Amir Sagiv

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https://asagivmath.github.io/

Academic and Professional Experience

New Jersey Institute of Technology
Tenure-track Assistant Professor — 2025–current

Technion - Israel Institute of Technology
Senior Lecturer (tenure-track Assistant Professor) — 2023–2024

Columbia University
Term Assistant Professor in Applied Mathematics and Associate Research Scientist — 2019–2023

Yale University
Visiting Graduate Student — 2018–2019

Tel Aviv University
Junior Lecturer and Teaching Assistant — 2016–2018

Education

Tel Aviv University
Ph.D. in Applied Mathematics — 2016–2019

Tel Aviv University
M.Sc. in Applied Mathematics — 2014–2016

Hebrew University of Jerusalem
B.Sc. in Mathematics and Physics (*"Talpiot" program*) — 2006–2009

Grants and Awards

- NSF DMS-2508811 ($182,956) *"A Dynamical Theory of Floquet Materials,"* PI, 2025–2027.
- Binational Science Foundation (BSF) Grant No. 2022254 ($118,000) *"Floquet Media - a Dynamic and Spectral Approach,"* PI, with M.I. Weinstein 2023–2027*
  * since only Israeli PI's are eligible, returned in 10/24 upon moving to NJIT.
- AMS-Simons Travel Grant ($5,000) 07/21–07/23
- SIAM Early Career Travel Award (CSE25) 03/25
- SIAM Early Career Travel Award (CSE21) 03/21
- SIAM Student Travel Award (CSE19) 02/19
- Israel Ministry of Science and Technology Doctoral Student 11/18
- Tel Aviv University Distinguished Ph.D. Award (School of Mathematics) 06/18
- SIAM Student Travel Award (NWCS18) 06/18
- Tel Aviv University Distinguished M.Sc. Award (School of Mathematics) 05/15
- Dean's List Excellence Award (Hebrew University of Jerusalem) 03/09

Papers

1. Alina Chertock, Pierre Degond, **A. Sagiv**, and Li Wang, "The Evolution of Pointwise Statistics in Hyperbolic Equations with Random Data." *arXiv:2507.11399* (under review).

2. **A. Sagiv**, Remy Kassem, and Michael I. Weinstein, "Dispersive Decay Estimates for periodic Jacobi operators on the half-line." *arXiv:2505.14498* (under review).

3. Joseph Kraisler, **A. Sagiv**, and Michael I. Weinstein, "On the Time-decay of solutions arising from periodically forced Dirac Hamiltonians." **Journal of Differential Equations,** 440, 113449, 2025.

4. **A. Sagiv** and Michael I. Weinstein, "Near invariance of quasi-energy spectrum of Floquet Hamiltonians." *arXiv:2304.10685 (under review).*

5. R. Baptista, B. Hosseini, N.B. Kovachki, Y.M. Marzouk, and **A. Sagiv**, "An Approximation Theory Framework for Measure-Transport Sampling Algorithms." **Mathematics of Computation,** 94, 1863–1909, 2025.

6. Joseph Kraisler, **A. Sagiv,** and Michael I. Weinstein, "Dispersive decay estimates for Dirac equations with a domain wall." **SIAM J. on Mathematical Analysis,** 56, 7194–7227, 2024.

7. Q. Du and **A. Sagiv**, "Minimizing optimal transport for functions with fixed-size nodal sets." **J. of Nonlinear Science,** 33:95, 2023.

8. S.N. Hameedi, **A. Sagiv**, and M.I. Weinstein, "Radiative decay of edge states in Floquet media." **SIAM Multiscale Modeling and Simulations,** 21, 925–962, 2023.

9. **A. Sagiv**, "Spectral Convergence of Probability Densities for Forward Problems in Uncertainty Quantification." **Numerische Mathematik** 150, 1165–1185. 2022.

10. **A. Sagiv** and M.I. Weinstein, "Effective Gaps in Continuous Floquet Hamiltonians." **SIAM J. on Mathematical Analysis,** 54, 986–1021, 2022.

11. O. Lindenbaum, **A. Sagiv**, G. Mishne, and R. Talmon, "Kernel-Based Parameter Estimation of Dynamical Systems with Unknown Observation Functions." **Chaos:** *An Interdisciplinary Journal of Nonlinear Science, 31, 043118, 2021.*

12. **A. Sagiv** and S. Steinerberger. "Transport and Interface: an Uncertainty Principle for the Wasserstein Distance." **SIAM J. on Mathematical Analysis***, 52, 3039—3051, 2020.*

13. **A. Sagiv**, A. Ditkowski, R.H. Goodman, and G. Fibich. "Loss of Physical Reversibility in Reversible Systems." **Physica D***, 410, 132515, 2020.*

14. **A. Sagiv**. "The Wasserstein Distances Between Pushed-Forward Measures with Applications to Uncertainty Quantification." **Communications in Mathematical Sciences***, 18, 707–724, 2020.*

