

Looking for a PhD position on the dynamics of life?

CriTiCS: Critical Transitions in Complex Systems - from Theory to Applications -

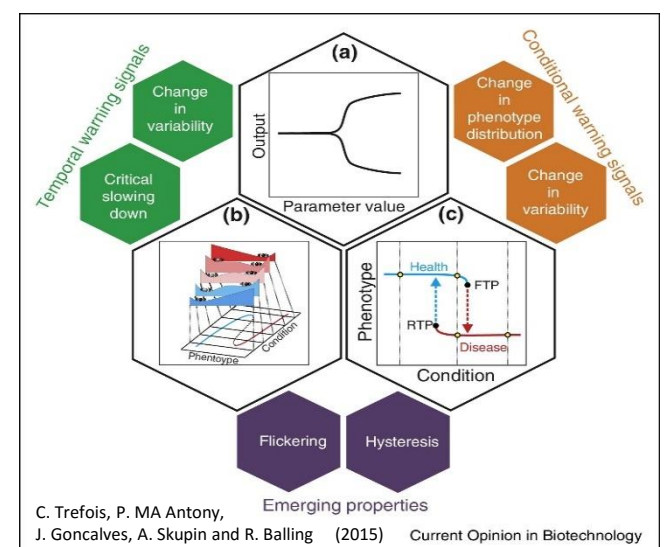
The CriTiCS doctoral training program at the University of Luxembourg, involving the Luxembourg Center for System Biomedicine, the Life Science Research Unit, the Physics and Materials Science research Unit, the Luxembourg School of Finance and the Luxembourg Institute of Health, in collaboration with the Institute for Systems Biology (Seattle, USA), the Wageningen UR (Netherlands) and Saarland University (Germany), funded under the PRIDE scheme of the Luxembourg National Research Fund, invites applications for

11 fully funded open PhD positions.

You will be a member of the highly interdisciplinary and truly collaborative graduate school on early warning signals and critical transitions in complex systems. This inter-institutional research group will integrate experimental biology and biomedicine approaches with mathematical concepts from non-equilibrium physics, system control theory and finance mathematics to develop the foundation of a future predictive, preventive and personalised medicine. We are looking for candidates for theoretical projects (background in math, physics, engineering, finance or a related field) as well as candidates for experimental projects (background in biology, biotechnology or a related field).

Join us in Luxembourg.

Apply right now, flexible start during 2017.



The **theoretical project** of:

- **Jorge Goncalves** (1st project) will study critical transitions in the framework of control theory and system identification.
- **Jorge Goncalves** (2nd project) will apply control theory and system identification to the study of cardiac arrhythmia.
- **Alexander Skupin** will apply methods from statistical physics and information theory to high-dimensional single cell omics data to establish a distribution biology framework.
- **Roman Kräussl** will study critical transitions during financial market crises in the framework of behavioural finance.
- **Massimiliano Esposito** will study energy and information processing in spatially extended open chemical reactions networks undergoing spatio-temporal symmetry breaking.

The **experimental project** of:

- **Alexander Skupin** and **Rudi Balling** will characterize patient-based iPS cells during differentiation and maturation by cutting-edge single cell omics methods, to investigate how mutations in Parkinson's disease related genes affect the cellular phenotype.
- **Paul Wilmes** will focus on the identification and understanding of critical transitions within mixed microbial communities.
- **Feng He** will investigate how molecular networks of CD4 T cells shift during the critical transition from acute to chronic neuroimmune stresses.
- **Anne Grünwald** will establish whether herpes virus infections contribute to Parkinson's disease-associated mtDNA depletion and mitochondrial dysfunction accelerating the transition from healthy to pathological state.
- **Alexander Crawford** will focus on seizure characterisation in zebrafish to investigate critical transitions in human epilepsy.
- **Stephanie Kreis** will combine molecular biology and bioinformatics to study transitions from healthy skin to melanoma cancer cells.

More information and applications at www.critics.uni.lu or contact info.critics@uni.lu.