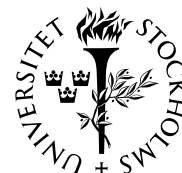




BRÅKET



*Information om seminarier och högre undervisning
i matematiska ämnen i Stockholmsområdet*

NR 33

FREDAGEN DEN 16 OKTOBER 2009

BRÅKET

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

Redaktör: Gunnar Karlsson

Telefon: 08-790 84 79

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gunnarkn@math.kth.se

Bråket på Internet: <http://www.math.kth.se/braaket.html> eller
<http://www.math.kth.se/braket/>

Postadress:

Red. för Bråket
Institutionen för matematik
KTH
100 44 Stockholm

Sista manustid för nästa nummer:
Torsdagen den 22 oktober
kl. 13.00.

Disputation i optimerings- lära och systemteori

Maja Karasalo skall disputerar på
avhandlingen *Data Filtering and
Control Design for Mobile Robots*
torsdagen den 22 oktober kl. 10.00
i sal F3, KTH, Lindstedtsvägen
26, b.v. Se Bråket nr 32 sidan 8.

Money, jobs: Se sidan 8.

SEMINARIER

Fr 10–16 kl. 11.00–12.00. **Optimization and Systems Theory Seminar.** Maja Karasalo, Optimeringslära och systemteori, KTH: *Data Filtering and Control Design for Mobile Robots*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 31 sidan 7.

Fr 10–16 kl. 13.15–14.15. **Graduate Student Seminar.** David Eklund, KTH: *Classification of integral bilinear forms*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 32 sidan 5.

Må 10–19 kl. 15.15–16.00. **Seminarium i finansiell matematik.** Alexander Argiriou presenterar sitt examensarbete: *Determining Margin Levels using Risk Modelling*. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 3.

Må 10–19 kl. 15.15. **Seminarium i matematisk statistik.** (*Observera dagen!*) Tom Andersson, SU: *Sensitivity analysis of firing dynamics of a nociceptor model*. Rum 306 (Cramérnummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se Bråket nr 32 sidan 7.

Fortsättning på nästa sida.

Disputation i matematisk statistik

Jens Svensson skall disputerar på avhandlingen *On Importance Sampling and Dependence Modeling* fredagen den 23 oktober kl. 13.00 i sal D2, KTH, Lindstedtsvägen 5, b.v. Se Bråket nr 32 sidan 6.

Disputation i matematisk statistik

Daniel Andersson skall disputerar vid KTH på avhandlingen *Contributions to the Stochastic Maximum Principle* fredagen den 30 oktober kl. 13.00. Se sidan 4.

Seminarier (fortsättning)

- Må 10–19 kl. 16.15–17.00. Seminarium i finansiell matematik.** Johan Nykvist presenterar sitt examensarbete: *Time Consistency in Option Pricing Models*. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 3.
- On 10–21 kl. 13.15–14.15. Seminarium i analys och dynamiska system.** Anne-Maria Ernvall-Hytönen, KTH: *On cusp forms, Fourier coefficients and exponential sums*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.
- On 10–21 kl. 13.15–15.00. Algebra and Geometry Seminar.** Nicola Pagani: *Chen-Ruan cohomology of moduli of curves*. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 5.
- On 10–21 kl. 14.00–15.00. Institut Mittag-Leffler Seminar.** Menachem Magidor, The Hebrew University of Jerusalem: *The Lowenheim-Skolem-Tarski number of the Hartig quantifier can be the first inaccessible*. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 5.
- On 10–21 kl. 15.00. Seminarium i matematisk statistik. (Observera tiden!)** Åke Svensson, SU: *Modelling, analysing and observing epidemic spread*. Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 6.
- On 10–21 kl. 15.30–16.30. Institut Mittag-Leffler Seminar.** Benno van den Berg, Technische Universität Darmstadt: *An introduction to algebraic set theory*. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 5.
- On 10–21 kl. 16.00. KTH/SU Mathematics Colloquium.** Professor Peter Jagers, Chalmers tekniska högskola, Göteborg: *Extinction: how often, how soon, and in what way?* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Kaffe/te serveras kl. 15.30 i pausrummet, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 4. Se Bråket nr 32 sidan 5.
- To 10–22 kl. 14.00–15.00. Institut Mittag-Leffler Seminar.** Meeri Kesälä, Helsingfors universitet: *Finitary abstract elementary classes*. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 6.
- To 10–22 kl. 15.30–16.30. Institut Mittag-Leffler Seminar.** Fredrik Engström, Göteborgs universitet: *Logical constants and invariance*. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 7.
- Fr 10–23 kl. 11.00. Optimization and Systems Theory Seminar.** Professor Clyde F. Martin, Texas Tech University: *Control of Information: The Role of Information in New Markets*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 32 sidan 7.
- Fr 10–23 kl. 15.15–16.15. Matematiska kollokviet i Uppsala.** Reinhard Siegmund-Schultze, Universitetet i Agder, Norge: *Refugee mathematicians from Nazi-Germany: Recent findings with some emphasis on emigration to Scandinavia*. Höggsalen, Ångströmlaboratoriet, Uppsala universitet. Kaffe/te serveras utanför föreläsningssalen kl. 14.55. Se sidan 7.
- On 10–28 kl. 13.15–14.15. Seminarium i analys och dynamiska system.** Tomas Johnson, Uppsala: *Title to be announced*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

