Robert J. Lillis

CURRICULUM VITAE

EDUCATION

2006 – Doctor of Philosophy, Physics, UC Berkeley. *Advisor*: Prof. Robert P. Lin
Thesis Topic: Electron Reflectometry as a Probe of the Martian Crust and Atmosphere
2003 – Master of Arts, Physics, University of California Berkeley
2001 – Bachelor of Arts (Honors, 1st class), Theoretical Physics, Trinity College Dublin

RESEARCH INTERESTS

I am a planetary space physicist and geophysicist specializing in three main areas: 1) planetary aeronomy, including auroral processes, atmospheric escape, and ionospheric electrodynamics, 2) the nature and geophysical implications of crustal remanent magnetism, including meteorite impacts, volcanism, and interiors, and 3) solar energetic particles and their effects on planetary environments. My research targets have included Mercury, Venus, the Moon, and Europa, but Mars is my primary focus. My research approach is broad, encompassing data analysis, theoretical modeling, instrumentation development and mission formulation and planning.

SKILLS

- Planetary Geophysics & Space Physics: hypothesis testing, multidimensional trend analysis of large data sets, physical simulations
- Scientific management: group and large project leadership, collaboration with engineers & technicians, mentoring students.
- Space Instrumentation: solid state detectors, familiarity with particle analyzers & UV spectrometers
- Programming: expert in IDL, proficient in C, C++, Python, Fortran.

SCIENTIFIC EMPLOYMENT HISTORY

Dates	Title	Employer
2019-present	*Research Physicist*	*UC Berkeley Space Sciences Laboratory*
2014-2019	*Associate Research Physicist*	*UC Berkeley Space Sciences Laboratory*
2008-2014	*Assistant Research Physicist*	*UC Berkeley Space Sciences Laboratory*
2006-2008	*Postdoctoral Researcher*	*UC Berkeley Space Sciences Laboratory*
2001-2006	*PhD Student researcher*	*UC Berkeley Space Sciences Laboratory*
Fall 2004	*Graduate Student Instructor*	*UC Berkeley Department of Physics*
Summer 2000	*Research Assistant*	*PHOBOS experiment, Brookhaven National Lab*
Summer 1999	*Research Assistant*	*University of Notre Dame (Foam Rheology)*

AWARDS & HONORS

Date	Award	Awarding Institution
06/2016	Group Achievement Award - MAVEN Science Team	NASA
03/2016	Robert H. Goddard Exceptional Achievement Award for Science - MAVEN Science Team	NASA
05/2014	Robert H. Goddard Exceptional Achievement Award for Engineering Team - MAVEN Team	NASA
05/2013	Outstanding Contribution to the Mars Express mission	European Space Agency (ESA)
08/2011	Group Achievement Award for successful completion of MAVEN Mars Scout Mission Phase B	NASA
01/2005	Frederick and Edith Ehrman Fellowship	UC Berkeley
12/2004	Outstanding Student Paper Award for Planetary Sciences, AGU Fall meeting	American Geophysical Union
06/2001	Fitzgerald Medal (1st ranked physics graduate)	Trinity College Dublin, Ireland

PEER-REVIEWED PUBLICATIONS:

- 147 total, 28 as lead author, ~7418 total citations (Google Scholar). H-index: 46.
- Science, Nature Astronomy, Icarus, GRL, JSW, JGR, PSJ, JVGR, ApJL

CONFERENCE PROCEEDINGS:

- ~400 total, ~80 as lead author.
- Meetings: AGU, LPSC, EGU, EPSC, COSPAR, AOGS, DPS and various smaller workshops.

FUNDED SPACE SCIENCE PROJECT/MISSION PARTICIPATION

Dates	Title	Project
2019-now	*Principal Investigator*	*ESCAPADE twin-spacecraft Mars mission*
2014-now	*Science team member*	*UAE, Emirates Mars Mission*
2008-now	*Dep. instrument lead & team member*	*NASA MAVEN Mars Scout Mission*
2002-2007	*Science Team Member*	*NASA Mars Global Surveyor Mission*

CURRENT RESEARCH GRANTS/CONTRACTS

Dates	Title	Source	Role	UCB Role	UCB Budget
2019-	ESCAPADE SIMPLEX mission	NASA	PI	PI	~$61M
2022-2025	Reassessing Martian Dynamo History	NASA	Co-I	PI	~$80k
2020-2025	Electron Impact Effects in the Martian nightside ionosphere	NASA	PI	PI	~$400k
01/09-	MAVEN Mars Scout Mission	NASA	Co-I	Co-I	~$35M
01/15-	Emirates Mars Mission Science, UV detector, systems engineering	UAESA	Co-I	PI	~$11M

SERVICE:

- *Peer review*: Reviewed more than 60 journal articles for recognized journals.
- *Proposal evaluation*: Served on 18 NASA review panels (5 as chair) incl. 2 mission reviews.
- *Conference Convener* at 10 international conferences (AGU, AOGS, MUAN)
- *VenusBridge*: NASA HQ-directed effort to define low cost options for Venus science 2017-2024.
- *Planetary Science Decadal Survey input:*
  - 2013-2022: Whitepaper lead author: "Mars Crustal Magnetism"
  - 2023-2032: Planetary Mission Concept Study Lead: "Mars Orbiters for Surface-Atmosphere-Ionosphere Connections (MOSAIC)"

TEACHING & MENTORING OF STUDENTS:

- Primary nonfaculty advisor for EPS PhD student Melissa Marquette. Thesis: "Investigating the effects of electron precipitation on Mars' nightside ionosphere"
- Teaching assistant and lab instructor for Physics 8A for scientists (UC Berkeley).
- UCB undergraduate senior thesis advisor/mentor for:
  - *Jesse Engel*: Constraining neutral densities in Mars atmosphere with electron reflectometry
  - *Rebecca Jolitz*: High-energy ion transport through planetary atmospheres.
  - *Melissa Marquette*: Characterizing heliospheric variability for the MAVEN mission.
  - *Naomi Weiss*: Characterizing the Martian radiation environment over two solar cycles
  - *Laura Johan*: Hydrogen Precipitation in the Martian atmosphere
- UCB mentor for summer Space Science interns from the United Arab Emirates: Hind Al Ali (2015), Khalid Al Awar (2016), Abdulla Al Muharrami (2017), Ahmed Al Mehdi (2018), and Maryam Al Abdouli (2019), and Shouq Altaffaq (2022).

MEDIA INTERACTION & ONLINE PRESENCE:

- **Interviews for print & online media**:
  - *Science Magazine*: Did Mars' Magnetic Field Die with a Whimper or a Bang?
  - *Berkeley News*:
    - ESCAPADE Mission selection.
    - Emirates Hope Mars Mission Arrival.
    - ESCAPADE NASA Confirmation.
  - *Daily Californian:*
    - MAVEN Launch (front page: my photo), MAVEN Cruise, MAVEN Mars Arrival.
    - Emirates Hope Mars Mission Arrival.
    - ESCAPADE Selection, ESCAPADE NASA Confirmation.
  - *United Press International*: ESCAPADE mission interview.
  - *KRON4 Bay Area News*: ESCAPADE selection.
  - *NBC Bay Area news:* Emirates Mars Mission launch.
  - *Supercluster:* Rolling the dice with cheaper missions to Mars.
  - *Sky and Telescope* special issue: Mysteries & Marvels of the Red Planet.
  - *Realtor.com*: Challenges of Life & Housing on the Martian surface.
  - *Los Angeles Times*: Mars colonization & UAE plans for Mars.
- **Radio Interviews:**
  - *02/2012. Big Picture Science* with Molly Bentley about the science goals of the MAVEN mission and the history of Martian habitability. Aired nationwide on National Public Radio.
  - 11/2015. *Radio New Zealand* with Kathryn Ryan. On-air interview about MAVEN's first results news announcement and Mars Habitability.
  - 10/2021. *Planetary Radio* with Matt Kaplan. "An ESCAPADE to Mars, on the cheap." Aired on many NPR stations.
- **TV Interviews**:
  - EU-funded Spanish Science Show: "Escaping Atmosphere"
  - NBC Bay Area news: "Spacecraft Made With Help From UC Berkeley Arrives at Mars"
  - Sky News Arabia: Live coverage of Emirates Mars Hope mission Orbit Insertion.
- **Internet Forums**: Reddit "Ask Me Anything" twice (11/2013 and 12/2015),
- **San Francisco Nerd Nite** "Challenges of Resurrecting the Martian Atmosphere".
- **Discovery Channel Digital (Seeker Media): "**How close are we to terraforming Mars?"
- **MAVEN Science Team Blog**: Tracing Mars Atmospheric Loss through Time: the Three Devils.

