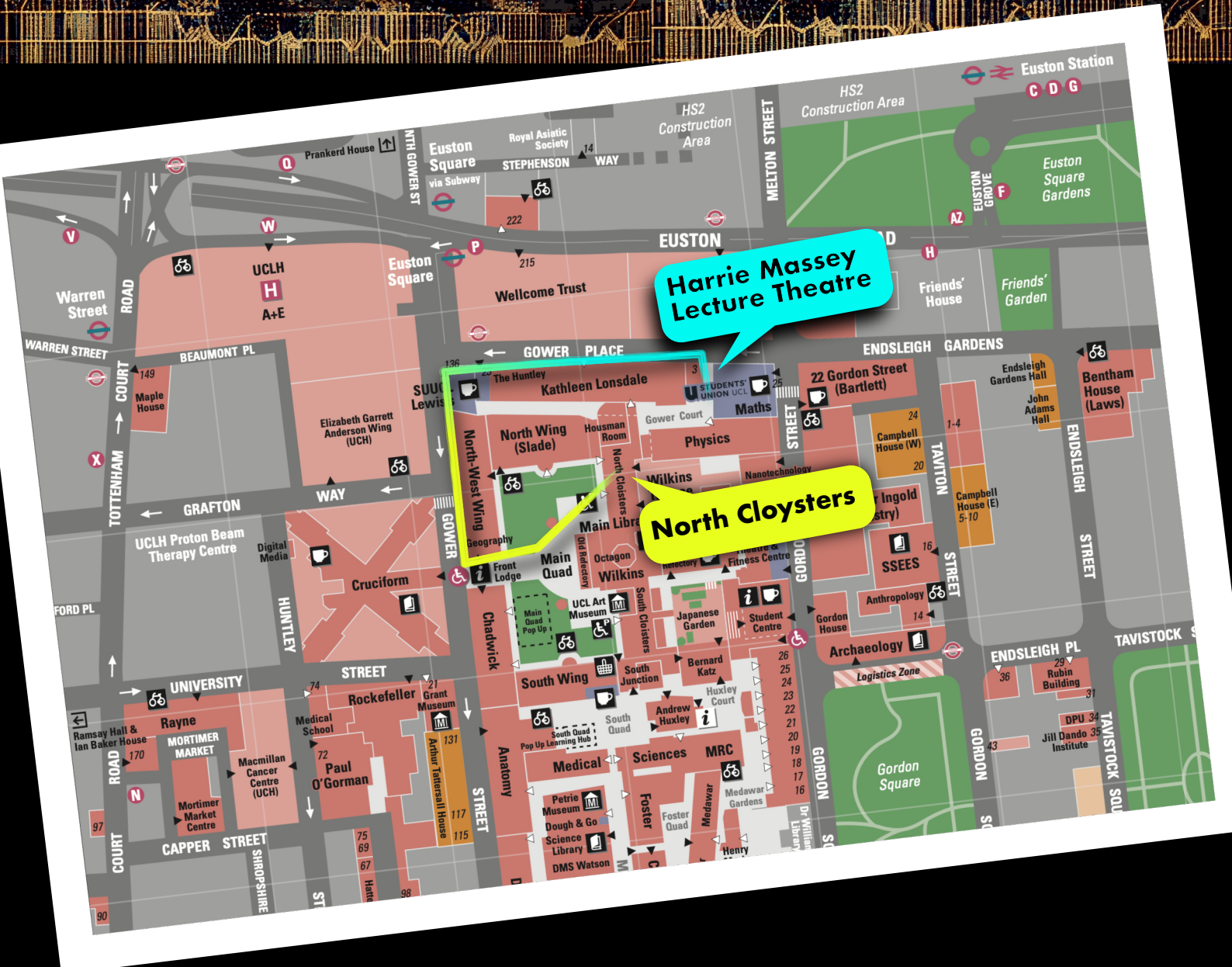
LONDON MATHEMATICAL BIOLOGY CONFERENCE

UCL 18-19 September 2023



LONDON MATHEMATICAL BIOLOGY 2023 SCHEDULE

All talks will be held in **Harrie Massey Lecture Theatre**

Monday 18th September

10:30 - 10:40 Welcome

10:40 - 11:15 **Wenying Shou** - *University College London*
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11:15 - 11:30 **Jessie Renton** - *Queen Mary University of London*
A somatic genetic clock for clonal organisms

