, 2000-present; SWICS and SWIMS, *ACE*, 2000-2021

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: *SWFC:* Leading an engineering team in design of novel Faraday Cup for measuring solar wind plasma ion properties during fast coronal mass ejections. *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, as well as 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

Post-doctoral

Dr. Ryan M. Dewey, 2020-present

Dr. Erik Fischer, 2019-2021

Dr. Patrick J. Tracy, 2016-2017

Doctoral

Christopher M. Bert, 2020-present.

Sarah A. Spitzer, 2018-present.

Austin N. Glass, 2017-present.

Ryan M. Dewey, 2015-2020, graduated April 2020.

Patrick J. Tracy, 2011-2016, graduated December 2016.

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-Energy 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)

Dior Gillins, "Search for suprathermal ion features in Earth's magnetosphere with Wind/STICS" University of Buffalo, Summer 2021

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

Mike Huff, 2019 – present

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

Small student group discussion, “My Work in the Space Program: Missions, Instruments and Science”, Michigan Research and Discovery Scholars, February 2021.

Participated in multiple print and video pieces related to the Solar Orbiter Launch, produced by UM CoE and CLaSP Marketing and Communications personnel, February 2020.
<https://news.engin.umich.edu/2020/03/launching-solar-orbiter/>
<https://clasp.engin.umich.edu/stories/solar-orbiter-heads-for-the-sun/>
<https://news.engin.umich.edu/2020/02/it-looks-like-the-sun/>

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/>.

Small student group discussion, “A Glimpse into being a Space Physicist”, Lincoln High School, January 2018.

Student seminar, “My Research, Career Path and Mentoring Style”, Undergraduate Research Opportunities Program, September 2015.

Student seminar, “MESSENGER Observations of the Mercury Space Environment” and “Getting the Most from UROP”, Undergraduate Research Opportunities Program, September 2014.

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>

Small student group discussion, “My Work in the Space Program”, Lincoln Elementary School, March 2007.

Small student group discussion, “My Work in the Space Program”, Lincoln Elementary School, March 2006.

Service - Community

1. Group Chief, NASA rolling instrumentation evaluation panel, 2021-present.
2. External dissertation examiner for Martina Foehn, University of Bern (Bern, Switzerland), November 2021.
3. Referee, Journal of Geophysical Research Space Physics, August 2021.
4. Panelist, NASA instrumentation review panel, March 2021.
5. Referee, Geophysical Research Letters, February 2021.
6. Group chief, NASA participating scientist review panel, 19-23 October 2020.
7. Referee, Space Science Reviews, 2020
8. Panelist, NASA HQ Heliophysics Senior Review, Data Archiving Subpanel, July-September 2020.
9. Referee, Astrophysics Journal, 2020.
10. Referee, Geophysical Review Letters, 2020.
11. G.R.E.A.T workshop panelist, Climate and Space Sciences and Engineering Dept., April 4, 2019.
12. Dissertation Jury for Sae Aizawa, Tohoku University (Sendai, Japan) & Sorbonne University (Paris, France), February 2019, Sendai, Japan
13. Conference Organizing Committee and Session Chair, "Mercury: Current and Future Science of the Innermost Planet", May 1-3, 2018, Columbia, MD.
14. Referee, Icarus, 2016
15. Referee, Journal of Geophysical Research: Space Physics, 2014 - 2019
16. Referee, Planetary and Space Sciences, 2014 - 2015
17. Reviewer, NASA Proposal Review Panel: NASA Earth and Space Science Fellowship, 2014
18. Reviewer, NASA Proposal Review Panel: Heliospheric Guest Investigator, 2014
19. Reviewer, NASA Proposal Review Panel: Discovery Data Analysis, 2014
20. Reviewer, NSF Proposal Review Panel: Solar, Heliospheric, and Interplanetary Environment, 2014
21. Referee, Annales Geophysica, 2013
22. Reviewer, NSF Proposal Review Panel: Solar-Terrestrial Program, 2013

Service – University

1. CLaSP Qual Committee, 2020-present. Served on 3 Step 2 qualifier committees.
2. Dissertation committee member for Yeimy Rivera, Sept. 2020
3. Dissertation committee member for Daniel Vech, December 2019
4. CLaSP Step 2 Qualifier committee Janelle Holmes, 2019
5. CLaSP Graduate Admissions Committee, 2018-2021.
6. Dissertation committee member for Blake Johnson, January 2018
7. CLaSP Step 2 Qualifier committee Daniel Vech and Yeimi Rivera, 2018
8. Dissertation committee member for Gang-kai Poh, March 2017
9. CLaSP Step 2 Qualifier committee Sergio Vidal-Luengo, 2017
10. CLaSP Executive Committee, 2016-2020
11. Dissertation committee member for Mark O. Stakhiv, 2016

Classroom Teaching

1. Guest lecture, “Charged Particle Instrumentation”, SPACE 595 (Magnetospheres), Winter 2019.
2. Co-taught, SPACE 590 (Space Systems Projects), Winter 2019
3. Guest lecture, “An Overview of the MESSENGER Mission”, SPACE 310, Fall 2018.
4. Taught, SPACE 590 (Space Systems Projects), Fall 2018.
5. Co-taught, SPACE 747 (Climate and Space Seminar Series), AY2015-2016.
6. Co-taught, SPACE 501 (Magnetospheric Physics Journal Club), 2014-present.
7. Guest lecture, “Charged Particle Instrumentation”, SPACE 595, Fall 2014.

