



# BRÅKET



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

NR 9

FREDAGEN DEN 10 MARS 2006

## 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

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Sista manustid för nästa nummer:  
Torsdagen den 16 mars kl. 13.00.

## Disputation i numerisk analys

Andreas Atle disputerar på avhandlingen *Approximations of Integral Equations for Wave-Scattering* torsdagen den 16 mars kl. 10.15 i sal E2, KTH, Lindstedtsvägen 3, b.v. Se Bråket nr 8 sidan 7.

Money, jobs: Se sidorna 10–11.

## SEMINARIER

Fr 03–10 kl. 10.00–12.00. Högre seminarium i språkfilosofi och logik. Peter Pagin presents a paper draft: *Against the knowledge account of assertion*. Rum D700, Filosofiska institutionen, SU.

Fr 03–10 kl. 11.00–12.00. Optimization and Systems Theory Seminar. Anders Forsgren, Optimeringslära och systemteori, KTH: *On the behaviour of the conjugate-gradient method on ill-conditioned problems*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 8 sidan 6.

Fr 03–10 kl. 13.15–14.15. Graduate Student Seminar. Joakim Arnlind, Matematik, KTH: *What is a genus  $g$  Riemann surface?* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 8 sidan 5.

Fr 03–10 kl. 13.30. Hodge Seminar. Roy Skjelnes: *Sheaves and cohomology*. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

Fr 03–10 kl. 14.15. Licentiatseminarium i numerisk analys. Elin Olsson presenterar sin licentiatavhandling: *Mass Conserving Simulations of Two Phase Flow*. Opponent/granskare: Professor Stig Larsson, Chalmers tekniska högskola, Göteborg. Sal D31, KTH, Lindstedtsvägen 17, b.v.

Fortsättning på nästa sida.

## Mini-Symposium in Free Boundary Problems

Detta äger rum vid KTH måndagen den 13 mars. Se sidan 5.

## Kurs

Anders Forsgren: Integer programming — practical algorithms. Se sidan 6.

### Seminarier (fortsättning)

- Må 03–13 kl. 10.15–12.00. Working Seminar on Differential and Homological Geometries.** Sergei Shadrin, SU: *Geometry of the moduli space of curves IV*. Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 5.
- Må 03–13 kl. 13.15. Seminarium i teoretisk datalogi.** Dilian Gurov, Teorigruppen, KTH CSC: *Compositional verification of sequential programs with procedures*. Rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5. Se sidan 7.
- Må 03–13 kl. 18.30. Populärvetenskaplig föreläsning i fysik.** Professor Fredrik Laurell, Laserfysik, KTH: *Lasern — skarpt ljus: Om lasern, dess speciella egenskaper och användning*. Oskar Kleins auditorium, Roslagstullsbacken 21, Alba-Nova universitetscentrum.
- Ti 03–14 kl. 10.15. Plurikomplexa seminariet.** Karl-Heinz Fieseler, Uppsala: *Introduction to basic toric geometry: hard Lefschetz for non-rational polytopes*. Sal 2214, MIC, Polacksbacken, Uppsala universitet. Se sidan 3.
- Ti 03–14 kl. 13.15. Plurikomplexa seminariet.** Slimane Benelkourchi, KTH: *Semi-global uniform integrability for a class of plurisubharmonic functions*. Sal 2215, MIC, Polacksbacken, Uppsala universitet. Se sidan 4.
- On 03–15 kl. 13.00. Seminarium i statistik.** Bertil Wegmann: *Skattning av parametrar i en auktionsmodell*. Sal B705, Statistiska institutionen, SU, Universitetsvägen 10B, plan 7, Frescati.
- On 03–15 kl. 13.15–14.15. Seminarium i analys och dynamiska system.** Thomas Hoffman-Ostenhof, ESI Wien: *Nodal domains and spectral optimal partitions*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.
- On 03–15 kl. 13.15–15.00. Algebra- och geometriseminarium.** Carel Faber, KTH: *On the tautological ring of the moduli space of stable curves of genus 4*. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 6.
- On 03–15 kl. 15.00. Seminarium i matematisk statistik.** Jörgen Backelin, SU: *What effects do ‘different positivity’ yield e.g. in discrete infection propagation modelling?* Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 8.
- To 03–16 kl. 14.00–15.00. Mittag-Leffler Seminar.** Jelena Grbic, University of Aberdeen: *The homotopy type of the complement of the coordinate subspace arrangement*. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 4.
- To 03–16 kl. 14.00–16.00. Kollokvium i filosofi.** Dr Roger Crisp, St. Anne’s College, University of Oxford: *Hedonism reconsidered*. Rum D255, Filosofiska institutionen, SU.
- To 03–16 kl. 15.30–16.30. Mittag-Leffler Seminar.** Christian Schlichtkrull, Universitetet i Bergen: *Cyclic algebraic K-theory and the cyclotomic trace*. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 6.
- Fr 03–17 kl. 13.15–14.15. Graduate Student Seminar.** Daniel Schnellmann, Matematik, KTH: *On the random series  $\sum \pm \lambda^n$* . Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 9.

