

Michael Felix Adamer

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RESEARCH INTERESTS

I develop mathematical techniques for analysing chemical reaction networks. My aim is to extend and, ideally, combine the two current predominant frameworks of modelling chemical reactions, namely deterministic and stochastic dynamics. I use a wide range of mathematical techniques including algebraic geometry, graph theory, ODEs, linear algebra and stochastic analysis.

EMPLOYMENT

Compulsory Austrian Army Service, January 2020 - July 2020, Austria

Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany
Postdoctoral Researcher, August 2019 - December 2019.

EDUCATION

University of Oxford, Oxford, UK
Doctor of Philosophy, Mathematical Institute and
Doctoral Training Centre, Systems Biology, October 2015 - October 2019.

Thesis title: *Algebraic Methods for Chemical Reaction Networks with Extrinsic Noise*,
Supervisors: Heather Harrington, Thomas Woolley, Eamonn Gaffney.

Master of Physics, October 2011 - June 2015 (4-year integrated masters),
First Class Honours, Supervisor: Julia Yeomans.

PROFESSIONAL ACTIVITIES

Jul 2019: Organiser, minisymposium on Stochastic Chemical Reaction Networks, SIAM AG19, Bern, Switzerland

Oct 2018: Advances in Chemical Reaction Network Theory, ESI, Vienna, Austria

Jun 2018: Macaulay2 Workshop, Leipzig, Germany

Sept 2017: Co-organiser, Applied Algebra and Geometry Research Network UK, Third Meeting, Oxford, UK

Jul 2017: Macaulay2 Workshop, Atlanta, GA, USA

Mar 2017: Stochastic PDEs: Analysis and Computation, University of Warwick, UK

Mar 2017: Modelling of Tissue Growth and Form, MBI, Columbus, OH

Nov 2016: MPI für Mathematik in den Naturwissenschaften, Leipzig, Germany

AWARDS AND FELLOWSHIPS

Jul 2019: SIAM Travel Award for the SIAM AG19 Conference (declined)

Jul 2018: Poster Prize at the European Conference for Mathematical Biology, Lisbon

May 2018: Doctoral Training Centre Short Project Publication Prize

Oct 2015: EPSRC Scholarship (DPhil Funding)

Jun 2015: First Class Honours in Physics

Oct 2014: Exhibitioner, Merton College

Jan 2012: Fowler Prize, Merton College (multiple times)

PAPERS

6. **MF Adamer**, AC Lőrincz, A-L Sattelberger, B Sturmfels, *Algebraic Analysis of Rotation Data* (accepted at Algebraic Statistics), arXiv:1912.00396.
5. **MF Adamer**, M Helmer. *Families of toric chemical reaction networks*, J. Math. Chem. (2020), <https://doi.org/10.1007/s10910-020-01162-x>
4. **MF Adamer**, HA Harrington, EA Gaffney, TE Woolley. *Coloured noise from stochastic inflows in reaction-diffusion systems*, Bull. Math. Biol. 82(4), 1-28.

3. **MF Adamer**, M Helmer. *Complexity of model testing for toric dynamical systems*, Adv. Appl. Math. 110, 42-75.
2. **MF Adamer**, TE Woolley, HA Harrington. *Graph-facilitated resonant mode counting in stochastic interaction networks*, J. R. Soc. Interface 2017 14 20170447.
1. A Doostmohammadi, **MF Adamer**, SP Thampi, JM Yeomans. *Stabilization of active matter by flow-vortex lattices and defect ordering*, Nat. Commun., 7, 2016.

TALKS

Nov 2019: Applied Mathematics Department Seminar, University of Tokyo, Tokyo, Japan.

Nov 2019: Probability / Statistics / Matrix Workshop, Tachikawa, Tokyo, Japan.

Jul 2019: SIAM Conference on Applied Algebraic Geometry, Bern, Switzerland.

Jul 2018: ECMTB Conference, Lisbon, Portugal (Poster).

Jun 2018: Macaulay2 Workshop, Leipzig, Germany.

May 2018: Applied Topology and Algebra Seminar, Mathematical Institute, University of Oxford.

Nov 2017: Junior Applied Topology and Algebra Seminar, Mathematical Institute, University of Oxford.

Aug 2017: SIAM Conference on Applied Algebraic Geometry.

Nov 2016: Max Planck Institut, Leipzig.

Jul 2016: SIAM Annual General Meeting (joint with SIAM Conference on the Life Sciences).

Dec 2014: ETH Zurich, Esslinger Group (internal seminar).

TEACHING

University of Oxford (2016-present):

General Relativity (Class Tutor)

Introduction to Programming (Demonstrator, Doctoral Training Centre module)

Statistics (Demonstrator, Doctoral Training Centre module)

Further Mathematical Biology (TA)

Stochastic Modelling for Mathematical Biology (TA, Revision Tutor)

Mathematical Biology Short Option (Tutor)

Geometry and Dynamics (Revision Tutor)

Marker for College examinations and admissions tests

Graduate Mentor in Physics and Mathematics (Merton College)

SERVICE AND ACTIVITIES

Dec 2018: Christmas Lecture at the Natural History Museum, Oxford

Nov 2018: Reviewer for Bulletin of Mathematical Biology

Apr 2016 - present: Co-organiser, group meetings of the Wolfson Centre for Mathematical Biology.

Oct 2016 - present: Mentor, Project Access.

May 2017 - May 2018: President, Oxford University Mountaineering Club.

Feb 2016 - Feb 2017: President, Oxford University Austrian Society.

PROFESSIONAL MEMBERSHIPS

Society for Industrial and Applied Mathematics (2016 - present), activity groups: Algebraic Geometry, Life Sciences

London Mathematical Society (2016 - present)

Society for Mathematical Biology (2017 - present)