

Laboratoire Jean Perrin (UMR 8237 CNRS)  
Sorbonne Université  
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France

# Silvia Grigolon

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## CNRS Research Fellow

Italian — Born on October, 7th 1987

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### Experience

- 2021 – today **CNRS Research Fellow**, *Sorbonne Université, Laboratoire Jean Perrin*, Paris, France  
Ranked 1st ex aequo.
- 2020 – 2021 **Postdoctoral Research Fellow**, *Sorbonne Université, Laboratoire Jean Perrin*, Paris, France  
Main topic of study: Collective cell migration and bleb formation.  
Supervisor: Prof. Raphaël Voituriez.  
Main experimental collaborator: Dr. Matthieu Piel (Institut Pierre-Gilles de Gennes, Paris).
- 2015 – 2020 **Postdoctoral Research Fellow**, *The Francis Crick Institute*, London, UK  
Main topic of study: Models of active-gel theory and complex molecular networks for vertebrates' early morphogenesis at cell and tissue scales.  
Supervisor: Prof. Guillaume Salbreux.  
Main experimental collaborators: Prof. C.-P. Heisenberg (IST Austria) and Dr. Caroline Hill (The Francis Crick Institute, UK).
- 2012– 2015 **Early Stage Researcher**, *LPTMS, Université Paris-Sud XI*, Orsay, France  
Part of the Marie Curie Training Network NETADIS, (NETworks Across DISciplines, grant no. FP7 290038).  
Main topics of study:
  - Models of molecular networks governing plant morphogenesis at cell and tissue scales;
  - Inference methods for protein sequences.Supervisors: Prof. Silvio Franz and Prof. Olivier C. Martin.

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### Education

- 2015 **Ph.D. in Theoretical Physics**, *Université Paris-Sud XI*, Orsay, France  
Supervisors: Prof. Silvio Franz and Prof. Olivier Martin
- 2012 **Master's Degree in Theoretical Physics**, *Sapienza Università di Roma*, Italy  
Supervisors: Prof. Enzo Marinari and Dr. Francesca Di Patti

Mark: 110/110 cum laude

2009 **Bachelor's Degree in Physics**, *Sapienza Università di Roma*, Italy

Supervisor: Prof. Enzo Marinari

Mark: 110/110 cum laude

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## Awards, distinctions & qualifications

2024 **ANR JCJC** by Agence Nationale de la Recherche for the project LiPhysiX (280 k€).

2024 **80Prime** by MITI CNRS for one PhD scholarship and yearly allowance (11.5 k€) for the project CELL-MIGRA-GLASS with Benoit Ladoux.

2023 **PEPR Santé Numérique** by France 2030 and ANR within the French network AI4scMED. Principal coordinator: Franck Picard (ENS Lyon).

2022 **ICL-CNRS fellowship** by Imperial College London for a three-months stay (6 k£).

2022 **Tremplin@INP 2022** by CNRS (20 k€).

2020 Qualified as Maître de Conférence in France in the disciplinary sections 28 (condensed matter) and 29 (elementary constituents).

2015 **Postdoctoral Research Fellowship** at the Francis Crick Institute, London, UK.

2012 **Winner** of a competitive Marie Skłodowska-Curie PhD scholarship at LPTMS, Université Paris-Sud XI, France within the network NETADIS (FP7 290038).

2008-2010 **Twice winner** of *Borsa di Collaborazione* at Department of Physics - Sapienza Università di Roma aimed at tutoring students in the afternoon sessions of the Computational Labs.

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## Languages

Italian Native

English Fluent

French Fluent

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## Technical Expertise

Programming C, Matlab, Mathematica, Python, R, Bash

OS Unix, Windows

Software and Tools Microsoft Office applications, Adobe Illustrator and Photoshop, ImageJ, Chimera, PyMol, LaTeX

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## Teaching and mentoring

2024 **12 hours** of tutoring for Mathematics I at ESPCI, Paris, France

2021-2023 **50 hours per year** of tutoring for the programming projects (Master's level) at Chimie ParisTech, France

