BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 17 **ONSDAGEN DEN 30 APRIL 2008**

BRÅKET

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

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Sista manustid för nästa nummer: Torsdagen den 8 maj kl. 13.00.

CIAM/DNA mini-workshop on Computational Number Theory

Denna äger rum vid KTH torsdagen den 15 maj. Se sidan 9.

Kurs

Martin Gulbrandsen: Local aspects of geometric invariant theory. Se sidan 10.

Money, jobs: Se sidorna 10 – 11.

SEMINARIER

On 04–30 kl. 11.00 – 12.00. KTH/Nordita/SU Seminar in Theoretical Physics. Vieri Mastropietro, Università di Roma "Tor Vergata": *Luttinger and Fermi liquids: a constructive renormalization group approach.* Sal FA32, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se Bråket nr 15 sidan 6.

On 04–30 kl. 13.15 – 14.15. Seminarium i analys och dynamiska system. Denis Gaidashev, KTH: *Title to be announced.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

On 04–30 kl. 13.15 – 15.00. Algebra and Geometry Seminar. Torsten Ekedahl, SU: *Plurioperads on functor categories.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se Bråket nr 16 sidan 7.

Fortsättning på nästa sida.

Disputation i datalogi

Jakob Nordström disputerar vid KTH på avhandlingen *Short Proofs May Be Spacious: Understanding Space in Resolution* fredagen den 9 maj kl. 10.00. Se sidorna 6 – 7.

Disputation i statistik

Ellinor Fackle Fornius disputerar på avhandlingen *Optimal Design of Experiments for the Quadratic Logistic Model* fredagen den 9 maj kl. 10.00 i hörsal 4, hus B, SU, Universitetsvägen 10, Frescati. Se Bråket nr 16 sidan 6.

Disputation i statistik

Daniel Bruce disputerar vid SU på avhandlingen *Optimal Design and Inference for Correlated Bernoulli Variables using a Simplified Cox Model* fredagen den 16 maj kl. 10.00. Se sidan 8.

Seminarier (fortsättning)

Må 05–05 kl. 16.00–17.00. Extra kombinatorikseminarium. *(Observera dagen, tiden och lokalen!)* **Niklas Eriksen,** Göteborg: *Permutations with prescribed descents, and fixed point coloured permutations.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

Ti 05–06 kl. 14.00–15.00. Mittag-Leffler Seminar — Plurikomplexa seminariet. Ann-Katrin Herbig, Universität Wien: *Plurisubharmonic defining functions.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 5.

Ti 05–06 kl. 15.30–16.30. Mittag-Leffler Seminar — Plurikomplexa seminariet. Jeff McNeal, Ohio State University: *Non-holomorphic projections and biholomorphic maps.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 4.

On 05–07 kl. 10.15–12.00. Kombinatorikseminarium. Klas Markström, Umeå: *Azuma-Hoeffding inequalities for matrix martingales and random expanders.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 5.

On 05–07 kl. 11.00–12.00. KTH/Nordita/SU Seminar in Theoretical Physics. Francesco Sannino, Odense: *Dynamical stabilization of the Fermi scale: From colliders to cosmology.* Sal FA31, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se Bråket nr 16 sidan 4.

On 05–07 kl. 13.15–14.15. Seminarium i analys och dynamiska system. Mats Andersson, Chalmers tekniska högskola, Göteborg: *Ideals of holomorphic functions and residue currents.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 8.

On 05–07 kl. 13.15. Algebra and Geometry Seminar. Alexander Berglund, SU: *Title to be announced.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

On 05–07 kl. 14.00. Logikseminariet Stockholm-Uppsala. Steve Awodey, Carnegie Mellon University: *Topology and modality.* Rum Å12167, Ångströmlaboratoriet, Uppsala universitet. Se sidan 5.

