Delores J. Knipp

Professional Address:

Smead Aerospace Engineering Sciences Department
429 UCB, University of Colorado Boulder
Boulder, CO 80309

ORCID: 0000-0002-2047-5754
H-Index = 41, i10-Index = 87, Google Scholar

Education:

1986 - 1989 University of California, Los Angeles
Ph.D*. in Atmospheric Science (emphasis, Space and Upper Atmosphere Physics)*
Dissertation Title: Quantifying and reducing uncertainty in the Assimilative Mapping of Ionospheric Electrodynamics Procedure
M.S*. in Atmospheric Science (emphasis, Space and Upper Atmosphere Physics), 1987*

1983 - 1984 University of Missouri
M.S*. in Atmospheric Science (emphasis, Remote Sensing)*

1972 - 1976 University of Missouri
B.S*. in Agriculture (emphasis Atmospheric Science, cum laude)*

Current Positions and Appointments:

Emeritus Research Professor, Smead Aerospace Engineering Sciences Department
2026-Present

Research Professor, Smead Aerospace Engineering Sciences Department
Member Colorado Center for Astrodynamics Research
Member Space Weather Technology Research and Education Center
Graduate Student Advisor, Remote Sensing Earth and Space Science Focus Area
Principle Investigator: Space Environment Data Analysis Group
2013 - 2026 University of Colorado, Boulder, CO

Senior Research Associate, High Altitude Observatory
2008 – 2025 National Center for Atmospheric Research

Previous Positions and Professional Experience:

Visiting Professor, Aerospace Engineering Sciences Department
2009-2013 University of Colorado, Boulder, CO

Senior Research Associate NOAA Space Weather Prediction Center
2009 - 2010 National Research Council, resident at NOAA

Professor of Physics
1996 - 2008 US Air Force Academy (USAFA)
Physics Department Director of Operations and Director of Meteorology
Initiated Space Physics and Atmospheric Research Center at USAFA
Taught: Astronomy, Physics, and Meteorology at all undergrad levels
Member of AF Multi University Research Initiative Team
1977 - 1999 US Air Force Officer, Meteorologist, Physicist

Research Interests:

Prof. Knipp's research focuses on the space environment and the atmospheric and solar events that disturb it. She works with students to investigate methods for: 1) specifying satellite drag; 2) describing how structures on the Sun produce disturbances in near-Earth space; 3) improving scientific use of space environment measurements from DoD, NASA and international space missions; 4) inter-comparing measurements from research and commercial satellites with an eye toward making broader use of commercial satellite 'housekeeping' data to monitor environmental conditions in near-Earth space; 5) investigating new or novel uses of data for their utility in supporting machine learning efforts related to space weather. She also studies historical space weather events to understand the impacts these events have had on society and the US military.

Editorships:

Editor in Chief for the American Geophysical Union's ***Space Weather-the International Journal of Research and Applications*** (2014-2019); Editor (2020)
Guest editor for Journal of Atmospheric and Solar Terrestrial Physics (2000-2001)

Memberships in Professional Societies:

American Geophysical Union (AGU)
American Meteorological Society (AMS)
Japan Geoscience Union (JpGU)
European Geoscience Union (EGU)
European Space Weather and Space Climate Association

Recent Professional Service Activities:

2026 Invited Lecturer ISWI-SCOSTEP Space Weather School, Mumbai, India
2020 -2024 Member European Space Weather Symposium Medal Committee
2021 -2025 Member National Academy SciEngr&Med (NASEM) Space Weather Round Table
2022 -2024 Member Space Weather Advisory Group (FACA)
2021- 2022 Member/Organizer Phase II Workshop, Space Weather Operations and Research Infrastructure for National Academy of Science and Engineering
2020-2021 Smead Aerospace Engineering Department Inclusive Culture Committee
2020 Search Committee Member for NCAR High Altitude Observatory Director
2019-2021 Chair, Coupling Energetic & Dynamics of Atmospheric Regions (CEDAR) Science Steering Committee
2019 Member Next Step Space Weather Benchmarks Working Group (Ionizing Radiation)
2019 Convener AGU Chapman Conference on Forecasting Space Weather Including Extremes
2017-2021 AMS Ad Hoc Committee on Space Weather Certification
2017 Invited Plenary Speaker on Space Weather at 230th AAS Meeting
2015-2016 Portfolio Review Committee, National Science Foundation (NSF) Geospace Section, Division of Atmospheric and Geospace Sciences
2012-2013: Convener and Instructor for 1st AMS Space Weather Short Course
2005 –2006: Member of the National Space Weather Program Assessment Committee

Recent Refereeing and Reviewing:

Journals: *Advances in Space Research; Journal of Atmospheric and Solar Terrestrial Physics Acta Geophysica; Geophysical Research Letters* (AGU), *Space Science Reviews International Astronomical Union; Journal Geophysical Research-Space Physics (AGU) Journal of Space Weather and Space Climate; Space Weather Journal (AGU)*

Agencies: NASA, NSF and AFOSR proposals, Canada Foundation for Innovation (2017)
Science Foundation of Ireland (2019, 2023), UK Natural Environment Research Council (2020)

Awards and Honors:

2021 University of Missouri, College of Agriculture Food and Natural Resources Columns Award (Outstanding Alumni)
2019 International Marcel Nicolet Medal for Space Weather and Space Climate
2019 Michael J. Buonsanto 20th Annual Memorial Lecture, MIT Haystack
2019 Fellow of the American Meteorological Society
2017 NSF Coupling Energetic and Dynamics of Atmospheric Regions (CEDAR) Prize Lecture
2013 American Geophysical Union Citation for Excellence in Refereeing
2008 USAF Academy Professor of the Year 2008