Peer-reviewed articles: 147 total, 28 as lead author, Citations: 7418, h-index: 46

148 02/2024 Lillis, R. J., J. L. Deighan, K. P. Chirakkil, S. Jain, et al. (2024), Sinuous Aurora at Mars: a Link to the Tail Current Sheet?, Journal of Geophysical Research, under review.

147 12/2023 Halekas, J. S., Shaver, S., Azari, A. R., Fowler, C. M., Ma, Y., Xu, S., et al. (2023). The day the solar wind disappeared at Mars. Journal of Geophysical Research: Space Physics, 128, e2023JA031935. https://doi.org/10.1029/2023JA031935

146 11/2023 Xu, S. S., J. G. Luhmann, D. L. Mitchell, T. Weber, D. A. Brain, Y. J. Ma, S. M. Curry, G. A. DiBraccio, J. S. Halekas, S. Ruhunusiri, C. Mazelle, R. J. Lillis, B. Langlais (2023), Open Magnetic Fields in the Martian Magnetosphere Revealing Dipole-like Intrinsic Magnetic Fields at Mars, Astrophys J Lett, 957(2), doi:10.3847/2041-8213/ad0784.

145 08/2023 Mittelholz, A., L. Heagy, C. L. Johnson, J. Bapst, J. Espley, A. A. Fraeman, B. Langlais, R. Lillis, and W. Rapin (2023), Exploring Martian Magnetic Fields with a Helicopter, Planet Sci J, 4(8), doi:10.3847/PSJ/ace9c1

144 08/2023 Cheng, L., Lillis, R., Wang, Y., Mittelholz, A., Xu, S., Mitchell, D. L., et al. (2023). Martian bow shock oscillations driven by solar wind variations: Simultaneous observations from Tianwen-1 and MAVEN. Geophysical Research Letters, 50, e2023GL104769. https://doi.org/10.1029/2023GL104769

143 03/2023 Girazian, Z., J. Halekas, and R. J. Lillis (2023), Solar cycle and seasonal variability of the nightside ionosphere of Mars: Insights from five years of MAVEN observations, Icarus, 393, 114615, doi:https://doi.org/10.1016/j.icarus.2021.114615.

142 02/2023 Jolitz, R. D., Rahmati, A., Brain, D. A., Lee, C. O., Lillis, R. J., Thiemann, E., et al. (2023). Energy input of EUV, solar wind, and SEPs at Mars: MAVEN observations during solar minimum. Journal of Geophysical Research: Space Physics, 128, e2022JA030884. https://doi.org/10.1029/2022JA030884

141 10/2022 Jain, S. K., Deighan, J., Chaffin, M., Holsclaw, G., Lillis, R., Fillingim, M., et al. (2022). Morphology of extreme and far ultraviolet Martian airglow emissions observed by the EMUS instrument on board the Emirates Mars Mission. Geophysical Research Letters, 49, e2022GL099885. https://doi.org/10.1029/2022GL099885

140 10/2022 England, S. L., Jain, S., Deighan, J., Chaffin, M., Holsclaw, G., Evans, J. S., et al. (2022). Spatio-temporal structure of far ultraviolet Martian dayglow observed by EMM-EMUS. Geophysical Research Letters, 49, e2022GL099611. https://doi.org/10.1029/2022GL099611

139 09/2022 Xu, S., Mitchell, D. L., McFadden, J. P., Fowler, C. M., Hanley, K., Weber, T., et al. (2022). Nightside auroral electrons at Mars: Upstream drivers and ionospheric impact. Journal of Geophysical Research: Space Physics, 127, e2022JA030801. https://doi.org/10.1029/2022JA030801

138 09/2022 Chaffin, M. S., Fowler, C. M., Deighan, J., Jain, S., Holsclaw, G., Hughes, A., et al. (2022). Patchy proton aurora at Mars: A global view of solar wind precipitation across the Martian dayside from EMM/EMUS. Geophysical Research Letters, 49, e2022GL099881. https://doi.org/10.1029/2022GL099881

137 09/2022 Lootah, F. H., Deighan, J., Fillingim, M., Jain, S., Evans, J. S., Al Matroushi, H., et al. (2022). Emirates Mars Ultraviolet Spectrometer's (EMUS) observation of argon in the Martian thermosphere. Geophysical Research Letters, 49, e2022GL099852. https://doi.org/10.1029/2022GL099852

136 08/2022 Evans, J. S., Correira, J., Deighan, J., Jain, S., Al Matroushi, H., Al Mazmi, H., et al. (2022). Retrieval of CO relative column abundance in the Martian

thermosphere from FUV disk observations by EMM EMUS. Geophysical Research Letters, 49, e2022GL099615. https://doi.org/10.1029/2022GL099615

135 08/2022 Chaffin, M. S., Deighan, J., Jain, S., Holsclaw, G., AlMazmi, H., Chirakkil, K., et al. (2022). Combined analysis of hydrogen and oxygen 102.6 nm emission at Mars. Geophysical Research Letters, 49, e2022GL099851. https://doi.org/10.1029/2022GL099851

134 03/2022 Lillis, R. J., Deighan, J., Brain, D., Fillingim, M., Jain, S., Chaffin, M., et al. (2022). First synoptic images of FUV discrete aurora and discovery of sinuous aurora at Mars by EMM EMUS. Geophysical Research Letters, 49, e2022GL099820. https://doi.org/10.1029/2022GL099820

133 02/2022 Xu, S., Mitchell, D. L., McFadden, J. P., Schneider, N. M., Milby, Z., Jain, S., et al. (2022). Empirically determined auroral electron events at Mars—MAVEN observations. Geophysical Research Letters, 49, e2022GL097757. https://doi.org/10.1029/2022GL097757

132 12/2021 Amiri, H.E.S., Brain, D., Sharaf, O. et al. The Emirates Mars Mission. Space Sci Rev 218, 4 (2022). https://doi.org/10.1007/s11214-021-00868-x

131 12/2021 Almatroushi, H., AlMazmi, H., AlMheiri, N. et al. Emirates Mars Mission Characterization of Mars Atmosphere Dynamics and Processes. Space Sci Rev 217, 89 (2021). https://doi.org/10.1007/s11214-021-00851-6

130 12/2021 Holsclaw, G.M., Deighan, J., Almatroushi, H. et al. The Emirates Mars Ultraviolet Spectrometer (EMUS) for the EMM Mission. Space Sci Rev 217, 79 (2021). https://doi.org/10.1007/s11214-021-00854-3

129 12/2021 Lillis, R. J., Xu, S., Mitchell, D., Thiemann, E., Eparvier, F., Benna, M., & Elrod, M. (2021). Ionization efficiency in the dayside ionosphere of Mars: Structure and variability. Journal of Geophysical Research: Planets, 126, e2021JE006923. https://doi.org/10.1029/2021JE006923

