

Lauren W. Blum

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EDUCATION

- 2014 PhD, Aerospace Engineering Sciences, University of Colorado Boulder
Thesis: *Relativistic Electrons in Earth's Outer Radiation Belt: Wave-Particle Interactions and Precipitation Loss*
2010 MA, Astronomy, Boston University
2007 BA, Physics, Dartmouth College

EMPLOYMENT

- 2020-present University of Colorado, Astrophysical and Planetary Sciences Department – Assistant Professor
2016-2020 NASA/Goddard Space Flight Center (GSFC) – Research Scientist
2014-2016 Space Sciences Lab (SSL), University of California Berkeley – Postdoctoral Fellow
2010-2014 Laboratory for Atmospheric and Space Physics (LASP), University of Colorado – PhD Student
2008-2010 Center for Space Physics, Boston University – Graduate Student
2007-2008 Space Science and Applications Group, Los Alamos National Laboratory – PostBac Researcher
2004-2007 Plasma Physics Rocket Laboratory, Dartmouth College – Undergraduate Researcher

PROFESSIONAL COLLABORATIONS

- 2021-present Living With a Star Focus Science Topic Team Lead – “Understanding and predicting radiation belt loss in the coupled magnetosphere”
2021-present Goddard’s ISFM Science Team on “Space Precipitation Impacts” – high energy precipitation Lead
2021-present Korea Astronomy and Space Science Institute’s SNIPE mission – Data Users Group
2021-present Japan-Italy-US CALET instrument Guest Investigator
2021-present International Space Science Institute (ISSI) team member – “Geomagnetic activity and solar cycle dependence of EMIC wave activity and wave parameters in Earth’s magnetosphere”
2019-present Geospace Environment Modelling (GEM) Focus Group lead: “System understanding of radiation belt particle dynamics through multi-spacecraft and ground-based observations and modeling”
2019-present International Space Science Institute (ISSI) team member – “Radiation belt physics from top to bottom”
2020-present International Union of Radio Science (URSI) Member, Commission H “Waves in Plasmas”
2018-2020 PI, GTOSat CubeSat
2017-2020 Project Manager, Compact Radiation Belt Explorer (CeREs) CubeSat (PI Shri Kanekal)
2016 JPL Planetary Science Summer School
2015 ISSI team young scientist – “Understanding energetic particle injections and their effect on Earth’s outer radiation belt electrons using multipoint observations”
2011-2015 Project Manager, Colorado Student Space Weather Experiment (CSSWE) CubeSat (PI Xinlin Li)

RESEARCH INTERESTS

General interests involve heliospheric physics and the coupled nature of various particle populations in planetary magnetospheres. Recent work has focused on wave-particle interactions and their influence on the dynamics of the radiation belts at Earth and Jupiter, as well as the influence of magnetospheric particles on Earth’s atmosphere. Experience includes analysis of particle and field measurements from satellites, balloons, and ground stations, as well as instrument and small satellite/mission development.

FUNDING & AWARDS

- 2023-present Co-I on Heliophysics Flight Opportunity Study grant “The loss through auroral microburst pulsations satellite (LAMPsat) flight opportunity study” (PI Mykhaylo Shumko)
2022-present PI on Heliophysics Innovation in Technology and Science grant “Space weather instruments for the SWAP-E CubeSat constellation flight opportunity”
2022-present Co-I on NSF grant “Energetic particle precipitation from the magnetosphere and effects on ozone dynamics in the mesosphere and stratosphere” (PI Mick Denton)
2021-present Co-I on H-SR grant “The roles of inward radial diffusion and local heating on energy-dependent acceleration of ultrarelativistic electrons (PI Hong Zhao)

2021-present Co-I on HTIDES grant “The miniaturized high-energy-resolution relativistic electron telescope (HERT)” (PI Hong Zhao)

2021-present PI of H-SR grant “Investigating the generation and properties of relativistic electron microbursts”

2021-present PI of LWS grant “The contribution of atmospheric precipitation to radiation belt loss”

2021-2022 Co-I on Heliophysics Mission Concept Study “Jupiter’s global magnetic environment and radiation observatory” (PI George Clark)

