



SFB  716



University of Stuttgart
Germany

Colloquium of the SFB 716

January 26th, 2017 | 4 pm

University of Stuttgart
Campus Vaihingen
Allmandring 3
Room 1.079

The Collaborative Research Center (SFB) 716 invites colleagues and interested persons to the upcoming colloquium. In this lecture series renowned researchers and members of our subprojects talk about their research findings regarding dynamic simulation of systems with large particle numbers.

TALK

Prof. George Biros

University of
Texas at Austin,
Institute for
Computational
Engineering
and Sciences

Parallel numerical algorithms for simulations of complex fluids

Complex fluids are challenging to simulate as they are characterized by fluid-structure interaction and the presence of a stationary or evolving microstructure. We will discuss the discretization of integral equation formulations for complex fluids. In particular, we will discuss the challenges and scalability of algorithms for volume integral equations and we will present a new open-source library

for such problems. Key algorithmic primitives include tree-data structures (like oct-trees) and fast summation methods (like the Fast Multipole Method).

We will compare their performance to other state-of-the-art codes. Representative applications will include blood flow in microcirculation and flow in porous media.

TALK

Milena Smiljanic

Institute for
Combustion
Technology,
Subproject A.8

Coarse-graining approach for nanoparticle agglomeration

All-atom simulations of Langevin particles, suspended into a turbulent flow, require excessive computational requirements, due to the large number of particles and multi-scaling nature of the process. Within our project, we aim to bridge this challenges, by replacing parts of agglomerates by coarser "representative" particles of ellipsoidal shape.

Our work on collision-detection for ellipsoids and further dynamic clustering will be reported in detail. Some results on agglomerates' breakage will be also presented.