Pat Lank

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PERSONAL

- Born on October 7th, 1993
- Citizenship: United States

RESEARCH INTERESTS

Algebraic geometry, commutative algebra, triangulated categories

POSITIONS

Università degli Studi di Milano Fall 2024 — Present

- Postdoctoral researcher
- Supervisor: Amnon Neeman

Simons-Laufer Mathematical Sciences Institute April 2024

- Research associate

EDUCATION

University of South Carolina January 2021 to May 2024

- Phd in Mathematics
- Advisor: Matthew Ballard

University of New Mexico August 2017 to December 2020

- M.Sc. in Mathematics
- Advisor: Alexandru Buium

University of Massachusetts in Lowell August 2015 to August 2017

- B.Sc. in Mathematics

RESEARCH

Published

- *Approximation by perfect complexes detects Rouquier dimension*, joint with Noah Olander - `arXiv version`; accepted to Mosc. Math. J.
- *Descent conditions for generation in derived categories*, `J.Pure Appl. Algebra` (2024)
- *Generation and dimension for derived categories*, PhD thesis, 2024

Preprints

- "Derived characterizations for rational pairs à la Schwede-Takagi and Kollár-Kovács" joint with Peter McDonald and Sridhar Venkatesh - `arXiv version`
- "Descent and generation for noncommutative coherent algebras over schemes" joint with Timothy De Deyn and Kabeer Manali Rahul - `arXiv version`
- "Classification and nonexistence for t-structures on derived categories of schemes" joint with Alexander Clark, Kabeer Manali Rahul and Chris J. Parker - `arXiv version`
- "Approximability and Rouquier dimension for noncommuative algebras over schemes" joint with Timothy De Deyn and Kabeer Manali Rahul - `arXiv version`
- "Triangulated characterizations of singularities" joint with Sridhar Venkatesh - `arXiv version`
- "Closedness of the singular locus and generation for derived categories" joint with Souvik Dey - `arXiv version`
- "Dévissage for generation in derived categories" joint with Souvik Dey - `arXiv version`
- "A note on generation and descent for derived categories of noncommutative schemes" joint with Anirban Bhaduri, Souvik Dey - `arXiv version`

- "Strong generation for module categories" joint with Souvik Dey, Ryo Takahashi - `arXiv version`
- "High Frobenius pushforwards generate the bounded derived category" joint with Matthew Ballard, Srikanth Iyengar, Alapan Mukhopadhyay, and Josh Pollitz - `arXiv version`

In preparation

- "Perfect complexes and proper descent for algebraic stacks" joint with Jack Hall, Fei Peng, and Alicia Lamarche
- "Integral transforms on singularity categories for Noetherian schemes" joint with Uttaran Dutta and Kabeer Manali Rahul
- "Mayer-Vietoris squares and generation for monoidal triangulated categories" joint with Timothy De Deyn and Kabeer Manali Rahul
- "Compact objects detect big generators for weak approximable triangulated categories" joint with Timothy De Deyn and Kabeer Manali Rahul
- "Regular locus and singularity categories for noncommutative algebras over schemes" joint with Timothy De Deyn and Kabeer Manali Rahul

INVITED TALKS

- Algebra seminar, Charles University (Univerzita Karlova), February 2025
- Topology seminar, Universität Hamburg, January 2025
- Algebraic Geometry Northeastern Section (AGNES), Dartmouth University, November 2024
- Algebraic Geometry Seminar, Purdue Uiversity, October 2024
- AMS Special Session on Commutative Algebra and its Applications, Howard University, Washington, DC April 2024
- COMA/NAG Joint Graduate Student Seminar for Simons-Laufer Mathematical Sciences Institute March 2024
- AMS Contributed Paper Session on Commutative Algebra at the Joint Mathematics Meetings January 2024
- Algebraic Geometry seminar, University of Georgia October 2023
- Syzygies and mirror symmetry workshop, American Institute of Mathematics September 2023
- New Directions in Group Theory and Triangulated Categories May 2023
- Georgia Algebraic Geometry Symposium, University of Georgia May 2023
- Categorical methods in moduli theory, University of Pennsylvania April 2023
- AMS Special Session on Interactions between Noncommutative Ring Theory and Algebraic Geometry, Spring Central Sectional April 2023
- AMS Special Session on Recent Developments in Commutative Algebra, Southeast Sectional March 2023
- Algebraic Geometry seminar, University of Utah September 2022
- Algebraic Geometry & Singularity theory workshop, University of Washington June 2022
- Commutative Algebra Regional Expository Seminar April 2022
- University of South Carolina, Algebraic Geometry & Commutative Algebra Seminar February 2022
- Commutative Algebra Regional Expository Seminar October 2021
- University of South Carolina, Algebraic Geometry Number Theory Seminar March 2021
- Algebra & Geometry Seminar, University of New Mexico November 2019
- Algebra & Geometry Seminar, University of New Mexico December 2018
- Women in Mathematics in New England (WIMIN 2016), Smith College September 2016
- MAA Northeast Spring Section Meeting, University of New England June 2016

ORGANIZATION

- Algebraic geometry seminar, Università degli Studi di Milano Spring 2025
- Derived categories and noncommutative enthusiasts (D.A.N.C.E) online seminar January 2025 to present
- Joint Mathematics Meeting Special Session on Derived Categories, Arithmetic and Geometry January 2024
- Graduate colloquium, University of South Carolina Fall 2021 to Spring 2023
- Algebraic geometry & commutative algebra seminar, University of South Carolina Fall 2021 to Spring 2023

GRANTS

- AMS Graduate Student Sectional Travel Grant Spring 2023

AWARDS

- Outstanding Graduate Student Award in Mathematics at University of South Carolina Spring 2024
- Teaching Award from Student Disability Resource Center at University of South Carolina Fall 2023

REFEREE & REVIEW

- zbMATH Open

SERVICE

- Math 111 Textbook Committee for University of South Carolina — Spring 2024
- Math Tutoring Center Coordinator — Summer 2023
- Graduate Student Panel Committee — Summer 2021, Spring 2022
- Proctor for UNM PNM State Wide Mathematics Exam — Fall 2017, Spring 2019
- City-wide Concert & Fundraiser, Nashua NH Soup Kitchen — Fall 2011

TEACHING

University of South Carolina

Instructor of Record

- MATH 241 - Calculus III — Summer 2021, Summer 2022
- MATH 174 - Discrete structures for computer science — Spring 2023
- MATH 122 - Business Calculus — Spring 2021, Spring 2022, Spring 2024
- MATH 115 - Precalculus — Fall 2021
- MATH 111 - Basic College Mathematics — Fall 2021 (overload), Fall 2022
- MATH 111i - Intensive Basic College Mathematics — Fall 2023

University of New Mexico

Instructor of Record

- MATH 180 - Calculus I — Summer 2020
- MATH 121 - College Algebra — Fall 2017
- MATH 101, 102, 103 - Intermediate Algebra Part I, II, III — Fall 2018

Graduate Teaching Assistant

- MATH 521 - Abstract Algebra — Spring 2020
- MATH 327 - Discrete Structures — Spring 2019
- MATH 322 - Modern Algebra — Spring 2019
- MATH 321 - Linear Algebra W/ Applications — Fall 2019
- Math 319 - Number theory — Spring 2020