BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 30 **FREDAGEN DEN 1 OKTOBER 2004**

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 7 oktober kl. 13.00.

Disputation i matematik

Sergei Shadrin disputerar vid SU på avhandlingen *Intersections on moduli spaces of curves* fredagen den 1 oktober kl. 10.15. Se sidan 3.

Studiecirkel

En studiecirkel om *Ion Channels* startar vid SU den 26 oktober. Se sidan 5.

SEMINARIER

Fr 10–01 kl. 13.00–15.00. Seminar on Etale Cohomology. Wojciech Chacholski: *Material on Henselian rings.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

Fr 10–01 kl. 14.00. Gästföreläsning i filosofi. Brian McGuinness: *Wittgenstein: Philosophy or literature?* Rum D255, Filosofiska institutionen, SU.

Fr 10–01 kl. 16.15. Mathematical Physics Seminar. *(Observera tiden!)* **Professor Anton Alekseev,** University of Geneva: *Invariant star products on coadjoint orbits.* Seminarierummet, Roslagstullsbacken 11, AlbaNova universitetscentrum. Se sidan 4.

Må 10–04 kl. 14.15–15.00. Seminarium i numerisk analys. Scott B. Baden, Department of Computer Science and Engineering, University of California, San Diego (on leave at KTH): *A method of local corrections for a highly scalable elliptic solver.* Rum 4523, Nada, KTH, Lindstedtsvägen 5, plan 5. Se Bråket nr 29 sidan 8.

Ti 10–05 kl. 10.15. Plurikomplexa seminariet. Gerd Schmalz, Bonn: *Automorphisms of elliptic CR manifolds and second order ODE.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 4.

Ti 10–05 kl. 13.15. Plurikomplexa seminariet. August Tsikh, Krasnojarsk: *Special integral representations for local Grothendieck residues.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 5.

Fortsättning på nästa sida.

Money, jobs: Se sidorna 7 – 8.

Seminarier (fortsättning)

Ti 10–05 kl. 15.30–16.15. Seminar in Theoretical and Applied Mechanics. Professor Anders Eriksson, Mekanik, KTH: *Musculoskeletal biomechanics seen as applied structural mechanics.* Seminarierummet, Institutionen för mekanik, KTH, Teknikringen 8. Se Bråket nr 29 sidan 9.

Ti 10–05 kl. 16.00–17.00. Study Group on Zeta Functions in Dynamics and Algebraic Geometry. Christian Lundkvist: *Zeta functions in algebraic geometry and the Weil Conjectures.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 29 sidan 7 och detta nr sidan 6.

Ti 10–05 kl. 17.00–18.00. Stockholms matematiska kollokvium. Professor Alexander Stolin, Chalmers tekniska högskola och Göteborgs universitet: *Fermat's Last Theorem and Kervaire-Murthy conjectures.* Sal 14, hus 5, Matematiska institutionen, SU, Kräftriket. Te och kaffe serveras kl. 16.30 i lunchrummet. Se Bråket nr 29 sidan 9.

On 10–06 kl. 10.00–11.45. Logikseminariet Stockholm-Uppsala. Per Martin-Löf: *Normalization by evaluation and by the method of computability. Part III.* (Fortsättning från seminariet den 22 september.) Sal 16, hus 5, Matematiska institutionen, SU, Kräftriket.

On 10–06 kl. 13.15–14.15. Seminarium i analys och dynamiska system. Dimitri Gioev, KTH: *Introduction to Random Matrix Theory.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 29 sidan 6.

On 10–06 kl. 13.15–15.00. Algebra and Geometry Seminar. Daniel Coray: *Some applications of algebraic geometry to the arithmetic of surfaces and threefolds.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 7.

On 10–06 kl. 15.15. Seminarium i matematisk statistik. Professor William B. Levy, University of Virginia, USA: *Understanding biological computation via constraint-based optimizations.* Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 6.

To 10–07 kl. 13.00–14.00. Presentation av examensarbete i matematik. Eric Clapham: *Limit cycles in perturbed harmonic oscillators.* Sal 16, hus 5, Matematiska institutionen, SU, Kräftriket. Se sidan 5.

To 10–07 kl. 14.00–15.00. Presentation av examensarbete i matematik. Alexander Sellerholm: *Brownian motion and probabilistic interpretation of the heat equation.* Sal 16, hus 5, Matematiska institutionen, SU, Kräftriket.

To 10–07 kl. 14.00–16.00. Kollokvium i filosofi. Nicos Stavropoulos, University of Oxford: *Principles, laws and hypotheses.* Rum D255, Filosofiska institutionen, SU.

