

# PhD study in Complexity Science

Robert MacKay,  
Director of Mathematical Interdisciplinary  
Research, Centre for Complexity Science,  
and MathSys CDT

THE UNIVERSITY OF  
WARWICK

# As past president of the IMA

- The Institute of Mathematics and its Applications (IMA) is pleased to be supporting this event
- The IMA is a UK learned and professional society for the promotion of mathematics
- Among many things, it offers support for undergraduate mathematics societies, undergraduate maths prizes, and mathematical research student groups. Contact the university liaison officer [Erica.tyson@ima.org.uk](mailto:Erica.tyson@ima.org.uk) or postgraduate university liaison officer [sam.kamperis@ima.org.uk](mailto:sam.kamperis@ima.org.uk)

# What is Complexity Science?

- The study of systems with many interdependent components
- e.g. Electricity network, Financial system, Spread of infectious diseases, Cell biology
- Requires extensive mathematics and ability to engage with application areas

# Some examples

- Graph/network theory, e.g. mobile wireless device channel selection
- Stochastic interacting particle systems, e.g. spread of Ebola
- Dynamical systems, e.g. instabilities of electricity grid
- Game theory, e.g. design of financial regulation
- Statistical inference, e.g. gene expression in cancer

# Some places where you can do it

- Warwick Centre for Complexity Science
- Bristol Centre for Complexity Sciences
- Southampton Institute for Complex Systems Simulation
- Bath Institute for Complex Systems
- York Centre for Complex Systems Analysis
- UCL CoMPLEX (centre for maths, physics, engineering in the life sciences and experimental biology)
- Manchester Complex systems and Statistical physics group
- KCL Complex systems modelling, and Non-equilibrium systems
- Queen Mary London Complex Systems & Networks Group
- Imperial College London Centre for Complexity Science
- Strathclyde Institute of Complex Systems
- Edinburgh Institute for Condensed Matter & Complex Systems

# Warwick Complexity Science & MathSys

- Our Complexity Science DTC has evolved into MathSys CDT, a new EPSRC & MRC Centre for Doctoral Training on Mathematics for Real-world Systems, that took its first intake this September.
- It runs a 1-year MSc and a 3-year PhD, with the normal route being to do both.
- It is offering 10 x 4-year MSc+PhD studentships per intake for 5 intakes (Sept 2014-18), and welcomes applications from self-funding students also (5 in our first intake).
- Next open days 28 January, 11 March.
- It is a collaboration between mathematicians in the Centre for Complexity Science, Warwick Systems Biology, and Warwick Infectious Disease Epidemiology Research.
- It is run by the Mathematics department, hosted by the Centre for Complexity Science, and is a natural evolution from our Complexity Science Doctoral Training Centre, whose last funded intake was Sept 2013.
- We continue to take applications for direct entry to PhD in Complexity Science if you (will) have an equivalent MSc, are ready for a PhD project, and have suitable funding.
- !! For start by 1 Feb 2015, we have 2 x 3-year Complexity Science PhD studentships from EPSRC and a 3-year MathSys PhD studentship funded by Elexon !!

# Goals of MathSys CDT

- MathSys CDT works with external partners to train and nurture the research of bright PhD students, helping you develop the new mathematical insights needed to address high impact problems and challenges for society in areas like health, industry and finance.
- You will become entrepreneurs, innovators and leaders in business, public services and academia.



**EPSRC**

Pioneering research  
and skills

**MRC**

Medical  
Research  
Council

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# Real-world people





# Other mathematical PhD opportunities at Warwick

- PhD in Mathematics or Interdisciplinary Mathematics
- MASDOC (Mathematics & Statistics doctoral training centre)
- PhD in Statistics
- OxWaSP CDT
- Also recently awarded Leverhulme DTC bridging the gap between mathematical and social sciences, on social information.