Abstracts of the December 15 session of the Paris-London Analysis Seminar

Sylvie Benzoni-Gavage (Université Claude-Bernard, Lyon 1),
Stability of Hamiltonian periodic waves.

Abstract. The stability of nonlinear periodic travelling waves has been studied intensively in the last fifteen years. Nevertheless, stability criteria can hardly ever be checked analytically for general partial differential equations. The talk will be concerned with two asymptotic regimes in a rather general Hamiltonian framework. More specifically, I will consider waves of either small amplitude or large wavelength. The main purpose will be to show how the expansion of stability criteria reveals non degeneracy conditions for small amplitude waves, and the relationship with the stability of solitary waves for large wavelength waves.

Mark Pollicott (University of Warwick),
Transfer operators, determinants and some applications.

Abstract. The transfer operators we are interested in are linear operators closely related to composition operators on the Hardy Hilbert spaces. They are examples of trace class operators, and one can associate a determinant function, i.e., an entire function of a complex variable. This viewpoint is useful, for example, in studying: (i) Zeros of the Selberg zeta function in geometry; (ii) Numerical estimation of the Hausdorff Dimension of some sets. No prior knowledge will be assumed.

Peter Topping (University of Warwick),
Ricci flow and Ricci limit spaces.

Abstract. Ricci flow theory has been developing rapidly over the last couple of years, with the ability to handle Ricci flows with unbounded curvature finally becoming a reality. This is vastly expanding the range of potential applications. I will describe some recent work in this direction with Miles Simon that shows the right way to pose the Ricci flow PDE in this setting in order to make applications to the understanding of Ricci limit spaces. (No knowledge of Ricci flow and Ricci limit spaces etc. will be assumed.)

Franck Sueur (Université de Bordeaux),
Controllability of the Navier-Stokes equation in a rectangle with a little help of an interior phantom force.

Abstract. We consider the 2D incompressible Navier-Stokes equation in a rectangle with the usual no-slip boundary condition prescribed on the upper and lower boundaries. We prove that for any positive time, for any finite energy initial data, there exist controls on the left and right boundaries and a distributed force such that the corresponding solution is at rest at the given final time. The distributed force can be chosen arbitrarily small in any Sobolev norm in space, and supported away from the uncontrolled boundaries. This is joint work with Jean-Michel Coron, Frédéric Marbach and Ping Zhang.