

Pat Lank

plankmathematics@gmail.com — www.patlank.com

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 noncommutative 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 University, | 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

- Rend. Sem. Mat. Univ. Padova, 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