**Fortsättning på nästa sida.**

**Seminarier (fortsättning)**

- On 03–22 kl. 13.00–14.45. Algebra- och geometriseminarium.** Torsten Ekedahl, SU: *Title to be announced.* Rum 306, hus 6, Matematiska institutionen, SU, Kräft-riket.
- On 03–22 kl. 13.15–14.15. Seminarium i analys och dynamiska system.** Julius Borcea, SU: *A conjectural Hausdorff geometric symphony.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.
- On 03–22 kl. 16.00. KTH/SU Mathematics Colloquium.** Professor Rainer Vogt, Institut für Mathematik, Universität Osnabrück: *Operads, interchange, and iterated loop space structures.* Sal 14, hus 5, Matematiska institutionen, SU, Kräftriket. Se sidan 8.
- To 03–23 kl. 13.15. Seminarium i teoretisk datalogi. (Observera dagen!)** Christoph Sprenger, Departement Informatik, ETH Zürich: *Cryptographically sound theorem proving.* Rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5. Se sidan 7.
- To 03–23 kl. 14.00–15.00. Mittag-Leffler Seminar.** Stefan Schwede, Universität Bonn: *On the homotopy groups of symmetric spectra.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 9.
- To 03–23 kl. 15.30–16.30. Mittag-Leffler Seminar.** Morten Brun, Universitetet i Bergen: *Equivariant cobordism and Witt vectors.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 5.

**PLURIKOMPLEXA SEMINARIET****Karl-Heinz Fieseler:****Introduction to basic toric geometry:  
hard Lefschetz for non-rational polytopes**

*Abstract:* Projective toric varieties  $X \subset \mathbb{P}_N$  can be completely described by lattice polytopes  $P \subset \mathbb{R}^n$  (i.e. with vertices in  $\mathbb{Z}^n$ ), where  $n := \dim X$ . For a simple polytope  $P$  (i.e. at every vertex meet exactly  $n$  edges) the corresponding variety is (almost) smooth, and the Betti numbers of  $X$  are in one-to-one correspondence with the “ $f$ (ace)-vector” of  $P$ , whose  $i$ -th component is the number of  $i$ -dimensional faces of  $P$ . For the characterization of the possible face-vectors the Hard-Lefschetz theorem plays a decisive role (HLT: “The  $k$ -fold cup product with the hyperplane class yields an isomorphism  $H^{n-k}(X) \longrightarrow H^{n+k}(X)$ ”). For non-simple polytopes (and thus singular  $X$ ) the cohomology can be replaced with intersection cohomology (which coincides with cohomology in the smooth case). The corresponding Betti numbers are combinatorial invariants and can be defined recursively for any polytope, not only lattice polytopes. In contrast to the simple case the combinatorial type of such a polytope can in general not be realized by a lattice polytope; hence we cannot at all apply toric varieties. So in order to understand also in this case the combinatorially defined Betti numbers, one needs an intersection cohomology theory for polytopes. Here a counterpart to the Hard-Lefschetz theorem plays an important role. In this talk I describe how Kalle Karu’s proof can be completely understood in terms of elementary operations on polytopes. No prerequisites — neither toric varieties nor intersection cohomology — are required!

