

# Sophia Elia

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**Pronouns:** She/her

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## Education

<b>Freie Universität Berlin</b>	Germany
Ph.D. in Mathematics, Defended March 2022	2018 – 2022
Advisors: Christian Haase and Jean-Philippe Labbé	
<b>Freie Universität Berlin</b>	Germany
Master of Science in Mathematics	2016 – 2018
<b>University of California, Berkeley</b>	USA
Bachelor of Arts in Pure Mathematics (Honors)	2012 – 2016

## Work Experience

<b>Keysight Technologies</b>	Santa Rosa, California
Software Engineer	2022-Present
Program FPGAs. Collect and analyze data. Design and test algorithms for automatic level control and digital signal processing.	
<b>Vantage Point History</b>	Rapid City, South Dakota
Scientific Consultant, As needed	2021-2022
Create explanations of research in the physical sciences for historians and the layperson. Organize data in spreadsheets.	
<b>Lawrence Berkeley National Laboratory</b>	Berkeley, California
Student Researcher for the Majorana Demonstrator Experiment	2013-2016

## Honors

Scholar of the Facets of Complexity Research Training Group	2018 – 2022
Scholarship holder (Berlin Mathematical School)	2016 – 2018
Haas Scholar (2015), Bergeron Scholar (2015), Cal NERD Scholar (2015), PROTON Scholar (2015), Cal Alumni Leadership Award Scholar (2012), Davis-Bahcall Scholar (2012)	

## Publications

<b>Techniques in Equivariant Ehrhart Theory</b>	
With Donghyun Kim and Mariel Supina	
<i>Annals of Combinatorics</i> , 2023, DOI: 10.1007/s00026-023-00673-z	
<b>Rational Ehrhart Theory</b>	
With Matthias Beck and Sophie Rehberg	
<i>Integers</i> , 2023, <a href="https://math.colgate.edu/~integers/x60/x60.pdf">https://math.colgate.edu/~integers/x60/x60.pdf</a>	

## Publications Cont.

### **Multivariate Volume, Ehrhart, and $h^*$ Polynomials of Polytopes**

With Marie-Charlotte Brandenburg and Leon Zhang

*Journal of Symbolic Computation*, 2023, DOI: 10.1016/j.jsc.2022.04.011

### **On Three Ehrhart Theories & Simplicial Hyperplane Arrangements**

*Freie Universität's Refubium*, Dissertation, 2022, DOI: 10.17169/refubium-34540

### **Congruence Normality of Simplicial Hyperplane Arrangements via Oriented Matroids**

With Michael Cuntz and Jean-Philippe Labbé

*Annals of Combinatorics*, 2021, DOI: 10.1007/s00026-021-00555-2

## Skills

Team player, Fast learner, Organized, Enjoys teaching and helping people.  
Excellent written and verbal communication skills.

### **Languages**

English (native), German (advanced), Italian (basic)

### **Programming**

Proficient in: Microsoft Suite, python, VHDL,  $\LaTeX$ , GitHub, pandas

Experience with: Matlab, C++, perl, verilog, R, machine learning

## Service & Outreach

### **Volunteering**

Nature Walk Leader with San Francisco Nature Education 2024-2025

Transcriber for Buddha at the Gas Pump 2024

Helper at Redwood Empire Food Bank 2024

Helper at Pepperwood Nature Preserve 2023

**Reviewer for Annals of Combinatorics** 2022

**Berlin Mathematical School Student Representative** 2018 – 2020

*Represent BMS students at board meetings, present motions on students' behalf,*

*organize BMS student conference, lead social activities*

## Teaching Experience

**Presented Over 20 Conference Talks and Seminar Lectures** 2018-2022

**Bachelor's Thesis Co-Advisor (with Prof. Matthias Beck)** Summer 2021

**Organizer, Discrete Geometry Graduate Student Seminar** 2020 – 2022

**Grader, Mathematics (Freie Universität Berlin)** Winter 2019 – 2020

Discrete Geometry 3, Course instructor: Matthias Beck

**Tutoring** 2015-2016

Middle school through college math: algebra, fractions, calculus, group theory

## Other Interests

Music, knitting, film photography, flora and fauna of California