
SEMINAR

on

COMPLEX AND HYPERCOMPLEX ANALYSIS

Sala Sousa Pinto (2^o piso), Departamento de Matemática

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Generalized convolutions and Laplacian eigenfunctions

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A fundamental question in the theory of generalized convolutions is the following: *given an elliptic operator \mathcal{L} on a domain E of Euclidean space, can we construct a convolution-like operator which commutes with \mathcal{L} , in analogy with the corresponding property between the ordinary convolution and the Laplacian?* It turns out that a positive answer to this question depends on certain geometrical properties of the eigenfunctions of the elliptic operator. In this talk we show that if the domain E is smooth and bounded, then the Laplacian eigenfunctions on E do not have a common critical point, and we discuss the implications of this result for the motivating question above. We will also give an overview of ongoing work on convolution structures associated with Laplace-Beltrami operators on manifolds endowed with cone-like metrics.

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