*Tid och plats:* Tisdagen den 14 mars kl. 10.15 sal 2214, MIC, Polacksbacken, Uppsala universitet.

## HODGE SEMINAR

### Roy Skjelnes: Sheaves and cohomology

*Abstract:* Sheaves of abelian groups and sheaf cohomology will be recalled. We will thereafter discuss the de Rham resolution of the constant sheaf of differentiable manifolds, and the Dolbeault resolution of holomorphic vector bundles on complex manifolds.

*Tid och plats:* Fredagen den 10 mars kl. 13.30 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

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## PLURIKOMPLEXA SEMINARIET

### Slimane Benelkourchi:

#### Semi-global uniform integrability

#### for a class of plurisubharmonic functions

*Abstract:* In this talk we will consider the global behaviour of a class of plurisubharmonic functions, studied earlier by Lars Hörmander (in a particular case) and by Alexander Brudnyi (in a more general context), in terms of their uniform exponential integrability. The proof of this result involves the use of techniques from pluripotential theory in order to achieve estimates on the plurisubharmonic functions. A key step is a doubling Bernstein-type inequality proved in the polynomial case by Charles Fefferman and Raghavan Narasimhan (for extending results of Alberto Parmeggiani on pseudodifferential operators to higher dimensions), and by Brudnyi in a more general situation. We will give an explicit version and a simple proof.

*Tid och plats:* Tisdagen den 14 mars kl. 13.15 i sal 2215, MIC, Polacksbacken, Uppsala universitet.

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## MITTAG-LEFFLER SEMINAR

### Jelena Grbic:

#### The homotopy type of the complement of the coordinate subspace arrangement

*Abstract:* We study the homotopy type of the complement of a complex coordinate subspace arrangement by studying the connection between its topological and combinatorial structures. An arrangement  $\mathcal{CA} = \{L_1, \dots, L_r\}$  in  $\mathbb{C}^n$  is called coordinate if every  $L_i$  for  $i = 1, \dots, r$  is a coordinate subspace, that is, generated by some subset of the standard basis for  $\mathbb{C}^n$ . The unstable homotopy type of the complement  $U(\mathcal{CA}) := \mathbb{C}^n \setminus \bigcup_{i=1}^r L_i$  of a given coordinate subspace arrangement  $\mathcal{CA}$  will be described by combining the methods of classical homotopy theory with the new achievements of Toric Topology. In particular, a family of arrangements for which the complement is homotopy equivalent to a wedge of spheres is described. One consequence of the above result is an application in commutative algebra: we give a new proof of the Golod result considering the rationality of the Poincaré series of certain local rings. We prove that the Stanley-Reisner rings associated to the complements of arrangements which are homotopy equivalent to a wedge of spheres are Golod, that is, all Massey products in their homology vanish.

*Tid och plats:* Torsdagen den 16 mars kl. 14.00–15.00 vid Institut Mittag-Leffler, Aura-vägen 17, Djursholm.

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### Mini-Symposium in Free Boundary Problems

This will take place on Monday, March 13, 2006, in room D41, KTH, Lindstedtsvägen 17, first floor.