Fr 10–08 kl. 13.15. Presentation i kursen "Elliptiska kurvor". Christian Grundh: *How to calculate the Jacobian of a hyper-elliptic curve.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 3.

Må 10–11 kl. 10.00–17.30. Mini Workshop on Computational Electromagnetics. Denna anordnas av Nada, KTH, och äger rum i sal E32, KTH, Lindstedtsvägen 3, b.v. Program finns på http://www.nada.kth.se/~olofr/CEM04/.

Fortsättning på nästa sida.

Seminarier (fortsättning)

Må 10–11 kl. 13.15–14.15. DNA-seminariet Uppsala-KTH (Dynamics, Number theory, and Analysis). Dimitri Gioev, KTH: *Universality in Random Matrix Theory for orthogonal and symplectic ensembles.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 29 sidan 7.

Må 10–11 kl. 18.30. Populärvetenskaplig föreläsning i fysik. Dr Stefan Larsson, Astronomi, SU: *En gamma-astronom ser på universum: Om resultat från INTEGRAL-satelliten.* Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se sidan 7.

On 10–13 kl. 13.15–14.15. Seminarium i analys och dynamiska system. Nikolai Filonov, St. Petersburg University: *Some inequalities between Dirichlet and Neumann eigenvalues.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

DISPUTATION I MATEMATIK

Sergei Shadrin

disputerar på avhandlingen

Intersections on moduli spaces of curves

fredagen den 1 oktober kl. 10.15 i sal 14, hus 5, Matematiska institutionen, SU, Kräftriket. Till fakultetsopponent har utsetts *professor Carel Faber,* KTH.

Abstract of the thesis

We present a new approach to perform calculations with the certain standard classes in cohomology of the moduli spaces of curves. It is based on an important lemma of Ionel relating the intersection theory of the moduli space of curves and that of the space of admissible coverings. As particular results, we obtain expressions of Hurwitz numbers in terms of the intersections in the tautological ring, expressions of the simplest intersection numbers in terms of Hurwitz numbers, an algorithm of calculation of certain correlators which are the subject of the Witten conjecture, an improved algorithm for intersections related to the Boussinesq hierarchy, expressions for the Hodge integrals over two-pointed ramification cycles, cut-and-join type equations for a large class of intersection numbers, etc.

PRESENTATION I KURSEN ”ELLIPTISKA KURVOR”

Christian Grundh:

How to calculate the Jacobian of a hyper-elliptic curve

Abstract: Let E be a hyper-elliptic curve of genus g. Let also $\mathrm{Jac}(E)$, the Jacobian of E, be the group of classes of linearly equivalent divisors of degree 0. In this talk I will show that there is a natural map from $E^{(g)}$, the g'th symmetric power of E, to $\mathrm{Jac}(E)$ which is surjective. We will see that when E is elliptic, this gives an isomorphism between E and $\mathrm{Jac}(E)$, and that the two group structures on E and $\mathrm{Jac}(E)$ agree. I will also discuss briefly how one can use this surjective map to show that $\mathrm{Jac}(E)$ is an abelian variety.

Tid och plats: Fredagen den 8 oktober kl. 13.15 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

SEMINAR ON ETALE COHOMOLOGY

Wojciech Chacholski:
Material on Henselian rings

Abstract: We plan to continue the AK-seminar with a seminar on etale cohomology/topology. The idea is to read Milne's book *Etale Cohomology.* Material on Henselian rings will be presented during the first talk.

Tid och plats: Fredagen den 1 oktober kl. 13.00 – 15.00 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

MATHEMATICAL PHYSICS SEMINAR

Anton Alekseev:
Invariant star products on coadjoint orbits

Abstract: We give explicit Moyal type formulas for star products on a wide class of coadjoint orbits. Examples include the 2-sphere, complex projective spaces, flag manifolds, coadjoint orbits of the Virasoro and Kac-Moody algebras.

Tid och plats: Fredagen den 1 oktober kl. 16.15 i seminarierummet, Roslagstullsbacken 11, AlbaNova universitetscentrum.

PLURIKOMPLEXA SEMINARIET

Gerd Schmalz:
Automorphisms of elliptic CR manifolds and second order ODE

Abstract: According to results by Beloshapka and Loboda, CR-quadrics can be characterized by the property that they possess non-trivial automorphisms that preserve a point and whose differential acts trivially on the complex part of the tangent space at the fixed point. In contrast to this, there exists a class of non-quadratic elliptic CR-manifolds of codimension two with the analogous property. This class can be described in terms of second order ODE with a special "shear" symmetry.

The investigation of such elliptic manifolds with additional automorphism has led to a series of interesting examples.