2020 Goddard Space Flight Center IRAD Team Award – CubeSat scientist and engineering team

2018-2021 PI of HTIDs LCAS CubeSat: “GTOSat: A 6U CubeSat in Geosynchronous Transfer Orbit to Study Radiation Belt Dynamics”

2018-2020 PI of H-GI project: “Plasma Structure and Composition as a Driver of Wave Growth in the Inner Magnetosphere”

2017-2018 PI of H-GI grant “EMIC wave electric fields in the outer radiation belt”

2015-2017 Co-I of H-GI grant “Perpendicular and parallel spatial scales of VLF/ULF waves in the terrestrial radiation belts from multi-point measurements” (PI Oleksiy Agapitov)

2017 AGU Basu US Early Career Award for Research in Sun-Earth Systems Science

2015-2016 NSF Atmospheric and Geospace Sciences (AGS) Postdoctoral Research Fellowship

2014 John A. Vise Graduate Student Excellence Award, University of Colorado

2012-2014 NASA Earth and Space Science Graduate Student Research Fellowship (NESSF)

2011-2014 Student Poster Awards: GEM Workshop 2014, 2013; EGU Meeting 2014; Fall AGU Meeting 2012; AGU Chapman Conference on Dynamics of the Earth's Radiation Belts, 2011

2012 Student Scholarship recipient, 3rd place (\$2,500 award), Small Satellite Conference

2010-2011 Dean’s Outstanding Merit Fellowship (\$20,000 + tuition), University of Colorado

2010-2011 Dean’s Graduate Assistantship (\$5,000), University of Colorado

SERVICE & TEACHING

2022-present National Academies Decadal Survey for Solar and Space Physics, Panel on the Physics of Magnetospheres member

2022-present Thesis committee member for: 3 PhD dissertations, 1 Master’s thesis, 7 PhD candidacy exams, 1 preliminary exam, 2 Undergraduate honors theses

2023 Instructor, CU Boulder ASTR2020 – Intro to Space Astronomy and Exploration

2022 Science Organizing Committee for the “Helio2050: Measurement techniques and technologies” Workshop, Feb 2022

2021, ’22, ’24 Instructor, CU Boulder ASTR 4800 – Space Science: Practice and Policy

2021 Instructor, CU Boulder ASTR 5780 – Mission Design and Development for Space Sciences

2015-present Session Convener: Small Satellites for Space Weather Research & Forecasting, 2022; URSI-NRSM, 2022-2023; JpGU, 2021; Fall AGU 2017-2022; EGU 2019; Van Allen Probes SWG 2017; Spring AGU 2015

2015-present Undergraduate student internships, research advisor

2019 Science Organizing Committee for the “Ion composition in the Sun-Earth system” meeting in Durango CO, July 2019

2019 Organizing Committee for the “Planetary CubeSats Symposium” at NASA/GSFC, June 2019

2018 Heliophysics booth volunteer, US Science and Engineering Festival, Washington DC

2016 Expanding Potential Workshop participant – “Fostering an inclusive STEM community”

2015-2016 Space Plasmas Seminar organizer, Space Sciences Lab, UC Berkeley

2015 Introductory Plasma Physics guest lecturer, Spring semester, UC Berkeley

2014 Berkeley Intensive Evidence-Based Teaching Workshop participant, Fall semester

2014 MIT’s Women in Aerospace Symposium, invited participant

2012 Expanding Your Horizons (introduces middle school girls to STEM fields) volunteer

2011-present LASP Summer REU tutorial speaker (topic: CubeSats, magnetospheres)

2011-2013 GEM student tutorial presenter (topics: magnetospheric waves, geomagnetic storms, Earth’s magnetotail)

2015-present Panel reviewer, NSF and NASA

2013-present Judge for STEM science fairs (Longmont CO Middle School, DC STEM Fair)

2013-present Journal Reviewer for Geophysical Research Letters, Journal of Geophysical Research, and Space Weather

2008-2014 Women in Science/Women in Astronomy group member, co-chair

2007-present American Geophysical Union member
2006-2008 Snowboarding instructor

PUBLICATIONS (57 total, 14 first author, 9 student/postdocs lead author - underlined)