Invited Presentations

- Raines, J. M.** (2022), Particle precipitation at Mercury through observations and modeling, Mercury’s surface response to the interplanetary environment: Identifying needed studies in laboratory astrophysics, Planetary Science Institute, 24-27 January 2022.
- Raines, J. M.** (2020), 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, Noordwijk, 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 Oceania Geosciences Society (AOGS), Taipei, Taiwan.

Book Chapters

1. Slavin, J. A., S. M. Imber, and **J. M. Raines** (2021), A Dungey Cycle in the Life of Mercurys Magnetosphere, *Magnetospheres in the Solar System*, 2, 537, doi: 10.1002/9781119815624.ch34.

Contributed Presentations

2021

- Aizawa, S., N. André, R. Modolo, E. Werner, J. Slavin, S. Boardsen, F. Leblanc, J.-Y. Chaufray, and J. Raines (2021), Influence of time-variable solar wind on the response of Mercury's magnetosphere, European Planetary Science Congress, EPSC2021-531, doi: 10.5194/epsc2021-531.
- Aizawa, S., N. André, and J. Raines (2021), Ion properties of Mercury's northern cusp under extreme solar wind observed by MESSENGER, EGU General Assembly Conference Abstracts, EGU21-11897, doi: 10.5194/egusphere-egu21-11897.
- Carnevale, G., R. Bruno, R. Marino, E. Pietropaolo, and J. M. Raines (2021), Sudden depletion of Alfvénic turbulence in the rarefaction region of corotating solar wind high speed streams at 1 AU: possible solar origin?, arXiv e-prints, arXiv:2108.09552, doi:.
- Ernst, C. M., S. Kubota, N. Chabot, R. Klima, G. Rogers, P. Byrne, S. A. Hauck, K. E. Vander Kaaden, R. J. Vervack, S. Besse, D. Blewett, B. Denevi, S. Goossens, S. Indyk, N. Izenberg, C. Johnson, L. Jozwiak, H. Korth, R. McNutt, S. Murchie, P. Peplowski, J. Raines, E. Rampe, and M. Thompson (2021), Mercury Lander: Planetary Mission Concept Study for the 2023-2032 Decadal Survey, arXiv e-prints, arXiv:2107.06795, doi:.
- Hauck, S., D. Blewett, P. K. Byrne, N. L. Chabot, C. M. Ernst, C. L. Johnson, E. Mazarico, J. M. Raines, K. E. Vander Kaaden, R. J. Vervack, A. Deutsch, G. DiBraccio, S. Imber, C. Klimczak, and G. Poh (2021), Fundamental and Interdisciplinary Questions Drive the Scientific Exploration of Mercury, *Bulletin of the American Astronomical Society*, 53, 092, doi: 10.3847/25c2cfcb.dc162eb4.
- James, M., T. Yeoman, S. Imber, J. Raines, and R. Dewey (2021), A machine learning approach to classifying MESSENGER FIPS proton spectra, European Planetary Science Congress, EPSC2021-611, doi: 10.5194/epsc2021-611.
- Ernst, C. M., N. L. Chabot, R. L. Klima, S. Kubota, G. Rogers, P. K. Byrne, S. A. Hauck, K. E. Vander Kaaden, R. J. Vervack, S. Besse, D. T. Blewett, B. W. Denevi, S. Goossens, S. J. Indyk, N. R. Izenberg, C. L. Johnson, L. M. Jozwiak, H. Korth, R. L. McNutt, S. L. Murchie, P. N. Peplowski, J. M. Raines, E. B. Rampe, M. S. Thompson, and S. Z. Weider (2021), The Mercury Lander Mission Concept Study: Enabling Transformative Science from the Surface of the Innermost Planet, 52nd Lunar and Planetary Science Conference, 2565.
- Hauck, S., D. Blewett, P. K. Byrne, N. L. Chabot, C. M. Ernst, C. L. Johnson, E. Mazarico, J. M. Raines, K. E. Vander Kaaden, R. J. Vervack, A. Deutsch, G. DiBraccio, S. Imber, C. Klimczak, and G. Poh (2021), Fundamental and Interdisciplinary Questions Drive the Scientific Exploration of Mercury, *Bulletin of the American Astronomical Society*, 53, 092, doi: 10.3847/25c2cfcb.dc162eb4.
- Lepri, S. T., S. A. Livi, J. M. Raines, A. B. Galvin, L. M. Kistler, R. M. Dewey, B. L. Alterman, F. Allegrini, M. R. Collier, and C. J. Owen (2021), Updates and Early Results from the Heavy Ion Sensor on Solar Orbiter, EGU General Assembly Conference Abstracts, EGU21-12435, doi: 10.5194/egusphere-egu21-12435.
- Vander Kaaden, K. E., C. M. Ernst, N. L. Chabot, R. L. Klima, S. J. Indyk, P. N. Peplowski, E. B. Rampe, S. Besse, D. T. Blewett, P. K. Byrne, B. W. Denevi, S. Goossens, S. A. Hauck, N.

R. Izenberg, C. L. Johnson, L. M. Jozwiak, H. Korth, R. L. McNutt, S. L. Murchie, J. M. Raines, M. S. Thompson, R. J. Vervack, and S. Z. Weider (2021), Landing on Mercury: A Geochemical Perspective, 52nd Lunar and Planetary Science Conference, 1087, doi: .

