



BRÅKET



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

NR 38

FREDAGEN DEN 21 NOVEMBER 2008

BRÅKET

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

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Red. för Bråket
Institutionen för matematik
KTH
100 44 Stockholm

Sista manustid för nästa nummer:
Torsdagen den 27 november
kl. 13.00.

SEMINARIER

Fr 11–21 kl. 13.15–14.15. Graduate Student Seminar.
Alan Sola, Matematik, KTH: *Univalent functions*
IV. Seminarierum 3721, Institutionen för mate-
matik, KTH, Lindstedtsvägen 25, plan 7. Se
Bråket nr 37 sidan 8.

Fr 11–21 kl. 14.15–15.00. Seminarium i numerisk ana-
lysis. Dr Ridgway Scott, University of Chicago,
USA: *The mathematical basis for molecular van der*
Waals forces. Rum 1537, KTH CSC, Lindstedts-
vägen 3, plan 5.

Ti 11–25 kl. 13.15. Plurikomplexa seminariet. Gerd
Schmalz, Armidale: *Holomorphicity of functions*
annihilated by one singular vector field. Rum 306,
hus 6, Matematiska institutionen, SU, Kräftriket.
Se sidan 4.

Ti 11–25 kl. 15.15–16.00. Föreläsning. Ewa Wigaeus
Tornqvist, gästprofessor i vårdergonomi vid
KTH: *Datorarbete, teknik och hälsa*. Sal E3, KTH,
Osquars Backe 14, 2 tr. Efterföljande mingel med
förtäring i anslutning till salen. Förhandsanmälan
skall göras senast den 21 november. Se Bråket nr
37 sidan 4.

Fortsättning på nästa sida.

Miniworkshop in PDE and Potential Theory

Denna skall äga rum vid KTH
fredagen den 28 november. Se
sidorna 9–10.

CIAM Outreach

Detta skall äga rum vid KTH onsdagen den 26 november. Se
sidan 12.

Kurs

Alexander Engström, Timo Koski
och Lars Svensson: Graduate
reading course in algebraic
statistics. Se sidan 13.

Disputation i mekanik

Espen Åkervik skall disputeras vid KTH på avhandlingen
Global stability and feedback control of boundary layer flows
fredagen den 5 december kl. 10.30. Se sidan 7.

Money, jobs: Se sidorna 13–14.

Seminarier (fortsättning)

- On 11–26 kl. 8.00. Presentation av examensarbete i matematisk statistik. Mika Korhonen:** *IRR som värdeutvecklingsmått på fondkonton — en undersökning av risken för missvisande värden samt förslag till åtgärd*.Handledare: **Anders Björkström**. Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 5.
- On 11–26 kl. 9.00. Presentation av examensarbete i matematisk statistik. Michel Metin Örun:** *A Fundamental Connection Between Credit Default Swaps and Equities*.Handledare: **Ola Hössjer**. Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 6.
- On 11–26 kl. 10.00. Presentation av examensarbete i matematisk statistik. Hülya Göker:** *Cause-specific mortality forecasting for the Scandinavian nations by using the Lee-Carter model*.Handledare: **Åke Svensson**. Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 6.
- On 11–26 kl. 10.15–12.00. Kombinatorikseminarium. Michael Shapiro:** *Directed planar networks in the disk and in the annulus*. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 8.
- On 11–26 kl. 11.00. Presentation av examensarbete i matematisk statistik. Mehrdad Jafari Mamaghani:** *Spatial Point Pattern Analysis of Neurons Using Ripley's K-function and Voronoi Tessellation*.Handledare: **Mikael Andersson**. Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 7.
- On 11–26 kl. 13.00. Seminarium i statistik. Karin Dahmström** minns och berättar: *Att bli och vara statistiker — hur slumpen griper in*. Sal B705, Statistiska institutionen, SU, Universitetsvägen 10B, plan 7, Frescati.
- On 11–26 kl. 13.15–14.15. Seminarium i analys och dynamiska system. Nicolae Mihalache, KTH:** *John regularity of Fatou components*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 8.
- On 11–26 kl. 13.15–15.00. Algebraic Geometry Seminar. Holger Brenner:** *Deformations of vector bundles and the localization problem in tight closure*. Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 11.
- On 11–26 kl. 13.15–15.00. Seminarium, arrangerat av Gruppen för säkerhetsforskning, KTH. Per Sandin, KTH:** *Försiktighetsprincipen*. TLA:s bibliotek, KTH, rum 135, Teknikringen 78 B, 1 tr. Se sidan 4.
- To 11–27 kl. 10.30. Seminar in Fluid Mechanics. S. J. Garrett, University of Leicester:** *A theoretical study of the transition of boundary layers on rotating bodies*. Seminarierummet, Institutionen för mekanik, KTH, Teknikringen 8. Se sidan 10.
- To 11–27 kl. 13.15–14.15. DNA-seminariet Uppsala-KTH (Dynamical systems, Number theory, Analysis). Henrik Ueberschaer, University of Bristol:** *The trace formula for singular perturbations of the Laplacian on a hyperbolic surface*. Sal 64119, Ångströmlaboratoriet, Uppsala universitet. Se sidan 4.
- To 11–27 kl. 14.00–15.00. Institut Mittag-Leffler Seminar. Alfonso Garcia-Parrado, Linköpings universitet:** *Kerr initial data*. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 5.

