BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 27 **FREDAGEN DEN 4 SEPTEMBER 2009**

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 10 september kl. 13.00.

The Rolf Sundberg Symposium

Detta skall äga rum vid SU onsdagen den 16 september. Se sidan 7.

Postdoktorstipendier

i operatorteori och komplex analys utlyses av Institutionen för matematik vid KTH. Se sidorna 9 – 10.

SEMINARIER

Fr 09 – 04 kl. 13.15 – 14.15. Graduate Student Seminar. Michael Björklund: *The Lindenstrauss maximal inequality.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 26 sidan 4.

Fortsättning på nästa sida.

Disputation i optimeringslära och systemteori

Tove Gustavi skall disputera på avhandlingen *Control and Coordination of Mobile Multi-Agent Systems* fredagen den 4 september kl. 10.00 i sal F3, KTH, Lindstedtsvägen 26, b.v. Se Bråket nr 25 sidan 6.

A Celebration of the Field of Systems and Control

Ett symposium med denna titel skall äga rum vid KTH den 9 – 11 september. Se Bråket nr 26 sidorna 7 – 8.

Disputation i numerisk analys

Måns Elenius skall disputera vid SU på avhandlingen *Computer Simulations of Simple Liquids with Tetrahedral Local Order: the Supercooled Liquid, Solids and Phase Transitions* fredagen den 11 september kl. 10.15 i Sydvästra galleriet, KTHB, Osquars Backe 31. Se Bråket nr 26 sidorna 5 – 6.

Colloquium in honour of Allan Gut on the occasion of his 65th birthday

Detta skall äga rum i Uppsala fredagen den 18 september. Se sidan 8.

Kurser

Andreas Axelsson: Geometric multilinear analysis. Se sidan 4.

Anders Szepessy: Inverse Problems. Se sidan 3.

Seminarier (fortsättning)

Må 09–07 kl. 16.15 – 17.00. Seminarium i finansiell matematik. *(Observera tiden!)* **Johan Obermayer** presenterar sitt examensarbete: *An analysis of the fundamental price drivers of EU ETS carbon credits.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

Ti 09–08 kl. 10.00 – 11.00. Seminar in Automatic Control. Professor Sanjoy Mitter, Massachusetts Institute of Technology: *Towards a unified theory of communication and control.* Himmelriket, Osquldas väg 10, plan 8. Se sidan 5.

On 09–09 kl. 13.00. Seminarium i statistik. Feng Li, Statistiska institutionen, SU: *Flexible modelling of conditional distributions using smooth mixtures of asymmetric Student t densities.* Sal B705, Statistiska institutionen, SU, Universitetsvägen 10B, plan 7, Frescati. Se Bråket nr 26 sidan 6.

On 09–09 kl. 13.15 – 14.15. Algebra and Geometry Seminar. Gregory G. Smith, KTH/Queens: *Smooth and irreducible multigraded Hilbert schemes.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

On 09–09 kl. 14.00 – 15.00. Institut Mittag-Leffler Seminar. John Baldwin, University of Illinois, Chicago: *Shelah's conjecture: The universe is wide or deep.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

Please note: The Institut Mittag-Leffler seminars will take place on Wednesdays and Thursdays during the fall semester 2009.

On 09–09 kl. 15.30 – 16.30. Institut Mittag-Leffler Seminar. Ilijas Farah, York University, Toronto: *Model theory of operator algebras (joint work with Bradd Hart and David Sherman).* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 6.

On 09–09 kl. 16.00. KTH/SU Mathematics Colloquium. Professor Jürg Kramer, Humboldt-Universität zu Berlin: *Irrationality of $\sqrt{2}$ and Arakelov Geometry.* 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 Bråket nr 26 sidan 4.

On 09–09 kl. 18.00 – 19.00. Offentlig föreläsning på Kungl. Vetenskapsakademien. Gunilla Svensson, SU: *Varför smälter isen?* Beijersalen, Kungl. Vetenskapsakademien, Lilla Frescativägen 4A, Stockholm. Se Bråket nr 26 sidan 5.

To 09–10 kl. 13.15 – 15.00. Algebra and Geometry Seminar. *(Extra seminarium. Observera dagen!)* **Professor Michael Gekhtman,** Notre Dame, USA: *Bi-orthogonal Cauchy polynomials: total positivity and Riemann-Hilbert problems.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 6.

