

Jian Liu | CV

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Research Interests

My research interests are commutative algebras, derived categories and representation theory of finite dimensional algebras.

Education

- **Shanghai Jiao Tong University** Shanghai, China
Postdoc in Mathematics. Advisor: Pu Zhang July 2021 –
- **University of Science and Technology of China** Hefei, China
Ph.D. in Mathematics. Advisor: Xiao-Wu Chen September 2016 – June 2021
- **Northeast Normal University** Changchun, China
B.S. in Mathematics. Advisor: Xian-Hui Fu September 2012 – June 2016

Research Experiences

- **University of Utah** Salt Lake City, USA
Joint Ph.D. student. Advisor: Srikanth Iyengar August 2019 – October 2020

Publications and Preprints

13. Souvik Dey, Kaito Kimura, **Jian Liu**, Yuya Otake, *On local rings of finite syzygy representation type*, arXiv:2507.17097.
12. **Jian Liu**, *Base change of (Gorenstein) transpose, k -torsionfree modules, and quasi-faithfully flat extensions*, arXiv:2507.12219.
11. Souvik Dey, **Jian Liu**, Liran Shaul, *Openness with respect to levels in triangulated categories*, arXiv:2505.14353.
10. Souvik Dey, **Jian Liu**, Yuki Mifune, Yuya Otake, *Generation of singularity categories and infinite injective dimension locus via annihilation of cohomologies*, arXiv:2503.24186.
9. **Jian Liu**, Josh Pollitz, *Classifying thick subcategories over a Koszul complex via the curved BGG correspondence*, arXiv:2502.13806.
8. **Jian Liu**, Souvik Dey, *Gorenstein local rings whose cohomological annihilator is the maximal ideal*, accepted in **Publications of the Research Institute for Mathematical Sciences**.
7. **Jian Liu**, Wei Ren, *Ascent and descent of Gorenstein homological properties*, **Journal of Pure and Applied Algebra**, 2025.
- [6] **Jian Liu**, *Annihilators and dimensions of the singularity category*, **Nagoya Mathematical Journal**, 2023,.
- [5] **Jian Liu**, *Triangulated categories of periodic complexes and orbit categories*, arXiv:2109.08831, **Czechoslovak Mathematical Journal**, 2023.
- [4] **Jian Liu**, Josh Pollitz, *A partial converse ghost lemma for the derived category of a commutative noetherian ring*, **Proceedings of the American Mathematical Society**, 2023.
- [3] Srikanth Iyengar, Janina Letz, **Jian Liu**, Josh Pollitz, *Exceptional complete intersection maps of local rings*, **Pacific Journal of Mathematics**, 2022.
- [2] Xiao-Wu Chen, **Jian Liu**, Ren Wang, *Singular equivalences induced by bimodules and quadratic*

monomial algebras, **Algebras and Representation theory**, 2021.

[1] **Jian Liu**, Josh Pollitz, *Duality and symmetry of complexity over complete intersections via exterior homology*, **Proceedings of the American Mathematical Society**, 2021.

Awards

- **Chinese Government Scholarship** **University of Science and Technology of China**
This award is to support graduate students to study abroad for one or two years. *June 2019*
- **National Scholarship** **Northeast Normal University**
This is awarded annually in the University with few awards in each school. *October 2014*

Teaching

Teaching Assistant, *University of Science and Technology of China, Hefei, China.*

- *Linear Algebra A2*, lecture: Xiao-Wu Chen, September 2018–January 2019.
- *Linear Algebra A1*, lecture: Xiao-Wu Chen, February 2018–June 2018.
- *Elements of Algebra*, lecture: Xiao-Wu Chen, September 2017–January 2018.
- *Complex Analysis*, lecture: Luo Luo, February 2017–June 2017.

Talks

Invited Talks.....

- **Duality of thick subcategories over complete intersections via cohomological supports**
Algebra Seminar, University of Science and Technology of China, January 2 2021.
- **Duality of thick subcategories over complete intersections**
Algebra Seminar, Northeast Normal University, November 6 2020.

Student Seminar.....

- **Virtually small complexes and complete intersections**
Algebra Seminar, University of Science and Technology of China, December 2020.
- **Kahler differentials and the Hochschild cohomology ring**
Algebra Seminar, University of Utah, October 13 2020.
- **Classifying thick subcategories of the singularity category over a hypersurface**
Algebra Seminar, University of Utah, June 22 2020.
- **Support varieties and cohomology over complete intersections**
Algebra Seminar, University of Utah, February 20 2020.
- **Local cohomology modules-various definitions**
Algebra Seminar, University of Utah, November 15 2019.
- **Koszul duality patterns in representation theory**
Algebra Seminar, University of Science and Technology of China, March 2019.
- **The singularity category over Gorenstein rings**
Algebra Seminar, University of Science and Technology of China, January 2018.

Conferences Attended

- **DG Methods in Commutative Algebra and Representation Theory** **University of Utah**
Participant via Zoom, Salt Lake City, Utah, USA *May 2 and 3, 2020*

- The 20th National Conference on Representation theory of Algebras** **Nanjing University**
Participant, Nanjing, Jiangsu Province, China. *June 21 2018 – June 26 2018*
- The 19th National Conference on Representation theory of Algebras** **Huaqiao University**
Participant, Quanzhou, Fujian Province, China. *November 08 2017 – November 12 2017*
- Workshop on Groups and Algebras** **Southern University of Science and Technology**
Participant, Shenzhen, Guangdong Province, China. *July 16 2017 – August 11 2017*