Pat Lank

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PERSONAL

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

RESEARCH INTERESTS

Algebraic geometry, (non)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

- "Compact approximation and descent for algebraic stacks" joint with Jack Hall, Fei Peng, and Alicia Lamarche, *in preparation*
- "Integral transforms on singularity categories for Noetherian schemes" joint with Uttaran Dutta and Kabeer Manali Rahul, *in preparation*
- "Zariski descent for singularity categories" joint with Timothy De Deyn and Kabeer Manali Rahul, *in preparation*
- "Compact objects detect big generators for weak approximable triangulated categories" joint with Timothy De Deyn and Kabeer Manali Rahul, *in preparation*
- "Regular locus and singularity categories for noncommutative algebras over schemes" joint with Timothy De Deyn and Kabeer Manali Rahul, *in preparation*
- "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`; accepted to Nagoya Math. J.
- "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`

- *Approximation by perfect complexes detects Rouquier dimension*, joint with Noah Olander - `arXiv version`; accepted to Mosc. Math. J.
- "A note on generation and descent for derived categories of noncommutative schemes" joint with Anirban Bhaduri, Souvik Dey - `arXiv version`
- *Descent conditions for generation in derived categories*, `arXiv version`, `J.Pure Appl. Algebra` (2024)
- "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`
- *Generation and dimension for derived categories*, PhD thesis, 2024

INVITED TALKS

- Algebraic geometry seminar, University of Glasgow, March 2025
- 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, Simons-Laufer Mathematical Sciences Institute March 2024
- AMS contributed paper session on commutative algebra, 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, interactions between noncom. ring theory and alg. geo. 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 and singularity theory workshop, University of Washington June 2022
- Commutative algebra regional expository seminar April 2022
- Algebraic geometry and commutative algebra seminar, University of South Carolina, February 2022
- Commutative algebra regional expository seminar October 2021
- Algebraic geometry number theory seminar, University of South Carolina, March 2021
- Algebra and geometry seminar, University of New Mexico November 2019
- Algebra and geometry seminar, University of New Mexico December 2018
- Women in mathematics in New England (WIMIN 2016), Smith College September 2016
- MAA mortheast 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 and 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

- Rend. Sem. Mat. Univ. Padova, zbMATH Open

SERVICE

- Math 111 textbook committee for University of South Carolina — Spring 2024
- Math tutoring Ccnter 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 and 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 with applications — Fall 2019
- Math 319 - Number theory — Spring 2020