Jae Hyung (John) Sim

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Education

Ph.D. Mathematics [Candidate] — Started September 2019
Boston University — Boston, MA
Advisor: Glenn Stevens

B.A. Mathematics with Honors; Minor in Computer Science — Completed 2019
University of Chicago — Chicago, IL

High School Diploma — Graduated 2015
Milton Academy — Milton, MA

Papers and Seminars

Papers

Explicit Cocycle of the Dedekind-Rademacher Cohomology Class and the Darmon-Dasgupta Measures
- Submitted for publication

Seminars

Graduate Research Seminar organized by Darmon at McGill - Aut 2023
- Invited speaker on the Dedekind-Rademacher cocycle.

Fermat's Last Theorem Seminar - Aut 2023
- Talk given on Taylor-Wiles Patching.

Learning Seminar on p-adic Geometry - Spr 2023
- Talk given on Foundations of Adic Spaces.

Boston University Number Theory Expository Seminar (BUNTES)
- Organizer in Spr 2024 on p-adic Hodge Theory and p-divisible Groups.
- Organizer in Spr 2022 on Class Field Theory.
- Organizer in Aut 2020 on Complex Multiplication.
- Talks Given:
  - Introduction to p-adic Hodge Theory - Spr 2024
  - Semistable and Crystalline Period Rings - Aut 2023
  - Representability of a deformation functor via a Hida Family - Aut 2023
  - Galois Representations - Aut 2023
  - Tate Algebras - Spr 2023
  - 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 Algebrais 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

Recent Progress on Hilbert's 12th Problem — ICMS
Workshop on Ceresa Cycle — ICERM
- 2024 Lightning Talk given: "Rigid Cocycles and RM Theory."

Maine-Quebec Number Theory Conference — University of Maine
- 2023 Talk given: "Dedekind-Rademacher Cocycle and Explicit Class Field Theory."

AMS New England Graduate Student Conference — Brown University
- 2024 Talk given: "Euler Systems and Adelic Distributions."
- 2023 Talk given: "The Missing Theory of RM Elliptic Curves."

Spring School on Non-archimedean geometry and eigenvarieties (Mar 2023) — Heidelberg
Arizona Winter School — University of Arizona
- 2024 - Abelian Varieties
- 2022 - Automorphic Forms Beyond GL2

Tenth Annual Upstate Number Theory Conference (Oct 2021) — Union College
Elliptic Curves and the Special Values of L-functions (Aug 2021) — ICTS (virtual)
paraDIGMS (Apr 2021) — AMS (virtual)

Teaching

Instructor of Record at Boston University – (†) indicates use of ungrading assessment system.
- MA 341 Elementary Number Theory - Sum1 2023 (†)
- MA 242 Linear Algebra - Sum1 2022 (†)
- MA 113 Elementary Statistics - Sum1 2021
- MA 225 Multivariate Calculus - Sum1 2020

Teaching Fellow at Boston University
- MA 581 Probability - Spr 2023
- MA 541 Abstract Algebra - Aut 2021
- MA 442 Linear Algebra - Spr 2021
- MA 225 Multivariate Calculus - Spr 2024, Sum 2020, Aut 2019
- MA 123 Calculus I - Aut 2023, Aut 2022, Spr 2022
- MA 122 Calculus for Social Sciences - Spr 2020
- MA 121 Calculus - Aut 2020

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

PROMYS
- Assistant to David Fried for Research Labs - 2022 until present
- Teacher's Teacher (T^2) for PROMYS for Teachers - 2020

BU Center for Teaching and Learning Alternative Grading Project [Link]
- Project to create a webpage for instructors interested in alternative grading - Summer 2022

GeMsGetMath@BU — August 2022 until present
Boston University — Boston, MA
- Five-day mathematics program for high schoolers regardless of gender.
- Worked as Teaching Fellow

Outreach and Administrative Roles

Directed Reading Program September 2019 - Current
Boston University Boston, MA

- Steering Committee Member - Spr 2020 - Current.
- Mentor:
  - Aut 2023 - Algebraic Number Theory.
  - Aut 2022 - Algebraic Number Theory.
  - Aut 2021 - Riemann Surfaces and Complex Analysis.
  - Spr 2021 - Group Theory.
  - Aut 2020 - Machine Learning and CNN.
  - Spr 2020 - Elliptic Curve Cryptography.
  - Aut 2019 - Algebraic Number Theory.

Graduate Student Organization Representative September 2021 - Current
Boston University Boston, MA

- Representative for Math and Stats Department

Maroon Tutor Match January 2016 - June 2019
University of Chicago 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

Number Theory Reading Course April 2018 - June 2019
University of Chicago Chicago, IL

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

REU in Mathematics June - August 2018
University of Chicago 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 September 2017 - June 2019
University of Chicago Chicago, IL

Miscellaneous Skills and Hobbies

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