Fortsättning på nästa sida.

Seminarier (fortsättning)

- To 11–27 kl. 15.15–16.15. AlbaNova and Nordita Colloquium in Physics.** Susanne Viefers, Oslo: *Exotic quantum states in two dimensions — Rotating Bose condensates and quantum Hall liquids*. Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum.
- To 11–27 kl. 15.30–16.30. Institut Mittag-Leffler Seminar.** Håkan Andreasson, Chalmers tekniska högskola, Göteborg: *Sharp bounds on the critical stability radius for relativistic charged spheres*. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 8.
- Fr 11–28 kl. 15.15–16.15. Matematiska kollokviet i Uppsala.** Lars Andersson, Albert Einstein Institut, Golm, och Institut Mittag-Leffler: *Black holes, horizons and stability*. Polhemsalen, Ångströmlaboratoriet, Uppsala universitet. Kaffe/te serveras utanför föreläsningssalen kl. 14.55. Se sidan 11.
- On 12–03 kl. 11.00–12.00. KTH/Nordita/SU Seminar in Theoretical Physics.** David Haviland, Tillämpad fysik, KTH: *Intermodulation Atomic Force Microscopy*. Sal FA31, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se sidan 11.
- On 12–03 kl. 13.00. Seminarium i statistik.** Docent Gebrenegus Ghilagaber, Stockholms universitet, och professor Rolf Larsson, Uppsala universitet: *Maximum likelihood adjustment of anticipatory covariates in analysing retrospective survey data*. Sal B705, Statistiska institutionen, SU, Universitetsvägen 10B, plan 7, Frescati. Se sidan 12.
- On 12–03 kl. 13.15. Algebra and Geometry Seminar.** Fredrik Nordström: *Title to be announced*. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.
- On 12–03 kl. 19.00. Populärvetenskaplig föreläsning i fysik.** Jan Schober, Astronomi, SU: *”Giör intet afwel af sig”*: Om den svenska almanackan från omkring 1540 till dataåldern. Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se nedan.
- To 12–04 kl. 13.15–14.15. DNA-seminariet Uppsala-KTH (Dynamical systems, Number theory, Analysis).** Nikolai Proskurin, Steklov Institute: *Title to be announced*. Sal 64119, Ångströmlaboratoriet, Uppsala universitet.

POPULÄRVETENSKAPLIG FÖRELÄSNING I FYSIK**Jan Schober:****”Giör intet afwel af sig”:****Om den svenska almanackan från omkring 1540 till dataåldern**

Sammanfattning: Almanackan har alltid varit den näst mest brukade av alla böcker i vårt land. Med utförliga kronologiska, astronomiska, astrologiska och många olika praktiska upplysningar för vardagslivet blev den en nödvändighetsartikel i varje hem. Men hur är det idag? Finns det fortfarande ett behov eller intresse för almanackan eller är det på tiden att lägga ned den?

Tid och plats: Onsdagen den 3 december kl. 19.00 i Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum.

PLURIKOMPLEXA SEMINARIET

Gerd Schmalz:

**Holomorphicity of functions
annihilated by one singular vector field**

Abstract: I will talk about the following generalization of Forelli's theorem: Suppose F is a holomorphic vector field with singular point at p , such that F is linearizable at p and the matrix is diagonalizable with eigenvalues whose ratios are positive and real. Then any function ϕ that has an asymptotic Taylor expansion at p and is holomorphic along the complex integral curves of F is holomorphic in a neighbourhood of p . The requirement for the ratios of the eigenvalues to be positive reals is necessary.