#### *Schedule*

- 10.00–10.50 **Arshak Petrosyan**, Purdue University, West Lafayette: *On geometric and energetic criteria for the regularity of the free boundary in an obstacle-type problem.*
- 10.50–11.10 Coffee.
- 11.10–12.00 **Hayk Mikaelyan**, Max-Planck-Institut, Leipzig: *Convexity of the free boundary for the exterior free boundary problem involving perimeter.*
- 12.00–13.30 Lunch.
- 13.40–14.30 **G. S. Weiss**, Tokyo University: *Self-propagating High temperature Synthesis (SHS) in the high activation energy regime.*
- 14.40–15.30 **John Andersson**, Max-Planck-Institut, Leipzig: *Free boundary singularities for an unstable two phase problem.*
- 15.30–15.50 Coffee.
- 15.50–16.40 **Erik Lindgren**, KTH: *Regularity of a free boundary problem in two dimensions.*

### WORKING SEMINAR ON DIFFERENTIAL AND HOMOLOGICAL GEOMETRIES

**Sergei Shadrin:**

#### **Geometry of the moduli space of curves IV**

*Abstract:* (1) Symmetric functions, semi-infinite Grassmannian, Hirota (Plücker) equations. (2) Generating function for Hurwitz numbers, KP equation. (3) Change of variables in ELSV formula, KdV equation for psi-classes.

*Tid och plats:* Måndagen den 13 mars kl. 10.15–12.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

### MITTAG-LEFFLER SEMINAR

**Morten Brun:**

#### **Equivariant cobordism and Witt vectors**

*Abstract:* The aim of this talk is to explain why the ring of  $G$ -typical Witt vectors on the Lazard ring embeds as a subring of the cobordism ring of unitary manifolds with action of a finite group  $G$ . Dress and Siebeneicher's ring of  $G$ -typical Witt vectors on a commutative ring  $A$  is a variation on the classical Witt ring of  $A$  with underlying set given by the set of maps from the set of conjugacy classes of subgroups of  $G$  to  $A$ . This construction is related to homotopy groups of  $E_\infty G$ -ring spectra. In particular there is a homomorphism from the ring of  $G$ -typical Witt vectors to the ring of equivariant homotopy groups of the spectrum  $MU$ . This homomorphism turns out to be injective because  $MU$  has structure similar to the restriction maps for topological Hochschild homology.

*Tid och plats:* Torsdagen den 23 mars kl. 15.30–16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

**GRADUATE COURSE  
IN OPTIMIZATION AND SYSTEMS THEORY**

**Anders Forsgren:**

**5B5860 Integer programming — practical algorithms, 5 p**

*Summary of contents:* The course deals with theory and algorithms for linear integer programming problems and includes the theory of valid inequalities, duality and relaxations, general algorithms and special purpose algorithms for integer programming problems. In addition, areas like model formulation, linear programming, computational complexity and polyhedral theory are treated on a relatively superficial level.

*Textbook:* G. L. NEMHAUSER & L. A. WOLSEY, *Integer and Combinatorial Optimization*. John Wiley & Sons, New York, 1988. (The majority of Chapters I and II is included in the course.)

*First lecture:* Tuesday, March 14, at 13.15–15.00 in seminar room 3721, Department of Mathematics, KTH, Lindstedtsvägen 25.

For more information, see <http://www.math.kth.se/optsys/research/5B5860/>.

Welcome!

Anders Forsgren

**ALGEBRA- OCH GEOMETRISEMINARIUM**

**Carel Faber:**

**On the tautological ring of the moduli space  
of stable curves of genus 4**

*Abstract:* After introducing the tautological ring of the moduli space of stable  $n$ -pointed curves of genus  $g$  and discussing several results and conjectures concerning it, I will consider the case  $g = 4$  and  $n = 0$ . The cohomology groups of this moduli space were determined recently by Bergström and Tommasi, together with their Hodge structure. All classes are of type  $(p, p)$  and hence presumably algebraic. I will attempt to explain how Pandharipande and I were able to show that they are even tautological.

*Tid och plats:* Onsdagen den 15 mars kl. 13.15–15.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

**MITTAG-LEFFLER SEMINAR**

**Christian Schlichtkrull:**

**Cyclic algebraic  $K$ -theory and the cyclotomic trace**

*Abstract:* The definition of cyclic algebraic  $K$ -theory is similar to the definition of algebraic  $K$ -theory, except that instead of considering the usual classifying space of a category, one uses Waldhausen's cyclic version. In this talk we shall analyse the cyclic algebraic  $K$ -theory in various cases and show how it relates to topological cyclic homology via the cyclotomic trace. We shall try to give a non-technical introduction to these concepts, emphasizing Goodwillie's idea of "counting periodic orbits".

