Charlas abiertas IEMath-GR & Coloquio "José Mendoza Ríos"



Bispectrality: a way to expand the special functions paradise

Antonio J. Durán

Universidad de Sevilla

Viernes 1 de diciembre de 2017, 12:00

Sala de Conferencias, IEMath-GR

The first paradise for a scientist interested in orthogonal polynomials is that of the classical families. Besides the orthogonality these families are also common eigenfunctions of certain exclusive type of second order operators (bispectrality). The classical families of orthogonal polynomials played a fundamental role in the successes of quantum mechanics in the 1920's in the hands of Schrödinger, and this was due to their bispectral character.

More than 70 years ago, H.L. Krall started to explore a new paradise: he classified all families of orthogonal polynomials which are common eigenfuntions of a fourth order differential operator. This study was completed during the 1980's and 1990's. However, up to five years ago, nothing similar was known for difference operators, besides this problem was explicitly proposed by Richard Askey in 1991. The purpose of this talk is to show a constructive answer to this question.