- 2016-2019 **16.5 hours** of tutoring (problem classes) for the afternoon sessions of **Matlab Classes by SysMic** at UCL, UK
- 2016 **14 hours** of tutoring (problem classes) for **Mathematical Methods I (PHAS1245)** at UCL, UK
- 2014 **8 hours** of **Introduction to Genome Analysis and Noise-Reduction Techniques** (lectures) within the course of Inference, Learning and Big Data held by Prof. Silvio Franz, Sorbonne Université (former UPMC), Paris, France
- 2012-2013 **Mentor** for the Master's Thesis of Nicola Quadri (officially supervised by Prof. Silvio Franz and Prof. Amos Maritan), Università di Padova, Italy
- 2008-2010 **About 300 hours** of tutoring (problem classes) students during the afternoon sessions of the **Computational Physics Lab courses** at Sapienza Università di Roma, Italy

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### Student supervision

- 2024 Paul Sitoleux (M2, ENS Paris-Saclay). Now Ph.D. student under the joint supervision of myself and Thierry Mora and Aleksandra Walczak. Defence expected October 2027
- 2024 Mathéo Aksil (M2, ENS Paris). Now Ph.D. student under my supervision. Defence expected October 2027
- 2023-2024 Felix Wang (M2, Imperial College London), co-supervised with Barbara Bravi
- 2023 Kristiana Mihali (M2, Université Paris-Saclay, Orsay)
- 2023 Sam-Rayden Malanda (L2, Sorbonne Université, Paris)
- 2023 Vincent Hulot (L2, Engineering School De Vinci, Paris)
- 2022 Roberto Netti, co-supervised with O. C. Martin (M2, Politecnico di Torino, Italy, & Sorbonne Université, Paris, France)

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### Conference and meeting (co-)organisation

- 2023 Co-organiser with Pierre Ronceray (CENTURI, Marseille) of the mini-conference of Physics of Living Systems at Congrès Général de la Société Française de Physique, Paris
- 2021-2023 Organiser with Clément Nizak of the seminars at Laboratoire Jean Perrin, Sorbonne Université, Paris
- 2019 Salbreux and Arroyo Lab Retreat, La Cerdanya, Spain
- 2015-2020 Friday Physics Club at the Francis Crick Institute, London, UK
- 2017 Salbreux and Tapon Lab Retreat, Lyndhurst, UK
- 2016 Biophysics meeting of Lates at LIMS, London, UK
- 2014 & 2015 Paris Biological Physics Community day, Paris, France

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### Research visits

Aug 2024 - Sep 2024, Dipartimento di Fisica, Sapienza Università di Roma, Italy  
Nov 2024

Feb 2024 - Apr 2024 Department of Mathematics, Imperial College London, UK  
Sep 2019 Politecnico di Torino, Italy  
Jan 2017 HuGef & Politecnico di Torino, Italy  
Nov 2015 Heisenberg Lab at IST Austria  
Jul 2015 Salbreux Lab at the Francis Crick Institute, UK  
Apr 2015 Bennett Lab at the University of Nottingham, UK

Jun 2014 - Dec 2015 Multiple times at Quantitative Life Science group at ICTP, Trieste, Italy  
Oct 2013 - Dec 2013 Disordered Systems group at King's College London, UK  
Feb 2013 Chimera group, Sapienza Università di Roma, Italy

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### Service to the community

- Peer Review for several interdisciplinary journals among which ELife, Nature Physics, Physical Review Letters, Physical Review Research and Plos Computational Biology
- Member and secretary of the office of Physics of Living Systems at Société Française de Physique
- Member of the council of the Faculty of Physics at Sorbonne Université, Paris

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### Academic interests

Mathematical Biology, Developmental Biology, Statistical and Out-of-equilibrium Physics, Bioinformatics.

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### Invited and contributed talks and posters

since 2012 More than 30 talks (invited and contributed) and poster presentations at international conferences.

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### List of publications

- 2024 E. Lardet, R. Voituriez, **S. Grigolon**\*, T. Bertrand\*  
Disordered Yet Directed: The Emergence of Polar Flocks with Disordered Interactions  
*under revision*, <https://arxiv.org/pdf/2409.10768>
- 2024 X. Yang, T. Ferraro, K. Molnar, S. R. Malanda, N. Maghelli, L. Royer, J. Pontabry, S. Grill, G. Myers, **S. Grigolon**, M. Labouesse  
Repeated extraneous tensional inputs and lower surface tension promote polarised adherens junction extension  
*under revision*, <https://www.biorxiv.org/content/10.1101/2024.07.09.602689v1.full.pdf>