This is joint work with Kang-Tae Kim and Evgeny Poletsky.

Tid och plats: Tisdagen den 25 november kl. 13.15 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

**SEMINARIUM, ARRANGERAT AV
GRUPPEN FÖR SÄKERHETSFORSKNING, KTH**

Per Sandin:

Försiktighetsprincipen

Sammanfattning: På senare år har försiktighetsprincipen blivit allt mer omtalad i riskhanteringssammanhang. Den har nämnts i så olika sammanhang som kemikalieriskhantering, GMO-användning, medicinsk forskning och homooptioner. Det råder dock vitt skilda uppfattningar om vad försiktighetsprincipen innebär och borde innebära, respektive vilka skäl som finns för att vara (eller inte vara) försiktig. Talaren kommer att presentera några olika tolkningar av försiktighetsprincipen, några problem med tolkningarna, och hur de kan hanteras.

Tid och plats: Onsdagen den 26 november kl. 13.15–15.00 i TLA:s bibliotek, KTH, rum 135, Teknikringen 78 B, 1 tr.

**DNA-SEMINARIET UPPSALA-KTH
(DYNAMICAL SYSTEMS, NUMBER THEORY, ANALYSIS)**

Henrik Ueberschaer:

**The trace formula for singular perturbations
of the Laplacian on a hyperbolic surface**

Abstract: Hyperbolic surfaces of finite volume are objects of study in Quantum Chaos since the geodesic flow on such surfaces is known to be ergodic. Selberg's trace formula famously links the eigenvalues of the Laplacian on such a surface to geometric quantities such as periodic orbits. I will present an analogue of Selberg's trace formula for a delta potential on a hyperbolic surface. In the case of a non-compact surface with a single cusp, I will present perturbative analogues of classical Maass forms and nonholomorphic Eisenstein series, which naturally arise in the development of the trace formula.

Tid och plats: Torsdagen den 27 november kl. 13.15–14.15 i sal 64119, Ångströmlaboratoriet, Uppsala universitet.

INSTITUT MITTAG-LEFFLER SEMINAR

Alfonso Garcia-Parrado:

Kerr initial data

Abstract: In this work we find conditions upon a vacuum initial data set ensuring that its development is isometric to a subset of the Kerr spacetime (Kerr initial data). These conditions contain a positive quantity defined on the initial data hypersurface which vanishes when the data are Kerr data. Applications of this result are discussed.

Work done in collaboration with Juan A. Valiente Kroon.

Tid och plats: Torsdagen den 27 november kl. 14.00–15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

PRESENTATIONER AV EXAMENSARBETEN I MATEMATISK STATISTIK

Onsdagen den 26 november kommer fyra examensarbeten i matematisk statistik att presenteras vid Matematiska institutionen, SU. Lokalen för alla presentationerna är rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket.

De fyra rapporterna kommer inom kort att finnas på sidan <http://www2.math.su.se/matstat/reports/serieb>.

Kl. 8.00 ges följande presentation:

Mika Korhonen:

**IRR som värdeutvecklingsmått på fondkonton —
en undersökning av risken för missvisande värden
samt förslag till åtgärd**

Handledare: **Anders Björkström.**

Sammanfattning: Premiepensionsmyndigheten (PPM) använder internräntan (IRR) som ett mått på enskilda fondkontons avkastning. Eftersom IRR-ekvationen kan ses som ett polynom, finns det emellertid en teoretisk möjlighet att det finns flera internräntor för ett och samma fondkonto.

Denna uppsats undersöker olika sätt att kringgå mångtydighetsproblemet. Alternativen utvärderas sedan med avseende på några olika krav som kan ställas på ett värdeutvecklingsmått. Ett centralt krav är att det skall finnas en ekonomisk tolkning av måttet. Eftersom fondkonton aldrig kan ha negativa saldon, bör den ekonomiska tolkningen av måttet överensstämma med detta villkor. I studiet introduceras konceptet ”den mest troliga saldoutvecklingen” och principen att längden på tidsperioden under vilken saldot på kontot är lika med noll inte bör ha någon inverkan på IRR. Om vi går med på dessa två koncept, vilket studiet argumenterar för att vi bör göra, så visar det sig att det finns en modifierad IRR som uppfyller samtliga krav som ställts. Arbetet inkluderar även beräkningstekniska tips för hur man garanterat kan finna dessa modifierade IRR.

