



BRÅKET



Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 23

FREDAGEN DEN 13 JUNI 2008

BRÅKET

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

Redaktör: Gunnar Karlsson

Telefon: 08-790 84 79

Adress för e-post:
gunnarkn@math.kth.se

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

Postadress:

Red. för Bråket
Institutionen för matematik
KTH
100 44 Stockholm

Sista manustid för nästa nummer:
Torsdagen den 14 augusti kl. 13.00.

Disputation i matematik

Martin Bender disputerar på avhandlingen *Limit theorems for generalizations of GUE random matrices* fredagen den 13 juni kl. 10.00 i sal F3, KTH, Lindstedtsvägen 26, b.v. Se Bråket nr 22 sidan 6.

Trevlig sommar

önskas Bråkets läsare. Nästa nummer utkommer den 15 augusti.

SEMINARIER

Fr 06–13 kl. 15.15. Licentiatseminarium i optimeringslära och systemteori. Yohei Kuroiwa presenterar sin licentiatavhandling: *Sensitivity Shaping under Degree Constraint: Nevanlinna-Pick Interpolation for Multivariable and Time-Delay Systems*. Opponent: **Professor Per-Olov Gutman**, Technion, Haifa, Israel. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 22 sidan 5.

Observera att tiden och lokalen för Yohei Kuroiwas licentiatseminarium har ändrats.

Fortsättning på nästa sida.

Disputation i strömningsmekanik

Linus Marstorp disputerar på avhandlingen *Modelling of sub-grid-scale stress and passive scalar flux in large eddy simulations of wall bounded flows* fredagen den 13 juni kl. 10.30 i sal D3, KTH, Lindstedtsvägen 5, b.v. Se Bråket nr 22 sidan 7.

Disputation i matematik

David Rydh disputerar vid KTH på avhandlingen *Families of cycles and the Chow scheme* måndagen den 11 augusti kl. 13.00. Se sidan 4.

Risk Modelling in Insurance and Finance

En konferens med denna titel skall äga rum vid KTH fredagen den 13 juni. Se Bråket nr 21 sidorna 8–10.

Integral Geometry and Tomography

En konferens med denna titel skall äga rum vid SU den 12–15 augusti. Se sidan 3.

Money, jobs: Se sidorna 5–6.

Seminarier (fortsättning)

- Fr 06–13 kl. 15.15–16.15. CIAM tutorial on the program Bertini.** Jon Hauenstein, University of Notre Dame, USA: *Algorithms of Numerical Algebraic Geometry and Bertini*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 21 sidan 11.
- On 06–18 kl. 13.15–15.00. Algebra and Geometry Seminar.** Timothy Logvinenko: *Correspondences of a K3 surface with itself via moduli of sheaves*. Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se nedan.
- On 06–18 kl. 16.00. KTH/SU Mathematics Colloquium.** Jon F. Carlson, UGA: *Presentations for matrix algebras*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Kaffe/te serveras kl. 15.30 i pausrummet, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 4. Se sidan 3.
- Ti 07–01 kl. 13.15–14.15. DNA-seminariet Uppsala-KTH (Dynamical systems, Number theory, Analysis).** Yves de Cornulier, Université de Rennes I: *On groups embedding quasi-isometrically into Hilbert spaces*. Seminariet skall äga rum vid KTH. Lokal meddelas senare. Se sidan 5.
- Ti 07–01 kl. 14.45–15.45. DNA-seminariet Uppsala-KTH (Dynamical systems, Number theory, Analysis).** Romain Tessera, Vanderbilt University: *Haagerup property, relative property T and expanders*. Seminariet skall äga rum vid KTH. Lokal meddelas senare.
- Fr 08–22 kl. 11.00–12.00. Optimization and Systems Theory Seminar.** Amol Sasane, London School of Economics: *Irrational transfer function classes and stabilization*. Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 5.

