Mariya Savinov

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https://mariyasavinov.github.io/

EMPLOYMENT	**NSF-Simons National Institute for Theory and Mathematics in Biology**

NITMB Fellow   Sept 2025 - *present*

University of Chicago

Chicago Fellow, Biological Sciences Division   Sept 2025 - *present*

EDUCATION

Courant Institute of Mathematical Sciences, New York University

Ph.D. in Mathematics   2020 - 2025
- Advisor: Prof. Alex Mogilner
- Thesis: Biophysical modeling and simulation of contractile actomyosin dynamics

University of Pittsburgh

B.Phil. in Mathematics and Physics, with honors   2016 - 2020
- Advisor: Prof. Bard Ermentrout
- Honors Thesis: Synchronization and locking in oscillators with flexible periods
- GPA: 4.0

RESEARCH
INTERESTS

mathematical cell biology, mechanics, morphogenesis, modeling, numerical simulation, data-driven methods, actomyosin, nonlinear phenomena, viscoelasticity

IN
PREPARATION

8. Biophysical modeling of competing actin networks with turnover
M. Savinov, C. Guérin, A. N'Diaye, L. Gressin, A. Mogilner, M. Théry, L. Blanchoin, A. Colin

7. Tumor cluster co-attraction is driven by the ECM
J. Garcia*, **M. Savinov***, A. Mogilner, C. Carmona-Fontaine

PUBLICATIONS

6. Simple cell motility on adhesive gradients
A. Mogilner and **M. Savinov**, *Nature Physics (News & Views)* vol. 21, pg. 1524-1525. doi: 10.1038/s41567-025-03010-8.

5. A model for contractile stress fibers embedded in bulk actomyosin networks
M. Savinov, C.S. Peskin, and A. Mogilner. *Journal of Mathematical Biology* vol. 91, no. 14, June 2025, doi: 10.1007/s00285-025-02245-6.

4. Size-dependent transition from steady contraction to waves in actomyosin networks with turnover
A. Krishna, **M. Savinov**, N. Ierushalmi, A. Mogilner, and K. Keren, *Nature Physics*, Jan 2024, vol. 20, pg. 123–134. doi: 10.1038/s41567-023-02271-5.

3. Friction patterns guide actin network contraction   **equally contributing first authors*
A. Colin*, M. Orhant-Prioux*, C. Guérin*, **M. Savinov***, I. Scarfone, A. Roux, E.M. De La Cruz, A. Mogilner, M. Théry, and L. Blanchoin, *PNAS*, Sept 2023, vol. 120, no. 39, p. e2300416120, Sep. 2023, doi: 10.1073/pnas.2300416120.

2. Crawling, waving, inch worming, dilating, and pivoting mechanics of migrating cells: Lessons from Ken Jacobson
A. Mogilner, **M. Savinov**, *Biophysical J.*, Mar 2023, doi: 10.1016/j.bpj.2023.03.023

1. Synchronization and locking in oscillators with flexible periods
M. Savinov, D. Swigon, and B. Ermentrout, *Chaos*, vol. 31, no. 3, p. 033143, Mar. 2021, doi: 10.1063/5.0021836.

AWARDS AND HONORS	**NSF Mathematical Sciences Postdoctoral Research Fellowship**	2025

NSF Mathematical Sciences Postdoctoral Research Fellowship — 2025
*Awarded support: $190,000, **declined***
Project Title: "Mechanosensitive assembly of yeast actin cables"

SIAM Travel Award, Society for Industrial and Applied Mathematics — 2024
In support of attendance at SIAM Life Sciences 2024, $650

BPS Travel Award, Biophysical Society — 2024
In support of attendance at BPS Annual Meeting 2024, $200

Paul Garabedian Fellowship, NYU Courant — 2023
Awarded to an outstanding PhD student

ASCB Travel Grant, American Society for Cell Biology — 2023
In support of attendance at Cell Bio 2023, $500

Martin & Sarah Leibowitz Graduate Prize for Quantitative Biology — 2023
NYU Courant
Awarded for academic excellence within the field of Quantitative Biology, $2500

