FACULTAD DE CIENCIAS FÍSICAS Y MATEMÁTICAS UNIVERSIDAD DE CHILE

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SEMINARIO

OPTIMIZACION Y EQUILIBRIO

EXPOSITORES

16:00--16:30 hrs. Prof. Boulmezaoud, Tahar Zamene, Laboratoire de Mathématiques de Versailles, Université de Versailles, France

Title: On Fourier transform and weighted Sobolev spaces

Astract: We prove that Fourier transform defines a simple correspondance between weighted Sobolev spaces. As a consequence, we display a chain of nested invariant spaces over which Fourier transform is an isometry.

16:30--17:00 hrs. Prof. Lev Birbrair, Federal Univerisity of Ceara, Brazil

Title: Resonance sequences. Differential equations meet Number Theory.

Abstract: We will present some combinatorial or number theoretical problems coming from Geometric Theory of Ordinary Differential Equations of the Second Order.

17:00—17:10 hrs. Coffee Break

17:10--17:40 hrs, Prof. Huynh Van Ngai, University of Quy Nhon, Vietnam

Title: Inverse function theorems for multifunctions in graded Fréchet spaces

Abstract: The inverse function theorem is one of the central components of the classical and the modern variational analysis and an essential device to solving nonlinear equations. The inverse function theorem or its variants known as the implicit function theorem or the rank theorem have been established originally in Euclidean spaces and then extended to the Banach space setting. Outside this setting, for instance in Fréchet spaces, it is known that the inverse function theorem generally fails. This is the reason why another form of inverse function theorem, nowadays called the Nash-Moser theorem is used as a powerful tool to prove local existence for non-linear partial differential equations in spaces of smooth functions.

Some inverse theorems of Nash-Moser type have also been proved for functions between Fréchet spaces, that are supposed to be tame, an additional property guaranteeing that the semi-norms satisfy some interpolation properties, or that allow the use of smoothing operators as introduced by Nash. To overcome the loss of derivatives, these additional properties in Fréchet spaces allow Newton's method on which the Nash-Moser type inverse function theorems are based to converge. Recently, Ekeland produced a new result within a class of spaces much larger than the
one used in the Nash-Moser literature.

In this talk, we present some inverse function theorems and implicit function theorems for set-valued mappings between Fréchet spaces. The proof relies on Lebesgue's Dominated Convergence Theorem and on Ekeland's variational principle. An application to the existence of solutions of differential equations in Fréchet spaces with non-smooth data is given.

Miércoles 22 de noviembre del 2017, sala de seminaries John Vob Neumann CMM

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