To 09–10 kl. 14.00 – 15.00. Institut Mittag-Leffler Seminar. Alexander Kechris, CALTECH, Pasadena: *The complexity of classification problems in ergodic theory.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 5.

To 09–10 kl. 15.30 – 16.30. Institut Mittag-Leffler Seminar. István Juhász, Hungarian Academy of Sciences, Budapest: *On the convergence and character spectra of compact spaces.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 9.

Fortsättning på nästa sida.

Seminarier (fortsättning)

Fr 09–11 kl. 15.15 – 16.15. Matematiska kollokviet i Uppsala. Boris Shapiro, SU: *Mystery of point charges.* Häggsalen, Ångströmlaboratoriet, Uppsala universitet. Kaffe/te serveras utanför föreläsningssalen kl. 14.55. Se sidan 6.

On 09–16 kl. 10.15 – 11.15. Kombinatorikseminarium — docentföreläsning i matematik. Axel Hultman, KTH: *Singularities of Schubert varieties and their relatives.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 7.

On 09–16 kl. 13.00 – 14.30. Öppen föreläsning anordnad av Institutionen för matematikämnets och naturvetenskapsämnenas didaktik vid SU. Kerstin Pettersson, Högskolan i Skövde: *Algoritmiska, intuitiva och formella aspekter av matematiken i dynamiskt samspel.* Amelinsalen, A508, Campus Konradsberg.

On 09–16 kl. 13.15. Algebra and Geometry Seminar. Wojciech Chachólski, KTH: *Property of groups.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

On 09–16 kl. 14.30 – 15.30. KCSE (KTH Computational Science and Engineering Centre) Seminar. Andreas Vallgren, Institutionen för mekanik, KTH: *High resolution simulations of 2D and 3D quasigeostrophic turbulence.* PDC:s seminarierum, KTH, Teknikringen 14, plan 3. Se sidan 8.

To 09–17 kl. 15.00 – 17.00. AlbaNova and Nordita Colloquium in Physics. *(Observera tiden!)* **Thomas Schlathölter,** University of Groningen: *Molecular mechanism underlying heavy ion therapy.* Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se sidan 10.

Fr 09–18 kl. 13.15 – 14.15. Graduate Student Seminar. Alan Sola: *Title to be announced.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

GRADUATE COURSE

Anders Szepessy: Inverse Problems

Goal: To understand basic mathematical and numerical methods to solve inverse problems related to partial differential equations.

Some topics: Ill-posed problems and their numerical solution by regularization methods, regularization of linear problems, Tikhonov regularization, regularization of nonlinear problems.

Some applications: Differentiation as an inverse problem, X-ray tomography, data-assimilation for weather and climate prediction, inverse scattering, optimal design, image processing, parameter identification.

Schedule: The course will start on Thursday, September 10, at 10.15 – 12.00 in seminar room 3721, Department of Mathematics, KTH, Lindstedtsvägen 25, floor 7. The course will then continue (preliminarily) on Thursdays at 10.15 – 12.00 in the same room. More information about the course (prerequisites, literature, plan, examination, ...) can be found on http://www.nada.kth.se/~szepessy/invers09.html.

Welcome!
Anders Szepessy

SEMINARIUM I FINANSIELL MATEMATIK

Johan Obermayer

presenterar sitt examensarbete:

An analysis of the fundamental price drivers of EU ETS carbon credits

Abstract: This thesis attempts to shed further light on price formation in the EU ETS carbon credits market. It explores relationships between credits and energy complex assets, including electrical power, coal, natural gas, and oil. Relationships are analysed using various statistical tools and methods, and explored in terms of fundamental economic relationships, correlation, and cointegration. Furthermore, the applicability of certain statistical tools, specifically correlation and multivariate regression, are examined. The switching price, according to the fundamentals theory, is found to be a poor indicator for valuing EUAs. Further, pairwise correlations between carbon credits, specifically EUAs and energy complex assets, are mostly found to be very noisy and weak. Power is found to be the only asset with significant correlation to EUAs. Weak correlations lead to weak multivariate regressions. Given these results, it is questionable whether correlation is a relevant tool for measuring relationships in the EU energy complex. To that end, cointegration is explored as a more relevant and robust measure. It is found that EUAs are cointegrated with natural gas and oil, but, surprisingly, not with power.

