

Research interests

In my research, I am mostly interested in mathematical statistical physics. In my PhD I studied a certain type of interacting particle systems called kinetically constrained models originally introduced in order to understand glassy materials; where my main focus was on their behavior in a disordered environment.

Education

- 2016–2019 **PhD. in Mathematics.**
Paris Diderot University, under the supervision of Cristina Toninelli.
- 2014–2016 **M.Sc. in Theoretical Physics.**
École Normale Supérieure, Paris.
- 2010–2014 **B.Sc. in Mathematics and Physics.**
Technion, Haifa.

Work and research

- 2021– **Associate professor (maître de conférences), MAP5, Université Paris Cité.**
- 2019–2021 **Postdoc, Roma Tre University.**
- 2017–2019 **Teaching assistant, Paris Diderot University.**
- 2016 **Research internship in statistical physics, LPTENS,** under the supervision of Kay Wiese.
- 2015 **Research internship in probability, LPMA,** under the supervision of Giambattista Giacomin and Cristina Toninelli.
- 2014 **Instructor in an experimental physics course, Technion's physics department.**
- 2013 **Section editor in “Netgar”, Technion's mathematics department's journal.**
- 2013 **North Rhine-Westphalia scholarship program, University of Bielefeld,** research in experimental physics and nanotechnology.
- 2012 **Kupcinet Getz summer school, Weizmann Institute of Science,** research internship in probability under the supervision of Itai Ben-jamini.

Publications and Preprints

- Assaf Shapira. “Noncooperative models of kinetically constrained lattice gases”. In: *arXiv preprint arXiv:2301.13559* (2023).
- Clément Cosco and Assaf Shapira. “Topologically induced metastability in a periodic XY chain”. In: *Journal of mathematical physics* 62 (2021).
- Anatole Ertul and Assaf Shapira. “Self-diffusion coefficient in the Kob-Andersen model”. In: *Electronic Communications in Probability* 26 (2021).
- Tyler Helmuth and Assaf Shapira. “Loop-erased random walk as a spin system observable”. In: *Journal of Statistical Physics* (2020).
- Fabio Martinelli, Assaf Shapira, and Cristina Toninelli. “Diffusive scaling of the Kob-Andersen model in \mathbb{Z}^d ”. In: *Annales de l’Institut Henri Poincaré, Probabilités et Statistiques* 56.3 (2020).
- Assaf Shapira. “A note on the spectral gap of the Fredrickson-Andersen one spin facilitated model”. In: *Journal of Statistical Physics* (2020).
- Assaf Shapira. “Hydrodynamic limit of the Kob-Andersen model”. In: *arXiv preprint arXiv:2003.08495* (2020).
- Assaf Shapira. “Kinetically constrained models with random constraints”. In: *Annals of Applied Probability* 30.2 (2020).
- Assaf Shapira and Kay Jörg Wiese. “An exact mapping between loop-erased random walks and an interacting field theory with two fermions and one boson”. In: *SciPost Physics* 9 (2020).
- Assaf Shapira. “Metastable behavior of bootstrap percolation on Galton-Watson trees”. In: *ALEA* 16 (2019).
- Assaf Shapira and Erik Slivken. “Time scales of the Fredrickson-Andersen model on polluted \mathbb{Z}^2 and \mathbb{Z}^3 ”. In: *arXiv preprint arXiv:1906.09949* (2019).
- Lucas Benigni, Clément Cosco, Assaf Shapira, and Kay Jörg Wiese. “Hausdorff dimension of the record set of a fractional Brownian motion”. In: *Electronic Communications in Probability* 23 (2018).
- Giambattista Giacomini, Christophe Poquet, and Assaf Shapira. “Small noise and long time phase diffusion in stochastic limit cycle oscillators”. In: *Journal of Differential Equations* 264.2 (2018).
- Amichai Lampert and Assaf Shapira. “On maximizing the speed of a random walk in fixed environments”. In: *Electronic Communications in Probability* 18 (2013).

Awards

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| 2007 | Honorable mention , <i>Asian Physics Olympiad</i> , Shanghai, China. |
| 2007 | Silver Medal , <i>International Chemistry Olympiad</i> , Moscow, Russia. |
| 2007 | 3rd place , <i>National mathematics Tournament of Towns</i> . |



Lannguages and other skills

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| Hebrew | native |
| English | fluent |
| French | fluent |
| German | good |
| Italian | basic |
| Programing | Python, C, Julia |