

Fachgebiet Analysis
Prof. Dr. Daniel Hauer
Prof. Dr. Friedrich Sauvigny

Fachgebiet Optimierung
Prof. Dr. Sabine Pickenhain

Fachgebiet Optimale Steuerung
Prof. Dr. Gerd Wachsmuth



Forschungsseminar Analysis und Optimierung Sommersemester 2026

Im Rahmen des Forschungsseminars spricht am **Donnerstag, den 8. Oktober 2026**

Dr. Wendi Xu

Shanghai Institute of Mathematical and Interdisciplinary Sciences, China

Titel: Poisson problem with Hardy operator on lattice graph and the application to semilinear equations

Inhalt: We investigate the analytic properties of the Hardy-type operator $L_\mu := -\Delta + \mu H_0$ on the integer lattice graph $\mathbb{Z}^d$, $d \geq 3$, where $\mu \geq -1$ and the nonnegative potential H_0 approaches the optimal lattice Hardy weight from below. We derive sharp fixed-pole Green kernel estimates on $\mathbb{Z}^d$ and obtain a necessary and sufficient weighted summability condition characterizing the solvability of the nonnegative Poisson problem associated with this operator. Based on this classification, we establish Liouville nonexistence ranges for $L_\mu u \geq W u^p$, $p > 0$, under a lower power bound on W . Under an upper power bound, we construct positive supersolutions with specified power or logarithmic profiles; additional two-sided control yields positive solutions of the equation in the stated sublinear ranges.

This is joint work with Professor Bobo Hua and Professor Huyuan Chen.

Weitere Details zum Seminar: Der Vortrag findet in Raum HG 3.45 des Zentralkampus Cottbus der BTU statt.