Ann Sinclair

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EDUCATION

Northwestern University, Evanston, IL — Sept. 2023 – Present

- PhD in Earth and Planetary Sciences, Current GPA: 4.00 out of 4.00, Supervisor: Dr. Daniel Horton

Swarthmore College, Swarthmore, PA — May 2023

- B.A. in Astronomy and Environmental Studies (double major), GPA: 4.00 out of 4.00

EXPERIENCE

Research Assistant, *Northwestern University* — Sept. 2024 – Present

Advisor: Dr. Daniel Lecoanet

- Model atmospheric convection using fully-resolved, three-dimensional direct numerical simulations
- Assess the effects of moisture and background profile on thermal entrainment and growth rates

Research Assistant, *Northwestern University* — Sept. 2023 – Present

Advisor: Dr. Daniel Horton

- Characterize uncertainty among quantitative precipitation estimates (QPEs) of extreme rainfall events
- Analyze and compare data from rain gauges, radar and satellite products, and forecast models
- Model overland flow and landslides to determine how QPEs affect simulated land surface hazards

Astronomy Research Assistant, *Swarthmore College* — May 2021 – May 2023

Advisor: Dr. Eric Jensen

- Identified young eclipsing binary stars using Transiting Exoplanet Satellite Survey data
- Modeled data to determine stellar and orbital parameters of target binary systems
- Obtained and analyzed ground-based photometric and spectroscopic observations

Green Teams Intern, *PSEG Institute for Sustainability Studies, Montclair State University*

Summer 2022

- Collaborated with community non-profits to promote NJ Natural Gas energy efficiency programs in overburdened communities
- Worked as part of an interdisciplinary team of five undergraduate students
- Delivered weekly presentations to corporate and general audiences

Astronomy Research Assistant, *Swarthmore College* — Summer 2020

Advisor: Dr. Deborah Schmidt

- Analyzed radio observations of planetary nebulae for detections of HCN and HCO^+
- Assisted in writing a proposal for observation time on the ARO Submillimeter Telescope

Physics/Astronomy Teaching Assistant, *Swarthmore College* — Aug. 2020 – May 2023

- Held peer assistant positions in Spacetime and Quanta, Astronomy, and Climate Science courses
- Aided students with homework and in-class problems

- Worked with professors to create lesson plans, write test questions, and improve classes

Linguistics Teaching Assistant, *Swarthmore College* Aug. 2020-May 2021

- Assisted students with homework and concept comprehension
- Worked with professors to plan course work and evaluate written assignments

SKILLS/CERTIFICATIONS

- *Proficiency with*: Python – including NumPy, Pandas, Matplotlib, Xarray, Cartopy, and PyMC3; Microsoft Excel; LaTeX; ArcGIS Pro; Adobe Illustrator
- *Experience with*: Linux; NCL
- Editing and revision of creative and technical writing
- Certifications in teaching pedagogy (2020), science communication (2022), and leadership (2022)

ACTIVITIES

Board Member, Mentorship Opportunities for Research Engagement, *Northwestern University* Aug. 2024-Present

Volunteer, Letters to a Pre-Scientist Aug. 2024-Present

Peer Mentor, Graduate Out in STEM, *Northwestern University* Oct. 2023-Present

Secretary/Co-Founder, SwatVotes Club, *Swarthmore College* Feb. 2020 – May 2023

Writer, Phoenix Newspaper, *Swarthmore College* Aug. 2019 – May 2023

Participant, Bi-College Social Justice Institute, *Swarthmore College* Aug. 2019

HONORS/AWARDS

AGU Precipitation Technical Committee Student Award 2024

Oak and Ivy Award, *Swarthmore College* 2023

William C. Elmore Prize, *Swarthmore College Department of Physics and Astronomy* 2023

Phi Beta Kappa, *Swarthmore College* 2023

Sarah Kaighn Cooper Scholarship, *Swarthmore College* 2022

PUBLICATIONS/PRESENTATIONS

Sinclair, A. E., Oakley, N. S., Horton, D. E. (2024). *Uncertainty Among Hourly Precipitation Estimates for Shallow Landslide and Debris Flow Events in Southern California*. Lightning talk presented at: American Geophysical Union Fall Meting; Dec 10, 2024. https://agu24.ipostersessions.com/templates/iPosters/template6.aspx?s=65-CE-D2-D1-52-03-38-1B-2A-ED-80-A5-87-55-5B-E2

Sinclair, A. E., West, A. J., Clark, M. K., Horton, D. E. (2024). *Uncertainty in Precipitation Observations, Hindcasts, and Forecasts over Southern California for Post-Tropical Storm Hilary*. Poster presented at: Establishing Directions in Postfire Debris Flow Science Conference; May 20, 2024. https://drive.google.com/file/d/1jUWW3rkQop9ZOy-Gxi5BWd3C8UsqurLw/view

Schmidt, D. R., Gold, K. R., Sinclair, A., Bergstrom, S., & Ziurys, L. M. (2022). HCN and HCO+ in Planetary Nebulae: The Next Level. *The Astrophysical Journal, 927*(1), 46. https://doi.org/10.3847/1538-4357/ac4474

Sinclair, A. & Parts, C. (2021). Discovering Young Eclipsing Binaries with TESS. In C. Salyk & K. Masters (Eds.), *Proceedings of the 32nd Annual Keck Northeast Astronomy Consortium Undergraduate Symposium on Research in Astronomy* (pp. 107-112). https://drive.google.com/file/d/1v16q_Wo7FwHQwS4pBaIFIvsMELMndhqy/view

Sinclair, A., Parts, C., Jensen, E., McLeod, K., Collins, K., & Kielkopf, J (2021). *Discovering Young Eclipsing Binary Systems with TESS*. Poster presented at: TESS Science Conference II; August 2 & 5, 2021. https://doi.org/10.5281/zenodo.5122888