15. A. Ditkowski, G. Fibich, and **A. Sagiv**. "Density Estimation in Uncertainty Propagation Problems Using a Surrogate Model." **SIAM/ASA J. on Uncertainty Quantification**, *8, 261–300, 2020.*

16. G. Patwardhan, X. Gao, **A. Sagiv**, A. Dutt, J. Ginsberg, A. Ditkowski, G. Fibich, and A.L. Gaeta. "Loss of Polarization of Elliptically Polarized Collapsing Beams." **Physical Review A**, *99, 033824, 2019.*

17. **A. Sagiv**, A. Ditkowski, and G. Fibich. "Loss of Phase and Universality of Stochastic Interactions Between Laser Beams." **Optics Express**, *25, 24387–24399, 2017.*

Talks

Invited and Seminar Talks

- *2025:* **UIUC** (PDE seminar), **Rutgers** (applied math), **ADMOS25** (minisympsium on adaptive sampling and surrogate modelling, Barcelona), **SIAM AN25** (minisymposium on analysis and modeling in photonics, Montreal), **SIAM PD25** (minisymposium talk on novel materials + minisymposium talk on Statistical Approaches to PDE Inverse Problems, Pittsburgh), **Auburn** (applied and comp math seminar)
- *2024:* **Early Career Workshop in Mathematical Physics** (at Texas A&M), **AMS Fall Central Sectional** (at UTSA), **Hebrew University of Jerusalem** (analysis), **Tel Aviv University** (applied math), **U of Washington** (applied math), **Texas A&M** (colloquium), **NJIT** (colloquium), **UBC** (colloquium)
- *2023:* **Louisiana State** (math physics, online), **Stony Brook** (analysis), **SIAM NNP Sectional** (at NJIT), **Michigan** (PDE), **Michigan State** (math physics), **UC San Diego** (math of data science), **UC Santa Barbara** (applied math), **Yale** (analyais), **Princeton** (PACM colloquium)
- *2022:* **Maryland** (numerical analysis), **CUNY** (harmonic analysis & PDE), **Minnesota** (applied math), **South Carolina** (applied math, online), **NJIT** (waves seminar), **SIAM Annual Meeting** (at Pittsburgh), **TU Chemnitz** (stochastics seminar, online), **UC Davis** (Center of Quantum Mathematics and Physics, math seminar), **Workshop talk:** Approximation of high-dimensional parametric PDEs in forward UQ workshop (Erwin Scrhodinger Institute, online), **U of Washington** (applied math), **SIAM UQ** (at Atlanta), **Ohio State** (analysis, online), **Texas A& M** (colloquium), **Drexel** (colloquium, online), **Northeastern** (colloquium, online), **UNC** (colloquium)
- *2021:* **SUNY Buffalo** (colloquium, online), **Rutgers** (special seminar, online), **Georgia Tech** (applied math, online), **UChicago** (CAM seminar), **UIUC** (PDE seminar), **Northwestern** (applied math), **CU Boulder** (waves seminar, online), **Texas A&M** (math physics), **Yale** (applied math), **MIT** (aerospace computational design seminar), **Workshop on Perturbation of Spectral Bands and Gaps** (TU Dortmund, online), **Hebrew U of Jerusalem** (analysis, online), **Tel Aviv University** (applied math, online), **SIAM MS** (online), **UC San Diego** (applied math, online), **Southern Methodist** (applied math colloquium, online), **Minnesota** (IMA Data Science, online)
- *2020:* **Maryland** (CSCAMM seminar, online), **Caltech** (CMX seminar), **UC Berkeley** (applied math)
- *2019:* **Flatiron** (CCM seminar), **RPI** (colloquium), **NJIT** (waves seminar), **Tel Aviv** (applied math), **Bar Ilan** (applied math), **IMACS11** (at UGA), **Technion** (applied math), **Weizmann Institute** (applied math), **SIAM CSE** (at Spokane), **Columbia** (applied math colloquium),

Stanford (applied math), **UC Merced** (applied math), **UC Irvine** (applied math), **CU Boulder** (waves seminar), **Yale** (applied math)

- *2018:* **SIAM NWCS** (at Orange County), **Israel Mathematical Union Annual Meeting** (at the Technion),

Contributed and other Talks

- *2025:* **NSF Comp Math Meeting** (Utah)
- *2023:* **87th Midwest PDE Seminar** (Notre Dame)
- *2022:* **Mid-Atlantic Numerical Analysis Day** (Temple), **Sayas Numerics Day** (U of Maryland Baltimore County)
- *2021:* **SIAM Annual Meeting** (online), **SIAM CSE** (online)
- *2020:* **Symposium on Machine Learning and Dynamical Systems** (Fields Institute, online), **Dynamics Days Digital** (online), **One World Waves** (online), **Dynamics Days** (Hartford)
- *2019:* **Brown-BU-UMass Dynamics and PDEs workshop** (Brown), **Young Researchers Workshop** (UMD), **OASIS 7** (Tel Aviv),
- *2017:* **Israel Physical Society Annual Meeting** (Technion), **Frontiers in Optics - OSA 101st Annyal Meetings** (Washington DC)