Det finns vissa villkor på en kassaflödesström som måste vara uppfyllda för att IRR för den strömmen skall vara missvisande. Dessa villkor tas fram i uppsatsen och används sedan för att undersöka om PPM:s fondkonton är i riskzonen. Slutsatsen är att de kassaflödesströmmar som representerar PPM:s fondkonton i regel inte uppfyller villkoren. De klaraste undantagsfallen är redan idag särbehandlade, varför ingen ny hantering av IRR-beräkningen är akut.

(Fortsättning på nästa sida.)

Kl. 9.00 ges följande presentation:

**Michel Metin Örun:
A Fundamental Connection
Between Credit Default Swaps and Equities**

Handledare: Ola Hössjer.

Abstract: In this paper we have aimed to find a fundamental connection between Credit Default Swaps (CDS) and Equities, concentrating on the banking sector. To this end, we introduce factor models, especially the Fama French three factor model. Moreover, we also tried to find an explanatory distribution for the CDS spread. Here we introduce the Normal Inverse Gaussian (NIG) distribution.

The fundamental difference between the Fama French framework and the theories of traditional corporate valuation made the results difficult to interpret. While both theories agree that smaller companies are riskier, they do not agree on the riskiness of growth and value stocks. However, we could still see that the risk taken when investing in risky credit stocks could be explained by the Fama French factors, i.e. “value” and “size”.

As an attempt to find an explanatory distribution for the CDS spread, we applied the “Chi-square goodness-of-test”. While the NIG distribution captured more of the heavy skewness and kurtosis compared to the Normal distribution, it could still not be fitted to the CDS spread.

Kl. 10.00 ges följande presentation:

**Hülya Göker:
Cause-specific mortality forecasting for the Scandinavian nations
by using the Lee-Carter model**

Handledare: Åke Svensson.

Abstract: Reliable forecasts of mortality are of importance for the pricing of life annuities in life insurance industry. Most often, historical dates of mortality are used in order to forecast the future mortality. In this study, we investigate how the Lee-Carter approach can be used to forecast mortality, by using cause-specific mortality experience of the period 1951–1980 for Scandinavian nations and compare the resulting projections with the official projections 1981–2005. In order to assess the performance of the cause-specific estimations, we have applied the Lee-Carter model to all-cause mortality data (the number of people who have died regardless of cause) and thereafter we have compared the results with the Lee-Carter approach.

The World Health Organization publishes death rates by disease in specific countries. ICD (International Classification of Diseases) are used to classify diseases. The classifications of the causes of death are very detailed, so we have chosen to collect the death causes into ten groups. Since Iceland has a small population, we could only classify causes of death into four groups.

Cancer, together with diseases of heart and arteries, are the most common causes of death in Scandinavia. The reductions in the trends for these diseases are the major factor for the total mortality decline from about 1970.

The result indicates that the cause-specific mortality forecasts yield higher mortality in the future than the all-cause forecasts. This is because the total mortality rates have decreasing rates over time, but some causes of death actually have increasing rates, and they will be forecast to increase over time by the Lee-Carter model.

(Fortsättning på nästa sida.)

Kl. 11.00 ges följande presentation:

Mehrdad Jafari Mamaghani:
Spatial Point Pattern Analysis of Neurons
Using Ripley's K -function and Voronoi Tessellation

Handledare: Mikael Andersson.

Abstract: The aim of this project is to apply and develop methods for statistical analysis of spatial point patterns. Spatial point pattern analysis is widely used within biological fields of inferential statistics. This text is constructed upon applications and development of such analysis on distribution of neurons. Unknown distributions in statistics are in principle investigated using non-parametric tools. Two such tools within the spatial point pattern's field are Ripley's K -function and Voronoi Tessellation. These methods have widely been used to study the 2-dimensional distribution of biological phenomena in the past decades.

Confocal microscopy has now given the possibility of acquiring data for expanding these studies to 3-dimensional domains and thus attaining more information. An authentic study in this case requires development of consistent tools. The tool chosen to develop here is Ripley's K -function and its edge correction term for operations in 3-dimensional domains.

The operability of this function, along with its corresponding function in two dimensions, and Voronoi tessellation are confirmed by different types of simulations. These methods are later used to investigate the distribution of neurons in samples obtained from a mouse brain.