57. Vidal-Luengo, S., L. W. Blum, et al. (under review), Characterization of relativistic electron precipitation events observed by the CALET experiment using self-organizing-maps, *Journal Geophys. Res. Space Phys.*
56. Feinland, M., L. W. Blum, R. Marshall, L. Gan, M. Shumko, M. Looper (under review), Lightning-induced relativistic electron precipitation from the inner radiation belt, *Nature Comm.*
55. Blum, L. W., et al. (under review), On the spatial and temporal evolution of EMIC wave-driven relativistic electron precipitation: magnetically conjugate observations from the Van Allen Probes and CALET, *Geophys. Res. Lett.*
54. Cao, X., et al., (in press) Science return of probing magnetospheric systems of ice giants, *Frontiers Astron. Space Sci.*
53. Denton, M, L. W. Blum, et al., (in press), Experiments at the edge of space: Balloon flights to the stratosphere, *Phys Ed.*
52. Greeley, A. D., Kanekal, S. G., Schiller, Q., Blum, L., Halford, A., Murphy, K., et al. (2024). Persistent pitch angle anisotropies of relativistic electrons in the outer radiation belts. *Journal of Geophysical Research: Space Physics*, 129, e2023JA031549.
51. Kandar, H., Blum, L., Shumko, M., Chen, L., & Shue, J.-H. (2023). The repetition period of MeV electron microbursts as measured by SAMPEX/HILT. *Geophysical Research Letters*, 50, e2023GL104663.
50. Nnadih, S., L. W. Blum, et al. (2023), Contrasting storm-time radiation belt events with and without dropouts – the importance of CME shocks, *Journal of Geophysical Research Space Physics*, <https://doi.org/10.1029/2023JA031293>
49. Galchenko, P., L. W. Blum, L. Kepko, H. Khalifi, and J. Lucas (2023), "Attitude Determination and Control System Design for the GTOSat Mission", AAS 23-031, 2023 AAS Guidance Navigation and Control Conference.
48. Meyer-Reed, C., L. W. Blum, & M. Shumko (2023), Pitch angle isotropy of relativistic electron microbursts as observed by SAMPEX/HILT: Statistical and storm-time properties. *Journal of Geophysical Research: Space Physics*, doi:10.1029/2022ja030926.
47. Lucas, J., et al. (2022), GTOSat: Radiation Belt Dynamics from the Inside, 36th Annual Small Satellite Conference, SSC22-II-04.
46. Elliott, S., A. Breneman, C. Colpitts, J. Bortnik, A. Jaynes, A. Halford, M. Shumko, L. W. Blum, L. Chen, A. Greeley, D. Turner (2022), Understanding the properties, wave drivers, and impacts of electron microburst precipitation: current understanding and critical knowledge gaps. *Frontiers Astronomy and Space Sciences*
45. Shumko, M., B. Gallardo-Lacourt, A. J. Halford, L. W. Blum, J. Jiang, et al. (2022). Proton aurora and relativistic electron microbursts scattered by EMIC waves, *Frontiers Astron. Space Sci.*, doi: 10.3389/fspas.2022.975123.
44. Lejosne, S., Lejosne S, Allison HJ, Blum LW, Drozdov AY, Hartinger MD, Hudson MK, Jaynes AN, Ozeke L, Roussos E and Zhao H (2022), Differentiating Between the Leading Processes for Electron Radiation Belt Acceleration. *Front. Astron. Space Sci.* 9:896245. doi: 10.3389/fspas.2022.896245
43. Bruno, A., L. W. Blum, G. Denolfo, et al. (2022). EMIC-wave driven electron precipitation observed by CALET on the International Space Station. *Geophys Res Lett.* <https://doi.org/10.1029/2021GL097529>
42. Drozdov, A. Y., Blum, L. W., Hartinger, M., Zhao, H., Lejosne, S., Hudson, M. K., et al. (2022). Radial transport versus local acceleration: The long- standing debate. *Earth and Space Science*, 9, e2022EA002216. <https://doi.org/10.1029/2022EA002216>
41. Matsuda, S., Y. Miyoshi, Y. Kasahara, L. Blum, C. Colpitts, et al. (2021). Multipoint measurements of fine-structured EMIC waves by Arase, Van Allen Probe A and ground stations. *Geophysical Research Letters*, <https://doi.org/10.1029/2021GL096488>.
40. Shumko, M., Gallardo-Lacourt, B., Halford, A. J., Liang, J., Blum, L. W., Donovan, E., et al. (2021). A strong correlation between relativistic electron microbursts and patchy aurora. *Geophysical Research Letters*, 48, e2021GL094696. <https://doi.org/10.1029/2021GL094696>