Supervision:

Supervisor of numerous junior and mid-level Air Force officers and civilians 1984-2008
Post-Doctoral Supervisee: Dr. Kelly Ann Drake, 2008-2009
Doctoral Students: Dr. Ryan McGranaghan, PhD (2016), Dr. Yining Shi, PhD (2019), Dr.
Dr. Valerie Bernstein (PhD, 2022), Dr Bhagyashree Waghule (PhD, 2026), Ms Tania Varesano (2026), Dr Brenna Royersmith (PhD-co-advisee, 2026)
MS Students: Ms Sierra Flynn (2017); Mr Alberto Cruz (2018); Ms. Bhagyashree Waghule (2021)
Undergraduate: Ms Kaiya Wahl, Discovery Learning Apprentice (REU) (2021)
Early Career Visiting Scientist: Dr. Zheng Li, Nanjing University/NCAR 2017-2018
Project supervision for numerous graduate students at CU (2013-2023)
More than a dozen Research Experience for Undergraduate students at USAFA and CU

Publications and Presentations:

Textbooks

Knipp D. J. Understanding Space Weather and the Physics Behind It, McGraw Hill, 2011, now in 2nd Edition as e-book by Space Technology Series: https://shop.spacetechnologyseries.com/ebooks/understanding-space-weather-and-the-physics-behind-it.html

Teaching Materials

Simulating Satellite Orbits and Atmospheric Drag - Teaching Materials Collection (https://nagt.org/nagt/teaching_resources/teachingmaterials/11311.html
This activity was selected for the On the Cutting-Edge Exemplary Teaching Collection.

Peer-reviewed

PEER-REVIEWED JOURNAL ARTICLES & BOOK CHAPTERS

1. Mutschler, Shaylah, Pilinski, Marcin, Bruinsma, Sean, Sutton, Eric, Tobiska, W. Kent, Knipp, Delores, Fang, Tzu-Wei, Casali, Steve, Mallik, Vishnuu, DiLorenzo, Brandon and Siemes, Christian, (2026) A Survey of Current Operations-Ready Thermospheric Density Models for Drag Modeling in LEO Operations, The Journal of the Astronautical Sciences, Vol 73, # 32, https://doi.org/10.1007/s40295-025-00558-8
2. Varesano, T., Hassler, D. M., Zambrana Prado, N., Laming, J. M., Plowman, Knipp, D. J., Molnar, M., Barczynski, K., and The SPICE consortium, (2026) FIP Bias Evolution in an Emerging Active Region as observed in SPICE Synoptic Observations Astronomy & Astrophysics, **706,** A155, https://doi.org/10.1051/0004-6361/202554166

