BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 10 **FREDAGEN DEN 14 MARS 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: Onsdagen den 19 mars kl. 13.00.

SEMINARIER

Fr 03–14 kl. 10.00 – 12.00. Seminarium i statistik. *(Observera lokalen!)* **Per Weidenman,** MM-analys: *Översikt av den 'kommersiella registervärlden' (med huvudsaklig fokus på företagsinformation).* Ahlmannsalen, Geohuset Hus U, plan 3, SU, Frescati. Se Bråket nr 8 sidan 7.

Må 03–17 kl. 14.15. Seminarium i numerisk analys. Mattias Sandberg, Center of Mathematics for Applications, Norway: *Symplectic Pontryagin revisited.* Rum 4523, KTH CSC, Lindstedtsvägen 5, plan 5. Se sidan 3.

Må 03–17 kl. 14.15 – 15.15. Extra seminarium i analys och dynamiska system. *(Observera dagen och tiden!)* **Ramona Anton,** Université Paris VII och Johns Hopkins University: *Non-linear Schrödinger equations on domains with boundary.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

Må 03–17 kl. 15.15 – 16.00. Seminarium i finansiell matematik. Lilly Zuo presenterar sitt examensarbete: *Diversity weighting on ETF:s.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 9 sidan 6.

Fortsättning på nästa sida.

Disputation i optimeringslära och systemteori

Mats Werme disputerar på avhandlingen *On Methods for Discrete Topology Optimization of Continuum Structures* fredagen den 14 mars kl. 10.00 i sal D3, KTH, Lindstedtsvägen 5, b.v. Se Bråket nr 8 sidorna 9 – 10.

Money, jobs: Se sidorna 7 – 8.

Disputation i teoretisk fysik

Martin Lindén disputerar vid KTH på avhandlingen *Stochastic modeling of motor proteins* fredagen den 28 mars kl. 10.00. Se sidan 6.

Nästa nummer av Bråket

utkommer den 20 mars, på skärtorsdagen. Material måste vara red. tillhanda senast onsdagen den 19 mars kl. 13.00.

Seminarier (fortsättning)

Ti 03–18 kl. 14.00 – 15.00. Mittag-Leffler Seminar — Plurikomplexa seminariet. Ngaiming Mok, University of Hong Kong: *Extension of germs of holomorphic isometries with respect to the Bergman metric.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 3.

Ti 03–18 kl. 15.30 – 16.30. Mittag-Leffler Seminar — Plurikomplexa seminariet. Alain Yger, Université de Bordeaux 1: *Integral kernels and representation formulas in view of algebraic or analytic geometry.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 5.

On 03–19 kl. 11.00 – 12.00. KTH/Nordita/SU Seminar in Theoretical Physics. Klas Markström, Umeå: *Quantum but no mechanics — an introduction to quantum probability theory.* Sal FA31, Roslagstullsbacken 21, AlbaNova universitetscentrum.

On 03–19 kl. 13.15. Algebra and Geometry Seminar. Mikael Vejdemo Johansson: *On the computation of A-infinity algebras and* Ext *algebras.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se Bråket nr 9 sidan 3.

On 03–19 kl. 15.15. Seminarium i matematisk statistik. Andreas Lindell, SU och Swedbank: *Hedging of real power options in terms of correlated assets.* Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 5.

To 03–20 kl. 14.00 – 15.00. Mittag-Leffler Seminar. David Barrett, University of Michigan, Ann Arbor: *Geometry, Leray transforms and duality for domains in* $\mathbb{CP}^2$. Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 5.

To 03–20 kl. 15.15 – 16.15. AlbaNova and Nordita Colloquium in Physics. Professor Bryan Gaensler, University of Sydney: *Overview talk on the Square Kilometer Array.* Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se Bråket nr 9 sidan 5.

To 03–20 kl. 15.30 – 16.30. Mittag-Leffler Seminar. Marco Brunella, Université de Bourgogne, Dijon: *On the normal bundle of Levi-flat hypersurfaces.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 4.

On 03–26 kl. 10.15 – 12.00. Kombinatorikseminarium: *Open Problems Seminar.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

On 03–26 kl. 11.00. KTH/Nordita/SU Seminar in Theoretical Physics. Torsten Ekedahl, SU: *Mirror symmetry.* Sal FA32, Roslagstullsbacken 21, AlbaNova universitetscentrum.

