



BRÅKET



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

NR 40

FREDAGEN DEN 5 DECEMBER 2008

BRÅKET

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

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Institutionen för matematik
KTH
100 44 Stockholm

Sista manustid för nästa nummer:
Torsdagen den 11 december
kl. 13.00.

Disputation i matematik

Fredrik Nordström skall disputeras vid KTH på avhandlingen *Cofinality Properties of Categories of Chain Complexes* tisdagen den 16 december kl. 13.00. Se sidan 7.

Nästa veckas nummer

av Bråket blir det sista före jul-uppehållet. Numret därefter utkommer den 9 januari 2009.

SEMINARIER

Må 12–08 kl. 9.00–9.05. Nobelföreläsningarna 2008.
Bo Sundqvist, Kungl. Vetenskapsakademiens
preses: *Introduktion*. Aula Magna, SU.

Fortsättning på nästa sida.

Automorphic forms, number theory, and computation

En workshop med denna titel skall äga rum i Uppsala den 8–10 december. Se sidan 4.

Disputation i mekanik

Espen Åkervik skall disputeras på avhandlingen *Global stability and feedback control of boundary layer flows* fredagen den 5 december kl. 10.30 i sal E1, KTH, Lindstedtsvägen 3, b.v. Se Bråket nr 38 sidan 7.

Disputation i matematik

Rikard Olofsson skall disputeras på avhandlingen *Problems in Number Theory related to Mathematical Physics* måndagen den 8 december kl. 13.00 i sal F3, KTH, Lindstedtsvägen 26, b.v. Se Bråket nr 39 sidan 12.

Disputation i matematik

Salla Franzén skall disputeras vid SU på avhandlingen *On Propagation of Boundary Continuity for Domains in Complex Space* fredagen den 19 december kl. 10.00. Se sidan 8.

Disputation i matematisk statistik

Mathias Lindholm skall disputeras vid SU på avhandlingen *Stochastic Epidemic Models: Different Aspects of Heterogeneity* fredagen den 19 december kl. 13.00. Se sidan 6.

Money, jobs: Se sidorna 11–12.

Seminarier (fortsättning)

- Må 12–08 kl. 9.05–9.45. Nobelföreläsning i fysik.** Pristagaren **Yoichiro Nambu** föreläsning kommer att framföras av **Giovanni Jona-Lasinio**, La Sapienza, University of Rome, Italien: *Spontaneous symmetry breaking in particle physics: a case of cross fertilization*. Aula Magna, SU.
- Må 12–08 kl. 9.45–10.25. Nobelföreläsning i fysik.** **Makoto Kobayashi**, High Energy Accelerator Research Organization, Tsukuba, Japan: *CP violation and flavour mixing*. Aula Magna, SU.
- Må 12–08 kl. 10.25–11.05. Nobelföreläsning i fysik.** **Toshihide Maskawa**, Yukawa Institute for Theoretical Physics, Kyoto University och Kyoto Sangyo University, Japan: *What did CP violation tell us?* Aula Magna, SU.
Toshihide Maskawas föreläsning kommer att hållas på japanska, men en engelsk översättning kommer att visas på en separat skärm.
- Må 12–08 kl. 12.30–13.10. Nobelföreläsning i kemi.** **Osamu Shimomura**, Marine Biological Laboratory, Woods Hole, USA, och Boston University Medical School, USA: *Discovery of Green Fluorescent Protein, GFP*. Aula Magna, SU.
- Må 12–08 kl. 13.10–13.50. Nobelföreläsning i kemi.** **Martin Chalfie**, Columbia University, New York, USA: *GFP: Lighting up life*. Aula Magna, SU.
- Må 12–08 kl. 13.50–14.30. Nobelföreläsning i kemi.** **Roger Y. Tsien**, Howard Hughes Medical Institute, University of California, San Diego, La Jolla, USA: *Constructing and exploiting the fluorescent protein paint box*. Aula Magna, SU.
- Må 12–08 kl. 15.00–15.50. Nobelföreläsning i ekonomi.** **Paul Krugman**, Princeton University, USA: *Increasing returns*. Aula Magna, SU.
- Må 12–08 kl. 15.15–17.00. Seminarium i matematisk statistik.** **Professor Holger Rootzén**, Chalmers tekniska högskola, Göteborg: *Pitting Corrosion: analysis of designed experiments with extreme value distributed responses*. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 5.
- Ti 12–09 kl. 13.15. Plurikomplexa seminariet.** **Mounir Nisse**, Paris: *Coamoebas, Descartes' rule, and Harnack curves*. Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 6.
- Ti 12–09 kl. 15.30–16.30. Institut Mittag-Leffler Seminar.** **Thomas Bäckdahl**, Linköpings universitet: *Multipole moments of stationary spacetimes*. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 7.
- On 12–10 kl. 10.00–11.00. Presentation av examensarbete i matematik** (30 högskolepoäng, fördjupningsnivå). **Karin Grankvist** och **Janne Åkerström**: *Dualitetsmetoder i stokastisk analys*. Handledare: **Yishao Zhou**. Sal 21, hus 5, Matematiska institutionen, SU, Kräftriket. Se sidan 8.
- On 12–10 kl. 10.00–11.45. Logikseminariet Stockholm-Uppsala.** **Docent Olga Antonova**, Filosofiska institutionen, Universitetet i Sankt Petersburg: *The modern categories of mathematical reason and their genesis*. Sal 16, hus 5, Matematiska institutionen, SU, Kräftriket.
- On 12–10 kl. 10.15–12.00. Kombinatorikseminarium.** **Anders Björner**: *Användning av FKG och liknande olikheter i extremal kombinatorik*. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 39 sidan 7. Se även kommentaren överst på nästa sida.