DISPUTATION I MEKANIK

Espen Åkervik

skall disputera på avhandlingen

Global stability and feedback control of boundary layer flows

fredagen den 5 december 2008 kl. 10.30 i sal E1, KTH, Lindstedtsvägen 3, b.v. Till opponent har utsetts *professor Dwight Barkley*, Mathematics Institute, University of Warwick, U.K.

Abstract of the thesis

In this thesis the stability of generic boundary layer flows is studied from a global viewpoint using optimization methods. Global eigenmodes of the incompressible linearized Navier-Stokes equations are computed using the Krylov subspace Arnoldi method. These modes serve as a tool both to study asymptotic stability and as a reduced basis to study transient growth. Transient growth is also studied using adjoint iterations. The knowledge obtained from the stability analysis is used to device systematic feedback control in the Linear Quadratic Gaussian framework. The dynamics is assumed to be described by the linearized Navier-Stokes equations. Actuators and sensors are designed and a Kalman filtering technique is used to reconstruct the unknown flow state from noisy measurements. This reconstructed flow state is used to determine the control feedback, which is applied to the Navier-Stokes equations through properly designed actuators. Since the control and estimation gains are obtained through an optimization process, and the Navier-Stokes equations typically form a very high-dimensional system when discretized, there is an interest in reducing the complexity of the equations. A standard method to construct a reduced order model is to perform a Galerkin projection of the full equations onto the subspace spanned by a suitable set of vectors, such as global eigenmodes and balanced truncation modes.

KOMBINATORIKSEMINARIUM

Michael Shapiro:

Directed planar networks in the disk and in the annulus

Abstract: We recall the definition of directed planar network. Following Postnikov's preprint we discuss the inverse problem for networks in the disk. We generalize Postnikov's definition to networks in the annulus and discuss different properties of such networks and the corresponding inverse problem.

Tid och plats: Onsdagen den 26 november kl. 10.15–12.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

Nicolae Mihalache:

John regularity of Fatou components

Abstract: A famous result of Carleson, Jones and Yoccoz shows that the basin of attraction of infinity of a polynomial P is a John domain if and only if P is semi-hyperbolic (i.e. the critical points are not recurrent and there are no parabolic orbits). We show that all Fatou components of a semi-hyperbolic rational map are John domains. The converse does not hold.

We show local connectivity of connected Julia sets for a large class of non-uniform hyperbolic rational maps, including semi-hyperbolic maps and topological Collet-Eckmann maps.

Tid och plats: Onsdagen den 26 november kl. 13.15–14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

INSTITUT MITTAG-LEFFLER SEMINAR

Håkan Andreasson:

Sharp bounds on the critical stability radius for relativistic charged spheres

Abstract: The problem of finding a lower bound on the radius R of a charged sphere with mass M and charge $Q < M$ is addressed. Such a bound is referred to as the critical stability radius. This problem has resulted in a number of papers in recent years, but neither a transparent nor a general inequality similar to the case without charge, i.e., $R \geq 9M/4$, has been found. In this talk I will discuss the surprisingly transparent inequality

$$\sqrt{M} \leq \frac{\sqrt{R}}{3} + \sqrt{\frac{R}{9} + \frac{Q^2}{3R}},$$

which holds for any solution which satisfies $p + 2p_T \leq \rho$, where p and p_T are the radial and tangential pressures, respectively, and ρ is the energy density. The inequality will be shown to be sharp. Although the inequality holds for any matter model satisfying the property above, special attention will be given to features of collisionless matter.

Tid och plats: Torsdagen den 27 november kl. 15.30–16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

MINIWORKSHOP IN PDE AND POTENTIAL THEORY

The workshop will take place on Friday, November 28, 2008, in seminar room 3733, Department of Mathematics, KTH, Lindstedtsvägen 25, floor 7.

Schedule

10.00–10.45 **Olof Runborg**, KTH: *Computational high frequency wave propagation.*

Abstract: The numerical approximation of high frequency wave propagation is important in many applications, including geophysics, electromagnetics and acoustics. When the wavelength is short compared to the overall size of the computational domain, direct simulation using standard wave equations is very expensive. Fortunately, there are computationally much less costly models that are good approximations of many wave equations precisely for very high frequencies. In this talk I will focus on the geometrical optics approximation, which is the infinite frequency limit of wave equations. Geometrical optics has traditionally been simulated using ray tracing. More recently numerical procedures based on various partial differential equations have been introduced. The classical PDE's for geometrical optics are the eikonal and transport equations, but there are also generalizations of these which can capture more realistic solutions. I will discuss these PDE's and their numerical approximation.

