Florian Klimm

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floklimm.github.io/

Education

2014–2018 **DPhil (PhD)**, *University of Oxford*, Kellogg College.
Systems Approaches to Biomedical Sciences Centre for Doctoral Training at the Mathematical Institute and the Department of Statistics
Full EPSRC Studentship
EPSRC Doctoral Prize from the University of Oxford

2012–2014 **Master of Science (Physics)**, *Humboldt-Universität zu Berlin*.
Specialisation: Statistical Physics and Nonlinear Dynamics

2011–2012 **Fulbright Scholar**, *University of California, Santa Barbara*.
Participation in the Education Abroad Programm of the UCSB

2008–2012 **Bachelor of Science (Physics with minor in Mathematics)**, *Humboldt-Universität zu Berlin*.

Employment

1/2023– **Senior Researcher**, *Novo Nordisk Research Centre Oxford*, Department of Systems Biology & Target Discovery.

10/2021–12/2022 **Postdoctoral Researcher**, *Freie Universität Berlin & Max-Planck-Institut für molekulare Genetik*, Martin Vingron.

10/2019–9/2021 **Postdoctoral Research Associate**, *Imperial College, Department of Mathematics & University of Cambridge, Mitochondrial Biology Unit*, Nick Jones & Patrick Chinnery.

10/2018–9/2019 **Stipendiary Lecturer for Mathematics**, *Christ Church, University Oxford*.

10/2018–9/2019 **Postdoctoral Researcher**, *University Oxford, Department of Statistics*, Charlotte Deane & Gesine Reinert.

Scholarly work

(* indicates equal contribution by multiple authors)

Publications

[1] Stephen P Burr*, **FK***, Angelos Glynos*, Malwina Prater, Pamella Sendon, Pavel Nash, Christopher A Powell, Marie-Lune Simard, Nina A Bonekamp, Julia Charl, et al. Cell lineage-specific mitochondrial resilience during mammalian organogenesis. *Cell*, 2023.

[2] **FK**, Nick S. Jones, and Michael T. Schaub. Modularity maximization for graphons. *SIAM Journal on Applied Mathematics*, 82(6):1930–1952, 2022.

[3] **FK**. Quantifying the 'end of history' through a bayesian markov-chain approach. *Royal Society Open Science*, 9(11), 2022.

[4] **FK**. Topological data analysis of truncated contagion maps. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 32(7):073108, 2022.

[5] Sarah M Griffin and **FK**. Networks and museum collections. In Tom Brughams, Matthew Peeples, Barbara Mills, and Jessica L. Munson, editors, *Oxford Handbook of Archaeological Network Research*. Oxford University Press, Oxford, (accepted to appear).

[6] Haixin Zhang, Marco Esposito, Mikael G Pezet, Juvid Aryaman, Wei Wei, **FK**, Claudia Calabrese, Stephen P Burr, Carolina H Macabelli, Carlo Viscomi, Mitinori Saitou, Marcos R Chiaratti, James B Stewart, Nick S Jones, and Patrick F Chinnery. Mitochondrial DNA heteroplasmy is modulated during oocyte development propagating mutation transmission. *Science Advances*, 7(50), 2021.

[7] Mikael G Pezet, Aurora Gomez-Duran*, **FK***, Juvid Aryaman, Stephen Burr, Wei Wei, Mitinori Saitou, Julien Prudent, and Patrick F Chinnery. Oxygen tension modulates the mitochondrial genetic bottleneck and influences the segregation of a heteroplasmic mtDNA variant in vitro. *Communications Biology*, 4(1):1–12, 2021.

[8] **FK**. Functional change along cellular trajectories *(invited News & Views article)*. *Nature Computational Science*, 1(2):102–103, 2021.

[9] **FK**, Charlotte M Deane, and Gesine Reinert. Hypergraphs for predicting essential genes using multiprotein complex data. *Journal of Complex Networks*, 9(2), 2021.

[10] **FK**, Enrique M Toledo, Thomas Monfeuga, Fang Zhang, Charlotte M Deane, and Gesine Reinert. Functional module detection through integration of single-cell RNA sequencing data with protein–protein interaction networks. *BMC Genomics*, 21(1):1–10, 2020.

