



Lothar-Collatz-Kolloquium für Angewandte Mathematik

Donnerstag, den 22. Januar 2026, um 14:30 Uhr, im Hörsaal 6

Prof. Dr. Marcus Waurick*

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Nonlocal effects induced by homogenization of metamaterials

Zusammenfassung/Abstract:

We consider a sequence of divergence form problems with conductivities constant in y , and highly oscillatory and periodic in x -direction. This problem class is well-studied and well-understood for coefficients having one sign only. If the sign-changes occur in such a way that the divergence form problems induce uniformly bounded solution operators, it can be shown that the limit is again of the same type with constant conductivity matrix. In the talk, we are able to construct a problem class where uniform boundedness fails while any pre-asymptotic solution operator is bounded. As a consequence, the limit operator is non-local. The techniques of the proof are scattered across the analysis of Sturm--Liouville operators with unbounded and sign-changing coefficients, elements of complex analysis, and an application of the Lindemann--Weierstraß theorem from transcendental number theory.

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