BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 32 **FREDAGEN DEN 4 OKTOBER 2002**

BRÅKET

Veckobladet från Institutionen för matematik vid Kungl Tekniska Högskolan och Matematiska institutionen vid Stockholms universitet

Redaktör: Gunnar Karlsson

Telefon: 08-790 84 79

Adress för e-post: gunnarkn@math.kth.se

Bråket på Internet: http://www2.math.kth.se/~gunnarkn/

Postadress:
Red. för Bråket
Institutionen för matematik
KTH
100 44 Stockholm

- - - - - - -

Sista manustid för nästa nummer:
Torsdagen den 10 oktober
kl. 13.00.

SEMINARIER

Fr 10–04 kl. 13.00–14.00. Optimization and Systems Theory Seminar. *(Observera tiden!)* **Professor Bjørn Nygreen,** Department of Industrial Economics and Technology Management, NTNU, Trondheim: *Optimal routing of oil and gas from wells to separators.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

Må 10–07 kl. 13.15. Presentation av examensarbete i matematik. Kristoffer Andersson: *Interpolation of Volumetric Data for Volume Visualization.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

Må 10–07 kl. 13.15–15.00. Algebra- och geometriseminarium. Sergei Merkulov: *Little discs operad and Hertling-Manin's F-manifolds.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 5.

Må 10–07 kl. 15.00–17.00. Mittag-Leffler Institute Series of Lectures. M. Birman, St. Petersburg, and **M. Solomyak,** Rehovot: *Double operator integrals (continued).* Institut Mittag-Leffler, Auravägen 17, Djursholm.

Fortsättning på nästa sida.

PLURIKOMPLEXA SEMINARIET

Hans Rullgård: An explicit inversion formula for the exponential Radon transformation using data from 180 degrees

Abstract: We derive a direct inversion formula of convolution-backprojection type for the exponential Radon transform. Our formula requires only the values of the transform over an 180° range of angles. It is an explicit formula, except that it involves a holomorphic function for which an explicit expression has not been found. In practice, this function can be approximated by an easily computed polynomial of rather low degree.

Tid och plats: Tisdagen den 8 oktober kl. 10.15 i sal 2215, Matematiska institutionen, Polacksbacken, Uppsala universitet.

Seminarier (fortsättning)

Må 10–07 kl. 15.15–17.00. Seminarium i finansiell matematik. Fredrik Armerin: *On cash flow valuation.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 31 sidan 3.

Ti 10–08 kl. 10.15. Plurikomplexa seminariet. Hans Rullgård: *An explicit inversion formula for the exponential Radon transformation using data from 180 degrees.* Sal 2215, Matematiska institutionen, Polacksbacken, Uppsala universitet. Se sidan 1.

Ti 10–08 kl. 13.15. Plurikomplexa seminariet. Christer Kiselman: *Analytic continuation of fundamental solutions.* Sal 2215, Matematiska institutionen, Polacksbacken, Uppsala universitet.

Ti 10–08 kl. 15.15. Kollokvium i fysik. *(Observera dagen!)* **Speaker to be announced:** *The 2002 Physics Nobel Prize.* Oskar Klein auditorium, rotundan, Roslagstullsbacken 21, Stockholms centrum för fysik, astronomi, bioteknik (SCFAB, AlbaNova). Kaffe serveras före kollokviet.

Ti 10–08 kl. 15.30–16.30. Mittag-Leffler Seminar. Pavel Exner, Prague: *Schrödinger operators with singular graph-type potentials.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 3.

Ti 10–08 kl. 17.00–18.00. Mittag-Leffler Seminar. Horia Cornean, Aalborg: *On the scattering theory for very long range magnetic fields.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 6.

On 10–09 kl. 10.30. Logikseminariet Stockholm-Uppsala. Alexander Rabinovich, Tel Aviv University, Israel: *Composition methods.* Sal 2:315, Matematiska institutionen, Polacksbacken, Uppsala universitet. Se sidan 4.

On 10–09 kl. 13.15–14.15. Seminarium i analys och dynamiska system. Jean-Marie Barbaroux, Nantes: *Quantum dynamics and fractal dimensions of measures.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 5.

On 10–09 kl. 13.15–15.00. Seminarium, arrangerat av Centrum för Säkerhetsforskning, KTH. Aktuarie Erik Alm, Hannover Re: *Riskanalys inom försäkringsväsendet.* Sal V1, KTH, Teknikringen 76, 1 tr. Se Bråket nr 31 sidan 4.

To 10–10 kl. 10.00. Licentiatseminarium i mekanik. Anders Ahlström, Mekanik, KTH: *Simulating Dynamical Behaviour of Wind Power Structures.* Seminarierummet, rum S40, Institutionen för mekanik, KTH, Teknikringen 8, b.v.

To 10–10 kl. 13.15–15.00. Working Seminar in Dynamical Systems. Professor Feliks Przytycki, Warszawa: *On pressure function for iteration of holomorphic maps I.* (Seminariet fortsätter den 17 oktober.) Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

To 10–10 kl. 14.00–15.00. Mittag-Leffler Seminar. Georgi Popov, Nantes: *Liouville billiard tables and an inverse spectral result.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 4.