[11] **FK*** and Benjamin F Maier*. Commentary: A network science summer course for high-school students. *Network Science*, pages 1–13, 2020.

[12] **FK**. Minimal connections and what they reveal. *Mathematics Today*, 2019.

[13] Lia Papadopoulos, Pablo Blinder, Henrik Ronellenfitsch, **FK**, Eleni Katifori, David Kleinfeld, and Danielle S. Bassett. Comparing two classes of biological distribution systems using network analysis. *PLOS Computational Biology*, 14(9):1–31, 09 2018.

[14] Megan M Sperry, Qawi K Telesford, **FK**, and Danielle S Bassett. Rentian scaling for the measurement of optimal embedding of complex networks into physical space. *Journal of Complex Networks*, 5(2):199–218, 2016.

[15] Dane Taylor, **FK**, Heather A Harrington, Miroslav Kramár, Konstantin Mischaikow, Mason A Porter, and Peter J Mucha. Topological data analysis of contagion maps for examining spreading processes on networks. *Nature Communications*, 6, 2015.

[16] **FK**, Javier Borge-Holthoefer, Niels Wessel, Jürgen Kurths, and Gorka Zamora-López. Individual node's contribution to the mesoscale of complex networks. *New Journal of Physics*, 16(12):125006, 2014.

[17] **FK**, Danielle S Bassett, Jean M Carlson, and Peter J Mucha. Resolving structural variability in network models and the brain. *PLOS Computational Biology*, 10(3):e1003491, 03 2014.

Peer-reviewed Conference Abstracts

FK, Charlotte M Deane, Jonny Wray, and Mason A Porter. Reconfiguration of protein interaction networks during nematode development *The International Conference on Complex Networks and Their Applications 2017*

Doctoral Thesis

title Generalised networks for protein interaction analysis

supervisors Mason Porter, Charlotte Deane, and Jonny Wray

examiners Gesine Reinert and Mariano Beguerisse Díaz (transfer of status), Jotun Hein and Felix Reed-Tsochas (confirmation of status), Heather Harrington and James Wakefield (DPhil)

Master Thesis

title Characterisation of individual nodes in the mesoscale of complex networks

supervisors Jürgen Kurths and Gorka Zamora-López

Bachelor Thesis

title Charge transmission through single molecules – A density matrix approach

supervisors Beate Röder and Volkhard May

Study Group Papers

(authors in alphabetical order)

2016 **Root Segmentation Over Multiple Time Points**, *Multi-scale Biology Study Group University of Birmingham*, Henry Allen, Laura Cooper, Gustav Delius, Meurig Gallagher, Tom Johnson, **FK**, Ferdinando Randisi, Tom Shearer, and Clare Ziegler.

2015 **Abstract Modelling of Adverse Outcome Pathways**, *Quantitative Systems Pharmacology Study Group AstraZeneca*, Gerold Baier, Teresa Collins, Joanne Dunster, Ciarán Fisher, Enuo He, Andrzej Kierzek, John King, **FK**, Gary Mirams, Tom Snowden, and John Ward.

Funding

2021 **Add-on Fellowships for Interdisciplinary Life Science by the Joachim Herz Foundation**, €$12,500$.

2021 **CRUK Imperial Centre & NIHR Imperial BRC Data Science in Cancer Research Award**, *Co-PI (with Nick Jones & Jesus Gil)*, £$25,000$.

2018 **EPSRC Doctoral Prize Fellowship**, $\sim$ £$23,000$.

2014 **EPSRC & MRC Doctoral Studentship**, $\sim$ £$87,000$.

Honours

2019 **Best Poster Award**, *University of Cambridge*, Cambridge Network Day.

2018 **EPSRC Doctoral Prize**, *University of Oxford*.

2018 **Award for 'Contribution to the Life of the Department'**, *Mathematical Institute, University of Oxford*.

2018 **Public Engagement Prize**, *Doctoral Training Centre, University of Oxford*.

2017 **Best Talk Award**, *London Mathematical Society*, Graduate Student Meeting.

2017 **MCR Excellence Award**, *Kellogg College University of Oxford*.

2011 **Silver Medal**, *University Physics Competition*.

