



Institut für Numerische Simulation
Rheinische Friedrich-Wilhelms-Universität Bonn



SEVENTH INTERNATIONAL WORKSHOP MESHFREE METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS

FIRST ANNOUNCEMENT

DATE: SEPTEMBER 9–11, 2013
LOCATION: BONN, GERMANY
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DEADLINES AND
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JULY 31, 2013 EARLY REGSIRATION DEADLINE

The numerical treatment of partial differential equations with meshfree discretization techniques has been a very active research area in recent years. While the fundamental theory of meshfree methods has been developed and considerable advances of the various methods have been made, many challenges in the mathematical analysis and practical implementation of meshfree methods remain.

Meshfree methods, particle methods, and generalized finite element methods have undergone substantial development since the mid 1990s. The growing interest in these methods is in part due to the fact that they are very flexible numerical tools and can be interpreted in a number of ways. For instance, meshfree methods can be viewed as a natural extension of classical finite element and finite difference methods to scattered node configurations with no fixed connectivity. Furthermore, meshfree methods have some advantageous features which are especially attractive when dealing with multiscale phenomena: A-priori knowledge about particular local behavior of the solution can be introduced easily in the meshfree approximation space, and an enrichment of a coarse scale approximation with fine scale information is possible in a seamless fashion. The implementation of meshfree methods and their parallelization however requires special attention, for instance with respect to numerical integration.

This symposium aims to promote collaboration among engineers, mathematicians, and computer scientists and industrial researchers to address the development, mathematical analysis, and application of meshfree and particle methods especially to multiscale phenomena. While contributions in all aspects of meshfree methods are invited, some of the key topics to be featured are

- Application of meshfree, generalized/extended finite element methods e.g. to
 - multiscale problems
 - multiphysics problems
 - non-local models
 - problems with multiple discontinuities and singularities
 - problems in high-dimensions
- Coupling of meshfree methods, finite element methods, particle methods, and finite difference methods
- Fictitious domain methods
- Application of meshfree, generalized/extended finite element methods
- Parallel computation in meshfree methods
- Mathematical theory of meshfree, generalized finite element, and particle methods
- Fast and stable domain integration methods
- Enhanced treatment of boundary conditions
- Identification and characterization of problems where meshfree methods have clear advantage over classical approaches

The workshop program will consist of invited lectures, contributed papers and poster sessions.

The workshop will be held at the University Club:

Universitätsclub
Konviktstraße 9
D-53113 Bonn
Germany

of the University Bonn in downtown Bonn.

The conference fees are:

Participant : 200,- €
Student : 100,- €
Late Registration: 300,- €

The conference fee includes the handbook of printed abstracts, admission to all sessions and receptions. There will a banquet as part of the social program of the workshop.