SIAM Travel Award, Society for Industrial and Applied Mathematics — 2023
In support of attendance at SIAM Dynamical Systems 2023, $650

Bella Manel Prize, NYU Courant — 2022
Awarded for excellence and promise in mathematics on the graduate level, $500

Dean's Doctoral Fellowship, NYU — 2020-2025

NSF Graduate Research Fellowship — 2020-2025

Goldwater Scholarship — 2019

DAAD Research Internships in Science and Engineering Scholarship — 2019
Advisors: Prof. Pawel Romanczuk and Dr. Winnie Poel (Humboldt University of Berlin)

Sigma Pi Sigma (ΣΠΣ) Induction, American Institute of Physics — 2019

Brackenridge Research Fellowship, PITT Honors College — 2018

Koehler Academic Achievement Award, PITT Dept. of Physics and Astronomy — 2018

NSF-REU in Extremal Graph Theory and Dynamical Systems — 2017
Advisor: Prof. Elizabeth Cherry (Rochester Institute of Technology)

PRESENTATIONS

SMB Annual Meeting 2025 | *Invited Minisymposium Presentation — July 2025
- *Modelling mechanically driven tumor cluster coattraction on ECM*
- Session: **Mechanistic modeling from inter- to intra-cellular phenomena**

NYU Biology Department Annual Symposium | *Invited Trainee Speaker — June 2025
- *Tumor cluster coattraction is driven by the ECM*

ASCB/EMBO 2024: Cell Bio | Subgroup Talk — Dec 2024
- *Tumor cluster coattraction is driven by the ECM*
- Session: Theoretical Mechanobiology from Single Cell to Multicellular Level

UPenn Center for Mathematical Biology: MathBio Seminar | *Invited Talk — Oct 2024
- *Contractile cytoskeletal networks: the guiding role of friction*

PRESENTATIONS
(CONT.)

ICERM: QCAM | Contributed Talk   June 2024
- *Modeling and simulation of the cytoskeleton: the role of friction*
- Workshop: Queer in Computational and Applied Mathematics

SIAM Life Sciences 2024 | *Invited Minisymposium Presentation   June 2024
- *Modeling the mechanics of actomyosin structures*
- Session: Data-driven Modeling of Spatial Subcellular Processes

PITT AWM Student Seminar | *Invited Talk   March 2024
- *Modeling the cytoskeleton: how friction can guide its dynamics*
- Talk recording can be found here

Biophysical Society Annual Meeting | Flash Talk (2598) and Poster (P3023)   Feb 2024
- *Friction, not myosin, directs actin network contraction*

ASCB/EMBO 2023: Cell Bio | Subgroup Talk   Dec 2023
- *Friction patterns guide actomyosin network contraction on micropatterned surfaces*
- Session: **Building the Cell**

Flatiron CCB Dynamics in Cells and Embryos Conference | Poster   Oct 2023
- *Friction patterns guide actin network contraction*

SIAM Dynamical Systems 2023 | *Invited Minisymposium Presentation   May 2023
- *Modeling Contractility Patterns of Actomyosin Networks on Micropatterned Surfaces*

ASCB/EMBO 2022: Cell Bio | Poster (P2438)   Dec 2022
- *Contractility patterns in actomyosin networks with turnover are controlled by system geometry*

Flatiron CCB Turing Symposium | Poster   Oct 2022
- *Modeling the Steady Flow-Wave Transition in Contractile Actomyosin Networks*

SIAM Life Sciences 2022 | Poster   July 2022
- *Modeling the Steady Flow-Wave Transition in Contractile Actomyosin Networks*

NIMBioS Undergraduate Research Conference | Oral Presentation   Oct 2018
- *Entrainment of Forced Oscillators with Flexible Periods*

SIAM Life Sciences 2018 | Poster   Aug 2018
- *Controlling Period-2 Electrical Activity in a Cardiac Cell Model*

SIAM Annual Meeting 2018 | Contributed Lecture   July 2018
- *Controlling Period-2 Electrical Activity in a Cardiac Cell Model*

PROFESSIONAL,
OUTREACH,
AND SERVICE
ACTIVITIES

NITMB Topical Workshop | Organizer   Feb 3-5, 2026
- **Curiosity-Driven Dialogue and Collaboration Between Experiment and Theory**
- Targeting early-career researchers with the goal of inspiring curiosity and revealing avenues of collaboration across the experiment-theory spectrum.

