Department of Chemical Engineering, University of Patras
Seminar Room, First Floor, Main Building
May 21, 2019, 17:30 – 18:30

Yannis Dimakopoulos

Recent Advances in Computational Rheology and Mechanics of Complex Fluids

Rheology is the science that deals with the behavior of materials under flow and deformation conditions, either by monitoring the change in their properties and material functions, or by relating their kinematics to the dynamics of the developed stresses. Computational rheology is based on in-silico experiments and aims at predicting the flow and stress fields as well as identifying structural instabilities that are developed either in rheometric or in complex flows. Fluids having either a macromolecular structure or microstructure generally exhibit non-Newtonian behavior. The present speech will present modern computational methods, developed in the Laboratory of Fluid Mechanics and Rheology, for the simulation of flows of fluids that have a double character, solid and liquid, depending on the levels of applied force (yield stress fluids), and of fluids with macromolecular structure where viscoelastic phenomena are significant. Studies will be presented on the development of pioneering computational algorithms for solving time-varying constitutional laws and governing equations in 2 and 3 dimensions and on the application of these algorithms to biological and industrial flows.

Speaker

Yannis Dimakopoulos

Dr. Yannis Dimakopoulos graduated in 1997 from the Department of Chemical Engineering of the University of Patras. In 2003, he received the Master's and Ph.D. degrees. In 2005 & 2006, he was a post-doctoral associate of the Laboratory of Computational Fluid Dynamics. In 2007, he joined the Biomedical Engineering and Soft Tissue Engineering group of the Biomedical Engineering Department of the Eindhoven Technological University in the Netherlands. In 2011, he was elected Assistant Professor at the University of Patras. From 2012 to 2013, he was adjunct Lecturer at Chemical Engineering Department. From 2012 to 2014, he worked as a researcher for the University of Cyprus. In January 2014, he was officially appointed as Assistant Professor, and in 2017 he received tenure at the same rank. His research and teaching works are related to Fluid Mechanics, Computational Rheology of Complex Fluids, Computational Transport Phenomena, Advanced Numerical Methods and Large Scale Computational Techniques with applications in the study of synthetic and biological fluid flows. Among the distinctions in his career, the Walter Prize for the best 2018 publication in the Journal of Non-Newtonian Fluid Mechanics stands out.