

# Jae Hyung (John) Sim

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## Education

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<i>Ph.D. Mathematics [Candidate]</i> Boston University Advisor: Glenn Stevens	Started September 2019 Boston, MA
<i>B.A. Mathematics with Honors; Minor in Computer Science</i> University of Chicago	Completed June 2019 Chicago, IL
<i>High School Diploma</i> Milton Academy	Graduated June 2015 Milton, MA

## Graduate Experience

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### *Seminars*

Boston University Number Theory Expository Seminar (BUNTES)

- Organizer in Spr 2022 on Class Field Theory.
- Organizer in Aut 2020 on Complex Multiplication.
- Talks Given:
  - Construction of Analytic Theta Cocycles - Sum 2022 [Qualifying Exam]
  - Stark's Conjectures - Spr 2022
  - Explicit and Cohomological Hilbert Symbol - Spr 2022
  - Introduction to Class Field Theory - Spr 2022
  - Complex Multiplication for Shimura Varieties - Aut 2021
  - Introduction to Quaternion Algebras and Shimura Curves - Aut 2021
  - Lefschetz Fixed Point Formula in Étale Cohomology - Spr 2021
  - $H^1$  and Torsors - Spr 2021
  - Étale Maps - Spr 2021
  - Coates-Wiles Complex Multiplication and BSD - Aut 2020
  - Intro and Overview of Complex Multiplication - Aut 2020
  - Raynaud's Generic Fiber - Spr 2020
  - Ramification of Curves - Spr 2020
  - Kolyvagin's Work - Aut 2019
  - Modular Curves Background I - Aut 2019

### *Conferences Attended*

- Arizona Winter School: Automorphic Forms Beyond GL2 - Mar 2022
- Tenth Annual Upstate Number Theory Conference (hosted by Union College) - Oct 2021
- Elliptic Curves and the Special Values of L-functions (hosted virtually by ICTS) - Aug 2021
- paraDIGMS (hosted virtually by AMS) - Apr 2021

### *Teaching Experience*

Teaching Fellow at Boston University

- MA 123 Calculus I - Spr 2022
- MA 541 Abstract Algebra - Aut 2021
- MA 442 Linear Algebra - Spr 2021
- MA 121 Calculus - Aut 2020
- MA 225 Multivariate Calculus - Sum 2020
- MA 122 Calculus for Social Sciences - Spr 2020
- MA 225 Multivariate Calculus - Aut 2019

#### Instructor at Boston University

- MA 242 Linear Algebra - Sum1 2022
- MA 113 Elementary Statistics - Sum1 2021
- MA 225 Multivariate Calculus - Sum1 2020

#### PROMYS

- Assistant to David Fried for Returning Student Labs - 2022
- Teacher's Teacher ( $T^2$ ) for PROMYS for Teachers - 2020

#### BU Center for Teaching and Learning Alternative Grading Project

- Contributed in project to create an introductory webpage for instructors interested in alternative grading - Summer 2022

#### Course Organizer

- Assisted in creating an asynchronous online course (MA 113) for BU - Sum 2021

### Non-academic

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#### *GirlsGetMath@BU*

Boston University

August 2022

Boston, MA

- Five-day mathematics program for high schoolers regardless of gender.
- Teaching Fellow - Aug 2022

#### *Directed Reading Program*

Boston University

September 2019 - Current

Boston, MA

- Reading program for undergraduates to work with a graduate mentor in studying higher level mathematics
- Steering Committee Member - Spr 2020 - Current.
- Aut 2021 - Mentored on Riemann Surfaces and Complex Analysis.
- Spr 2021 - Mentored on Group Theory.
- Aut 2020 - Mentored on basics of Machine Learning and CNN.
- Spr 2020 - Mentored on elliptic curve cryptography following Hoffstein, Pipher, and Silverman's "An Introduction to Mathematical Cryptography."
- Aut 2019 - Mentored on algebraic number theory following Serre's "A Course in Arithmetic," culminating on a proof of the sum of three squares.

#### *Graduate Student Organization Representative*

Boston University

September 2021 - Current

Boston, MA

- Representative for Math and Stats Department

#### *Maroon Tutor Match*

University of Chicago

January 2016 - June 2019

Chicago, IL

- Educational program providing affordable one-to-one tutoring for K-12 students in the Hyde Park neighborhood of Chicago
- Weekly tutoring three students in high school mathematics
- Tutoring undergraduates as a department tutor within University

### Undergraduate Experience

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#### *Number Theory Reading Course*

University of Chicago

April 2018 - June 2019

Chicago, IL

- Reading course with Professor Emerton on local and global class field theory
- Reading course with Professor Emerton on elliptic curves and CM fields

#### *REU in Mathematics*

University of Chicago

June - August 2018

Chicago, IL

- Talk: "Introduction to  $p$ -adic Numbers and Their Use in Algebraic Number Theory" - 2018
- Authored: "The  $p$ -adic numbers and a proof of the Kronecker-Weber theorem" [link] - 2018
- Authored: "The Fundamental Group and CW Complexes" - 2016

*Department Reader*  
University of Chicago

September 2017 - June 2019  
Chicago, IL

- Graded MATH 19620 in Fall 2017, Winter 2018 and MATH 20410 in Winter 2019

### **Miscellaneous Skills**

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- Proficient with Sage, C++, HTML, and  $\LaTeX$
- Event planning and coordination
- Fluent in Korean
- Breakdancing