

## Day 1 (Monday, 27 June) Programme

8:30 – 9:15 (27 June), Beveridge Hall

**Wald Lecture I** by **Martin Hairer**, Imperial College London

*Universality and Crossover in 1+1 Dimensions (Part I)*

Chair: Thomas Mikosch, University of Copenhagen

9:20 – 10:05 (27 June), Beveridge Hall

**Rietz Lecture** by **Hans-Georg Müller**, University of California, Davis

*Statistical Tools for Random Objects in Metric Spaces*

Chair: Rajen Shah, University of Cambridge

**10:05 – 10:30 (27 June): Tea break**

10:30 – 12:30 (27 June), Room G03

**IP3: Stochastic Partial Differential Equations**

Chair: Benjamin Gess, Bielefeld, Leipzig

*Optimal Regularity in Time and Space for Stochastic Porous Medium Equations*

**Hendrik Weber**, University of Bath

*Statistical inference for linear anisotropic SPDEs from multiple local measurements*

**Randolf Altmeyer**, University of Cambridge

*A semigroup approach for quasilinear rough PDEs*

**Alexandra Neamtu**, University of Konstanz

10:30 – 12:30 (27 June), Room G04

**IP6: Liouville Quantum Gravity and Planar Maps**

Chairs: Janne Junnilla and Jason Miller, Organizer: Nina Holden, ETH Zurich

*Liouville conformal field theory and the Virasoro algebra*

**Guillaume Baverez**, Humboldt-Universität zu Berlin

*A tour to imaginary chaos*

**Janne Junnilla**, University of Helsinki

*Tightness for approximations to the chemical distance metric for simple CLEs*

**Jason Miller**, University of Cambridge

*Title TBA*

**Baptiste Louf**, Uppsala University

10:30 – 12:30 (27 June), Room G05

**IP9: KPZ Universality**

Chair: Daniel Remenik, Universidad de Chile

*The Critical 2d Stochastic Heat Flow*

**Nikolaos Zygouras**, University of Warwick

*Universality in Random Growth Processes*

**Sourav Sarkar**, University of Cambridge

*One-point Distribution of the Geodesic in Directed Last Passage Percolation*

**Zhipeng Liu**, University of Kansas

*Stationary Measure for the Open KPZ Equation*

**Alisa Knizel**, University of Chicago

10:30 – 12:30 (27 June), Room G07

**IP13: Exact Monte Carlo for Stationary Analysis**

Chair: Gareth Roberts, University of Warwick

*Epsilon-Strong simulation of fractional Brownian motion and related stochastic differential equations*

**Jing Dong**, Columbia University

*Ensemble Rejection Sampling*

**George Deligiannidis**, University of Oxford

*Statistical Disaggregation --- A Monte Carlo Approach for Imputation under Constraints*

**Hongsheng Dai**, University of Essex

*Regenerative non-reversible MCMC and the Restore algorithm*

**Gareth Roberts**, University of Warwick

10:30 – 12:30 (27 June), Room G16

**IS1: A Statistical View on Neural Networks**

Chair: Michael Kohler, University of Darmstadt

*A theoretical comparison of deep learning and Bayes with deep Gaussian process priors*

**Johannes Schmidt-Hieber**, University of Twente

*Analysis of convolutional neural network image classifiers in a rotationally symmetric model*

**Benjamin Walter**, TU Darmstadt

*Over-parametrized deep neural networks minimizing the empirical risk do not generalize well*

**Adam Krzyzak**, Concordia University

*A statistical analysis of an image classification problem*

**Sophie Langer**, University of Twente

10:30 – 12:30 (27 June), Room G22

**IS2: Optimal Transport Methods for Statistical Data Analysis**

Chair: Jonathan Niles-Weed, New York University

*Optimal Transport Distributional Regression*

**Victor Panaretos**, EPFL

*Permuted and Unlinked Monotone Regression in multidimension: an approach based on mixture modelling and optimal transport*

**Bodhisattva Sen**, Columbia University

*Sample complexity of entropic optimal transport*

**Philippe Rigollet**, MIT

*The Sketched Wasserstein Distance for Mixture Distributions*

**Florentina Bunea**, Cornell University

10:30 – 12:30 (27 June), Room G26

**IS4: Second Generation Change-point Methods: Complex Models and Fast Computation**

Chair: Holger Dette, Ruhr-Universität Bochum, Organizer: Alexander Aue, UC Davis

*A Fast and Efficient Change-point Detection Framework based on Approximate k-Nearest Neighbor Graphs*