128 11/2021 Sánchez-Cano, B., Lester, M., Andrews, D.J. et al. Mars' plasma system. Scientific potential of coordinated multipoint missions: "The next generation". *Exp Astron* 54, 641–676 (2022). https://doi.org/10.1007/s10686-021-09790-0

127 10/2021 Fowler, C. M., Hanley, K. G., McFadden, J. P., Chaston, C. C., Bonnell, J. W., Halekas, J. S., et al. (2021). MAVEN observations of low frequency steepened magnetosonic waves and associated heating of the Martian nightside ionosphere. *Journal of Geophysical Research: Space Physics*, 126, e2021JA029615. https://doi.org/10.1029/2021JA029615

126 10/2021 Lillis, R. J., and 51 co-authors (2021), MOSAIC: A Satellite Constellation to Enable Groundbreaking Mars Climate System Science and Prepare for Human Exploration, *The Planetary Science Journal*, **2** 211

125 08/2021 Jolitz, R. D., Dong, C. F., Rahmati, A., Brain, D. A., Lee, C. O., Lillis, R. J., et al. (2021). Test particle model predictions of SEP electron transport and precipitation at Mars. Journal of Geophysical Research: Space Physics, 126, e2021JA029132. https://doi.org/10.1029/2021JA029132

124 07/2021 Henderson, S., Halekas, J., Lillis, R., & Elrod, M. (2021). Precipitating solar wind hydrogen as observed by the MAVEN spacecraft: Distribution as a function of column density, altitude, and solar zenith angle. *Journal of Geophysical Research*: Planets, 126, e2020JE006725. https://doi.org/10.1029/2020JE006725

123 05/2021 Lo, D. Y., R. V. Yelle, R. J. Lillis, and J. I. Deighan (2021), Carbon photochemical escape rates from the modern Mars atmosphere, *Icarus*, 360, 114371, doi:https://doi.org/10.1016/j.icarus.2021.114371.

122 01/2021 Thiemann, E. M. B., Eparvier, F. G., Knoer, V., Al Muharrami, A., & Lillis, R. J. (2021). Solar EUV irradiance uncertainties for planetary studies. *Journal of*

Geophysical Research: Space Physics, 126, e2020JA028184. https://doi.org/10.1029/2020JA028184

121 12/2020 Lo, D. Y., R. V. Yelle, and R. J. Lillis (2020), Carbon photochemistry at Mars: Updates with recent data, *Icarus*, 352, 114001, doi:https://doi.org/10.1016/j.icarus.2020.114001.

120 11/2020 Fowler, C. M., Bonnell, J. W., Xu, S., Benna, M., Elrod, M., McFadden, J., et al. (2020). First Detection of Kilometer-Scale Density Irregularities in the Martian Ionosphere. *Geophysical Research Letters*, 47, e2020GL090906. https://doi.org/10.1029/2020GL090906

119 11/2020 Rahmati, A., Larson, D. E., Cravens, T. E., Lillis, R. J., Lee, C. O., & Dunn, P. A. (2020). MAVEN SEP observations of Scorpius X-1 X-rays at Mars: A midatmosphere occultation analysis technique. *Geophysical Research Lett*ers, 47, e2020GL088927. https://doi.org/10.1029/2020GL088927

118 10/2020 Xu, S., Curry, S. M., Mitchell, D. L., Luhmann, J. G., Lillis, R. J., & Dong, C. (2020). Superthermal electron deposition on the Mars nightside during ICMEs. *Journal of Geophysical Research: Space Physics*, 125, e2020JA028430. https://doi.org/10.1029/2020JA028430

117 10/2020 Martinez, A., Modolo, R., Leblanc, F., Chaufray, J. Y., Witasse, O., Romanelli, N., et al. (2020). Influence of the solar wind dynamic pressure on the ion precipitation: MAVEN observations and simulation results. *Journal of Geophysical Research: Space Physics*, 125, e2020JA028183. https://doi.org/10.1029/2020JA028183

116 10/2020 Weber, T., Brain, D., Xu, S., Mitchell, D., Espley, J., Halekas, J., et al. (2020). The influence of interplanetary magnetic field direction on Martian crustal magnetic field topology. *Geophysical Research Letters*, 47, e2020GL087757. https://doi.org/10.1029/2020GL087757

115 10/2020 Brain, D.A., Weber, T., Xu, S., Mitchell, D.L., Lillis, R.J., Halekas, J.S., Espley, J. and Jakosky, B.M. (2020), Variations in Nightside Magnetic Field Topology at Mars. *Geophys. Res. Lett*., 47: e2020GL088921. https://doi.org/10.1029/2020GL088921

114 05/2020 Xu, S., Xu, Shaosui ; D.L. Mitchell, J.P. McFadden, M.O. Fillingim, L. Andersson, D. Brain, T. Weber, N. Schneider, S. Jain, C. Fowler, R. J. Lillis, C. Mazelle, J. Espley (2020), Inverted-V Electron Acceleration Events Concurring With Localized Auroral Observations at Mars by MAVEN, Geophysical Research Letters, 47, e87414, doi:10.1029/2020GL087414.

113 02/2020 Collinson, G. A., J. McFadden, J. Grebowsky, D. Mitchell, R. Lillis, P. Withers, M. F. Vogt, M. Benna, J. Espley, and B. Jakosky (2020), Constantly forming sporadic E-like layers and rifts in the Martian ionosphere and their implications for Earth, *Nature Astronomy*, 4, 486-491, doi:10.1038/s41550-019-0984-8.

112 02/2020 Gacesa, M., R. J. Lillis, K. J. Zahnle (2020), O(^{3}P) + CO2 scattering cross sections at Suprathermal collision energies for planetary aeronomy, *Monthly Notices of the Royal Astronomical Society*, Volume 491, Issue 4, p.5650-5659, doi: 10.1093/mnras/stz3366

111 08/2019 Steckiewicz, M., P. Garnier, R. Lillis, D. Toublanc, F. Leblanc, D. L. Mitchell, L. Andersson, and C. Mazelle (2019), Dawn/Dusk Asymmetry of the Martian UltraViolet Terminator Observed Through Suprathermal Electron Depletions, *Journal of Geophysical Research (Space Physics)*, *124*, 7283-7300, doi:10.1029/2018JA026336.

110 07/2019 Martinez, A., F. Leblanc, J. Y. Chaufray, R. Modolo, O. Witasse, Y. Dong, T. Hara, J. S. Halekas, R. J. Lillis, and 7 others (2019), Influence of Extreme Ultraviolet Irradiance Variations on the Precipitating Ion Flux From MAVEN Observations,