This is joint work with Vladimir Ezhov in Adelaide, Australia.

Tid och plats: Tisdagen den 5 oktober kl. 10.15 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

Nikolai Filonov:
Some inequalities between Dirichlet and Neumann eigenvalues

Abstract: We give a simple proof of the following result. Denote by λ_k (resp. μ_k) the eigenvalues of the Laplace operator of the Dirichlet problem (resp. the Neumann problem) in the domain Ω whose volume is supposed to be finite. Then $\mu_{k+1} < \lambda_k$ for all k.

Tid och plats: Onsdagen den 13 oktober kl. 13.15 – 14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

PLURIKOMPLEXA SEMINARIET

August Tsikh:
Special integral representations for local Grothendieck residues

Abstract: Starting from the construction of generalized local residues, we derive a new integral representation for certain local Grothendieck residues. One of the examples of such an integral realization allows us to represent also integrations of holomorphic mappings.

This is joint work with Bohadyr Shaimkulov in Tashkent, Uzbekistan.

Tid och plats: Tisdagen den 5 oktober kl. 13.15 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

PRESENTATION AV EXAMENSARBETE I MATEMATIK

Eric Clapham:
Limit cycles in perturbed harmonic oscillators

Abstract: This thesis considers limit cycles in differential equations of the second order. Lienard's theorem and approximations in oscillating systems are considered. Further, the theory is applied to four illustrative numerical examples. In particular, the behaviour of limit cycles in the presence of different perturbing functions is explored. One of the cases that are analysed is the well-known van der Pol oscillator.

Tid och plats: Torsdagen den 7 oktober kl. 13.00 – 14.00 i sal 16, hus 5, Matematiska institutionen, SU, Kräftriket.

STUDIECIRKEL I MATEMATISK STATISTIK

Ion Channels

This is an invitation to participate in self-studies in the area of ion channels. Ion channels are macromolecular pores in all cell membranes.

Today, ion channels are most obvious choice as the fundamental excitable elements in the membrane of excitable cells, especially nerves and muscles. The ion channels of sensory receptors produce electrical signals that constitute the cellular response to stimulation. The goal of our studies is to understand the mechanisms underlying a discrimination between very similar ions such as sodium and potassium and voltage control of the ion channels gating (opening and closing). We hope that our studies will be helpful in the understanding of many previous mathematical models of the gating process and will be useful for creation of new models.

Our study will be based mostly on the book of Bertil Hille, *Ion Channels of Excitable Cells,* third edition, Sinauer Associates Inc., 2001.

It is expected that the participants will present the subsequent parts of the book and that all will be involved in the discussions. It will give Ph.D. students 5 credit points.

We will start on Tuesday, October 26, at 9.15 in room 321, house 6, Department of Mathematics, Stockholm University, Kräftriket, and continue to meet on Tuesdays or Wednesdays depending on the preferences of the participants.

Welcome!
Joanna Tyrcha

STUDY GROUP ON ZETA FUNCTIONS IN DYNAMICS AND ALGEBRAIC GEOMETRY

Christian Lundkvist: Zeta functions in algebraic geometry and the Weil Conjectures

Abstract: My talk will concern the connection between two Zeta functions: One is the Zeta function associated to the number of k_m-rational points of a variety X, where k_m is the finite field with q^m elements, and q is a power of a prime. The other is the Artin-Mazur Zeta function associated to the Frobenius map $F : X \to X$. The Artin-Mazur Zeta function is defined using the number of periodic points of an iterated function (in our case the Frobenius map), and is thus of interest in dynamical systems. In the talk we will see that these two Zeta functions are the same.

I will also briefly mention the Weil Conjectures which state certain properties of the above-mentioned Zeta function, and verify some of the properties in a few simple examples.

The presentation will be quite elementary and does not require advanced knowledge of algebraic geometry.

Tid och plats: Tisdagen den 5 oktober kl. 16.00 – 17.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I MATEMATISK STATISTIK

William B. Levy: Understanding biological computation via constraint-based optimizations

Abstract: The brain is an information processing system whose fundamental elements are cells called neurons. Signals between neurons are usually binary, and the signals within a neuron are usually analogue. One way to understand neuron-based information processing is to analyse the transmitted, transformed, and recirculated signals via the methods of Shannon's information theory and via methods that are essentially at the intersection between information theory and Bayesian statistical theory. But there is more to consider.

In general, physics constrains computation. The notable constraints include the available time, energy, and space (including number of computational elements), as well as the rates of information transmission attainable by individual elements. Although living organisms are not optimal, they are the result of an optimizing process. Because (1) the random design process of natural selection has had 800 million years to respond to computational constraints at the microscopic level and 150 million years to work on some not-so-microscopic aspects peculiar to mammalian computation, and because (2) the microscopic environment of neurons has remained essentially constant over the eons, we assume that, microscopically, neuronal computation achieves an optimal compromise among the computational constraints.

