

# Matteo Sfragara

Stockholm University

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Nationality	Italian
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## About me

I am a postdoctoral researcher in the Department of Mathematics of Stockholm University and I am currently working on first passage percolation and related models.

My research interests are mainly focused in the areas of probability theory and networks. They cover a broad range of topics, including complex networks, random graphs, random matrices, metastability, large deviations, interacting particle systems, Markov chains, queueing theory, wireless networks and machine learning. In particular, I have been working on metastability in wireless networks, spectra of random graphs and Markov chain Monte Carlo algorithms.

## Research and work experiences

### Postdoc positions

May 2021 - present	Postdoc at Stockholm University (Sweden) Working on first passage percolation in the group of M. Deijfen
Feb-Apr 2021	Visiting Postdoc at KTH Royal Institute of Technology (Sweden) Working on machine learning over networks in the group of C. Fischione

### PhD

Sep 2016 - Oct 2020	PhD in Mathematics at Leiden University (The Netherlands) Research in Probability Theory as a member of the NETWORKS program Supervisors: F. den Hollander (Leiden University), S. Borst (Eindhoven University of Technology), F.R. Nardi (University of Florence) Thesis: Wireless random-access networks and spectra of random graphs Awards: Applied Probability Trust Prize 2020
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### Research visits

Jan 2020	Visiting R.S. Hazra and A. Chakrabarty, Indian Statistical Institute (ISI) Kolkata (India)
Mar 2019	Visiting D. Yogeshwaran, Indian Statistical Institute (ISI) Bangalore (India)
Feb-Mar 2019	Visiting R.S. Hazra and A. Chakrabarty, Indian Statistical Institute (ISI) Kolkata (India)
Jan-Feb 2018	Visiting R.S. Hazra and A. Chakrabarty, Indian Statistical Institute (ISI) Kolkata (India)

## Education

2013-2015	MSc in Mathematics, University of Padova (Italy) Final grade: 110/110 Thesis: The switch Markov chain for sampling irregular directed graphs
Jul-Nov 2015	Exchange, University of New South Wales, Sydney (Australia) Practicum Program: research exchange (4 months) under the supervision of C. Greenhill
2013-2014	Exchange, Stockholm University (Sweden) Erasmus Program: study exchange (10 months), courses in Mathematics at Stockholm University and KTH
2010-2013	BSc in Mathematics, University of Padova (Italy) Final grade: 102/110 Thesis: Exterior algebra and Grassmannians
2005-2010	Scientific high school, G. Galilei, Verona (Italy) Final grade: 100/100

## Languages

Italian	Mother tongue
English	Fluent
Portuguese	Good
Spanish	Basic

## Publications

### Journals

2022	M. Sfragara. Adding edge dynamics to wireless random-access networks, <i>Stochastic Models</i> 38(4), 545–581.
2021	A. Chakrabarty, R.S. Hazra, F. den Hollander and M. Sfragara. Large deviation principle for the maximal eigenvalue of inhomogeneous Erdős-Rényi random graphs, <i>Journal of Theoretical Probability</i> , <a href="https://doi.org/10.1007/s10959-021-01138-w">https://doi.org/10.1007/s10959-021-01138-w</a> .
2021	A. Chakrabarty, R.S. Hazra, F. den Hollander and M. Sfragara. Spectra of adjacency and Laplacian matrices of inhomogeneous Erdős-Rényi random graphs, <i>Random Matrices: Theory and Applications</i> 10(01), 2150009.
2020	S. Borst, F. den Hollander, F.R. Nardi and M. Sfragara. Transition time asymptotics of queue-based activation protocols in random-access networks, <i>Stochastic Processes and Their Applications</i> 130(12), 7483–7517.
2018	C. Greenhill and M. Sfragara. The switch Markov chain for sampling irregular graphs and digraphs, <i>Theoretical Computer Science</i> 719, 1–20.

### Submitted

- S. Borst, F. den Hollander, F.R. Nardi and M. Sfragara. Wireless random-access networks with bipartite interference graphs, [arXiv:2001.02841].
- M. Deijfen, R. van der Hofstad and M. Sfragara. The winner takes it all but one, [arXiv:2204.04125].

### In preparation

- D. Ahlberg, M. Deijfen and M. Sfragara. Chaos, concentration and multiple valleys in first-passage percolation.
- D. Ahlberg, M. Deijfen and M. Sfragara. From stability to chaos in last passage percolation.

## Outreach

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| 2021 | M. Sfragara. How does wireless communication work?, <i>The Network Pages</i> ( <a href="http://www.networkpages.nl/how-does-wireless-communication-work">www.networkpages.nl/how-does-wireless-communication-work</a> ). |
| 2019 | M. Maggioni and M. Sfragara. A glimpse into the Pre-University College, <i>Nieuw Archief voor Wiskunde</i> 5/20 nr. 4, 272–274.  |

## Academic activities

### Teaching

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|-------------|--|
| Spring 2023 | Stochastic Processes and Simulation II, Stockholm University, teacher  |
| Spring 2022 | Stochastic Processes and Simulation II, Stockholm University, teacher  |
| Fall 2019   | Complex Networks, Leiden University, teaching assistant  |
| Spring 2019 | Mathematical Reasoning, Leiden University College, Den Haag, teacher   |
| Spring 2018 | Mathematical Reasoning, Leiden University College, Den Haag, teacher   |
| Spring 2017 | Path Large Deviations, University of Florence, lecture for PhD course  |
| Spring 2017 | Stochastic Processes, Leiden University (MasterMath), teaching assistant   |
| Fall 2016   | Probability and Statistics (for Life Science and Technology), Leiden University, teaching assistant                |
| 2014-2015   | Mathematics (for Biology, Biotechnology, Chemistry and Natural Sciences), University of Padova, teaching assistant |

