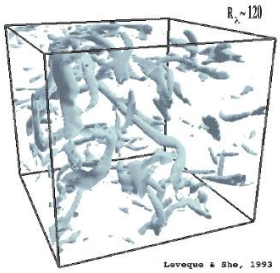
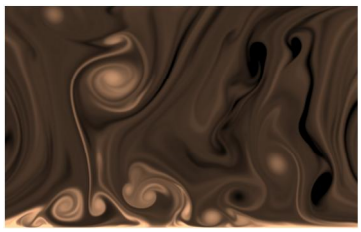
Theoretical Fluid Dynamics



LMS-EPSRC Short Course

Heriot-Watt University,
29 August – 2 September 2011

Organiser: Dr Simon Malham



Johnston and Doering, Phys. Rev. Lett. 102 (2009)

Course outline and prerequisites

As observers of nature, experimentalists and mathematicians, we marvel at the beauty and intricacies of real physical fluid flows: from cloud patterns to the turbulent intertwined tumbling mass of swirling vortices alongside a riverbank. Nearly eighty years ago Leray suggested that Navier-Stokes singularities may signify the onset of turbulence in a real fluid flow. During this five day residential school, world authorities on these topics will provide intensive courses on contemporary theoretical fluid dynamics, juxtaposing the latest exciting developments in Navier-Stokes regularity against the leading models of turbulent fluid flow. The courses will be accessible to first year PhD students in mathematics with some knowledge of partial differential equations, but a background in fluid mechanics is not required.

The three main lecture course topics are:

- *Fundamental mechanisms of fluid flow* (Simon Malham, Heriot-Watt; 3 lectures)
- *Navier-Stokes equations: regularity and singularity* (Charlie Doering, Michigan, and James Robinson, Warwick; 3 lectures each)
- *The physical nature of turbulence:* (Emmanuel Leveque, ENS Lyon; 5 lectures)

These will be supplemented by tutorial sessions. There will also be guest lectures by John Gibbon (Imperial) and Sergei Kuksin (Ecole Polytechnique). For further information see:
www.ma.hw.ac.uk/~simonm/lms-epsrc_short_course_2011

Application

Applications should be made using the registration form available via the Society's website at:
www.lms.ac.uk/content/short-instructional-courses.

The closing date for applications is **Friday 1 July 2011**. Numbers will be limited and those interested are advised to make an early application. All applicants will be contacted approximately two weeks after this deadline; we will not be able to give information about individual applications before then.

Fees

- All research students registered at a UK university will be charged a registration fee of £100. **They will not be charged for subsistence costs**.
- UK-based postdocs will be charged a registration fee of £100, plus half the subsistence costs (£160) £260 in total.
- All others (overseas students and postdocs, those working in industry) will be charged a registration fee of £250 plus the full subsistence costs (£320) £570 in total.

All participants must pay their own travel costs (for EPSRC funded students, this should be covered by their DTA). Fees are not payable until a place on the course is offered.

In the event of over-subscription preference will be given to UK-based research students.

LMS-EPSRC Short Courses *aim to provide training for postgraduate students in core areas of mathematics. Part of their success is the opportunity for students to meet other students working in related areas as well as the chance to meet a number of leading experts in the topic.*