Pre-doctoral Scholarships

2018 **Grad Student Travel Grant**, *Joint Mathematics Meetings*.
2013 **Leonardo da Vinci**, *European Commission*.
2012 **PROMOS**, *German Academic Exchange Service (DAAD)*.
2011–2012 **German-American Fulbright Program**.
2011–2012 **Full Fee Waiver**, *University of California at Santa Barbara*.
2008–2010 **Studienstiftung des Deutschen Volkes**, *German National Academic Foundation*.

Teaching Experience

Freie Universität zu Berlin

Winter 2022/23 **Lecturer**, with Katharina Jahn.
Algorithmic Bioinformatics

Summer 2022 **Lecturer**.
Bioinformatics for Biochemists

Summer 2022 **Co-Lecturer & Tutor**, with Alexander Bockmayr and Martin Vingron.
Complex Systems in Bioinformatics

Winter 2021/22 **Lecturer & Supervisor**.
Softwarepraktikum (software project)

Winter 2021/22 **Lecturer & Supervisor**.
Introduction to Focus Areas

Christ Church, University of Oxford

Trinity 2019 **Stipendiary Lecturer (Tutor)**.
Dynamics (Prelims), Calculus of Variation (Part A), Fourier Series and PDE's (Prelims), Multivariable Calculus (Part A)

Michaelmas 2018 **Stipendiary Lecturer (Tutor)**.
Quantum Theory (Part A), Differential Equations I (Part A), and Probability (Part A)

Somerville College, University of Oxford

Hilary 2017 **Tutor**.
Integral Transforms (Part A)

Michaelmas 2016 **Tutor**.
Quantum Theory (Part A)

Mathematical Institute, University of Oxford

Hilary 2019 **Tutor & Assessor**.
Networks (Part C)

Hilary 2018 **Tutor**.
Networks (Part C)

Hilary 2017 **Teaching Assistant**.
Networks (Part C)

Michaelmas 2016 **Teaching Assistant**.
Graph Theory (Part B)

Michaelmas 2015 **Teaching Assistant**.
Numerical Solutions to Differential Equations II (Part B)

Doctoral Training Centre, University of Oxford

Michaelmas 2018 **Senior Demonstrator & Lecturer**.
Introduction to Programming

Michaelmas 2015 & 2018 **Demonstrator**.
HTML and Web-Design

Michaelmas 2015 **Demonstrator**.
Introduction into Matlab

Humboldt-Universität zu Berlin & Charité Berlin

Summer 2010, 2013, 2014 **Teaching Assistant**.
Supervisor at the Physical laboratory for students of Dentistry

Winter 2009 **Lecturer & Tutor**.
Introduction to university-level Mathematics for Physicists

Teaching Qualifications

2017 Associate Fellowship of the Higher Education Academy

2015 Teaching Assistant Training Mathematical Institute University of Oxford

Research Supervision

6/2023–8/2023 Conor Rajan (Part III student in Applied Mathematics, University of Cambridge): 'Verifying the biological significance of graph-embeddings'

4/2022–7/2023 Kadir Cakir (Master student in Biophysics, Humboldt Universität zu Berlin): 'Statistical inference of assortative community structure in cell–cell similarity networks'

5/2022–9/2022 Elisa Maske (Bachelor student in Bioinformatics, Freie Universität Berlin): 'Categorisation of community structure in cell–cell similarity networks'

5/2020–10/2021 Rein Leetma (MRes/PhD student in Biomedical Research, Imperial College London, joint with Nick Jones): 'Mitochondria and cell competition'

3/2021–7/2021 Camilla Lyons (Visiting Master student, University of Cambridge, joint with Patrick F Chinnery): 'Single-cell analysis of the effects of heteroplasmic mtDNA mutations on cell-transcriptome in germline cells'

3/2021–9/2021 Muhan Ma (Master Thesis in Applied Mathematics, Imperial College London, joint with Nick Jones): 'RNA velocity for studying the effect of mitochondrial mutations'

3/2021–9/2021 Valentino Assandri (Master Thesis in Applied Mathematics, Imperial College London, joint with Nick Jones): 'A Topological Temporal Analysis of German Elections'

