

# Rhea Kommerell

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## Education

University of California at Los Angeles

2029 (expected)

Ph.D. in Mathematics

University of California at Berkeley

2024

B.A. in Mathematics · High Honors · GPA 3.97

## Research & Projects

Linear Preservers of Lorentz Spectra (UCSB REU)

June – Aug. 2022

- Determined a closed form for linear maps of  $3 \times 3$  matrices preserving the Lorentz spectrum

Fast Linguistic Data Collection with BERT

June – Dec. 2021

- Designed algorithms to detect context-specific meanings of given words
- Used Git for version control, TensorFlow and HuggingFace for machine learning models
- Accepted at conferences: Methods XVII, NWAV 50

## Publications & Preprints

- **Linear maps preserving the Lorentz spectrum of  $3 \times 3$  matrices.**

M. I. Bueno, Ben Faktor, Rhea Kommerell, Runze Li, Joey Veltri.

*Involve: A Journal of Mathematics*, **17.1**, 121-152. [arXiv:2209.00214](https://arxiv.org/abs/2209.00214). 2024.

- **A computational approach to detecting the envelope of variation.**

Isaac Bleaman, Rhea Kommerell.

Forthcoming in *Linguistics Vanguard*.

## Outreach & Teaching

Junior Staff, Hampshire College Summer Studies in Mathematics

2023 – Present

- Closely mentor talented high school students in college-level math
- Designed 7-day exploratory course on Category Theory
- Inquiry-based learning requires me to think on my feet at the board

President, Berkeley Math Undergraduate Student Association

2021 – 2024

- Facilitate communication and productivity within officer team
- Plan and host weekly social, professional, and academic events open to all Berkeley undergrads
- Interface with Math Department to connect undergraduates, graduate students, and faculty

Lead Instructor, Introduction to Category Theory

2023 – 2024

- Course content follows *Category Theory in Context*, Emily Riehl
- Plan syllabus and coordinate team of instructors
- Give lectures and grade assignments

Instructor, Transition to Upper Division Math

Spring 2023

- Prepared course material, including exercises and course notes
- Led lectures and discussion sections for Propositional Logic unit

Mentor, Berkeley Undergraduate Mathe-mentoring Program

2022 – 2024

- Provide individualized support and group mentorship to students new to the department, especially transfers

Peer Advisor, Berkeley Math Department

Fall 2022

- Created blog discussing strategies to make the most of the math major
- Held weekly office hours to advise students one-on-one

#### Associate Mentor, Computer Science Mentors

2021 – 2022

- Led supplemental section to help struggling students understand Python

### Talks & Presentations

*The right “Choice” in infinite guessing games*

Chalk talk, HCSSiM ..... July 2023, July 2024

*DVRs and separatedness*

Chalk talk, *The Rising Sea* Reading Group ..... May 2023

*Basis-free determinant and trace*

Chalk talk, Berkeley Seminar for Undergraduate Mathematics ..... April 2023

*Linear preservers of Lorentz spectra*, with Runze Li

Poster, Joint Mathematical Meetings ..... January 2023

*Detecting the envelope of variation using computational language models*, with Isaac Bleaman

Slides, New Ways of Analyzing Variation ..... October 2022

*Linear preservers of Lorentz spectra*, with Runze Li

Slides, Young Mathematicians Conference ..... August 2022

### Achievements

- Dorothea Klumpke Roberts Prize 2024
- Nominated by UC Berkeley Math Department for Alice T. Schafer Mathematics Prize
- Dean’s List Spring 2021
- UC Berkeley Regents’ and Chancellor’s Scholar
- Scholarship Foundation of Santa Barbara Kenneth & Margaret Millar Honors Scholarship
- National Merit Scholar

### Relevant Skills

#### Languages

English and German

#### Programming Languages

Python, C, Java,  $\text{\LaTeX}$