### Supervision

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|-------------|---|
| Fall 2019   | Emma de Rooij and Nina van Staaldune, “The Google PageRank algorithm”, Pre-University College, Leiden   |
| Spring 2019 | Nienke van der Velden, “A randomized algorithm for bipartite wireless networks”, BSc in Mathematics, Leiden University  |
| Fall 2018   | Aryan Rezaei and Tobias Lewerissa, “Markov chains, chessboards in $\mathbb{R}^d$ and supermarkets” (winners of the Jan Kijne-onderzoeksprijs), Pre-University College, Leiden |

### Organization

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| 2021 - present | Matstat seminars, Department of Mathematics, Stockholm University      |
| 2019-2020      | Leiden - Complex Networks - Network (LCN2) seminars, Leiden University |

### Referee

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| $\geq 2021$ | Journal of Combinatorial Theory, Series B |
| $\geq 2019$ | Electronic Journal of Combinatorics       |

## Invited talks

Jul 2023	29th Nordic Congress of Mathematicians with EMS, session on “Stochastic processes on random networks”, Aalborg (Denmark)
Jan 2023	Probabilistic Midwinter Meeting, Umeå (Sweden)
Jul 2022	Workshop “Francesca Romana Nardi: A life in probability, building communities across Europe”, Florence (Italy)
Jun 2022	Matstat seminar, Stockholm (Sweden)
May 2022	Seminar for the study trip of “De Leidsche Flesch”, Stockholm (Sweden), organization and talk
May 2020	LUM Munich seminar, online via zoom, Munich (Germany)
Sep 2019	NETWORKS Workshop “Random Graphs, Counting and Sampling”, Amsterdam (The Netherlands)
Jun 2019	Second Italian Meeting on Probability and Mathematical Statistics, Salerno (Italy)
May 2019	NETWORKS Training Week, Doorn (The Netherlands)
Mar 2019	ISI Probability Seminar, Bangalore (India)
Feb 2019	ISI Probability Seminar, Kolkata (India)
Jan 2019	Leiden - Complex Networks - Network (LCN2) Seminar, Leiden (The Netherlands)
Dec 2018	Young European Queueing Theorists (YEQT) Workshop, Toulouse (France)
Oct 2018	NETWORKS Training Week, Asperen (The Netherlands)
Jun 2018	Stochastic Processes and Applications (SPA) Conference, Gothenburg (Sweden)
Apr 2018	Most Informal Probability Seminar (MIPS), Leiden (The Netherlands)
Jan 2018	ISI-NETWORKS Conference in Probability, Kolkata (India)
May 2017	Most Informal Probability Seminar (MIPS), Leiden (The Netherlands)

## Workshops and conferences

Jul 2022	Workshop “Francesca Romana Nardi: A life in probability, building communities across Europe”, Florence (Italy)
Apr 2021	KNAW Corona Webinar “Mathematics and Covid-19: social network modelling and the spread of infectious diseases”, online via Zoom
Mar 2021	IUSTeC Webinar “Machine Learning. Introduzione e limiti dell’apprendimento automatico basato su reti neurali”, online via Zoom
Jan 2020	NETWORKS Matchmaking Event, Doorn (The Netherlands)
Nov 2019	Probability and Statistical Physics seminar, Florence (Italy)
Nov 2019	Stochastics Meeting Lunteren, Lunteren (The Netherlands)
Sep 2019	NETWORKS Workshop “Random Graphs, Counting and Sampling”, Amsterdam (The Netherlands)
Sep 2019	Summer School in Probability, Lisbon (Portugal)
Jun 2019	Second Italian Meeting on Probability and Mathematical Statistics, Salerno (Italy)
Jun 2019	Workshop “50 Years of Random Cluster Model”, Leiden (The Netherlands)
Dec 2018	36th International Symposium on Computer Performance, Modeling, Measurements and Evaluation 2018 (IFIP Performance Conference), Toulouse (France)
Dec 2018	Young European Queueing Theorists (YEQT) Workshop, Toulouse (France)
Nov 2018	Probability and Statistical Physics seminar, Florence (Italy), helping with the organization.
Oct 2018	KNAW Symposium on Networks, Amsterdam (The Netherlands)
Jun 2018	Stochastic Processes and Applications (SPA) Conference, Gothenburg (Sweden)
Jun 2018	ISI-NETWORKS Workshop, Leiden (The Netherlands)
Apr 2018	Dutch Mathematical Congress (NMC), Veldhoven (The Netherlands)
Jan 2018	ISI-NETWORKS Conference in Probability, Kolkata (India)
Dec 2017	Workshop on “Network Models: Structure and Function”, Oberwolfach (Germany), preparation of the final workshop report
Sep 2017	Stochastic Activity Month on “Random Graphs and Complex Networks”, EURANDOM, Eindhoven (The Netherlands)
Jul 2017	Stochastic Processes and Applications (SPA) Conference, Moscow (Russia)
Apr 2017	Dutch Mathematical Congress (NMC), Utrecht (The Netherlands)
Feb 2017	STAR Workshop “Random Graphs”, Utrecht (The Netherlands)
Dec 2016	Workshop “Guided tour: Random Media”, EURANDOM, Eindhoven (The Netherlands)
Nov 2016	Stochastics Meeting Lunteren, Lunteren (The Netherlands)
Sep 2016	Leiden - Complex Network - Network (LCN2) Day, Leiden (The Netherlands)