Lukas Eigentler (he/him)

Postdoctoral Researcher (University of Bielefeld)

Employment

since 2023 **Postdoctoral Researcher**, *Universität Bielefeld*, Bielefeld, Germany
Interdisciplinary research in the evolutionary biology group (PI: Prof. Klaus Reinhold).

2020-2022 **Postdoctoral Research Assistant**, *University of Dundee*, Dundee, United Kingdom
Interdisciplinary research in the lab led by Nicola R. Stanley-Wall.
- Research: Competition during 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)
  Winner of Reinhart Heinrich Award 2020
- 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 in peer-reviewed journals

[1] Eigentler, L. and Sherratt, J. A.: Long-range seed dispersal enables almost stationary patterns in a model for dryland vegetation. *J Math Biol* 86.15 (2023). doi: 10.1007/s00285-022-01852-x.

[2] Rosazza, T., Eigentler, L., Earl, C. S., Davidson, F. A., and Stanley-Wall, N. R.: Extracellular proteases are an essential public good supporting bacillus subtilis growth through exogenous protein degradation. *bioRxiv preprint* (2023). doi: 10.1101/2023.02.08.527645.

[3] Briganti Wiprachtiger, L. and Eigentler, L.: The effects of seasonality on competition for a limiting resource. *SIAM Undergrad. Res. Online* 15 (2022). doi: 10.1137/21S1458132.

[4] Eigentler, L., Stanley-Wall, N. R., and Davidson, F. A.: A theoretical framework for multi-species range expansion in spatially heterogeneous landscapes. *Oikos* 2022.8 (2022), e09077. doi: 10.1111/oik.09077.

[5] Eigentler, L., Davidson, F. A., and Stanley-Wall, N. R.: Mechanisms driving spatial distribution of residents in colony biofilms: an interdisciplinary perspective. *Open Biol* 12.220294 (2022). doi: 10.1098/rsob.220194.

[6] 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* 16.6 (2022), pp. 1512–1522. doi: 10.1038/s41396-022-01198-8.

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[7] 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.

[8] 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.

[9] 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.

[10] 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.

[11] Eigentler, L. and Sherratt, J. A.: 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.

[12] 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.

[13] 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.

Other publications

[1] Eigentler, L.: The reinhart-heinrich doctoral thesis award 2020. *European Communications in Mathematical and Theoretical Biology* 25 (2022), pp. 4–9.

Peer review

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

since 2023 **Chaos, Solitons & Fractals**
since 2022 **Journal of Mathematical Biology**
since 2022 **Bulletin of Mathematical Biology**
since 2022 **Journal of Theoretical Biology**
since 2022 **The ISME Journal**
since 2022 **Methods in Ecology and Evolution**
since 2022 **Scientific Reports**
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

2022 **Reinhart Heinrich Award 2020**, *European Society for Mathematical and Theoretical Biology*
Annual thesis prize awarded by the European Society for Mathematical and Theoretical Biology.

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).

Invited talks

05/2023 **Applied Mathematics seminar**, *University of Durham*

03/2023 **MBRG seminar**, *Maxwell Institute*, Edinburgh

02/2023 **FSPM^2 seminar**, *University of Bielefeld*

01/2023 **MoLSS/CMCB seminar**, *University of Surrey*

12/2022 **Seminar on Analysis and Numerics of PDEs**, *University of Innsbruck*

10/2022 **Mathematical Biology Seminar**, *University of St Andrews*

09/2022 **ECMTB 2022**, *University of Heidelberg*
Reinhart-Heinrich Prize (plenary) talk.

08/2022 **Evolution Seminar**, *University of Bielefeld*

06/2022 **MPDEE 2022**, *University of Turin (online)*
Invited speaker at minisymposium "Vegetation"

04/2022 **Applied Analysis Seminar**, *University of Graz (online)*

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 Dynamics Days Europe**, *University of Nice (online)*
Invited speaker at minisymposium "Pattern forming fronts in reaction-diffusion systems"

05/2021 **Mathematics Seminar**, *University of Dundee (online)*

10/2019 **Applied Analysis Seminar**, *University of Strathclyde*, Glasgow

07/2019 **Equadiff 2019**, *University of Leiden*
Invited speaker at minisymposium "Nonlocal dynamical systems"

07/2018 **ECMTB 2018**, *University of Lisbon*
Invited speaker at minisymposium "Spatial patterns across ecology: differences and similarities".

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 **3rd 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 qualifications

since 2022 **Associate Fellow of the Higher Education Academy (AFHEA)**, *Advance HE*

Taught courses

2023 **eKVV 202411 Key Concepts in Evolutionary Ecology**, *Universität Bielfeld*

2021–2022 **MA42002 Mathematical Biology II**, *University of Dundee*

Supervision

2021–2022 **Lluc Briganti-Wiprachtiger**, *University of Dundee*
Summer undergraduate project funded by LMS and IMA, and undergraduate Honours project. Lluc is now a Data Analyst at Amazon.

Public Engagement

2022 **Magnificent Microbes**, *University of Dundee*
Development of a role-playing card game for 9-11-year olds with a focus on bacterial competition and cooperation. Distributed across five schools in Dundee and Tayside.