Fortsättning på nästa sida.

Seminarier (fortsättning)

Observera att Anders Björners seminarium har flyttats till den 10 december. I Bråket nr 39 anges fel dag för detta seminarium.

- On 12–10 kl. 11.00–12.00. KTH/Nordita/SU Seminar in Theoretical Physics.** Jens Hoppe, Matematik, KTH: *M-brane singularity formation and zero energy singlet state*. Sal FA31, Roslagstullsbacken 21, AlbaNova universitetscentrum.
- On 12–10 kl. 13.00. Seminarium i statistik.** Pär Stockhammar och Lars-Erik Öller: *On the probability distribution of economic growth*. Sal B705, Statistiska institutionen, SU, Universitetsvägen 10B, plan 7, Frescati. Se Bråket nr 39 sidan 13.
- On 12–10 kl. 13.15–15.00. Algebra and Geometry Seminar.** Torsten Ekedahl: *Abstract Möbius inversion*. Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 9.
- On 12–10 kl. 16.00. KTH/SU Mathematics Colloquium.** Nikolai Vorobiev, University of Bath, England: *Compact approximations and topological complexity of definable sets*. Sal 14, hus 5, Matematiska institutionen, SU, Kräftriket. Kaffe/te serveras från kl. 15.30 i institutionens lunchrum. Se Bråket nr 39 sidan 11.
- To 12–11 kl. 14.00–15.00. Institut Mittag-Leffler Seminar.** Juan A. Valiente Kroon, Queen Mary, University of London: *Regularity conditions at spatial infinity revisited*. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 9.
- To 12–11 kl. 14.15–15.00. Seminarium i finansiell matematik.** (Observera dagen och tiden!) Jérémie Finas presenterar sitt examensarbete: *Forecasting power prices on the French electricity market — An overview*. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 39 sidan 13.
- To 12–11 kl. 15.30–16.30. Institut Mittag-Leffler Seminar.** Todd Oliynik, Monash University, Australia: *The fast Newtonian limit for perfect fluids*. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 9.
- To 12–11 kl. 19.00–21.00. Populärvetenskaplig julföreläsning i fysik.** Carl-Olof Fägerlind och Max Kesselberg visar historiska och mindre historiska fysikaliska experiment. *Välkomna till en experimentell exposé i Faradays anda!* Sal FD5 (The Svedbergsalen), Roslagstullsbacken 21, AlbaNova universitetscentrum.
- Fr 12–12 kl. 13.15. Seminarium i teoretisk datalogi.** Dilian Gurov, Teorigruppen, KTH CSC: *Reducing behavioural properties to structural properties of programs with procedures*. Rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5. Se sidan 11.
- Fr 12–12 kl. 13.15–14.15. Graduate Student Seminar.** Christian Lundkvist, Matematik, KTH: *What is a stack?* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 5.
- Fr 12–12 kl. 15.15–16.15. Matematiska kollokviet i Uppsala.** Ken Brown, Glasgow: *Small infinite non-commutative groups*. Siegbahnsalen, Ångströmlaboratoriet, Uppsala universitet. Kaffe/te serveras utanför föreläsningssalen kl. 14.55. Se sidan 10.
- On 12–17 kl. 18.00–19.00. Offentlig föreläsning på Kungl. Vetenskapsakademien.** Anders Björner, Johan Håstad och Torsten Ekedahl: *Primtalen — en mångtusenårig gåta*. Kungl. Vetenskapsakademien, Lilla Frescativägen 4A, Stockholm. Se sidan 10.

