

# Colloquium Talk

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## The stability of Kelvin-Stuart cat's eye flows

Wednesday, April 12, 2023

at 15:15 h

ESI, Boltzmann Lecture Hall and online via Zoom meeting

**Abstract:** Kelvin-Stuart vortices are classical mixing layer flows with many applications in fluid mechanics, plasma physics and planetary rings. We prove that the whole family of Kelvin-Stuart vortices is nonlinearly stable for co-periodic perturbations, and linearly unstable for multi-periodic or modulational perturbations. Kelvin-Stuart cat's eyes also appear as magnetic islands which are magnetostatic equilibria for the 2D ideal MHD equations in plasmas. We prove nonlinear stability of these magnetic islands for co-periodic perturbations, and give a rigorous proof of the coalescence instability.

A. Constantin, D. Dritschel, N. Paldor  
Zoom coordinates: <https://univiennea.zoom.us/>

Meeting ID: 663 0694 7737  
Passcode: hkmQPT

April 7, 2023