

Hana Jia Kong

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Research Interests

Equivariant stable homotopy theory, motivic stable homotopy theory.

Employment

2021-present **Member**, Institute for Advanced Study, Princeton, USA.

Education

2015-2021 **Ph.D. in Mathematics**, The University of Chicago, Chicago, USA.

Advisers: J. Peter May, Daniel C. Isaksen

M.S. in Mathematics, The University of Chicago, Chicago, USA.

2015 **B.S. in Mathematics**, Peking University, Beijing, China.

Papers

Publications **The Chow t -structure on motivic spectra**, joint with Tom Bachmann, Guozhen Wang and Zhouli Xu, [arXiv:2012.02687](https://arxiv.org/abs/2012.02687), accepted by Annals of Mathematics.

Algebraic slice spectral sequences, *Doc. Math.* 26 (2021), 1085-1119, joint with Dominic Leon Culver, J.D. Quigley, [arXiv:2007.08682](https://arxiv.org/abs/2007.08682), accepted by Documenta Mathematica.

Computational tools for twisted topological Hochschild homology of equivariant spectra, joint with Katharine Adamyk, Teena Gerhardt, Kathryn Hess, Inbar Klang, [arXiv:2001.06602](https://arxiv.org/abs/2001.06602), accepted by Topology and its Applications.

Preprints **\mathbb{R} -motivic v_1 -periodic homotopy**, joint with Eva Belmont, Daniel C. Isaksen, [arXiv:2204.05937](https://arxiv.org/abs/2204.05937).

A Toda bracket convergence theorem for multiplicative spectral sequences, joint with Eva Belmont, [arXiv:2112.08689](https://arxiv.org/abs/2112.08689).

A shadow framework for equivariant Hochschild homologies, joint with Katharine Adamyk, Teena Gerhardt, Kathryn Hess, Inbar Klang, [arXiv:2111.04152](https://arxiv.org/abs/2111.04152).

The C_2 -effective spectral sequence for C_2 -equivariant connective real K -theory, [arXiv:2004.00806](https://arxiv.org/abs/2004.00806), submitted.

Awards

- 2021 **Kowalsky Fellowship.**
Department of Mathematics, University of Chicago

Invited Talks

What is an operad?.

- May/2/2022 “What is ... ?” Seminar, Institute for Advanced Study, USA.

Calculations in the motivic stable homotopy category.

- Apr/29/2022 Loo-Keng Hua Youth Forum on Mathematics, Chinese Academy of Sciences, China.

Motivic image-of- J spectrum via the effective slice spectral sequence.

- Apr/15/2022 Columbia Algebraic Topology Seminar, Columbia University, USA.

- Mar/24/2022 Princeton Algebraic Topology Seminar, Princeton University, online.

- Mar/22/2022 Cornell Topology and Geometric Group Theory seminar, Cornell University, online.

- Feb/10/2022 URegina Topology Seminar, University of Regina, online.

Infinite loop space theory and recognition principle.

- Feb/25/2022 UConn SIGMA seminar, University of Connecticut, online.

The image of J in the motivic stable homotopy category.

- Feb/22/2022 MSU Geometry and Topology seminar, Michigan State University, online.

The Chow t -structure and calculations in motivic stable homotopy theory.

- Jan/14/2022 Fudan–Guanghua International Forum for Young Scholars, Fudan University, China.

- Jan/12/2022 SUSTech Global Young Mathematicians Forum, Southern University of Science and Technology, China

The homotopy of \mathbb{R} -motivic image-of- J spectrum.

- Apr/8/2022 Virtual 2022 Joint Mathematics Meetings, American Mathematical Society, online.

- Nov/29/2021 MIT Topology Seminar, Massachusetts Institute of Technology, USA.

- Oct/24/2021 AMS Sectional Meeting AMS Special Session, American Mathematical Society, online.

- Aug/9/2021 Transchromatic Homotopy Online Conference, University of Regensburg, online.

Basics of spectra.

- Jul/20/2021 IWoAT 2021, Fudan University, online.

The motivic Chow t -structure and the computational applications.

- Nov/17/2020 UCSD Topology Seminar, The University California, San Diego, online.

- Nov/16/2020 UCLA Algebraic Topology Seminar, The University of California, Los Angeles, online.

- Nov/12/2020 UK/Vanderbilt Topology Seminar, University of Kentucky and Vanderbilt University, online.

The motivic Chow t -structure.