**Hao Chen**, University of California, Davis

*Trend Filtering with Adaptive Bayesian Changepoint Analysis for Count Time Series*

**Toryn Schafer**, Cornell University

*Sparse change detection in high-dimensional regression*

**Fengnan Gao**, Fudan University

*Are Deviations in a Gradually Varying Mean Relevant? A Testing Approach*

*Based on Sup-Norm Estimators*

**Holger Dette**, Ruhr-Universität Bochum

10:30 – 12:30 (27 June), Chancellors Hall

**The Royal Statistical Society Invited Session: Statistical Inference in Stochastic Biological Systems with Complex Dynamics**

Chair: Ben Swallow, University of Glasgow

*A Dynamical Systems Approach to Understand, Design, and Explore Cell Fate Transitions*

**Ruben Perez-Carrasco**, Imperial College London

*Inferring kinetic parameters of oscillatory gene regulation from single cell time-series data*

**Joshua Burton**, University of Manchester

*Hidden Markov modelling for Digital circadian and Sleep Health*

**Bärbel Finkenstädt Rand**, University of Warwick

*How living cells do statistics? Lessons from Fisher, Shannon, and Rényi*

**Michał Komorowski**, Polish Academy of Sciences

10:30 – 12:30 (27 June), Room G21A

**CTS3: Clinical Data, Missing and Censored Data**

Chair: Yichuan Zhao, Georgia State University

*Optimal design strategies in clinical trials with variance heterogeneity*

**Lida Mavrogonatou**, University of Cambridge

*Assessing the use of variational inference for large real-world clinical data*

**Brian Buckley**, University College Dublin

*Seeing the Unseen - a Generalized Scheme for Missing Mass Estimation*

**Amichai Painsky**, Tel Aviv University

*Estimating heterogeneous treatment effects with right-censored data via causal survival forests*

**Yifan Cui**, National University of Singapore

*Instrumental variable quantile regression under random right censoring*

**Lorenzo Tedesco**, KU Leuven

**12:30 – 13:30 (27 June): Lunch break**

13:30 – 15:30 (27 June), Room G03

**IP1: Geometric Probability**

Chair: Joseph Yukich, Lehigh University

*Fluctuations of random convex interfaces*

**Pierre Calka**, University of Rouen Normandy

*The modularity of random graphs on the hyperbolic plane*

**Nikolaos Fountoulakis**, University of Birmingham

*Curve Envelopes and Their Applications*

**Raul Jimenez**, University of Carlos III, Madrid

*Coverage and connectivity in stochastic geometry*

**Mathew Penrose**, University of Bath

13:30 – 15:30 (27 June), Room G05

**IP10: Topology of Random Objects**

Chair: Takashi Owada, Purdue University

*Bootstrapping persistent Betti numbers and other stabilizing statistics*

**Johannes Krebs**, Heidelberg University

*Homological Connectivity in Random Čech Complexes and Poisson Approximation*

**Omer Bobrowski**, Technion-Israel Institute of Technology

*The Bulk and the Extremes of Minimal Spanning Acycles and Persistence Diagrams of Random Complexes*

**Sayan Mukherjee**, Duke University

*Large deviation principle for geometric and topological functionals and associated point processes*

**Christian Hirsch**, Aarhus University

13:30 – 15:30 (27 June), Room G07

**IS3: Interaction Discovery in Genetics**

Chair: Hongzhe Li, University of Pennsylvania

*Statistical Models for Discovery Interactions and Their Computation*

**Jun Liu**, Harvard University

*Statistical and Machine Learning Approaches for the Identification of Virus-host Interactions*

**Fengzhu Sun**, University of Southern California

*Microbial Co-variation Discovery using Mixture Margin Copula Models*

**Rebecca Deek**, University of Pennsylvania

*Discovering High-order Interaction with Signed Iterative Random Forests*

**Sumanta Basu**, Cornell University

13:30 – 15:30 (27 June), Chancellors Hall

**IS11: Statistical Methods in Reinforcement Learning**

Chair: Chengchun Shi, London School of Economics

*Recent Machine Learning Developments for Multiple Outcomes in Precision Health*

**Michael Kosorok**, University of North Carolina at Chapel Hill

*Policy Learning with Competing Agents*

**Stefan Wager**, Stanford University

*Demystifying (Deep) Reinforcement Learning: The Pessimist, The Optimist, and Their Provable Efficiency*

