EPSRC Icase PhD Studentship

"Dynamic break up of soft glassy materials"

School of Physics, University of Nottingham

Academic Supervisor: Dr Mike Smith

Industrial Supervisor: Dr David Snoswell

This project is inspired by current industrial problems encountered whilst drilling bore holes in complex fluids such as clays and muds. Accretion on drilling surfaces has a huge impact on cost and productivity for the oil industry, but there is limited understanding of the fundamental physics.

We will experimentally investigate the dynamics of soft glassy materials, consisting of concentrated particle pastes / gels. In particular we will study how the rheological dynamics are affected by key processes such as visco-elasticity and poro-elasticity at different timescales. Using this we hope to build up an understanding of factors which result in cohesive rather than adhesive failure at interfaces. This study will then use this understanding to investigate the dynamic break-up of soft glassy materials and how this leads to interfacial deposition of material on moving surfaces. We will formulate scaling arguments relating the amount of deposition to the underlying rheology and dynamic wetting.

The EPSRC Industrial case studentship offers certain additional benefits including 4 years of funding (fees + stipend) and research experience at a leading industrial research company (as part of the project, the student will perform 3 months research work in Cambridge with the industrial partner. The accommodation and travel expenses for this period will be met by the project).

Eligibility/Entry Requirements: We require an enthusiastic graduate with a degree in a relevant discipline such as Physics, Materials Science, Chemistry or Chemical Engineering, preferably at MSc/MRes level, or an equivalent overseas degree.

For any enquiries or to discuss the position / project please e-mail:
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This studentship is open until filled and will start October 2017. Early application is strongly encouraged.