Analysis Seminar

Title: Fujita exponent for Hörmander vector fields

Speaker: Marianna Chatzakou (Ghent University)

Date: Tue 12th November 2024 at 3:00PM

Location: E0.32 (beside Pi restaurant)

Abstract: We will discuss the global existence and non-existence results for the heat equation

$$\begin{cases} u_t(t,x) - \Delta u(t,x) = f(u(t,x)), \\ u(0,x) = u_0(x), \end{cases}$$

when the differential operator is given in terms of Hórmander vector fields on $\mathbb{R}^n$. In the particular case where $f(u) = u^p$ we obtain the so-called critical Fujita exponent. We will also discuss the same problem in the setting where the underlying manifold is a unimodular Lie group, but in this case with an extra time-dependent nonlinearity term. In both cases, our approach relies on the heat kernel estimates of the involved operators. In the particular case of the Heisenberg group these estimates yield necessary and sufficient conditions for the existence of the global solution which coincide.

This talk is based on two joints works with A. Kassymon and M. Ruzhansky.

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