BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

BRÅKET

SEMINARIER

Fr 10−05 kl. 11.00−12.00. Optimization and Systems Theory Seminar. Yulia Gel, St. Petersburg State University och Mälardalens högskola, Västerås: *The convergence analysis of the least-squares estimates for AR models of infinite order.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 31 sidan 3.

Fr 10−05 kl. 15.15. Presentation av examensarbete i matematik. Jonas Bergström: *Curves of genus three over finite fields.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 31 sidan 4.

Må 10−08 kl. 13.15. Potential Analysis Seminar. Henrik Shah Gholian: *A discussion on parabolic quadrature domains.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se nedan.

Må 10−08 kl. 13.15−15.00. Algebraseminarium. Jörgen Backelin: *Calculating Gröbner bases by cheating.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 5.

POTENTIAL ANALYSIS SEMINAR

Henrik Shah Gholian:
A discussion on parabolic quadrature domains

Abstract: This talk concerns parabolic quadrature domains which amounts to some kind of generalized mean value property for calroic functions. I aim to discuss possible extension of the concept to the parabolic case, and I hope I will have some feedback and ideas from the participants for a future development in the subject.

I will also represent some joint results with A. Hakobyan (Yerevan State University).

Tid och plats: Måndagen den 8 oktober kl. 13.15 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

Seminarier (fortsättning)

Må 10−08 kl. 16.15−17.00. Seminarium i finansiell matematik. *(Observera tiden!)* **Marcus Granstedt** presenterar sitt examensarbete: *Kredit- och försäkrings- derivat.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 31 sidan 4.

Ti 10−09 kl. 13.15. Seminar in Theoretical and Applied Mechanics. I. A. Molotkov, Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation, Russian Academy of Sciences, Moscow: *Asymptotic analysis of some nonlinear models for localized waves.* Seminarierummet, rum S40, Institutionen för mekanik, KTH, Teknikringen 8, b.v. Se sidan 3.

Ti 10−09 kl. 14.30−15.30. Mittag-Leffler Seminar. Bjarte Bøe, Bergen: *Interpolation by functions in the Bloch space.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

Ti 10−09 kl. 16.00−17.00. Mittag-Leffler Seminar. Gregory Lawler, Durham: *An introduction to Brownian motion IV: SLE.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

On 10−10 kl. 10.00−11.45. Logikseminariet Stockholm-Uppsala. Per Martin-Löf: *Gödel and intuitionism: How close was Gödel to the Curry-Howard correspondence?* Sal 16, hus 5, Matematiska institutionen, SU, Kräftriket.

On 10−10 kl. 10.15−12.00. Kombinatorikseminarium. Axel Hultman, KTH: *Poly- graph arrangements.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 3.

On 10−10 kl. 13.15−14.15. Seminarium i analys och dynamiska system. Ryszard Nest, University of Copenhagen: *Index for Fourier integral operators.* Seminarie- rum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

On 10−10 kl. 15.15. Seminarium i matematisk statistik. Ole Settergren och **Boguslaw Mikula:** *Finansiell balans i pensionssystem av fördelningstyp.* Rum 306, Cramér- rummet, hus 6, Matematiska institutionen, SU, Kräftriket. Se Bråket nr 31 sidan 5.

To 10−11 kl. 10.15. Docentföreläsning i matematik. Lars Villemoes: *Time-frequency bases.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 31 sidan 6.

To 10−11 kl. 13.15−14.15. Optimization and Systems Theory Seminar. *(Observera dagen och tiden!)* **Professor Vladimir A. Yakubovich,** St. Petersburg State Uni- versity: *Design of stabilizing controllers with system output independent of external disturbance.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedts- vägen 25, plan 7. Se sidan 5.

To 10−11 kl. 14.00−15.00. Mittag-Leffler Seminar. Esa Järvenpää, Jyväskylä: *SRB — Measures for coupled map lattices.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

To 10−11 kl. 15.30−16.30. Mittag-Leffler Seminar. Harry Kesten, Ithaca: *An intro- duction to percolation.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

Fr 10−12 kl. 15.15. Populära kollokviet. Peter Jones, Yale University och Institut Mittag-Leffler: *Multi-scale analysis, the travelling salesman, and geometry of measures.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedts- vägen 25, plan 7. Se sidan 4.

