Leibniz Universität Hannover

# Oberseminar Analysis

# Prof. Dr. Jan Rozendaal

**Polish Academy of Sciences, Warschau**

# Rough wave equations and Hardy spaces for Fourier integral operators

**It is well known that the solution operators $\cos(t\sqrt{-\Delta})$ and $\sin(t\sqrt{-\Delta})$ to the Euclidean wave equation $\partial_t^2 u = \Delta u$ are not bounded on $L^p(\mathbb{R}^n)$, for $n \geq 2$ and $1 \leq p \leq \infty$, unless $p = 2$ or $t = 0$. In fact, for $1 < p < \infty$ these operators are bounded from $W^{2s(p),p}(\mathbb{R}^n)$ to $L^p(\mathbb{R}^n)$ for $s(p) := \frac{n-1}{2}|\frac{1}{p} - \frac{1}{2}|$, and this exponent cannot be improved. The same phenomenon occurs for wave equations on manifolds, as is a consequence of the work of Seeger, Sogge and Stein from 1991 on the optimal $L^p$ regularity of Fourier integral operators, a class of operators with oscillatory kernels.**

**In this talk I will discuss a recent extension of the $L^p$ regularity theory of wave equations, to equations with rough coefficients. The proof uses spaces $H^p_{FIO}(\mathbb{R}^n)$ which are invariant under Fourier integral operators.**

**This talk is based on joint work with Andrew Hassell and Pierre Portal (Australian National University).**

## Dienstag, 21.11.2023, 15:00 Uhr, Raum c311
## Hauptgebäude der Leibniz Universität

Dazu laden herzlich ein:

Prof. Dr. Wolfram Bauer, Prof. Dr. Joachim Escher, Prof. Dr. Johannes Lankeit, Prof. Dr. Elmar Schrohe, Prof. Dr. Alexander Strohmaier, Prof. Dr. Christoph Walker, Dr. Alden Waters