Subcritical Transition in Channel Flows

JOSEPH MAESTRI,

PHILIP HALL, Imperial College London — Exact-coherent structures, or colloquially non-linear solutions to the Navier-Stokes equations, have been the subject of great interest over the past decade due to their relevance in understanding the process of transition to turbulence in shear flows. Over the past few years the relationship between high Reynolds number vortex-wave interaction theory and such states has been elucidated in a number of papers and has provided a solid asymptotic framework to understand the so-called self-sustaining process that maintains such structures. In this talk, we will discuss this relationship before talking about recent work on solving the vortex-wave interaction equations using numerical techniques in order to propose laminar-flow control techniques.