*Tid och plats:* Torsdagen den 16 mars kl. 15.30–16.30 vid Institut Mittag-Leffler, Aura-vägen 17, Djursholm.

## SEMINARIUM I TEORETISK DATALOGI

**Dilian Gurov:**

### **Compositional verification of sequential programs with procedures**

*Abstract:* I present a method for algorithmic, compositional verification of control flow based safety properties of sequential programs with procedures. The application of the method involves three steps: (1) decomposing the desired global property into local properties of the components, (2) proving the correctness of the property decomposition by using a maximal model construction, and (3) verifying that the component implementations obey their local specifications. I shall consider safety properties of the control flow behaviour of programs, as well as of the control flow structure.

The compositional verification method builds on a technique proposed by Grumberg and Long, who use maximal models to reduce compositional verification of finite-state parallel processes to standard model checking. The generalization of the maximal model technique to programs with recursion requires a refinement, since maximal applets are only guaranteed to exist for structural but not for behavioural properties. I therefore present a mixed, two-level approach where local assumptions are structural, while the global guarantee is behavioural.

The proposed verification method is applicable to arbitrary sequential programs with procedures. It is evaluated on an industrial case study taken from the smart card area. By separating the tasks of verifying global and local properties, the method supports secure post-issuance loading of applets onto a smart card.

*Tid och plats:* Måndagen den 13 mars kl. 13.15 i rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5.

## SEMINARIUM I TEORETISK DATALOGI

**Christoph Sprenger:**

### **Cryptographically sound theorem proving**

*Abstract:* Tools for security protocol verification are traditionally based on Dolev-Yao models, which give the adversary complete control over the network and assume cryptography to be perfect. Recently, much research has been devoted to underpinning such symbolic protocol models with sound cryptographic foundations (possibly relaxing the perfect cryptography assumption).

In this talk, I will describe a faithful embedding of the Dolev-Yao-style model of Backes, Pfitzmann, and Waidner (CCS 2003) in the theorem prover Isabelle/HOL. This model provides strong soundness guarantees in the sense of reactive simulatability: essentially arbitrary security properties proved in the symbolic model carry over to the cryptographic realization, and this holds under active attacks and in arbitrary protocol environments. The main challenge in designing a practical formalization of this model is to cope with the complexity of providing such strong guarantees. We have reduced this complexity by abstracting the model into a sound, light-weight formalization that enables both concise property specifications and efficient application of our proof strategies and their supporting proof tools. This yields the first tool-supported framework for symbolically verifying security protocols that enjoys the strong cryptographic soundness guarantees provided by reactive simulatability.

*Tid och plats:* Torsdagen den 23 mars kl. 13.15 i rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5.

SEMINARIUM I MATEMATISK STATISTIK

Jörgen Backelin:

What effects do ‘different ploivity’ yield  
e.g. in discrete infection propagation modelling?

*Abstract:* For some years I have been trying to get some understanding of the dynamics of genetic propagation in a geographically distributed population, where mating and competition between individuals depend on their relative location. Some modelling tools for this seem related to infection spread modelling, and perhaps even more exotic subjects like crystal growth modelling.

A classical approach (by Richardson and others) involves SI infection on the points of an integer lattice, with ‘implosive’ infection events. In this case, the infected area form tends to a fixed but non-circular form. In a study on a continuous set of ‘individuals’, Deijfen by necessity replaced this by ‘explosive’ events, or ‘sneeze driven infection’: Every time an individual sneezes, all susceptible neighbours are infected simultaneously. It is possible to study ‘explosivity’ in the lattice case, too; and I suspect that this difference influences the velocity of the infection spread and the infected area shape.

