Matematikcentrum
Köpenhamns universitet
Lunds universitet

ÖRESUNDSSEMINARIUM ÖVER MATEMATISK ANALYS
Lund, 16 juni 2009
Matematikhuset, sal C

Detta är ett i rad seminarier som vi arrangerar med en frekvens av någon till ett par gånger per termin, och som alternerar mellan Lund och Köpenhamn. Föredragen hålles på en relativt allmän nivå och vänder sig inte bara till etablerade forskare utan även till studenter, såväl doktorander som studenter på C- och D-nivå.

- **13.15-14.15** Jacob Stordal Christiansen (Köpenhamn)
  Descendants of Szegő's theorem
- **14.30-15.30** Erik Wahlén (Lund)
  A variational approach to solitary water waves with weak surface tension

  15.30-16.00 Kaffe
- **16.00-17.00** Gerd Grubb (Köpenhamn)
  Krein-type resolvent formulas on nonsmooth domains
- **17.15-18.15** Per-Anders Ivert (Lund)
  A fundamental existence theorem in nonlinear parabolic potential theory

  19.00-... Middag på restaurang "Kulturen"

Arrangörer: Gerd Grubb, Per-Anders Ivert, Pavel Kurasov, Jan Philip Solovej

Descendants of Szegő's theorem

Jacob Stordal Christiansen (Köpenhamn)

A celebrated result of Szegő for orthogonal polynomials on the unit circle says that the Szegő condition holds if and only if the recursion coefficients are square summable. The majority of my talk will deal with analogues of this result on the real line. As explained in more detail, the key to such results is step-by-step sum rules. If time allows, I'll also discuss recent results on Szegő asymptotics from joint work with Simon and Zinchenko.

A variational approach to solitary water waves with weak surface tension

Erik Wahlén (Lund)

We prove that solitary water waves with weak surface tension can be constructed by minimising the energy subject to the constraint of fixed momentum. The proof relies on the concentration-compactness method and the main difficulty is to prove that the infimum of the energy is a strictly sub-additive function of the momentum. This is done by a careful analysis of a certain minimising sequence. The resulting solutions are periodic wave trains modulated by exponentially decaying envelopes and the fact that they are constrained minimisers guarantees some kind of stability.

Krein-type resolvent formulas on nonsmooth domains

Gerd Grubb (Köpenhamn)

The resolvent of a general elliptic boundary value problem can be written as the sum of a reference resolvent plus a term that encodes eigenvalue information in terms of an operator family defined over the boundary. We report on this and recent efforts to extend the validity to nonsmooth domains.

A fundamental existence theorem in nonlinear parabolic potential theory

Per-Anders Ivert (Lund)

One of the very first steps in classical (elliptic) potential theory is the assertion that every continuous function defined on a sphere (boundary of a ball) can in exactly one way be extended continuously to the ball in such a manner that it is harmonic in the interior. This problem is very simple, and its solution is given by the Poisson integral. We present a corresponding theorem from nonlinear potential theory, with the Laplace equation replaced by the p-parabolic equation. In previously existing existence theorems for this equation a higher regularity of the boundary function is assumed. We discuss the prerequisites needed to reach our result by an approximation procedure for the boundary function. These prerequisites have not been present until rather recently.