



Lehrstuhl für Analysis und Modellierung

**Lehrstuhl-Seminar
Wintersemester
2019/2020**

Prof. Reika Fukuizumi

Tohoku University, Sendai

**Temperature effects and long time
behaviour of Gross-Pitaevskii equation**

16. September 2019 - 10:30

Fakultätssaal 8.122, Pfaffenwaldring 57

Abstract: The stochastic Gross-Pitaevskii equation is used as a model of Bose-Einstein condensation (BEC) at positive temperature. The equation is a complex Ginzburg-Landau equation with a trapping potential and an additive space-time white noise. A positive temperature effect, for example, the spontaneous vortex formation by a sudden quench in BEC (seen as a phase transition) is of great interest in Physics, and to analyze this phase transition from the point of view in statistical physics, the convergence of the physical system to the Gibbs equilibrium in large time is essential. In this talk we will first give a review on the justification of the model equation and the convergence to the Gibbs equilibrium in 1D case, and present some recent studies on the 2D case, where a Wick renormalization is required to give a sense to the nonlinearity.