- 2024 J. M. Garcia-Arcos, J. Ziegler, **S. Grigolon**, L. Reymond, G. Shajepal, A. Lomakin, C. J Cattin, D. Müller, V. Ruprecht, S. Wieser, R. Voituriez, M. Piel  
Advection percolation in the actomyosin cortex drives amoeboid cell motility  
*Dev. Cell*, 59, 1-18 (2024) DOI: 10.1016/j.devcel.2024.06.023
- 2021 **S. Grigolon**  
Morfogenesi: una sfida interdisciplinare  
*Ithaca*, 18 (in italian)
- 2021 L. Montel, I. Golovkova, **S. Grigolon**, E. Wandersman, A. M. Prevost, T. Bertrand, L.-L. Pontani  
Adhesion percolation determines global deformation behavior in biomimetic emulsions,  
*Frontiers in Physics*, 9, 547, DOI:10.3389/fphy.2021.744006
- 2020 E. Ferro, C. Enrico Bena, **S. Grigolon\***, C. Bosia\*,  
microRNA-mediated noise processing in cells: a fight or a game?,  
*Computational and Structural Biotechnology Journal*, 18, 642-649, DOI:10.1016/j.csbj.2020.02.020, \* co-last authors
- 2019 E. Ferro, C. Enrico Bena, **S. Grigolon\***, C. Bosia\*,  
From Endogenous to Synthetic microRNA-Mediated Regulatory Circuits: An Overview,  
*Cells*, 8(12), 1540, \* co-last authors, DOI:10.3390/cells8121540
- 2019 N. Petridou, **S. Grigolon**, G. Salbreux, E. Hannezo, C.-P. Heisenberg,  
Fluidization-mediated tissue spreading by mitotic cell rounding and non-canonical Wnt signalling,  
*Nat. Cell Biol.*, 21, 169-178 DOI:10.1038/s41556-018-0247-4
- 2018 M. Del Giudice, C. Bosia, **S. Grigolon**, S. Bo,  
Stochastic sequestration dynamics: a minimal model with extrinsic noise for bimodal distributions and competitors correlation,  
*Scientific Reports*, 8(1), 10387, DOI:10.1038/s41598-018-28647-9
- 2018 M. Del Giudice, S. Bo, **S. Grigolon\***, C. Bosia\*,  
On the role of extrinsic noise in microRNA-mediated bimodal gene expression,  
*Plos Comp. Biol.*, 14(4): e1006063, \* co-last authors DOI:10.1371/journal.pcbi.1006063
- 2018 **S. Grigolon**, B. Bravi, O. C. Martin,  
Responses to auxin signals: an operating principle for dynamical sensitivity yet high resilience,  
*R. Soc. Open Science*, 5 (1), 172098, DOI:10.1098/rsos.172098

- 2017 M. Smutny, Z. Ákos, **S. Grigolon**, S. Shamipour, ..., B. Hof, T. Vicsek, G. Salbreux, C.-P. Heisenberg,  
Friction forces position the neural anlage,  
*Nat. Cell Biol.*, 19 (4), 306, DOI:10.1038/ncb3492
- 2017 H. Morita, **S. Grigolon**, M. Bock, G. S. F. Krens, G. Salbreux, C.-P. Heisenberg,  
The physical basis of coordinated tissue spreading in zebrafish gastrulation,  
*Dev. Cell*, 40 (4), 354-366. e4, DOI:10.1016/j.devcel.2017.01.010
- 2016 **S. Grigolon**, F. Di Patti, A. De Martino, E. Marinari,  
Noise processing by microRNA-mediated circuits: the incoherent feed-forward loop, revisited,  
*Heliyon*, 2 (4), e00095, DOI:10.1016/j.heliyon.2016.e00095
- 2016 **S. Grigolon**, S. Franz., M. Marsili,  
Identifying relevant positions in proteins by Critical Variable Selection,  
*Mol. Biosystems*, 12 (7), 2147-2158, DOI:10.1039/C6MB00047A
- 2015 **S. Grigolon**,  
Modelling and inference for biological systems: from auxin dynamics in plants to protein sequences,  
Ph. D. thesis available on [theses.fr/2015PA112178](http://theses.fr/2015PA112178)
- 2015 **S. Grigolon**, P. Sollich, O. C. Martin,  
Modelling the emergence of polarity patterns for the intercellular transport of auxin in plants,  
*J. R. Soc. Interface*, 12 (106), 20141223, DOI:10.1098/rsif.2014.1223