

Institut für Numerische Mathematik (Math D)

## Habilitationskolloquium

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HS AE01

# Multiscale Analysis Beyond Wavelets

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Since the wavelet-boom in the 1980's, researchers have come a long way in exploiting the capabilities of wavelet transforms with impressive results in both pure and applied mathematics. By now also the inherent limitations of wavelets are quite well-understood. For applications, the most important such limitations are the incapability to deal with high-dimensional data with features along submanifolds (think of images) and the incapability to solve hyperbolic PDEs efficiently. This talk considers these problems and describes novel multiscale constructions that can overcome these deficiencies. In particular, I will show how to derive optimal image coding schemes based on the shearlet transform. Then I will describe a novel scheme which for the first time allows for a stable numerical solution of linear parametric transport problems.

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