To 10–10 kl. 15.30–16.30. Mittag-Leffler Seminar. Gian Michele Graf, Zürich: *Equality of bulk and edge Hall conductance revisited.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 6.

Fortsättning på nästa sida.

Seminarier (fortsättning)

Fr 10–11 kl. 13.15 – 15.00. Doktorandseminarium. Pelle Salomonsson: *Rationella kurv-operaden.* Sal 37, hus 5, Matematiska institutionen, SU, Kräftriket. Se sidan 5.

Må 10–14 kl. 15.15 – 17.00. Seminarium i matematisk statistik. Henrik Hult: *On multivariate regular variation for additive processes.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se nedan.

Ti 10–15 kl. 16.15. Seminarium i fysik. Professor Halina Rubinsztein-Dunlop, University of Queensland, Brisbane, Australia: *Laser manipulation of microparticles and atoms.* The Svedberg-salen (FD5), Stockholms centrum för fysik, astronomi, bioteknik (SCFAB, AlbaNova). Se sidan 6.

On 10–16 kl. 10.00. Licentiatseminarium i mekanik. Claes Holmqvist, Mekanik, KTH: *Modelling of the Pressure Distributions in Twin-Wire Blade Formers.* Seminarierummet, rum S40, Institutionen för mekanik, KTH, Teknikringen 8, b.v.

To 10–17 kl. 13.15 – 15.00. Working Seminar in Dynamical Systems. Professor Feliks Przytycki, Warszawa: *On pressure function for iteration of holomorphic maps II.* (Fortsättning från den 10 oktober.) Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

Fr 10–18 kl. 10.15 – 12.00. Valda problem i geometri. Torsten Ekedahl: *Hurwitz problems and Hurwitz spaces (continued).* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 6.

MITTAG-LEFFLER SEMINAR

Pavel Exner:
Schrödinger operators with singular graph-type potentials

Abstract: We discuss a model of an "imperfect" quantum graph which takes quantum tunnelling into account, being described formally by the Hamiltonian $-\Delta - \alpha\delta(x-\Gamma)$ in $L^2(\mathbb{R}^d)$, $d = 2, 3$, with $\alpha > 0$, where $\Gamma \subset \mathbb{R}^d$ is a graph. Several approximation results are derived and sufficient conditions are given under which such systems have a nonempty discrete spectrum for a noncompact Γ.

Tid och plats: Tisdagen den 8 oktober kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

SEMINARIUM I MATEMATISK STATISTIK

Henrik Hult:
On multivariate regular variation for additive processes

Abstract: We will continue our discussion on multivariate regular variation (see Bråket no. 28 page 6). We will present some results showing how multivariate regular variation of the tails of a stochastic process transfers to multivariate regular variation of some vectors of functionals acting on the process. The processes we study are additive, i.e. stochastically continuous with independent (not necessarily stationary) increments.

Tid och plats: Måndagen den 14 oktober kl. 15.15 – 17.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

OPTIMIZATION AND SYSTEMS THEORY SEMINAR

Bjørn Nygreen:
Optimal routing of oil and gas from wells to separators

Abstract: Networks of pipelines are used to connect oil and gas wells to central production plants where the oil, gas and water are separated. We consider networks where there are alternative routings between the wells and the production plants. The outputs of the wells depend nonlinearly on the pressure in the gathering pipelines.

We discuss the problem of finding the valve settings which maximize the output of the network and show how to model this as a MILP. We describe how to obtain sharp formulations of parts of the problem and present results from some real networks.

The talk is based on joint work with Ken McKinnon, University of Edinburgh.

Tid och plats: Fredagen den 4 oktober kl. 13.00 – 14.00 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

LOGIKSEMINARIET STOCKHOLM-UPPSALA

Alexander Rabinovich: Composition methods

Abstract: Composition theorems are tools which reduce sentences about a complex structure to sentences about its parts. A seminal example of such a result is the Feferman-Vaught Theorem (1959), which reduces the first-order theory of generalized products to the first order theory of its factors and the monadic second-order theory of index structure.

In this talk I explain

(1) a definition of a generalized sum of structure and

(2) a composition theorem for first-order logic over the generalized sum.

Some applications of the composition theorem to definability will be provided, which replace game (or inductive) arguments by transparent reductions.

Tid och plats: Onsdagen den 9 oktober kl. 10.30 i sal 2:315, Matematiska institutionen, Polacksbacken, Uppsala universitet.

MITTAG-LEFFLER SEMINAR

Georgi Popov:
Liouville billiard tables and an inverse spectral result

Abstract: We consider a class of billiard tables (X, g), where X is a smooth compact manifold of dimension 2 with smooth boundary ∂X, and g is a smooth Riemannian metric on X, the billiard flow of which is completely integrable. The billiard table (X, g) is defined by means of a special double cover with two branched points, and it admits a group of isometries $G \cong \mathbf{Z}_2 \times \mathbf{Z}_2$. Its boundary can be characterized by the string property, namely, the sum of distances from any point of ∂X to the branched points is constant.