3. Kozyra, J. U., Liemohn, M. W., Cattell, C. A., Dombeck, J., Escoubet, C. P., Thomsen, M., Lu, G, Knipp, D. J., Paxton, L. J., Skoug, R. M. Elliott, H. A., Davis, A. J., Rastaetter, L., DeZeeuw, D., Colpitts, C., (2026). Multi-species energy-banded ions in the ionosphere during the 21 January 2005 magnetic storm: Low-altitude edge of the warm plasma cloak. *Journal of Geophysical Research: Space Physics*, 131, e2024JA033556. https://doi.org/10.1029/2024JA033556
4. Waghule, B., Knipp, D. J., Stephens, G. K., & Malaspina, D. M. (2025). Linking very near-Earth reconnection (VNERX) to mid-latitude GICs: Evidence from the 7 September 2017 storm. *Geophysical Research Letters*, 52, e2025GL117714. https://doi.org/10.1029/2025GL117714
5. Royersmith, B., Knipp, D., Starr, G., Morton, Y. J., Mrak, S., & Wu, Q. (2025). Robust global analysis of mid-latitude ionospheric trough morphology. *Journal of Geophysical Research: Space Physics*, 130, e2024JA033605. https://doi.org/10.1029/2024JA033605
6. Waghule, B., Knipp, D. J., Gannon, J. L., Billet, D., Vines, S. K., & Goldstein, J. (2024). What drove the GICs >10 A during the 17 March 2013 event at Mäntsälä? A novel framework for distinguishing the magnetospheric sources. *Space Weather*, 22, e2024SW003980. https://doi.org/10.1029/2024SW003980
7. Lugaz, N., Knipp, D., Morley, S. K., Liu, H., Hapgood, M., Carter, B., et al. (2024). *In Memoriam* of editor Jennifer L. Gannon. *Space Weather*, 22, e2024SW004016. https://doi.org/10.1029/2024SW004016
8. Pulkkinen, A. A., Morley, S. K., Robinson, R. M., Knipp, D. J., & Olson, M. (2024). Memorial for Jennifer L. Gannon. *Perspectives of Earth and Space Scientists*, 5, e2024CN000249. https://doi.org/10.1029/2024CN000249
9. Liu, J., Lyons, L. R., Knipp, D., Zhang, Q., Wang, C.-P., Shen, Y., et al. (2024). Poynting flux input to the auroral ionosphere: The impact of subauroral polarization streams and dawnside auroral polarization streams. *Journal of Geophysical Research: Space Physics*, 129, e2024JA032605. https://doi.org/10.1029/2024JA032605
10. Hayakawa, H., Cliver, Edward W., Clette, Frédérigc, Ebihara, Yusuke, Toriumi, Shin, Ermolli, Ilaria, Chatzistergos, Theodosios, Hattori, Kentaro, Knipp, Delores J., Blake, Sean, Cauzzi, Gianna, Reardon, Kevin, Bourdin, Philippe-A., Just, Dorothea, Vokhmyanin, Mikhail, Matsumoto, Keitaro, Miyoshi, Yoshizumi, Ribeiro, José R., Correia, Ana P., Willis, David M., Wild, Matthew N. and Silverman, Sam M. (2023), The Extreme Space Weather Event of February 1872: Sunspots, Magnetic Disturbance and Auroral Displays, APJ **959** 1; https://iopscience.iop.org/article/10.3847/1538-4357/acc6cc
11. Cid, Consuelo, Saiz, Elena, Flores-Soriano, Manuel and Knipp, Delores, (2023) Interplanetary signatures during the early August 1972 solar storms, APJ 958 159, https://iopscience.iop.org/article/10.3847/1538-4357/acf9fd
12. Usoskin, Ilya Fusa Miyake, Melanie Baroni, Silvia Dalla, Hisashi Hayakawa, Hugh Hudson, Delores Knipp, Sergey Koldobskiy, Hiroyuki Maehara, Florian Mekhaldi, Yuta Notsu, Stepan Poluianov, Eugene Rozanov, Tobias Spiegl, and Timofei Sukhodolov, (2023) Extreme Solar Events: Setting up a paradigm**,** *Space Sci Rev,* **219**, 73 (2023). https://doi.org/10.1007/s11214-023-01018-1
13. Zhang, S.-R., Nishimura, Y., Vierinen, J., Lyons, L. R., Knipp, D. J., Gustavsson, B. J., et al. (2023). Simultaneous global ionospheric disturbances associated with penetration electric fields during intense and minor solar and geomagnetic disturbances. *Geophysical Research Letters*, 50, e2023GL104250. https://doi.org/10.1029/2023GL104250
14. Le G, Knipp D. J., Rastätter L., Lu., Ozturk D. S., Slavin J A., Maute A., Klenzing J., Zou S. Espley J. R., Purucker M., Akhavan-Tafti M., Poh G. K., Wang Z. (2022), Next generation magnetic field measurements from low-earth orbit satellites enable enhanced space weather operations, *Front. Astron. Space Sci.*, 9, 2022 https://www.frontiersin.org/articles/10.3389/fspas.2022.1076892, DOI=10.3389/fspas.2022.1076892
15. Maute, Astrid, Lu, Gang, Knipp, Delores J., Anderson, Brian J. and Vines, Sarah K., (2022) Importance of lower atmospheric forcing and magnetosphere-ionosphere coupling in simulating neutral density during the February 2016 geomagnetic storm, *Front. Astron. Space Sci.,* 30 August 2022, https://doi.org/10.3389/fspas.2022.932748

