Shay Gilpin

Department of Applied Mathematics, University of Colorado, Boulder, CO
shay.gilpin@colorado.edu

Education

2023 *Doctorate in Philosophy*
University of Colorado, Boulder
Applied Mathematics. Current grade point average of 3.93 out of 4.00. Expected PhD completion in May, 2023. Advisor: Dr. Tomoko Matsuo.

2022 *Masters of Science*
University of Colorado, Boulder
Applied Mathematics.

2017 *Bachelor of Arts*
University of California Santa Cruz
Mathematics with a pure concentration, minor in Chemistry. Summa cum laude with highest honors in the major. Grade point average of 3.97 out of 4.00.

Fellowships

2019 *National Science Foundation Graduate Research Fellowship*
Five year graduate research fellowship funded through the National Science Foundation that supports outstanding graduate students in the science, technology, engineering, and mathematics disciplines. Awarded in April 2019.

Research Experience

2022 *National Science Foundation Graduate Research Fellow*
University of Colorado Boulder, August 2019 – present
Graduate research on covariance propagation associated with data assimilation funded by the National Science Foundation Graduate Research Fellowship. Advisor: Dr. Tomoko Matsuo

2019 *Visiting Scientist*
UCAR COSMIC Program, October 2017 – March 2019
Research scientist for two projects regarding scientific applications of radio occultation for the University Corporation for Atmospheric Research (UCAR) Constellation Observing System for Meteorology, Ionosphere and Climate (COSMIC) program. Advisor: Dr. Richard Anthes

2017 *SOARS Protegé*
UCAR, June – October 2017; June – August 2016
Significant Opportunities in Atmospheric Research and Science (SOARS) research intern at the COSMIC Program.

Publications

2022 **Gilpin, S.**, Matsuo, T., and Cohn, S.E., 2022: *Continuum covariance propagation for understanding variance loss in advective systems, SIAM/ASA J. Uncertainty Quantification*, 10, 886 – 914, https://doi.org/10.1137/21M1442449.

2019 **Gilpin, S.**, Anthes, R., and Sokolovskiy, S., 2019: *Sensitivity of forward-modeled bending angles to vertical interpolation of refractivity for radio occultation data assimilation, Mon. Wea. Rev.*, 147, 269 – 289, https://doi.org/10.1175/MWR-D-18-0223.1

2018 **Gilpin, S.**, Rieckh, T., and Anthes, R., 2018: *Reducing representativeness errors during radio occultation – radiosonde comparisons, Atmos. Meas. Tech.*, 11, 2567 – 2582, https://doi.org/10.5194/amt-11-1-2018.

Conference Activity

2021 **Gilpin, S.**, Matsuo, T., and Cohn, S. E.: *Continuum covariance propagation for understanding variance loss in advective systems.* Poster Presentation, WCRP-WWRP Joint Symposium on Data Assimilation and Reanalysis (virtual), September 12 – 18, 2021.

Gilpin, S., Matsuo, T., and Cohn, S. E.: *Continuum covariance propagation for understanding variance loss in advective systems.* Contributed Presentation, Society for Industrial and Applied Mathematics (SIAM) Conference on Mathematical & Computational Issues in the Geosciences (virtual), June 21 – 24, 2021.

Gilpin, S., Matsuo, T., and Cohn, S. E.: *Continuum covariance propagation for understanding variance loss in advective systems.* Oral Presentation, International Symposium on Data Assimilation (virtual), March 12, 2021.

2019 **Gilpin, S.**: *Bringing science to the next generation: the impacts of Richard Anthes on a young scientist's carrer.* Invited Oral Presentation, American Meteorological Society Annual Meeting, Phoenix, AZ, 2019.

Gilpin, S., Rieckh, T., and Anthes, R.: *Reducing representativeness errors during radio occultation – radiosonde comparisons.* Oral Presentation, American Meteorological Society Annual Meeting, Phoenix, AZ, 2019.