11.00–11.45 **Stefan Rauch-Wojciechowski**, Department of Mathematics, Linköping University: *An effective criterion of separability for the Schrödinger equation and for the Hamilton-Jacobi equations of natural Hamiltonian systems.*

Abstract: The method of separation of variables is probably the most useful tool for finding solutions of partial differential equations. It consists of finding suitable new variables such that the problem can be split into a set of uncoupled ODE's of first order and second order that often can be solved by quadratures. For a given differential equation it is difficult to know if separation variables exist and how to find them.

Surprisingly for the Schrödinger equation and for the Hamilton-Jacobi equation of natural Hamiltonian systems, which are important in quantum and classical mechanics, I have found an algorithmic criterion of separability that allows for deciding if the equation is separable and for solving it by quadratures. It is a solution of an old problem stated by C. G. J. Jacobi in his lectures on dynamics given in Königsberg 1842–1843 and published in the volume “Vorlesungen über Dynamik” (Berlin 1866), edited by A. Clebsch.

11.45–13.15 Lunch.

13.15–14.00 **Marek Fila**, Department of Applied Mathematics and Statistics, Comenius University, Bratislava: *Reaction versus diffusion: Blow-up induced and inhibited by diffusivity.*

Abstract: We discuss results on the relation of the dynamics of a system of ordinary differential equations to the dynamics of the corresponding reaction-diffusion system when diffusion is added. We are mainly interested in the influence of diffusion on the global existence of solutions. We present examples of systems where diffusion induces or inhibits blow-up.

(Continued on the next page.)

14.15–15.00 **Filippo Gazzola**, Department of Mathematics, Politecnico di Milano: *Decay and eventual local positivity for biharmonic parabolic equations.*

Abstract: We study existence and positivity properties for solutions of Cauchy problems for both linear and semilinear parabolic equations with the biharmonic operator as elliptic principal part. The kernel of the parabolic operator $\partial_t + \Delta^2$ is a sign changing function, and the solutions of the evolution problem with a positive initial datum may display an almost instantaneous change of sign. We determine conditions on the initial datum for which the corresponding solution is global and exhibits some kind of positivity behaviour, both in the linear and semilinear cases. At the same time, we show that negativity of the solution may occur also for arbitrarily large given time, provided the initial datum is suitably constructed.

Welcome!

Sara Maad

Henrik Shahgholian

Andrzej Szulkin

SEMINAR IN FLUID MECHANICS

S. J. Garrett:

A theoretical study of the transition of boundary layers on rotating bodies

Abstract: Rotating spheres and cones are used as nose cones in aeroengine and spinning projectile applications. Here laminar-turbulent transition within the boundary-layer over the nose cones can lead to significant increases in drag. For aeroengine applications this has negative implications for the fuel efficiency through increased noise and energy dissipation, and for projectile applications this has negative implications for control and targeting. Furthermore, flows arising from rotating disks are present in types of chemical vapour deposition (CVD) reactors used for depositing thin films of optical and electrical materials on substrates in the electrochemical industry. Such reactors operate by forcing a carrier gas containing the reactive molecules onto the substrate held within a disk-like support placed horizontally in the flow. The gas flow can be considered as a uniform axial flow incident on a rotating disk, and it is desirable that the flow close to the substrate is free from instability to ensure uniform deposition. Understanding the stability of such boundary-layer flows and developing strategies to maintain laminar flow will lead to modifications in the design of these applications and enable significant cost savings. Although numerous visualization studies of the above flows have been conducted by Kobayashi and his team, previous theoretical research into the stability of rotating three-dimensional boundary-layer flows has been focused on the disk rotating in still fluid. In this talk the speaker will review his theoretical work on the stability of boundary-layer flows over the above rotating bodies, both in and out of an imposed axial flow. The work can be considered as a direct extension of Lingwood's earlier work on the rotating disk and a preliminary study with regard to the above applications. The results of convective and absolute instability analyses are presented (using numerical and asymptotic methods) with a view to discussing possible future collaboration with KTH's experimental team.

Tid och plats: Torsdagen den 27 november kl. 10.30 i seminarierummet, Institutionen för mekanik, KTH, Teknikringen 8.