**AUTOMORPHIC FORMS, NUMBER THEORY
AND COMPUTATION**

**Workshop in honour of Dennis Hejhal
on the occasion of his 60th birthday**

The workshop will take place at the Department of Mathematics, Uppsala University, from December 8 to December 10, 2008. All lectures will take place in room 80121.

General information about the workshop can be found at <http://www.math.uu.se/~astrombe/DNA/hejhal60/workshop.html>. A detailed program for the workshop (including abstracts to some of the lectures) can be found at <http://www.math.uu.se/~astrombe/DNA/hejhal60/prg.html>. The program (without abstracts) is also given below:

Monday, December 8

- 10.00–10.30 **Jay Jorgenson:** *Spectral asymptotics on elliptically degenerating Riemann surfaces.*
- 10.40–11.25 **Samuel Patterson:** *The life of Kurt Heegner.*
- 11.35–12.20 **Jim Haglund:** *Some multivariate conjectures involving the zeros of polynomials and analytic functions.*
- 12.30–13.00 **Holger Then:** *Numerical computation of Maass cusp forms. How to find all eigenvalues in a given interval.*
Lunch.
- 14.45–15.30 **Fredrik Strömberg:** *On computations of vector-valued Poincaré series and harmonic weak Maass forms.*
- 16.00–16.30 **Andrew Booker:** *Computing automorphic forms on $GL(2)$ and $GL(3)$.*
- 16.40–17.10 **Andreas Strömbergsson:** *Rigorous computation of Maass forms.*

Tuesday, December 9

- 10.00–10.45 **Nikolai Proskurin:** *On the zeros of the L -function associated to the cubic theta function.*
- 10.55–11.40 **Christopher Hughes:** *Moments of $S(t)$.*
- 11.50–12.20 **Stefan Lemurell:** *Deformations and Maass waveforms.*
Lunch.
- 14.00–14.45 **Jens Marklof:** *Horospherical averages and applications.*
- 15.00–
15.30 **Celebration** in the lunch and coffee room (4th floor) of the Department of Mathematics.
- 16.15–16.45 **Dennis Hejhal:** *Eigenvalues, gaussians, and zeros: some remarks.*
- 17.00–17.30 **Alexei Venkov:** *A classical approach to the Maass forms on the Jacobi half-space.*

Wednesday, December 10

- 10.15–11.00 **Morten Risager:** *Distribution of hyperbolic lattice points.*
- 11.15–12.00 **Pär Kurlberg:** *Dynamical analogues of the Mordell-Lang Conjecture and the Mumford gap principle.*
- 12.15–13.00 **Yiannis Petridis:** *On embedded eigenvalues.*
Lunch.
- 14.30–15.00 **Peter Sarnak:** *Unipotent orbits at prime exponents* (the talk is presented by Andreas Strömbergsson).
- 15.10–15.40 **Dieter Mayer:** *The transfer operator approach to Hecke triangle groups.*
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SEMINARIUM I MATEMATISK STATISTIK

Holger Rootzén:

Pitting Corrosion: analysis of designed experiments with extreme value distributed responses

Abstract: This talk discusses how Extreme Value Statistics can be used to validate and improve designed experiments with extremal responses, and how to extrapolate and compare results.