Werner, A. L. E., F. Leblanc, J.-Y. Chaufray, R. Modolo, S. Aizawa, J. M. Raines, W. Exner, and U. Motschmann (2021), Density, Energy and Phase Space Density Distribution of Planetary Ions He⁺, O⁺ and Na⁺ in Mercury's Magnetosphere, EGU General Assembly Conference Abstracts, EGU21-1191, doi: 10.5194/egusphere-egu21-1191.

Sun, W., X. Jia, J. Raines, A. J. Slavin, R. Dewey, and A. Smith (2021), Flux Transfer Event Showers at Mercury: Dependencies on Magnetic Shear and Plasma beta and influence on magnetospheric sodium ions, 43rd COSPAR Scientific Assembly. Held 28 January - 4 February, 43, 786.

2020

Aizawa, S., N. Andre, and **J. M. Raines** (2020), Ion properties of Mercury's northern cusp under extreme solar wind observed by MESSENGER, Am. Geophys. Union Fall Meeting.

Dewey, R. M., J. A. Slavin, **J. M. Raines**, A. R. Azari, and W.-j. Sun (2020), Substorm current wedge formation at Mercury, Am. Geophys. Union Fall Meeting.

Ernst, C. M., N. L. Chabot, R. L. Klima, S. Kubota, P. K. Byrne, S. A. Hauck, K. E. Vander Kaaden, R. J. Vervack, S. Besse, D. T. Blewett, B. W. Denevi, S. Goossens, N. R. Izenberg, C. L. Johnson, L. M. Jozwiak, H. Korth, R. L. McNutt, S. L. Murchie, P. N. Peplowski, **J. M. Raines**, E. B. Rampe, M. S. Thompson, and S. Z. Weider (2020), A Mercury Lander Mission Concept Study for the Next Decadal Survey, Lunar and Planetary Science Conference.

Glass, A. N., **J. M. Raines**, X. Jia, V. Tenisher, Y. Shou (2020), Na₂ Energization of Mercury's Dayside: Modeling and MESSENGER Observation, Am. Geophys. Union Fall Meeting.

Hadid, L., M. Dosa, M. Akos, T. Alberti, J. Benkhoff, Z. Bebesi, L. Griton, G. C. Ho, K. Iwai, M. Janvier, A. Milillo, Y. Miyoshi, D. Mueller, G. Murukami, **J. M. Raines**, D. Shiota, A. Walsh, J. Zender, and Y. Zouganelis (2020), BepiColombo and Solar Orbiter coordinated observations: scientific cases and measurements opportunities, EGU General Assembly Conference Abstracts.

Killen, R.M., **J. M. Raines**, L. S. Morissey, O. J. Tucker¹, M. H. Burger, D. L. Domingue, D. W. Savin (2020), Mercury's Exosphere: Sputter Yields and Ion Flux, AAS Division for Planetary Sciences, 26-30 October 2020.

Lepri, S. T., **J. M. Raines**, R. M. Dewey, A. Galvin, L. M. Kistler and S. Livi (2020), First Measurements of Heavy Ions from the Solar Orbiter Heavy Ion Sensor, Am. Geophys. Union Fall Meeting.

Livi, S., S. T. Lepri, **J. M. Raines**, A. Galvin, L. M. Kistler, F. Allegrini, K. Ogasawara, B. L. Alterman (2020), Heavy Ion Sensor on Solar Orbiter: Linking the Solar Wind and the Sun, Am. Geophys. Union Fall Meeting.

Romanelli, N., G. DiBraccio, D. Gershman, G. Le, C. Mazelle, K. Meziane, S. Boardsen, J. Slavin, **J. Raines**, A. Glass, and J. Espley (2020), Upstream Ultra-Low Frequency Waves Observed by MESSENGER's Magnetometer: Implications for Particle Acceleration at Mercury's Bow Shock, European Planetary Science Congress.

Spitzer, S. A., S. T. Lepri, **J. M. Raines**, F. Allegrini, A. N. Glass and J. A. Gilbert (2020), Assessing the Performance of the Solar Orbiter Heavy Ion Sensor via Cross Calibration with its Ion Optical Model, Am. Geophys. Union Fall Meeting.

Sun, W.-J., J. Slavin, A. Smith, R. Dewey, G. Poh, X. Jia, **J. Raines**, S. Livi, Y. Saito, D. Gershman, G. DiBraccio, S. Imber, J. Guo, S. Fu, Q.-G. Zong, and J. Zhao (2020),

MESSENGER observations of flux transfer event showers at Mercury: Contributions to Dungey cycle and influences on magnetospheric sodium ions, European Planetary Science Congress.

- Sun, W., J. A. Slavin, A. W. Smith, R. M. Dewey, G. Poh, X. Jia, **J. M. Raines**, S. Livi, Y. Saito, D. J. Gershman, G. A. DiBraccio, S. M. Imber, J. Guo, S. Fu, Q.-G. Zong, J. Zhao (2020), MESSENGER observations of flux transfer event showers and their influences on sodium ions in Mercury's dayside magnetosphere, Am. Geophys. Union Fall Meeting.
- Vander Kaaden, K. E., C. M. Ernst, N. L. Chabot, R. L. Klima, P. N. Peplowski, E. B. Rampe, S. Besse, D. T. Blewett, P. K. Byrne, B. W. Denevi, S. Goossens, S. A. Hauck, N. R. Izenberg, C. L. Johnson, L. M. Jozwiak, H. Korth, R. L. McNutt, S. L. Murchie, **J. M. Raines**, M. S. Thompson, and R. J. Vervack (2020), Geochemical Advances in Mercury Science Facilitated by a Landed Mission, Lunar and Planetary Science Conference.
- Werner, A. L. E., F. Leblanc, J.-Y. Chaufray, R. Modolo, S. Aizawa, **J. M. Raines**, W. Exner, and U. Motschmann, (2020) Energy distribution of planetary ions He⁺, O⁺ and Na⁺ in Mercury's magnetosphere, Am. Geophys. Union Fall Meeting.

