Analysis day in memory of Mikael Passare

September 19, 2018

Stockholms universitet

Organizers:
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ANALYSIS DAY IN MEMORY OF MIKAEL PASSARE

SEPTEMBER 19, 2018

DEPT. OF MATHEMATICS, STOCKHOLM UNIVERSITY

Program

12:00-13:00 **Lunch** at restaurant *Kräftan*

Rum 14, Building 5, Kräftriket

13:00–13:45 Håkan Hedenmalm:
Planar orthogonal polynomials, boundary universality, and arithmetic jellium.

13:50–14:20 Marta Kosek:
On the space of (pluri)regular polynomially convex compact sets

14:25–15:10 Sven Raum:
C^**-superrigidity*

Coffee break

15:30–16:15 Patrik Wahlberg:
Propagation of Gabor singularities for Schrödinger equations with quadratic Hamiltonians

16:15-17:00 Hannes Gernandt
Point interactions on infinite graphs

Visit to *Norra begravningsplatsen*

Dinner at *Stallmästaregården*

Abstracts

Point interactions on infinite graphs

Hannes Gernandt
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In this talk, we study extensions of symmetric operators $S = \oplus_{e \in E} S_e$ on graphs with a set of edges E which is possibly infinite. To describe the self-adjoint extensions of S, we use boundary triplets. Although that there is usually a boundary triplet for each S_e^*, one faces the problem that in general there is no natural boundary triplet for the direct sum operator S^*.

Here we consider a special class of extensions of S, which we call *locally finite extensions*, which have the advantage that properties of these extensions like self-adjointness and semi-boundedness can be described using recent results on weighted discrete Laplacians.

As an application, we show the self-adjointness of the Gesztesy-Šeba realization of the Dirac operator on an infinite metric graph.

Planar orthogonal polynomials, boundary universality, and arithmetic jellium

Håkan Hedenmalm
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This reports on joint work with A. Wennman. We obtain asymptotics of orthogonal polynomials in the planar case which goes beyond the classical works of Carleman and Suetin, needed for Random Normal Matrix theory. This then leads to boundary universality in terms of the error function. Moreover, we introduce degree porous jellium (and as a special instance arithmetic jellium), obtained by summing over only a (arithmetic) subsequence of the orthogonal polynomials to form the kernel function. This arithmetic jellium obtains interesting unexpected properties.

On the space of (pluri)regular polynomially convex compact sets

Marta Kosek
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The metric space of all pluriregular compact sets was introduced by Maciej Klimek in 1995. The metric is given by means of the pluricomplex Green functions. We list some properties and some applications.

C^*-superrigidity

Sven Raum
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In this talk, I will introduce the topic of C*-superrigidity assuming only a background in basic functional analysis and group theory. A discrete group is called C*-superrigid, if it can be recovered from its so called reduced group C*-algebra. An important question on this notion asks whether all torsion-free discrete groups are C*-superrigid, paralleling Higmans's unit conjecture for group rings. However, until 2017 the only known such examples of torsion-free C*-superrigid groups were abelian. To guarantee general understanding, it is exactly around the examples of abelian torsion-free groups that most of the talk will turn. Having motivated and described C*-superrigidity as a subject, in the end I will give a brief account of the developments since 2017 including my own contribution to the subject.

Propagation of Gabor singularities for Schrödinger equations with quadratic Hamiltonians

Patrik Wahlberg
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We study propagation of the Gabor wave front set for a Schrödinger equation with a Hamiltonian that is the Weyl quantization of a quadratic form with non-negative real part. We point out that the singular space associated to the quadratic form plays a crucial role for the understanding of this propagation. We show that the Gabor singularities of the solution to the equation for positive times are always contained in the singular space, and that they propagate in this set along the flow of the Hamilton vector field associated to the imaginary part of the quadratic form. This is joint work with K. Pravda-Starov and L. Rodino.