Fortsättning på nästa sida.

Seminarier (fortsättning)

Må 10−15 kl. 13.15−15.00. Algebraseminarium. Jesper Carlström framlägger sin licentiatavhandling: *Wheels: on division by zero.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

Må 10−15 kl. 15.15−16.00. Seminarium i finansiell matematik. Michael Hemph presenterar sitt examensarbete: *Bond Trading Strategies Based on Term Structure Models.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

Må 10−15 kl. 16.15−17.00. Seminarium i finansiell matematik. Nikolas Santikos presenterar sitt examensarbete: *Pricing Spread options on Swaps.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 6.

On 10−17 kl. 15.15. Seminarium i matematisk statistik. Rolf Sundberg: *Titel meddelas senare.* Rum 306, Cramérrummet, hus 6, Matematiska institutionen, SU, Kräftriket.

To 10−18 kl. 16.15−18.00. Seminarium i matematik och fysik vid Mälardalens högskola (Eskilstuna). PRIM-gruppen, Lärarhögskolan i Stockholm: *Analys och bedömning av elevers kunskaper i matematik.* Lektionssal A309, Mälardalens högskola, Eskilstuna.

SEMINAR IN THEORETICAL AND APPLIED MECHANICS

I. A. Molotkov: Asymptotic analysis of some nonlinear models for localized waves

Abstract: It is assumed to describe an analysis of several problems for nonlinear localized wave processes. Solutions of the kink type concentrated in a vicinity of some submanifold l are considered. Both the solution and the concentration submanifold l are unknown. It is shown that determination of l may be realized without the knowledge of the solution. For one class of problems a variational principal for finding l which is similar to the Fermat principle is obtained. It is detected a type of waves which exists at the expense of an inhomogeneity of the medium or at the expense of an initial front curvature only.

Tid och plats: Tisdagen den 9 oktober kl. 13.15 i seminarierummet, rum S40, Institutionen för mekanik, KTH, Teknikringen 8, b.v.

KOMBINATORIKSEMINARIUM

Axel Hultman: Polygraph arrangements

Abstract: Given a finite-dimensional vector space V and positive integers m and n, I will define a certain arrangement $Z_V(n, m)$ of subspaces of V^{m+n}, called the *polygraph arrangement*. This arrangement was recently introduced by Mark Haiman who managed to prove the elusive $n!$ conjecture by exploiting the algebraic properties of the coordinate ring of $Z_{\mathbb{C}^2}(n, m)$.

I will show how topological properties of the arrangement, such as the cohomology groups of the complement, can be obtained combinatorially by applying the technique of EL-shellability to its intersection lattice.

Tid och plats: Onsdagen den 10 oktober kl. 10.15−12.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

4

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

Ryszard Nest: Index for Fourier integral operators

Abstract: Let X and Y be two closed connected Riemannian manifolds of the same dimension and $\phi \colon S^*X \mapsto S^*Y$ a contact diffeomorphism. We will sketch the proof that the index of an elliptic Fourier operator Φ associated with ϕ is given by

$$\int_{B^*(X)} \mathrm{e}^{\theta_0} \hat{A}(T^*X) - \int_{B^*(Y)} \mathrm{e}^{\theta_0} \hat{A}(T^*Y),$$

where θ_0 is a certain characteristic class depending on the principal symbol of Φ, and $B^*(X)$ and $B^*(Y)$ are the unit ball bundles of the manifolds X and Y. In the special case when $X = Y$ we obtain a different proof of a theorem of Epstein-Melrose conjectured by Atiyah and Weinstein.

Tid och plats: Onsdagen den 10 oktober kl. 13.15 – 14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

POPULÄRA KOLLOKVIET

Peter Jones: Multi-scale analysis,
the travelling salesman, and geometry of measures

Vi är flera på Institutionen för matematik, KTH, som tycker att vi knappast vet vad "de andra" gör. Matematik är ju mycket vittomfattande, men mycket gemensamt finns också, och det är detta gemensamma som vi vill ta fasta på i en serie seminarier/kollokvier. De kommer att hållas på fredagar cirka en gång i månaden och är tänkta att vara tillgängliga för alla doktorander, lärare och forskare vid institutionen.