11:30 - 11:45 **Andrea Cairoli** - *The Francis Crick Institute*
Data-driven modelling of abdominal tissue growth in Drosophila during metamorphosis

11:45 - 12:50 Lunch and Posters (North Cloisters)

12:50 - 13:25 **Omer Karin** - *Imperial College London*
Self-tuning of long transients in cell biology

13:25 - 13:40 **Cara Neal** - *University of Liverpool*
The role of non-Newtonian fluids in microswimmer propulsion

13:40 - 13:55 **Euan Smithers** - *Sainsbury Laboratory*
How do plant leaf pavement cells pattern to form puzzle piece-like shapes?

13:55 - 14:30 Coffee Break and Posters (North Cloisters)

14:30 - 15:05 **Berta Verd** - *University of Oxford*
Evolving vertebral counts:
a mathematical modelling approach

15:05 - 15:20 **Santosh Manicka** - *Tufts University*
Information integration during bioelectric regulation of morphogenesis of the embryonic frog brain

15:20 - 15:35 **Kristian Kiradjiev** - *University of Nottingham*
Multiscale asymptotic analysis reveals how cell growth and subcellular compartments affect tissue-scale hormone transport

15:35 - 16:00 Coffee Break and Posters (North Cloisters)

16:00 - 16:35 **Carina Dunlop** - *University of Surrey*
What do cells and tissues feel? Integrating cell contractility, adhesion and ECM stiffness in mechanosensing.

16:35 - 17:10 **Andrew Krause** - *University of Durham*
Rethinking Pattern Formation through Nonlinear Dynamics and Web Browsers

17:10 - 17:25 **Martina Oliver -** *Imperial College London*
Modelling and parameter inference in synthetic reaction-diffusion patterns

18:00 Conference dinner (Cabana)

Tuesday 19th September

09:00 - 09:35 **Mohit Dalwadi** - *University College London*
A universal spatiotemporal robustness in pattern formation

09:35 -10:10 **James di Frisco** - *The Francis Crick Institute*
The complementarity of mathematical and conceptual theoretical biology

10:10 - 10:25 **Svetlana Petrenko** - *University College London*
Modelling of Silica Pattern Formation in Diatoms Using a Continuum Approach

10:30 - 11:00 Coffee Break and Posters (North Cloisters)

11:00 - 11:35 **Barbara Bravi** - *Imperial College London*
Machine learning-guided modelling of immune protein interactions

11:35 - 11:50 **Mohit Kumar Jolly** - *Indian Institute of Science*
Landscape of epithelial-mesenchymal plasticity as an emergent property of coordinated teams in regulatory networks

11:50 - 12:05 **Patricia Lamirande** - *University of Oxford*
Mean First Passage Time and its Application in Ocular Drug Development

12:05 - 12:20 **Yaron Ben-Ami** - *University of Oxford*
A probabilistic-continuum two-phase model for tumour cell migration induced by interstitial flow

12:20 - 13:20 Lunch (North Cloisters)

13:20 - 14:20 **Plenary talk: Philip Maini** *University of Oxford*
Modelling collective cell movement: mathematical challenges and biological applications

POSTER CONTRIBUTIONS

Monday 18th September

Matthew Asker - *University of Leeds*
Coexistence of competing microbial strains under twofold environmental variability and demographic fluctuations

Johannes Borgqvist - *Wolfson Centre for Mathematical Biology, Mathematical Institute, University of Oxford*
Construction of travelling wave models of collective cell migration using Lie symmetries of the Fisher KPP model

Joshua Bull - *University of Oxford*
Your Space or Mine? Mathematical quantification of inter-patient tumour heterogeneity

Jurjen Duintjer Tebbens - *Faculty of Pharmacy, Charles University Prague*
Reaction-diffusion models for PXR-induced drug metabolism

Giulia Laura Celora - *University College London*
Self-organised patterning in Dictyostelium group migration

