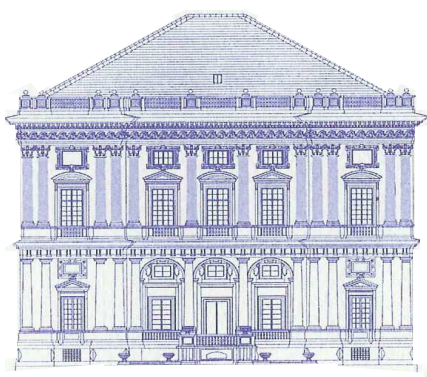# AVVISO DI SEMINARIO

"Laminar-turbulent transition for yield stress fluids: Some experimental observations and theoretical aspects"

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Facoltà di Ingegneria,
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UNIVERSITÀ DEGLI STUDI DI GENOVA

SCUOLA DI DOTTORATO DI MECCANICA DEI FLUIDI E DEI SOLIDI
Dottorato in Fluidodinamica e Processi dell'Ingegneria Ambientale
Progetto Marie Curie EST "FLUBIO"

Laminar-turbulent transition for yield stress fluids:
Some experimental observations and theoretical aspects

In the last decades considerable advances have been made in understanding the transition mechanisms from laminar to turbulent flow of Newtonian liquids in pipes. For non-Newtonian liquids however, perhaps unsurprisingly, given the inherent additional complexities involved, little is known. Aside from a handful papers, there is practically no data about the transitional flow of such non-Newtonian liquids. Although limited, the existing literature for the transitional pipe-flow of non-Newtonian liquids reveals an interesting and yet unexplained effect: above a certain Reynolds number the flow develops a stable asymmetry. For laminar and turbulent regimes, the velocity profiles are perfectly symmetric. In the present talk, the experimental observations will be discussed and an interpretation of the asymmetry will be proposed in the light of recent progress made in the study of transitional flows of Newtonian fluids.
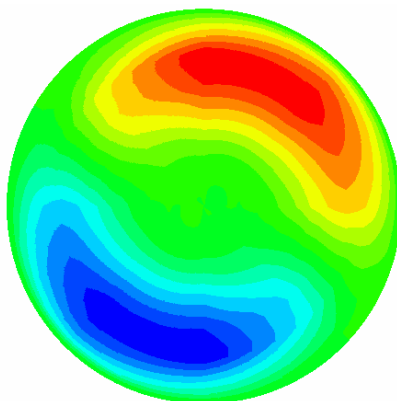
Stable streaky flow for a yield stress fluid at $Re_w = 2500$.
Red (blue) color indicates fast (slow) axial velocity.

Biographical sketch of Chérif Nouar

Chérif Nouar obtained his Batchelor of Science in Physics from the University of Algiers in 1982, M.S. and Ph.D. in Mechanics and Energy Systems from ENSEM-INPL, Nancy, in 1983 and 1986, respectively. He has received his "Habilitation à Diriger les Recherches" in Nancy in 2003. He has become a permanent researcher at the CNRS (French National Center for Scientific Research) in 1993, after occupying research and teaching positions in Blida, Nantes, Paris, Vancouver and Nancy. His research is centered on the dynamics of non Newtonian fluids, and in particular thermal convection, laminar-turbulent transition in shear flows, and hydrodynamic stability theory. He conducts research by analytical, numerical and experimental means, and has extensively published in the literature.