A main motivation is corrosion tests: Localized, or “pitting”, corrosion can limit the usefulness of magnesium and other new lightweight materials aimed at reducing weight, and thus CO₂ emissions from cars. It makes judicious choice of alloys and surface treatments necessary. Standard methods to evaluate corrosion test are based on analysing weight loss by ANOVA. These methods may be misleading in two ways. Usually it is not weight loss but the risk of perforation, i.e. the depth of the deepest pit which is of interest. Further the standard ANOVA assumptions of normality and homogeneity of variances typically are not satisfied by pit depth measurements, and do not give credible extrapolation into extreme tails.

The talk presents a streamlined approach to analysis of such experiments. It consists of

- 1) a preliminary analysis to check that the experiment has worked out as intended,
- 2) a separate analysis for each individual experimental condition, and
- 3) a strategy for pairwise comparisons.

Of particular interest is to try to separate situations with many but shallow pits from potentially more dangerous situations with rare but deep pits.

Further, a class of hierarchical random effects models for extreme value data is discussed. The models are obtained by mixing extreme value distributions over positive stable distributions. They open up exciting new possibilities to develop extreme value analogues of normal random effects models.

The big challenge is to develop a full theory of design and analysis of experiments with extreme value distributed responses — the present results are just an early beginning.

Tid och plats: Måndagen den 8 december kl. 15.15–17.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

GRADUATE STUDENT SEMINAR

Christian Lundkvist: What is a stack?

Abstract: Stacks are useful tools in algebraic geometry for constructing so-called *moduli spaces*. A moduli space is a space whose points correspond to certain geometric objects one is interested in. For instance, the *Grassmannian* $\text{Gr}(r, n)$ is a moduli space whose points correspond to r -dimensional linear subspaces of the projective space \mathbf{P}^n . Another prominent example is the moduli space \mathcal{M}_g whose points correspond to Riemann surfaces of genus g . I will start by describing how the machinery of categories and functors is well suited to deal with many questions regarding existence of moduli spaces. Then I will show some situations where the use of functors is not suitable, and one is then forced to introduce stacks to tackle the problems that arise.

Tid och plats: Fredagen den 12 december kl. 13.15–14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

PLURIKOMPLEXA SEMINARIET

Mounir Nisse:

Coamoebas, Descartes' rule, and Harnack curves

Abstract: I start by giving some geometrical and topological properties of the coamoebas of complex algebraic hypersurfaces, in particular the case of algebraic plane curves. The aim of the talk is to present an analogue in two variables of Descartes' sign rule for polynomials having support at all the integer points of its Newton segment. Using some geometric properties of coamoebas, we show that the support of the defining polynomial of a Harnack curve equals the full set of lattice points of the Newton polygon. Moreover, the monomial signs are well determined as soon as we fix one of them.

Tid och plats: Tisdagen den 9 december kl. 13.15 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

DISPUTATION I MATEMATISK STATISTIK

Mathias Lindholm

skall disputeras på avhandlingen

**Stochastic Epidemic Models:
Different Aspects of Heterogeneity**

fredagen den 19 december 2008 kl. 13.00 i sal 14, hus 5, Matematiska institutionen, SU, Kräftriket. Till opponent har utsetts *professor Gianpaolo Scalia Tomba*, Roms universitet 2, Italien.

Abstract of the thesis

This thesis is concerned with the study of stochastic epidemic models for infectious diseases in heterogeneous populations. All diseases treated are of SIR type, i.e. individuals are either Susceptible, Infectious or Recovered (and immune). The transitions between these states are according to $S \rightarrow I \rightarrow R$.

The thesis consists of five papers. Papers I and II treat approximations for the distribution of the time to extinction. In Paper I, a sub-community version of the SIR model with demography is considered. The interest is in how the distribution of the time to extinction is affected by varying the degree of interaction between the sub-communities. Paper II is concerned with a two-type version of Bartlett's model. The distribution of the time to extinction is studied when the difference in susceptibility/infectivity between the types of individuals is varied.

Papers III and IV treat random intersection graphs with tunable clustering. In Paper III a Reed-Frost epidemic is run on such a random intersection graph. The critical parameter R_0 and the probability of a large outbreak are derived, and it is investigated how these quantities are affected by the clustering in the graph. In Paper IV the interest is in the component structure of such a graph, i.e. the size and the emergence of a giant component is studied.