6/2020–9/2020 Vedang Joshi (Visiting undergraduate student from the University of Bristol, Imperial College London, joint with Nick Jones): 'Mitochondrial protein–protein interaction networks'

3/2020–9/2020 Benjamin Wong (Master Thesis in Applied Mathematics, Imperial College London, joint with Nick Jones): 'Topological data analysis of election outcomes'

6/2019–9/2019 Yiqian Qian (Master Thesis in Statistical Science, University of Oxford, joint with Gesine Reinert): 'Ranking Musicians and Concert Venues'

7/2019–9/2019 Harrison Green (Research intern, joint with industrial collaborator ADARGA): 'Edge-prediction in large temporal networks'

Membership of Examination Committees

11/7/2022 **Freie Universität Berlin**, *Doctorate in Computer Science*, Lam-Ha Ly.

5/7/2022 **Freie Universität Berlin**, *Doctorate in Computer Science*, Eldar Abdullaev.

4/7/2022 **Freie Universität Berlin**, *Doctorate in Computer Science*, Elzbieta Lida Gralinska.

27/6/2022 **Freie Universität Berlin**, *Doctorate in Computer Science*, Martyna Gajos.

16/9/2021 **Imperial College London**, *MSc Applied Mathematics*, Sophie Gruenstein.

16/9/2021 **Imperial College London**, *MSc Applied Mathematics*, Danny Lee.

Outreach

4/28/2022 **Speaker**, *Girls' Day* Max-Plack Institute for Molecular Genetics.
Bioinformatics for female high-school students

4/7/2019 **Speaker**, *Undergraduate Open Day* Mathematical Institute, University of Oxford.
Statistics & Probability for prospective students

3/2019–6/2019 **Presenter**, *Oxford Maths Festival* Department of Statistics, University of Oxford.
Presenting virtual reality experience to the general public

3/2019–6/2019 **Virtual Reality Designer**, *Dimensions: the Mathematics of Symmetry and Patterns* Ashmolean Museum of Art and Archaeology.
Creating a virtual reality experience for a general public audience (22k visitors). The exhibition was Highly Commended in Oxford's 'The Vice-Chancellor's Public Engagement with Research Awards 2019'.

29/4/2018 **Speaker**, *Oxford Maths Festival* Mathematical Institute, University of Oxford.
Networks: Describing an Interconnected World for general public

15/11/2017 **Speaker**, *Graduate Open Day* Mathematical Institute, University of Oxford.
Community Detection in Networks for prospective students

28/9/2017 **Speaker**, *Tag der Wissenschaft & Wirtschaft* Humboldt-Gymnasium Eichwalde.
Biomathematics and Networks for high school students

Summer 2016 **Co-Organiser & Lecturer**, *Schülerakademie*.
Summer school on *Networks and Complex Systems* for high school students, 16 days

2015 **Tutor**, Masterclass.
Networks for middle school students, two 45 min sessions

2015 **Translation**, Network Literacy: Essential Concepts and Ideas *from English into German*.

Voluntary Work & Services

6/5/2024 **Co-Organiser**, *Machine Learning for Drug Discovery*, Vienna.

9/12/2019 **Organiser**, *Complexity Oxford Imperial College (COXIC)*.

2018–2019 **Postdoctoral Representative**, *Departmental Committee*, Department of Statistics, University of Oxford.

2018–2019 **Organiser**, *Networks Seminar*, Mathematical Institute, University of Oxford.

2018 **Co-organiser**, *SIAM-IMA Student Chapter Conference*, University of Oxford.

2017–2018 **Treasurer**, *SIAM Student Chapter*, University of Oxford.

2017–2018 **Member**, *Consultative Committee for Graduate Students*, Mathematical Institute Oxford.

2016–2017 **President**, *Middle Common Room*, Kellogg College, (in this position member of various college committees).

2015–2016 **Treasurer**, *Middle Common Room*, Kellogg College.

2012–2013 **Mentor**, Stanford University in Berlin.

2009–2011 **Member**, Kommission für Lehre und Studium *(Committee of Studies)*, Institut für Physik der Humboldt-Universität zu Berlin.

2009–2011 **Mentor**, Institut für Physik der Humboldt-Universität zu Berlin.

