

# Lukas Eigentler (he/his)

*Postdoctoral Research Assistant (University of Dundee)*

## Employment

- since 2020 **Postdoctoral Research Assistant**, *University of Dundee*, Dundee, United Kingdom.  
Mathematical biologist in the lab led by Nicola Stanley-Wall.
- Research: Modelling of biofilm formation (PIs: Prof. Nicola R. Stanley-Wall, Prof. Fordyce A. Davidson).

## Education

- 2016–2020 **PhD**, *Maxwell Institute Graduate School in Analysis and its Applications, Heriot-Watt University and The University of Edinburgh*, Edinburgh, United Kingdom.
- Thesis: *Modelling dryland vegetation patterns: nonlocal dispersal, temporal variability in precipitation and species coexistence* (Supervisor: Prof Jonathan A. Sherratt, Examiners: Prof Andy R. White and Prof Arjen Doelman)
  - Taught courses: SMSTC Homogenisation 1, SMSTC Applied Analysis 1 & 2, SMSTC Pure Analysis 1 & 2, SMSTC Probability 1 & 2, F11MS Modelling and Simulation in Life Sciences, F11SS Stochastic Simulation.
- 2013–2016 **BSc Mathematics First Class Honours Degree**, *University of Dundee*, Dundee, United Kingdom.
- 2012–2013 **Undergraduate course Technische Mathematik**, *Universität Innsbruck*, Innsbruck, Austria.  
60 ECTS.
- 2004–2012 **Matura with distinction**, *Bundesrealgymnasium Adolf-Pichler-Platz*, Innsbruck, Austria.

## Publications

- [1] EIGENTLER, L., KALAMARA, M., BALL, G., MACPHEE, C. E., STANLEY-WALL, N. R., and DAVIDSON, F. A.: Founder cell configuration drives competitive outcome within colony biofilms. *ISME J* in press (2022). DOI: 10.1038/s41396-022-01198-8.
- [2] EIGENTLER, L.: Species coexistence in resource-limited patterned ecosystems is facilitated by the interplay of spatial self-organisation and intraspecific competition. *Oikos* 130.4 (2021), pp. 609–623. DOI: 10.1111/oik.07880.
- [3] EIGENTLER, L., STANLEY-WALL, N. R., and DAVIDSON, F. A.: A theoretical framework for multi-species range expansion in spatially heterogeneous landscapes. *BioRxiv preprint* (2021). DOI: 10.1101/2021.11.09.467881.
- [4] EIGENTLER, L. and SHERRATT, J. A.: Effects of precipitation intermittency on vegetation patterns in semi-arid landscapes. *Physica D* 405 (2020), p. 132396. DOI: 10.1016/j.physd.2020.132396.

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- [5] EIGENTLER, L. and SHERRATT, J.: Spatial self-organisation enables species coexistence in a model for savanna ecosystems. *J. Theor. Biol.* 487 (2020), p. 110122. DOI: 10.1016/j.jtbi.2019.110122.
- [6] EIGENTLER, L.: Intraspecific competition in models for vegetation patterns: decrease in resilience to aridity and facilitation of species coexistence. *Ecol. Complexity* 42 (2020), p. 100835. DOI: 10.1016/j.ecocom.2020.100835.
- [7] EIGENTLER, L. and SHERRATT, J. A.: An integrodifference model for vegetation patterns in semi-arid environments with seasonality. *J. Math. Biol.* 81 (2020), pp. 875–904. DOI: 10.1007/s00285-020-01530-w.
- [8] EIGENTLER, L. and SHERRATT, J. A.: Metastability as a coexistence mechanism in a model for dryland vegetation patterns. *Bull. Math. Biol.* 81.7 (2019), pp. 2290–2322. DOI: 10.1007/s11538-019-00606-z.
- [9] EIGENTLER, L. and SHERRATT, J. A.: Analysis of a model for banded vegetation patterns in semi-arid environments with nonlocal dispersal. *J. Math. Biol.* 77.3 (2018), pp. 739–763. DOI: 10.1007/s00285-018-1233-y.