39. **Shumko, M., Blum, L. W., & Crew, A. B.** (2021). Duration of individual relativistic electron microbursts: A probe into their scattering mechanism. *Geophysical Research Letters*, 48, e2021GL093879. <https://doi.org/10.1029/2021GL093879>
38. Bruno, A., **L. Blum**, G. de Nolfo, A. Ficklin, & G. Guzik (2021). Relativistic Electron Precipitation Detections with CALET on the International Space Station, Proceedings of Science, ICRC.
37. Lee, J., **L. W. Blum**, and L. Chen (2021) On the impacts of ions of ionospheric origin and their composition on magnetospheric EMIC waves. *Front. Astron. Space Sci.*, <https://doi.org/10.3389/fspas.2021.719715>.
36. **L. W. Blum**, et al. (2021), Prompt response of the dayside magnetosphere to discrete structures within the sheath region of a coronal mass ejection, *Geophys. Res. Lett.* <https://doi.org/10.1029/2021GL092700>
35. **Shumko, M.**, A. Johnson, T. P. O'Brien, D. Turner, A. Greeley, J. Sample, J. Blake, **L. Blum**, A. Halford. (2020), Statistical properties of electron curtain precipitation estimated with AeroCube-6, *J. Geophys. Res. Space Phys.*, doi:10.1029/2020JA028462.
34. **L.W. Blum**, L. Kepko, D. Turner, C. Gabrielse, A. Jaynes, S. Kanekal, Q. Schiller, J. Espley, D. Sheppard, L. Santos, J. Lucas, and S. West (2020) "The GTOSat CubeSat: scientific objectives and instrumentation", *Proc. SPIE 11389, Micro- and Nanotechnology Sensors, Systems, and Applications XII*, 113892E; <http://dx.doi.org/10.1117/12.2556268>.
33. Borovsky, J., G. L. Delzanno, J. Valdivia, P. Moya, M. Stepanova, J. Birn, **L. Blum**, W. Lotko, M. Hesse (2020), Outstanding Questions in Magnetospheric Plasma Physics: The Pollenzo View, *JASTP*, <https://doi.org/10.1016/j.jastp.2020.105377>.
32. **L. W. Blum**, R. Bhanu, M. H. Denton, Q. Schiller (2020), Persistent EMIC wave activity across the nightside inner magnetosphere, *Geophys. Res. Lett.* 47 (6), e2020GL087009.
31. E. Douma, C. Rodger, **L. W. Blum**, T. P. O'Brien, M. Clilverd, and J. Blake (2019), Characteristics of relativistic microburst intensity from SAMPEX observations, *J. Geophys. Res.*
30. Kanekal, S., **L. Blum**, et al. (2019), The Miniaturized Electron pRoton Telescope (MERiT) onboard the Compact Radiation belt Explorer (CeREs): A novel instrument to study energetic particles in the Earth's radiation belts, *Journal of Geophysical Research: Space Physics*, 124, 5734–5760. <https://doi.org/10.1029/2018JA026304>
29. **L. W. Blum**, A. Artemyev, O. Agapitov, D. Mourenas, S. Boardsen, and Q. Schiller (2019), EMIC wave driven bounce resonance scattering of energetic electrons in the inner magnetosphere, *J. Geophys. Res: Space Physics*, 124. <https://doi.org/10.1029/2018JA026427>
28. **L. Blum** and Breneman, A.(2019), Observations of radiation belt losses due to cyclotron wave-particle interactions, *The Dynamic Loss of Earth's Radiation Belts: From Loss in the Magnetosphere to Particle Precipitation in the Atmosphere*, Elsevier, (1st ed, 344pp).
27. Elder, C. M., A. M. Bramson, **L. W. Blum**, et al. (2018), OCEANUS: A high science return Uranus orbiter with a low-cost instrument suite, *Acta Astronautica*, 148, 1-11, doi:10.1016/j.actaastro.2018.04.019.
26. Schiller, Q., S. Kanekal, A. Boyd, **L. Blum**, A. Jones, D. Baker, and J. B. Blake (2017), On the cause of two prompt shock-induced relativistic electron depletion events, *J. Atmos. Sol. Terr. Phys.*, doi:10.1016/j.jastp.2017.08.017.
25. Douma, E., C. Rodger, **L. W. Blum**, M. A. Clilverd (2017), Occurrence characteristics of relativistic electron microbursts from SAMPEX observations, *J. Geophys. Res. Space Phys.*, 122, 8096-8107, doi:10.1002/2017JA024067.
24. Agapitov, O., **L. W. Blum**, F. Mozer, J. W. Bonnell., and J. Wygant (2017), Chorus whister wave source scales as determined from multipoint Van Allen Probe measurements, *Geophys. Res. Lett.*, 44, 2634-2642, doi:10.1002/2017GL072701.
23. **Blum, L. W.**, J. W. Bonnell, O. Agapitov, K. Paulson, and C. Kletzing (2017), EMIC wave scale size in the inner magnetosphere: observations from the dual Van Allen Probes, *Geophys. Res. Lett.*, 44, doi:10.1002/2016GL072316.
22. Artemyev, A. V., D. Mourenas, O. V. Agapitov, **L. Blum** (2017), Transverse eV ion heating by random electric field fluctuations in the plasmasphere, *Phys. Of Plasmas*, 24(2):022903.
21. M. Clilverd, C. Rodger, M. McCarthy, R. Millan, **L. W. Blum**, N. Cobbett, J. Brundell, D. Danskin, and A. Halford (2017), Investigating energetic electron precipitation through combining ground-based and balloon observations, *J. Geophys. Res. Space Phys.*, 122, doi:10.1002/2016JA022812.
20. **Blum, L. W.**, O. Agapitov, J. W. Bonnell, C. Kletzing, and J. Wygant (2016), EMIC wave spatial and coherence scales as determined from multipoint Van Allen Probe measurements, *Geophys. Res. Lett.*, 43, 4799–4807, doi:10.1002/2016GL068799.

