

Dr. William H. Ashfield IV

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Appointments

- 2022-Present *Postdoctoral Research Scientist* Bay Area Environmental Research Institute/
Lockheed Martin Solar & Astrophysics Laboratory
- 2019-2022 *Graduate Research Assistant* Montana State University Physics Dept.
Advisor: Dana Longcope
- 2018-2019 *Graduate Teaching Assistant* Montana State University Physics Dept.

Education

- 2022 Ph.D. | Physics | Montana State University
- 2021 M.S. | Physics | Montana State University
- 2017 B.A. | Physics | Reed College

Areas of Specialisation

Solar Flares | Chromospheric Diagnostics | Turbulence
UV and Hard X-ray Spectroscopy
Data Analysis and Visualization | Image Processing
Numerical Modeling | Scientific Python Development

Research Experience

- Present Analysing ultra-high cadence chromospheric UV ribbon emission using IRIS and SST to understand the interconnection between condensation, QPPs, and flare energy release.
- 2022-2024 Investigated the temporal and spatial evolution of turbulence through Fe XXI 1354.1 Å spectral line broadening and its effects on electron acceleration inferred via high-frequency microwaves and hard X-ray emission.
- 2021-2022 Modeled the effects of Alfvén wave-induced turbulence on flare heating, chromospheric condensation, and long-duration coronal EUV emission.

- 2020-2021 Forward modeled IRIS observations using synthetic Si IV 1402.77 Å emission spectra created from data-driven simulations.
- 2019-2020 Modeled downflows seen in the lower solar atmosphere during flares using one-dimensional MHD simulations of coronal loops.
- 2016-2017 Undergraduate Thesis, *Reduced Simulations: A technique for $\gamma - \gamma$ angular correlation analysis*. Developed a novel analysis technique to reduce the amount of time necessary to extract angular correlation coefficients from nuclear decay measurements using the GRIFFIN spectrometer at the TRIUMF facility in Vancouver, Canada. Read it [here](#).

Publications & Conference Proceedings

REFEREED ARTICLES

- 2024 **W. Ashfield IV**, V. Polito, S. Yu, H. Collier, L. Hayes, “Non-thermal Observations of a Flare Loop-top using IRIS and EOVS: Implications for Turbulence and Electron Acceleration” *In Prep. for ApJ*
- 2024 H. Collier, L. Hayes, S. Yu, A. Battaliga, **W. Ashfield**, V. Polito, L. K. Harra, S. Krucker, “Localising pulsations in the hard X-ray and microwave emission of an X-class flare”, *A&A*
<https://doi.org/10.1051/0004-6361/202348652>
- 2023 **W. Ashfield IV** & D.W. Longcope, “A Model for Gradual Phase Heating Driven by MHD Turbulence in Solar Flare”, *ApJ*
<https://doi.org/10.3847/1538-4357/acb1b2>
- 2022 **William Ashfield IV**, Dana W. Longcope, Chunming Zhu, and Jiong Qiu, “Connecting Chromospheric Condensation Signatures to Reconnection Driven Heating Rates in an Observed Flare”, *ApJ*
<https://doi.org/10.3847/1538-4357/ac402d>
- 2021 **W. H. Ashfield** & D.W. Longcope “Relating the Properties of Chromospheric Condensation to Flare Energy Transported by Thermal Conduction”, *ApJ*
<https://doi.org/10.3847/1538-4357/abedb4>
- 2019 J. K. Smith, A. D. MacLean, **W. Ashfield**, A. Chester, A. B. Garnsworthy, C. E. Svensson, “Gamma-gamma angular correlation analysis techniques with the GRIFFIN spectrometer”, *NIM A*
<https://doi.org/10.1016/j.nima.2018.10.097>
- 2019 A. B. Garnsworthy, C. E. Svensson, M. Bowry, R. Dunlop, A. D. MacLean, B. Olaizola, J. K. Smith, F. A. Ali, C. Andreoiu, J. E. Ash, **W. H. Ashfield**, G. C. Balle, et. al., “The GRIFFIN Facility for Decay-Spectroscopy Studies at TRIUMF-ISAC”, *NIM A*
<https://doi.org/10.1016/j.nima.2018.11.115>