- Nov/10/2020 *Chicago-Northwestern Topology Seminar*, The University of Chicago and Northwestern University, online.
- Nov/9/2020 *John Hopkins Topology Seminar*, Johns Hopkins University, online.
The C_2 -effective spectral sequence and the C_2 -equivariant homotopy of \mathbf{ko}_{C_2} .
- Mar/3/2020 *Equivariant Stable Homotopy Theory and p -adic Hodge Theory Workshop*, Banff International Research Station, Canada.
- Dec/11/2019 *University of Rochester Topology Seminar*, University of Rochester, USA.
- Nov/19/2019 *Wayne State University Topology Seminar*, Wayne State University, USA.
The C_2 -equivariant homotopy of \mathbf{ko}_{C_2} .
- Aug/19/2019 *International Workshop on Algebraic Topology 2019*, Fudan University, China.
Presheaves on the orbit category.
- Aug/14/2019 *Summer School on Equivariant Stable Homotopy Theory*, Fudan University, China.

Teaching

- 2021-2022 **Co-instructor in electronic Computational Homotopy Theory (eCHT) Reading Seminars**, eCHT online research community.
 ◦ Autumn 2021, eCHT Equivariant Homotopy Theory Reading Seminar.
 ◦ Spring 2022, eCHT Kan Seminar.
- 2017–2020 **Instructor**, The University of Chicago.
 Primary instructor for 10-week courses. Responsibilities included planning and giving all lectures, assigning weekly homework and grading part of homework, writing and grading midterms and final exams, running problem sessions and office hours, supervising undergraduate teaching assistants, and assigning final grades.
 ◦ 2019 – 2020, Calculus I, II.
 ◦ 2018 – 2019, Calculus I, II, III.
 ◦ 2017 – 2018, Calculus II, III, Mathematical methods for social sciences.
- Summer 2017, 2019-2021 **Mentor in Research Experiences for Undergraduates**, The University of Chicago.
 Mentees and projects:
 ◦ Nathaniel Bannister, *Coefficient rings of C_2 -equivariant Eilenberg-MacLane spectra*.
 ◦ Natalie Bohm, *Morse theory and handle decompositions*.
 ◦ John Churay, *Classification of surfaces and characterization of graph imbeddings*.
 ◦ Gabrielle Li, *Classification of bundles and orientations, Adams spectral sequence*.
 ◦ Josh Turner, *Ultraproducts in algebra*.
 ◦ Jinghui Yang, *Algebraic K-theory and trace method*.
 ◦ Adam Zheleznyak, *Discrete Morse theory*
 ◦ Heidi Lei, *Duality in algebraic topology*

- 2016–2021 **Mentor in Directed Reading Program**, The University of Chicago.
 Mentees and projects:
- Yiheng Ye, *Basics in algebraic topology*.
 - Eli Baur, *Basics in algebraic topology*.
 - Connor Lockhart, *Ultraproducts and Los's theorem*
 - Sam Craig, *Category theory in physics, logic and computer science*.
 - Joseph T. Previdi, *A strictly monotone measure on tame sets that corresponds to a numerosity*.
 - Younggeun Yoo, *Game theory and equilibrium*.
- 2019–2020 **TA in eCHT Reading Seminars**, eCHT online research community.
- Spring 2020, eCHT Topological Hochschild Homology (THH) Reading Seminar.
 - Autumn 2019, eCHT Kan Seminar.
- Summer 2019 **Instructor in Chicago Academic Achievement Program**, The University of Chicago.
- 2016–2017 **College Fellow**, The University of Chicago.
 Teaching assistant for undergraduate classes. Responsibilities included grading, running problem sessions and office hours, reading students' journals and papers, and giving several lectures.
- Spring 2017, Algebraic Topology.
 - Winter 2017, IBL Honors Calculus II.
 - Autumn 2016, IBL Honors Calculus I.

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- 2019–2022 **Co-organizer of the eCHT Seminars**, eCHT online research community.
- Summer 2021 **Co-organizer of International Workshop on Algebraic Topology 2021**, Fudan University, China.
- Summer 2020 **Co-organizer of International Workshop on Algebraic Topology 2020**,
 (Postponed) Peking University, China.
- Co-organizer of Summer School on Higher Algebra and Its Applications**,
 Fudan University, China.
- Winter 2020 **Co-organizer of UChicago topology seminar**, The University of Chicago, USA.
- Summer 2019 **Co-organizer of International Workshop on Algebraic Topology 2019**, Fudan University, China.
- Co-organizer of Summer School on Equivariant Stable Homotopy Theory**,
 Fudan University, China.
- Spring 2017 **Co-organizer of Spring 2017 Midwest Topology Seminar**, The University of Chicago, USA.