		Geophysical Research Letters, *46*(13), 7761-7768, doi:10.1029/2019gl083595.
109	06/2019	Langlais, B., E. Thebault, A. Houliez, M. E. Purucker, and R. J. Lillis (2019), A New Model of the Crustal Magnetic Field of Mars Using MGS and MAVEN, *Journal of Geophysical Research-Planets*, *124*(6), 1542-1569, doi:10.1029/2018je005854.
108	06/2019	Sanchez-Cano, B., P.-L. Blelly, M. Lester, O. Witasse, M. Cartacci, R. Orosei, H. Opgenoorth, R. J. Lillis, Robert (2019), Origin of the Extended Mars Radar Blackout of September 2017, *Journal of Geophysical Research-Space Physics*, *124*(6), 4556-4568, doi:10.1029/2018ja026403.
107	06/2019	O'Rourke, J. G., J. Buz, R. R. Fu, and R. J. Lillis (2019), Detectability of Remanent Magnetism in the Crust of Venus, *Geophysical Research Letters*, *46*(11), 5768-5777, doi:10.1029/2019gl082725
106	05/2019	Lillis, R. J., M. O. Fillingim, Y. J. Ma, F. Gonzalez-Galindo, F. Forget, C. L. Johnson, A. Mittelholz, C. T. Russell, L. Andersson, and C. M. Fowler (2019), Modelling Wind-Driven Ionospheric Dynamo Currents at Mars: Expectations for InSight Magnetic Field Measurements, *Geophysical Research Letters*, *46*(10), 5083-5091, doi:10.1029/2019gl082536.
105	04/2019	Fowler, C. M., C. O. Lee, S. S. Xu, D. L. Mitchell, R. J. Lillis, and 7 others (2019), The Penetration of Draped Magnetic Field Into the Martian Upper Ionosphere and Correlations With Upstream Solar Wind Dynamic Pressure, *Journal of Geophysical Research-Space Physics*, *124*(4), 3021-3035, doi:10.1029/2019ja026550.
104	04/2019	Leblanc, F., M. Benna, J. Y. Chaufray, A. Martinez, R. J. Lillis, and 6 others (2019), First In Situ Evidence of Marc Nonthermal Exosphere, *Geophysical Research Letters*, *46*(8), 4144-4150, doi:10.1029/2019gl082192.
103	03/2019	Wu, X. S., J. Cui, S. S. Xu, R. J. Lillis, and 10 others (2019b), The Morphology of the Topside Martian Ionosphere: Implications on Bulk Ion Flow, *Journal of Geophysical Research-Planets*, *124*(3), 734-751, doi:10.1029/2018je005895
102	03/2019	Weber, T., D. Brain, D. Mitchell, S. S. Xu, J. Espley, J. Halekas, R. Lillis, and B. Jakosky (2019), The Influence of Solar Wind Pressure on Martian Crustal Magnetic Field Topology, *Geophysical Research Letters*, *46*(5), 2347-2354, doi:10.1029/2019gl081913.
101	02/2019	Soobiah, Y. I. J., J. R. Espley, J. E. P. Connerney, J. R. Gruesbeck, G. A. DiBraccio, J. S. Halekas, L. Andersson, C. M. Fowler, R. J. Lillis, and 11 others (2019), MAVEN Case Studies of Plasma Dynamics in Low-Altitude Crustal Magnetic Field at Mars 1: Dayside Ion Spikes Associated With Radial Crustal Magnetic Fields, *Journal of Geophysical Research-Space Physics*, *124*(2), 1239-1261, doi:10.1029/2018ja025569.
100	01/2019	Xu, S. S., S. M. Curry, D. L. Mitchell, J. G. Luhmann, R. J. Lillis, and C. F. Dong (2019), Magnetic Topology Response to the 2003 Halloween ICME Event at mars, *Journal of Geophysical Research-Space Physics*, *124*(1), 151-165, doi:10.1029/2018ja026118.
99	01/2019	Martinez, A., F. Leblanc, J.-Y. Chaufray, R. Modolo, N. Romanelli, S Curry, J Luhmann, R Lillis, and 10 others (2019), Variability of Precipitating Ion Fluxes During the September 2017 Event at Mars, Journal of Geophysical Research: Space Physics, 0(0), doi:10.1029/2018JA026123.
98	01/2019	Angelopoulos, V., et al. (2019), The Space Physics Environment Data Analysis System (SPEDAS), Space Science Reviews, 215(1), 9, doi:10.1007/s11214-018-0576-4.
97	11/2018	Jakosky, B. M., D. Brain, M. Chaffin, S. Curry, J. Deighan, J. Grebowsky, J. Halekas, F. Leblanc, R. J. Lillis, J.G. Luhmann and 123 co-authors. Loss of the Martian

		atmosphere to space: Present-day loss rates determined from MAVEN observations and integrated loss through time (2018), Icarus, doi:10.1016/j.icarus.2018.05.030
96	11/2018	Adams, D., S. Xu, D. L. Mitchell, R. J. Lillis, M. Fillingim, L. Andersson, C. Fowler, J. E. P. Connerney, J. Espley, and C. Mazelle (2018), Using Magnetic Topology to Probe the Sources of Mars' Nightside Ionosphere, Geophysical Research Letters, 45(22), 12190-12197, doi:10.1029/2018gl080629.
95	10/2018	Sanchez-Cano, B., et al. (2018), Energetic Particle Showers Over Mars from Comet C/2013 A1 Siding Spring, Journal of Geophysical Research-Space Physics, 123(10), 8778-8796, doi:10.1029/2018ja025454.
94	09/2018	Mittelholz, A., Morschhauser, A., Johnson, C. L., Langlais, B., Lillis, R. J., Vervelidou, F., & Weiss, B. P. (2018). The Mars 2020 candidate landing sites: A magnetic field perspective. Earth and Space Science, 5, 410–424. https://doi.org/10.1029/2018EA000420
93	08/2018	Thiemann, E. M. B., et al. (2018), The Mars Topside Ionosphere Response to the X8.2 Solar Flare of 10 September 2017, Geophysical Research Letters, 45(16), 8005-8013, doi:10.1029/2018gl077730.
92	08/2018	Schneider, N. M., S.K. Jain, J. Deighan, C. R. Nasr, DA Brain, D. E. Larson, D., R. J. Lillis, A. Rahmati, J. S. Halekas, C. O. Lee and 14 co-authors. Global Aurora on Mars During the September 2017 Space Weather Event (2018), *Geophysical Research Letters*, 45, 15, doi: 10.1029/2018GL077772
91	08/2018	Ramstad, R., M Holmstrom, Y. Futaana, C. O. Lee, A. Rahmati, P. A. Dunn, R. J. Lillis, D. E. Larson, the September 2017 SEP Event in Context with the Current Solar Cycle: Mars Express ASPERA-3/IMA and MAVEN/SEP Observations (2018), *Geophysical Research Letters*, 45, 15, doi: 10.1029/2018GL077842.
90	05/2018	Rahmati, A., DE Larson, TE Cravens, RJ Lillis, JS Halekas, JP McFadden, DL Mitchell, and 10 co-authors, Seasonal Variability of Neutral Escape from Mars as Derived from MAVEN Pickup Ion Observations (2018), *Journal of Geophysical Research: Planets*, 123, 5, doi: 10.1029/2018JE005560
89	05/2018	Lillis R. J., D. L. Mitchell, M. Steckiewicz, D. A. Brain, S. Xu, T. Weber, J. S. Halekas, J. E. P. Connerney, J. Espley, M. Benna, M. Elrod, E. Thiemann, Ionizing Electrons on the Martian Nightside: Structure and Variability (2018). *Journal of Geophysical Research: Space Physics, 123, 5, doi:10.1029/2017JA025151*
88	05/2018	Ma, Y., C. T. Russell, G. Toth, Y. Chen, A. F. Nagy, Y. Harada, J. McFadden, J. Halekas, R. J. Lillis, J. E. P. Connerney and 6 co-authors (2018), Reconnection in the Martian magnetotail: Hall-MHD with embedded particle-in-cell simulations, Journal of Geophysical Research: Space Physics, 123, 5, doi: 10.1029/2017JA024729
87	05/2018	Leblanc, F., A. Martinez, J. Y. Chaufray, R. Modolo, T. Hara, J. G. Luhmann, R. Lillis, S. Curry, J. McFadden, J. Halekas, B. Jakosky (2018), On Mars's atmospheric sputtering after MAVEN's first Martian year of measurements, *Geophysical Research Letters*, 45, 10, doi: 10.1002/2018GL077199
86	04/2018	Liu, G., S. L. England, R. Lillis, P. Withers, P. Mahaffy, D. Rowland, Douglas M. Elrod, M. Benna, D. Kass, D. Janches, B. Jakosky (2018) Thermospheric expansion associated with dust increase in the lower atmosphere on Mars observed by MAVEN/NGIMS, *Geophysical Research Letters*, 45, 7,doi: 10.1002/2018GL077525
85	04/2018	Guo, J., R. Lillis, R. Wimmer-Schweingruber, C. Zeitlin, P. Simonson, A. Rahmati, A. Posner, A. Papaioannous, N. Lundt, C. O. Lee (2018), Measurements of Forbush decreases at Mars: both by MSL on ground and by MAVEN in orbit, Astronomy and Astrophysics, 611, doi: 10.1051/0004-6361/201732087

