Lily Gebhart

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Education

Occidental College   *Los Angeles, CA*
GPA: 3.96 out of 4.00   *Aug. 2021 - Present*
B.A. in Cognitive Science, Mathematics
Minors in Neuroscience, Computer Science

Awards and Honors

Sept. 2024	**Phi Beta Kappa Honor Society Member**: One of ten early inductees from the 2025 graduating class.
Mar. 2024	**Barry Goldwater Scholarship**: Prestigious $7,500 national scholarship for excellence in the sciences.
Apr. 2022	**General Chemistry Award**: Award for Excellence in Foundations of General Chemistry
Fall 2021 - Present	**Margaret Bundy Scott Scholarship**: A $120,000 Merit Scholarship for study at Occidental College

Research

Integrated Mechanisms for Modeling Long-Term Memory Retrieval   *Occidental College, CA*
Mentor: Justin Li (Occidental College, Computer Science & Cognitive Science)   *Feb. 2022 - Present*
- Designed computational experiments to assess the relationship between two factors that impact long-term memory retrieval (co-occurrence and semantics).

Neuroimaging-Informed Multilevel Modeling with Applications to Working Memory   *University of Missouri, MO*
Mentors: Satish Nair (University of Missouri, Electrical Engineering), Walt Omelyusik (PhD Candidate)   *May 2024 - Present*
- Synthesized recent work in mathematical and biophysical multi-level neural modeling for a review paper, and developed open-access python implementations of two biophysical models: the Synaptic Source Mixing Model and Dynamic Causal Model.

The Effect of Love on Durational Time Perception   *Occidental College, CA*
Mentors: Carmel Levitan (Occidental College, Cognitive Science), Aysha Motala (University of Stirling, Psychology)   *Dec. 2022 - Present*
- Proposed, designed, collected human participants data for and analyzed two psychophysics experiments to assess the effects of strong, positive emotions on short duration time perception. Facilitated an international research team, and mentored six research assistants at Occidental and Stirling to assist with data collection.

Adjustments for Kurtosis and Continuity on the Prentice Test   *Rutgers University, NJ*
Mentor: John Kolassa (Rutgers University, Statistics)   *May 2023 - Jul. 2023*
- Developed and implemented improved approximations to the Prentice test and related tests for kurtosis and continuity via simulations in R.

Simulated Muography for Detection of Dynamic Border Tunnels   *Occidental College, CA*
Mentor: Daniel Snowden-Ifft (Occidental College, Physics)   *May 2022 - Aug. 2022*
- Produced evidence for the feasibility of the detection of underground tunnels with particle (muon) borehole detectors via dynamic simulations in R.

Publications

[1] **L. Gebhart**, D. Snowden-Ifft. (2023). Muon Tomography for Detection of Dynamic Border Tunnels, *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 1053*, 168383.

[2] **L. Gebhart**, J. Kolassa (2024). Adjustments for Kurtosis and Continuity on the Prentice Test. *Advances in Pure Mathematics*, 14(2), 101-117.

[3] V. Omelyusik, **L. Gebhart**, S. Nair (2024). Communication in Brain Circuits and Systems: A Primer. *IEEE International Symposium on Circuits and Systems Conference Journal*, Under Review.

[4] **L. Gebhart**, C. Levitan, A. Motala (2024). A User-Friendly Framework for Short Duration Visual Time Perception. *Timing and Time Perception*. Journal Article in Preparation.

[5] V. Omelyusik, **L. Gebhart**, Nair, S. (2024). Communication in Brain Circuits and Systems. Journal Article in Preparation.

[6] **L. Gebhart**, J. Li (2025). Integrated Co-Occurrent and Semantic Mechanisms for Long Term Memory Retrieval. *International Conference for Cognitive Modeling*. Conference Journal Article In Preparation.

Presentations

[1] **Gebhart, L.** (Nov. 2024) Integrated Co-occurrent and Semantic Mechanisms for Modeling Long Term Memory Retrieval [Poster conference presentation]. 2024 Southern California Conference for Undergraduate Research. California State University San Bernadino, San Bernadino, CA, United States.

