GABRIELLA (GABI) SEIFERT

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EDUCATION

Scripps College, Claremont, CA **Graduated 2023**
Bachelor of Arts in Physics, Minor in German, GPA 3.99, Summa Cum Laude

University of Colorado Boulder, Boulder, CO **Exp. 2028**
PhD in Physics

RESEARCH EXPERIENCE

University of Colorado Boulder, Kapteyn-Murnane Group / ***Research Assistant*** **May 2024 - Present**
Boulder, CO

- Optimizing ultrafast pulses from an optical parametric chirped pulse amplification system to drive high-harmonic generation
- Building a multi-pass cell to temporally compress ultrafast pulses by balancing self-phase modulation and anomalous chromatic dispersion
- Developing crystal metallization processes to mount and cool optical crystals

W.M. Keck Science Department of the Claremont Colleges, Physics / ***Senior Thesis Student*** **Aug 2022 - May 2023**
Claremont, CA

- Independently built optical tweezers; aligned laser, calibrated camera, and troubleshot issues with extensive research to create a functioning optical trap

W.M. Keck Science Department of the Claremont Colleges, Physics / ***Research Assistant*** **May 2021 - Aug 2021**
Claremont, CA

- Conducted research involving chemical concentration prediction by networks of E. coli
- Independently modeled E. coli networks in Python, solved differential equations, utilized regression analysis to create predictions, applied results to video prediction, and analyzed accuracy

W.M. Keck Science Department of the Claremont Colleges, Physics / ***Research Assistant*** **May 2020 - Apr 2022**
Claremont, CA

- Conducted research involving motion patterns and regeneration of single-celled organism Stentor coeruleus
- Surveyed literature, analyzed data in Python, wrote up results, and coordinated with publishers

PUBLICATIONS

D. Morrill, W. Hettel, D. Carlson, B. Shearer, C. Klein, J. Thurston, G. Golba, R. Larsen, **G. Seifert**, J. Uhrich, D. Lesko, T. N. NGuyen, G. Arisholm, J. Knight, S. Diddams, M. Murnane, H. Kapteyn, M. Hemmer; Soft x-ray high-harmonic generation in an anti-resonant hollow core fiber driven by a 3 μm ultrafast laser. APL Photonics 1 November 2025; 10 (11): 116101. https://doi.org/10.1063/5.0292771

Seifert, G., Sealander, A., Marzen, S., Levin, M., "From reinforcement learning to agency: Frameworks for understanding basal cognition." (2024) Biosystems, Volume 235, 105107, ISSN 0303-2647, https://doi.org/10.1016/j.biosystems.2023.105107

Seifert, G., "Optical Tweezers: Exerting Force with Light" (2023). Scripps Senior Theses. 2015. https://scholarship.claremont.edu/scripps_theses/2015

Sheung, J. Y., Otsuka, M., **Seifert, G.**, Lin, A., Marshall, W. F., "Analysis of Motility Patterns of Stentor During and After Oral Apparatus Regeneration Using Cell Tracking." J. Vis. Exp. (170), e62352, doi:10.3791/62352 (2021). https://www.jove.com/v/62352

PRESENTATIONS

Seifert, G. "Comparison of multi-pass cell and anti-resonant hollow core fiber mid-IR self-compression," Frontiers in Optics + Laser Science, Denver, CO, October 2025

Seifert, G. "Soft X-ray high-harmonic generation in an anti-resonant hollow core fiber driven by a 3 μm ultrafast laser," JILA Posterfest, Boulder, CO, Poster, May 2025

Seifert, G. "Two-optical cycle 3 μm mid-IR pulses via multi-pass cell nonlinear self-compression," Frontiers in Optics + Laser Science, Denver, CO, September 2024

Seifert, G., "Optical Tweezers: Exerting Force with Light," Scripps College Capstone, Claremont, CA, May 2023

Seifert, G. "Frameworks for understanding goal-directed agents," American Physical Society March Meeting, Las Vegas, NV, Poster, March 2023

Seifert, G. "Environment prediction by E. coli," Keck Science Summer Research Symposium, Claremont, CA, September 2021

Sheung, J. Y., Seifert, G., "Motility and Behavior of S. Coeruleus During Regeneration," 65th Biophysical Society Annual Meeting, Poster, February 2021

TEACHING EXPERIENCE

University of Colorado Boulder / ***Teaching Assistant*** **Aug 2023 - May 2024**
Boulder, CO

- Taught introductory electromagnetism using small-group tutorials, short lessons, and in-class experiments
- Provided one-on-one support and mentoring to students outside of the classroom through the Physics Helproom, as well as in grading and proctoring tests

Quantitative and Computing Lab of Claremont McKenna College / ***Head Mentor*** **Aug 2021 - May 2023**
Claremont, CA

- Independently designed lessons around core concepts to address gaps in students' knowledge, mentored students individually or in small groups
- Organized teams of 3-5 mentors to teach physics students core concepts, prepare for tests, or help with homework

Scripps College Academy / ***Teaching Assistant*** **Aug 2022 - Nov 2022**
Claremont, CA

- Collaborated with an academic advisor to develop a semester-long curriculum to introduce 5 high-achieving underrepresented highschool students to a biophysics lab environment as a part of the Math and Science Scholars program
- Independently led discussions with students, introduced the scientific method and how to keep a lab notebook; guided students through creating a hypothesis, slide preparation, using a confocal microscope, and digital analysis of particle motion

Graz International Bilingual School / ***Teaching Assistant*** **May 2022 - Aug 2022**

Graz, Austria

- Created lesson plans in English and German for highschool physics classes; independently taught classes on nuclear physics; mentored small groups of students in physics projects

Scripps College / ***German Department Tutor*** **Jan 2021 - May 2021**
Online

- Guided advanced German students in presentation preparation and speaking

AWARDS

- NSF Graduate Research Fellowship Program (GRFP) recipient, 2025
- CU Physics Award for TA Excellence, for outstanding contributions to the Phys 1240 teaching team, both working individually with students and suggesting ideas to improve the class, 2024
- Barbara McClintock Award, awarded for the best senior thesis written by a graduating Scripps senior in the sciences, 2023
- Annual Alumnae Award, in recognition of outstanding contributions to the life of the College, Scripps College, 2023
- Merle A. and Edith G. Potter Award, given annually to a student excelling in German, Scripps College, 2023
- Elected to membership in the Phi Beta Kappa academic honor society, Scripps College, 2023
- Scripps College Dean's List, Fall 2019, Spring 2020, Fall 2020, Fall 2021, Spring 2022, Fall 2022, Spring 2023
- Award for excellence in undergraduate research, The Claremont Chapter of Sigma Xi, 2022
- National Merit Scholarship, 2019

SKILLS

- Proficient in Python, MATLAB, Mathematica, and Maple
- German (native fluency)