The last paper, Paper V, treats the situation when a simple epidemic is running in a varying environment. A varying environment is in this context any external factor that affects the contact rate in the population, but is itself unaffected by the population. The model treated is a term-time forced version of the stochastic general epidemic, where the contact rate is modelled by an alternating renewal process. A threshold parameter R_* and the probability of a large outbreak are derived and studied.

INSTITUT MITTAG-LEFFLER SEMINAR

Thomas Bäckdahl:

Multipole moments of stationary spacetimes

Abstract: The relativistic multipole moments for stationary asymptotically flat spacetimes were introduced by Geroch and Hansen in the seventies. These multipole moments give an asymptotic description of the gravitational field in a coordinate independent way. It has been a long standing conjecture that these multipole moments give a complete characterization of the stationary spacetimes. Much progress toward a proof has been made over the years. However, there is one remaining difficult task: to prove that a spacetime exists with an *a priori* given arbitrary set of multipole moments subject to some given condition. Here we present such a condition for the axisymmetric case, and prove that it is both necessary and sufficient. In the process we get a simplified scheme for computation of the multipole moments as well as a method to generate a solution with a specified set of multipole moments.

Tid och plats: Tisdagen den 9 december kl. 15.30–16.30 vid Institut Mittag-Leffler, Aura-vägen 17, Djursholm.

DISPUTATION I MATEMATIK

Fredrik Nordström

skall disputeras på avhandlingen

Cofinality Properties of Categories of Chain Complexes

tisdagen den 16 december 2008 kl. 13.00 i sal F3, KTH, Lindstedtsvägen 26, b.v. Till opponent har utsetts *professor Kathryn Hess*, Lausanne, Schweiz.

Abstract of the thesis

This thesis treats a family of categories, the chain categories of an A -module M , and functors indexed by them. Among the chain categories are two classical constructions; the category of finitely generated projective A -modules, and the category of finitely generated free A -modules, here denoted by $P_0(0)$ and $\text{Sing}(0)$ respectively. The focus of this thesis is on how to construct homotopy colimits of functors indexed by chain categories, and taking values in non-negative chain complexes of A -modules.

One consequence of Lazard's theorem is that if M is flat, then all functors over $\text{Sing}(M)$ are flat; that is, the homotopy colimits of these functors are weakly equivalent to the ordinary colimits. A motivating question has been to understand when functors over $\text{Sing}(M)$ are flat for non-flat M . In particular, when the forgetful functor U_M is flat. One of the results obtained is that if A is Noetherian, then U_M is flat over many chain categories, and this property is independent of M . In contrast, if A is commutative, then the pointwise tensor product $U_M \otimes U_M$ is defined, and this is not a flat functor in general, even if U_M is flat.

The key notion used to study these questions is that of a cofinal functor. Among the main results are the cofinality of various inclusion functors among the chain categories themselves, and the existence, construction and classification of cofinal simplicial objects in $P_0(M)$ and $\text{Sing}(M)$. Also, a method to construct flat resolutions of functors indexed by P_0 and taking values in A -modules is developed (but applicability of this construction depends on severe restrictions on M). These methods are used to compute the homotopy colimits of several functors defined over various chain categories.

PRESENTATION AV EXAMENSARBETE I MATEMATIK

**Karin Grankvist och Janne Åkerström:
Dualitetsmetoder i stokastisk analys**

Handledare: Yishao Zhou.

Sammanfattning: Denna uppsats behandlar studiet av optimeringsproblem, särskilt stokastiska sådana. Vi studerar de fascinerande och kraftfulla resultat som dualitetsmetoder för optimering, applicerade på stokastiska miljöer, ger. Vi inleder med att grundligt förklara och sedan fördjupa oss i de i sig åtskilda delarna dualitetsteori och Itôkalkyl, för att i slutet visa att det är först när de används tillsammans som dessa metoder för optimering kommer till sin fulla rätt.

Tid och plats: Onsdagen den 10 december kl. 10.00–11.00 i sal 21, hus 5, Matematiska institutionen, SU, Kräftriket.

DISPUTATION I MATEMATIK

Salla Franzén

skall disputeras på avhandlingen

**On Propagation of Boundary Continuity
for Domains in Complex Space**

fredagen den 19 december 2008 kl. 10.00 i sal 14, hus 5, Matematiska institutionen, SU, Kräftriket. Till opponent har utsetts *professor Ragnar Sigurdsson*, University of Iceland.