On 05–07 kl. 14.30–15.30. KCSE (KTH Computational Science and Engineering Centre) Seminar. Universitetslektor Martin Norgren, Skolan för Elektro- och Systemteknik, KTH: *Full Newton method for electromagnetic inverse scattering, utilizing explicit second order derivatives.* PDC:s seminarierum, KTH, Teknikringen 14, plan 3. Se Bråket nr 16 sidan 7.

On 05–07 kl. 15.15. Seminarium i matematisk statistik. Andreas Nordvall Lagerås, Chalmers tekniska högskola, Göteborg: *Branching processes conditioned on extinction.* Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 4.

On 05–07 kl. 19.00. Populärvetenskaplig föreläsning i fysik. Docent Philippe Thébault, Astronomi, SU: *Exoplaneter — sökandet efter andra världar: Om observationer och teori, framgångar och överraskningar.* Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se Bråket nr 16 sidan 6.

To 05–08 kl. 13.15–14.10. DNA-seminariet Uppsala-KTH (Dynamical systems, Number theory, Analysis). Christopher Hughes, The University of York: *Zeros and derivatives.* Sal Å80127, Ångströmlaboratoriet, Uppsala universitet. Se sidan 5.

Fortsättning på nästa sida.

Seminarier (fortsättning)

To 05–08 kl. 14.00 – 15.00. Mittag-Leffler Seminar. Dano Kim, University of Chicago: *L^2 extension of adjoint line bundle sections.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 7.

To 05–08 kl. 14.15 – 15.10. DNA-seminariet Uppsala-KTH (Dynamical systems, Number theory, Analysis). Tom Ward, University of East Anglia: *Rigidity and entropy geometry.* Sal Å80127, Ångströmlaboratoriet, Uppsala universitet. Se sidan 7.

To 05–08 kl. 15.15 – 16.15. AlbaNova and Nordita Colloquium in Physics. Professor Luca Peliti, Università "Federico II", Napoli: *The puzzle of the evolutionary dynamics of influenza.* Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se Bråket nr 16 sidan 5.

To 05–08 kl. 15.30 – 16.30. Mittag-Leffler Seminar. Eric Bedford, Indiana University: *Parabolic implosion in C^2.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 7.

Fr 05–09 kl. 11.00 – 12.00. Optimization and Systems Theory Seminar. Professor Augusto Ferrante, Università di Padova: *Multivariate spectrum approximation in the Hellinger distance.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 16 sidan 5.

Fr 05–09 kl. 13.15 – 14.15. Graduate Student Seminar. Anders Karlsson, Matematik, KTH: *On the work of the 2008 Abel Laureates Thompson and Tits.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 9.

On 05–14 kl. 13.00. Licentiatseminarium i datalogi. John Ardelius presenterar sin licentiatavhandling: *On State Space Structure and Average Case Complexity.* Opponent: **Professor Bart Selman,** Cornell University, USA. Rum 132:028, Roslagstullsbacken 23, AlbaNova universitetscentrum.

On 05–14 kl. 13.15. Algebra and Geometry Seminar. Andreas Knutsen, Bergen: *Title to be announced.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

On 05–14 kl. 16.00. KTH/SU Mathematics Colloquium. Nalini Anantharaman, Centre de Mathématiques Laurent Schwartz, École Polytechnique, Palaiseau, Frankrike: *Title to be announced.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Kaffe/te serveras kl. 15.30 i pausrummet, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 4.

Fr 05–16 kl. 11.00 – 12.00. Optimization and Systems Theory Seminar. Stefan Almér, Optimeringslära och systemteori, KTH: *Control and Analysis of Pulse-Modulated Systems.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

Fr 05–16 kl. 13.15 – 14.15. DNA-seminariet Uppsala-KTH (Dynamical systems, Number theory, Analysis). Nalini Anantharaman, Centre de Mathématiques Laurent Schwartz, École Polytechnique, Palaiseau, Frankrike: *Title to be announced.* Lokal för seminariet meddelas senare.