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. A. 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. Jasinski, 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. Schrifer, 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:
- Schrifer, 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.

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: 37; Citations: 4322)

2022

- Carnevale, G., R. Bruno, R. Marino, E. Pietropaolo, and **J. M. Raines** (2022), Sudden depletion of Alfvénic turbulence in the rarefaction region of corotating solar wind high speed streams at 1 AU: possible solar origin?, *in press*
- Raines, J. M.**, N. M. Staudacher, R. M. Dewey, P. J. Tracy, C. M. Bert, M. Sarantos, D. J. Gershman, J. M. Jasinski and J. A. Slavin (2022), Proton precipitation in Mercury's northern magnetospheric cusp, *submitted*.

2021

108. D'Amicis, R., K. Alielden, D. Perrone, R. Bruno, D. Telloni, **J. M. Raines**, S. T. Lepri, and L. Zhao (2021), Solar wind Alfvénicity during solar cycle 23 and 24. Perspective for future observations with Parker Solar Probe and Solar Orbiter, *Astronomy and Astrophysics*, 654, doi: 10.1051/0004-6361/202140600.
107. Glass, A. N., **Raines, J. M.**, Jia, X., Tenishev, V., Shou, Y., Aizawa, S., & Slavin, J. A. (2021). A 3D MHD-particle tracing model of Na⁺ energization on Mercury's dayside. *Journal of Geophysical Research: Space Physics*, 126, <https://doi.org/10.1029/2021JA029587>.
106. Grava, C., R. M. Killen, M. Benna, A. A. Berezhnoy, J.S. Halekas, F. Leblanc, M. N. Nishino, C. Plainaki, **J. M. Raines**, M. Sarantos, B. D. Teolis, O. J. Tucker, R. J. Vervack Jr., A. Vorburgur (2021), Volatiles and Refractories in Surface-Bounded Exospheres in the Inner Solar System, *Space Science Reviews*, 217:61, <https://doi.org/10.1007/s11214-021-00833-8>.
105. Hadid, L. Z., V. Génot, S. Aizawa, A. Milillo, J. Zender, G. Murakami, J. Benkhoff, I. Zouganelis, T. Alberti, N. André, Z. Bebesi, F. Califano, A. P. Dimmock, M. Dosa, C. P. Escoubet, L. Griton, G. C. Ho, T. S. Horbury, K. Iwai, M. Janvier, E. Kilpua, B. Lavraud, A. Madar, Y. Miyoshi, D. Müller, R. F. Pinto, A. P. Rouillard, **J. M. Raines**, N. Raouafi, F. Sahraoui, B. Sánchez-Cano, D. Shiota, R. Vainio, and A. Walsh (2021), BepiColombo's cruise phase: unique opportunity for synergistic observations, *Frontiers in Astronomy and Space Sciences*, 8, doi: 10.3389/fspas.2021.718024.
104. Jasinski, J. M., T. A. Cassidy, **J. M. Raines**, A. Milillo, L. H. Regoli, R. Dewey, J. A. Slavin, V. Mangano, and N. Murphy (2021), Photoionization Loss of Mercury's Sodium Exosphere: Seasonal Observations by MESSENGER and the THEMIS Telescope, *Geophysical Research Letters*, 48, e92980, doi: 10.1029/2021GL092980.