ALGEBRA AND GEOMETRY SEMINAR

Timothy Logvinenko:

Correspondences of a K3 surface with itself via moduli of sheaves

Abstract: Let X be a K3 surface. A basic invariant of a sheaf E on X is its Mukai vector (r, C, s) in $H^*(X, \mathbb{Z})$. Here r is the rank $r(E)$ of E , C its first Chern class and s is $\chi(E) - r(E)$, its Euler characteristic minus its rank.

It was proven by Mukai that if a Mukai vector $v = (r, C, s)$ is primitive in $H^*(X, \mathbb{Z})$ and isotropic (i.e. $v^2 = 0$), then the moduli space M_v of stable sheaves on X whose Mukai vector is v is again a K3 surface.

In this talk we give an overview of a work by Nikulin and Madonna, which studies the question: when is the resulting K3 surface M_v isomorphic to the original surface X ? An answer turns out to be a simple condition expressed in terms of the Picard lattice $P(X)$ of X .

Tid och plats: Onsdagen den 18 juni kl. 13.15–15.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

KTH/SU MATHEMATICS COLLOQUIUM

Jon F. Carlson:

Presentations for matrix algebras

Abstract: In this lecture I will describe algorithms for obtaining presentations of matrix algebras. The results are joint work with Graham Matthews. The idea is to be able to construct examples in representation theory and homological algebra using computers. The programs not only compute generators and relations for a matrix algebra, they also construct a condensed version that is Morita equivalent to the original algebra. Other calculations such as the dimension of the algebra, the Cartan matrix and the endomorphism ring are made easy in the process. A demonstration of the programs might be given. The programs run on the MAGMA system.

Tid och plats: Onsdagen den 18 juni kl. 16.00 i 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.

INTEGRAL GEOMETRY AND TOMOGRAPHY

International Conference

**dedicated to Jan Boman's 75th birthday,
Stockholm University, August 12–15, 2008**

The main theme of the conference is integral geometry and its applications. The conference will bring together specialists in pure and applied aspects of the mathematics of tomography and related techniques.

Organizers: P. Kurasov, M. Passare, H. Rullgård, J.-O. Strömberg, and O. Öktem.

Advisory board: J. Boman, F. Natterer, T. Quinto, and G. Uhlmann.

Invited speakers: Yves Colin de Verdière (Grenoble), Leon Ehrenpreis (Philadelphia), David Finch (Corvallis, Oregon), Simon Gindikin (New Brunswick), Allan Greenleaf (Rochester, NY), Eric L. Grinberg (New Hampshire), Maarten V. de Hoop (Purdue), Alexander Katsevich (Kansas), Peter Kuchment (Texas), Matti Lassas (Helsinki), Alfred Louis (Saarbrücken), Anders Melin (Lund), Frank Natterer (Münster), Roman G. Novikov (Nantes), Victor Palamodov (Tel-Aviv), Lassi Päiväranta (Helsinki), Todd Quinto (Boston), Vladimir Sharafutdinov (Novosibirsk), and Günther Uhlmann (Seattle).

If you want to participate, please register for the conference by sending an e-mail containing the following information to igt@math.su.se:

- Name,
- Affiliation,
- Period of stay.

There will be no conference fee, but the organizers reserve the right to charge for a contribution towards the conference dinner.

More information about the conference can be found at web-page of the conference: <http://www2.math.su.se/igt/>.

P. Kurasov, M. Passare, H. Rullgård, J.-O. Strömberg, and O. Öktem

DISPUTATION I MATEMATIK

David Rydh

disputerar på avhandlingen

Families of cycles and the Chow scheme

måndagen den 11 augusti 2008 kl. 13.00 i sal F3, KTH, Lindstedtsvägen 26, b.v. Till opponent har utsetts *professor Martin Olsson*, University of California, Berkeley, USA.