EXTRA KOMBINATORIKSEMINARIUM

Niklas Eriksen:
Permutations with prescribed descents, and fixed point coloured permutations

Abstract: Stanley conjectured that the number of alternating permutations on $[2n]$ with maximal number of fixed points equals the number of derangements on $[n]$. While this is not too hard to prove, it can also be extended to the following: Permutations on $[n]$ with k falling blocks (containing only descents) of length $a_1, a_2, \ldots, a_k$ and maximal number of fixed points are in bijection with derangements on $[n-k]$ with falling blocks of length $a_1 - 1, a_2 - 1, \ldots, a_k - 1$, and possibly with descents between blocks.

We enumerate these derangements. A crucial role will be played by so-called fixed point coloured permutations, generalizing both derangements and permutations.

Tid och plats: Måndagen den 5 maj kl. 16.00 – 17.00 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

MITTAG-LEFFLER SEMINAR — PLURIKOMPLEXA SEMINARIET

Jeff McNeal:
Non-holomorphic projections and biholomorphic maps

Abstract: Let D be a smoothly bounded domain in C^n. If T and W are given functions defined on D, let $H(D;T)$ denote the "T-twisted" holomorphic functions on D and $L^2(D;W)$ be the square-integrable functions on D with respect to the weight W. I will discuss how biholomorphic mappings of D are related to the operator projecting $L^2(D;W)$ onto $H(D;T)$, for certain choices of T and W. The connections discussed are inspired by the work of Bell and Ligocka from the late 1970s.

Tid och plats: Tisdagen den 6 maj kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

SEMINARIUM I MATEMATISK STATISTIK

Andreas Nordvall Lagerås:
Branching processes conditioned on extinction

Abstract: It is well-known that a simple, supercritical Bienaymé-Galton-Watson process turns into a subcritical such process if conditioned to die out. In this talk I will show that this is essentially a consequence of the branching property, and not any other particular feature of the BGW process, such as the Markov property. Therefore the corresponding result holds true for general, multi-type branching processes, where child bearing may occur at different ages, life-span may depend on reproduction, and the whole course of events is affected by conditioning on extinction. No prior knowledge of branching processes is assumed.

This is a joint work with Peter Jagers.

Tid och plats: Onsdagen den 7 maj kl. 15.15 i rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket.

MITTAG-LEFFLER SEMINAR — PLURIKOMPLEXA SEMINARIET

Ann-Katrin Herbig:
Plurisubharmonic defining functions

Abstract: Let D be a smoothly bounded domain which admits a smooth defining function plurisubharmonic on the boundary of D. Then the Diederich-Fornaess exponent for D can be chosen arbitrarily close to 1, and the closure of D admits a Stein neighbourhood basis.

This is joint work with J. E. Fornaess.

Tid och plats: Tisdagen den 6 maj kl. 14.00 – 15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

KOMBINATORIKSEMINARIUM

Klas Markström:
Azuma-Hoeffding inequalities
for matrix martingales and random expanders

Abstract: In this talk I will discuss a concentration inequality for random sequences of hermitian matrices. As an application I will prove a sharp version of Alon-Roichman's theorem about the expansion properties of random Cayley graphs, and an extension of this theorem to random vertex-transitive graphs.

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

LOGIKSEMINARIET STOCKHOLM-UPPSALA

Steve Awodey: Topology and modality

Abstract: In the 1940s, Tarski showed how to interpret propositional modal logic using the operation of interior in a topological space as the necessity operator. Here it is shown how to extend that interpretation to all of first-order logic using sheaves on the space to interpret arbitrary predicates. Completeness is established by sheaf-theoretic methods generalizing the Stone representation theorem.

The talk is based on joint work with Kohei Kishida.

Tid och plats: Onsdagen den 7 maj kl. 14.00 i rum Å12167, Ångströmlaboratoriet, Uppsala universitet.

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

Christopher Hughes: Zeros and derivatives

Abstract: In this talk we will discuss the horizontal distribution of the zeros of the derivatives of the Riemann zeta function (which gives information about the zeros of the zeta function itself), and try to model it by the radial distribution of zeros of the derivative of characteristic polynomials of random unitary matrices.