ALGEBRAIC GEOMETRY SEMINAR

Holger Brenner: Deformations of vector bundles and the localization problem in tight closure

Abstract: We translate the algebraic theory of tight closure into a more geometric setting. In particular we use the language of strongly semistable vector bundles and of torsors to establish inclusion and exclusion results. We give examples that strong semistability and tight closure behave weirdly under arithmetic and under geometric deformations. The last example, which is joint work with Paul Monsky, shows also that tight closure does not commute with localization.

Tid och plats: Onsdagen den 26 november kl. 13.15 – 15.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

MATEMATISKA KOLLOKVIET I UPPSALA

Lars Andersson: Black holes, horizons and stability

Abstract: Black holes play a central role in astronomy. Black hole mergers represent some of the most energetic phenomena in the universe, and gravitational wave astronomy is expected to give important new cosmological data.

Motivated by these facts, the analysis and geometry of black hole spacetimes has emerged as one of the central fields in numerical and mathematical relativity.

I will discuss some recent developments, including the results on the structure of apparent horizons and decay estimates for wave equations on black hole spacetimes.

Tid och plats: Fredagen den 28 november kl. 15.15 – 16.15 i Polhemsalen, Ångströmlaboratoriet, Uppsala universitet. Kaffe/te serveras utanför föreläsningssalen kl. 14.55.

KTH/NORDITA/SU SEMINAR IN THEORETICAL PHYSICS

David Haviland: Intermodulation Atomic Force Microscopy

Abstract: Atomic Force Microscopy (AFM) is a powerful tool to map the topography of a wide variety of surfaces at the nanometer scale, from insulators to conductors, for both soft and hard matter. Beyond topography mapping, the surface analysis power of the AFM lies in its ability to measure tip-surface forces. Today such measurements can only be done in a quasistatic way, and presently there is great interest in the AFM community to develop dynamic AFM methods which can more rapidly extract the tip-surface forces while scanning an oscillating cantilever over the surface. I will discuss these developments and our approach to this problem, which is based on the nonlinear dynamics of the oscillating cantilever when driven with two pure tones.

Tid och plats: Onsdagen den 3 december kl. 11.00 – 12.00 i sal FA31, Roslagstullsbacken 21, AlbaNova universitetscentrum.

WELCOME TO CIAM OUTREACH

You are invited to take part in CIAM Outreach. This is organized by Center for Industrial and Applied Mathematics (CIAM), and it will take place on Wednesday, November 26, 2008, at 13.00–20.00 in room K1, KTH, Teknikringen 56, entrance floor.

CIAM Outreach is a yearly event, where we try to get people interested in CIAM together to get acquainted and to listen to some CIAM results. This time we are trying to have a lighter program with more popular lectures. In this way we try to reach also a wider range of KTH students. In fact the program will start by a presentation by Anne Lidgard from Vinnova, who got her complete education (including the Ph.D.) from KTH and who was a student union president (kårordförande). We end the event by a buffet, where it will be possible to mingle and get to know each other and CIAM. We have the following program:

- Introduction by Anne Lidgard.
- 2007 CIAM award for best master thesis. Winner 2007: Andreas Molin Eklund.
- Presentations of ongoing research projects by CIAM Ph.D. students.
- Buffet and mingle. The buffet is served at Lindstedtsvägen 15.

You are very welcome. If you like to attend the buffet, we would appreciate if you could contact Marie Lundin (malund@math.kth.se) no later than Friday, November 21.

Anders Lindquist
Director of CIAM

SEMINARIUM I STATISTIK

Gebrenegus Ghilagaber och Rolf Larsson: Maximum likelihood adjustment of anticipatory covariates in analysing retrospective survey data

Abstract: We propose a maximum likelihood (ML) procedure to estimate parameters of a multiplicative hazard model in the presence of anticipatory covariates — covariates in life-course data that do not follow the temporal order of events. The issues are illustrated by estimating effects of educational level on risks of divorce in a piecewise-constant hazard model. For individuals with anticipatory educational level, we compute conditional probabilities of having attained the reported level before marriage. These probabilities are then used as weights in their contribution to the likelihood from which the adjusted parameters are derived. The results build on conventional wisdom concerning educational gradients of divorce, but our results reveal a much stronger effect of education than those obtained from anticipatory analysis. This is contrary to earlier results from a Bayesian analysis of the same data set, where estimates of the relative risks across educational levels were much larger in anticipatory analysis than those obtained from the Bayes-adjusted model.

