

4 PhD Fellowships and post doctoral positions in Polymers, Colloids and Applications

*The positions are funded by “THALES” research project:
“Complex Visco-elastic and Visco-plastic Materials: From Microscopic Structure and Dynamics to Macroscopic Flow”*

The positions, funded by the Greek Ministry of Education, are available at **IESL/FORTH (Crete), University of Patras, National Technical University of Athens and Technical University of Crete**. PhD candidates should hold Master's degree in the field of Physics, Chemistry, Materials Science or Engineering. Postdoctoral candidates should have a PhD degree with relevant experience in Soft Matter Science and Engineering.

Overall project description: The aim of the project is to investigate the flow of complex visco-elastic and visco-plastic materials with emphasis in the elucidation of the relation of microscopic structure and dynamics with mechanical properties. Polymers, colloids and granular systems are main representatives with applications in consumer products often involving complex flows during their processing. The research program will be performed in collaboration with world leading scientists with complimentary expertise in experiments, theory and simulations. *The PhD (or post-doctoral) positions are available immediately on the following topics:*

PhD 1: (IESL-FORTH & Department of Materials Science and Technology, Heraklion, Crete): Structure and Dynamics of colloidal particles (Experiments, 1PhD student)

Experimental study of the structure and dynamics of colloidal particles with Hard and soft repulsive interactions in concentrated suspensions and glasses. Spherical and anisotropic particles will be studied, the latter as a function of size anisotropy. Bulk (3D) and quasi-2D (near surfaces) translational and rotational dynamics will be explored. Experiments involve Static and Dynamic light scattering, EWDLs, MSDLS and shear rheology (FORTH) as well as FCS (MPIP, Mainz, Germany) under the supervision of G. Petekidis, G. Fytas and B. Loppinet. Candidates should contact Prof. G. Petekidis, (georgp@iesl.forth.gr).

PhD 2: (Department of Mining Engineering and Metallurgy, National Technical University of Athens): Computational Rheology (Simulations, 1 PhD student)

Development and running of computer code describing the flow behaviour of complex materials, such as viscoplastic and viscoelastic fluids. These fluids obey rheological models of differential and integral form. The PhD candidate must have a strong background in computational methods, including finite element methods, solution of non-linear system of equations, and advanced computer skills. The modelling and simulations will be under the supervision of Prof. E. Mitsoulis (contact: mitsouli@metal.ntua.gr).

PhD 3 or PostDoc: (Dept. of Sciences, Tech.Uni.Crete), Polymer Rheology:

Experimental and theoretical study on the relation between the macromolecular structure and melt rheology. Emphasis will be given to rheological properties that are relevant to industrial forming processes, especially those that involve elongational flows. The effect on the solid (mechanical) properties of the product will also be examined. The work involves the preparation of controlled macromolecular structures, their rheological characterization (TUC, NTUA, FORTH) and development/application of models to describe their properties. The project can take the form of a PhD work (3-years) or a PostDoc (18 months). The supervisors will be A. D. Gotsis and Ch. Tsenoglou. Candidates should contact A.D. Gotsis, (gotsis@science.tuc.gr)

PhD 4 or PostDoc: (University of Patras): Behavior of lead and sand extrusion dampers (Experiments and simulations)

Modeling and experiments of the plastic flow and damping forces in lead and sand extrusion dampers used for a performance improvement of concrete base constructions. Candidates for the modeling effort should have good knowledge of computer programming using FORTRAN and of finite element and solution methods of non-linear equations. The work will be performed under the supervision of N. Makris and I. Tsamopoulos. Candidates should contact Prof. N. Makris, (nmakris@upatras.gr)

Deadline for applications: 20 December 2012

PhD fellowships provide a 36 month funding with a stipend of 850 Euro/month (A personal insurance scheme is also provided by the University and FORTH). Post-doctoral salaries depend on research experience.