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"

AVVISO DI SEMINARIO

"Highly symmetric travelling waves in pipe flow"

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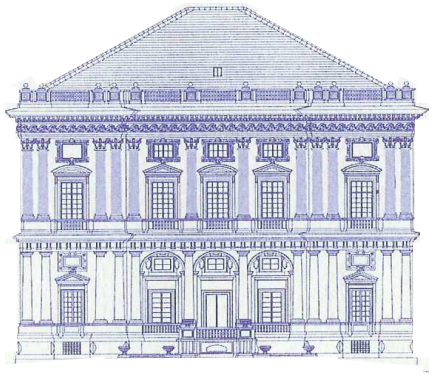
Mercoledì 11 giugno, 2008 – ore 14.00
Facoltà di Ingegneria,
Aula A11, atrio DICAT
Villa Giustiniani Cambiaso



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Highly symmetric travelling waves in pipe flow

The recent theoretical discovery of finite-amplitude travelling waves in pipe flow has re-ignited interest in the transitional phenomena that Osborne Reynolds studied 125 years ago. Despite all being unstable, these waves are providing fresh insight into the flow dynamics. We describe two new classes of travelling wave which while possessing more restrictive symmetries than the previously found travelling waves of Faisst & Eckhardt (2003) and Wedin & Kerswell (2004) seem to be more fundamental to the hierarchy of exact solutions. They exhibit much higher wall-shear stresses and appear at notably lower Reynolds numbers. The first M-class comprises of the various discrete-rotationally symmetric analogues of the mirror-symmetric wave found in Pringle & Kerswell (2007) and have a distinctive double layer structure of fast and slow streaks across the pipe radius. The second N-class has the more familiar separation of fast streaks to the exterior and slow streaks to the interior and looks like the precursor to the class of non-mirror-symmetric waves already known.

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