

A Funded Open Positions in Computational Rheology and Complex Fluid Mechanics

Project – PhD Level:

Modeling and Simulation of Yield-Stress Fluids.

The research is focused on predicting and controlling deformation and flow of a group of complex materials abundant in nature and industry, called Yield-Stress (YS) or viscoplastic (VP) materials. These start to flow when a sufficient stress is applied to them but behave as solids otherwise. Originally it was believed that YS materials are just generalized Newtonian fluids, i.e. fluids with a viscosity that depends on the strain-rate when the yield-stress is exceeded. Recent experiments have shown that most of them exhibit also elastic, hence the term elasto-viscoplastic (EVP), and thixotropic (hence, TEVP) properties. The former allows them to partially recover after a deformation and strongly resist extension, while the latter indicates that both their viscosity and yield-stress evolve dynamically along with the flow field. The effort will be divided into the following objectives:

- Constitutive model development and testing in simple flows.
- Use existing and new models of EVP fluids in particulate flows.
- Study transient flows of VP and EVP materials.

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Our research environment

The research of the Fluids Lab (officially the Laboratory of Fluid Mechanics and Rheology) in the University of Patras focuses on the rheology of complex fluids and materials that are of industrial and biological relevance. To establish a more fundamental understanding of their rheological behavior under various conditions, the Fluids Lab investigates the relationship between their rheology and their microstructure using a variety of different methods. For more information, please visit our website: <http://fluidslab.chemeng.upatras.gr/>

Your profile

We are looking for talented individuals who are excited about academic research. They should be able to work independently as well as to collaborate with an interdisciplinary team of researchers. Applicants should hold a Diploma in Chemical or Mechanical engineering, Applied Physics or a related field. Good communication skills and fluency in both written and spoken English are required. Analytical, Physical Modeling and Programming skills are expected (e.g. one language among Fortran 2015, C++, Python, Matlab)

Our Offer

The Fluids Lab is one of the most renowned Labs in the field of Computational Rheology in Europe. We are offering excellent working conditions in a highly international research environment with large computational capacities. The salary is in accordance with the ELIDEK call: 1250€. The position can be filled immediately and is initially limited to three years. Continuation of the appointment beyond this period of time is intended. The project is in collaboration with The University of British Columbia.

Contact Info

Please express your interest by electronic mail and preferably in one single pdf-document to Professor John Tsamopoulos in the following address: tsamo@chemeng.upatras.gr

For full consideration, the application should include a cover letter, a detailed CV, a list of possible publications, copies of all educational certificates and transcripts, a summary of past research activities and the names of three references.