[2] **Gebhart, L.** (Aug. 2024) Integrated Co-occurrent and Semantic Mechanisms for Modeling Long Term Memory Retrieval [Poster conference presentation]. 2024 Summer Research Program Conference. Occidental College, Los Angeles, CA, United States.

[3] **Gebhart, L.** (Apr. 2024) Adjustments for Kurtosis and Continuity on the Prentice Test [Poster conference presentation]. National Conference for Undergraduate Research. California State University Long Beach, Long Beach, CA, United States.

[4] **Gebhart, L.** (Apr. 2024) The Effect of Love on Durational Time Perception [Oral campus presentation]. Occidental College Cognitive Science Department Advanced Research Talks. Occidental College, Los Angeles, CA, United States.

[5] **Gebhart, L.** (Jan. 2024) Adjustments for Kurtosis and Continuity on the Prentice Test [Oral conference presentation]. National Conference for Undergraduate Women in Mathematics. University of Nebraska - Lincoln, Lincoln, NE, United States.

[6] **Gebhart, L.** (Nov. 2023) Adjustments for Kurtosis and Continuity on the Prentice Test [Oral conference presentation]. 2023 Southern California Conference for Undergraduate Research. California State University Fullerton, Fullerton, CA, United States.

[7] **Gebhart, L.** (Nov. 2023) Adjustments for Kurtosis and Continuity on the Prentice Test [Oral campus presentation]. Occidental College Math Department Student REU Talks. Occidental College, Los Angeles, CA, United States.

[8] **Gebhart, L.** (Jul. 2023) Adjustments for Kurtosis and Continuity on the Prentice Test [Oral conference presentation]. 2023 Discrete Mathematics and Theoretical Computer Science (DIMACS) NSF REU Program Conference. Rutgers University, Piscataway, NJ, United States.

[9] **Gebhart, L.** (Nov. 2022) Simulated Muography for Detection of Dynamic Border Tunnels [Oral conference presentation]. 2022 Southern California Conference for Undergraduate Research. Pepperdine University, Malibu, CA, United States.

[10] **Gebhart, L.** (Aug. 2022) Simulated Muography for Detection of Dynamic Border Tunnels [Oral conference presentation]. 2022 Summer Research Program Conference. Occidental College, Los Angeles, CA, United States.

Fellowships and Grants

Missouri Neuroscience Research Experience for Undergraduates (REU)   *University of Missouri, MO*

Supported by NSF Grant CNS-1950787   May 2024 - Present

Funding by the National Science Foundation for a 7 month part-time remote research fellowship at the University of Missouri-Columbia, MO.

Science Scholars Fellowship   *Occidental College, CA*

Supported by the Fletcher-Jones Foundation   Jan. 2024 - Present

A selective $15,000 scholarship grant supporting 15 months of research during the Spring 2024, Fall 2024, and Spring 2025 semesters and participation in the Occidental College Summer Research Program for the project, "Integrated Mechanisms for Long Term Memory Retrieval".

Discrete Mathematics and Theoretical Computer Science NSF REU   *Rutgers University, NJ*

Supported by NSF Grant CNS-2150186   May 2023 - Jul. 2023

Funding by the National Science Foundation for a 3 month full-time summer research fellowship at Rutgers University, NJ.

Academic Student Project Travel Grants   *Occidental College, CA*

Supported by the Occidental College Undergraduate Research Center   Dec. 2023, Mar. 2024

Funding for travel and registration expenses related to my attendance of the 2024 National Conference for Undergraduate Women in Mathematics at the University of Nebraska-Lincoln, NE and the 2024 National Conference for Undergraduate Research in Long Beach, CA.

Student Research Assistantship Program Fellowships   *Occidental College, CA*

Supported by the Undergraduate Research Center Funds at Occidental College   Spring, Fall 2023

A $750 research grant supporting 50 hours of research during the semester for the projects, "The Effect of Love on Durational Time Perception" (Fall 2023) and "Integrated Mechanisms for Long Term Memory Retrieval" (Spring 2023).

