FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

NATURWISSENSCHAFTLICHE
FAKULTÄT

DEPARTMENT MATHEMATIK

Zwei-Städte-Kolloquium zur Analysis Erlangen-Regensburg

am 18.11.2011, im Hörsaal H12, Cauerstr. 11, 91058 Erlangen

15:00 Prof. José Antonio Carrillo de la Plata, ICREA and Departament de Matemàtiques, Universitat Autònoma de Barcelona

Keller-Segel, Fast-Diffusion and Functional Inequalities

It will be shown how the critical mass classical Keller-Segel system and the critical displacement convex fast-diffusion equation in two dimensions are related. On one hand, the critical fast diffusion entropy functional helps to show global existence around equilibrium states of the critical mass Keller-Segel system.

On the other hand, the critical fast diffusion allows to show functional inequalities such as the Logarithmic HLS inequality in simple terms who is essential in the behavior of the subcritical mass Keller-Segel system. HLS inequalities can also be recovered in several dimensions using this procedure. It is crucial the relation to the GNS inequalities obtained by DelPino and Dolbeault.

This talk corresponds to two works in collaboration with E. Carlen and A. Blanchet (to appear in JFA), and with E. Carlen and M. Loss (PNAS 2010).

16:15 Kaffeepause

16:45 Prof. Herbert Koch, Mathematisches Institut der Universität Bonn

Selfsimilar blow up for the supercritical generalized Korteweg de Vries equation

Wave collapse for the cubic focusing nonlinear Schrödinger equation in three space dimensions is the most prominent example of blow-up for supercritical dispersive equations. Despite a fairly detailed heuristic and numerical picture of the blow up analytic progress on the mechanism is recent and fairly limited.

I report on the construction of selfsimilar solutions of finite energy to the generalized KdV equation in the slightly super critical regime.
Heuristically the self similar solutions are expected to bifurcate from the ground state in the critical case, the exponent being the bifurcation parameter. This turns out to be correct, but the details were unexpected and intricate. Numerical simulations confirm and extend the analytic results.

Organisatoren: H. Abels (Regensburg), E. Bänsch (Erlangen), G. Dolzmann (Regensburg), F. Duzaar (Erlangen), F. Finster (Regensburg), H. Garcke (Regensburg) G. Grün (Erlangen), P. Knabner (Erlangen), A. Knauf (Erlangen)