Spectral Theory and Harmonic Analysis of First Order Systems, with Applications to Second Order PDEs

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Tuesday 4 10:00 - 12:00  Instituto de Ciencias Matemáticas
Thursday 6 10:00 - 12:00  Campus de Cantoblanco
Friday 7 10:00 - 12:00  Aula Azul

Abstract:

The first order Cauchy-Riemann equations have long been used in the study of harmonic boundary value problems in the plane, and Clifford analysis provided higher dimensional analogues. Connections between first order Maxwell’s equations and second order wave equations are well known. Perturbed Dirac operators provided insight into the solution of the Kato square-root problem for elliptic operators, and have been used to study the solvability of elliptic partial differential equations with square integrable boundary conditions. The finite propagation speed of first order systems implies the weak Huygen’s principle for second order hyperbolic equations. I shall survey this chain of ideas, drawing upon joint work with Auscher, Keith, Morris, Nahmod, Rosén (Axelsson) and others.