Fortsättning på nästa sida.

Seminarier (fortsättning)

To 10–29 kl. 13.15. Seminarium i teoretisk datalogi. Gerardo Schneider, Chalmers tekniska högskola, Göteborg: *Evolving contracts*. Rum 4423, CSC, KTH. Se sidan 6.

Fr 10–30 kl. 13.15–14.15. Graduate Student Seminar. Fredrik Johansson (prel.): *Title to be announced*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I FINANSIELL MATEMATIK**Alexander Argiriou**

presenterar sitt examensarbete:

Determining Margin Levels using Risk Modelling

Abstract: This thesis addresses the problem of how a broker should to set margin levels on individual stock or subportfolios using risk modelling. Expected Shortfall is used together with historical data to set margin levels on individual stock. Another method is then derived with the Euler allocation principle to take dependencies into account. A basic comparison is made that shows how a broker can increase the revenue from lending money by taking dependencies into account and set margin levels on subportfolios instead of individual stock.

Tid och plats: Måndagen den 19 oktober kl. 15.15–16.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I FINANSIELL MATEMATIK**Johan Nykvist**

presenterar sitt examensarbete:

Time Consistency in Option Pricing Models

Abstract: Since the introduction of the famous Black-Scholes model (1973), several attempts have been made to construct option pricing models that allow for non-gaussian return distributions as well as varying volatilities. In this thesis, we examine the robustness of two of these models in terms of the time consistency, or possibly inconsistency, of the model parameters. We restrict our attention to the stochastic volatility model provided by Heston (1993) and the local volatility model introduced by Dupire (1994). We estimate the models daily in order to find parameters that match the current market prices as closely as possible, hence the calibration process constitutes a major part of the thesis. Our results show that both models are successful in explaining important characteristics of the implied volatility surface, when the market conditions are fairly stable. On the other hand, when the market is heavily fluctuating, both models reveal a high degree of time inconsistency, as they are unable to capture the current market conditions without large parameter variations. In addition, the use of principal component analysis shows that variations of the local volatility surface, to a large extent can be explained by three distinct movements.

Tid och plats: Måndagen den 19 oktober kl. 16.15–17.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

Anne-Maria Ernvall-Hytönen:

On cusp forms, Fourier coefficients and exponential sums

Abstract: I will briefly talk about modular forms in general, and cusp forms in particular. I will concentrate on exponential sums of their Fourier coefficients, and tell what we can say about them (both in theory and in practice: I will show some theorems and some pictures about computations), and I also try to explain why certain problems are extremely difficult.

