

# Sonderforschungsbereich 1060

The Mathematics of Emergent Effects

Einladung zu einem Vortrag im SFB-Seminar

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spricht zum Thema

**Zooming in - Multiscale RBF  
approximation can be locally refined**

**Zeit: Dienstag, den 3. Juni 2014, 14.15 Uhr**

**Ort: Lipschitz-Saal 1.016, Endenicher Allee 60**

**Kaffee/Tee: anschl. im Plückerraum 1.015**

gez. Michael Griebel

**Abstract:** Physical phenomena on the earth's surface occur on many different length scales, so it makes sense when seeking an efficient approximation to start with a crude approximation, and then make a sequence of corrections on finer and finer scales. It also makes sense for fine-scale approximations to be computed locally, rather than through a large global computation. In the present talk, describing recent joint work with Q. Thong Le Gia and Holger Wendland, we start with our global multiscale radial basis function (RBF) approximation scheme (SIAM J. Numer. Anal. 2010), based on a sequence of point sets with decreasing mesh norm, and a sequence of associated (spherical) radial basis functions with proportionally decreasing scale. We then prove that we can zoom in on a region of particular interest, by carrying out further stages of multiscale refinement on a local region. The process can be continued indefinitely, since the condition numbers of the matrices for different scales remain bounded. Colorful numerical experiments illustrate the possibilities.