## Peer review

I have been a regular peer reviewer for the following journals.

- since 2022 **The ISME Journal.**
- since 2021 **The IMA Journal of Applied Mathematics.**
- since 2021 **Journal of Nonlinear Dynamics.**
- since 2021 **Applied Mathematics and Computation.**
- since 2021 **Journal of Nonlinear Science.**

## Awards, Prizes & Grants

- 2021 **IMA Small Grant**, *Institute of Mathematics & and its Applications*.  
Grant to continue supervision of an undergraduate research project (£600).
- 2021 **EMS Thesis Prize Commendation**, *Edinburgh Mathematical Society*.  
Certificate of Commendation in recognition of my PhD thesis entitled “Modelling dryland vegetation patterns: nonlocal dispersal, temporal variability in precipitation and species coexistence”.
- 2021 **LMS Undergraduate Research Bursary**, *London Mathematical Society*.  
Grant to supervise an 8-week-long summer undergraduate project (£1720).
- 2020 **IMA Small Grant**, *Institute of Mathematics & and its Applications*.  
Award to attend XL Dynamics Days Europe (£600) - returned due to event being moved online.
- 2020 **Poster Prize**, *SIAM UKIE Annual Meeting 2020*.  
Award for best poster at the conference (£75).
- 2019 **IMA University Liaison Grant**, *Institute of Mathematics & and its Applications*.  
Funding obtained for the Edinburgh SIAM & IMA Student Chapter (£400).
- 2019 **ESMTB Travel Support**, *European Society of Mathematical and Theoretical Biology*.  
Funding to attend MMEE 2019 (€100).

- 2019 **Laura Wisewell Travel Scholarship**, *The University of Edinburgh*.  
Funding to attend Advances in Pattern Formation: New Questions Motivated by Applications (£500).
- 2018 **ESMTB Travel Support**, *European Society of Mathematical and Theoretical Biology*.  
Funding to attend The Helsinki Summer School on Mathematical Ecology and Evolution 2018 (€200).
- 2018 **Researcher Development Fund**, *The University of Edinburgh*.  
Funding to attend The Helsinki Summer School on Mathematical Ecology and Evolution 2018 (£250).
- 2018 **Laura Wisewell Travel Scholarship**, *The University of Edinburgh*.  
Funding to attend ECMTB 2018 (£400).
- 2016-2020 **PhD Funding**, *The Maxwell Institute Graduate School in Analysis and its Applications*.  
(approx. £60,000)
- 2016 **British Association 1939 Prize, Class Medal**, *University of Dundee*.  
Best year 4 student in the School of Science and Engineering (£100).
- 2015 **Ede & Ravenscroft Prize, James Durham Prize, Boyack Bursary**, *University of Dundee*.  
Best year 3 student in the School of Engineering, Physics and Mathematics (£1,483).
- 2014 **Class medal**, *University of Dundee*.  
Best year 2 Mathematics student.
- 2013 **Leistungsstipendium**, *Universität Innsbruck*.  
Scholarship for extraordinary academic achievement in the academic year 2012/13 (€726.72).

## Talks & Posters

- 04/2022 **Spatial Ecology Workshop: Integrating mathematical theory and ecological applications**, *University of Sheffield*.  
(upcoming)
- 04/2022 **Applied Analysis Seminar Seminar**, *University of Graz (online)*.  
(upcoming)
- 11/2021 **Mathematical Biology Seminar**, *University of St Andrews (online)*.
- 11/2021 **Workshop on Mathematical Modelling for Biosciences**, *University of Yaoundé, (online)*.  
Invited speaker
- 08/2021 **XL Dynamic Days Europe**, *University of Nice (online)*.  
Invited speaker at minisymposium "Pattern forming fronts in reaction-diffusion systems"
- 06/2021 **SMB 2021**, *University of California, Riverside (online)*.
- 06/2021 **SMEEB 2021**, *University of Venice (online)*.
- 06/2021 **Subtillery 2021**, *online*.
- 05/2021 **Mathematics Seminar**, *University of Dundee (online)*.
- 04/2021 **MPDEE 2021**, *University of Marseille (online)*.
- 01/2021 **Virtual Asilomar 2021**, *online*.