Tid och plats: Torsdagen den 8 maj kl. 13.15 – 14.10 i sal Å80127, Ångströmlaboratoriet, Uppsala universitet.

DISPUTATION I DATALOGI

Jakob Nordström

disputerar på avhandlingen

Short Proofs May Be Spacious:
Understanding Space in Resolution

fredagen den 9 maj 2008 kl. 10.00 i sal D3, KTH, Lindstedtsvägen 5, b.v. Till opponent har utsetts *professor Albert Atserias,* Universitat Politècnica de Catalunya, Barcelona, Spanien.

Abstract of the thesis

Most state-of-the-art satisfiability algorithms today are variants of the DPLL procedure augmented with clause learning. The two main bottlenecks for such algorithms are the amounts of time and memory used. Thus, understanding time and memory requirements for clause learning algorithms, and how these requirements are related to one another, is a question of considerable practical importance.

In the field of proof complexity, these resources correspond to the length and space of resolution proofs for formulas in conjunctive normal form (CNF). There has been a long line of research investigating these proof complexity measures and relating them to the width of proofs, another measure which has turned out to be intimately connected with both length and space. Formally, the length of a resolution proof is the number of lines, i.e., clauses, the width of a proof is the maximal size of any clause in it, and the space is the maximal number of clauses kept in memory simultaneously if the proof is only allowed to infer new clauses from clauses currently in memory.

While strong results have been established for length and width, our understanding of space has been quite poor. For instance, the space required to prove a formula is known to be at least as large as the needed width, but it has remained open whether space can be separated from width or whether the two measures coincide asymptotically. It has also been unknown whether the fact that a formula is provable in short length implies that it is also provable in small space (which is the case for length versus width), or whether on the contrary these measures are "completely unrelated" in the sense that short proofs can be maximally complex with respect to space.

In this thesis, as an easy first observation we present a simplified proof of the recent length-space trade-off result for resolution in (Hertel and Pitassi 2007) and show how our ideas can be used to prove a couple of other exponential trade-offs in resolution.

Next, we prove that there are families of CNF formulas that can be proven in linear length and constant width but require space growing logarithmically in the formula size, later improving this exponentially to the square root of the size. These results thus separate space and width. Using a related but different approach, we then resolve the question about the relation between space and length by proving an optimal separation between them. More precisely, we show that there are families of CNF formulas of size $O(n)$ that have resolution proofs of length $O(n)$ and width $O(1)$ but for which any proof requires space $\Omega(n/\log n)$. All of these results are achieved by studying so-called pebbling formulas defined in terms of pebble games over directed acyclic graphs (DAGs) and proving lower bounds on the space requirements for such formulas in terms of the black-white pebbling price of the underlying DAGs.

(Continued on the next page.)

Finally, we observe that our optimal separation of space and length is in fact a special case of a more general phenomenon. Namely, for any CNF formula F and any Boolean function $f : \{0,1\}^d \mapsto \{0,1\}$, replace every variable x in F by $f(x_1, \ldots, x_d)$ and rewrite this new formula in CNF in the natural way, denoting the resulting formula $F[f]$. Then if F and f have the right properties, $F[f]$ can be proven in resolution in essentially the same length and width as F but the minimal space needed for $F[f]$ is lower-bounded by the number of variables that have to be mentioned simultaneously in any proof for F.

MITTAG-LEFFLER SEMINAR

Dano Kim:
L^2 extension of adjoint line bundle sections

Abstract: We will discuss an L^2 extension theorem of Ohsawa-Takegoshi type which extends line bundle sections from a subvariety Z of general codimension to its ambient projective variety X. Our setting is to have Z as a log-canonical centre, that is, a locus of non-integrable singularity of an adjoint line bundle on X. We will explain why such a setting is natural both for application to algebraic geometry and for the method of proof of general L^2 extension statements.