84	01/2018	Lillis, R. J., Halekas, J. S., Fillingim, M. O., Poppe, A. R., Collinson, G., Brain, D. A., & Mitchell, D. L. (2018). Field-aligned electrostatic potentials above the Martian exobase from MGS electron reflectometry: Structure and variability. Journal of Geophysical Research: Planets, 123. https://doi.org/10.1002/2017JE005395
83	12/2017	Leblanc, F., J. Y Chaufray, R. Modolo, L. Leclercq, S. Curry, J. Luhmann, R. Lillis, T. Hara, J. McFadden, J. Halekas, and 10 coauthors (2017) On the origins of Mars' exospheric nonthermal oxygen component as observed by MAVEN and modeled by HELIOSARES, Journal of Geophysical Research: Planets, 122, 12, doi: 10.1002/2017JE005336
82	11/2017	Vervelidou, F. V. Lesur, M. Grott, A. Morschhauser, R. J. Lillis (2017), Constraining the date of the Martian Dynamo shut down by means of crater magnetization signatures, Journal of Geophysical Research: Planets, 122, 11,doi: 10.1002/2017JE005410
81	11/2017	Girazian, Z. P. Mahaffy, R. J. Lillis, M. Benna, M. Elrod, C. M. Fowler, D. L. Mitchell (2017), Ion Densities in the Nightside Ionosphere of Mars: Effects of Electron Impact Ionization, Geophysical Research Letters, 44, 22,doi: 10.1002/2017GL075431
80	11/2017	Fowler, C. M., L. Andersson, S. R. Shaver, J. P. Thayer, J. D. Huba, R. J. Lillis, M. E. Usanova, J. Espley, R. E. Ergun, J. Mcfadden, and 7 co-authors (2017), MAVEN Observations of Ionospheric Irregularities at Mars, Geophysical Research Letters, 44, 21, doi: 10.1002/2017GL075189
79	10/2017	Garnier, P., M. Steckiewicz, C. Mazelle, S. Xu, D. Mitchell, M. K. G. Holmberg, J. S. Halekas, L. Andersson, D. A. Brain, J. E. P. Connerney, J. R. Espley, R. J. Lillis, J. G. Luhmann, J.-A. Sauvaud, B. M. Jakosky (2017). The Martian photoelectron boundary as seen by MAVEN. Journal of Geophysical Research: Space Physics, 122, 10, Doi:10.1002/2017JA024497
78	06/2017	Mittelholz, A., C. L. Johnson, and R. J. Lillis (2017), Global-scale external magnetic fields at Mars measured at satellite altitude, *J. Geophys. Res.* Planets, 122, 1243–1257, doi:10.1002/2017JE005308.
77	05/2017	Jolitz, R. D., C. F. Dong, C. O. Lee, R. J. Lillis, D. A. Brain, S. M. Curry, S. Bougher, C. D. Parkinson, and B. M. Jakosky (2017), A Monte Carlo model of crustal field influences on solar energetic particle precipitation into the Martian atmosphere, *J. Geophys. Res. Space Physics*, 122, 5653–5669, doi:10.1002/2016JA023781.
76	04/2017	Girazian, Z., P. R. Mahaffy, R. J. Lillis, M. Benna, M. Elrod, and B. M. Jakosky (2017), Nightside ionosphere of Mars: Composition, vertical structure, and variability, *J. Geophys. Res. Space Physics*, 122, 4712–4725, doi:10.1002/2016JA023508.
75	04/2017	Fang, X., Y. Ma, K. Masunaga, Y. Dong, D. Brain, J. Halekas, R. Lillis, B. Jakosky, J. Connerney, J. Grebowsky, C. Dong (2017), The Mars crustal magnetic field control of plasma boundary locations and atmospheric loss: MHD prediction and comparison with MAVEN, *J. Geophys. Res. Space Physics*, 122, 4117–4137, doi:10.1002/2016JA023509.
74	03/2017	Lillis, R. J., et al. (2017), Photochemical escape of oxygen from Mars: First results from MAVEN in situ data, *Journal of Geophysical Research-Space Physics*, 122(3), 3815-3836, doi:10.1002/2016ja023525.
73	03/2017	Rahmati, A., D. E. Larson, T. E. Cravens, R. J. Lillis, J. S. Halekas, J. P. McFadden, P. A. Dunn, D. L. Mitchell, E. M. B. Thiemann, F. G. Eparvier, G. A. DiBraccio, J. R. Espley, C. Mazelle, B. M. Jakosky (2017), MAVEN measured oxygen and hydrogen pickup ions: Probing the Martian exosphere and neutral escape, J. Geophys. Res. Space Physics, 122, 3689–3706, doi:10.1002/2016JA023371.

72	03/2017	Lee, C. O., T. Hara, J. S. Halekas, E. Thiemann, P. Chamberlin, F. Eparvier, R. J. Lillis, D. E. Larson, P. A. Dunn, J. R. Espley, J. Gruesbeck, S. M. Curry, J. G. Luhmann, B. M. Jakosky (2017), MAVEN observations of the solar cycle 24 space weather conditions at Mars, *J. Geophys. Res. Space Physics*, 122, 2768–2794, doi:10.1002/2016JA023495.
71	02/2017	Collinson, G., David Mitchell, S. Xu, A. Glocer, J. Grebowsky, T. Hara, R. Lillis, J. Espley, C. Mazelle, J.-A. Sauvaud, A. Fedorov, M. Liemohn, L. Andersson, B. Jakosky (2017), Electric Mars: A large trans-terminator electric potential drop on closed magnetic field lines above Utopia Planitia, *Journal of Geophysical Research-Space Physics*, 122(2), 2260-2271, doi:10.1002/2016ja023589.
70	01/2017	Liu, G. P., S. England, R. J. Lillis, P. R. Mahaffy, M. Elrod, M. Benna, and B. Jakosky (2017), Longitudinal structures in Mars' upper atmosphere as observed by MAVEN/NGIMS, *Journal of Geophysical Research-Space Physics,* 122(1), 1258-1268, doi:10.1002/2016ja023455.
69	01/2017	Cravens, T. E., A. Rahmati, J. L. Fox, R. Lillis, S. Bougher, J. Luhmann, S. Sakai, J. Deighan, Y. Lee, M. Combi, B. Jakosky (2017), Hot oxygen escape from Mars: Simple scaling with solar EUV irradiance, *Journal of Geophysical Research-Space Physics*, *122*(1), 1102-1116, doi:10.1002/2016ja023461.
68	01/2017	Steckiewicz, M., P. Garnier, N. André, D. L. Mitchell, L. Andersson, E. Penou, A. Beth, A. Fedorov, J.-A. Sauvaud, C. Mazelle, D. A. Brain, J. R. Espley, J. McFadden, J. S. Halekas, D. E. Larson, R. J. Lillis, J. G. Luhmann, Y. Soobiah, B. M. Jakosky (2017), Comparative study of the Martian suprathermal electron depletions based on Mars Global Surveyor, Mars Express, and Mars Atmosphere and Volatile EvolutioN mission observations, *Journal of Geophysical Research-Space Physics*, 122(1), 857-873, doi:10.1002/2016ja023205.
67	10/2016	Harada, Y., L. Andersson, C. M. Fowler, D. L. Mitchell, J. S. Halekas, C. Mazelle, J. Espley, G. A. DiBraccio, J. P. McFadden, D. A. Brain, S. Xu, S. Ruhunusiri, D. E. Larson, R. J. Lillis, T. Hara, R. Livi, B. M. Jakosky (2016a), MAVEN observations of electron-induced whistler mode waves in the Martian magnetosphere, *Journal of Geophysical Research-Space Physics*, 121(10), 9717-9731, doi:10.1002/2016ja023194.
66	09/2016	Xu, S., D. Mitchell, M. Liemohn, C. Dong, S. Bougher, M. Fillingim, R Lillis, J McFadden, C. Mazelle, J. Connerney, B. Jakosky (2016), Deep nightside photoelectron observations by MAVEN SWEA: Implications for Martian northern hemispheric magnetic topology and nightside ionosphere source, *Geophys. Res. Lett.,* 43, 8876–8884, doi:10.1002/2016GL070527.
65	04/2016	Lillis, R. J., C. O. Lee, D. E. Larson, J. G. Luhmann, J. S. Halekas, J. E. P. Connerney, B. M. Jakosky (2016), Shadowing and Anisotropy of Solar Energetic Ions at Mars measured by MAVEN during the March 2015 solar storm, *J. Geophys. Res. Space Physics*, 121(4), 2818-2829, doi:10.1002/2015ja022327.
64	02/2016	Harada, Y., D. L. Mitchell , J. S. Halekas , J. P. McFadden , C. Mazelle , J. E. P. Connerney , J. Espley , D. A. Brain , D. E. Larson , R. J. Lillis , T. Hara , R. Livi , G. A. DiBraccio , S. Ruhunusiri , B. M. Jakosky, MAVEN observations of energy-time dispersed electron signatures in Martian crustal magnetic fields, Geophysical Research Letters, 43(3), 939-944, doi:10.1002/2015gl067040.
63	01/2016	Withers, P, M. Matta, M Lester, D Andrews, NJ Edberg, H Nielsen, a job at North, S Curry, R.J. Lillis, E Dubinin and 10 co-authors (2016), The morphology of the topside ionosphere of Mars under different solar wind conditions: results of a multi-instrument observing campaign by Mars Express in 2010, Planet. Spa. Sci., 24-34, doi: 10.1016/j.pss.2015.10.013