2018 **Gilpin, S.**, Anthes, R., Sokolovskiy, S., and Rieckh, T.: *Calculation of radio occultation bending angles from models: sensitivity to vertical interpolation methods.* Oral presentation, American Meteorological Society Annual Meeting, Austin, TX, 2018.

2017 **Gilpin, S.**, Anthes, R., Sokolovskiy, S., and Rieckh, T.: *Calculation of radio occultation bending angles from models: sensitivity to vertical interpolation methods.* Poster presentation, COSMIC/IROWG Workshop, Estes Park, CO, 2017.

Gilpin, S., Rieckh, T., Anthes, R., and Lu, G.: *An elliptical approach to radio occultation and radiosonde comparisons.* Poster presentation, American Meteorological Society Annual Meeting, Seattle, WA, 2017.

Honors and Awards

2021 *Society for Industrial and Applied Mathematics Travel Award*
Travel award for attendance at the Society for Industrial and Applied Mathematics Conference on Mathematical & Computational Issues in the Geosciences, June 21 - 24, 2021.

2019 *American Meteorological Society Conference Best Student Presentation*
Best student presentation at the 23rd Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS) Conference at the American Meteorological Society Annual Meeting, Phoenix, AZ, 2019.

Academic Service, Mentoring, and Scientific Outreach

2022 *Applied Mathematics Graduate Student Mentor*
University of Colorado Boulder, July 2019 – May, 2020, July 2021 – May 2022, July 2022 – present
Mentorship program for first year graduate students in the Applied Mathematics Department, providing advice and support through the first year in the program.

AWM/SIAM Study Session Coordinator
University of Colorado Boulder, January 2020 – May 2022
One of two coordinators for the Association for Women and Math (AWM)/Society for Industrial and Applied Mathematics (SIAM) study sessions for Calculus 1/2/3 and Differential Equation courses. Includes scheduling facilitators, locations, and times for the study sessions, and helping run both in-person and virtual study sessions.

2021 *Center for Teaching and Learning Lead*
University of Colorado Boulder, May 2020 – May 2021
One of two lead teaching assistants for the Applied Mathematics Department, serving as a resource for department teaching assistants and liaison between department and the Center for Teaching and Learning.

Gilpin, S.: *Mathematics of the atmosphere and how we predict the weather.* Oral Presentation, CU Boulder STEMinar Series, April 6, 2021.

2019 *Graduate School Peer Mentor*
University of Colorado Boulder, August – December 2019
Mentor for a first year PhD physics student, providing support and mentorship through the first semester of graduate school.

SOARS Mentor
UCAR, May – August 2019
Mentor for a SOARS Protegé through the UCAR. Included mentoring in research skills, presenting scientific research, and the graduate school application process.

2017 *President*
Slugs United by Mathematics, University of California Santa Cruz, August 2016 – June 2017

Teaching Experience

2020 *Teaching Assistant*
University of Colorado Boulder, August 2018 – May 2019, August 2020 – December 2020.
Teaching assistant for Calculus 1, 2 for Engineers and Teaching Excellence course on teaching pedagogy. Calculus courses required teaching weekly recitations for about 65 students, writing weekly quizzes and worksheets, hosting office hours, grading quizzes, homework, and exams.

Teaching Excellence course required lesson planning, running weekly classes. Experience in teaching both in-person and remote classes.

2015 *Teaching Assistant*
University of California Santa Cruz, January – March 2015
Teaching assistant for Extreme Environmental Virology in both the lecture and wet lab portions of the course, including set up, running, and clean up of the wet lab and scientific writing assistance.

Memberships

2022 *Society for Industrial and Applied Mathematics*
Member of the Society for Industrial and Applied Mathematics (SIAM) and the University of Colorado, Boulder SIAM Chapter.

Association for Women in Mathematics
Member of the Association for Women in Mathematics (AWM) University of Colorado, Boulder Chapter.