103. Lavraud, B., R. Kieokaew, N. Fargette, P. Louarn, A. Fedorov, N. André, G. Fruit, V. Génot, V. Réville, A. P. Rouillard, I. Plotnikov, E. Penou, A. Barthe, L. Prech, C. J. Owen, R. Bruno, F. Allegrini, M. Berthomier, D. Kataria, S. Livi, **J. M. Raines**, R. D'Amicis, J. P. Eastwood, C. Froment, R. Laker, M. Maksimovic, F. Marcucci, S. Perri, D. Perrone, T. D. Phan, D. Stansby, J. Stawarz, S. Toledo-Redondo, A. Vaivads, D. Verscharen, I. Zouganelis, V. Angelini, V. Evans, T. S. Horbury, and H. O'Brien (2021), Magnetic reconnection as a mechanism to produce multiple thermal proton populations and beams locally in the solar wind, *Astronomy and Astrophysics*, 656, A37, doi: 10.1051/0004-6361/202141149.
102. Louarn, P., A. Fedorov, L. Prech, C. J. Owen, R. Bruno, S. Livi, B. Lavraud, A. P. Rouillard, V. Génot, N. André, G. Fruit, V. Réville, R. Kieokaew, I. Plotnikov, E. Penou, A. Barthe, D. Kataria, M. Berthomier, R. D'Amicis, L. Sorriso-Valvo, F. Allegrini, J. Raines, D. Verscharen, V. Fortunato, G. Mele, T. S. Horbury, H. O'Brien, V. Evans, V. Angelini, M. Maksimovic, J. C. Kasper, and S. D. Bale (2021), Multiscale views of an Alfvénic slow solar wind: 3D velocity distribution functions observed by the Proton-Alpha Sensor of Solar Orbiter, *Astronomy and Astrophysics*, 656, A36, doi: 10.1051/0004-6361/202141095.
101. Orsini, S., S. A. Livi, H. Lichtenegger, S. Barabash, A. Milillo, E. De Angelis, M. Phillips, G. Laky, M. Wieser, A. Olivieri, C. Plainaki, G. Ho, R. M. Killen, J. A. Slavin, P. Wurz, J.-J. Berthelier, I. Dandouras, E. Kallio, S. McKenna-Lawlor, S. Szalai, K. Torkar, O. Vaisberg, F. Allegrini, I. A. Daglis, C. Dong, C. P. Escoubet, S. Fatemi, M. Fränz, S. Ivanovski, N. Krupp, H. Lammer, F. Leblanc, V. Mangano, A. Mura, H. Nilsson, **J. M. Raines**, R. Rispoli, M. Sarantos, H. T. Smith, K. Szego, A. Aronica, F. Camozzi, A. M. Di Lellis, G. Fremuth, F. Giner, R. Gurnee, J. Hayes, H. Jeszczyszky, F. Tominetti, B. Trantham, J. Balaz, W. Baumjohann, D. Brienza, U. Bührke, M. D. Bush, M. Cantatore, S. Cibella, L. Colasanti, G. Cremonese, L. Cremonesi, M. D'Alessandro, D. Delcourt, M. Delva, M. Desai, M. Fama, M. Ferris, H. Fischer, A. Gaggero, D. Gamborino, P. Garnier, W. C. Gibson, R. Goldstein, M. Grande, V. Grishin, D. Haggerty, M. Holmström, I. Horvath, K.-C. Hsieh, A. Jacques, R. E. Johnson, A. Kazakov, K. Kecskemety, H. Krüger, C. Kürbisch, F. Lazzarotto, F. Leblanc, M. Leichtfried, R. Leoni, A. Loose, D. Maschietti, S. Massetti, F. Mattioli, G. Miller, D. Moissenko, A. Morbidini, R. Noschese, F. Nuccilli, C. Nunez, N. Paschalidis, S. Persyn, D. Piazza, M. Oja, J. Ryno, W. Schmidt, J. A. Scheer, A. Shestakov, S. Shuvalov, K. Seki, S. Selci, K. Smith, R. Sordini, J. Svensson, L. Szalai, D. Toublanc, C. Urdiales, A. Varsani, N. Vertolli, R. Wallner, P. Wahlstroem, P. Wilson, and S. Zampieri (2021), Correction to: SERENA: Particle Instrument Suite for Determining the Sun-Mercury Interaction from BepiColombo, *Space Science Reviews*, 217, doi: 10.1007/s11214-021-00809-8.
100. Orsini, S., S. A. Livi, H. Lichtenegger, S. Barabash, A. Milillo, E. De Angelis, M. Phillips, G. Laky, M. Wieser, A. Olivieri, C. Plainaki, G. Ho, R. M. Killen, J. A. Slavin, P. Wurz, J.-J. Berthelier, I. Dandouras, E. Kallio, S. McKenna-Lawlor, S. Szalai, K. Torkar, O. Vaisberg, F. Allegrini, I. A. Daglis, C. Dong, C. P. Escoubet, S. Fatemi, M. Fränz, S. Ivanovski, N. Krupp, H. Lammer, F. Leblanc, V. Mangano, A. Mura, H. Nilsson, **J. M. Raines**, R. Rispoli, M. Sarantos, H. T. Smith, K. Szego, A. Aronica, F. Camozzi, A. M. Di Lellis, G. Fremuth, F. Giner, R. Gurnee, J. Hayes, H. Jeszczyszky, F. Tominetti, B. Trantham, J. Balaz, W. Baumjohann, D. Brienza, U. Bührke, M. D. Bush, M. Cantatore, S. Cibella, L. Colasanti, G. Cremonese, L. Cremonesi, M. D'Alessandro, D. Delcourt, M. Delva, M. Desai, M. Fama, M. Ferris, H. Fischer, A. Gaggero, D. Gamborino, P. Garnier, W. C. Gibson, R. Goldstein, M. Grande, V. Grishin, D. Haggerty, M. Holmström, I. Horvath, K.-C. Hsieh, A. Jacques, R. E. Johnson, A. Kazakov, K. Kecskemety, H. Krüger, C. Kürbisch, F. Lazzarotto, F. Leblanc, M.

Leichtfried, R. Leoni, A. Loose, D. Maschietti, S. Massetti, F. Mattioli, G. Miller, D. Moissenko, A. Morbidini, R. Noschese, F. Nuccilli, C. Nunez, N. Paschalidis, S. Persyn, D. Piazza, M. Oja, J. Ryno, W. Schmidt, J. A. Scheer, A. Shestakov, S. Shuvalov, K. Seki, S. Selci, K. Smith, R. Sordini, J. Svensson, L. Szalai, D. Toublanc, C. Urdiales, A. Varsani, N. Vertolli, R. Wallner, P. Wahlstroem, P. Wilson, and S. Zampieri (2021), SERENA: Particle Instrument Suite for Determining the Sun-Mercury Interaction from BepiColombo, *Space Science Reviews*, 217, doi: 10.1007/s11214-020-00787-3.