Tid och plats: Onsdagen den 21 oktober kl. 13.15–14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

DISPUTATION I MATEMATISK STATISTIK

Daniel Andersson

skall disputeras på avhandlingen

Contributions to the Stochastic Maximum Principle

fredagen den 30 oktober 2009 kl. 13.00 i sal F3, KTH, Lindstedtsvägen 26, b.v. Till opponent har utsetts *professor Fred Espen Benth*, Universitetet i Oslo, Norge.

Abstract of the thesis

This thesis consists of four papers treating the maximum principle for stochastic control problems.

In the first paper we study the optimal control of a class of stochastic differential equations (SDEs) of mean-field type, where the coefficients are allowed to depend on the law of the process. Moreover, the cost functional of the control problem may also depend on the law of the process. Necessary and sufficient conditions for optimality are derived in the form of a maximum principle, which is also applied to solve the mean-variance portfolio problem.

In the second paper, we study the problem of controlling a linear SDE where the coefficients are random and not necessarily bounded. We consider relaxed control processes, i.e. the control is defined as a process taking values in the space of probability measures on the control set. The main motivation is a bond portfolio optimization problem. The relaxed control processes are then interpreted as the portfolio weights corresponding to different maturity times of the bonds. We establish existence of an optimal control and necessary conditions for optimality in the form of a maximum principle, extended to include the family of relaxed controls.

The third paper generalizes the second one by adding a singular control process to the SDE. That is, the control is singular with respect to the Lebesgue measure and its influence on the state is thus not continuous in time. In terms of the portfolio problem, this allows us to consider two investment possibilities — bonds (with a continuum of maturities) and stocks — and incur transaction costs between the two accounts.

In the fourth paper we consider a general singular control problem. The absolutely continuous part of the control is relaxed in the classical way, i.e. the generator of the corresponding martingale problem is integrated with respect to a probability measure, guaranteeing the existence of an optimal control. This is shown to correspond to an SDE driven by a continuous orthogonal martingale measure. A maximum principle which describes necessary conditions for optimal relaxed singular control is derived.

ALGEBRA AND GEOMETRY SEMINAR

Nicola Pagani:

Chen-Ruan cohomology of moduli of curves

Abstract: In 1969 Deligne and Mumford defined moduli spaces of smooth genus g curves with n marked points and their compactification, as smooth algebraic stacks. In the eighties, Mumford started a research program on the enumerative geometry and intersection theory on these moduli spaces. This led to several results and conjectures on the cohomology ring and on the Chow ring. Motivated by string theory, Chen and Ruan in 2001 and Abramovich, Graber and Vistoli in 2003 defined the orbifold cohomology and its algebraic analogue, the stringy Chow ring, respectively. This is meant to be the degree zero part of the small quantum cohomology ring for orbifolds.

In the first part of this seminar, we review the definition of Chen-Ruan cohomology. We explain what we mean by computing the Chen-Ruan cohomology for moduli spaces of curves, and then we describe the results that we obtained in the first non-trivial case: the moduli spaces of genus 1 curves with marked points and its compactification. In the second part, we try to give more technical details, and to study moduli of curves of higher genus. If there is time, we will spend a few words about the quest of defining an orbifold Tautological Ring, taking inspiration from Faber's conjectures and Faber-Pandharipande's definition.

Tid och plats: Onsdagen den 21 oktober kl. 13.15–15.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

INSTITUT MITTAG-LEFFLER SEMINAR

Menachem Magidor:

The Lowenheim-Skolem-Tarski number of the Hartig quantifier can be the first inaccessible

Abstract: In this talk I sketch the proof of the following theorem: If $ZFC +$ “There is a supercompact cardinal” is consistent, then so is $ZFC +$ “There is an inaccessible cardinal” + “The downward Lowenheim-Skolem-Tarski theorem for the Hartig quantifier holds for the first inaccessible cardinal”. The assumption of a supercompact cardinal seems almost unavoidable, since this Lowenheim-Skolem-Tarski theorem implies the failure of weak square for large enough cardinals.

The talk is based on joint work with Jouko Väänänen.

Tid och plats: Onsdagen den 21 oktober kl. 14.00–15.00 vid Institut Mittag-Leffler, Aura-vägen 17, Djursholm.