Efter föredragen kommer att finnas dryck och förtäring.

Det första tillfället är fredagen den 12 oktober då *Peter Jones,* Yale University och Institut Mittag-Leffler, håller föredraget *Multi-scale analysis, the travelling salesman, and geometry of measures.*

Tid och plats: Fredagen den 12 oktober kl. 15.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I FINANSIELL MATEMATIK

Michael Hemph

presenterar sitt examensarbete:

Bond Trading Strategies Based on Term Structure Models

Abstract: The *term structure of interest rates* describes the relationship between the length of a fixed income investment and the yield of the investment. The *Svensson* model is used to characterize the term structure over time. A risk-hedging construction, the *barbell* portfolio, is used to exploit statistical deviations between market quotes and prices implied by the model. Using simple rules based on the assumption that trading on the deviation reverting to its mean is profitable, historical data are analysed. For typical parameters the average result is weakly positive, 0.79 ± 0.11 units per unit of risk invested. The impact of some parameters is studied briefly, indicating that the assumption holds.

Tid och plats: Måndagen den 15 oktober kl. 15.15 – 16.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

ALGEBRASEMINARIUM

Jörgen Backelin:
Calculating Gröbner bases by cheating

Abstract: Gröbner basis techniques may be used in order to calculate not only Gröbner bases for (two-sided) ideals, but also for a large number of variants, and for calculating a number of variants of homologies. However, implementing a lot of specific variants is tedious; while, on the other side, a general purpose implementation will tend to be fairly slow.

One way to overcome this is to write a few fast, special purpose programmes, and then by means of algebraic trickery employ them in various different situations. In this talk, I will discuss this, with emphasis on what you may press out of one algorithm for Gröbner bases for homogeneous ideals in free associative algebras over a field k, and one algorithm for calculating a free resolution of k, and $\mathrm{Tor}^R(k,k)$, for the residue class ring R with respect to such an ideal. It will turn out that e.g. general $\mathrm{Tor}(M,N)$ and Hochschild homology may be calculated with very little extra work.

These results were achieved by joint work with Victor Ufnarovski.

Tid och plats: Måndagen den 8 oktober kl. 13.15 – 15.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

OPTIMIZATION AND SYSTEMS THEORY SEMINAR

Vladimir A. Yakubovich:
Design of stabilizing controllers
with system output independent of external disturbance

Abstract: The problem of the design of a universal controller that makes the output of a control system invariant under any external disturbance has a long history. Before the Second World War a discussion about the possibility of developing such controllers took place among Russian specialists in control theory. The special commission of the Russian Academy of Sciences considered the arguments of the disputing sides. After the Second World War regular conferences on this subject were held in Russia.

In this talk a variant of this problem is considered. The simple formulas are obtained describing the set of all stabilizing controllers for the minimum-phase object. It is shown that the absolute invariance is possible under some conditions if the external disturbance is measured and if it is one of the inputs of the controller. It is also proved that the absolute invariance is impossible if the external disturbance is not measured. (An example of the first case is the problem of automatic car steering.) It is shown that in the second case the approximate solution of the invariance problem is possible (with any precision) if the external disturbances belong to some sufficiently general classes. As an example of the second case the approach problem is considered (one moving object must approach the other).

Tid och plats: Torsdagen den 11 oktober kl. 13.15 – 14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I FINANSIELL MATEMATIK

Nikolas Santikos

presenterar sitt examensarbete:

Pricing Spread options on Swaps

Abstract: In this thesis, interest rate spread options on swaps are priced by using the BGM model. A trader's view on how the market will develop in the future is incorporated in the pricing process. It turns out that there are no closed form solutions for spread options. The price of the option is therefore obtained by using Monte Carlo simulations.

Since this kind of spread options is not yet traded in the Swedish market, the resulting prices are compared to the prices of traded swaptions. The result shows that pricing spread options on swaps in this way makes sense, since the prices of the spread options change correctly according to the correlation between the two swaps.

Two well-known and established methods for valuing general spread options are also studied. These methods are not suited to price interest spread options, since they cannot fully grasp the complexity of the correlated interest rates.

Tid och plats: Måndagen den 15 oktober kl. 16.15 – 17.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.