Abstract of the thesis

We consider continuity properties of analytic functions in bounded domains in complex space, focusing on the following two questions:

Question 1. Given a bounded domain G in complex affine n -space. For which subsets S of the boundary of G does the following hold? If f is a bounded function which is analytic in G and extends continuously to the union of G and S , then f extends continuously to the closure of G .

Question 2. Given a domain G as above and a function f analytic in G and continuous in the closure of G . For which subsets S of the boundary is the rate of continuity of f on the closure of G determined already by its rate of continuity along S ?

Previously it was known that in some cases, the set S may be taken to be the Shilov boundary of the algebra of analytic functions on the domain which are continuous on the closure of the domain, but examples when this is not sufficient were also known.

In Paper I we prove that for a bounded, smoothly bounded pseudoconvex domain G in two-dimensional complex affine space, one may take for S an open neighbourhood of the Shilov boundary (in the boundary of the domain G). This is joint work with B. Jöricke.

Paper II considers smoothly bounded Reinhardt domains in two dimensions and complete Reinhardt domains in complex affine n -space. We prove that in many cases one may let S be the Shilov boundary. Moreover, the respective continuity properties propagate to the closure of the envelope of holomorphy of the domain.

Paper III considers pseudoconvex Hartogs domains with connected vertical sections in two dimensions. We prove that in some cases S may be taken to be the Shilov boundary and give examples for when this is not enough.

ALGEBRA AND GEOMETRY SEMINAR

Torsten Ekedahl:

Abstract Möbius inversion

Abstract: The Möbius inversion formula, or more particularly the inclusion/exclusion principle, is a very powerful combinatoric method with applications outside of combinatorics as for example in the case of computing the Euler characteristic of a space covered by open subsets in terms of the Euler characteristic of intersections of the covering opens. There are, however, situations that go beyond the usual situation. One may for instance have a group acting on a set and a covering of the set by subsets, where the elements of the covering are permuted among themselves by the group action without being individually stabilized by it. This situation leads to a generalized Möbius inversion formula, which roughly speaking mixes the ordinary formula with permutation characters for the action of the group on the covering.

I will present an axiomatic approach to a generalized inversion formula. Somewhat surprisingly the axiomatics involve a cosimplicial ring, which is also a simplicial abelian group with relations between the two sets of data. Some examples will then be discussed.

Tid och plats: Onsdagen den 10 december kl. 13.15–15.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

INSTITUT MITTAG-LEFFLER SEMINAR

Juan A. Valiente Kroon:

Regularity conditions at spatial infinity revisited

Abstract: I will discuss a certain type of regularity conditions on initial data sets for the vacuum Einstein field equations, which ensure a certain degree of smoothness of the development at the “critical sets” where null infinity touches spatial infinity. These conditions can be phrased in terms of asymptotic conditions on the freely specifiable data. In particular, it is shown that Kerr data satisfy these regularity conditions. Whether more general stationary data satisfy these conditions remains an open question. Finally, I discuss how these conditions can be used to construct purely radiative data at “past null infinity”.

Tid och plats: Torsdagen den 11 december kl. 14.00–15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

INSTITUT MITTAG-LEFFLER SEMINAR

Todd Oliynik:

The fast Newtonian limit for perfect fluids

Abstract: In this talk, I will outline how energy and dispersive estimates can be used to obtain a rigorous formulation of the Newtonian limit. Time permitting, I will also show how these estimates can be used to justify post-Newtonian expansions to the second order.

Tid och plats: Torsdagen den 11 december kl. 15.30–16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

MATEMATISKA KOLLOKVIET I UPPSALA

Ken Brown:

Small infinite non-commutative groups

Abstract: I will review background, and explain some recent work of myself, Goodearl and Zhang on the structure and classification of Hopf algebras of small Gelfand-Kirillov dimension.

Tid och plats: Fredagen den 12 december kl. 15.15–16.15 i Siegbahnsalen, Ångströmlaboratoriet, Uppsala universitet. Kaffe/te serveras utanför föreläsningssalen kl. 14.55.

