Amir Sagiv

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

2. 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.

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

4. 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.

5. 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.

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

7. 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.

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

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

10. 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.*

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

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

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

14. 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.*

15. 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.*

16. **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