16. Kilcommons, L. M., Knipp, D. J., Hairston, M., & Coley, W. R. (2022). DMSP Poynting flux: Data processing and inter-spacecraft comparisons. *Journal of Geophysical Research: Space Physics*, 127, e2022JA030299, https://doi.org/10.1029/2022JA030299
17. Cosgrove, R. B., Bahcivan, H., Chen, S., Sanchez, E., & Knipp, D. (2022). Violation of Hemispheric Symmetry in Integrated Poynting Flux via an Empirical Model. *Geophysical Research Letters*, 49, e2021GL097329. https://doi.org/10.1029/2021GL097329
18. Kaeppler, S. R., D. J. Knipp, L. M. Kilcommons, O. Verkhoglyadova, W. Zhan, (2022) Electromagnetic energy input and dissipation, Chapter 5, in Cross-Scale Coupling and Energy Transfer in the Magnetosphere–Ionosphere–Thermosphere System, Editors: Y. Nishimura, O. Verkhoglyadova, Y. Deng, S.-R. Zhang, Elsevier, https://doi.org/10.1016/B978-0-12-821366-7.00006-8 in ISBN: 9780128213735, https://doi.org/10.1016/C2019-0-00526-2
19. Knipp, D., Kilcommons, L., Hairston, M., & Coley, W. R. (2021). Hemispheric Asymmetries in Poynting Flux Derived from DMSP Spacecraft. *Geophysical Research Letters*, 48, e2021GL094781. https://doi.org/10.1029/2021GL094781
20. Knipp DJ, Bernstein V, Wahl K & Hayakawa H (2021). Timelines as a tool for learning about space weather storms. *J. Space Weather Space Clim*., 2021, 11, 29. https://doi.org/10.1051/swsc/2021011.
21. Zhu, Q., Deng, Y., Maute, A., Kilcommons, L., Knipp, D., & Hairston, M. (2021). ASHLEY: A new empirical model for the high-latitude electron precipitation and electric field. *Space Weather*, 19, e2020SW002671. https://doi.org/10.1029/2020SW002671
22. Cliver, Edward W. & Delores J Knipp, (2021) Avril Hart and the discovery of solar supergranulation, (2021) ASTRONOMY & GEOPHYSICS, Volume 62, Issue 6, Pages 6.38–6.40, https://doi.org/10.1093/astrogeo/atab106
23. Hayakawa H, Hattori K, Pevtsov AA, Ebihara Y, Shea MA, McCracken KG, Daglis IA, Bhaskar A, Ribeiro P, Knipp DJ (2021). The intensity and evolution of the extreme solar and geomagnetic storms in 1938 January. Astrophys J 909: 197.https://doi.org/10.3847/1538-4357/abc427.
24. Maute, A., Richmond, A. D., Lu, G., Knipp, D. J., Shi, Y., & Anderson, B. (2021). Magnetosphere-ionosphere coupling via prescribed field-aligned current simulated by the TIEGCM. *Journal of Geophysical Research: Space Physics*, 126, e2020JA028665. https://doi.org/10.1029/2020JA028665
25. Bernstein Valerie, Marcin Pilinksi and Delores Knipp, (2020) Evidence for Drag Coefficient Modeling Errors near and Above the Oxygen-to-Helium Transition, Journal of Spacecraft and Rockets 0:0, pp. 1–18, https://doi.org/10.2514/1.A34740
26. Wu Haonan, Xian Lu, Gang Lu, Xinzhao Chu, Wenbin Wang, Zhibin Yu, Liam M. Kilcommons, Delores J. Knipp, Boyi Wang, Yukitoshi Nishimura, Importance of regional-scale auroral precipitation and electrical field variability to the storm-time thermospheric temperature enhancement and inversion layer (TTEIL) in the Antarctic E region, *Journal of Geophysical Research: Space Physics*, 125, e2020JA028224. https://doi.org/10.1029/2020JA02822
27. Hayakawa, Hisashi, Frédéric Clette, Toshihiro Horaguchi, Tomoya Iju, Delores J. Knipp, Huixin Liu and Takashi Nakajima, Sunspot Observations by Hisako Koyama: 1945 – 1996, (2020), Monthly Notices Of The Royal Astronomical Society, 492, (3), Pages 4513 4527 , https://doi.org/10.1093/mnras/stz3345
28. Hayakawa, Hisashi, Paulo Ribeiro, José M. Vaquero, María Cruz Gallego, Delores J. Knipp, Florian Mekhaldi, Ankush Bhaskar, Denny M. Oliveira, Yuta Notsu, Víctor M. S. Carrasco, Ana Caccavari, Bhaskara Veenadhari, Shyamoli Mukherjee, and Yusuke Ebihara (2020), The Extreme Space Weather Event in 1903 October/November: An Outburst from the Quiet Sun, *The Astrophysical Journal Letters*, 888(2), https://doi.org/10.3847/2041-8213/ab6a18
29. Shi, Y., Knipp, D. J., Matsuo, T., Kilcommons, L., & Anderson, B. (2020). Modes of (FACs) variability and their hemispheric asymmetry revealed by inverse and assimilative analysis of iridium magnetometer data. *Journal of Geophysical Research: Space Physics*, 125, e2019JA027265. https://doi.org/10.1029/2019JA027265

30. Shi, Y., Knipp, D. J., Matsuo, T., Kilcommons, L., & Anderson, B. (2020). Event studies of high-latitude FACs with inverse and assimilative analysis of AMPERE magnetometer data. *Journal of Geophysical Research: Space Physics*, 125, e2019JA027266. https://doi.org/10.1029/2019JA027266
31. Zhu, Q., Deng, Y., Richmond, A., Maute, A., Chen, Y.-J., Hairston, M., et al. (2020). Impacts of binning methods on high-latitude electrodynamic forcing: Static versus boundary-oriented binning methods. *Journal of Geophysical Research: Space Physics*, 125, e2019JA027270. https://doi.org/10.1029/2019JA027270
32. Shi, Y., Oliveira, D. M., Knipp, D. J., Zesta, E., Matsuo, T., & Anderson, B. (2019). Effects of Nearly Frontal and Highly Inclined Interplanetary Shocks on High-latitude Field-aligned Currents (FACs). *Space Weather*, 17, 1659– 1673. https://doi.org/10.1029/2019SW002367
33. Wu, Q., Knipp, D., Liu, J., Wang, W., Varney, R., Gillies, R., et al (2019). HIWIND observation of summer season polar cap thermospheric winds. *Journal of Geophysical Research: Space Physics*, 124, 9270– 9277. https://doi.org/10.1029/2019JA027258
34. Li, Z., Knipp, D., Wang, W., Shi, Y., Wang, M., Su, Y., & Li, J. (2019). An EOFs Study of Thermospheric Nitric Oxide Flux Based on TIEGCM simulations. *Journal of Geophysical Research: Space Physics*, 124, 9695– 9708. https://doi.org/10.1029/2019JA027004
35. Lin, C. Y., Deng, Y., Knipp, D. J., Kilcommons, L. M., & Fang, X. (2019). Effects of Energetic Electron and Proton Precipitations on Thermospheric Nitric Oxide Cooling during shock-led Interplanetary Coronal Mass Ejections. *Journal of Geophysical Research: Space Physics*, 124, 8125-8137. https://doi.org/10.1029/2019JA027089
36. Hayakawa, H., Ebihara, Y., Willis, D. M., Toriumi, S., Iju, T., Hattori, K., Wild M. N., Oliveira D. M., Ermolli, I., Robeiro J.R. Correia A. P. Ribeiro A. I. Knipp D. J., (2019). Temporal and spatial evolutions of a large sunspot group and great auroral storms around the Carrington event in 1859. *Space Weather, 17, 1553-1569.* https://doi.org/10.1029/2019SW002269
37. Wu, Q., Knipp, D., Liu, J., Wang, W., Häggström, I., Jee, G., et al. (2019). What do the new 2018 HIWIND thermospheric wind observations tell us about high-latitude ion-neutral coupling during daytime? *Journal of Geophysical Research: Space Physics*, 124, 6173– 6181. https://doi.org/10.1029/2019JA026776
38. Li, Z., Knipp, D., & Wang, W. (2019). Understanding the behaviors of thermospheric Nitric Oxide cooling during the 15 May 2005 geomagnetic storm. *Journal of Geophysical Research: Space Physics*, 124. https://doi.org/10.1029/2018JA026247
39. Knipp, D. J., Fraser, B. J., Shea, M. A., & Smart, D. F. (2018). On the little-known consequences of the 4 August 1972 ultra-fast coronal mass ejecta: Facts, commentary, and call to action. *Space Weather*, 16, 1635–1643. https://doi.org/10.1029/2018SW002024
40. Li, Z., Knipp, D., Wang, W., Sheng, C., Qian, L., & Flynn, S. (2018). A comparison study of NO cooling between TIMED/SABER measurements and TIEGCM simulations. *Journal of Geophysical Research: Space Physics*, 123. https://doi.org/10.1029/2018JA025831
41. Lu, Y., Deng, Y., Sheng, C., Kilcommons, L., & Knipp, D. J. (2018). Poynting flux in the dayside polar cap boundary regions from DMSP F15 satellite measurements. *Journal of Geophysical Research: Space Physics*, 123. https://doi.org/10.1029/2018JA025309
42. Flynn, S., Knipp, D. J., Matsuo, T., Mlynczak, M. & Hunt, L. (2018). Understanding the Global Variability in Thermospheric Nitric Oxide Flux Using Empirical Orthogonal Functions (EOFs). *Journal of Geophysical Research: Space Physics*, 123. https://doi.org/10.1029/2018JA025353
43. Knipp, D. J. (2018). The Reprise Special Collection for the 2001 Space Weather Monograph. *Space Weather*, 16. https://doi.org/10.1002/2018SW001807
44. Mlynczak, M. G., Knipp, D. J., Hunt, L. A., Gaebler, J., Matsuo, T., Kilcommons, L. M. & Young, C. L. (2018). Space-Based Sentinels for Measurement of Infrared Cooling in the Thermosphere for Space Weather Nowcasting and Forecasting. *Space Weather*, 16. https://doi.org/10.1002/2017SW001757