OFFENTLIG FÖRELÄSNING

PÅ KUNGL. VETENSKAPSAKADEMIEN

Anders Björner, Johan Håstad och Torsten Ekedahl:

Primtalen — en mångtusenårig gåta

Föreläsningen består av tre delar:

Anders Björner:

Allmänt om primtalen

Sammanfattning: En elementär översikt av vad vi vet (och inte vet) om primtalen från Euklides' bevis för att det finns ett oändligt antal primtal till moderna resultat av Green och Tao som grundar sig bl.a. på idéer från årets Rolf Schockpristagare i matematik Endre Szemerédi. Men fortfarande finns olösta gåtor om primtalen: primtalstvillingar, Goldbachs förmodande.

Johan Håstad:

Användning av primtalen inom kryptering

Sammanfattning: Talaren kommer att diskutera hur primtalen spelar en avgörande roll inom modern kryptografi. Det mest kända exemplet är RSA (efter upphovsmännen Rivest, Shamir och Adleman), som är ett av världens mest använda kryptosystem och en av grundpelarna i många säkerhetslösningar på Internet. RSA bygger på det faktum att det är betydligt lättare att avgöra om ett stort tal är ett primtal än att, om så inte är fallet, faktorisera det i primtal. RSA är dessutom ett så kallat öppet nyckelsystem, vilket gör det möjligt att skicka krypterade meddelanden till personer som man aldrig tidigare har träffat, och det kan även användas till digitala signaturer.

Torsten Ekedahl:

**Riemanns hypotes för zeta-funktionen (1859)
och dess betydelse för primtalen**

Sammanfattning: Riemanns förmodan är det mest berömda öppna problemet inom matematiken. Det är också ett av Clayinstitutets millennieproblem och skulle således ge den som löser det en miljon dollar. Förmodan ger en mycket precis formel för antalet primtal under ett givet tal och skulle ha många tillämpningar såväl inom talteori som inom t.ex. kryptografi.

Talarna: **Anders Björner** är professor i matematik vid KTH och föreståndare för akademiens Institut Mittag-Leffler. **Johan Håstad** är professor i teoretisk datalogi vid KTH. **Torsten Ekedahl** är professor i matematik vid Stockholms universitet. Alla tre är ledamöter av akademiens klass för matematik.

Tid och plats: Onsdagen den 17 december kl. 18.00–19.00 på Kungl. Vetenskapsakademien, Lilla Frescativägen 4A, Stockholm.

SEMINARIUM I TEORETISK DATALOGI

Dilian Gurov:

Reducing behavioural properties to structural properties of programs with procedures

Abstract: There is an intimate link between program structure and behaviour. Exploiting this link to phrase program correctness problems in terms of the structural properties of a program graph rather than in terms of its unfoldings is a useful strategy for making analyses more tractable. This talk presents a characterization of behavioural program properties through sets of structural properties by means of a translation. The characterization is given in the context of a program model, based on control flow graphs of sequential programs with procedures and properties expressed in a fragment of the modal μ -calculus with boxes and greatest fixed-points only. The property translation is based on a tableau construction that conceptually amounts to symbolic execution of the behavioural formula, collecting structural constraints along the way. By keeping track of the subformulae that have been examined, recursion in the structural constraints can be identified and captured by fixed-point formulae. The tableau construction terminates, and the characterization is exact, i.e., the translation is sound and complete. A prototype implementation has been developed. We discuss several applications of the characterization, in particular compositional verification for behavioural properties, based on maximal models.

The talk is based on joint work with Marieke Huisman, University of Twente.

Tid och plats: Fredagen den 12 december kl. 13.15 i rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5.

MONEY, JOBS

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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>.

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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 meritera 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.

Jobs to apply for

13. KTH utlyser postdoc-tjänster (postdoctoral fellowships) i matematik. De sökande förväntas bedriva forskning inom ett av följande områden: Algebraisk geometri, dynamiska system, kombinatorik, komplex analys, matematisk fysik och spektralteori, talteori eller partiella differentialekvationer. Tjänsten varar i ett år men kan förlängas med ytterligare ett år. Sista ansökningsdag är den 7 januari 2009. Web-info: <http://www.math.kth.se/postdocs/>.
 14. 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/>.
 15. 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>.
 16. 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.
 17. 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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