19. Osmane, A., L. B. Wilson, **L. W. Blum**, T. I. Pulkkinen (2015), On the connection between microbursts and nonlinear electronic structures in planetary radiation belts, *Astrophys. Journal*. doi:10.3847/0004-637X/816/2/51.
18. **Blum, L. W.**, A. Halford, R. Millan, J. W. Bonnell, J. Goldstein, M. Usanova, M. Engebretson, M. Ohnsted, G. Reeves, H. Singer, M. Clilverd, and X. Li (2015), Observations of coincident EMIC wave activity and duskside energetic electron precipitation on 18-19 January 2013, *Geophys. Res. Lett.*, *42*, doi:10.1002/2015GL065245.
17. **Blum, L. W.**, X. Li, and M. Denton (2015), Rapid MeV electron precipitation as observed by SAMPEX/HILT during high speed stream driven storms, *J. Geophys. Res. Space Physics*, *120*, 3783–3794. doi: 10.1002/2014JA020633.
16. Li, X., R. Selesnick, D. Baker, A. Jaynes, S. Kanekal, Q. Schiller, and **L. Blum** (2014), Upper limit on the inner radiation belt MeV electron intensity, *J. Geophys. Res.*, doi:10.1002/2014JA020777.
15. Baker, D., A. Jaynes, V. Hoxie, R. Thorne, J. Foster, X. Li, J. Fennell, J. Wygant, S. Kanekal, P. Erickson, W. Kurth, W. Li, Q. Ma, Q. Schiller, **L. Blum**, D. Malaspina, A. Gerrard, and L. Lanzerotti (2014), An impenetrable barrier to ultra-relativistic electrons in the Van Allen radiation belt, *Nature*, *515*, 531-534, doi:10.1038/nature13956.
14. Califf, S., X. Li, **L. Blum**, A. Jaynes, Q. Schiller, H. Zhao, D. Malaspina, M. Hartinger, R. Wolf, D. Rowland, J. Wygant, and J. Bonnell (2014), THEMIS measurements of quasi-static electric fields in the inner magnetosphere, *J. Geophys. Res.*, doi:10.1002/2014JA020360.
13. Jaynes, A., X. Li, Q. Schiller, **L. Blum**, W. Tu, et al. (2014), Evolution of relativistic outer belt electrons during an extended quiescent period, *J. Geophys. Res.*, doi:10.1002/2014JA020125.
12. Gerhardt, D., S. E. Palo, Q. Schiller, **L. Blum**, X. Li, and R. Kohnert (2014), The Colorado Student Space Weather Experiment (CSSWE) on-orbit performance, *JoSS, Vol. 03*, No. 01, pp 265-281.
11. Schiller, Q., D. Gerhardt, **L. Blum**, X. Li, S. Palo (2014), Design and scientific return of a miniaturized particle telescope onboard the Colorado Student Space Weather Experiment (CSSWE) CubeSat, *Aerospace Conference, IEEE*, doi:10.1109/AERO.2014.6836372.
10. Schiller, Q., X. Li, **L. Blum**, W. Tu, D. Turner, and J. Blake (2014), A non-storm time enhancement of relativistic electrons in the outer radiation belt, *Geophys. Res. Lett.*, doi:10.1002/2013GL058485.