45. Hayakawa, Hishasi, Kiyomi Iwahashi, Yusuke Ebihara, Harufami Tamazawa, Kazunari Shibata, Delores J. Knipp, Akito Davis Kawamura, Kentaro Hattori, Kumiko Mase, Ichiro Nakanishi, Hiroaki Isobe (2017), Long-Lasting Extreme Magnetic Storm Activities in 1770 Found in Historical Documents, *Astrophys. J. Lett., 850,* https://doi.org/10.3847/2041-8213/aa9661
46. Knipp, D., Liu, H., & Hayakawa, H. (2017). Ms. Hisako Koyama: From amateur astronomer to long-term solar observer. Space Weather, *15, 1215–1221 https://doi.org/10.1002/2017SW001704*
47. Eriksson, S., M. Maimaiti, J. B. H. Baker, K. J. Trattner, D. J. Knipp, *and* F. D. Wilder (2017), Dual **E** × **B** flow responses in the dayside ionosphere to a sudden IMF By rotation, *Geophys. Res. Lett., 44, 6525–6533, doi:10.1002/2017GL073374.*
48. Kilcommons, L., Redmon, R. J., Knipp, and D. J. (2017). A New DMSP Magnetometer Dataset and Estimates of Field Aligned Currents in Dynamic Auroral Boundary Coordinates, *J. Geophys. Res. Space Physics, 122, 9068–9079, doi:10.1002/2016JA023342.*
49. Redmon, Robert, Liam Kilcommons, William Denig, and Delores Knipp, New DMSP Database of Precipitating Auroral Electrons and Ions, (2017), *J. Geophys. Res. Space Physics, 122, 9056–9067, doi:10.1002/2016JA023339.*
50. Knipp, D. J. (2017), Essential science for understanding risks from radiation for airline passengers and crews, *Space Weather, 15, 549–552, doi:10.1002/2017SW001639.*
51. Knipp, D. J., D. V. Pette, L. M. Kilcommons, T. L. Isaacs, A. A. Cruz, M. G. Mlynczak, L. A. Hunt and C. Y. Lin (2017), Thermospheric Nitric Oxide Response to Shock-led Storms, *Space Weather, 15, 325–342, doi:10.1002/2016SW001567.*
52. Knipp, D. J., et al. (2016), The May 1967 great storm and radio disruption event: Extreme space weather and extraordinary responses, *Space Weather*, 14, 614–633, doi:10.1002/2016SW001423.
53. Zhang, B., W. Wang, Q. Wu, D. Knipp, L. Kilcommons, O. J. Brambles, J. Liu, M. Wiltberger, J. G. Lyon, and I. Häggström (2016), Effects of magnetospheric lobe cell convection on dayside upper thermospheric winds at high latitudes, *Geophys. Res. Lett*., 43, 8348–8355, doi:10.1002/2016GL069834.
54. McGranaghan, R., D. J. Knipp, and T. Matsuo (2016), High-latitude ionospheric conductivity variability in three dimensions, *Geophys. Res. Lett.,* 43, 7867–7877, doi:10.1002/2016GL070253.
55. McGranaghan, R. M., D. J. Knipp, T. Matsuo, and E. Cousins (2016) Optimal interpolation analysis of high-latitude ionospheric Hall and Pedersen conductivities: Application to assimilative ionospheric electrodynamics reconstruction, *J. Geophys. Res. Space Physics*, 121, 4898–4923, doi:10.1002/2016JA022486.
56. Rastätter Lutz, Ja Soon Shim, Maria M. Kuznetsova, Liam M. Kilcommons, Delores J. Knipp, Mihail Codrescu, Tim Fuller-Rowell, Barbara Emery, Daniel R. Weimer, Russell Cosgrove, Michael Wiltberger, Joachim Raeder, Wenhui Li, Gábor Tóth, and Daniel Welling (2016), GEM-CEDAR challenge: Poynting flux at DMSP and modeled Joule heat, *Space Weather*, 14, doi:10.1002/2015SW001238.
57. McGranaghan, R., D. J. Knipp, T. Matsuo, H. Godinez, R. J. Redmon, S. C. Solomon, and S. K. Morley (2015), Modes of high-latitude auroral conductance variability derived from DMSP energetic electron precipitation observations: Empirical orthogonal function analysis, *J. Geophys. Res. Space Physics*, 120, 11,013–11,031, doi:10.1002/2015JA021828.
58. Knipp, D. J. (2015), Synthesis of Geomagnetically Induced Currents: Commentary and Research, *Space Weather*, 13, 727–729, doi:10.1002/2015SW001317.
59. Knipp, D. J. (2015), Forward to space weather collection on geomagnetically induced currents: Commentary and research, *Space Weather*, 13, 742–746, doi:10.1002/2015SW001318.
60. Knipp, D. J., and D. A. Biesecker (2015), Changing of the guard: Satellite will warn Earth of solar storms, *Eos*, 96, doi:2015EO026579.
61. Redmon, R. J., J. V. Rodriguez, J. C. Green, D. Ober, G. Wilson, D. Knipp, L. Kilcommons, and R. McGuire (2015), Improved Polar and Geosynchronous Satellite Data Sets Available in Common Data