62	12/2015	Fang, X., Y. Ma, D. Brain, Y. Dong, and R. Lillis (2015), Control of Mars global atmospheric loss by the continuous rotation of the crustal magnetic field: A time-dependent MHD study, *J. Geophys. Res. Space Physics*, 120, 10,926–10,944, doi:10.1002/2015JA021605.
61	12/2015	Larson, D. E., *R.J. Lillis, CO Lee, PA Dunn, K Hatch, M Robinson, D Glaser and six co-authors (2015), the MAVEN Solar Energetic Particle Investigation, Space Sci. Rev., 195, 1-4, 153-172, doi: 10.1007/s11214-015-0218-z **corresponding author*
60	12/2015	Lillis, R.J., D.A Brain, S. W. Bougher, F. Leblanc, J. G. Luhmann, B. M. Jakosky, R. Modolo, J. L. Fox, J. Deighan, X. Fang, and 17 co-authors (2015), Characterizing atmospheric escape from Mars today and through time, with MAVEN, Space Sci. Rev., 195, 1-4, 357-422, doi: 10.1007/s11214-015-0165-8
59	12/2015	Jakosky, B. M. and 71 co-authors including R.J. Lillis (2015), The Mars Atmosphere and Volatile Evolution (MAVEN) Mission, Space Sci. Rev., 195, 1-4, 3-48, doi: 10.1007/s11214-015-0139-x
58	11/2015	Lee, Y., M. Combi, V. Tenishev, S. W. Bougher, R. J. Lillis (2015), Hot oxygen corona at Mars and the photochemical escape of oxygen: Improved description of the thermosphere, ionosphere, and exosphere, J. Geophys. Res. Planets, 120, 1880–1892, doi:10.1002/2015JE004890.
57	11/2015	Fowler, C. M., L. Andersson, R. E. Ergun, M. Morooka, G. Delory, D. J. Andrews, R. J. Lillis, T. McEnulty, T. D. Weber, T. M. Chamandy, et al. (2015), The first in situ electron temperature and density measurements of the Martian nightside ionosphere, Geophys. Res. Lett., 42, 8854–8861, doi:10.1002/2015GL065267.
56	11/2015	Brain, D. A., J. P. McFadden, J. S. Halekas, J. E. P. Connerney, S. W. Bougher, S. Curry, C. F. Dong, Y. Dong, F. Eparvier, X. Fang, K. Fortier, T. Hara, Y. Harada, B. M. Jakosky, R. J. Lillis, R. Livi, J. G. Luhmann, Y.-J. Ma, R. Modolo , K. Seki (2015), The spatial distribution of planetary ion fluxes near Mars observed by MAVEN, Geophys. Res. Lett., 42, 9142–9148, doi:10.1002/2015GL065293.
55	11/2015	Collinson, G., D. Mitchell, A. Glocer, J. Grebowsky, W. K. Peterson, J. Connerney, L. Andersson, J. Espley, C. Mazelle, J.-A. Sauvaud, A Fedorov, Y.-J. Ma, S. Bougher, R. J. Lillis, R.E. Ergun, B. M. Jakosky (2015), Electric Mars: The first direct measurement of an upper limit for the Martian "polar wind" electric potential, Geophys. Res. Lett., 42, 9128–9134, doi:10.1002/2015GL065084.
54	11/2015	Leblanc, F., R. Modolo, S. Curry, J. Luhmann, R. Lillis, J. Y. Chaufray, T. Hara, J. McFadden, J. Halekas, F. Eparvier, et al. (2015), Mars heavy ion precipitating flux as measured by Mars Atmosphere and Volatile EvolutioN, Geophys. Res. Lett., 42, 9135–9141, doi:10.1002/2015GL066170.
53	11/2015	Steckiewicz, M., C. Mazelle, P. Garnier, N. André, E. Penou , Beth (1,2), J.-A. Sauvaud, D. Toublanc, D. L. Mitchell, J. P. McFadden, J. G. Luhmann, R. J. Lillis, J. E. P. Connerney, J. R. Espley, L. Andersson, J. S. Halekas, D. E. Larson, B. M. Jakosky (2015), Altitude dependence of nightside Martian Suprathermal electron depletions as revealed by MAVEN observations, in press.
52	11/2015	Rahmati, A., D. E. Larson, T. E. Cravens, R. J. Lillis, P. A. Dunn, J. S. Halekas, J. E. Connerney, F. G. Eparvier, E. M. B. Thiemann, and B. M. Jakosky (2015), MAVEN insights into oxygen pickup ions at Mars, Geophys. Res. Lett., 42, doi:10.1002/2015GL065262.
51	11/2015	Halekas, J. S., R. J. Lillis and 13 others (2015), MAVEN observations of solar wind hydrogen deposition in the atmosphere of Mars, Geophys. Res. Lett., 42, doi:10.1002/ 2015GL064693
50	11/2015	Schneider, N. M, J. I. Deighan, S. K. Jain, A. Stiepen, A. I. F. Stewart, D. E. Larson, D. L. Mitchell, C. Mazelle, C. O. Lee, R. J. Lillis and 12 co-authors (2015), Discovery

of diffuse aurora on Mars, *Science*, 49 *350*(6261).

49 11/2015 Jakosky, B. M. and 93 co-authors, including R. J. Lillis (2015), MAVEN observations of the response of Mars to an interplanetary coronal mass ejection, *Science*, *350*(6261).

48 11/2015 Bougher, S. W. and 93 co-authors, including R. J. Lillis (2015), Early MAVEN Deep Dip campaign reveals thermosphere and ionosphere variability, *Science*, *350*(6261).

