

## Company Description

BCAM is the Research Center on applied mathematics created with the support of the Basque Government and the University of the Basque Country, which aims to strengthen the Basque science and technology system, by performing interdisciplinary research in the frontiers of mathematics, talented scientists' training and attraction, so the excellence of our results are recognized by the Society.

## Information

 Deadline: 2021-03-12  
 Category: Business  
 Province: Bizkaia

 Country: Basque Country

## Company

BCAM



## Main functions, requisites & benefits

### Main functions

Applications are invited for a Research Technician position in "Friction and contact forces from the Theory of Coarse-Graining" at the CFD group (BCAM) in collaboration with the UNED. Suspensions of particles are ubiquitous in nature and in technological applications. They are a paradigmatic example of complex fluid displaying non-trivial rheological and microstructural behaviour. Even the simplest case of spherical rigid non-Brownian suspensions exhibit fascinating non-Newtonian behaviour. While much is known about the rheology of hydrodynamics-dominated dilute suspension, the community is now addressing the challenge of considering concentrated suspensions, where hydrodynamics is restricted to lubrication effects and other surface-surface interactions begin to dominate. In the present project, we aim at using the Theory of Coarse-Graining (ToCG) in order to motivate a specific model for the surface-surface interaction between suspended particles. The ToCG, also known as the Mori-Zwanzig approach, GENERIC, or simply Non-Equilibrium Statistical Mechanics, is a general framework to derive the equations governing the evolution of Coarse-Grained variables describing the system at a coarse level of description, starting from the underlying Hamiltonian dynamics of the atoms or molecules. It provides, therefore, the link between Molecular Dynamic (MD) simulations and the corresponding quantities in a coarse-grained theory. The RT candidate will work under the supervision of Ikerbasque Prof. Marco Ellero (CFD group, BCAM) in collaboration with Prof. Pep Español (UNED), on the developments and use of microscopic particle-simulation methods to better understand the origin and improved modelling of frictional processes in granular media.

### Requisites

Promising Young Researchers. Applicants must have their Bachelor's or Master degree preferable in Physics, Engineering, Mathematics or related fields.