

Seminar of the Work Group  
Nonlinear Partial Differential Equations  
SS 23

**May 16th, 2023, 14:00 - 14:40**  
**Seminar room: SR 3.068**

## Vanishing Limit of a Small Solid in a Three-dimensional Incompressible Viscous Fluid.

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### **Abstract**

In this talk, I will present our recent result on the study of the evolution of a small rigid body in an incompressible viscous fluid that fills the whole space  $\mathbb{R}^3$ . When the small rigid body shrinks to a “massless” point in the sense that its density is constant, we prove that the solution of the fluid-rigid body system converges to a solution of the Navier-Stokes equations in the full space. To achieve this, I will introduce a technique that utilizes  $L^p$ - $L^q$  estimates of the fluid-structure semi-group and a fixed-point argument to obtain a uniform estimate of velocity of the rigid body. I then will present the construction of the test function and the process of passing to the limit. This is a joint work with Pei Su (Charles University).