47 11/2015 Luhmann, J. G., Y.-J. Ma, D. A. Brain, D. Ulusen, R. J. Lillis, J. S. Halekas, J. R. Espley (2015), Solar wind interaction effects on the magnetic field around Mars: consequences for interplanetary and crustal field measurements, Planet. Spa. Sci., 117, 15-23, doi: 10.1016/j.pss.2015.05.004

46 09/2015 Lillis, R. J., J. Dufek, W. S. Kiefer, B. A. Black, M. Manga, J. A. Richardson, and J. E. Bleacher (2015), The Syrtis Major volcano, Mars: A multidisciplinary approach to interpreting its magmatic evolution and structural development, J. Geophys. Res. Planets, 120, 1476–1496, doi:10.1002/2014JE004774.

45 07/2015 Lillis, R.J., X. Fang (2015), Electron impact ionization in the Martian atmosphere: interplay between scattering and crustal magnetic field effects, J. Geophys. Res., 120, 7, 1332-1345 doi:10.1029/2015JE004841.

44 07/2014 Rahmati, A., T. E. Cravens, A. F. Nagy, J. L. Fox, S. W. Bougher, R. J. Lillis, S. A. Ledvina, D. E. Larson, P. A. Dunn, J. A. Croxell, Pick up ion measurements by MAVEN: a diagnostic of photochemical escape from Mars, Geophys. Res. Lett., 41, 14, 4812-4818, doi: 10.1002/2014GL060289

43 11/2014 Soobiah, Y. I., J. J. A. Wild, M. J. Beharrell, S. Barabash, R. J. Lillis, D. L. Mitchell, A. J. Coates, J. D. Winningham, R. A. Frahm (2014), Properties of a large scale flux rope and current sheet region on the dayside of Mars: MGS MAG/ER and MEX ASPERA-3 ELS observations, Icarus, 242, 297-315, doi: 10.1016/j.icarus.2014.08.019.

42 07/2014 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, M. T. Zuber (2014), Mercury's surface magnetic field determined from proton-reflection magnetometry, Geophys. Res. Lett., 41, 13, 4463-4470, doi:10.1002/2014GL060258.

41 02/2014 Riousset, J. A., C. S. Paty, R. J. Lillis, M. O. Fillingim, S. L. England, P.G. Withers, J. P. M. Hale (2014), Electrodynamics of the Martian dynamo region near magnetic cusps and loops, Geophys. Res. Lett., 41, 4, 1119-1125, doi:10.1002/2013GL059130.

40 06/2013 Lillis, R. J. S. J. Robbins, M. Manga, J. S. Halekas, H. V. Frey (2013), Time history of the Martian dynamo from crater magnetic field analysis, *J. Geophys. Res*. Planets, 118, doi:10.1002/jgre.20105.

39 06/2013 Lillis, R. J., and D. A. Brain (2013), Nightside electron precipitation at Mars: Geographic variability and dependence on solar wind conditions, J. Geophys. Res. Space Physics, 118, 3546–3556, doi:10.1002/jgra.50171.

38 06/2013 Riousset, J. A., C. S. Paty, R. J. Lillis, M. O. Fillingim, S. L. England, P. G. Withers, and J. P. M. Hale (2013), Three dimensional multifluid modeling of atmospheric electrodynamics in Mars' dynamo region, J. Geophys. Res. Space Physics, 118, 3647–3659, doi:10.1002/jgra.50328.

37 05/2013 Lillis, R. J., S. T. Stewart, and M. Manga (2013), Demagnetization by basin-forming impacts on early Mars: Contributions from shock, heat, and excavation, J. Geophys. Res. Planets, 118, 1045–1062, doi:10.1002/jgre.20085.

36 04/2013 Robbins, S. J, B. M. Hynek, R. J. Lillis, W. F. Bottke (2013), Large impact crater histories of Mars: the effect of different model crater edge techniques, Icarus,

225, 173-184, doi: 10.1016/j.icarus.2013.03.019

35 12/2012 Withers, P., M. O. Fillingim, R. J. Lillis, B. Häusler, D. P. Hinson, G. L. Tyler, M. Pätzold, K. Peter, S. Tellmann, and O. Witasse (2012), Observations of the nightside ionosphere of Mars by the Mars Express Radio Science Experiment (MaRS), J. Geophys. Res., 117, A12307, doi:10.1029/2012JA018185.

34 06/2012 Delory, G. T., J. G. Luhmann, D. Brain, R. J. Lillis, D. L. Mitchell, R. A. Mewaldt, and T. V. Falkenberg (2012), Energetic particles detected by the Electron Reflectometer instrument on the Mars Global Surveyor, 1999–2006, Space Weather, 10, S06003, doi:10.1029/2012SW000781.

33 05/2012 Gronoff, G., C. Simon Wedlund, C. J. Mertens, M. Barthélemy, R. J. Lillis, and O. Witasse (2012), Computing uncertainties in ionosphere-airglow models: II. The Martian airglow, J. Geophys. Res., 117, A05309, doi:10.1029/2011JA017308.

32 04/2012 Fillingim, M. O., R. J. Lillis, S. L. England, L. M. Peticolas, D. A. Brain, J. S. Halekas, C. Paty, D. Lummerzheim, and S. W. Bougher (2012), On wind-driven electrojets at magnetic cusps in the nightside ionosphere of Mars, Earth Planets Space, 64, 93-103, doi:10.5047/eps.2011.04.010.

31 04/2012 Gronoff, G., C. Simon Wedlund, C. J. Mertens, and R. J. Lillis (2012), Computing uncertainties in ionosphere-airglow models: I. Electron flux and species production uncertainties for Mars, J. Geophys. Res., 117, A04306, doi:10.1029/2011JA016930.

30 03/2012 Lillis, R. J., D. A. Brain, G. T. Delory, D. L. Mitchell, J. G. Luhmann, and R. P. Lin (2012), Evidence for superthermal secondary electrons produced by SEP ionization in the Martian atmosphere, J. Geophys. Res., 117, E03004, doi:10.1029/2011JE003932.

29 02/2012 England, S. L., and R. J. Lillis (2012), On the nature of the variability of the Martian thermospheric mass density: Results from electron reflectometry with Mars Global Surveyor, J. Geophys. Res., 117, E02008, doi:10.1029/2011JE003998.

28 09/2011 Lillis, R. J., M. O. Fillingim, and D. A. Brain (2011), Three-dimensional Structure of the Martian Nightside Ionosphere: Predicted Rates of Impact Ionization from Mars Global Surveyor MAG/ER measurements of precipitating electrons, *J. Geophys. Res*., doi:10.1029/2011JA016982.

27 09/2011 Zou, H., R. J. Lillis, J. S. Wang, and E. Nielsen (2011), Determination of seasonal variations in the Martian neutral atmosphere from observations of ionospheric peak height, J. Geophys. Res., 116, E09004, doi:10.1029/2011JE003833.

26 08/2011 Brain, D.A., G.T. Delory, R. J. Lillis, D. Ulusen, D. Mitchell, J. Luhmann (2010), Mars Global Surveyor measurements of solar storms and their effects. Chapter in IAAA book 'The Energetic Particle Radiation Hazard en route to and at Mars' edited by Susan McKenna-Lawlor

25 05/2011 Sibeck, D.G., V. Angelopoulos, D.A. Brain, G.T. Delory, J.P. Eastwood, W.M. Farrell, R.E. Grimm, J.S. Halekas, H. Hasegawa, P. Hellinger, K.K. Khurana, R. J. Lillis, M. Øieroset, T.-D. Phan, J. Raeder, C.T. Russell ·D. Schriver · J.A. Slavin · P.M. Travnicek · J.M. Weygand, (2011) ARTEMIS Science Objectives. Space Science Reviews 270.

