Lukas Eigentler (he/him)

Assistant Professor (University of Warwick)

Employment

since 2024 **Assistant Professor**, *University of Warwick*, Coventry, United Kingdom

2023 **Postdoctoral Researcher**, *Universität Bielefeld*, Bielefeld, Germany

2020-2022 **Postdoctoral Research Assistant**, *University of Dundee*, Dundee, United Kingdom

Education

2016–2020 **PhD**, *Maxwell Institute Graduate School in Analysis and its Applications, Heriot-Watt University and The University of Edinburgh*, Edinburgh, United Kingdom
Winner of Reinhart Heinrich Award 2020

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

Peer-reviewed publications

[1] Reinhold, K., Eigentler, L., and Kikuchi, D. W.: Evolution of individual variation in a competitive trait: a theoretical analysis. *Journal of Evolutionary Biology* (2024). doi: 10.1093/jeb/voae036.

[2] Rosazza, T., Earl, C., Eigentler, L., Davidson, F. A., and Stanley-Wall, N. R.: Reciprocal sharing of extracellular proteases and extracellular matrix molecules facilitates bacillus subtilis biofilm formation. *Molecular Microbiology* 122.2 (2024), pp. 184–200. doi: 10.1111/mmi.15288.

[3] 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.

[4] Rosazza, T., Eigentler, L., Earl, C., Davidson, F. A., and Stanley-Wall, N. R.: *Bacillus subtilis* extracellular protease production incurs a context-dependent cost. *Mol. Microbiol.* 120.2 (2023), pp. 105–121. doi: 10.1111/mmi.15110.
This paper has been the "Editor's Choice" of this issue.

[5] 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.

[6] 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.

[7] 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.

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[8] 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.

[9] 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.

[10] 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.

[11] 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.

[12] Eigentler, L. and Sherratt, J. A.: Effects of precipitation intermittency on vegetation patterns in semi-arid landscapes. *Phys. D* 405 (2020), p. 132396. doi: 10.1016/j.physd.2020.132396.

[13] 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.

[14] 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.

[15] 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.

Preprints

[1] Eigentler, L. and Reinhold, K.: Maintenance and evolution of individual differences in a prey defence trait examined with a dynamic predator-prey model. *bioRxiv preprint* (2023). doi: 10.1101/2023.12.07.570589.

[2] Eigentler, L. and Sensi, M.: Delayed loss of stability of periodic travelling waves: insights from the analysis of essential spectra. *arXiv preprint* (2023). doi: 10.48550/ARXIV.2311.14717.

Other publications

[1] Eigentler, L., Reinhold, K., and Kikuchi, D.: Feisty fish and birds with attitude: why does evolution not lead to identical individuals? *The Science Breaker* 10.3 (2024). doi: 10.25250/thescbr.brk793.

[2] 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 funding bodies:

since 2024 **British Council**

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

since 2024 **SIAM Journal on Applied Mathematics**

since 2024 **Oikos**
since 2024 **Proceedings of the Royal Society B**
since 2023 **CATENA**
since 2023 **Cell Press Community**
since 2023 **Chaos, Solitons & Fractals**
since 2023 **Qualitative Theory of Dynamical Systems**
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

2024–2026 **International Exchanges**, *Royal Society*
Project title: *Livestock grazing in Sub-Saharan humid savannas: identifying optimal strategies and assessing epidemiological risk* with Ivric Valaire Yatat Djeumen (£12,000)

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 **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".

Invited talks

08/2024 **XLIV Dynamic Days**, Bremen
Invited speaker at minisymposium Vegetation pattern formation

04/2024 **QSEB seminar**, *University of Warwick*

04/2024 **BAMC 2024**, *University of Newcastle*
Invited speaker at minisymposium "Nonlinear systems in biology"

02/2024 **SBIDER seminar**, *University of Warwick*

09/2023 **Modelling Diffusive Systems 2023: Theory & Biological Applications**, *International Centre for Mathematical Sciences (ICMS)*, Edinburgh

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

2024 **SBIDER Seminar**, *University of Warwick*
Seminar organiser

2023 **Behaviour & Evolution Seminar**, *University of Bielefeld*
Seminar organiser

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

2024–2025 **MA133 Differential Equations**, *University of Warwick*

2024 **MA256 Introduction to Mathematical Biology**, *University of Warwick*

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 became a Data Analyst at Amazon in 2022.

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.