Academic Student Project Grants   *Occidental College, CA*

Supported by the Occidental College Undergraduate Research Center   Aug. 2023, Jan. 2024

Two $300 grants for funding participant compensation for the project, "The Effect of Love on Durational Time Perception".

Research Early Access Program   *Occidental College, CA*

Supported by the Sherman Fairchild Foundation   May 2022 - Aug. 2022

Funding for a 3 month full-time summer research fellowship at Occidental College, CA.

Teaching & Professional Experience

Program Co-Coordinator
Occidental College, CA

Scientific Scholars Achievement Program
Apr. 2023 - Present

- Overseeing, interviewing, hiring, and training a body of 20 tutors serving students in introductory courses in seven STEM disciplines.
- Introduced initiatives to increase attendance and boost SSAP's campus presence by hosting beginning of semester welcome events, introducing attendance tracking measures, redesigning training, and developing targeted advertising initiatives.

Mathematics Tutor
Occidental College, CA

Scientific Scholars Achievement Program
Nov. 2022 - Present

- Assist students with homework and exam preparation of introductory and advanced undergraduate mathematics courses twice weekly.

Teaching Assistant: Computational Neuroscience
Occidental College, CA

Occidental College Cognitive Science Department
Jan. 2024 - May 2024

- Hosted office hours to help students with and graded lab assignments weekly.
- Organized and taught exam review workshops with 60+% student attendance prior to exams.
- Taught one week of lecture and lab sections on the operation of artificial neural networks.

Curriculum Assistant
Remote

Boundless Brilliance
Jun. 2023 - Aug. 2023

- Restructured and updated the organization's body of 300+ experiments and activities for presentations to students in grades K-6.
- Illustrated a STEM coloring book, and developed 12 summer STEM packets and workshop series for college chapters.

Teaching Assistant: Fundamentals of Computer Science & Data Structures
Occidental College, CA

Occidental College Computer Science Department
Jan. 2023 - May 2023

- Attended lab sections weekly, held weekly office hours for both courses, and graded projects.

Ordinary Differential Equations Grader
Occidental College, CA

Occidental College Mathematics Department
Aug. 2022 - Dec. 2022

- Created a rubric and graded students' homework for Ordinary Differential Equations weekly.

Activities & Leadership

Board Member
Los Angeles, CA

Boundless Brilliance Nonprofit
Nov. 2023 - Present

- Assisted in restructuring the board mission and activities to better support college chapters.
- Organize and run events for the organization, including a board retreat (Feb. 2023), a booth at Los Angeles's City of STEM (Apr. 2024, 2025) and a board-chapter leadership summit (Sep. 2024).

Student Board Member
Los Angeles, CA

Boundless Brilliance Nonprofit
Nov. 2022 - Nov. 2023

- Served a one-year term as Student Board Member as the voice for the undergraduate chapters of the organization.

Chapter Outreach Co-coordinator
Occidental College, CA

Boundless Brilliance
July 2024 - Present

- Organizing the Occidental Boundless Brilliance chapter's elementary school STEM fairs in Nov. 2024 and Mar. 2025.
- Manage a small team of volunteers in coordinating elementary school presentations.

Chapter President
Occidental College, CA

Boundless Brilliance
May 2022 - May 2024

- Led and supported the Boundless Brilliance chapter at Occidental College in providing presentations and community events to increase diversity in STEM and encourage K-6 students and undergraduates to embrace their potential.
- Initiated and managed the organization of the chapter's first annual STEM Fair in Spring 2024 with 100+ attendees.
- Implemented initiatives to encourage club involvement on campus by creating weekly all team meetings and simplifying recruitment procedures. Restructured and expanded event opportunities for elementary school presentations.

Co-Treasurer
Occidental College, CA

Dance Production
May 2022 - May 2023

- Organized and ran five fundraisers throughout the year, managed ticket sales for three shows in March 2023, and maintained a club budget.

Technical Skills

Programming	Python, R, MATLAB, Java
Software	PsychToolBox3, Neuron, Qualtrics, SPSS
Drawing & Typesetting	Microsoft Suite, LaTeX, Adobe Creative Suite, Canva