BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 36 **FREDAGEN DEN 6 NOVEMBER 2009**

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 12 november kl. 13.00.

Disputation i matematik

Jakob Erik Björnberg skall disputera vid KTH på avhandlingen *Graphical representations of Ising and Potts models: Stochastic geometry of the quantum Ising model and the space-time Potts model* onsdagen den 18 november kl. 13.30. Se sidan 8.

SEMINARIER

Fr 11–06 kl. 13.15 – 14.00. Presentation av examensarbete i matematik. Andreas Minne: *Mathematical analysis of a homogenization model for molecular motors.* Examinator: **Professor Henrik Shahgholian.** Handledare: **Professor Benoit Perthame.** Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 3.

Må 11–09 kl. 15.15. Seminarium i finansiell matematik. Professor Xunyu Zhou, University of Oxford: *Finding quantiles.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 35 sidan 2.

Ti 11–10 kl. 18.30. Populärvetenskaplig föreläsning i fysik. Christer Fuglesang, astronaut, ESA, och affilierad professor i fysik, KTH: *Med Discovery till ISS: Om min flygning till internationella rymdstationen samt lite om strålning i rymden.* Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se sidan 4.

On 11–11 kl. 10.15 – 12.00. Kombinatorikseminarium. Martina Kubitzke, Reykjavík: *The Lefschetz property for barycentric subdivisions of shellable complexes.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 3.

Fortsättning på nästa sida.

Miniworkshop in PDE and Potential Theory

Denna skall äga rum vid KTH onsdagen den 18 november. Se sidorna 9 – 10.

Money, jobs: Se sidorna 10 – 11.

Seminarier (fortsättning)

On 11–11 kl. 13.15 – 14.15. Seminarium i analys och dynamiska system. Håkan Hedenmalm, KTH: *Heisenberg uniqueness pairs and the Klein-Gordon equation.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 3.

On 11–11 kl. 13.15 – 15.00. Algebra and Geometry Seminar. Kelly Jabbusch, KTH: *Families over special base manifolds and a conjecture of Campana.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 4.

To 11–12 kl. 10.30. Seminar in Fluid Mechanics. Daniel Bodony, University of Illinois at Urbana-Champaign: *Aeroacoustic predictions in complex geometries.* Seminarierummet, Institutionen för mekanik, KTH, Teknikringen 8. Se sidan 4.

To 11–12 kl. 14.00 – 15.00. Institut Mittag-Leffler Seminar. Lauri Hella, University of Tampere: *Monadic Sigma-1-1 and modal logic with quantified binary relations.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 5.

To 11–12 kl. 15.15 – 16.15. AlbaNova and Nordita Colloquium in Physics. William A. Goddard, III, California Institute of Technology: *Theory and applications to Energy, Water, Catalysis, Materials Science, and Pharma.* Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se sidan 5.

To 11–12 kl. 15.30 – 16.30. Institut Mittag-Leffler Seminar. Juha Kontinen, University of Helsinki: *Regular representations of uniform TC0.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 7.

Fr 11–13 kl. 13.15 – 14.15. Graduate Student Seminar. Oscar Andersson Forsman: *What is Lie group methods for PDE?* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 6.

On 11–18 kl. 13.00 – 14.30. Öppen föreläsning anordnad av Institutionen för matematikämnets och naturvetenskapsämnenas didaktik vid SU. Inger Wistedt, Pedagogiska institutionen, SU: *Stöd och utveckling av matematisk förmåga — nationella och internationella perspektiv.* Amelinsalen, A502, Campus Konradsberg.

On 11–18 kl. 13.15. Algebra and Geometry Seminar. Sandra Di Rocco, KTH: *Title to be announced.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

On 11–18 kl. 16.00. KTH/SU Mathematics Colloquium. Alexander Gorodnik, University of Bristol: *Arithmetic geometry and dynamical systems.* 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 7.

To 11–19 kl. 10.15 – 11.00. Guest Lecture. Professor Alberto Isidori, University of Rome, Italy: *A unified design method for output regulation of minimum phase and non-minimum phase systems.* Sal M3, KTH, Brinellvägen 64. Se sidan 6.