2020

99. Aizawa, S., **J. M. Raines**, D. Delcourt, N. Terada, and N. André (2020), MESSENGER Observations of Planetary Ion Characteristics in the Vicinity of Kelvin-Helmholtz Vortices at Mercury, *Journal of Geophysical Research (Space Physics)*, 125, doi: 10.1029/2020JA027871.
98. Dewey, R. M., J. A. Slavin, **J. M. Raines**, A. R. Azari, and W. Sun (2020), MESSENGER Observations of Flow Braking and Flux Pileup of Dipolarizations in Mercury's Magnetotail: Evidence for Current Wedge Formation, *Journal of Geophysical Research (Space Physics)*, 125, doi: 10.1029/2020JA028112.
97. Milillo, A., M. Fujimoto, G. Murakami, J. Benkhoff, J. Zender, S. Aizawa, M. Dósa, L. Griton, D. Heyner, G. Ho, S. M. Imber, X. Jia, T. Karlsson, R. M. Killen, M. Laurenza, S. T. Lindsay, S. McKenna-Lawlor, A. Mura, **J. M. Raines**, D. A. Rothery, N. André, W. Baumjohann, A. Berezhnoy, P. A. Bourdin, E. J. Bunce, F. Califano, J. Deca, S. de la Fuente, C. Dong, C. Grava, S. Fatemi, P. Henri, S. L. Ivanovski, B. V. Jackson, M. James, E. Kallio, Y. Kasaba, E. Kilpua, M. Kobayashi, B. Langlais, F. Leblanc, C. Lhotka, V. Mangano, A. Martindale, S. Massetti, A. Masters, M. Morooka, Y. Narita, J. S. Oliveira, D. Odstrcil, S. Orsini, M. G. Pelizzo, C. Plainaki, F. Plaschke, F. Sahraoui, K. Seki, J. A. Slavin, R. Vainio, P. Wurz, S. Barabash, C. M. Carr, D. Delcourt, K.-H. Glassmeier, M. Grande, M. Hirahara, J. Huovelin, O. Korabely, H. Kojima, H. Lichtenegger, S. Livi, A. Matsuoka, R. Moissl, M. Moncuquet, K. Muinonen, E. Quémérais, Y. Saito, S. Yagitani, I. Yoshikawa, and J.-E. Wahlund (2020), Investigating Mercury's Environment with the Two-Spacecraft BepiColombo Mission, *Space Science Reviews*, 216, doi: 10.1007/s11214-020-00712-8.
96. Jasinski, J. M., L. H. Regoli, T. A. Cassidy, R. M. Dewey, **J. M. Raines**, J. A. Slavin, A. J. Coates, D. J. Gershman, T. A. Nordheim, and N. Murphy (2020), A transient enhancement of Mercury's exosphere at extremely high altitudes inferred from pickup ions, *Nature Communications*, 11, doi: 10.1038/s41467-020-18220-2.
95. James, M. K., S. M. Imber, **J. M. Raines**, T. K. Yeoman, and E. J. Bunce (2020), A Machine Learning Approach to Classifying MESSENGER FIPS Proton Spectra, *Journal of Geophysical Research (Space Physics)*, 125, doi: 10.1029/2019JA027352.
94. Owen, C. J., R. Bruno, S. Livi, P. Louarn, K. Al Janabi, F. Allegrini, C. Amoros, R. Baruah, A. Barthe, M. Berthomier, S. Bordon, C. Brockley-Blatt, C. Brysbaert, G. Capuano, M. Collier, R. DeMarco, A. Fedorov, J. Ford, V. Fortunato, I. Fratter, A. B. Galvin, B. Hancock, D. Heirtzler, D. Kataria, L. Kistler, S. T. Lepri, G. Lewis, C. Loeffler, W. Marty, R. Mathon, A. Mayall, G. Mele, K. Ogasawara, M. Orlandi, A. Pacros, E. Penou, S. Persyn, M. Petiot, M. Phillips, L. Přech, **J. M. Raines**, M. Reden, A. P. Rouillard, A. Rousseau, J. Rubiella, H. Seran, A. Spencer, J. W. Thomas, J. Trevino, D. Verscharen, P. Wurz, A. Alapide, L. Amoroso, N. André, C. Anekallu, V. Arciuli, K. L. Arnett, R. Ascolese, C. Bancroft, P. Bland, M. Brysch, R. Calvanese, M. Castronuovo, I. Čermák, D. Chornay, S. Clemens, J. Coker, G.

