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CBC Talk on Smooth Particle Hydrodynamics: Fast solvers and flexible modelling - June 23, 2013

The talk will be held by Nathaniel Trask from Brown University.

Total number of participants: 13

Total number of guests outside of CBC: 4

Number of different nationalities represented: 10



Total number of speakers: 1

Total number of talks: 1

Abstract:

Smooth particle hydrodynamics (SPH) is a meshfree collocation method commonly used for solving the Lagrangian form of the Navier-Stokes equations. While the method was originally proposed in the seventies for solving the Euler equations in astrophysical applications, in the last decade the method has gained traction as an attractive platform for solving multiphase flows at mesoscopic length scales where thermal fluctuations within the flow become important. Recent work with the method has investigated the use of implicit projection schemes for satisfying the divergence constraint in incompressible flows rather than the explicit artificial compressibility approaches commonly used in the past.

In this talk, the foundations of the method and some of its diverse modelling applications in ground water flows, Brownian motion of colloid suspensions, multiphase flows, and electrohydrodynamics are reviewed. Our recent work is presented using fast algebraic multigrid solvers and high order splitting schemes to achieve performance several orders of magnitude faster than that obtained using traditional SPH formulations.

What	
When	Jun 23, 2013 from 01:00 PM to 04:00 PM
Where	Bakrommet @ Simula
Contact Name	Jonathan Feinberg
Attendees	Alessio Lavecchia Aymen Said Christian Tarrou Halvard Moe Jonathan Feinberg Julia Wiebe Lyuda Vynnytska Nathaniel Trask Omar Al-Khayat Sabine Hippchen Stuart Clark Yapi Donatien Achou Øyvind Evju
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