24 05/2011 Louzada, K. L., S. T. Stewart, B. P. Weiss, J. Gattacceca, R. J. Lillis, and J. S. Halekas (2011), Impact Demagnetization of the Martian Crust: Current Knowledge and Future Directions, *Earth and Planetary Science Letters,* 305, 257-269, doi: 10.1016/j.epsl.2011.03.013

23	11/2010	Lillis, R. J., D. A. Brain, S. L. England, P. Withers, M. O. Fillingim, and A. Safaeinili (2010), Total electron content in the Mars ionosphere: Temporal studies and dependence on solar EUV flux*, J. Geophys. Res.,* 115, A11314, doi:10.1029/2010JA015698.
22	07/2010	Lillis, R. J., M. E. Purucker, J. S. Halekas, K. L. Louzada, S. T. Stewart, M. Manga and H. V. Frey (2010), Study of impact demagnetization at Mars using Monte Carlo modeling and multiple altitude data, *J. Geophys. Res.* 115, E07007, doi:10.1029/2009JE003556
21	07/2010	Lillis, R. J., S. W. Bougher, F. Gonzalez-Galindo, F. Forget, M. D. Smith (2010), Four Martian years of night side upper thermospheric mass densities from electron reflectometry: method extension and comparison with GCM simulations, *J. Geophys. Res.* 115, E07014 doi:10.1029/2009JE003529
20	07/2010	Hood, L. L. K. P. Harrison, B. A. Langlais, R. J. Lillis, F. Poulet, and D. A. Williams (2010), Magnetic anomalies near Apollinaris Patera and the Medusae Fossae Formation in Lucus Planum, Mars, *Icarus* 208, 118-131, doi: 10.1016/j.icarus.2010.01.009
19	03/2010	Halekas J.S., R. J. Lillis, R.P. Lin, M. Manga, M.E. Purucker, R.A. Carley (2010) How strong are lunar crustal magnetic fields at the surface? Considerations from a reexamination of the electron reflectometry technique, *J. Geophys. Res.,* 115, E03006, doi:10.1029/2009JE003516.
18	03/2010	Fillingim, M. O., L. M. Peticolas, R. J. Lillis, D. A. Brain, J. S. Halekas, D. Lummerzheim, and S. W. Bougher (2010), Localized ionization patches in the nighttime ionosphere of Mars and their electrodynamic consequences, *Icarus* 206, 112-119. doi:10.1016/j.icarus.2009.03.005
17	11/2009	Lillis, R. J., M. O. Fillingim, L. M. Peticolas, D. A. Brain, R. P. Lin, and S. W. Bougher (2009), The nightside ionosphere of Mars: modeling the effects of crustal magnetic fields and electron pitch angle distributions on electron impact ionization, *J. Geophys. Res., 114,* E11009 doi:10.1029/2009JE003379.
16	08/2009	Lillis, R. J., J. Dufek, J. E. Bleacher, M. Manga (2009), Demagnetization of crust by magmatic intrusion near the Arsia Mons volcano: magnetic and thermal implications for the development of the Tharsis province, Mars, *J. Volcan. Geotherm. Res.*, 185, 123-138, doi:10.1016/j.jvolgeores.2008.12.007
15	04/2009	Roberts, J. H., R. J. Lillis, and M. Manga (2009), Giant impacts on early Mars and the cessation of the Martian dynamo*, J. Geophys. Res*., 114, E04009, doi:10.1029/2008JE003287.
14	03/2009	Kletetschka, G., R. J. Lillis, N. F. Ness, M. H. Acuña, J. E. P. Connerney, and Peter J. Wasilewski (2009), Magnetic zones of Mars: Deformation controlled origin of magnetic anomalies, *Meteoritics and Planetary Science.* 44, 131-140.
13	07/2008	Lillis, R. J., H. V. Frey, M. Manga (2008), Rapid decrease in Martian crustal magnetization in the Noachian era: implications for the dynamo and climate of early Mars, *Geophys. Res. Lett*., 35, L14203, doi: 10.1029/2008GL034338
12	04/2008	Lillis, R. J., D. L. Mitchell, H.V. Frey, R. P. Lin, M. H. Acuña and S. W. Bougher (2008), An improved crustal magnetic field map of Mars from electron reflection magnetometry: highland volcano magmatic history and the end of the Martian dynamo, *Icarus,* 194, 575-596, doi:10.1016/j.icarus.2007.09.031
11	04/2008	Lillis, R. J., D. L. Mitchell, D. A. Brain, R. P. Lin, S. W. Bougher and M. H. Acuña (2008), Continuous monitoring of night side upper thermospheric mass

densities in the Martian southern hemisphere over 4 Martian years using electron reflectometry, *Icarus,* 194, 562-574, doi:10.1016/j.icarus.2007.09.031

10 04/2008 Lillis, R. J., D. L. Mitchell, R. P. Lin, and M. H. Acuña (2008), Electron reflectometry in the Martian atmosphere, *Icarus*, 194, 544–561, doi:10.1016/j.icarus.2007.09.030

9 11/2007 Hood, L. L., N. C. Richmond, K. P. Harrison, R. J. Lillis (2007), East-West trending magnetic anomalies in the southern hemisphere of Mars: modeling analysis and interpretation, *Icarus*, 191, 1, 113-131, doi: 10.1016/j.icarus.2007.04.025

8 09/2007 Brain, D. A., R. J. Lillis, D. L. Mitchell, J. S. Halekas, and R. P. Lin (2007), Electron pitch angle distributions as indicators of magnetic field topology near Mars, *J. Geophys. Res.*, 112, A09201, doi:10.1029/2007JA012435.

7 06/2007 Fillingim, M. O., L. M. Peticolas, R. J. Lillis, D. A. Brain, J. S. Halekas, D. L. Mitchell, R. P. Lin, D. Lummerzheim, S. W. Bougher and D. L. Kirchner (2007), Model calculations of electron precipitation-induced ionization patches on the nightside of Mars, *Geophys. Res. Lett*., 34, 12, L12101, doi: 10.1029/2007GL029986

6 01/2007 Mitchell, D. L. R. J. Lillis, R. P. Lin, J. E. P. Connerney, and M. H. Acuña (2007), A global map of Mars' crustal magnetic field based on electron reflectometry, *J. Geophys*. *Res*., Vol. 112, No. E1, E0100, doi 10.1029/2005JE002564

5 07/2006 Halekas, J. S. Brain, D. A. Lillis, R. J. Fillingim, M. O. Mitchell, D. L. Lin, R. P. (2006), Current sheets at low altitudes in the Martian magnetotail, *Geophys. Res. Lett*., 33, 13, DOI: 10.1029/2006GL026229

4 02/2006 Lillis, R. J., M. Manga, D. L. Mitchell, R. P. Lin and M. H. Acuña (2006), Unusual magnetic signature of the Hadriaca Patera Volcano: Implications for early Mars, *Geophys. Res. Lett*., 33, L03202, doi:10.1029/2005GL024905.

3 12/2005 Lillis, R. J., J. H. Engel, D. L. Mitchell, D. A. Brain, R. P. Lin, S. W. Bougher, and M. H. Acuña (2005), Probing upper thermospheric neutral densities at Mars using electron reflectometry, *Geophys. Res. Lett.*, *32*, L23204, doi: 10.1029/2005GL024337

2 09/2005 Brain, D. A., J. S. Halekas, R. J. Lillis, D. L. Mitchell, R. P. Lin, D. H. Crider (2005), Variability of the altitude of the Martian sheath, *Geophys. Res. Lett*., 32, L18203, doi: 10.1029/2005GL023126

1 08/2004 Lillis, R. J., Mitchell D. L., Lin R. P., this Connerney J. E. P., and Acuña M. H. (2004), Mapping crustal magnetic fields at Mars using electron reflectometry, *Geophys. Res. Lett*., 31, L15702, doi:10.1029/2004GL020189.