16th I²plus Seminar

Schedule: 15:00 ~, Sept. 24th 2015

Place: ME Meeting Room (2F,Bldg #2)

Speaker: Prof. Serafim Kalliadasis
(Dept. Chem. Eng., Imperial College London)

A never ending journey. Singularities, Slip, Substrates and Structure: Challenges of modelling the moving contact line problem

Abstract: The moving contact line problem occurs when modelling one fluid replacing another as it moves along a solid surface, a situation widespread throughout industry and nature. Classically, the no-slip boundary condition at the solid substrate, a zero-thickness interface between the fluids, and motion at the three-phase contact line are incompatible - leading to the well-known shear-stress singularity. In this talk we will review recent progress made by our group, considering the problem and related physics from the micro to macroscopic length scales. This includes comparing a variety of models used to overcome the singularities, based on slip, disjoining pressure, interface formation and diffuse-interfaces; analysing the impact of random substrate heterogeneities and inclinations; and exploring the detailed nature of the fluid structure in the vicinity of the contact line at the smallest scales by developing rigorously justified models based on the statistical mechanics of fluids.

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Organizer: International Research Div. of Interfacial Thermo-Fluid Dynamics (I²plus), RIST, TUS

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