Format at the Coordinated Data Analysis Web, *Space Weather*, 13, 254–256. doi:10.1002/2015SW001176.
62. Deng, Y., C. Sheng, Y.-J. Su, M. R. Hairston, D. Knipp, C. Y. Huang, D. Ober, R. J. Redmon, and R. Coley (2015), Correlation between Poynting flux and soft electron precipitation in the dayside polar cap boundary regions, *J. Geophys. Res. Space Physics*, 120, 9102–9109, doi:10.1002/2015JA021075.
63. Matsuo, T., D. J. Knipp, A. D. Richmond, L. Kilcommons, and B. J. Anderson (2015), Inverse procedure for high-latitude ionospheric electrodynamics: Analysis of satellite-borne magnetometer data, *J. Geophys. Res. Space Physics*, 120, 5241–5251, doi:10.1002/2014JA020565.2.
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PAPERS IN PRESS, REVISION, REVIEW AND PREPARATION

110. Knipp, D. J., V. Ray, E. Sutton, L. Kilcommons et al. Retrospective: Attitude Control Anomaly on the International Space Station During the December 2006 Intense Geomagnetic Storm
111. Mishra, Shreya, Bulusu, Jayashree, Chakraborty Sumanjit, Knipp, Delores. J. Ebihara, Yusuke, Ram, S.Tulasi, Seemala, Gopi K., Dimri, A. P., Role of Pi3/Pc5 geomagnetic pulsations in driving GIC-level dB/dt signatures over the Antarctic region during 10-12 May 2024 storm, Submitted to Polar Science
112. Janet U. Kozyra, Hannah Marlowe Delores J. Knipp, Liam Kilcommons, Michael W. Liemohn, Aaron Ridley, Marc Hairston, Robin W. Coley, Ruth Skoug, Heather A. Elliott Yigit Aytac, Ekaterina M.Verner, Jeffrey Hayes, Into the Storm: Anomaly Detection Approaches for Geospace Superstorm Investigation Using Machine Learning, Manuscript in Preparation