- Collinson, R. D'Amicis, I. Dandouras, R. Darnley, D. Davies, G. Davison, A. De Los Santos, P. Devoto, G. Dirks, E. Edlund, A. Fazakerley, M. Ferris, C. Frost, G. Fruit, C. Garat, V. Génot, W. Gibson, J. A. Gilbert, V. de Giosa, S. Gradone, M. Hailey, T. S. Horbury, T. Hunt, C. Jacquy, M. Johnson, B. Lavraud, A. Lawrenson, F. Leblanc, W. Lockhart, M. Maksimovic, A. Malpus, F. Marcucci, C. Mazelle, F. Monti, S. Myers, T. Nguyen, J. Rodriguez-Pacheco, I. Phillips, M. Popecki, K. Rees, S. A. Rogacki, K. Ruane, D. Rust, M. Salatti, J. A. Sauvaud, M. O. Stakhiv, J. Stange, T. Stubbs, T. Taylor, J.-D. Techer, G. Terrier, R. Thibodeaux, C. Urdiales, A. Varsani, A. P. Walsh, G. Watson, P. Wheeler, G. Willis, R. F. Wimmer-Schweingruber, B. Winter, J. Yardley, and I. Zouganelis (2020), The Solar Orbiter Solar Wind Analyser (SWA) suite, *Astronomy and Astrophysics*, 642, doi: 10.1051/0004-6361/201937259.
93. Poh, G., W. Sun, K. M. Clink, J. A. Slavin, R. M. Dewey, X. Jia, **J. M. Raines**, G. A. DiBraccio, and J. R. Espley (2020), Large-Amplitude Oscillatory Motion of Mercury's Cross-Tail Current Sheet, *Journal of Geophysical Research (Space Physics)*, 125, doi: 10.1029/2020JA027783.
92. Romanelli, N., G. DiBraccio, D. Gershman, G. Le, C. Mazelle, K. Meziane, S. Boardsen, J. Slavin, **J. Raines**, A. Glass, and J. Espley (2020), Upstream Ultra-Low Frequency Waves Observed by MESSENGER's Magnetometer: Implications for Particle Acceleration at Mercury's Bow Shock, *Geophysical Research Letters*, 47, doi: 10.1029/2020GL087350.
91. Rouillard, A. P., R. F. Pinto, A. Vourlidas, A. De Groof, W. T. Thompson, A. Bemporad, S. Dolei, M. Indurain, E. Buchlin, C. Sasso, D. Spadaro, K. Dalmasse, J. Hirzberger, I. Zouganelis, A. Strugarek, A. S. Brun, M. Alexandre, D. Berghmans, N. E. Raouafi, T. Wiegmann, P. Pagano, C. N. Arge, T. Nieves-Chinchilla, M. Lavarra, N. Poirier, T. Amari, A. Aran, V. Andretta, E. Antonucci, A. Anastasiadis, F. Auchère, L. Bellot Rubio, B. Nicula, X. Bonnin, M. Bouchemit, E. Budnik, S. Caminade, B. Cecconi, J. Carlyle, I. Cernuda, J. M. Davila, L. Etesi, F. Espinosa Lara, A. Fedorov, S. Fineschi, A. Fludra, V. Génot, M. K. Georgoulis, H. R. Gilbert, A. Giunta, R. Gomez-Herrero, S. Guest, M. Haberleiter, D. Hassler, C. J. Henney, R. A. Howard, T. S. Horbury, M. Janvier, S. I. Jones, K. Kozarev, E. Kraaikamp, A. Kouloumvakos, S. Krucker, A. Lagg, J. Linker, B. Lavraud, P. Louarn, M. Maksimovic, S. Maloney, G. Mann, A. Masson, D. Müller, H. Önel, P. Osuna, D. Orozco Suarez, C. J. Owen, A. Papaioannou, D. Pérez-Suárez, J. Rodriguez-Pacheco, S. Parenti, E. Pariat, H. Peter, S. Plunkett, J. Pomoell, **J. M. Raines**, T. L. Riethmüller, N. Rich, L. Rodriguez, M. Romoli, L. Sanchez, S. K. Solanki, O. C. St Cyr, T. Straus, R. Susino, L. Teriaca, J. C. del Toro Iniesta, R. Ventura, C. Verbeek, N. Vilmer, A. Warmuth, A. P. Walsh, C. Watson, D. Williams, Y. Wu, and A. N. Zhukov (2020), Models and data analysis tools for the Solar Orbiter mission, *Astronomy and Astrophysics*, 642, doi: 10.1051/0004-6361/201935305.
90. Sun, W. J., J. A. Slavin, R. M. Dewey, Y. Chen, G. A. DiBraccio, **J. M. Raines**, J. M. Jasinski, X. Jia, and M. Akhavan-Tafti (2020), MESSENGER Observations of Mercury's Nightside Magnetosphere Under Extreme Solar Wind Conditions: Reconnection-Generated Structures and Steady Convection, *Journal of Geophysical Research (Space Physics)*, 125, doi: 10.1029/2019JA027490.
89. Sun, W. J., J. A. Slavin, A. W. Smith, R. M. Dewey, G. K. Poh, X. Jia, **J. M. Raines**, S. Livi, Y. Saito, D. J. Gershman, G. A. DiBraccio, S. M. Imber, J. P. Guo, S. Y. Fu, Q. G. Zong, and J. T. Zhao (2020), Flux Transfer Event Showers at Mercury: Dependence on Plasma β and Magnetic Shear and Their Contribution to the Dungey Cycle, *Geophysical Research Letters*, 47, doi: 10.1029/2020GL089784.