Price forecasters should observe that day-to-day EUA prices move in sync with electrical power. In the longer term, the EUA price is linked to oil, and, to a lesser extent, to natural gas.

Tid och plats: Måndagen den 7 september kl. 16.15 – 17.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

GRADUATE COURSE IN MATHEMATICS

Geometric multilinear analysis

Teacher: **Andreas Axelsson.**

The course will take place on Wednesdays at 10.15 – 12.00 in room 306, house 6, Department of Mathematics, SU, Kräftriket, starting on September 9.

For more information, see http://kurser.math.su.se/course/view.php?id=350 and Bråket no. 26, page 6.

ALGEBRA AND GEOMETRY SEMINAR

Gregory G. Smith:
Smooth and irreducible multigraded Hilbert schemes

Abstract: The multigraded Hilbert scheme parametrizes all homogeneous ideals in a polynomial ring graded by an abelian group with a fixed Hilbert function. In this talk, we will show that any multigraded Hilbert scheme is smooth and irreducible when the polynomial ring is $\mathbb{Z}[x, y]$; this establishes a conjecture of Haiman and Sturmfels.

Tid och plats: Onsdagen den 9 september kl. 13.15 – 14.15 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINAR IN AUTOMATIC CONTROL

Sanjoy Mitter:
Towards a unified theory of communication and control

Speaker: Professor Sanjoy Mitter received his Ph.D. degree from the Imperial College of Science and Technology, University of London, in 1965. His research has spanned the broad areas of Systems, Communication and Control. Although his primary contributions have been on the theoretical foundations of the field, he has also contributed to significant engineering applications, notably in the control of interconnected power systems, character recognition, and automatic recognition and classification of electrocardiograms. His current research interests are theory of stochastic dynamical systems, nonlinear filtering, stochastic and adaptive control; mathematical physics and its relationship to system theory; image analysis and computer vision; and structure, function and organization of complex systems.

Abstract: We would like to interconnect heterogeneous elements such as plants, sensors, actuators and controllers through noisy communication channels and predict the behaviour of the interconnected system from the knowledge of the behaviour of the components and the interconnection links. We do not have any such theory today. For point to point digital communication the fundamental limits of reliable transmission is given by the Noisy Channel Coding Theorem. A consequence of this theorem is the Source Channel Separation Theorem which provides an architecture (universal) of a digital communication system. For partially observable stochastic control problems for Markov Chains, the separation theorem states that the optimal control can be chosen as a function of the conditional distribution of the state given the past of the observation. For the second theorem causality obviously is of paramount importance whereas the first theorem requires that we need to pass to an appropriate thermodynamic limit. In what sense can we interpret the Noisy Channel Coding Theorem as a problem in Partially Observable Stochastic Control? Is coding really control in disguise?

Is there a canonical problem whose solution will give us insight into the distributed control problem? What is the role of signalling through the plant in distributed control problems?

Many of these questions were in some sense raised in the late sixties and early seventies but have remained dormant for over thirty years. In joint work with Nicola Elia, Nigel Newton, Anant Sahai and Sekhar Tatikonda, I have been investigating these issues for the last ten years. In this talk I want to give an exposition of these ideas.

Tid och plats: Tisdagen den 8 september kl. 10.00 – 11.00 i Himmelriket, Osquldas väg 10, plan 8.

INSTITUT MITTAG-LEFFLER SEMINAR

Alexander Kechris:
The complexity of classification problems in ergodic theory

Abstract: The last two decades have seen the emergence of a theory of set theoretic complexity of classification problems in mathematics. In this talk, I will survey recent developments concerning the application of this theory to classification problems in ergodic theory.

Tid och plats: Torsdagen den 10 september kl. 14.00 – 15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

INSTITUT MITTAG-LEFFLER SEMINAR

Ilijas Farah:
Model theory of operator algebras
(joint work with Bradd Hart and David Sherman)

Abstract: McDuff and Kirchberg have considered whether the ultrapower and the relative commutant of a II_1 factor or a C^*-algebra, respectively, depend on the choice of the ultrafilter. I will show that the negative answer to each of these questions is equivalent to the Continuum Hypothesis, extending results of Ge-Hadwin and myself. I will also outline a version of 'model theory for metric structures', suitable for study of C^*-algebras and tracial von Neumann algebras.