INVITED PRESENTATIONS SINCE 2020

113. Solar Energetic Particle Effects During a 21st Century "Moderate" Event, Delores J. Knipp, Invited Presentation to the Royal Society of London, Hooke-Theo Murphy Meeting on Radiocarbon and Cosmic Radiation Events, Edinburgh Scotland, May 2025
114. Low Earth Orbit Challenges During the 10-14 May 2024 'Gannon' Storm, Delores Knipp, Eric Sutton, Invited presentation to the Space Weather Week Workshop, Boulder, CO March 2025
115. How Should We Categorize and Compare Unusually Intense Geomagnetic Storms? Delores. J. Knipp, Bhagyashree Waghule, and Janet Kozyra; Invited presentation to the May 2024 Solar and Geospace Superstorm Workshop, Johns Hopkins University Applied Physics Laboratory, Laurel MD Oct 28 – Nov 1, 2024.
116. GIC response to solar wind pressure pulses embedded in strong interplanetary magnetic field," Delores. J. Knipp and Bhagyashree Waghule; Invited presentation to the NSF-Sponsored Workshop on Geomagnetically Induced Currents, University of Maryland, College Park MD, October 2024
117. Operations to Research: The Power Grid Comes Online in Support of GIC Monitoring, Delores. J. Knipp, Jennifer Gannon and Bhagyashree Waghule, Invited Presentation at the American Meteorological Society Meeting Baltimore Maryland, January 2024
118. The Sun: Jammer, Spoofer, Data Denier, Delores. J. Knipp, Invited Panelist, Value of Space Summit, Space Information and Analysis Data Center, Colorado Springs, October 2023
119. When the Sun Goes Rogue, Delores. J. Knipp, Invited Presentation to the Boulder Solar Alliance Community, Boulder Solar Day, National Center for Atmospheric Research, September 2023
120. Space Weather: Balancing an Unbalanced Threat, Delores. J. Knipp, Chief Scientist Distinguished Lecture Series Invited (Online) to the AF Research Laboratory and AF Office of Scientific Research Community, September 2023. Also invited and presented to the Correspondence of Operations, Space weather, and Magnetosphere-Ionosphere Coupling (COSMIC) Research Group at the US Military Academy, West Point NY, May 2024
121. Solar Wind and Magnetospheric Drivers of the 12 May 2021 Geomagnetically Induced Current Event, Delores. J. Knipp, Jennifer Gannon and Bhagyashree Waghule, Invited presentation to the North American Electric Reliability Corporation, St Paul MN, August 2023
122. Inter-Hemispheric Asymmetry from Satellite View(s), Delores Knipp, Coupling Energetics and Dynamics of Atmospheric Regions (CEDAR) Workshop, San Diego, CA June 2023,
123. The Great Farewell to Solar Cycle 23: A Review of Effects and Impacts of Active Region 10930, May 2023, Delores Knipp, Belgian Institute for Research in Aeronomy, Brussels Belgium
124. Characteristics of Geospace Super Storms: Applying Machine Learning to Defense Meteorological Satellite Program (DMSP) Particle Data, Delores Knipp, SNOWLITE DoD Machine Learning Meeting, May 2023, Virtual

125. The “Last Hurrah” of Solar Cycle 23 with Lessons for Solar Cycle 25, Delores Knipp, Triennial Earth Sun Summit, August 2022, Bellevue WA
126. Space Weather Impact on Starlink Satellite Launches (and Implications) Delores Knipp, Space based Precision, Navigation and Timing Advisory Board, Baltimore Maryland, May 2022
127. Future of Ground-Based Magnetosphere, Thermosphere, Ionosphere, Mesosphere Research Panel, Heliophysics Decadal Survey Input Meeting March 2022, Virtual
128. Weather in Space: What happens when our well-behaved Sun behaves badly?, American Association for the Advancement of Science, Annual Meeting, February 2022, (virtual), Subsequent PodCast and Science Articles
129. Severe Space Weather as a Source of Rare Events of Major Significance, Delores Knipp, December 2006, Anticipating Rare Events of Major Significance: An Unclassified Workshop, December 2021, National Academy of Science Engineering and Medicine (virtual)
130. Hemispheric Asymmetries in Poynting Flux and Related Quantities Derived from Defense Meteorological Satellite Program Spacecraft, Delores Knipp, Liam Kilcommons, Marc Hairston, W. Robin Coley, Russell Cosgrove, American Geophysical Union Meeting, (virtual) December 2021
131. Understanding and Modelling Solar Energetic Particle Events, Delores Knipp, International Space Science Institute, Bern, Switzerland (virtual) September 2021
132. Into the Storm: Machine Learning Approaches for Solar Superstorm Investigation, Kozyra, J. Knipp D. J, Kilcommons, L. M. and Marlowe H. Invited Team Conference Keynote Presentation to NASA Langley Research Center Data Science Expo, Virtual Meeting, July 2021
133. Heliophysics 2050 Scene-Setting Presentation: Space Weather**,** Heliophysics 2050 Workshop, Delores Knipp, Virtual NASA-Sponsored National Meeting May 2021
134. A Historical Perspective on Space Weather Effects on Communication & Navigation Signals, NSF Sponsored Workshop: Predicting Extremes by Data-driven Analytics (PrExDA September, 2020, Virtual
135. From Data Sparse to Data Rich: How Can we Make the Best Use of Space Weather Data?, Delores Knipp and Yining Shi, Project for Solar-Terrestrial Environment Prediction (PSTEP) International Symposium, Nagoya, Japan January 27-30 2020,
136. Extreme Space Weather: How Often Does It Occur?, Delores Knipp, Hisashi, Hayakawa and Mike Hapgood, American Meteorological Society Winter 2020 Meeting, January 2020; Boston MA
137. Low altitude measurements gaps--Particles (POES/DMSP*),* Solar/Helio Science Gap Session, Delores Knipp National Academy of Science, Virtual Space Weather Workshop, Virtual NAS meeting 16-17 June 2020

POPULAR PRESS, REVIEWED EDITORIALS, EDITOR’S VOX AND BOOK REVIEWS

138. Knipp, D. J and Lanzerotti, L (2006). The important role of data centers in space climate and weather, Space Weather, 4: DOI: 10/1029/2006SW000233
139. Tretkoff, E. (2010), Teaching Space Weather to Undergraduates: An Interview with Delores Knipp. Space Weather, 8: n/a. doi: 10.1029/2010SW000610
140. Knipp, D. J. (2012), Review of “Future Global Shocks: Geomagnetic Storms”. Space Weather, 10: n/a. doi: 10.1029/2011SW000747
141. Knipp, D. J. (2014), Space Weather Journal: Retrospective and Prospective, Space Weather, 12, 567–567, doi:10.1002/2014SW001128
142. Knipp, D. J. (2015), Space Weather and Citizen Science, Space Weather, 13, 97–98, doi: 10.1002/2015SW001167.
143. Knipp, D., and W. Lotko (2015), Now Is the Time to be Heard!, Space Weather, 13, 251–252. doi:10.1002/2015SW001207.
144. Knipp D. J. (2015), Celebrating Accomplishments and Anniversaries of Space Weather Observations and Forecasting. Space Weather 13(6):357-358
145. Knipp, D. J., and L. J. Lanzerotti (2015), Appreciation of *Space Weather* Peer Reviewers for 2014, Space Weather, 13, 395–395, doi:10.1002/2015SW001253.