The talk will mainly be a discussion of ‘work in progress’, and will consist of three parts. I shall describe the setting and discuss what kinds of results we reasonably could expect. The effects of different choices of ‘ploivity’ and ‘adjacency’ will be discussed, with a few actual results (e.g., in deterministic SI infection on  $Z^2$ ). Finally some related general questions about ‘directed Markov processes’ will be posed, mainly in the hope that the audience will be able to explain why all of this is elementary and well-known.

*Tid och plats:* Onsdagen den 15 mars kl. 15.00 i rum 306 (Cramérummet), hus 6, Matematiska institutionen, SU, Kräftriket.

KTH/SU MATHEMATICS COLLOQUIUM

Rainer Vogt:

Operads, interchange, and iterated loop space structures

*Abstract:* Operads encode certain algebraic structures. Originally they were introduced to study iterated loop spaces. The algebraic structure of an  $n$ -fold space  $\Omega^n X$  is encoded by a so-called  $E_n$ -operad. Each  $n$ -fold loop space has an  $E_n$ -structure and each connected space with an  $E_n$ -structure is of the weak homotopy type of an  $n$ -fold loop space. Now  $\Omega^n X$  has  $n$  interchanging single loop space structures. So a space having an  $E_n$ -structure should have  $n$  interchanging  $E_1$ -structures, and a space having an  $E_k$ - and an  $E_l$ -structure which interchange morally should be an  $E_{k+l}$ -space. The talk deals with this question. We recall the notions of an operad, of an  $E_n$ -structure, and of the interchange of two algebraic structures. We then address the above-mentioned problem. If time allows, we apply the obtained results to show that the topological Hochschild homology  $\mathrm{THH}(R)$  of an  $E_{n+1}$ -ring spectrum is an  $E_n$ -ring spectrum and hence has an interesting multiplicative structure if  $n \geq 1$ .

*Remarks:* 1) The result about  $\mathrm{THH}(R)$  was also obtained by Maria Basterra and Mike Mandell using different methods. 2) The talk is about joint work with Zig Fiedorowicz and Roland Schwänzl.

*Tid och plats:* Onsdagen den 22 mars kl. 16.00 i sal 14, hus 5, Matematiska institutionen, SU, Kräftriket.



## GRADUATE STUDENT SEMINAR

**Daniel Schnellmann:**  
**On the random series  $\sum \pm \lambda^n$**

*Abstract:* Consider the random series

$$Y_\lambda = \sum_{n=0}^{\infty} \pm \lambda^n, \text{ for } 0 < \lambda < 1,$$

where the “+” and the “−” signs are chosen independently with probability 1/2. Let  $\nu_\lambda$  be the distribution of  $Y_\lambda$ , i.e.

$$\nu_\lambda(E) = \text{Prob}\{Y_\lambda \in E\}.$$

The question (already posed by Erdős) is: for which  $\lambda \in (0, 1)$  is this distribution absolutely continuous? I will sketch a proof of Peres and Solomyak which shows that  $\nu_\lambda$  is absolutely continuous for a.e.  $\lambda \in (1/2, 1)$ . After that I will explain how the idea of this proof can be applied to solve problems in dynamical systems. The talk will be accessible to anyone who has taken an elementary course in measure theory, respectively probability theory.

*Tid och plats:* Fredagen den 17 mars kl. 13.15–14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

## MITTAG-LEFFLER SEMINAR

**Stefan Schwede:**  
**On the homotopy groups of symmetric spectra**

*Abstract:* The symmetric spectra introduced by Hovey, Shipley and Smith are a convenient model for the stable homotopy category with a nice associative and commutative smash product on the point set level. About the only disadvantage of this model is that the stable equivalences cannot be defined by inverting those morphisms which induce isomorphisms on homotopy groups, because this would leave too many homotopy types. So the conclusion has previously been that the naively defined homotopy groups are often “wrong”, and then their precise relationship to the “true” homotopy groups (i.e., morphisms in the homotopy category from sphere spectra) remained largely mysterious.