Tid och plats: Torsdagen den 8 maj kl. 14.00 – 15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

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

Tom Ward: Rigidity and entropy geometry

Abstract: Abelian measure rigidity (situations where measures invariant by several commuting maps are forced to be algebraic in nature) has found many applications. In the case of zero-dimensional algebraic systems, a very simple approach to proving measure rigidity may be given using the geometry of how the systems produce entropy.

The talk is based on joint work with Manfred Einsiedler.

Tid och plats: Torsdagen den 8 maj kl. 14.15 – 15.10 i sal Å80127, Ångströmlaboratoriet, Uppsala universitet.

MITTAG-LEFFLER SEMINAR

Eric Bedford:
Parabolic implosion in C^2

Abstract: We consider invertible maps of $\mathbf{C}^2$ of the form $f_\epsilon(x,y) = (x + \epsilon + x^2 + \cdots, by + \cdots)$, where "$\cdots$" indicates higher order terms in both x and y, and $|b| < 1$. When $\epsilon = 0$, the origin is a semi-attracting/semi-parabolic fixed point. Here we will discuss the bifurcation behaviour f_ϵ as $\epsilon \to 0$. The main point of our work (with John Smillie and Tetsuo Ueda) is to show that the 2-dimensional behaviour is parallel to the phenomenon of "parabolic implosion" in dimension 1.

Tid och plats: Torsdagen den 8 maj kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

Mats Andersson:
Ideals of holomorphic functions and residue currents

Abstract: Any analytic variety in $\mathbb{C}^n$, or more generally any ideal of holomorphic functions, can be represented as the annihilator of an analytic object, a so-called residue current. This was proved independently by Dickenstein-Sessa and Passare some 20 years ago for the case when the ideal is given as a so-called complete intersection. The general case was recently obtained in a joint work with E. Wulcan. We will indicate the construction of such residue currents and discuss some applications; for instance we obtain (in a joint work with H. Samuelsson) new existence results for the dbar-equation on analytic varieties.

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

DISPUTATION I STATISTIK

Daniel Bruce

disputerar på avhandlingen

Optimal Design and Inference for Correlated Bernoulli Variables using a Simplified Cox Model

fredagen den 16 maj 2008 kl. 10.00 i hörsal 3, hus B, SU, Universitetsvägen 10, Frescati. Till opponent har utsetts *professor Werner G. Müller,* Johannes Kepler Universität Linz, Österrike.

Abstract of the thesis

This thesis proposes a simplification of the model for dependent Bernoulli variables presented in Cox and Snell (1989). The simplified model, referred to as the simplified Cox model, is developed for identically distributed and dependent Bernoulli variables.

Properties of the model are presented, including expressions for the loglikelihood function and the Fisher information. The special case of a bivariate symmetric model is studied in detail. For this particular model, it is found that the number of design points in a locally D-optimal design is determined by the log-odds ratio between the variables. Under mutual independence, both a general expression for the restrictions of the parameters and an analytical expression for locally D-optimal designs are derived.

Focusing on the bivariate case, score tests and likelihood ratio tests are derived to test for independence. Numerical illustrations of these test statistics are presented in three examples. In connection to testing for independence, an E-optimal design for maximizing the local asymptotic power of the score test is proposed.

The simplified Cox model is applied to a dental data. Based on the estimates of the model, optimal designs are derived. The analysis shows that these optimal designs yield considerably more precise parameter estimates compared to the original design. The original design is also compared against the E-optimal design with respect to the power of the score test. For most alternative hypotheses the E-optimal design provides a larger power compared to the original design.