146. Knipp, D. J. (2015), GICs: The bane of technology-dependent societies, EOS, 96, https://doi.org/10.1029/2018EO039635.
147. Knipp, D. J. (2016), Advances in Space Weather Ensemble Forecasting, Space Weather, 14, 52–53, doi:10.1002/2016SW001366.
148. Knipp, D. J. (2016) Space Weather Research and Forecasting Act Introduced to Senate, *Eos, 97,* https://doi.org/10.1029/2018EO053437. Published on 10 June 2016.
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150. Carter, B and D. J. Knipp (2016), It's never been more important to keep an eye on space weather, https://theconversation.com/its-never-been-more-important-to-keep-an-eye-on-space-weather-65648, Theconversation.com > 17,000 reads
151. Hapgood, M., and D. J. Knipp (2016), Data Citation and Availability: Striking a Balance Between the Ideal and the Practical, Space Weather, 14, doi:10.1002/2016SW001553.
152. Knipp, D. J. (2017) Global Positioning System Sparks New Data Revolution, Eos Editor's Vox, https://eos.org/editors-vox/global-positioning-system-sparks-new-data-revolution
153. Knipp, D. J. *(*2017*),* Space Weather Editors in Transition: Hail and Farewell*,* Space Weather*,* 15*,* 279*, doi:*10.1002/2017SW001611.
154. Knipp, D. J., M. A. Hapgood, D. Welling, and T. Paul O'Brien (2017), Thank You to Space Weather Peer Reviewers, Space Weather, 15, 542–544, doi:10.1002/2017SW001621.
155. Knipp, D. J. *(*2017*).* On space weather during a total eclipse*.* Space Weather*,* 15*,* 1092*.* https://doi.org/10.1002/2017SW001723
156. Hanson, B., J. Lunn, B. van der Pluijm, J. Orcutt, R. R. Colwell, S. Trumbore, T. W. Becker, N. Diffenbaugh, R. Pincus, M. Liemohn, U. ten Brink, P. Brewer, M. Zhang, S. A. Hauck II, B. Hubbard, M. Goni, E. Thomas, P. Wilkinson, M. Moldwin, D. J. Knipp, J. Geissman, and M. Clark (2017), Earth and space science for the benefit of humanity, EOS, 98, https://doi.org/10.1029/2018EO071991.
157. Knipp, D. J., Hapgood, M. A., & Welling, D. T. (2017). Maintaining a strong signal and strong impact. Space Weather, 15, 1560–1561. https://doi.org/10.1002/2017SW001783
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159. Knipp, D. J. (2019). Fall 2018 AGU Editors' highlights: Living within the Sun's stormy atmosphere. *Space Weather*, 17. https://doi.org/10.1029/2019SW002154
160. Knipp, D. J., & Gannon, J. L. (2019). The 2019 National Space Weather Strategy and Action Plan and Beyond. *Space Weather*, 17. https://doi.org/10.1029/2019SW002254
161. Knipp, Delores, Lessons from the Sun: The Great Solar Storm of August 1972, (2019) ROOM the Space Journal of Asgardia, Summer 2019, pp 15-19, ISBN7447058068, https://room.eu.com/article/lessons-from-the-sun,
162. Knipp, D. J., and M. Hapgood (2019), Space weather aviation forecasting on a global scale, *Eos, 100,* https://doi.org/10.1029/2019EO135277.
163. Knipp, D. J. (2019). Space Weather Journal: Into the future. *Space Weather*, 17. https://doi.org/10.1029/2019SW002337
164. Chartier, A., Matsuo, T., Perry, G. W., Deng, Y., Billett, D., Cosgrove, R. B., *Thayer, J. P., Lu, G., Verkhoglyadova, O.P., Pfaff, R. F., Knipp, D. J.*, *Laakso, H. E., Datta-Barua, S., and* Vines, S. K. (2023). Understanding the Transfer of Electromagnetic Energy Between the Earth's Magnetosphere and Upper Atmosphere. *Bulletin of the AAS*, *55*(3). https://doi.org/10.3847/25c2cfeb.756a6068

CONFERENCE PROCS/PAPERS, NATIONAL GUIDES/STANDARDS/STUDIES, WHITE PAPERS

Reviewed:

165. Waghule, B. and D. J. Knipp, (2025), Ionospheric Response During the 10-12 May 2024 Geomagnetic Storm and its Connection to GICs, 2025 United States National Committee of URSI, National Radio Science Meeting (USNC-URSI NRSM), Boulder, CO, USA, 2025, pp. 362-363, doi: 10.23919/USNC-URSINRSM66067.2025.10973159

166. Space Weather Advisory Group: Dickinson, T., Bishop, R., Elliott, H., Duncan, N., Fugate, C., Gombosi, T., Gannon, J., Ho, G., Jonas, S., Knipp D., Lautenbacher, C., McIntosh, S., Olsen, M, Stills, M., Tobiska, K., (2024) Results of the First National Survey of User Needs for Space Weather, https://www.weather.gov/media/nws/Results-of-the-First-National-Survey-of-User-Needs-for-Space-Weather-2024.pdf
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