

Das Wolfgang Pauli Institut lädt zum

## 12. Pauli Kolloquium

im Rahmen des Kolloquium der Fakultät f. Mathematik

**Zeit: Mittwoch, 23. November 2011, 15:30**

**Ort: UZA 4 / Seminarraum C 209**

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**15:30**

„Welcome“ by WPI programme director **Christian Schmeiser**

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**15:40**

**Jean Dolbeault** (CNRS c/o Université Paris Dauphine)

**Title: “Free energies, nonlinear flows and functional inequalities”**

**Abstract:** This lecture will be devoted to a review of results based on "entropy methods" in nonlinear diffusion equations. The basic example is the fast diffusion equation in the euclidean space and the study of the asymptotic behaviour of the solutions in self-similar variables. Recent results (in collaboration with G. Toscani) provide interesting refinements for the study of the asymptotic behaviour of the solutions, based on best matching asymptotic profiles rather than on self-similar rescalings. As a result, we obtain for instance improved Sobolev inequalities which solve an old open question raised by H. Brezis and E. Lieb. Nonlocal improvements of standard functional inequalities will also be introduced, based on duality and nonlinear flows approaches. They suggest deep links connecting mean field models like the Keller-Segel system with purely local nonlinear diffusion.

**CV:** Former student of the ENS, Dolbeault has received a double training in mathematics and theoretical physics; his PhD advisor was P.-L. Lions. He is director of research at the CNRS, after being Chargé de recherches for 3 years at the IRSAMC in Toulouse. In 1994 he joined the CEREMADE (Centre de recherche de mathématiques de la décision) at U. Paris-Dauphine) whose director he currently is. He has also been a member of the Scientific Committee of the Université Paris-Dauphine since 2004 (and Vice-president of the University in charge of research in 2011). His research interests range from nonlinear analysis applied to partial differential equations to the applications of mathematics in physics and biology, and from the theoretical issues to the study of qualitative properties of the solutions and to scientific computing.