INSTITUT MITTAG-LEFFLER SEMINAR

Benno van den Berg:

An introduction to algebraic set theory

Abstract: In this talk I will give an introduction to “algebraic set theory”. Algebraic set theory is an approach to the semantics of set theory based on categorical logic and inspired by topos theory. I will concentrate on the main ideas, rather than on technical results.

Tid och plats: Onsdagen den 21 oktober kl. 15.30–16.30 vid Institut Mittag-Leffler, Aura-vägen 17, Djursholm.

SEMINARIUM I MATEMATISK STATISTIK

Åke Svensson:

Modelling, analysing and observing epidemic spread

Abstract: Deterministic and stochastic models have been important tools to understand the dynamics of epidemic spread. We will discuss possibilities and difficulties in adjusting basic model assumptions and parameter values to make the models “realistic” for specific infections.

The discussion will be illustrated using simple stochastic models but is valid for more complex model. Note that we will not discuss the current pandemic caused by the new influenza. If time allows we will exemplify with very old observations of a measles epidemic.

Tid och plats: Onsdagen den 21 oktober kl. 15.00 i rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket.

INSTITUT MITTAG-LEFFLER SEMINAR

Meeri Kesälä:

Finitary abstract elementary classes

Abstract: We discuss types and independence in a non-elementary context.

Tid och plats: Torsdagen den 22 oktober kl. 14.00–15.00 vid Institut Mittag-Leffler, Aura-vägen 17, Djursholm.

SEMINARIUM I TEORETISK DATALOGI

Gerardo Schneider: Evolving contracts

Abstract: Any formalism to describe contracts must be able to capture evolvability over time, and also to correlate such evolutions to changes in the environment or in the behaviour of the parties involved in contracts. Yet, few works have focused on the general problem of verifying evolvable contracts.

In this talk I will present ongoing work on the definition of an abstract theory of dynamic contracts, including some preliminary results concerning verification of static and dynamic contracts. Starting from a very general view of contracts as syntactic entities that characterize sets of traces, I show how to accommodate two essential ingredients of dynamic contracts: spillover, which characterizes the remains of a clause when it is withdrawn from a contract, and power, which characterizes when a principal is entitled to perform a change in a contract. Although the technical development is carried in an abstract setting, I will illustrate our definitions and results using contract languages for rights and obligations; these languages, despite their simplicity, share many essential features with other formalisms for digital right management and access control, and are therefore representative of the potential interest of our approach.

The talk is based on joint work with Gilles Barthe and Gordon Pace.

Tid och plats: Torsdagen den 29 oktober kl. 13.15 i rum 4423, CSC, KTH.

INSTITUT MITTAG-LEFFLER SEMINAR

Fredrik Engström:

Logical constants and invariance

Abstract: According to Tarski an operation on a domain should be counted as a logical constant iff it is invariant under all permutations of the domain, thus defining logic as the study of permutation invariant operations. Tarski's thesis has been heavily criticized (on good grounds) for generating way to many logical constants. In the last twenty years there have been some alternative suggestions for characterizing logical constancy in terms of invariant operators. I will try to give an introduction to this field and also prove some new results.

Tid och plats: Torsdagen den 22 oktober kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Aura-vägen 17, Djursholm.

MATEMATISKA KOLLOKVIET I UPPSALA

Reinhard Siegmund-Schultze:

Refugee mathematicians from Nazi-Germany:

Recent findings with some emphasis on emigration to Scandinavia

Abstract: The emigration of mathematicians from Europe after 1933 and the ensuing shift of the world centre of mathematics from Europe to the United States is arguably the most important historical result of Nazi rule for mathematics.

My recent book at Princeton University Press (an extended and revised translation into English of the German edition published in 1998) gives an account of emigration in mathematics within Europe (mainly to the U.K.) and from Europe during the Nazi period. The discussion is restricted to German-speaking emigration, which, however, was by far the most important part, only to some degree matched by Polish, and, to an even lesser extent, French and Italian emigration.