PRESENTATION AV EXAMENSARBETE I MATEMATIK

Andreas Minne:
Mathematical analysis of a homogenization model for molecular motors

Examinator: **Professor Henrik Shahgholian.**

Handledare: **Professor Benoit Perthame.**

Abstract: Homogenization is a mathematical tool widely used in different parts of applied mathematics. Here I compare two different articles, *Asymmetric potentials and motor effect: a homogenization approach*, [1], and *Homogenization of a neutronic critical diffusion problem with drift*, [2], that both describe an exponential drift that occurs to the solution of a PDE eigenvalue problem, as the periods become smaller. I shed some light over a subtle but interesting difference between them, namely that the zeros of the effective Hamiltonian $\overline{H}$ to the problem are key to the solutions in [1] while it is the maximum of $\overline{H}$ in [2] that is important. Emphasis is put on presenting and analysing [1] that models molecular motors.

Tid och plats: Fredagen den 6 november kl. 13.15 – 14.00 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

KOMBINATORIKSEMINARIUM

Martina Kubitzke:
The Lefschetz property for barycentric subdivisions of shellable complexes

Abstract: We show that an 'almost strong Lefschetz' property holds for the barycentric subdivision of a shellable complex. From this we conclude that for the barycentric subdivision of a Cohen-Macaulay complex, the h-vector is unimodal, peaks in its middle degree (one of them if the dimension of the complex is even), and that its g-vector is an M-sequence. In particular, the (combinatorial) g-conjecture is verified for barycentric subdivisions of homology spheres. In addition, using the above algebraic result, we derive new inequalities on a refinement of the Eulerian statistics on permutations, where permutations are grouped by the number of descents and the image of 1.

This is joint work with Eran Nevo.

Tid och plats: Onsdagen den 11 november kl. 10.15 – 12.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

Håkan Hedenmalm:
Heisenberg uniqueness pairs and the Klein-Gordon equation

Abstract: It is well-known that for solutions of elliptic PDE we have smoothness, which in case of real analyticity leads to local restrictions on the zero set. Here we discuss the non-elliptic case of the Klein-Gordon equation in one spatial dimension, and obtain surprisingly that a lattice-cross is a uniqueness set under some additional conditions.

Tid och plats: Onsdagen den 11 november kl. 13.15 – 14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

POPULÄRVETENSKAPLIG FÖRELÄSNING I FYSIK

Christer Fuglesang:
Med Discovery till ISS: Om min flygning till internationella rymdstationen samt lite om strålning i rymden

Sammanfattning: Föreläsningen inleds med den halvtimmes film, som STS-128-besättningen gjorde om sin flygning med rymdfärjan Discovery till Internationella Rymdstationen ISS i augusti-september. Jag berättar om resan och vad vi gjorde, medan filmen visar allt från start till landning, rymdpromenader och flyttjobbsarbeten samt lite vardagsaktiviteter. Därefter följer lite diskussioner om framtida rymdfärder och det specifika problemet med strålning i rymden för långa resor. Gott om tid för frågor från publiken på slutet.

Tid och plats: Tisdagen den 10 november kl. 18.30 i Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum.

ALGEBRA AND GEOMETRY SEMINAR

Kelly Jabbusch:
Families over special base manifolds and a conjecture of Campana

Abstract: Complex varieties are traditionally classified by their Kodiara-Iitaka dimension. Refining the distinction between "general type" and "other", Campana defined the class of special log varieties (Y, D), characterized by the fact that if $\mathscr{A} \subseteq \Omega^p_Y(\log D)$ is an invertible subsheaf for some p, then $\kappa(\mathscr{A}) < p$. Generalizing classical Shafarevich Hyperbolicity, he conjectured that any smooth projective family of canonically polarized manifolds over a special base variety is necessarily isotrivial. In this talk I will discuss special pairs and Shafarevich Hyperbolicity, and I will report on joint work with Stefan Kebekus in which we prove Campana's conjecture for quasi-projective base manifolds of dimension two and three.

Tid och plats: Onsdagen den 11 november kl. 13.15 – 15.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

SEMINAR IN FLUID MECHANICS

Daniel Bodony:
Aeroacoustic predictions in complex geometries

Abstract: Historically, algorithms developed for computational aeroacoustics focused on the accurate treatment of wave propagation in geometrically simple domains. The move towards more predictions involving complex geometries has been somewhat slower. In this talk we will discuss recent advancements made in high-fidelity aeroacoustic prediction methods for complex geometries using the overset mesh (or Chimera) approach. Focus will be given to proving energy stability in overset techniques and in a novel approach to handling moving Chimera meshes distributed over many processors. Examples of the algorithms will be given including the prediction and control of jet noise and high-fidelity simulations of rotor-stator wake interactions.