On 03–26 kl. 13.15 – 14.15. Algebra and Geometry Seminar. Professor Ciro Ciliberto, University of Rome 2: *Interpolation and degeneration.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

On 03–26 kl. 16.00 – 17.00. KTH/SU Mathematics Colloquium. Professor Ciro Ciliberto, University of Rome 2: *Secant varieties: a crossroad of projective geometry, algebra and topology.* 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 6.

To 03–27 kl. 13.15 – 14.15. DNA-seminariet Uppsala-KTH (Dynamical systems, Number theory, Analysis). Alexander Fish, Ohio State University: *Title to be announced.* Seminariet äger rum vid KTH. Lokal meddelas senare.

Fortsättning på nästa sida.

Seminarier (fortsättning)

Fr 03–28 kl. 13.00. Licentiatseminarium i mekanik. Fredrik Hellström presenterar sin licentiatavhandling: *Numerical computations of the unsteady flow in a radial turbine.* Opponent: **Dr Jonas Bredberg,** Epsilon High Tech AB, Göteborg. Sal E3, KTH, Osquars Backe 14, 2 tr.

SEMINARIUM I NUMERISK ANALYS

Mattias Sandberg: Symplectic Pontryagin revisited

Abstract: The development, evaluation, and application of the Symplectic Pontryagin method involves many members of the department. The method uses that minimizing functions to optimal control problems solve a Hamiltonian system when the Hamiltonian is differentiable. When it is not differentiable, a regularized Hamiltonian is used. I will describe the method and a new convergence proof. It extends the previous result in the following ways:

1) Existence of solutions to Symplectic Pontryagin for a large class of problems.
2) The previous assumption on a bounded gradient of the dual variable with respect to state variables is no longer needed.
3) A slight improvement in the error bound.

Tid och plats: Måndagen den 17 mars kl. 14.15 i rum 4523, KTH CSC, Lindstedtsvägen 5, plan 5.

MITTAG-LEFFLER SEMINAR — PLURIKOMPLEXA SEMINARIET

Ngaiming Mok: Extension of germs of holomorphic isometries with respect to the Bergman metric

Abstract: Motivated by a problem from Arithmetic Geometry raised by Clozel-Ullmo, we study the question of characterizations of germs of holomorphic isometric immersions between bounded domains with respect to the Bergman metric. Extension and rigidity problems for holomorphic isometries into space forms dated back to works of Bochner and Calabi. Embedding a bounded domain into the infinite-dimensional projective space equipped with the Fubini-Study metric, in the simply connected case interior extension results already follow from Calabi's seminal work on the subject. Here we are primarily concerned with extension beyond the boundary for bounded domains with specific realizations, notably bounded symmetric domains in their Harish-Chandra realizations. The upshot is that the graph of a germ of holomorphic isometry extends algebraically in the latter case. On the other hand, we have found examples of proper holomorphic isometric embeddings of the Poincaré disk into bounded symmetric domains which are not totally geodesic, giving in particular counterexamples to a conjecture of Clozel-Ullmo's.

Tid och plats: Tisdagen den 18 mars kl. 14.00 – 15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

EXTRA SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

Ramona Anton:
Non-linear Schrödinger equations on domains with boundary

Abstract: We are interested in proving global existence results in the energy space for the semi-linear Schrödinger equation on domains of dimension 2 or 3. The main ingredients are generalized Strichartz inequalities adapted to the domains, which have some loss of derivatives. We present the results and the strategy for three types of domains.

Tid och plats: Måndagen den 17 mars kl. 14.15 – 15.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

MITTAG-LEFFLER SEMINAR

Marco Brunella:
On the normal bundle of Levi-flat hypersurfaces

Abstract: I will show that the normal bundle of a Levi-flat hypersurface in a higher-dimensional compact Kaehler manifold does not admit a metric with positive curvature.

Tid och plats: Torsdagen den 20 mars kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

KOMBINATORIKSEMINARIUM

Open Problems Seminar

Abstract: We take turns stating and discussing open problems. Everyone is welcome to contribute problems, suggest solutions, participate in discussion, or just enjoy.

Tid och plats: Onsdagen den 26 mars kl. 10.15 – 12.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

Välkomna!
A. Björner, A. Hultman, S. Linusson

ALGEBRA AND GEOMETRY SEMINAR

Ciro Ciliberto:
Interpolation and degeneration

Abstract: In this talk I will discuss basic questions and conjectures concerning the Hermite interpolation problem in several variables, and I will show how toric degeneration techniques can be usefully applied to this and related problems.