These ideas lead to the following research strategy to understand neurobiological computation: Optimized computational constraint formulations that predict observed biology are evidence favouring these formulations as a valid theoretical perspective, while formulations that produce incorrect predictions are presumed invalid.

The talk will explain these statements with examples.

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

ALGEBRA AND GEOMETRY SEMINAR

Daniel Coray:
Some applications of algebraic geometry to the arithmetic of surfaces and threefolds

Abstract: Various examples are presented, most of which involve intersections of quadrics and cubics. The object of the lecture is to describe some tools from algebraic geometry and the way in which they interact with number theory. This also raises some new open questions.

Tid och plats: Onsdagen den 6 oktober kl. 13.15 – 15.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

POPULÄRVETENSKAPLIG FÖRELÄSNING I FYSIK

Stefan Larsson:
En gamma-astronom ser på universum:
Om resultat från INTEGRAL-satelliten

Sammanfattning: Gamma-strålning ger oss en bild av de mest extrema och våldsamma fenomenen i universum. Från avlägsna kvasarer till pulsarer och andra källor i vår egen galax. Sedan två år tillbaka kartläggs Vintergatans gamma-strålning av ESA:s INTEGRAL-satellit. Med strålningens hjälp kan vi bl.a. studera kärnreaktioner i interstellära mediet och förhållanden kring svarta hål och neutronstjärnor.

Tid och plats: Måndagen den 11 oktober kl. 18.30 i Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum.

MONEY, JOBS

Columnist: Hans Rullgård, Department of Mathematics, SU. E-mail: hansr@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/~hansr/mj.html.
Unless stated otherwise, a given date is the last date (e.g. for applications), and the year is 2004. 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://www.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. Matematik LTH vid Lunds universitet söker en doktorand i matematik med inriktning mot datorseende, 15 oktober. Info: Kalle Åström, 046-222 45 48, e-post Karl.Astrom@math.lth.se. Web-info: http://www.lth.se/lthjobb/JobbDetail.aspx?id=418.

Old information

Money, to apply for

12. Wenner-Gren Stiftelserna utlyser ett antal anslag och stipendier. Web-info: http://www.swgc.org/anvisningar.html.
13. Från stiftelsen P. E. Lindahls fond utdelas sex forskningsstipendier om vardera 120 000 kr. Stipendier utdelas för vetenskapliga studier eller fortsatt praktisk utbildning inom eller utom Sverige. Sökande skall ha avlagt doktorsexamen år 1998 eller senare eller vara behörig att antagas till forskarutbildning inom någon av de filosofiska eller medicinska fakulteterna i riket och får inte inneha tjänst hos stat eller kommun. Ansökan skall vara poststämplad senast den 30 september. Web-info: http://www.kva.se/KVA_Root/swe/awards/scholarships/detail_scholarships.asp?grantsId=15.
14. Hellmuth Hertz' Foundations postdoktorsstipendier vill ge yngre forskare möjlighet till vidareutbildning och forskning vid välrenommerat icke svenskt universitet (eller motsvarande) under en längre period (minst 6 månader). Stipendium är öppet för sökande som avlagt doktorsexamen högst 3 år före ansökningsdatum vid svenskt universitet eller teknisk högskola inom ämnesområdena naturvetenskap, medicin eller teknik. Sista ansökningsdag 30 september. Info: 046-13 25 28, e-post kansli@fysiografen.org. Web-info: http://www.fysiografen.org/.
15. Sweden-Japan Foundation (SJF) utlyser stipendier för studier, forskning samt examensarbete och praktik på högskolenivå i Japan. Stipendierna är främst avsedda för studier inom teknik, naturvetenskap, ekonomi, juridik, medicin och handel. Beslut fattas vid två tillfällen per år. Sista ansökningsdagar är den 1 mars och den 1 oktober. Info: SJF, 08-611 68 73. Web-info: http://www.swejap.a.se.
16. 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.

Jobs, to apply for

17. Matematiska och systemtekniska institutionen vid Växjö universitet söker en doktorand i matematik/tillämpad matematik, 6 oktober. Info: Andrei Khrennikov, 0470-70 87 90, e-post Andrei.Khrennikov@msi.vxu.se, Mathias Hedenborg, 0470-70 86 38, e-post Mathias.Hedenborg@msi.vxu.se. Web-info: http://www.vxu.se/jobb/041006_doktorand_matematik.html.