

## **Theoriekolloquium**

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Am **21. Januar 2016** um **14.15 Uhr** in **W2 1-143** hält

**Herr Dr. Johannes Knebel (München)**

einen Vortrag mit dem Titel

### **Evolutionary games of condensates in driven-dissipative systems of non-interacting bosons**

Condensation is a collective behavior of particles observed in both classical and quantum physics. For example, when an equilibrated, dilute gas of bosonic particles is cooled to a temperature near absolute zero, the ground state becomes macroscopically occupied (Bose-Einstein condensation). Whether novel condensation phenomena occur far from equilibrium is a topic of vivid research. Only recently has it been proposed that a driven and dissipative gas of bosons may condense not only into a single, but also into multiple quantum states. This phenomenon may occur when a system of non-interacting bosons is weakly coupled to a reservoir and is driven by an external time-periodic force. Coherence becomes negligible and the condensation is described by a Pauli master equation, which also describes the evolutionary dynamics of classical agents in game theory. In this talk, we present how we applied concepts from evolutionary game theory to determine the quantum states that become the condensates. This selection process is guided by the vanishing of relative entropy production. We find that the system of condensates never comes to rest: The occupation numbers of condensates oscillate, which we demonstrated for a rock-paper-scissors game of condensates.

Interessierte sind herzlich eingeladen.

gez. Prof. Dr. Andreas Engel