Tid och plats: Onsdagen den 26 mars kl. 13.15 – 14.15 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

MITTAG-LEFFLER SEMINAR — PLURIKOMPLEXA SEMINARIET

Alain Yger:
Integral kernels and representation formulas in view of algebraic or analytic geometry

Abstract: Since the Bergman-Weil representation formula appeared to be an efficient tool in order to solve the algebraic or even arithmetic *Nullstellensätze,* there have been many efforts to enlarge the class of integral representation formulas that could be of any help in similar questions as well as to clarify the reason why it could be so. I will illustrate the efficiency of residual currents towards such problems as far as they fit in the complete intersection situation, focus in particular on the ubiquity of Briançon-Skoda's theorem and on questions related to improper intersection theory, where the notion of trace, together with Radon or Fantappié transforms, plays some significant role.

Tid och plats: Tisdagen den 18 mars kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

SEMINARIUM I MATEMATISK STATISTIK

Andreas Lindell:
Hedging of real power options in terms of correlated assets

Abstract: I will give a brief introduction to power derivatives and in particular a specific contingent claim. The contingent claim can be used as a proxy for power plants as well as certain retail contracts.

Hedging techniques for this type of claim are formally derived in two ways, by stochastic control theory and by a special type of replacement strategy. Both are evaluated in a simulation setting. The interesting part is that we are able to derive hedging strategies in terms of traded assets that perform well, despite the fact that the underlying contracts are not traded.

The work is joint with Mikael Raab, currently employed at Vattenfall AB, formerly at KTH.

Tid och plats: Onsdagen den 19 mars kl. 15.15 i rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket.

MITTAG-LEFFLER SEMINAR

David Barrett:
Geometry, Leray transforms and duality for domains in $\mathbb{CP}^2$

Abstract: This talk will explore the interplay between the following three topics in the setting of smoothly bounded two-dimensional linearly convex domains, with emphasis on invariance under automorphisms of $\mathbb{CP}^2$:

- Relative and absolute differential invariants of the boundary.
- The dual complement construction.
- Spectral properties of the Leray integral transform.

Tid och plats: Torsdagen den 20 mars kl. 14.00 – 15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

KTH/SU MATHEMATICS COLLOQUIUM

Ciro Ciliberto:
Secant varieties: a crossroad
of projective geometry, algebra and topology

Abstract: In this talk I will show how the study of secant varieties, which belongs to the realm of projective geometry, gives important information about the topology of projective varieties and interesting algebraic problems, like interpolation, tensor rank computations, canonical forms, etc., which have also a serious impact in applications.

Tid och plats: Onsdagen den 26 mars kl. 16.00 – 17.00 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.

DISPUTATION I TEORETISK FYSIK

Martin Lindén

disputerar vid KTH på avhandlingen

Stochastic modeling of motor proteins

fredagen den 28 mars 2008 kl. 10.00 i sal FA32, Roslagstullsbacken 21, AlbaNova universitetscentrum. Till opponent har utsetts *professor Dean Astumian,* Department of Physics, University of Maine, USA.

Abstract of the thesis

Motor proteins are microscopic biological machines that convert chemical energy into motion and mechanical work. They power a diverse range of biological processes, for example the swimming and crawling motion of bacteria, intracellular transport, and muscle contraction. Understanding the physical basis of these processes is interesting in its own right, but has also an interesting potential for applications in medicine and nanotechnology.

The ongoing rapid developments in single molecule experimental techniques make it possible to probe these systems on the single molecule level, with increasing temporal and spatial resolution. The work presented in this thesis is concerned with physical modeling of motor proteins on the molecular scale, and with theoretical challenges in the interpretation of single molecule experiments.

First, we have investigated how a small group of elastically coupled motors collaborate, or fail to do so, when producing strong forces. Using a simple model inspired by the motor protein PilT, we find that the motors counteract each other if the density becomes higher than a certain threshold, which depends on the asymmetry of the system.

