



Probability Seminar

Title: Moment equations and classical invariant theory derived from stagnation-point-type 3D Euler fluid equations

Speaker: Miguel Bustamante (UCD)

Date: Wed 26th November 2025 at 2:00PM

Location: E0.32 (beside Pi restaurant)

Abstract: The 3D (three-dimensional) Euler fluid equations for a fluid near a wall have a quasi-2D solution with vorticity and with vorticity stretching rate as the main two fields. The moments of the stretching rate distribution satisfy a coupled system of nonlinear ordinary differential equations of evolution (in time). For specific choices of the fluid model's interaction parameter, we show how this system is related to Hilbert's classical invariant theory, which allows us to find a number of integrals of motion, and thus reduce the problem to an integrable system in some cases. This work is in progress and in collaboration with Neil O'Connell (UCD).