



Institut für  
Angewandte Mathematik



Leibniz  
Universität  
Hannover

Institut für Angewandte Mathematik  
24.10.2019

## Oberseminar Analysis und Theoretische Physik

**Dr. Joachim Rehberg  
(WIAS Berlin)**

### **Explicit and uniform estimates for second order divergence operators on $L^p$ spaces**

It is the aim of the talk to give – aside the Beurling/Deny approach – a consistent definition of second order divergence operators on  $L^p$  spaces, even if the underlying domain is highly non-smooth, the boundary conditions are mixed and the coefficient function is real, bounded and elliptic – but not necessarily symmetric. In order to do this, one first proves that, under minimal assumptions, the  $L^2$  resolvent transports the spaces  $L^p$  with sufficiently large  $p$  into  $L^\infty$ . This shows that, for these  $p$ , the part of the  $L^2$  operator in  $L^p$  possesses a domain which embeds into  $L^\infty$ . Having this at hand, one can modify ideas of Cialdea/Maz'ya to include the numerical range in a certain sector. This leads to suitable resolvent estimates. Moreover, we prove that the resulting semigroup is contractive and analytic with explicitly determined holomorphy angle. Finally, a holomorphic calculus is established with (half) angle smaller than  $\pi/2$ . This gives even maximal parabolic regularity via the Dore/Venni theorem.

**Dienstag, 03.12.2019, 15:00 Uhr, Raum c311  
Hauptgebäude der Universität**

Über Ihren Besuch würden sich freuen:

Prof. Dr. Wolfram Bauer  
Prof. Dr. Joachim Escher  
Prof. Dr. Elmar Schrohe  
Prof. Dr. Christoph Walker