JINGHUI YANG

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EDUCATION

St Catherine's College, University of Oxford   Oct 2021 - July 2022
- Master of Science (MSc) in Mathematics
- Degree with Merit

University of Illinois, Urbana-Champaign   Aug 2018 - May 2021
- Bachelor of Science in Mathematics
- Cumulative GPA : 3.93/4.00; Major GPA: 3.93/4.00
- Graduation with
  ⋄ Departmental Honors: Highest Distinction
  ⋄ Institutional Honors: Magna Cum Laude

HONORS & AWARDS

- Most Outstanding Undergraduate Major Award in Mathematics (UIUC)   Mar 2021
- Dean's List (UIUC)   Dec 2018 - May 2021
- Honor Society Membership: Pi Mu Epsilon (UIUC)   Sep 2019 - Present
- Hendrick House Scholarship Awards (UIUC)   Fall 2018 & Spring 2019

RESEARCH EXPERIENCE

Seminar on Homotopy Theory   Shanghai, China
Membership in the reading group   May 1-Present, 2022
- Took place at Shanghai Center for Mathematical Sciences (SCMS) and Fudan University, led by Prof. Guozhen Wang. The seminar took the form mostly online due to the COVID-restrictions.
- Studied various topics in homotopy theory and ∞-categories. Mainly focused on cobordism theory and chromatic homotopy theory.
- Lectured on homotopical algebra (simplicial categories, homotopy theory of categories, Quillen theorem A and B, etc.).
- Lectured on the Spanier-Whitehead duality, thick subcategory theorem, and relations to the periodicity theorem in chromatic homotopy theory. See here.
- Organized the notes in LaTeX. See here (ongoing, and still under construction).

Homotopy Groups of Spheres in Homotopy Type Theory   Oxford, UK
Master's dissertation   Jun-Apr 2022
- Master's dissertation supervised by Prof. Yakov Kremnitzer.
- Studied the Martin-Löf type theory and the homotopy type theory. Presented and examined various (dependent) types like identity type, $\prod$-types, etc. Constructed homotopy theory in hoTT and calculated homotopy groups of spheres $\pi_n(S^n)$. Constructed the Serre spectral sequences in hoTT and used them to compute homotopy groups of some chosen spaces. Conjectured on hoTT-version UCT with my potential approach with the hope of solving it. Paper here.

Algebraic K-theory and Trace Method   Chicago, IL
2020 REU at University of Chicago   Jun-Oct 2020
- REU in University of Chicago, led by Prof. Peter May, mentored by Dr. Hana Jia Kong.

- Studied equivariant stable homotopy theory. Observed into the basic definition and properties of topological Hochschild homology (THH) and topological cyclic homology (TC). Studied how to relate them to the algebraic K-theory via Dennis and Bökstedt trace method. Went through some easy calculations of THH using spectral sequences.
- Had one talk on the research topic. Paper here.

Smith Theory   Urbana, IL
Research project led by Prof. Bruce Reznick in course Math 496 (Honors Seminar)   Jan-May 2020

- Studied the equivariant homotopy theory. Went through categorical settings about homotopy category and Elmendorf's theorem, and used them to construct the Bredon cohomology theory. Focused on Smith theory and its converse with a detailed discussion.
- Had a final report on the research topic. Final paper here.

Riemann-Roch Theorem   Urbana, IL
Independent Research advised by Prof. Jeremiah Heller   Sep-Dec 2019

- Studied the Riemann surfaces and the divisor theory on them. Stated and proved Riemann-Roch Theorem in both viewpoints from sheaf cohomology and without sheaf cohomology. Calculated basic example on projective planes. Final report here.

Homological Algebra of Quiver Representations   Urbana, IL
Illinois Geometry Lab Scholar   Jan-May 2019

- Illinois Geometry Lab research project led by Prof. James Pascaleff. Information can be found here.
- Studied the representations of quivers, along with the computational tools from homological algebra. Worked on the Beilinson quiver for the projective line and the related representations.
- Team-worked on calculations of selected algebraic objects with Sage and GAP programming. Poster here.

ACTIVITIES

Seminar on Homological Mirror Symmetry (HMS)   Oxford, UK
Co-host   Jun 20-Present, 2022

- The seminar took place at St Peter's College and Mathematical Institute. Info here. 3-times meeting weekly with one-month interruption.
- Studied and presented various topics in HMS and additional topics of interest to participants. Main topics include A_∞-categories and twisted complexes, complex geometry and Hodge Theory, operads, Floer (co)homology, Fukaya categories, coherent sheaves, derived categories, deformation theory, HMS, etc.
- Lectured on complex geometry, Hodge theory, and HMS for 2-torus, along with a broad range of side-topics in homotopy theory, category theory, etc. Expected to lecture on the deformation theory, and the King & Bridgeland stability theory.
- Organized the notes and typed many of them in LaTeX.

Summer School on Equivariant Homotopy Theory   Shanghai, China
Participant   Jul 19-30, 2021

- Took place at Fudan University in Shanghai on Jul.19-30 2021. Info here.
- Went to the lectures on equivariant homotopy theory and HHR. Much involved in spectra, functors, spectral sequences, and the equivariant version of them.
- Participated in the lectures and took notes on the topics. Communicated with other students and experts.
- Hosted on-site seminars with peers on spectral sequences and operads.

Undergraduate Mathematics Friday Seminar   Urbana, IL
Invited speaker   Oct 2019

- Presented talk on Kuratowski 14-Sets Theorem and Related Classifications of Topological Spaces via K-numbers based on the paper *The Kuratowski closure-complement theorem* by B.J. Gardner and M. Jackson (2008).

Pi Mu Epsilon - Math Courses Workshop Urbana, IL
Invited speaker and co-host Sep 2019

- Co-hosted the event in the honor society Pi Mu Epsilon in UIUC. Shared research experiences and information about undergraduate/graduate courses in math with students (around 30) from the math department.

International Workshop on Algebraic Topology Shanghai, China
Participant Aug 13-21, 2019

- Joint event with the Summer School on Equivariant Homotopy Theory which took place at SCMS and Fudan University in Shanghai on Aug 13-17, 2019. Info here.
- Lectures on equivariant homotopy theory. Participated in the lectures and took notes on the topics. Communicated with other students and experts.

TEACHING EXPERIENCE

Course Assistant of Math 231 E: Engineering Calculus Urbana, IL
Department of Mathematics, University of Illinois at Urbana-Champaign Aug-Dec 2019

- Hired by the Math Department. Assisted Prof. Yuliy Baryshnikov in monitoring exams.
- Graded assignments and exams. Tutored students on their questions related to assignments and the course.

SKILLS

Programming:	C (Proficient), Java (Proficient), Python (Proficient), HTML 5 (Proficient), PHP (Basic)
Others:	LaTeX(Proficient), MATLAB (Intermediate), Sage (Basic)
Languages:	English (Fluent), Chinese (Native Speaker), French (Intermediate)