

## Cologne Colloquium on Theoretical Physics

## Cologne Evolution Colloquium

Joint Seminar

Erwin Frey LMU, Munich

## **Evolutionary Games**

Microbial laboratory communities have become model systems for studying the complex interplay between nonlinear dynamics of evolutionary selection forces, stochastic fluctuations arising from the probabilistic nature of interactions, and spatial organization. Major research goals are to identify and understand mechanisms that ensures viability of microbial colonies by allowing for species diversity, cooperative behavior and other kinds of social behavior. A synthesis of evolutionary game theory, nonlinear dynamics, and the theory of stochastic processes provides the conceptual framework for a deeper understanding of these ecological systems. In this talk, we will give an introduction into the modern formulation of these theories and illustrate their effectiveness focusing on selected examples of microbial systems. We also discuss current challenges and future perspectives in quantifying bacterial population dynamics, and how this might have an impact on research in non-equilibrium physics.

Friday, May 13, 2016, 16:30 Institute for Theoretical Physics, New Building Seminar Room 003, Ground Floor

Hosted by Joachim Krug