9. **Blum, L. W.**, Q. Schiller, X. Li, R. Millan, A. Halford, and L. Woodger (2013), New conjunctive CubeSat and balloon measurements to quantify rapid energetic electron precipitation, *Geophys. Res. Lett.*, *40*, doi:10.1002/2013GL058546.
8. Li, X., Q. Schiller, **L. Blum**, S. Califf, H. Zhao, W. Tu, D. L. Turner, D. Gerhardt, S. Palo, S. Kanekal, D. N. Baker, J. Fennel, J. B. Blake, M. Looper, G. D. Reeves, and H. Spence (2013), First results from CSSWE CubeSat: Characteristics of relativistic electrons in the near-Earth environment during the October 2012 magnetic storms, *J. Geophys. Res. Space Physics*, *118*, doi:10.1002/2013JA019342.
7. Li, X., S. Palo, R. Kohnert, **L. Blum**, D. Gerhardt, Q. Schiller, and S. Califf (2013), Small Mission Accomplished by Students—Big Impact on Space Weather Research, *Space Weather*, *11*, doi:10.1002/swe.20025.
6. **Blum, L. W.**, E. A. MacDonald, L. B. N. Clausen, and X. Li (2012), A comparison of magnetic field measurements and a plasma-based proxy to infer EMIC wave distributions and geosynchronous orbit, *J. Geophys. Res.*, Vol. 117, A05220, doi:10.1029/2011JA017474.
5. Li, X., S. Palo, R. Kohnert, D. Gerhardt, **L. Blum**, Q. Schiller, D. Turner, W. Tu, N. Sheiko, and C. S. Cooper (2012), Colorado Student Space Weather Experiment: Differential flux measurements of energetic particles in a highly inclined low Earth orbit, in Dynamics of the Earth's Radiation Belts and Inner Magnetosphere, *Geophys. Monogr. Ser.*, Vol. 199, edited by D. Summers et al., 385-404, AGU, Washington, D. C., doi:10.1029/2012GM001313.
4. **Blum, L. W.** and Q. Schiller (2012), Characterization and testing of an energetic particle telescope for a CubeSat platform, Tech. Rep. SSC12-VIII-4, *Small Satellite Conference*, AIAA/USU.
3. Spasojevic, M., **L. W. Blum**, E. A. MacDonald, S. A. Fuselier, and D. I. Golden (2011), Correspondence between a plasma-based EMIC wave proxy and subauroral proton precipitation, *Geophys. Res. Lett.*, *38*, L23102.
2. MacDonald, E. A., **L. W. Blum**, S. P. Gary, M. F. Thomsen, and M. H. Denton (2010), High-speed stream-driven inferences of global wave distributions at geosynchronous orbit: relevance to radiation belt dynamics, *Proc. R. Soc. A*, 466:3351–3362.
1. **Blum, L. W.**, E. A. MacDonald, S. P. Gary, M. F. Thomsen, and H. E. Spence (2009), Ion observations from geosynchronous orbit as a proxy for ion cyclotron wave growth during storm times, *J. Geophys. Res.*, *114*, A10214.