Tid och plats: Onsdagen den 9 september kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

ALGEBRA AND GEOMETRY SEMINAR

Michael Gekhtman:
Bi-orthogonal Cauchy polynomials:
total positivity and Riemann-Hilbert problems

Abstract: Motivation behind the introduction of bi-orthogonal Cauchy polynomials (Cauchy BOPs) stems from the cubic peakon equation and novel 2-matrix models. We will discuss the general framework for Cauchy BOPs and their fundamental properties. This includes: total positivity of recursion operators, interlacing of zeroes, generalized Christoffel-Darboux identities and a characterization in terms of a 3×3 matrix Riemann-Hilbert problem.

This is a joint project with M. Bertola and J. Szmigielski.

Tid och plats: Torsdagen den 10 september kl. 13.15 – 15.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

MATEMATISKA KOLLOKVIET I UPPSALA

Boris Shapiro:
Mystery of point charges

Abstract: In his famous book *Treatise of Electricity and Magnetism* J. C. Maxwell among numerous other things made the following claim:

Consider an arbitrary system of N point electric charges in $\mathbb{R}^3$. Assume that the electrostatic field created by these charges has only isolated equilibrium points (which is true for generic systems). Then the number of such points is at most $(N-1)^2$. He suggested a completely erroneous but very interesting proof of this claim containing elements of the Morse theory for smooth functions, which was rigorously created only at least half a century later.

In my talk I will discuss Maxwell's conjecture and some generalizations and describe much weaker results in this direction proven by D. Novikov, A. Gabrielov and myself some years ago. Maxwell's original claim is still unproven even for the case of 3 charges. No preliminary knowledge except some basic potential theory is required.

Tid och plats: Fredagen den 11 september kl. 15.15 – 16.15 i Häggsalen, Ångströmlaboratoriet, Uppsala universitet. Kaffe/te serveras utanför föreläsningssalen kl. 14.55.

THE ROLF SUNDBERG SYMPOSIUM

Conference in honour of Rolf Sundberg's retirement

To the honour of Professor Rolf Sundberg on his 67th birthday, Stockholm University arranges a one day symposium on statistical inference and its applications.

Time and place: Wednesday, September 16, 2009, in room 14, house 5, Department of Mathematics, SU, Kräftriket.

Web page: Updated information is available at http://www2.math.su.se/matstat/sundberg.

Programme

9.30	**Tom Britton/Anders Björkström:** *Opening.*
9.45 – 10.30	**Per Martin-Löf,** Stockholm: *On the concept of repetitive structure.*
10.30 – 11.15	**Steffen Lauritzen,** Oxford: *Graphical models with symmetry restrictions.*
11.15 – 11.45	Coffee.
11.45 – 12.30	**Inge Helland,** Oslo: *Partial least squares regression and mathematical statistics.*
12.30 – 13.15	**Philip Brown,** Kent: *Robust shrinkage and model selection in Regression.*
13.15 – 14.30	Lunch.
14.30 – 15.15	**Juni Palmgren,** Stockholm: *Genetic epidemiology and generalized linear mixed models.*
15.15 – 16.00	**Daniel Thorburn,** Stockholm: *Subjective probability, scientific inference and official statistics.*
16.00 – 16.30	Coffee.
16.30 – 16.50	**Rachel Fisher,** Stockholm: *T-tests or tea tests? A tale of students, statistics and a very large breakfast.*
16.50 – 17.35	**Nanny Wermuth,** Göteborg: *About 100 years of multivariate statistics, a personal view.*
17.35 – 17.45	Closing.
18.30 –	Dinner.

KOMBINATORIKSEMINARIUM — DOCENTFÖRELÄSNING I MATEMATIK

Axel Hultman:
Singularities of Schubert varieties and their relatives

Abstract: Given a point x on a Schubert variety, how does one determine whether or not x is singular? I plan to review some aspects of this well-studied problem that revolve around a celebrated criterion due to Carrell and Peterson. It reduces the problem to a combinatorial study of a certain "Bruhat graph".

The talk is intended as a brief survey for non-experts of more or less classical material. Time permitting, I shall, however, touch upon some recent developments concerning closures of symmetric orbits towards the end.