GRADUATE STUDENT SEMINAR

Anders Karlsson:
On the work of the 2008 Abel Laureates Thompson and Tits

Abstract: On May 20 in Oslo, John G. Thompson and Jacques Tits will receive the 2008 Abel Prize for "their profound achievements in algebra and in particular for shaping modern group theory". Thompson proved deep results on finite groups, eventually leading to the monumental classification of finite simple groups, and Tits is noted for his highly original and influential work on linear groups. Finite groups is a subject with origins in the work of Galois and Abel, while the theory of linear groups owes in particular to the mathematical legacy of Lie. Serre wrote a few years ago that "the importance of group theory is much more evident now than in Poincaré's days, and that is true in areas as different as geometry, number theory, and theoretical physics". I will describe some of the main contributions of Thompson and of Tits, in particular the celebrated Feit-Thompson theorem, Tits buildings and the Tits alternative, and comment on their place in the development of mathematics.

Tid och plats: Fredagen den 9 maj kl. 13.15 – 14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

CIAM/DNA MINI-WORKSHOP ON COMPUTATIONAL NUMBER THEORY

The workshop will take place on Thursday, May 15, in seminar room 3721, Department of Mathematics, KTH, Lindstedtsvägen 25, floor 7. If you have any questions, contact Pär Kurlberg (e-mail: last name at math.kth.se).

Schedule

14.00 – 14.50 **Hans Riesel,** Nada, KTH: *Title to be announced.*

15.00 – 15.50 **Niels Möller,** Reglerteknik, KTH: *Subquadratic GCD.*
Abstract: Subquadratic divide-and-conquer algorithms for computing the greatest common divisor have been studied for a couple of decades. The integer case has been notoriously difficult, with the need for "backup steps" in various forms. This talk explains why backup steps are necessary for algorithms based directly on the quotient sequence, and proposes a robustness criterion that can be used to construct a "half-gcd" algorithm without any backup steps.

15.50 – 16.10 Coffee break.

16.10 – 17.00 **Torbjörn Granlund,** Teoretisk datalogi, KTH: *GMP — current and future algorithms and tricks.*
Abstract: The goal with the GMP library for arithmetic on large integers, is to provide a building block for research and applications within the areas of computer algebra and computational number theory. For this goal to succeed, performance and ease of use are central objectives.
We will talk about the methods and tricks that make GMP fast, from algebra via dynamic algorithm choice to assembly loops. We will also talk about areas where large improvements are planned, such as multiplication, division, operations in a ring, and operations with invariant operands.

17.30 Dinner.

MINICOURSE IN MATHEMATICS

Martin Gulbrandsen: Local aspects of geometric invariant theory

Abstract: If a group scheme G acts on a scheme X, one is led to ask whether there exists a scheme deserving the name "the quotient X/G". Mumford's geometric invariant theory addresses this problem for actions by reductive groups.

In this course we will focus on the affine case $X = \mathrm{Spec}(A)$. The quotient X/G is then the spectrum $\mathrm{Spec}(A^G)$ of the invariant ring. It is usually hard to understand the quotient (e.g. is it smooth?) by analysing the invariant ring directly. The central result that enables us to answer many local questions is Luna's étale slice theorem. In particular, Luna's theorem can be used to show that a quotient $X \to X/G$ is a principal G-bundle if and only if all stabilizers are trivial.

I will give a reasonably self-contained presentation, beginning with basic concepts surrounding group schemes and their actions, and ending up with Luna's theorem and its applications.

Time and place: Thursdays, May 8, 15, 22 and 29, at 13.15 – 14.15 in seminar room 3733, Department of Mathematics, KTH, Lindstedtsvägen 25, floor 7.

Welcome!
Carel Faber

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.

(Continued on the next page.)

New information

Jobs to apply for

11. The Australian National University i Canberra söker en "Postdoctoral/Research Fellow in Mathematics". Tjänsten varar upp till två år och finansieras av "an ARC Discovery Project grant in Harmonic Analysis of Elliptic Systems on Riemannian Manifolds". Kandidater bör ha forskningserfarenhet av harmonisk analys och till viss del av operatorteori, partiella differentialekvationer och differentialgeometri. Sista ansökningsdag är den 16 maj. Web-info: http://info.anu.edu.au/hr/Jobs/Academic_Positions/_MSI4767.asp.