INVITED TALKS

- When and where does MeV electron precipitation contribute to atmospheric dynamics?** Invited talk, ISSI workshop “Physical links between weather and climate in space and lower atmosphere” Jan 2024
- Revisiting SAMPEX: two decades of radiation belt measurements to study electron loss,** Invited talk, LASP Friends of Magnetospheres seminar, Oct 2023.
- Energetic electron precipitation: magnetospheric drivers and atmospheric impacts,** Invited talk, UCLA colloquium, May 2023.
- Recent advances in miniaturized energetic particle instruments for CubeSat platforms,** Invited talk, Fall AGU meeting, Dec 2022.
- Detailed properties of MeV electron microburst precipitation,** Invited talk, Fall AGU meeting, Dec 2022.
- GTOSat: Venturing where no CubeSat has gone before,** Invited seminar, LASP public lecture series, Nov 2022.
- Multipoint measurements to study the drivers, structure, and effects of waves in Earth’s magnetosphere,** Invited talk, MMS Workshop, May 2022
- Multipoint measurements to understand the drivers and structure of plasma waves in Earth’s magnetosphere,** Invited colloquium, CU Boulder Center for Integrated Plasma Studies (CIPS), April 2022.
- LEARNING about GTOSat,** NASA’s monthly Smallsat LEARN forum, March 2022.
- Current and future measurements for radiation belt studies,** Invited colloquium, Auburn University, Nov 2021.
- Energetic electron precipitation: Magnetospheric drivers and atmospheric impacts,** Invited colloquium, LASP seminar series, Oct 2021.
- Energetic Electron Precipitation,** Invited seminar, Magnetosphere Online Seminar Series, Sept 2021.
- What the detailed properties of MeV electron microbursts reveal about their scattering mechanisms and contribution to radiation belt loss,** Invited talk, ICEAA-IEEE APWC-USNC URSI, Aug 2021.
- GTOSat: A next-generation CubeSat to study Earth’s radiation belts,** Invited colloquium, Taiwan Space Union, July 2021.
- Energetic electron precipitation: detailed properties, scattering mechanisms, and contributions to radiation belt loss,** Invited Colloquium, Los Alamos National Lab, June 2021.
- Multipoint measurements to study wave structure and drivers in the inner magnetosphere,** Invited colloquium, NASA Goddard Space Flight Center, Feb 2021.
- GTOSat: A next-generation CubeSat to study Earth’s radiation belts,** Invited talk, Committee on Space Research (COSPAR) meeting, Jan 2021.
- The GTOSat CubeSat: A Pathfinder for Future SmallSat Radiation Belt Monitoring,** Invited talk, American Meteorological Society Meeting, Jan 2021.
- Current and future multipoint measurements for radiation belt studies,** Invited Colloquium, University of Minnesota, Nov 2020.
- The next generation of heliophysics CubeSat explorers,** Invited tutorial, Geospace Environments Modeling (GEM) Workshop, virtual, July 2020.
- Current and future multipoint measurements for radiation belt science,** Invited talk, Royal Astronomical Society, London UK Jan 2020.
- Rapid MeV electron precipitation: Detailed properties and wave drivers,** Invited talk, Fall AGU, San Francisco CA Dec 2019.
- GTOSat: A Next-Generation CubeSat to Study Earth’s Radiation Belts,** Invited talk, COSPAR Symposium “Small satellites for sustainable science and development,” Herzliya Israel, Nov 2019.
- Coupling between EMIC waves, plasma, and energetic particles in the inner magnetosphere,** Invited talk, Plasma Physics of the Magnetosphere, Pollenzo Italy, June 2019.
- The GTOSat CubeSat: A Next-Generation Radiation Belt Monitor,** Invited talk, Applied Space Environments Conference (ASEC), Los Angeles CA, May 2019.
- Coupling between EMIC waves, plasma, and energetic particles in the inner magnetosphere: Observations form NASA’s Van Allen Probes,** Invited talk, EGU, Vienna Austria, Apr 2019.
- The properties and wave drivers of energetic electron precipitation,** Invited talk, AGU Fall meeting, Washington DC, Dec 2018.
- Exploring the physics of near-Earth space with CubeSats, the newest generation of spacecraft,** Invited colloquium, American University, Nov 2018.