The talk puts emphasis on emigration to Scandinavia. For some young emigrants such as Willy Feller, who was influenced by Harald Cramér in Stockholm, and Werner Romberg, who changed from physics to applied mathematics in Norwegian exile, the years in Scandinavian exile were crucial for their later careers. Others, in particular older ones such as Hermann Müntz, were not equally successful. Emigrants to Norway, such as Ernst Jacobsthal and Paul Kuhn (Trondheim), and to Denmark, such as Werner and Käte Fenchel (Copenhagen) and Otto Neugebauer, had to proceed to other countries, notably Sweden, after German occupation. For others such as Max Dehn and Carl Ludwig Siegel (Oslo) and Herbert Busemann (Copenhagen), Scandinavia was a temporary refuge before going on to the United States.

The role of Danish (Harald Bohr), Norwegian (Viggo Brun), and Swedish (Gunnar Dahlberg, Harald Cramér) hosts will be briefly considered too.

Tid och plats: Fredagen den 23 oktober kl. 15.15 – 16.15 i Höggsalen, Ångströmlaboratoriet, Uppsala universitet. Kaffe/te serveras utanför föreläsningssalen kl. 14.55.

MONEY, JOBS

Columnist: Johannes Lundqvist, Department of Mathematics, Stockholm University.

E-mail: johannes@math.su.se.

Info = information. This will be given and repeated until obsolete. Rely on other sources as well.

BBKTH = Bulletin Board at the Department of Mathematics, KTH.

BBSU = Bulletin Board at the Department of Mathematics, SU.

The following information, with links, is also available at <http://www2.math.su.se/~johannes/mj.html>.

Unless stated otherwise, a given date is the last date (e.g. for applications), and the year is 2009. A number without an explanation is a telephone number.

Standard information channels

1. A channel to information from Vetenskapsrådet: <http://www.vr.se/naturteknik/index.asp>.
2. A channel to information from the European Mathematical Society: <http://www.emis.de>.
3. A channel to information from the American Mathematical Society: <http://www.ams.org>.
4. KTH site for information on funds: <http://www.kth.se/aktuellt/stipendier>.
5. Stockholm University site for information on funds: <http://www2.su.se/forskning/stipendier/databas.php3>.
6. Umeå site for information on funds: http://www.umu.se/umu/aktuellt/stipendier_fond_anslag.html.
7. Job announcement site: <http://www.maths.lth.se/nordic/Euro-Math-Job.html>. This is run by the European Mathematical Society.
8. Stiftelsen för internationalisering av högre utbildning och forskning (STINT) site for information on funds: <http://www.stint.se>.
9. Nordisk Forskerutdanningsakademi (NorFA) site for information on funds: <http://www.norfa.no>.
10. Svenska institutet (SI) site for information on funds: <http://www.si.se>.

New information

Jobs to apply for

11. Lunds universitet söker en doktorand i matematik. Forskningsarbetet handlar om att utveckla och analysera metoder för att lösa inversa problem för komplexa industriella processer. Sista ansökningsdag är den 22 oktober. Web-info: <http://www3.lu.se/info/lediga/admin/document/PA2009-3574.pdf>.

Old information

Money to apply for

12. Stiftelsen G. S. Magnusons fond utdelar stipendier inom matematik med bland annat följande ändamål: Stöd till doktorander, stöd till den som önskar ytterligare meritera sig efter doktorsexamen och bidrag för att kvarhålla forskare inom landet. Sista ansökningsdag är den 1 februari 2010. Web-info: http://www.kva.se/Documents/Utlysningar/Stipendier/sarskilda/info_stip_Magnuson_sv_10.pdf.
 13. Kungl. Vetenskapsakademien utlyser stipendier och anslag inom matematik enligt följande: Till doktorander utdelas stipendier med ett maximibelopp på 100 000 kr, och till forskare som avlagt doktorsexamen år 2004 eller senare utdelas forskningsanslag med ett maximibelopp på 300 000 kr. Anslag utgår under högst ett år. Sista ansökningsdag är den 1 februari 2010. Web-info: <http://www.kva.se/sv/utlysningar/stipendier-och-anslag/Matematik/>.
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