Tid och plats: Onsdagen den 16 september kl. 10.15 – 11.15 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

KCSE SEMINAR

Andreas Vallgren:
High resolution simulations of
2D and 3D quasigeostrophic turbulence

Abstract: The thinness of the Earth's atmosphere introduces two different ways of exploiting the turbulence characteristics. A first approximation is to study two-dimensional turbulence, which is interesting on its own, due to decades of theoretical development but lagging numerical support. Another approximation is to treat the problem as quasi-3D, with a stretched vertical coordinate. Accordingly, a number of simulations have been performed at a variety of computer clusters in Sweden. The talk will give a short introduction to 2D- and QG3D-turbulence, but the main focus will be on the numerical methods.

Tid och plats: Onsdagen den 16 september kl. 14.30 – 15.30 i PDC:s seminarierum, KTH, Teknikringen 14, plan 3.

COLLOQUIUM IN HONOUR OF PROFESSOR ALLAN GUT ON THE OCCASION OF HIS 65TH BIRTHDAY

Time and place: Friday, September 18, 2009, in the Polhem room, the Ångström Laboratory, Uppsala University.

Welcome to register by e-mail no later than Wednesday, September 9, to Silvelyn.Zwanzig@math.uu.se. Please indicate food preferences, e.g. vegetarian. There is no registration fee.

Web page: http://www.math.uu.se/inform/colloquium09/.

Programme

9.00	**Maciej Klimek,** Head of the Department of Mathematics, Uppsala University: *Opening.*
9.10 – 9.40	**Svante Janson,** Uppsala: *Some applications of renewal theory to random trees.*
9.45 – 10.15	**Marius Iosifescu,** Roumanian Academy: *Proving a limit theorem for the continued fraction expansion using an iterated function system with strictly stationary iteration mechanism.*
10.15 – 10.40	Coffee.
10.40 – 11.10	**Gerold Alsmeyer,** Münster: *On the transience of critical branching random walks on the line.*
11.15 – 11.45	**Thomas Mikosch,** Copenhagen: *The maximum increment of a heavy-tailed random walk.*
11.50 – 12.20	**Rainer Schwabe,** Magdeburg: *Stopped random walks for designed experiments.*
12.20 – 13.15	Lunch.
13.15 – 13.45	**Philip Protter,** Cornell University: *Questions on filtration shrinkage and illusory arbitrage.*
13.50 – 14.20	**Oleg Klesov,** Kiev: *Almost sure convergence of multiple random series.*
14.25 – 14.55	**Josef Steinebach,** Cologne: *Renewals, changes, and invariance.*
14.55 – 15.20	Coffee.
15.20 – 15.50	**Ulrich Stadtmüller,** Ulm: *Limit theorems for increments of random fields.*
15.55 – 16.25	**Lars Holst,** Stockholm: *On records.*
18.00 –	Dinner.

INSTITUT MITTAG-LEFFLER SEMINAR

István Juhász:
On the convergence and character spectra of compact spaces

Abstract: An infinite set A in a space X converges to a point p (denoted by $A \to p$) if for every neighbourhood U of p we have $|A \setminus U| < |A|$. We call $cS(p,X) = \{|A| : A \subset X$ and $A \to p\}$ the convergence spectrum of p in X and $cS(X) = \cup\{cS(x,X) : x \in X\}$ the convergence spectrum of X. The character spectrum of a point $p \in X$ is $\chi S(p,X) = \{\chi(p,Y) : p$ is non-isolated in $Y \subset X\}$ and $\chi S(X) = \cup\{\chi S(x,X) : x \in X\}$ is the character spectrum of X. If $\kappa \in \chi S(p,X)$ for a compactum X then $\{\kappa, cf(\kappa)\} \subset cS(p,X)$.

A selection of our joint results with W. Weiss (X is always a compactum):

(1) If X is countably tight then $\chi(p,X) > \lambda = \lambda^\omega$ implies $\lambda \in \chi S(p,X)$.

(2) If $\chi(X) > 2^\kappa$ then $\kappa^+ \in cS(X)$, in fact there is a converging discrete set of size κ^+ in X.

(3) If we add λ Cohen reals to a model of GCH then in the extension for every $\kappa \leq \lambda$ there is X with $\chi S(X) = \{\omega, \kappa\}$.