CubeSat missions to study radiation belt electron dynamics and loss, Invited talk, Committee on Space Research (COSPAR), Pasadena CA, July 2018.

EMIC wave-driven electron precipitation via cyclotron and bounce resonance, Invited talk, Asia-Oceania Geoscience Society (AOGS), Honolulu HI, Jun 2018.

Multipoint measurements to characterize particle and wave populations in the inner magnetosphere, Invited colloquium, Dartmouth College space plasma seminar, Hanover NH, May 2018.

Energetic electron precipitation and associated scattering processes: recent advances and remaining questions, Invited talk, Chapman Conference on Particle Dynamics in the Earth's Radiation Belts, Cascais, Portugal, Mar 2018.

EMIC waves in the inner magnetosphere: wave generation, properties, and impact on radiation belt dynamics, Invited colloquium, Institute of Geophysics and Planetary Physics, University of California Los Angeles (UCLA), Dec 2017.

Wave spatial scales in the inner magnetosphere, Invited talk, The Magnetosphere: New Tools, New Thinking, and New Results, Puerto Varas Chile, Nov 2017.

EMIC wave parallel electric fields in the outer radiation belt: estimates of electron bounce resonance scattering, Invited talk, Asia-Oceania Geoscience Society (AOGS), Singapore, Aug 2017.

Van Allen Probe multipoint measurements of the spatial and coherence scales of EMIC waves, Invited talk, International Union of Radio Science (URSI), Boulder CO, Jan 2017.

Causes and consequences of radiation belt electron precipitation, Invited talk, Unsolved Problems in Magnetospheric Physics Workshop, Scarborough UK, Sept 2015.

Injection-driven EMIC waves and radiation belt precipitation, Invited talk, Van Allen Probe Science Working Group Meeting, JHU-APL, July 2015.

Investigating the dynamics of Earth's radiation belts through new CubeSat measurements, Invited colloquium, Heliophysics Division, Goddard Space Flight Center, April 2015.

The dynamics of Earth's radiation belts: New CubeSat measurements and conjunction studies, Invited colloquium, Department of Physics and Astronomy, University of Minnesota, March 2015.

New CubeSat measurements to characterize the near-Earth radiation environment. Invited talk, MIT Women in Aerospace Symposium, Apr 2014.

New CubeSat measurements to characterize radiation belt electron precipitation. Invited colloquium, Space Sciences Laboratory, Berkeley CA, Feb 2014.

New CubeSat measurements to characterize rapid electron precipitation and radiation belt losses. Invited colloquium, NOAA/Space Weather Prediction Center (SWPC) seminar series, Nov 2013.

The Van Allen radiation belts: New missions and measurements. Invited colloquium, Department of Astrophysics and Planetary Science, University of Colorado Boulder, Sept 2013.

Characterization and testing of an energetic particle telescope for a CubeSat platform. Oral presentation, Small Satellite Conference, Logan UT, Aug. 2012.

Geosynchronous EMIC wave distributions and associated plasma properties. Invited talk, GEM Workshop, Snowmass CO, June 2012.

Geomagnetic storms. Invited student tutorial, Joint CEDAR-GEM Workshop, Santa Fe NM, June 2011.

The Colorado Student Space Weather Experiment (CSSWE): A CubeSat to measure energetic particles in low earth orbit. Invited colloquium, NOAA/Space Weather Prediction Center (SWPC) seminar series, May 2011.

Particle distributions as a free energy source for EMIC waves. Invited talk, Radiation Belt St. Petersburg (RBSPb) Workshop, St. Petersburg, Russia, July 2010.