Abstract of the thesis

The objects studied in this thesis are *families of cycles* on schemes. A space — the *Chow variety* — parameterizing effective equidimensional cycles was constructed by Chow and van der Waerden in the first half of the twentieth century. Even though cycles are simple objects, the Chow variety is a rather intractable object. In particular, a good functorial description of this space is missing. Consequently, descriptions of the corresponding families and the infinitesimal structure are incomplete. Moreover, the Chow variety is not intrinsic but has the unpleasant property that it depends on a given projective embedding. A main objective of this thesis is to construct a closely related space which has a good functorial description. This is partly accomplished in the last paper.

The first three papers are concerned with families of *zero-cycles*. In the first paper, a functor parameterizing zero-cycles is defined and it is shown that this functor is represented by a scheme — *the scheme of divided powers*. This scheme is closely related to the symmetric product. In fact, the scheme of divided powers and the symmetric product coincide in many situations.

In the second paper, several aspects of the scheme of divided powers are discussed. In particular, a universal family is constructed. A different description of the families as *multi-morphisms* is also given. Finally, the set of k -points of the scheme of divided powers is described. Somewhat surprisingly, cycles with certain rational coefficients are included in this description in positive characteristic.

The third paper explains the relation between the Hilbert scheme, the Chow scheme, the symmetric product and the scheme of divided powers. It is shown that the last three schemes coincide as topological spaces and that all four schemes are isomorphic outside the degeneracy locus.

The last paper gives a definition of families of cycles of arbitrary dimension and a corresponding Chow functor. In characteristic zero, this functor agrees with the functors of Barlet, Guerra, Kollár and Suslin-Voevodsky when these are defined. There is also a monomorphism from Angéniol's functor to the Chow functor which is an isomorphism in many instances. It is also confirmed that the morphism from the Hilbert functor to the Chow functor is an isomorphism over the locus parameterizing normal subschemes and a local immersion over the locus parameterizing reduced subschemes — at least in characteristic zero.

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

Yves de Cornulier:

On groups embedding quasi-isometrically into Hilbert spaces

Abstract: We conjecture that a finitely generated group embeds quasi-isometrically into a Hilbert space if and only if it is crystallographic. We will give partial results towards this conjecture, based on affine isometric actions of groups. As an outcome, we obtain an original proof of Bourgain's result: a regular tree of degree three does not embed quasi-isometrically into a Hilbert space.

Tid och plats: Tisdagen den 1 juli kl. 13.15–14.15 vid KTH. Lokal meddelas senare.

OPTIMIZATION AND SYSTEMS THEORY SEMINAR

Amol Sasane:

Irrational transfer function classes and stabilization

Abstract: Let D denote the open unit disk with centre 0 in the complex plane, and let T denote its boundary. If S is an open subset of T , then let $A(S)$ denote the sets of all complex-valued functions f defined on the union of D and S such that f is holomorphic in D , and f is bounded and continuous on the union of D and S . We will discuss a few properties of these function classes: that the corona theorem holds, its stable rank is 1, and its topological stable rank is 2.

Functions from the classes $A(S)$ arise naturally as transfer functions of infinite-dimensional linear systems, and consequences of the above properties in the context of the stabilization problem in control theory will be discussed.

Tid och plats: Fredagen den 22 augusti kl. 11.00–12.00 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

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.

(Continued on the next page.)

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. KTH söker en forskarassistent i matematik med inriktning mot algebra, algebraisk geometri, kombinatorik eller närliggande områden. Sista ansökningsdag är den 15 augusti. Web-info: <http://www.kth.se/aktuellt/tjanster/2/ShowAdd.aspx?ID=127745>.

Old information

Jobs to apply for

12. KTH söker en lektor i matematik med inriktning mot matematisk analys. Sista ansökningsdag är den 15 juni. Web-info: <http://www.kth.se/aktuellt/tjanster/2/ShowAdd.aspx?ID=124487>.
 13. KTH söker två lektorer i matematik med inriktning mot nätbaserad pedagogik. Sista ansökningsdag är den 15 juni. Web-info: <http://www.kth.se/aktuellt/tjanster/2/ShowAdd.aspx?ID=124317>.
-