**Zhuoran Yang**, Yale University

*A Reinforcement Learning Framework for A/B Testing*

**Chengchun Shi**, London School of Economics

13:30 – 15:30 (27 June), Room G22

**IS26: Recent Developments in High-Dimensional Time Series**

Chairs and Organizers: Haeran Cho, University of Bristol and Matteo Barigozzi, University of Bologna

*Community Network Auto-Regression for High-Dimensional Time Series*

**Elynn Y. Chen**, UC Berkeley

*CP Factor Model for Dynamic Tensors*

**Rong Chen**, Rutgers University

*Rank and Factor Loadings Estimation in Time Series Tensor Factor Model by Pre-averaging*

**Clifford Lam**, London School of Economics

*Spectral inference of high dimensional time series*

**Danna Zhang**, UC San Diego

13:30 – 15:30 (27 June), Room G26

**IS28: Scalable Particle Filter Algorithms and its Applications**

Chair: Ning Ning, University of Michigan

*Diffusion Schrodinger Bridges: Generative modeling, Inference and Applications to Filtering*

**Arnaud Doucet**, University of Oxford

*An iterated block particle filter for inference on coupled dynamic systems with shared and unit-specific parameters*

**Edward Ionides**, University of Michigan, Ann Arbor

*Intermediate distributions and complexity bounds for SMC*

**Anthony Lee**, University of Bristol

13:30 – 15:30 (27 June), Room G16

## **CTS2: Inference on Change-Points**

Chair: Yudong Chen, London School of Economics

*High-Dimensional Data Segmentation Under a Sparse Regression Model*

**Dominic Owens**, University of Bristol

*Multiple hypothesis testing from the change-point detection viewpoint – surprises and new results*

**Anica Kostic**, London School of Economics

*Cross-validation for change-point regression: pitfalls and solutions*

**Florian Pein**, Lancaster University

*Robust Inference for Change Points using Confidence Sets*

**Shakeel Gavioli-Akilagun**, London School of Economics

*Variance change point detection with credible sets*

**Lorenzo Cappello**, Universitat Pompeu Fabra

*Inference in high-dimensional online changepoint detection*

**Yudong Chen**, London School of Economics

13:30 – 15:30 (27 June), Room G21A

## **CTS23: Complex Probability models**

Chair: Alexandre Pannier, Imperial College London

*Level Densities for General  $\beta$ -ensembles: An Operator-valued Free Probability*

*Perspective*

**Andrej Srakar**, IER and University of Ljubljana

*Permutations avoiding a pattern of length three under Mallows distributions*

**Ross Pinsky**, Technion-Israel Institute of Technology

*Coexistence in discrete time multi type competing frog models*

**Rishideep Roy**, IIM Bangalore

*Nonlinear semigroups and their generator with respect to Gamma-convergence*

**Jonas Blessing**, University of Konstanz

*Pathwise large deviations for white noise chaos expansions*

**Alexandre Pannier**, Imperial College London

13:30 – 15:30 (27 June), Room G04

## **TC6: Recent Advances in Rank-based Inference**

Chair: Marc Hallin, Université libre de Bruxelles

*On Universally Consistent and Fully Distribution-Free Rank Tests of Vector Independence*

**Hongjian Shi**, Technical University of Munich

*Regression and Autoregression Rank Score Processes and their Functionals*

**Jana Jurecková**, Charles University and Academy of Sciences, Prague

*Ancillarity and Semiparametric Efficiency*

**Bo Zhou**, Durham University

*Center-outward rank tests for multiple-output regression and MANOVA*

**Šárka Hudecová**, Charles University

**15:30 – 16:00 (27 June): Tea break**

16:00 – 17:30 (27 June), Room G03

## **TC1: Semiparametric Approaches and Randomization Test in Causal Inference**

Chair: Yu Cheng, University of Pittsburgh

*Instrumental Variable Estimation of Complier Causal Treatment Effect with Interval-Censored Data*

**Limin Peng**, Emory University

*Imputation-Based Q-Learning for Optimizing Dynamic Treatment Regimes with Right-Censored Survival Outcome*