Second, we have contributed to the interpretation of experiments in which the stepwise motion of a motor protein is followed in real time. Such data are naturally interpreted in terms of first passage processes. Our main conclusions are: (1) Contrary to some earlier suggestions, the stepping events do not correspond to the cycle completion events associated with the work of Hill and co-workers. We have given a correct formulation. (2) Simple kinetic models predict a generic mechanism that gives rise to correlations in step directions and waiting times. Analysis of stepping data from a chimaeric flagellar motor was consistent with this prediction. (3) In the special case of a reversible motor, the chemical driving force can be extracted from statistical analysis of stepping trajectories.

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://www.math.su.se/~johannes/mj.html.en.
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.

New information

Jobs to apply for

11. Linköpings universitet söker minst en universitetslektor i tillämpad matematik. Sista ansökningsdag är den 7 april. Web-info: http://www.liu.se/jobbdb/show.html?2381.
12. Göteborgs universitet söker en biträdande universitetslektor i optimering med tillämpning inom medicin. Det huvudsakliga forskningsområdet ligger inom projektet "Optimerad strålbehandling av cancer via biologiska modeller av bot och biverkningar och en förbättrad planering av dosfördelningen i intensitetsmodulerad radioterapi". Sista ansökningsdag är den 24 april. Web-info: http://www.math.chalmers.se/bitrlektoroptimering080229eng.pdf.
13. Göteborgs universitet söker en universitetslektor i matematisk statistik med inriktning mot statistisk inferens. Sista ansökningsdag är den 22 maj. Web-info: http://www.math.chalmers.se/univlektormatematiskstatistik080228eng.pdf.
14. Chalmers tekniska högskola söker en professor i matematisk statistik. Sista ansökningsdag är den 22 maj. Web-info: http://www.math.chalmers.se/ProfMathStat4March08.pdf.

Old information

Money to apply for

15. Kungl. Vetenskapsakademien har två olika avtal om postdoc-stipendier för vistelse i Japan för forskning inom bland annat matematik. Det första avtalet omfattar ett till två års vistelse, och det andra omfattar 15 dagar till 11 månaders vistelse. Resekostnader och kostnader under vistelsen täcks av The Japan Society for the Promotion of Science (JSPS). Sista ansökningsdag är den 2 april. Web-info: http://www.kva.se/KVA_Root/swe/awards/scholarships/detail_scholarships.asp?grantsId=25 respektive http://www.kva.se/KVA_Root/swe/awards/scholarships/detail_scholarships.asp?grantsId=41.
16. Kungl. Vetenskapsakademien har avtal om forskarutbyte omfattande två veckor till sex månaders vistelse i Japan för studier/forskning inom bland annat matematik. Resan skall påbörjas under perioden 1 april – 31 december 2008. Sista ansökningsdag är den 2 april. Web-info: http://www.kva.se/KVA_Root/swe/awards/scholarships/detail_scholarships.asp?grantsId=18.

(Continued on the next page.)

Jobs to apply for

17. Forskarskolan i matematik och beräkningsvetenskap (FMB) söker fyra doktorander med tillträde den 1 juli 2008. Varje doktorand antas till forskarutbildning vid ett av de fyra lärosätena, Uppsala universitet, Karlstads universitet, Mittuniversitetet och Mälardalens högskola, i ett av de ämnen som omfattas av FMB, nämligen matematik, tillämpad matematik, beräkningsvetenskap, datoriserad bildbehandling, matematisk logik och matematisk statistik. Även den som redan är doktorand sedan högst ett år kan antas till forskarskolan. Sista ansökningsdag är den 17 mars. Web-info: http://www.math.uu.se/fmb/annons2008.php.
18. Malmö högskola utlyser en postdoc-tjänst i tillämpad matematik. För behörighet krävs doktorsexamen i tillämpad matematik eller närliggande ämne. Din nuvarande forskningsinriktning skall ligga inom något/några av områdena: digital bildanalys, datorseende och/eller biomatematik. Anställningen är tidsbegränsad till två år. Sista ansökningsdag är den 20 mars. Web-info: http://www.mah.se/templates/Job____74834.aspx.
19. Umeå universitet söker en ”postdoctoral fellow” med doktorsexamen i matematisk statistik eller statistik. Innehavaren av tjänsten skall bedriva forskning med anknytning till ”statistical modelling of sediment records to study environment and climate change”. Tjänsten varar i ett år med möjlighet till förlängning med ytterligare ett år. Sista ansökningsdag är den 17 mars. Web-info: http://www.math.umu.se/Aktuellt/Vacancies/postdocfellow31515508.pdf.