Tid och plats: Onsdagen den 3 december kl. 13.00 i sal B705, Statistiska institutionen, SU, Universitetsvägen 10B, plan 7, Frescati.

GRADUATE READING COURSE IN ALGEBRAIC STATISTICS

The last fifteen years have seen an increased use of methods from algebraic geometry, commutative algebra, and combinatorics to solve problems in statistics and its applications. This has stimulated the development of new methods both in algebra and statistics. The area with most applications of algebraic statistics so far is computational biology.

We will use the following book: MATHIAS DRTON, BERND STURMFELS and SETH SULLIVANT, *Lectures on Algebraic Statistics*. Oberwolfach Seminars Series, Birkhauser Verlag. The book has not yet been published. It will be released in December 2008.

Time and place: Fridays at 15–17 from November 28 in seminar room 3733, Department of Mathematics, KTH, Lindstedtsvägen 25, floor 7.

Welcome!

Alexander Engström

Timo Koski

Lars Svensson

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 2008. 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>.

Old information

Money to apply for

11. Stiftelsen Anna-Greta och Holger Crafoords fond utlyser bidrag och anslag för att främja grundforskning inom matematik och vissa naturvetenskaper. Såväl enskilda som institutioner kan beviljas medel för bland annat vetenskaplig verksamhet, vetenskapliga konferenser och inbjudan av utländska gästforskare. Bidrag och anslag delas ut företrädesvis till unga forskare. Sista ansökningsdag är den 1 mars 2009. Web-info: http://www.kva.se/KVA_Root/swe/awards/scholarships/detail_scholarships.asp?grantsId=11&br=ns&ver=6up.
12. Stiftelsen G. S. Magnusons fond utdelar stipendier och anslag inom ämnesområdet matematik för följande ändamål: Stöd till doktorander. Stöd till den som önskar ytterligare meriterna sig efter doktorsexamen. Stöd till svenska forskare för forskning hemma eller i utlandet samt för inbjudan av utländska gästforskare. Bidrag för att kvarhålla forskare inom landet. Stöd till den som inom sin verksamhet utnyttjar matematik och som önskar bidrag till vetenskaplig förkovran inom ämnet. Sista ansökningsdag är den 2 februari 2009. Web-info: http://www.kva.se/KVA_Root/swe/awards/scholarships/detail_scholarships.asp?grantsId=45.

(Continued on the next page.)

Jobs to apply for

13. KTH söker en doktorand i beräkningsmatematisk modellering. Sista ansökningsdag är den 21 november. Web-info: <http://www.kth.se/aktuellt/tjanster/2/ShowAdd.aspx?ID=139350>.
 14. KTH utlyser en postdoc-tjänst i beräkningsmatematisk modellering. Sista ansökningsdag är den 21 november. Web-info: <http://www.kth.se/aktuellt/tjanster/2/ShowAdd.aspx?ID=139361>.
 15. Lunds universitet söker en biträdande universitetslektor (associate senior lecturer) i matematik med inriktning mot icke-linjära partiella differentialekvationer. Sista ansökningsdag är den 28 november. Web-info: http://www.science.lu.se/upload/LUPDF/natvet/Utlysningar/081128_3331e.pdf.
 16. Københavns Universitet söker doktorander i matematik. Sista ansökningsdag är den 1 januari 2009. Web-info: <http://www.math.ku.dk/english/programmes/ph.d/apply/>.
 17. Institut Mittag-Leffler announces a number of Post Doctoral Fellowship Grants for the academic year 2009/2010. The subject areas for the year's two programs are: Mathematical Logic: set theory and model theory (September 1 – December 15, 2009). Dynamics and PDE's (January 15 – June 15, 2010). Last day for application is January 20, 2009. Web-info: <http://www.mittag-leffler.se/programs/0910/grants.php>.
 18. Umeå universitet söker två universitetslektorer i matematik, varav en är med inriktning mot matematisk analys. Sista ansökningsdag är den 15 december. Web-info: http://www.umu.se/umu/aktuellt/arkiv/lediga_tjanster/312-3204,3036-08.html.
 19. Umeå universitet söker en professor i matematisk statistik. Sista ansökningsdag är den 15 december. Web-info: http://www.umu.se/umu/aktuellt/arkiv/lediga_tjanster/311-3037-08.html.
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