INVITED PRESENTATIONS

- 2022 William Ashfield, Dana Longcope, Chunming Zhu, and Jiong Qiu “Connecting Chromospheric Condensation Signatures to Reconnection Driven Heating rates in an X1.0 Flare”, Hinode-15 / IRIS-12, Prague, Czech Republic

CONTRIBUTED PRESENTATIONS

- 2023 W. Ashfield IV, V. Polito, S. Yu, H. Collier, L. Hayes, “Non-thermal Observations of a Flare Loop-top using IRIS and EOVS: Implications for Turbulence”, Oral Talk, AGU Fall Meeting, San Francisco, California
- 2023 W. Ashfield IV, V. Polito, S. Yu, H. Collier, L. Hayes, “Non-thermal Observations of a Flare Loop-top using IRIS and EOVS: Implications for Turbulence”, Oral Talk, SPHERE Workshop, College Park, Maryland
- 2023 William Ashfield, Dana Longcope “A Model for Gradual Phase Heating Driven by MHD Turbulence in Solar Flares”, RoCMI Workshop, Longyearbyen, Svalbard, Norway
- 2022 William Ashfield, Dana Longcope “A Model for Gradual Phase Heating Driven by MHD Turbulence in Solar Flares”, SHINE Conference, Honolulu, Hawai’i
- 2021 William Ashfield, Dana Longcope, Chunming Zhu, and Jiong Qiu “Connecting Chromospheric Condensation Signatures to Reconnection Driven Heating rates in an X1.0 Flare”, Oral Talk, AGU Fall Meeting, New Orleans, Louisiana
- 2021 William Ashfield, Dana Longcope, Chunming Zhu, and Jiong Qiu “Connecting chromospheric condensation signatures to reconnection driven heating rates in an X1.0 flare”, SolFER Spring Meeting (Virtual Poster) See it [here](#).
- 2020 William Ashfield and Dana Longcope “Characterizing Chromospheric Condensation from Shocks Driven by Thermal Conduction”, (Virtual Oral Talk), AGU Fall Meeting

CONFERENCE ACTIVITIES

- 2021 Session Co-chair - Solar Flare Onset and Energy Release II Oral, AGU Fall Conference, New Orleans, Louisiana

Invited Talks and Seminars

- 2022 Stanford Solar Seminar, “Modeling the Effects of Flare Energy Release and Transport through Chromospheric Condensation and Coronal EUV Emission”
- 2022 Lockheed Martin Solar and Astrophysics Seminar, “Modeling the Effects of Flare Energy Release and Transport through Chromospheric Condensation and Coronal EUV Emission”
- 2021 National Solar Observatory APS Seminar, “Chromospheric Condensations as a Diagnostic for the Flare Energy Release Process”

Workshops

- 2023 EOVSA Data and GX Simulator Modeling Camp, NJIT, Newark, NJ
- 2022 Solar Spectropolarimetry and Diagnostic Techniques School, NSO/HAO, Boulder, CO
- 2022 Solar Physics High Energy Research (SPHERE) Workshop, SwRI, Boulder, CO
- 2022 5nd NCSP DKIST Data-Training Workshop, NSO, Virtual
- 2021 4nd NCSP DKIST Data-Training Workshop, NSO, Virtual
- 2020 2nd NCSP DKIST Data-Training Workshop, NSO, Cal State Northridge
- 2020 Heliophysics Summer School, UCAR, CU Boulder

Space-Based Telescope Observing/Planning Experience

- 2023 Interface Region Imaging Spectrograph (IRIS) - 4 weeks

Software Development

- Present PyREFT | Rewriting and expanding the numerical simulation code developed by [Longcope and Klimchuk](#) for efficiency and integration with scientific Python.
- 2017 US Elections Data Visualization App | Assisted Dr. Michael McDonald with the US Elections Project Team in creating automated election demographic visualization using R shiny.

Work

- 2015-2017 *Science Educator*, Oregon Museum for Science and Industry
- 2015-2017 *Tutor & Grader*, Reed College Dorothy Johansen House for Academic Support Services
- 2014-2016 *Line Chef* Pok Pok