**Abdus Wahed**, University of Pittsburgh

*Multi-Threshold Structural Equation Model*

**Jialiang Li**, National University of Singapore

*Multiple conditional randomization tests*

**Qingyuan Zhao**, University of Cambridge

16:00 – 17:30 (27 June), Room G04

**TC2: Algebraic Structures in Statistics**

Chair: Jane Ivy Coons, University of Oxford

*Statistics for Phylogenetic Trees with Tropical Geometry*

**Anthea Monod**, Imperial College London

*Interventional Model Equivalence via Algebraic Geometry*

**Liam Solus**, KTH Royal Institute of Technology

*On the Strongly Robustness Property: When Markov and Graver Basis Coincidence*

**Dimitra Kosta**, University of Edinburgh

*Gaussian conditional independence beyond graphical models*

**Tobias Boege**, Max Planck Institute for Mathematics in the Sciences

16:00 – 17:30 (27 June), Room G05

**TC3: Statistical Methods for Innovative Experimental Designs**

Chair: Sofia S Villar, University of Cambridge

*Bayesian Algorithms for Adaptive Trials that Trade Off Statistical Analysis with Benefits to Participants*

**Joseph J Williams**, University of Toronto

*A Bayesian decision-theoretic randomisation procedure for multi-armed clinical trials with normally distributed outcomes*

**Faye Williamson**, Newcastle University

*Optimal designs for testing the efficacy of heterogeneous experimental groups*

**Rosamarie Frieri**, University of Bologna

*Multinomial Thompson Sampling for adaptive experiments with rating scales data*

**Nina Deliu**, Sapienza University of Rome

16:00 – 17:30 (27 June), Room G07

**TC4: Advances in Time Series Analysis**

Chair: Greta Goracci, Free University of Bolzano

*Classification with high-dimensional time series*

**Kung-Sik Chan**, University of Iowa

*High-dimensional time series segmentation via factor-adjusted vector autoregressive modelling*

**Haeran Cho**, University of Bristol

*The validity of bootstrap testing in the threshold framework*

**Simone Giannerini**, University of Bologna

*High dimensional threshold regression with common stochastic trends*

**Lorenzo Trapani**, University of Nottingham

16:00 – 17:30 (27 June), Room G16

**TC5: Graphical Models**

Chair: Alexandros Grosdos, TU Munich

*Towards standard imsets for maximal ancestral graphs*

**Robin Evans**, Oxford University

*Staged Trees and Asymmetry-Labeled DAGs*

**Manuele Leonelli**, IE University

*Total positivity in graphical models for extremes*

**Frank Röttger**, University of Geneva

*Causal Structure Discovery between Clusters of Nodes Induced by Latent Factors*

**Chandler Squires**, Massachusetts Institute of Technology

16:00 – 17:30 (27 June), Room G22

**TC7: New Progress and Directions in Nonparametric Statistics**

Chair: Hongjian Shi, Technical University of Munich

Organizer: Fang Han, University of Washington

*Nonparametric regression on Lie groups with measurement errors*

**Jeong Min Jeon**, KU Leuven

*Honest Confidence Bands for Quantile Curves*

**Lutz Duembgen**, University of Bern

*Limiting laws for optimal transport plans on finite spaces*

**Yoav Zemel**, University of Cambridge

16:00 – 17:30 (27 June), Room G26

**TC8: New Changepoint Algorithms and Theoretical Results**

Chair: Toby Hocking, Northern Arizona University

*Optimistic search strategy: Change point detection for large-scale data via adaptive logarithmic queries*

**Solt Kovacs**, ETH Zurich

*FOCuS: Online Changepoint Detection via Functional Pruning CUSUM Statistics.*

**Gaetano Romano**, University of Lancaster

*Detecting changepoints in periodic data*

**Owen Li**, University of Lancaster

*Random Forests for Change Point Detection*

**Malte Lonschien**, ETH Zurich

16:00 – 17:30 (27 June), Chancellors Hall

**IMS Lawrence D Brown PhD Student Awards Session**

Chair: Tracy Ke, Harvard University

*Statistical Inference for High-Dimensional Generalized Linear Models with Binary Outcomes*

**Rong Ma**, Stanford University

*Assumption-Lean Analysis of Cluster Randomized Trials in Infectious Diseases for Intent-to-Treat Effects and Network Effects*

**Chan Park**, University of Wisconsin-Madison

*Exact Clustering in Tensor Block Model: Statistical Optimality and Computational Limit*

**Rungang Han**, Duke University

**18:30 – 20:00 (27 June), Conference Reception**

Great Hall, Paul Marshall Building

London School of Economics

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