88. Walsh, A. P., T. S. Horbury, M. Maksimovic, C. J. Owen, J. Rodríguez-Pacheco, R. F. Wimmer-Schweingruber, I. Zouganelis, C. Anekallu, X. Bonnin, R. Bruno, I. Carrasco Blázquez, I. Cernuda, T. Chust, A. De Groof, F. Espinosa Lara, A. N. Fazakerley, H. R. Gilbert, R. Gómez-Herrero, G. C. Ho, S. Krucker, S. T. Lepri, G. R. Lewis, S. Livi, P. Louarn, D. Müller, T. Nieves-Chinchilla, H. O'Brien, P. Osuna, P. Plasson, **J. M. Raines**, A. P. Rouillard, O. C. St Cyr, L. Sánchez, J. Soucek, A. Varsani, D. Verscharen, C. J. Watson, G. Watson, and D. R. Williams (2020), Coordination of the in situ payload of Solar Orbiter, *Astronomy and Astrophysics*, 642, doi: 10.1051/0004-6361/201936894.
87. Zhao, J.-T., Q.-G. Zong, J. A. Slavin, W.-J. Sun, X.-Z. Zhou, C. Yue, **J. M. Raines**, and W.-H. Ip (2020), Proton Properties in Mercury's Magnetotail: A Statistical Study, *Geophysical Research Letters*, 47, doi: 10.1029/2020GL088075.
86. Zouganelis, I., A. De Groof, A. P. Walsh, D. R. Williams, D. Müller, O. C. St Cyr, F. Auchère, D. Berghmans, A. Fludra, T. S. Horbury, R. A. Howard, S. Krucker, M. Maksimovic, C. J. Owen, J. Rodríguez-Pacheco, M. Romoli, S. K. Solanki, C. Watson, L. Sanchez, J. Lefort, P. Osuna, H. R. Gilbert, T. Nieves-Chinchilla, L. Abbo, O. Alexandrova, A. Anastasiadis, V. Andretta, E. Antonucci, T. Appourchaux, A. Aran, C. N. Arge, G. Aulanier, D. Baker, S. D. Bale, M. Battaglia, L. Bellot Rubio, A. Bemporad, M. Berthomier, K. Bocchialini, X. Bonnin, A. S. Brun, R. Bruno, E. Buchlin, J. Büchner, R. Bucik, F. Carcaboso, R. Carr, I. Carrasco-Blázquez, B. Cecconi, I. Cernuda Cangas, C. H. K. Chen, L. P. Chitta, T. Chust, K. Dalmasse, R. D'Amicis, V. Da Deppo, R. De Marco, S. Dolei, L. Dolla, T. Dudok de Wit, L. van Driel-Gesztelyi, J. P. Eastwood, F. Espinosa Lara, L. Etesi, A. Fedorov, F. Félix-Redondo, S. Fineschi, B. Fleck, D. Fontaine, N. J. Fox, A. Gandorfer, V. Génot, M. K. Georgoulis, S. Gissot, A. Giunta, L. Gizon, R. Gómez-Herrero, C. Gontikakis, G. Graham, L. Green, T. Grundy, M. Haberreiter, L. K. Harra, D. M. Hassler, J. Hirzberger, G. C. Ho, G. Hurford, D. Innes, K. Issautier, A. W. James, N. Janitzek, M. Janvier, N. Jeffrey, J. Jenkins, Y. Khotyaintsev, K.-L. Klein, E. P. Kontar, I. Kontogiannis, C. Krafft, V. Krasnoselskikh, M. Kretschmar, N. Labrosse, A. Lagg, F. Landini, B. Lavraud, I. Leon, S. T. Lepri, G. R. Lewis, P. Liewer, J. Linker, S. Livi, D. M. Long, P. Louarn, O. Malandraki, S. Maloney, V. Martinez-Pillet, M. Martinovic, A. Masson, S. Matthews, L. Matteini, N. Meyer-Vernet, K. Moraitis, R. J. Morton, S. Musset, G. Nicolaou, A. Nindos, H. O'Brien, D. Orozco Suarez, M. Owens, M. Pancrazzi, A. Papaioannou, S. Parenti, E. Pariat, S. Patsourakos, D. Perrone, H. Peter, R. F. Pinto, C. Plainaki, D. Plettemeier, S. P. Plunkett, **J. M. Raines**, N. Raouafi, H. Reid, A. Retino, L. Rezeau, P. Rochus, L. Rodriguez, L. Rodriguez-Garcia, M. Roth, A. P. Rouillard, F. Sahraoui, C. Sasso, J. Schou, U. Schühle, L. Sorriso-Valvo, J. Soucek, D. Spadaro, M. Stangalini, D. Stansby, M. Steller, A. Strugarek, Š. Štverák, R. Susino, D. Telloni, C. Terasa, L. Teriaca, S. Toledo-Redondo, J. C. del Toro Iniesta, G. Tsiropoula, A. Tsounis, K. Tziotziou, F. Valentini, A. Vaivads, A. Vecchio, M. Velli, C. Verbeeck, A. Verdini, D. Verscharen, N. Vilmer, A. Vourlidas, R. Wicks, R. F. Wimmer-Schweingruber, T. Wiegmann, P. R. Young, and A. N. Zhukov (2020), The Solar Orbiter Science Activity Plan. Translating solar and heliospheric physics questions into action, *Astronomy and Astrophysics*, 642, doi: 10.1051/0004-6361/202038445.

2019

85. 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.
84. 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.
83. 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.
82. 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".
81. 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.
80. 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.
79. 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

78. 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.
77. 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.
76. 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.
75. 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.
74. 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.
73. 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

72. 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.
71. 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.
70. 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.
69. 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.
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), Mercury's cross-tail current sheet: Structure, X-line location and stress balance, *Geophysical Research Letters*, 44, 678-686, doi: 10.1002/2016GL071612.
67. 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.
66. 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.
65. 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

64. 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.
63. 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.
62. 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.
61. 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.
60. 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.
59. 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.
58. 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

57. 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.
56. 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. Odstroil, 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.
55. 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.
54. 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.
53. 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.
52. 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.

51. 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.
50. **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.
49. 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 Alfvén and compressional waves during Mercury's substorms, *Geophysical Research Letters*, 42, 6189-6198, doi: 10.1002/2015GL065452.
48. 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.
47. 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.
46. 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.
45. 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

44. 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.
43. 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.
42. 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.
41. **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.

40. 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.
39. 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.
38. 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.
37. 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

36. 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
34. 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.
33. 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.
32. **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.
31. 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.

30. 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

29. 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.
28. 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.
27. 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. LeFevre, 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.