Calum Gabbutt - *Institute of Cancer Research*
Lineage tracing in patients with blood cancer using fluctuating DNA methylation

Poulami Somanya Ganguly - *Queen Mary University of London*
Models of extrachromosomal DNA replication during cancer cell division

Magnus Haughey - *Barts Cancer Institute, Queen Mary University of London*
Investigating spatial signatures of extracellular DNA with agent-based computational modelling

Diana Khoromskaia - *The Francis Crick Institute*
Morphogen transport in tissues as active porous media

Nandakishor Krishnan *- Centre for Ecological Research, Budapest*
The evolution of symbiosis in the context of eukaryogenesis

Jamie Lee *- Imperial College London*
In silico-guided treatment design for skin damaging S. aureus-S. epidermis colonisation in atopic dermatitis lesions

Ves Manojlovic - *City, University of London*
Fluctuating methylation clocks for inferring the evolutionary history of human cancers

Taniya Mandal - *The Francis Crick Institute*
Exploring evolutionary variations in forebrain development using patterned organoids

Charlotte Manser - *Imperial College London*
A Mathematical Framework for Tuning Tempo in Developmental Gene Regulatory Networks

Andela Markovic - *University College London*
Communication is the key: positional information transmission in neural tube patterning

Nathaniel Mon Pere - *Barts Cancer Institute*
Clonal interference in aging haematopoiesis

Roozbeh Pazuki - *Imperial College London*
Upper limits on the robustness of Turing models and other multi-parametric dynamical systems

Domènec Ruiz-Balet - *Imperial College London*
The tragedy of the commons in mean-field games

Hugh Selway-Clarke - *Imperial College London*
In Silico Testing of Hypotheses for the Effect of Smoking on Somatic Evolution in the Healthy Human Lung

Kimberley Verity - *City, University of London*
Improved tree indices under the Yule and Uniform models.

POSTER CONTRIBUTIONS

Tuesday 19th September

Andrew Bate - *University of Leeds*
Modelling respiratory virus exposure on local buses

Amy Bowen - *The Francis Crick Institute*
TBC

Prakrati Dangarh - *Imperial College London*
Mechanistic modelling of pre-school wheezing and progression to school-age asthma

Luke Davis - *University College London*
Understanding biomolecular condensates through statistical mechanical and minimal modelling approaches

Anqi Huang - *The Francis Crick Institute*
Brk feedback motif underlies precise decoding of the morphogen tail

Ferdinando Insalata & Daniel Kornai - *Imperial College London*
Stochastic survival of the densest can solve the enigma of the expansion of mitochondrial mutations in the ageing of skeletal muscle fibres

Jack Jennings *- Sheffield University*
Understanding self-organised tissue patterning across scales

Jacob Jepson - *University of Nottingham*
Modelling phloem transport and sucrose delivery within the plant seedling

Juan David Marmolejo Lozano - *University of Los Andes*
A generalised model for noise propagation in transcriptional genetic cascades

Xiaoyuan Liu - *University of York*
Parthenogenesis, sexual conflict and the evolution of oogamy

Norberto Lucero Azuara *- Queen Mary University of London*
Modeling movement in two dimensions by fractional Brownian motion

Antonio Matas Gil - *Imperial College London*
Unraveling Biochemical Spatial Patterns: Physics Informed Neural Networks for solving the inverse problem in Turing systems

Christo Morison - *Queen Mary University of London*
Single-cell mutational burden distributions in birth-death processes

Lewis Mosby *- Lewis Mosby*
Evolving Tissue Pattern Scaling and Robustness Through Spatially Heterogeneous Feedback

Frixos Papadopoulos - *University of Southampton*
Simpler sequence Histograms outperform word2vec-based Representations across Protein Inference tasks

Paul Piho - *Imperial College London*
Quantifying the fitness effects of stochastic gene expression

Elisa Scanu - *Queen Mary University of London*
Coordinated inheritance of multiple extrachromosomal DNA species in human cancer cells

Alan Scaramangas - *Queen Mary University of London*
Evolutionary and eco-evolutionary stability of Batesian mimicry systems

Dimitris Volteras - *Imperial College London*
Understanding cell-cycle dependent transcription dynamics using single-cell RNA-sequencing data