Klainerman Conference: *Talk titles and abstracts.*

(Partial list as of 6 January 2016)

Speaker: **Jean Bourgain**

Title: “Decoupling in harmonic analysis and applications to PDE and number theory”

Abstract:
We present a new class of inequalities in harmonic analysis, called decouplings. Applications include a full Strichartz theory for the periodic Schrodinger equation, eigenfunction bounds,new estimates on exponential sums and a proof of the Vinogradov mean value conjecture

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Speaker: **Jean-Yves Chemin**

Title: "The Fourier transform on the Heisenberg group: a distribution point of view".

Abstract:
In this talk, we want to construct a theory of Fourier transform which can be extended to the tempered distribution on the Heisenberg group. This implies the precise description of the range of the Scwartz space by the Fourier transform. This leads to an usual theory of tempered distributions.

Speaker: **Peter Constantin**

Title: "On the inviscid limit"

Abstract:
I will recall a few issues concerning high Reynolds number flows and present some recent results about the limit of vanishing viscosity."

Speaker: **Charles Fefferman**

Title: Breakdown of smoothness for fluid interfaces

Abstract:
Water waves, oil and water in sand, and weather fronts on the Earth's surface present fluid mechanics problems involving an interface between two fluids (or between a fluid and a vacuum). The talk presents results from the last few years, showing that such interfaces may become nonsmooth in finite time.

Speaker: **Alex Ionescu**

Title: "Global solutions of the gravity-capillary water wave system in 3 dimensions"

Abstract: I will discuss some recent work, joint with Yu Deng, Benoit Pausader, and Fabio Pusateri, on the global existence of solutions of the full gravity-capillary water wave system in 3D. The main new issues in this problem are the slow pointwise decay of solutions and the presence of a large set of resonances.

Speaker: **Carlos Kenig**

Title: "The energy critical wave equation"

Abstract:
I will give an overview on recent research on the long-time behavior of large solutions to the focusing energy critical wave equation, concentrating on type II solutions, that is, solutions whose energy norm remains bounded up to the final time of existence.

Speaker: **Joachim Krieger**

Title: "Radiation versus dynamic bubbles in critical nonlinear wave equations."

Abstract:
I will discuss recent work related to global existence and scattering as well as more complex nonlinear dynamics in the context of geometric nonlinear waves.

Speaker: **Gigliola Staffilani**

Title: "The Study of Wave and Dispersive Equations: Random Versus Determination."

Abstract:
The point of this talk is to show how certain well-posedness results that are not available using deterministic techniques involving Fourier and harmonic analysis can be obtained when introducing randomization in the set of initial data. Along the way I will also prove a certain "probabilistic propagation of regularity" for certain almost sure globally well-posed dispersive equations. This talk is based on joint work with A. Nahmod.

Speaker: **Terence Tao**

Title: "Finite time blowup for an averaged Navier-Stokes equation"

Abstract:

The Navier-Stokes equation in three dimensions can be expressed in the form u_t = Delta u + B(u,u) for a certain bilinear operator B. It is a notorious open question whether finite time blowup solutions exist for this equation. We do not address this question directly, but instead study an averaged Navier-Stokes equation u_t = Delta u + B'(u,u), where B' is a certain average of B (where the average involves rotations and Fourier multipliers of order 0). This averaged Navier-Stokes equation obeys the same energy identity as the original Navier-Stokes equation, and the nonlinear term B'(u,u) obeys essentially the same function space estimates as the original nonlinearity B(u,u). By using a modification of a dyadic Navier-Stokes model of Katz and Pavlovic, which is "engineered" to generate "self-replicating machine" or "von Neumann machine" type solutions, we can construct an example of an averaged Navier-Stokes equation which exhibits finite time blowup. This demonstrates a "barrier" to establishing global regularity for the true Navier-Stokes equations, in that one cannot hope to prove global regularity by relying purely on function space estimates on the nonlinearity B, combined with the energy identity.

6jan2016 **(4th update)**