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CENTRE for QUANTUM GEOMETRY of MODULI SPACES

DEPARTMENT of MATHEMATICS, AARHUS UNIVERSITY, DENMARK

Masterclass
by Barry Simon
(Caltech)
17-20 Feb 2014

Spectral Theory of Orthogonal Polynomials

Abstract

Spectral theory is the study of the connections between the fundamental equations of a system and its spectral properties - typically as seen in audio, optical or other scattering data. The difficulty is often that there is no explicit solution of the inverse problem - that is going from the spectral data to the parameters of the equations ("can you hear the shape of a drum"). The spectral theory of orthogonal polynomials on the real line (OPRL) or unit circle (OPUC) is an especially useful spectral theory laboratory precisely because the solution of the inverse problem is so explicit. These lectures will begin by describing the underlying framework, then turn to the basic results for the case of a single interval or whole circle (regularity, Rachmanov's theorem, Szego's theorem, Killip-Simon theorem) and then discuss the finite gap case which requires the study of certain Fuchsian groups. No prior exposure to OPs or Fuchsian groups will be required but the students will be expected to have a working knowledge of the basics of functional analysis and Hilbert space operator theory, especially of the spectral theorem.
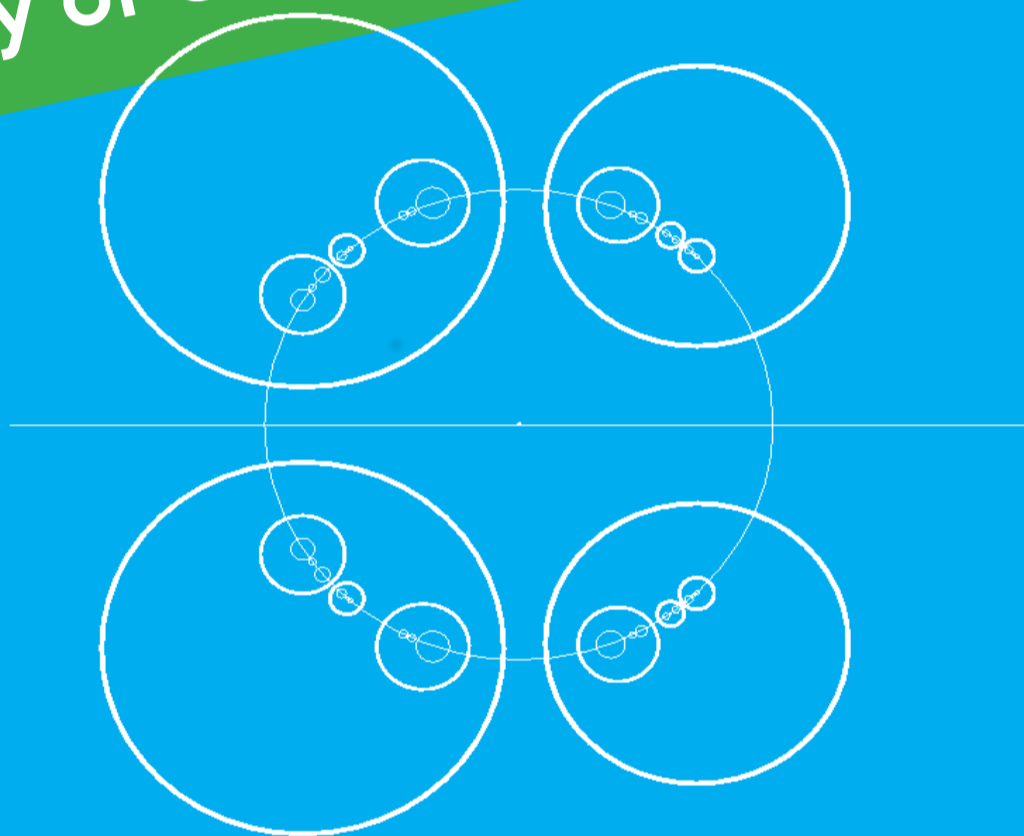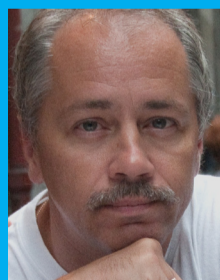
Guest speakers

Andrei Martínez Finkelshtein (Universidad de Almería)
Jacob Stordal Christiansen (Lund University)
Jonathan Breuer (Hebrew University of Jerusalem)

Organiser
Jørgen Ellegaard Andersen

More information and registration:
http://www.qgm.au.dk
Registration deadline: 20 Jan 2014

Application deadline for financial support (junior researchers)
10 Jan 2014

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