Dr. Chris "Gilly" Gilbert iD 0000-0003-0021-9056   Résumé

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PROFESSIONAL SUMMARY

Solar and Heliophysicist seeking my next research position. My research centers on solar coronal magnetic fields, waves, and plasma physics, with emphasis on coronal heating and solar wind acceleration. I have broad experience with Heliospheric modeling—including polarized and spectral emissivity models, magnetic field relaxation schemes, NLTE ionization computations, and solar wind velocity solvers—as well as observational analysis with imagers, spectrometers, spectropolarimeters, and occulting coronagraphs. I have experience in optical and electronics labs and I'm an active Python/SunPy contributor, developing new imaging filters and analysis tools for the solar python ecosystem.

EDUCATION

- **2022 PhD** in **Astrophysical and Planetary Sciences:** University of Colorado, Boulder.
  - *"Spectroscopic Analysis and Image Processing of the Optically-Thin Solar Corona"*
- *Heliophysics Summer School (2017), Space Weather Workshop (2021)*
- **2018 MS** in **Astrophysical and Planetary Sciences** : University of Colorado, Boulder.
- **2015 BS** in **Physics (Astrophysics Concentration):** Georgia Institute of Technology, ΣΠΣ.

RESEARCH EXPERIENCE

- **PUNCH Mission Co-Investigator** with *Dr. Craig Deforest, SwRI* (01/2025-now)
  - Bringing funding to work with PUNCH data
  - Experience working with the Science Operation Center of a major space mission
- **Postdoctoral Research Scientist** with *Dr. Chris Lowder, SwRI* (01/2023-01/2026)
  - Simulate coronal magnetic topology with the Fluxon framework; explore solar wind acceleration along field lines, model plasma parameters throughout the heliosphere.
  - Develop and document data-processing procedures and analysis scripts (Python/SunPy) for coronal imagery and models.
  - Prepare technical figures; coordinate with instrument/modeling teams.
- **PUNCH Mission Associate Investigator** with *Dr. Sarah Gibson, HAO* (01/2021-01/2025)
  - Built forward models in IDL to simulate heliospheric white-light imagery and processing steps.
  - Supported image analysis pipelines and verification for observing coronal structures and solar wind evolution. Contributed to community strategy via decadal white papers focused on middle-corona science and space-weather drivers.
- **Graduate Research Assistant** for *Dr. Steven Cranmer, LASP, CU Boulder* (08/2016-12/2022)
  - Developed Python forward models to assess line-of-sight effects and nonequilibrium ionization in coronal spectroscopy.
  - Analyzed AIA/DKIST observations; produced reproducible workflows (SunPy, SolarSoft)
  - Published in ApJ and co-authored community papers; presented findings at AGU, AAS/SPD, SHINE, and TESS.

SELECTED PUBLICATIONS

- **Gilly, C.** & Molnar, M. (2026, in prep), Frontiers in Astronomy and Space Science *"Characterization of Coronal Alfvén Waves with DKIST Cryo-NIRSP."*
- **Gilly, C.** & Lowder, C. (2025, in prep), Solar Physics, *"Fluxons as scaffolding for solar wind velocity models"*
- Lowder, C, **Gilly, C.** (2025, in revisions) Solar Physics, *"Mapping Coronal Magnetic Field Connectivity using FLUX and a Potential Field."*
- **Gilly, C.** & Cranmer, S. R. (2025, in revisions), Solar Physics, *"Visualization of High Dynamic Range Solar Imagery and the Radial Histogram Equalizing Filter."*
- Lowder, C, **Gilly, C.**, Deforest, C. (2024), ApJ, *"Field Line Universal relaXer (FLUX): A Fluxon Approach to Coronal Magnetic Field Modeling."* http://doi.org/10.3847/1538-4357/ad2845
- West, M., …, **C. Gilly** et al. (2023). "*Defining the Middle Corona.*" Solar Physics. https://doi.org/10.48550/arXiv.2208.04485
- **Gilly, C.** & Cranmer, S. R. (2020). "*The Effect of Solar Wind Expansion and Nonequilibrium Ionization on the Broadening of Coronal Emission Lines.*" ApJ, 901(2), 150. https://doi.org/10.3847/1538-4357/abb1ad

LEADERSHIP & SERVICE

- Early Career Committee, AGU Space Physics & Aeronomy Executive Committee (2023–Present)
- Webmaster, AGU SPA Section (2020–present)
- Student Representative, SHINE Conference Steering Committee (2020–2022)
- Organizer/Host for SHINE Student Day and multi-day outreach programs (2017–2022)
- Member of AAS/SPD and AGU/SPA professional societies (2014–Present)

SELECTED OUTREACH AND VOLUNTEER WORK

- **Production Manager and Public Talk Facilitator** at *Fiske Planetarium* (2018-2022)
- **Public Speaker** (2018-2022)
    - *Fiske Planetarium*; Boulder, CO (2018-2022)
    - *WesterCon / Myths and Legends Convention*; Denver, CO (2018, 2019)
- **Public Observatory Host** (2013-2022)
    - *Sommers-Bausch Observatory*; Univ. of Colorado (2015-2022)
    - *GT Observatory;* Georgia Tech (2013-2015)

COMPUTER EXPERIENCE

- Data/Programming: Python, SunPy, IDL, MATLAB, C, LaTeX, Git, HTML, Generative AI
- Instruments: SDO/AIA, PUNCH, COMP, DKIST/Cryo-NIRSP
- Models: ZEPHYR, GHOSTS, FLUX, WSA, PFSS/NLFFF, FORWARD