

## Christian Lentz

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### Education

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Macalester College | St. Paul, Minnesota | 09/2020 - 05/2024

- Double BA in Mathematics and Computer Science
- Summa Cum Laude
- Honors Thesis: Persistent Relative Homology for Topological Data Analysis
- Advisors: Lori Ziegelmeier, Susan Fox

Oxford University | Oxford, England, United Kingdom | 01/2023 - 06/2023

- Visiting Student at St. Catherine's College, Mathematics
- Relevant Coursework: Real Analysis, Groups and Group Actions, Number Theory

University of Wisconsin | Madison, Wisconsin | 06/2022 - 08/2022

- Visiting Student, Mathematics
- Relevant Coursework: Ordinary Differential Equations, Combinatorics

### Experience

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Food Server | 07/2021 - Current

Crossover Cantina and Eatery - Waterford, WI

Teaching Assistant | 01/2022 - 05/2024

Macalester College MSCS Department - St. Paul, MN

- Worked with professors and students in four courses: Linear Algebra, Introduction to Statistical Modeling, Computational Geometry, Algorithms.
- Attended lectures and held office hours twice weekly.
- Graded submitted code, proofs and problem sets.

Undergraduate Research Assistant | 05/2023 - 07/2023

University of Minnesota - Minneapolis, MN

- Advisors: Lori Ziegelmeier ([lziegell@macalester.edu](mailto:lziegell@macalester.edu)), Macalester College and Greg Henselman-Petrusek ([gregory.roek@pnnl.gov](mailto:gregory.roek@pnnl.gov)), Pacific Northwest National Laboratory.
- Research in Algebraic and Computational Topology.
- In progress contribution to open-source project [Open Applied Topology](#) using the Rust programming language.

## QA Engineering Intern | 06/2022 - 01/2023

Maverick Software Consulting - Minneapolis, MN

- Contracted with TravelNet Solutions in Cottage Grove, MN.
- Supervisor: Tracy Olhausen ([tracyolnhausen@gmail.com](mailto:tracyolnhausen@gmail.com)), Senior Director of Quality.
- Manual and automated software testing with two development teams: API and Finance.
- Reproduction and documentation of bugs in production code.
- Contributed to automated test framework; JavaScript, Playwright, CSS.
- Experience with agile development / scrum teams.
- Frequent participation with code review and Github issue management.

## **Talks and Presentations**

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### *A Computational Approach for Persistent Relative Homology*

- 2023 Fall Meeting of the Mathematical Association of America, North Central Section, University of Minnesota-Duluth, September 2023
- Macalester College Summer Showcase, St. Paul, MN, October 2023
- AIM-AMS Special Session on Applied Topology Beyond Persistence Diagrams, 2024 Joint Mathematics Meetings, San Francisco, CA, January 2024
- PME Undergraduate Student Poster Session, 2024 Joint Mathematics Meetings, San Francisco, CA, January 2024

### *Persistent Relative Homology for Topological Data Analysis*

- Undergraduate Honors Defense, Macalester College Department of Mathematics, Statistics and Computer Science, St. Paul, MN, April 2024

## **Publications**

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G. Henselman-Petrusek\*\*, C. Lentz\*, X. Xia\*, L. Ziegelmeier\* (2024). *A computational approach for persistent relative homology*. [manuscript in preparation]. Department of Mathematics, Statistics and Computer Science, Macalester College\*. Pacific Northwest National Laboratory\*\*.

## **Awards and Honors**

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Konhauser Achievement Award for Mathematics, Macalester College, 2024

## **Languages and Technical Skills**

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Proficient: Python, Java, JavaScript and Node.js, R and RStudio, Rust, C

Intermediate: HTML, CSS, Mathematica, Spanish

Frameworks / SDKs: Playwright, Google Firebase