

Università degli Studi di Udine

Dottorato di Ricerca in Scienze dell'Ingegneria Energetica e Ambientale



Seminari del Corso di Dottorato

The role of polymer additives in improving the tribological performance of lubricated contacts

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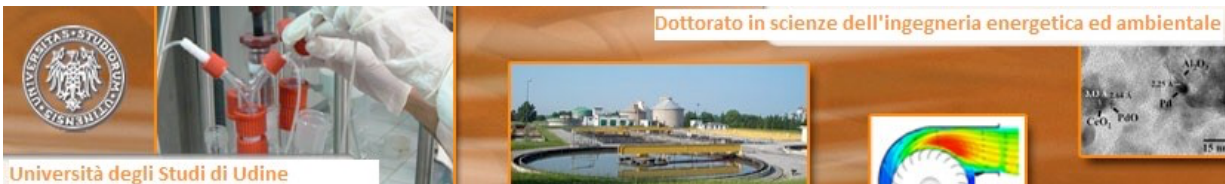
Website: <http://web4.bilkent.edu.tr/fluidframe/>

Venerdì 18 Ottobre 2024, ore 10:30

Sala Riunioni Verde (SR 1, L1-0F-NF)

Abstract: Lubrication is essential for the proper functioning of the mechanical components susceptible to degradation due to friction and wear. In particular, we talk about hydrodynamic lubrication when a fluid is introduced between two solid surfaces to mitigate this degradation. A "good" lubricant, then, minimises the friction and wear but maximising at the same time the load carrying capacity. Low values of the friction coefficient (i.e. friction over load) are required to ensure high performance of lubricants. Recent studies covering the four main energy consuming sectors, namely transportation, manufacturing, power generation, and residential, have shown that about 20% of the world's total energy consumption is used to overcome friction. This has highlighted the huge potential for energy savings to be made through friction reduction in all systems with moving parts. For this reason lubricant formulation must be developed for reducing the friction coefficient in vehicles, machinery and other equipment worldwide. In this presentation we explore the behaviour of lubricants with polymer additives, in which the complex rheology of the liquid creates subtle non-Newtonian effects, such as viscoelasticity. We introduce new theoretical-computational models of viscoelastic lubricants to improve the accuracy and the computational efficiency with respect to those currently available in literature.

CV: Luca Biancofiore received his Ph.D degree in Fluid Mechanics/Applied Mathematics at University of Nice-Sophia Antipolis (France). In light of his research contributions, Prof. Biancofiore was selected as recipient of the 2012 Göran Gustafsson Fellowship in Science, the 2012 Marie Curie Intra-European Fellowship (IEF), and the 2015 Imperial College Research Fellowship. In 2016, he became Associate Professor at the Mechanical Engineering Department of Bilkent University, where he coordinated the FluidFrame Laboratory as Principal Investigator. Since 2024, he joined the University of L'Aquila.



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