

Kristopher G. Klein

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Professional Profile

Space plasma physicist studying solar wind turbulence, kinetic-scale instabilities, wave-particle interactions, and multipoint methods for heliophysics missions. Deputy Principal Investigator for HelioSwarm and Deputy Principal Investigator for the SWEAP instrument suite on Parker Solar Probe. Active community leader through AGU, SHINE, ISSI, APS-DPP.

Education and Appointments

University of Arizona, Department of Planetary Sciences & LPL	2018-present
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Associate Professor, 2023-present; Assistant Professor, 2018-2023.

University of Michigan, Climate and Space Sciences and Engineering	2016-2018
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Postdoctoral Research Scholar.

University of New Hampshire, Space Science Center	2014-2016
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NSF AGS Postdoctoral Research Fellow.

University of Iowa	Ph.D. Physics, 2013
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Dissertation: *The Kinetic Plasma Physics of Solar Wind Turbulence*.

Professional and Community Service

- **AGU service:** member, 2013-present; Fall Meeting session organizer, 2017 and 2019.
- **SHINE:** Steering Committee, 2023-2025; workshop session organizer, 2015-2019 and 2022.
- **Parker Solar Probe:** Science Working Group organizer, Fall 2022-present; Parker Two Conference Science Organizing Committee, Spring 2022; PSP Science Working Group Local Organizing Committee, Fall 2022.
- **APS-DPP/GPAP:** APS Topical Group in Plasma Astrophysics Treasurer, 2021-2027; APS-DPP Program Committee, 2023; APS-DPP mini-conference organizer, 2017.
- **ISSI and international organization:** ISSI workshop organizing committee member, *Electron Kinetic Physics: The Next Frontier in Space and Astrophysical Plasmas*, 2024; ISSI team member for solar-wind evolution, cross-scale energy transfer, and ion kinetic instabilities teams, 2022-2026.
- **Review service:** NASA review panelist and chair; NSF review panelist; external reviewer for NASA, NSF, DOE, UKRI, DFG, and ANR. Journal referee for 60+ manuscripts.
- **Professional memberships:** American Geophysical Union; American Astronomical Society, Solar Physics Division; American Physical Society, Division of Plasma Physics.

Honors and Awards

- University of Arizona Distinguished Scholar Award, 2025.
- American Astronomical Society Solar Physics Division Karen Harvey Prize, 2024.
- Collier Trophy for Greatest Achievement in Aeronautics or Astronautics, PSP Mission Team, 2024.
- American Physical Society Division of Plasma Physics Lev D. Landau and Lyman Spitzer Jr. Award, 2022.
- NASA Silver Achievement Medal, Parker Solar Probe Team, 2019

Mission and Scientific Leadership

- **HelioSwarm**, NASA Medium-Class Explorer mission: Deputy Principal Investigator, 2019-present.
- **Parker Solar Probe/SWEAP:** Deputy PI, 2025-present; SWEAP science team member 2018-present.
- **ISSI team leader:** *Excitation and Dissipation of Kinetic-Scale Fluctuations in Space Plasmas*, 2025-2026.
- Open-source plasma software contributor/developer: **PLUME**: used for linear Vlasov-Maxwell dispersion analysis of bi-Maxwellian plasmas. **ALPS**: used for linear Vlasov-Maxwell dispersion analysis of non-Maxwellian plasmas. These tools support community analysis of linear plasma physics, kinetic instabilities, and wave-particle interactions in spacecraft-observed plasmas.

Research Impact and Selected Publications

153 peer-reviewed journal articles; h-index 45; i10-index 101; i100-index 17; 6482 citations. Metrics from SAO/NASA ADS as of April 30, 2026.

- Klein, K.G. et al., *Ion-Scale Wave Emission and Absorption for Non-Maxwellian Velocity Distributions in the Inner Heliosphere*, GRL, 2026. Demonstrated ion-scale wave emission and absorption driven by non-Maxwellian velocity distributions in the inner heliosphere.
- Klein, K.G. and Verscharen, D., *The Dielectric Response of Plasmas with Arbitrary Gyrotropic Velocity Distributions*, Physics of Plasmas, 2025. Extended linear plasma response theory to characterize the dielectric properties of plasmas with general non-Maxwellian distributions.
- Klein, K.G. et al., *Wave-Telescope Analysis for Multipoint Observatories: Impact of Timing and Spatial Uncertainties*, JGR, 2024. Analyzed the impact of timing and spatial uncertainties on wave-telescope techniques for reconstructing plasma fluctuations from multipoint measurements.
- Klein, K.G. et al., *HelioSwarm: A Multipoint, Multiscale Mission to Characterize Turbulence*, Space Science Reviews, 2023. Outlined the scientific objectives and measurement strategy of the HelioSwarm mission to characterize turbulence using a multipoint, multiscale observatory.
- Kasper, J.C., Klein, K.G. et al., *Parker Solar Probe Enters the Magnetically Dominated Solar Corona*, PRL, 2021. Reported the first in situ measurements demonstrating Parker Solar Probe's entry into the magnetically dominated, sub-Alfvénic solar corona.
- Verscharen, D., Klein, K.G., and Maruca, B.A., *The Multiscale Nature of the Solar Wind*, Living Reviews in Solar Physics, 2019. Synthesized multiscale plasma physics challenges in the solar wind, clarifying key open questions and observational constraints.
- Klein, K.G., Alterman, B.L., Stevens, M.L., Vech, D., and Kasper, J.C., *Majority of Solar Wind Intervals Support Ion-Driven Instabilities*, PRL, 2018. Statistical evaluation of solar wind stability at 1 AU, accounting for multiple ion sources of free energy driving wave emission.
- Chen, C. H. K, Klein, K. G., & Howes, G. G., *Evidence for Electron Landau Damping in Space Plasma Turbulence* Nature Communications, 2019. Provided the first observational evidence of electron Landau damping operating in space plasma turbulence using the field-particle correlation technique.
- Klein, K.G., Howes, G.G., and TenBarge, J.M., *Diagnosing Collisionless Energy Transfer Using Field-Particle Correlations: Gyrokinetic Turbulence*, JPP, 2017. Extended the field-particle correlation technique to gyrokinetic simulations, enabling identification of dissipation mechanisms through velocity-space signatures.

Selected Teaching

- Instructor for graduate/upper-level undergraduate courses in plasma physics, planetary physics, solar physics, and undergraduate general education courses on solar-system exploration.
- Summer-school lecturer for NSF/APS-DPP GPAP, Simons Collaboration on Extreme Electrodynamics of Compact Sources, and multipoint heliospheric space-plasma physics schools.
- Supersized four graduate students and two postdoctoral researchers, whose ongoing careers have spanned academia, national laboratories, and industry.