Students Supervised

- Remy Kassem (Columbia Ph.D. student), "Dispersive dynamics of the SSH model", 2022-ongoing (with MI Weinstein).
- Ruoxi Li (Columbia Applied Math '22). "Geometric Measure Theory" spring 2022.
- Jerry Qu (Columbia Applied Math '23). "Reproducing kernel Hilbert spaces and kernel PCA," summer 2021 (with MI Weinstein).
- Sameh N. Hameedi (Columbia Applied Math M.Sc. '21, currently Ph.D. student at Oxford University). "Defect mode decay in Floquet Media," 2020-2021 (with MI Weinstein).
- Ho Jia Xu Dion (Yale-NUS '21, currently Ph.D. student at Columbia University). "Solitary waves interactions with highly non-integrable nonlinearities," 2019 (with W Schlag).

Service and Organization

- **Workshop organizer** "Mathematics of Condensed Matter Physics" at ETH, Zurich (with GM Graf, J Shapiro, and MI Weinstein) 07/23
- **Referee:** Adv Math, SIAM J Math Anal, SIAM J Appl Math, SIAM J Sci Comp, SIAM J Num Anal, Comm Math Phys, Pure Appl Anal (MSP), Bull London Math Soc, PRL, PRA, PRE, Phys Rev Res, J Math Phys, Ann Henry Poincare, Wave Motion, Int J Uncer Quant, Foundations of Data Science, Data-Centered Eng., Comput Stats Data Anal, JOSA B, J Math Imag Vision.
- **Grant Panel:** Binational Science Foundation (BSF)
- **Doctoral Committee**
  - Wen Ding, Columbia University, 08/22
  - Huaiyu Li, Columbia University, 08/23
  - Zirui Xu, Columbia University, 09/24

  - Edith Zhang, Columbia University, 04/25

- **Service,** Technion Faculty of Mathematics:

  Mathematics Entry and Classification Exam 2023–2024

- **Service**, Columbia's Department of Applied Physics and Applied Mathematics:
  - **Seminar organizer** of the APAM Friday Research Conference spring 2020, 2021, 2022
  - **Secretary of the Faculty** fall 2019 – fall 2020, spring 2022
  - **Qualifying Exams** Spring 2020, 2021, 2022, 2023

- **Mini-Course** on dynamical systems at "Columbia Summer Undergraduate Research Experiences in Mathematical Modeling" summer 2021

- **Mini-symposium and special sessions organized:**
  - "Spectra and Dynamics of Complex Materials" for SIAM/CAIMS Annual Meeting, Montreal (with E. Hiltunen) 07/25
  - "Measure Transport - Algorithms and Analysis" for SIAM CSE25, Fort Worth, TX (with C. Moosmueller) 03/25
  - "Computational Measure Transport" for SIAM UQ24, Trieste, Italy (with R. Baptista, A. Hsu, & B. Pandey) 02/24
  - "Optimal transport in uncertainty quantification and learning" for SIAM UQ22, Atlanta, GA (with C. Moosmueller) 04/22
  - "Machine Learning for Scientific Discovery" for SIAM Annual Meeting, online (with O. Lindenbaum) 07/21
  - "Recent Advances in Computational Probability" for SIAM CSE21, online (with B. Hosseini) 03/21
  - "Theory of Optical Waves in Novel Media" for Metamaterials 2020, online (with M.I. Weinstein) 09/20

- **Outreach talk** for undergraduate students at the Technion, "Are all functions (approximately) polynomials?" 11/23

- **Conference referee** for Metamaterials 2020 and Metamaterials 2021

- **Tutoring** for undergraduate students with physical disabilities and for supporting foreign students. Tel Aviv University 2016-2017

Teaching Experience

New Jersey Institute of Technology

- Complex Variables I (graduate, MATH656) spring 2025

Technion

- Introduction to Applied Mathematics (undergraduate, 00104192) spring 2024
- Asymptotic Analysis (graduate, 00198000) spring 2024

Columbia University

- Multivariate Calculus for Engineering and Applied Sciences (APAM2000E) — fall 2019, 2020, 2021
- Principles of Applied Mathematics (APMA4001E) — spring 2020
- Applied Mathematics III: Dynamical Systems (APMA4101E) — spring 2021, 2022, 2023

Tel Aviv University

- Numerical Analysis for Engineering — spring 2018

Tel Aviv University - Teaching Assistant

- Numerical Analysis — fall 2017
- Ordinary Differential Equations — spring 2017
- Calculus I — fall 2017
- Ordinary Differential Equations for Engineering — spring 2016