We provide examples of such billiard tables in the plane (elliptical regions), on the sphere $\mathbf{S}^2$, on the hyperbolic space $\mathbf{H}^2$, and on quadrics. The main result is that the spectrum of the corresponding Laplace-Beltrami operator with Robin boundary conditions involving a smooth function K on ∂X determines uniquely the function K provided that K is invariant under the action of G.

Tid och plats: Torsdagen den 10 oktober kl. 14.00 – 15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

ALGEBRA- OCH GEOMETRISEMINARIUM

Sergei Merkulov:
Little discs operad and Hertling-Manin's F-manifolds

Abstract: Motivated by mirror symmetry and the theory of singularities, Hertling and Manin introduced recently a notion of F-manifold as a weaker version of the notion of Frobenius manifold. We show that F-manifolds arise naturally in every mathematical structure which admits an action of the main operad of the homotopy theory, the little discs operad. In particular, extended moduli spaces of complex and symplectic structures are proved to have a natural F-manifold structure; through the recent proof of the Deligne's conjecture the same statement applies to the cohomology space of any compact topological space, where the induced F-manifold structure gets assembled essentially from the higher Steenrod operations.

Tid och plats: Måndagen den 7 oktober kl. 13.15 – 15.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

Jean-Marie Barbaroux:
Quantum dynamics and fractal dimensions of measures

Abstract: We present here some results concerning the dynamics of a quantum mechanical system and the connections with the fractal dimensions associated with the Hamiltonian H of this system.

The time evolution of the system is given by a time-dependent Schrödinger equation

$$i(d/dt)f(t) = Hf(t), \;\; f(0) = f_0,$$

where f_0 is a given initial state of the system.

The dynamics will be given by the "observable" position at time t, i.e., by the quantity $(f(t), |x|f(t))$ (other related quantities will be considered). We show that this quantity can be estimated from below by a power of t:

$$(f(t), |x|f(t)) > t^{\alpha}.$$

This power α is related to multifractal dimensions of the spectral measures associated to H and f_0.

We will also present a specific model, where H is given by Julia matrices. In that case, one can derive upper bounds for the position at time t.

Tid och plats: Onsdagen den 9 oktober kl. 13.15 – 14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

DOKTORANDSEMINARIUM

Pelle Salomonsson: Rationella kurv-operaden

Sammanfattning: Den mest kända operaden nu för tiden är den som parametriserar rationella kurvor med punktkonfigurationer på sig (det är en smula irriterande att detta mycket viktiga föremål har ett så otympligt namn). Jag skall beskriva dess geometri och rapportera om egen forskning.

Tid och plats: Fredagen den 11 oktober kl. 13.15 – 15.00 i sal 37, hus 5, Matematiska institutionen, SU, Kräftriket.

MITTAG-LEFFLER SEMINAR

Horia Cornean:
On the scattering theory for very long range magnetic fields

Abstract: We consider a two-dimensional magnetic field which is homogeneous of degree -1 in leading order. We show the existence of a critical energy above which every classical orbit will escape at infinity following an energy determined path resembling a logarithmic spiral. This result is then formulated in quantum mechanical terms.

Tid och plats: Tisdagen den 8 oktober kl. 17.00 – 18.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

MITTAG-LEFFLER SEMINAR

Gian Michele Graf:
Equality of bulk and edge Hall conductance revisited

Abstract: The integral quantum Hall effect can be explained either as resulting from bulk or edge currents (or, as it occurs in real samples, as a combination of both). This leads to different definitions of Hall conductance, which agree under appropriate hypotheses, as shown by Schulz-Baldes et al. by means of K-theory. We propose an alternative proof based on a generalization of the index of a pair of projections to more general operators. The equality of conductances is an expression of the stability of that index as a flux tube is moved from within the bulk across the boundary of a sample.

This is joint work with P. Elbau.

Tid och plats: Torsdagen den 10 oktober kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

SEMINARIUM I FYSIK

Halina Rubinsztein-Dunlop:
Laser manipulation of microparticles and atoms

Abstract: Optical forces can be used to trap small particles ranging from micron size to individual atoms. Two diverse examples will be considered in this talk: the rotation of microscopic particles using optical angular momentum and the process of dynamical tunnelling of ultra-cold atoms in modulated optical potentials.

Tid och plats: Tisdagen den 15 oktober kl. 16.15 i The Svedberg-salen (FD5), Stockholms centrum för fysik, astronomi, bioteknik (SCFAB, AlbaNova).

VALDA PROBLEM I GEOMETRI

Torsten Ekedahl:
Hurwitz problems and Hurwitz spaces (continued)

Den tredje och sista delen i serien om Hurwitz' problem kommer att ges (se Bråket nr 28 sidan 4 och nr 30 sidan 7). Som tidigare finns information om kursen på
http://www.matematik.su.se/~teke/valda.html.

Tid och plats: Fredagen den 18 oktober kl. 10.15 – 12.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.