12. KTH söker doktorander i matematik. Sista ansökningsdag är den 16 maj. Web-info: http://www.math.kth.se/utlysning.tjanst/utlysn.dokt.080416.html.

Old information

Jobs to apply for

13. Linköpings universitet söker en doktorand i matematik. Sista ansökningsdag är den 9 maj. Web-info: http://www.liu.se/jobbdb/show.html?2449.

14. Linköpings universitet söker en doktorand inom forskarskolan i tvärvetenskaplig matematik. Utbildningen vänder sig till studenter som har ett starkt intresse för matematik och som samtidigt är intresserade av att arbeta aktivt med problem med anknytning till ett tillämpat ämne. Aktuella avhandlingsprojekt finns beskrivna på http://www.mai.liu.se/tvarvetenskap/. Sista ansökningsdag är den 16 maj. Web-info: http://www.liu.se/jobbdb/show.html?2447.

15. Umeå universitet söker en doktorand i matematik med inriktning mot partiella differentialekvationer. Sista ansökningsdag är den 8 maj. Web-info: http://www.umu.se/umu/aktuellt/arkiv/lediga_tjanster/313-1430,70-08.html.

16. Umeå universitet söker en doktorand i matematisk statistik. Doktoranden kommer att arbeta i en forskargrupp med inriktning mot stokastiska processer och numerisk analys av slumpfunktioner, med tillämpningar inom signal- och bildbehandling samt simuleringstekniker. Sista ansökningsdag är den 8 maj. Web-info: http://www.umu.se/umu/aktuellt/arkiv/lediga_tjanster/313-1430,70-08.html.

17. Uppsala universitet söker två forskare i tillämpad matematik. Anställningen omfattar längst två år. Doktorsexamen i matematik eller annat ämne med stort matematiskt innehåll skall ha avlagts tidigast tre år före ansökningstillfället. Sista ansökningsdag är den 26 maj. Web-info: http://www.personalavd.uu.se/ledigaplatser/780forsk.html.

18. SU söker en eller två doktorander i matematisk statistik. Ett antal förslag till doktorandprojekt finns specificerade på hemsidan för forskarutbildningen. Även andra forskningsprojekt kan bli aktuella. Sista ansökningsdag är den 2 maj. Web-info: http://www.math.su.se/matstat/foutb/.

19. SU söker doktorander i matematik. Sista ansökningsdag är den 2 maj. Web-info: http://www.math.su.se/matematik/forskning/2008/applsve08.pdf.

20. Uppsala universitet söker två biträdande lektorer i matematik. Anställningen är tidsbegränsad till fyra år men kan förlängas med högst ett år. Sista ansökningsdag är den 5 maj. Web-info: http://www.personalavd.uu.se/ledigaplatser/561,562bitrlekt.html.

21. Uppsala universitet söker en forskarassistent i matematik. Anställningen är tidsbegränsad till fyra år. Sista ansökningsdag är den 5 maj. Web-info: http://www.personalavd.uu.se/ledigaplatser/563forass.html.

22. Institutionen för matematik vid KTH söker upp till tre doktorander i Optimeringslära och systemteori till följande projekt: Storskalig ickelinjär optimering. Skalbar styrning av nätverkskopplade system. Optimering av lastbärande strukturer. Sista ansökningsdag är den 30 april. Web-info: http://www.math.kth.se/utlysning.tjanst/doktorander080320.html.

23. Göteborgs universitet söker en universitetslektor i matematisk statistik med inriktning mot statistisk inferens. Tjänsten är placerad vid Matematiska vetenskaper (samverkande med CTH). Sista ansökningsdag är den 22 maj. Web-info: http://www.math.chalmers.se/univlektormatematiskstatistik080228eng.pdf.

24. Chalmers tekniska högskola söker en professor i matematisk statistik. Sista ansökningsdag är den 22 maj. Web-info: http://www.math.chalmers.se/ProfMathStat4March08.pdf.