2009–2010 **Co-organiser**, Zusammenkunft aller Physikfachschaften *(Federal Union of all Physics Student Representatives)*, Berlin/Frankfurt.

Peer Review

Journals *Physical Review Letters*, *Physical Review E*, *Scientific Reports*, *Journal of Complex Networks*, *Physical Review Research*, *Nature Computational Science*, *PLOS ONE*, *Bioinformatics*, *Computational and Structural Biotechnology Journal*, *Applied Network Science*

Conferences ISMB (*Intelligent Systems for Molecular Biology*), RECOMB (*International Conference on Research in Computational Molecular Biology*), NetBio

Grant Panels UK Fulbright Commission

Membership in Professional Organisations

2021–present London Mathematical Society

2017–present Royal Statistical Society

2016–present Society for Industrial and Applied Mathematics

2014–present Complex Systems Society

2008–present Deutsche Physikalische Gesellschaft (DPG, German Physical Society)

Talks

(**bold** indicates invited talks)

24/7/2023 Intelligent Systems for Molecular Biology, Lyon (contributed talk & poster)

15/12/2022 **S3RI seminar, University of Southampton**

10/2022 TopoNets22, Palma de Mallorca

10/2022 Conference on Complex Systems 2022, Palma de Mallorca

9/2022 IMA Conference on The Mathematical Challenges of Big Data, Oxford

7/2022 NetSci 2022, Shanghai

2/2022 Bioinformatics Social Meeting, Berlin

7/2021 Networks 2021: A joint Sunbelt and NetSci Conference

25/6/2021 NetBioMed: Networks in Biology and Medicine, a Networks 2021 Satellite

14/6/2021 **Oberseminar Dynamics, Technical University Munich**

26/5/2021 CompleNet 2021: International Conference on Complex Networks

23/05/2021 **SIAM Dynamical Systems: Mini-symposium on Topological Data Analysis in the Biological Sciences**

4/3/2021 Digital Approaches to Art History and Cultural Heritage, Oxford Research Centre in the Humanities

5/1/2021	**Max Planck Institute for Molecular Genetics**, Berlin
9/11/2020	Single Cell Biology, Wellcome Genome Campus (short talk & poster)
05/10/2020	**Virtual Seminar on Complexity**, University of Milan
21/9/2020	NetSci, Rome
18/9/2020	TopoNets 2020 NetSci, Rome
15/7/2020	Intelligent Systems for Molecular Biology, virtual event (short talk & poster)
30/3/2020	**Networks Approaches for Healthcare Applications**, University of Exeter
8/10/2019	**Centre for Complexity Science**, Imperial College London
3/9/2019	Single Cell Biology Consortium, University of Oxford
29/8/2019	Cambridge Networks Day ('flash talk', poster & *Best Poster Award*)
7/12/2018	The Connected Past, University of Oxford
14/6/2018	NetSci, Paris
12/6/2018	NetSciEd Satellite, Paris
25/4/2018	Kellogg College Seminar, Oxford
17/4/2018	COXIC, Imperial College London
10/1/2018	Joint Mathematics Meeting, San Diego
29/11/2017	Complex Networks, Lyon
10/11/2017	London Mathematical Society Graduate Student Meeting (*Best Talk Award*)
13/9/2017	2nd Symposium on Spatial Networks, Oriel College Oxford
6/9/2017	Mediterranean School of Complex Networks
16/6/2017	SIAM Student Conference, Reading
13/6/2017	Cambridge Networks Day ('flash talk'& poster)
17/5/2017	SIAM Student Conference, Oxford
21/9/2016	Conference on Complex Systems, Amsterdam
23/3/2016	Emphasis Workshop 'Generalized Network Structures & Dynamics', MBI Columbus, Ohio
21/9/2015	14th Mathematics of Networks Meeting, Oxford
6/2/2015	TOPONETS15 NetSci, Zaragoza
24/02/2015	Algebraic Topology Workshop, University Oxford

Languages

German	Native speaker	
English	Fluent	*UniCERT IV, TOEFL iBT with 107 points (30/28/24/25)*
French	Basic	*4 years of high school education, participation in student exchange*
Latin	Basic	*3 years of high school education*