In this talk I will discuss extra algebraic structure on the naively defined homotopy groups of symmetric spectra, namely a special kind of action of the monoid of injective self maps of the natural numbers. This extra structure clarifies several issues and explains why the naive homotopy groups are not so wrong after all. For example, with the monoid action included, the naive homotopy groups are just a spectral sequence away from the “true” homotopy groups.

*Tid och plats:* Torsdagen den 23 mars kl. 14.00–15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

## MONEY, JOBS

*Columnist:* Eric Emtander, Department of Mathematics, SU. E-mail: [erice@math.su.se](mailto:erice@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://www.math.su.se/~erice/mj.html>.

Unless stated otherwise, a given date is the last date (e.g. for applications), and the year is 2006. 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](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. Mälardalens högskola utlyser en doktorandtjänst i matematik/tillämpad matematik. Tjänsten tillhör FMB (Forskarskolan i matematik och beräkningsvetenskap). Info: Dmitrii Silvestrov, 021-10 16 67, fax 021-10 13 30, e-post [dmitrii.silvestrov@mdh.se](mailto:dmitrii.silvestrov@mdh.se). Sista ansökningsdag är den 20 mars. Web-info: <http://www.mdh.se/job/VisaAnstallning?id=625>.
12. Uppsala universitet ledigförklarar en tjänst som universitetslektor i matematisk statistik. Sista ansökningsdag är den 22 mars. Web-info: <http://www.personalavd.uu.se/ledigaplatser/528unlekt.html>.
13. Lunds universitet ledigförklarar en tjänst som universitetslektor i matematisk statistik. Sista ansökningsdag är den 22 mars. Web-info: <http://www.lth.se/omlth/ledigatjanster/?aid=204>.
14. NTNU (Norges teknisk-naturvitenskapelige universitet, Trondheim) och Universitetet i Bergen utlyser en doktorandtjänst och en postdoktjänst. Båda har inriktning mot matematisk analys eller numerisk analys. Sista ansökningsdag för båda tjänsterna är den 7 april. Web-info: <http://www.math.ntnu.no/WaveMaker/positions.php>.

### Old information

#### *Money to apply for*

15. Sparbanksstiftelsen Norrbotten kommer att dela ut ett antal stipendier om vardera 25 000 kr till studenter som gör examensarbeten på små och medelstora företag i Norrbotten. Ansökan skall vara inskickad innan examensarbetet påbörjas. Web-info, innehållande regler och kontaktuppgifter: [http://www.kth.se/aktuellt/stipendier/Sparbanksstiftelsen\\_Norrbotten.pdf](http://www.kth.se/aktuellt/stipendier/Sparbanksstiftelsen_Norrbotten.pdf).