(4) If all members of $\chi S(X)$ are limit cardinals then

$$|X| \leq (\sup\{|\overline{S}| : S \in [X]^\omega\})^\omega.$$

(5) It is consistent that 2^ω is as big as you wish and there are arbitrarily large X with $\chi S(X) \cap (\omega, 2^\omega) = \emptyset$.

Tid och plats: Torsdagen den 10 september kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

Institutionen för matematik vid KTH ledigförklarar
ett antal postdoktorstipendier i operatorteori och komplex analys

Avsikten med varje stipendium är att bereda stipendiaten möjlighet att utveckla sin vetenskapliga förmåga i en god forskningsmiljö vid KTH. Vid bedömningen av ansökan kommer vikt att läggas vid vetenskaplig skicklighet i det specificerade området samt vid möjligheten till vetenskapligt samarbete med Hedenmalms forskningsgrupp i området.

Den sökande skall ha doktorsexamen eller motsvarande kompetens. Avhandlingen skall vara författad inom eller mycket nära det specificerade forskningsområdet. Doktorsexamen skall dessutom ha avlagts högst fem år före ledigförklarandet. Den sökande får ej heller ha varit anställd vid KTH under de senaste tre åren.

Varje stipendium finansieras ur Hedenmalms anslag från Göran Gustafssons Stiftelse. Stipendiet fastställs för ett år med möjlig förlängning med ytterligare ett år. Det finns även — om det bedöms lämpligt — möjlighet till stipendium för en kortare vistelse om två månader; även i detta fall finns möjlighet till förlängning med ytterligare två månader under nästföljande år. Stipendiebeloppet utbetalas månadsvis; det månatliga beloppet fastställs i samråd med stipendiaten före tillträdet. Dock skall beloppet falla inom intervallet 15 000 – 18 000 kr per månad. Till detta tillkommer ett reseanslag om 15 000 kr per år för att bekosta stipendiatens resor till och från hemorten samt eventuella övriga resor. I fall av det kortare stipendiet blir stödet till resor mindre, 7 000 kr per år.

KTH har höjt ambitionerna när det gäller mångsidig kompetensförsörjning och välkomnar därför sökande som kompletterar vår fakultet med avseende på jämställdhet.

(Fortsättning på nästa sida.)

Upplysningar om postdoktorstipendierna lämnas av professor Håkan Hedenmalm, telefon 08-790 78 32, e-post haakanh@kth.se.

Ansökan skall ha inkommit senast tisdagen den 15 september 2009 till KTH, Institutionen för matematik, Lindstedtsvägen 25, 100 44 Stockholm. Ange referensnummer S-2009-0658 i ansökan.

ALBANOVA AND NORDITA COLLOQUIUM IN PHYSICS

Thomas Schlathölter:
Molecular mechanism underlying heavy ion therapy

Abstract: The current increasing social and corporate interest in proton- and heavy ion-therapy of malignant tumours leads to an increasing number of treatment facilities worldwide. When fast ions traverse tissue and are decelerated to MeV energies and below, the so-called Bragg-peak is reached. At this well-defined depth, damage is highest due to maximum linear energy transfer and radiobiological effectiveness at these energies. This volume sensitivity renders ion-therapy a superior tool for a number of tumours, often decreasing the yearly risk of radiation induced development of lethal secondary tumours by up to one order of magnitude! The chemical and biological aspects of biological radiation damage have been studied in great detail. Whereas for conventional radiation the molecular mechanisms underlying biological action are to some extent understood, the exceptional cell killing efficiency of heavy ions and protons is largely unexplored on the molecular level. In Groningen we recently observed fragment ion kinetic energies exceeding 10 eV when irradiating isolated DNA building blocks with ions at Bragg-peak energies. Such energetic fragments can in turn induce further ionization and fragmentation of DNA building blocks, leading to an avalanche of damage that could manifest in clustered DNA lesions. Currently, more complex targets such as electrosprayed nanosolvated biomolecules and biomolecular complexes are employed to extend radiation damage studies to more realistic systems. First results indicate that a chemical environment opens up additional fragmentation channels for DNA building blocks. Water solvation shells, on the other hand, seem to prevent fragmentation.

Tid och plats: Torsdagen den 17 september kl. 15.00 – 17.00 i Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum.