NITMB Work-in-Progress Meeting | Seminar Organizer   fall 2025-present
- Co-organizing the schedule and moderating sessions for this seminar on in-progress NITMB research at various stages of completion in an informal setting with the goal to spark discussion, get feedback, and potentially form new collaborations.

Mathematical and Statistical Modeling of Complex Systems Workshop | Speaker
- Northeastern Illinois University's annual workshop for undergraduate students
- Contributed talk on Nov 20, 2025: "Resource competition modeling of actin-propelled beads" (30 minutes).

Modeling and Simulation Group Meeting | Seminar Organizer 2023-2024 AY
- Co-organized the schedule and moderated sessions for this seminar in applied mathematics for graduate students, postdocs, and faculty at the Courant Institute. Seminar featured research talks, figure-making tutorials, and discussions of open problems and research challenges.

cSplash 2024 | Lecturer April 28, 2024
- NYU Courant's annual math-outreach lecture series for high-schoolers.
- Contributed lecture "A crash course in modeling population dynamics" (40 minutes)

Peer reviewer | *Biophysical J.* 2021 - *present*

Courant PhD Student Survey | Lead student organizer fall 2022, 2023
- Facilitated the design and analysis of an internal PhD student survey, with the intention to identify Courant student needs and concerns to department leadership. Roughly two-thirds of PhD students responded both years.

Courant DEI Reading Group | Organizer 2021-2024
- Organizing and leading discussions on Diversity, Equity, and Inclusion issues in the context of Mathematics education and academia.

TESSA Talks | Founder and lead student organizer 2018-2020
- Technology, Education, Science, Society, and Art discussion forum at the UPITT Honors College.

TEACHING
AND
MENTORING

Mentoring MD-PhD research rotation project summer 2025
MD-PhD student: Anna Tang
- Co-advised project on characterizing *Ciona* migrating cell shapes from experimental data using spherical harmonics, with Prof. Alex Mogilner.

Co-advising MS theses in mathematics 2024-2025 AY
Masters students: Rongjie Zhu and Tongtong Liu
- Co-advising projects on mathematical modeling and simulation of (1) cell motility in *Ciona* and (2) *in vitro* actomyosin dynamics, with Prof. Alex Mogilner.

Teaching assistant for MATH-UA 258: Honors Numerical Analysis spring 2025
Course instructor: Prof. Alan Kaptanoglu
- Designed weekly recitation section worksheets and held weekly office hours. Course covers the analysis of numerical algorithms ubiquitously used to solve problems throughout mathematics, physics, engineering, finance, and the life sciences.

Teaching assistant for MATH-UA 251: Mathematical Modeling 2023-2024 AY
Course instructor: Prof. Aaditya Rangan (fall 2023), Prof. Alex Mogilner (spring 2024)
- Designed recitation section materials and wrote weekly quizzes, with weekly office hours. Courses focused on the formulation and analysis of mathematical models for problems in biology, physics, economics, etc.

Course assistant for MATH-GA 2020: Graduate Numerical Methods II spring 2023
Course instructor: Prof. Aleksandar Donev
- Ran weekly office hours and graded computational assignments, as well as assisted in creation of an example suite of ODE solvers with object-oriented design, responsible for designing the MATLAB codes (available on github.)
- On 02/28, taught 1h50min course lecture on "Absolute Stability and Stiffness"

TEACHING AND MENTORING (CONT.)	**Substitute Lecturer for MATH-UA 252: Numerical Analysis** spring 2023 *Course instructor: Dr. Samuel Potter* • On 4/18 and 4/20, taught two 1h15min lectures introducing numerical methods for ODEs at the undergraduate level. Lecture notes can be found on my webpage.
SKILLS	**Computing – advanced**: `MATLAB, Python, LaTeX` **Computing – basic**: `C, CUDA, MPI` **Russian**, heritage speaker