



## Perspective Lecture

# Complex non-autonomous dynamical systems

**Prof. Aneta Stefanovska**  
Lancaster University UK.

**Mercoledì 8 Novembre 2017 ore 15.00**  
**Aula Magna di Ingegneria**  
**Via L. Loredan, 20 – Padova**



Aneta Stefanovska is Professor of Biomedical Physics at the Physics Department at Lancaster University, UK. Fascinated by the complexity of living systems, she has dedicated herself to understanding their principles, considering them as networks of coupled non-autonomous oscillators. With collaborators she has proposed a new subclass of dynamical systems, chronotaxic systems, that can sustain stable frequencies in the face of external perturbation. She has also proposed numerous time series analysis methods to study measured oscillations with variable frequencies and their interactions and couplings.

These methods include wavelet-based phase coherence and bispectral analysis, nonlinear mode decomposition and dynamical Bayesian inference to study coupling functions. Aneta Stefanovska is applying her theories and methods to understand oscillations, coherences and couplings in health and disease at cellular level as well as at system level in relation to cardiovascular and brain dynamics. With collaborators, she is also investigating the photo-excited 2-D electron gas on superfluid helium as an experimental model of chronotaxic dynamics.

The work has given rise to more than 100 journal articles and several patent applications, and it has been presented in over 100 invited conference talks and seminars around the world.