



## The first workshop on Approximate Approximations and their applications

Funded by the Research Centre in Mathematics and Modelling,  
Department of Mathematical Sciences, Liverpool University

The basic idea of approximate approximations is simple: we take approximations to functions where the approximants depend on parameters such as a step size. Classically one wishes to establish convergence theorems as the step size goes to zero. Also, we are usually interested in an order of convergence or an approximation order. However, in many cases, although good approximations can be made, convergence to zero is ultimately not achieved. Nonetheless, the approximations are highly useful if the remaining error can be singled out and kept below machine precision for example. This leads to important mathematical applications, such as approximation of integral operators and cubature formulae. A variety of important generalisations and applications can be addressed, e.g. approximation with wavelets, general grids and scattered data, algorithms for solving differential and integral equations and boundary value problems. Altogether the approximate approximations proved to be a useful alternative to the classical ideas of strict convergence. This workshop is organized in order to meet and discuss new methods in the area, problems and perspectives.

### Organizers:

Prof Vladimir Maz'ya (Liverpool University),

Dr Gunther Schmidt (Weierstrass Institute for Applied Analysis and Stochastics, Berlin)

Dr Bakhtier Vasiev (Liverpool University).

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### Program

Tuesday 14 <sup>th</sup> December	Wednesday 15 <sup>th</sup> December
4PM – Introductory speech by Prof Vladimir Maz'ya. 4:10 PM—Talk “ <a href="#">Multiscale Approximate Approximation Operators</a> ” by Dr Tjavidar Ivanov, Jönköping, Sweden	3PM – Talk “ <a href="#">Numerical Calculation of Elastic Fields and Effective Properties of Homogeneous Media with Sets of Isolated Inclusions</a> ” by Prof Sergey Kanaun, ITESM-CEM, Mexico
5PM – Talk “ <a href="#">Tensor product approximations of high dimensional potentials</a> ” by Prof Flavia Lanzara, Rome, Italy	4PM – Talk “ <a href="#">On the computation of volume potentials over high-dimensional rectangular domains</a> ” by Dr Gunther Schmidt, Berlin, Germany
6PM – Discussions	5PM - Discussions
7PM - Dinner	6PM - Dinner