Wir laden recht herzlich zu einem Vortrag im Rahmen des

Oberseminars Partielle Differentialgleichungen

ein:

PD Dr. Yana Kinderknecht

(Universität Saarbrücken)

"Chernoff approximation of Markovian and non-Markovian evolution."

Donnerstag, 04. Juli 2019

Beginn: **15:15 Uhr**
Raum: **F0426**

Interessenten sind herzlich willkommen!

R. Denk, M. Kunze

Abstract: First, we discuss how to approximate evolution semigroups by means of the Chernoff theorem. We discuss different approaches to construct Chernoff approximations for Feller semigroups. In particular, we outline the techniques based on pseudo-differential operators; we show how to approximate semigroups obtained from some original (known or already approximated) ones by such procedures as additive and/or multiplicative perturbations of generators, subordination, adding Dirichlet boundary/external or Robin boundary conditions. The described approaches allow to approximate semigroups generated, e.g., by subordinate Feller diffusions on star graphs and Riemannian manifolds, killed Feller processes in a domain of $\mathbb{R}^d$. Second, we show how the constructed Chernoff approximations for evolution semigroups can be used to approximate solutions of some time-fractional evolution equations describing anomalous diffusion (solutions of such equations do not posess the semigroup property and are related to some non-Markov processes).

The method of Chernoff approximation provides simultaneousely numerical schemes for PDEs and pseudo-differential equations (in particular, the operator splitting method), Euler–Maruyama schemes for the corresponding SDEs, can be understood as a numerical path integration method, allows to obtain new Feynman–Kac formulas /Feynman path integrals for the considered evolution equations.

(eingeladen von Dr. Markus Kunze)