
Personal Information

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Employment

since 10/2022 **Research Associate**, Imperial College London
with [Dr P Thomas](#) working on Statistical Models of cell proliferation
2019 – 2022 **Henry Philpott Teaching and Research Fellow in Mathematics**
St Catharine's College and DAMTP, University of Cambridge
Director of Studies, Undergraduate Tutor
04 – 09/2019 **Doctoral Prize Fellow**, Imperial College London

Education

2015 – 2019 **PhD in Mathematics, Imperial College London**
Title: Topics in Statistical Mechanics. Research Topics: Stochastic Processes in Branching, Filament Self-Assembly in Cells, Neural Avalanches, Evolutionary Game Theory and Wetting Phenomena
Supervisors: [Prof A O Parry](#), [Dr G Pruessner](#)
2013 – 2014 **MASt in Physics, University of Cambridge**
Research Project: *Transfer Matrix Study of 2D Lattice Coloring Models*.
Adviser: [Prof C Castelnovo](#)
2011 – 2013 **MSc in Mathematics, Paris VI**
MSc-Thesis topic: *Structure and Renormalization in Effective Field Theory following Kevin Costello*. Advisers: Dr F Paugam, [Prof Oancea](#), Dr G Ginot;
Master essay: *Methods of Stationary Phase*. Adviser: [Prof N Lerner](#)
2009 – 2011 **BSc in Mathematics, TU Berlin**
BSc-Thesis topic: *Invariant Sets of Dynamical Systems in a Neighborhood of a Homoclinic Orbit*. Advisers: [Prof Y Suris](#), [Dr M Petreira](#)
2008 – 2011 **BSc in Physics, TU Berlin**
BSc-Thesis topic: *Non-linear Dynamics of Optically Injected Quantum Dot Lasers, Impact of Microscopic Carrier-Carrier Scattering*. Advisers: [Prof E Schöll](#), [Prof K Lüdge](#)

Publications

- 2022 From Neuronal Spikes to Avalanches – Effects and Circumvention of Time Binning: J Pausch [doi: 10.1103/PhysRevResearch.4.023212](https://doi.org/10.1103/PhysRevResearch.4.023212), *Phys. Rev. Res.* **4**, 023212
- 2021 Noise can lead to exponential epidemic spreading despite R_0 below one: J Pausch, R Garcia-Millan, G Pruessner, [arXiv:2109.00437](https://arxiv.org/abs/2109.00437), submitted to *R. Soc. Open Sci.*
- 2020 Time-dependent branching processes: a model of oscillating neuronal avalanches: J Pausch, R Garcia-Millan and G Pruessner: [doi: 10.1038/s41598-020-69705-5](https://doi.org/10.1038/s41598-020-69705-5) in *Sci. Rep.*
- 2019 Is Actin Filament and Microtubule Growth Reaction- or Diffusion-Limited?: J Pausch and G Pruessner, [doi: 10.1088/1742-5468/ab081c](https://doi.org/10.1088/1742-5468/ab081c), in *J. Stat. Mech.: Exp. Theory*

- 2018 Field-theoretic approach to the universality of branching processes: R Garcia-Millan, J Pausch, B Walter, G Pruessner, doi: [10.1103/PhysRevE.98.062107](https://doi.org/10.1103/PhysRevE.98.062107) in *Phys. Rev. E*
- 2018 First-order Wedge Wetting revisited: C Rascon, J Pausch, and A O Parry; *Soft Matter*, doi: [10.1039/c8sm00342d](https://doi.org/10.1039/c8sm00342d)
- 2015 Finding four decay components in Li glass and three decay components in CeBr₃ scintillation light pulses in the temperature range from -30°C to $+50^{\circ}\text{C}$ by iterative subtraction of composite decays: J Pausch, F Scherwinski, J Stein; *Nucl. Instrum. Methods Phys. Res. A* 807 (2015) doi:[10.1016/j.nima.2015.11.002](https://doi.org/10.1016/j.nima.2015.11.002)
- 2012 Optically injected quantum dot lasers: impact of non-linear carrier lifetimes on frequency-locking dynamics: J Pausch, C Otto, E Taylaite, N Majer, E Schöll, K Lüdge; *New Journal of Physics* 14 (2012) doi:[10.1088/1367-2630/14/5/053018](https://doi.org/10.1088/1367-2630/14/5/053018)

Talks

On spreading dynamics:

- 2021 Sept Bernstein Conference 2021, Jülich, Germany
Jan Soft Matter Seminar, University of Cambridge
- 2020 June Soft Matter Seminar, University of Cambridge
- 2019 April DPG Frühjahrstagung, U Regensburg, Germany
- 2018 Nov Complexity Seminar, Imperial College London, UK

On actin and microtubule self-assembly:

- 2018 May Circle Meeting, The Francis Crick Institute, London, UK
March DPG Frühjahrstagung, TU Berlin, Germany
March University of Tokyo, visit of Nen Saito's Laboratory, Japan
January Winter School on Active Matter, Tel Aviv University, Israel
- 2017 Dec Complexity Seminar, Imperial College London, UK
Nov COXIC workshop, University of Oxford, UK
Nov Quantitative Systems Biology Workshop, King's College London, UK
Sept Summer School, Stoch. Processes with Applic. in Physics and Biophysics, Acre, Israel
June Meeting on Theoretical Physics of Life, Imperial College London, UK

On wetting of structured surfaces:

- 2017 Feb Complexity Seminar, Imperial College London, UK
- 2016 Nov Junior Applied Mathematics Seminar, Imperial College London, UK

On other topics:

- 2017 Nov Junior Applied Math. Seminar, "Field Theories for Stochastic Processes with Applications to Biology", Imperial College London, UK

Conferences and Workshops (Co-) Organised

- 2020 – 2022 Soft Matter Mini Seminar, DAMTP, University of Cambridge
- April 2019 Theory of Stochastic Processes with Applications in Biology, a 1-day focus session at the DPG spring meeting, Regensburg, Germany
- April 2018 [Field Theories Come to Life](#), 1-day workshop, Imperial College London
- 2017 – 2019 [Biophysics Journal Club](#), Imperial College London
- Jun 2017 [Annual Conference of Imperial College SIAM student chapter](#), 1-day workshop
- Feb 2017 [Imperial College SIAM Mathematical Physics Day](#), 1-day workshop

Teaching

- Lectures Created and delivered graduate course on [non-equilibrium statistical field theory](#)
- Small Group covering most applied mathematics undergraduate courses, e.g. Differential Equations, Classical Physics, Probability, Statistics.
- Co-supervision two PhD students
- Supervision summer research projects of so far 7 undergraduate students