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16. Svenska matematikersamfundet utlyser två olika resestipendier avsedda för forskare i matematik som ännu icke avlagt doktorsexamen: Wallenbergsstipendierna är till för att användas som delfinansiering vid kortare utlandsvistelser eller konferensresor. Stipendierna är på högst 3 000 kr per person. Essénstipendierna är avsedda för deltagande i sommarskolor och liknande aktiviteter. Reglerna är samma som för Wallenbergsstipendierna med skillnaden att beloppet kan uppgå till högst 8 000 kr. Sista ansökningsdag är den 31 mars. Web-info: <http://www.math.chalmers.se/~olleh/resebidrag.html>.
  17. Stiftelsen G. S. Magnusons fond utlyser: Till doktorander utdelas stipendier med ett engångsbelopp på normalt 7 000 kr, och till forskare som avlagt doktorsexamen år 2000 eller senare utdelas forskningsanslag med i normalfallet 30 000 kr (0–3 år efter disputation), respektive 50 000 kr (4–6 år efter disputation). Anslag utgår under högst två år i rad för doktorander och högst tre år i rad för disputerade. Sista ansökningsdag är den 31 mars. Web-info: [http://www.kva.se/KVA\\_Root/swe/awards/scholarships/detail\\_scholarships.asp?grantsId=8&br=ie&ver=4up](http://www.kva.se/KVA_Root/swe/awards/scholarships/detail_scholarships.asp?grantsId=8&br=ie&ver=4up).
  18. Från Knut och Alice Wallenbergs Stiftelse ställs anslag till rektors för KTH förfogande för att ”i första hand användas till bidrag för sådana resor, som bäst befordrar ett personligt vetenskapligt utbyte till gagn för svensk forskning. Bidrag skall främst beviljas till yngre forskare. Medel kan även — efter rektors bedömning — undantagsvis disponeras för utländska gästforskare.” Bidrag kan sökas under hela året. Info: Anette Nyström, 08-790 70 59. Web-info: se punkt 4 ovan.
  19. Från Vetenskapsrådet kan konferensbidrag sökas med huvudsyftet att göra det möjligt att inbjuda framstående utländska föredragshållare. Ansökan skall vara inkommen senast två månader innan konferensen äger rum. Ansökningar behandlas ej mellan den 15 juni och den 15 augusti. Info: Mona Berggren, 08-546 44 246, e-post [Mona.Berggren@vr.se](mailto:Mona.Berggren@vr.se). Web-info: <http://www.vr.se/forskning/bidrag/ovrbidrag.jsp?resourceId=822&languageId=1>.
  20. Stiftelsen för internationalisering av högre utbildning och forskning (STINT) erbjuder korttidsstipendier: 2 veckor till 3 månader långa besök. Stipendierna är avsedda för besök vid utländska institutioner, alternativt för att bjuda in en utländsk forskare. De kan ej sökas av doktorander. Ansökan kan göras löpande under året. Info: Agneta Granlund, 08-671 19 95, e-post [agneta.granlund@stint.se](mailto:agneta.granlund@stint.se). Web-info: <http://www.stint.se/index.php?articleId=34>.
  21. Från Vetenskapsrådet kan resebidrag sökas av främst disputerade forskare, av doktorander i undantagsfall. Bidrag kan bland annat sökas för konferensdeltagande (ej posterpresentation), för att representera Sverige i viktiga sammanhang samt för att bjuda in utländska gästforskare. Bidrag för resa till internationellt forskningssamarbete kan också få finansiering. Ansökan skall vara inkommen senast två månader innan resan äger rum. Ansökningar behandlas ej mellan den 15 juni och den 15 augusti. Info: Mona Berggren, 08-546 44 246, e-post [Mona.Berggren@vr.se](mailto:Mona.Berggren@vr.se). Web-info: <http://www.vr.se/forskning/bidrag/ovrbidrag.jsp?resourceId=665&languageId=1>.
  22. Wenner-Gren Stiftelserna utlyser gästföreläsaranslag som ger institutioner bidrag till att bjuda in utländska gästföreläsare m.m. Ansökan kan inlämnas när som helst under året. Web-info: <http://www.swgc.org/>.
  23. Vetenskapsrådets utbildningsvetenskapliga kommitté utlyser konferens- och resebidrag för i första hand unga och/eller nydisputerade forskare. Bidrag kan sökas när som helst under året. Web-info: <http://www.vr.se/omvr/organisation/sida.jsp?unitId=24>.
  24. Svenska institutet ger bidrag för utbildning och forskning utomlands. Sista ansökningsdag varierar för olika länder. Web-info: Se punkt 10 ovan.
- Jobs to apply for*
25. FMB (Forskarskolan i matematik och beräkningsvetenskap) utlyser fem doktorandtjänster och två postdoktjänster. FMB drivs i samarbete mellan Uppsala universitet, Karlstads universitet, Mittuniversitetet och Mälardalens högskola. Sista ansökningsdag är den 20 mars. Web-info: <http://www.math.uu.se/fmb/announcement2006.html>.
  26. Uppsala universitet utlyser en doktorandtjänst i matematik. Grundläggande kunskaper i funktionalanalys, partiella differentialekvationer, numerisk analys och programmering är meriterande. Sista ansökningsdag är den 20 mars. Web-info: <http://www.personalavd.uu.se/ledigplatser/556dorand.html>.
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