- 08/2020 **eSMB 2020**, *online*.
- 02/2020 **Dynamical Systems Applied to Biology and Natural Sciences (DSABNS) 2020**, Trento.
- 01/2020 **SIAM UKIE Annual Meeting 2020**, *International Centre for Mathematical Sciences, Edinburgh*.  
Winner of Best Poster Prize.
- 10/2019 **Applied Analysis Seminar**, *University of Strathclyde, Glasgow*.
- 09/2019 **Philip Maini's 60th birthday workshop**, *University of Oxford*.
- 07/2019 **MMEE 2019**, *University of Lyon*.
- 07/2019 **Equadiff 2019**, *University of Leiden*.  
Invited speaker at minisymposium "Nonlocal dynamical systems"
- 05/2019 **LMS Research School: PDEs in Mathematical Biology: Modelling and Analysis**, *International Centre for Mathematical Sciences, Edinburgh*.
- 02/2019 **Advances in Pattern Formation: New Questions Motivated by Applications**, *Ben-Gurion University of the Negev*.
- 07/2018 **ECMTB 2018**, *University of Lisbon*.  
Invited speaker at minisymposium "Spatial patterns across ecology: differences and similarities".
- 04/2018 **CDT Colloquium 2018**, *University of Oxford*.

## Organised Events

- 02/2020 **SIAM-IMA Student Chapter PhD Colloquium 2020**, *International Centre for Mathematical Sciences, Edinburgh*.  
Co-organiser.
- 05/2019 **SIAM Student Chapter Symposium 2019**, *International Centre for Mathematical Sciences, Edinburgh*.  
Co-organiser.
- 12/2018 **Scottish Mathematical Biology Forum**, *International Centre for Mathematical Sciences, Edinburgh*.  
Member of organising committee.
- 09/2017 **3<sup>rd</sup> MIGSAA Annual Colloquium**, *International Centre for Mathematical Sciences, Edinburgh*.  
Co-organiser.

## Professional Memberships

- 2019–2020 **President of the Edinburgh SIAM & IMA Student Chapter**.
- 2018–2019 **Vice-president of the Edinburgh SIAM Student Chapter**.

## Teaching

- 2021–2022 **MA42002 Mathematical Biology II**, *University of Dundee*.  
Delivering lectures and tutorials

Further, I have been a tutorial assistant for the following courses:

2019–2020 **F17CA Calculus A**, *Heriot-Watt University*.  
2019–2020 **F17SG Mathematics for Scientists 1**, *Heriot-Watt University*.  
2018–2019 **F10AM Mathematical Biology A**, *Heriot-Watt University*.  
2018–2019 **F10AN Mathematical Biology B**, *Heriot-Watt University*.  
2018–2019 **F19MO Ordinary Differential Equations**, *Heriot-Watt University*.  
2018–2019 **F17SG Mathematics for Scientists 1**, *Heriot-Watt University*.  
2017–2018 **F10AM Mathematical Biology A**, *Heriot-Watt University*.  
2017–2018 **F10AN Mathematical Biology B**, *Heriot-Watt University*.  
2017–2018 **F19MO Ordinary Differential Equations**, *Heriot-Watt University*.  
2017–2018 **F17GA Problem Solving**, *Heriot-Watt University*.  
2017–2018 **F17SG Mathematics for Scientists 1**, *Heriot-Watt University*.  
2017–2018 **F17XB Mathematics for Engineers and Scientists 2**, *Heriot-Watt University*.  
2017–2018 **F18XC Mathematics for Engineers and Scientists 3**, *Heriot-Watt University*.  
2017–2018 **F18XD Mathematics for Engineers and Scientists 4**, *Heriot-Watt University*.

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## Supervision

2021–2022 **Lluc Briganti-Wiprachtiger**, *University of Dundee*.  
Summer undergraduate project funded by LMS and IMA, and undergraduate Honours project.