Tid och plats: Torsdagen den 12 november kl. 10.30 i seminarierummet, Institutionen för mekanik, KTH, Teknikringen 8.

INSTITUT MITTAG-LEFFLER SEMINAR

Lauri Hella:
Monadic Sigma-1-1 and modal logic with quantified binary relations

Abstract: We investigate the expressive power of a range of modal logics extended with second-order prenex quantification of binary and unary relations. Our main result is that Sigma-1-1(BML=), i.e., Boolean modal logic extended with identity modality and existential prenex quantification of binary and unary relations, translates to monadic Sigma-1-1. As a corollary, we get decidability results for multimodal logics on various classes of Kripke frames. Our result can also be seen as a step towards showing that Sigma-1-1(FO2) is contained in monadic Sigma-1-1, i.e., each existential second-order sentence with first-order part containing only two variables is equivalent to a sentence in monadic Sigma-1-1. This was conjectured by Grädel and Rosen in 1999.

The talk is based on joint work with Antti Kuusisto (University of Tampere).

Tid och plats: Torsdagen den 12 november kl. 14.00 – 15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

ALBANOVA AND NORDITA COLLOQUIUM IN PHYSICS

William A. Goddard, III:
Theory and applications to Energy, Water, Catalysis, Materials Science, and Pharma

Abstract: Advances in theoretical and computational chemistry are making it practical to consider first principles based predictions of important systems and processes in the Chemical, Biological, and Materials Sciences. Our approach to applying first principles to such systems is to build a hierarchy of models to make practical the consideration of larger length and time scales. Connecting this hierarchy back to quantum mechanics enables the application of first principles to the coarse levels essential for practical simulations of complex systems.

We will highlight some recent advances in methodology with illustrations from recent applications to problems involving Energy, Water, Catalysis, and Materials Science and Pharma selected from:

- Nonadiabatic dynamics for highly excited systems (eFF) with application to materials at extreme conditions (warm dense matter).
- The mechanisms underlying superconductivity in cuprates and FeAsLaO systems.
- Mechanism of dioxygen reduction reaction (ORR) on Pt alloy and non Pt cathodes.
- Mechanisms of Organometallic reactions for converting methane to methanol.
- Mechanism Heterogeneous catalysis: oxidation and ammoxidation on multimetal oxides.
- Predicted three-dimensional structures of G-Protein Coupled Receptors (GPCRs) with agonists, antagonists.
- Dendrimer Enhanced Nanotechnology Filtration process for low pressure ultrafiltration (UF) and microfiltration for remediation of contaminated groundwater.

Tid och plats: Torsdagen den 12 november kl. 15.15 – 16.15 i Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum.

GRADUATE STUDENT SEMINAR

Oscar Andersson Forsman:
What is Lie group methods for PDE?

Abstract: The talk will be a short presentation of how you find explicit solutions for PDEs with symmetry techniques. I will present this topic by showing how these methods work for the KdV-equation.

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

GUEST LECTURE

Alberto Isidori:
A unified design method for output regulation of minimum phase and non-minimum phase systems

Speaker: Alberto Isidori obtained his degree in EE from the University of Rome in 1965. Since 1975, he is Professor of Automatic Control at this university. He has held visiting positions in various leading universities, which include the University of Illinois at Urbana-Champaign, the University of California at Berkeley, the ETH in Zürich. Between 1989 and 2006, he has also been regularly collaborating with Washington University in St. Louis. His research interests are primarily in analysis and design of nonlinear control systems. He is the author of the highly-cited book *Nonlinear Control Systems.* He is the recipient of various prestigious awards, which include the Georgio Quazza Medal (in 1996) from the International Federation of Automatic Control. He is also the recipient of the Ktesibios Award, from the Mediterranean Control Association (in 2000), and of the Bode Lecture Award, from the Control Systems Society of IEEE (in 2001). In 2009, he received the Galileo Galiei Award, from the Italian Rotary Clubs, in recognition of his contributions to the progress of engineering sciences in Italy. He received best paper awards on the IEEE Transactions on Automatic Control and Automatica, twice on both journals. In 1986 he was elected Fellow of IEEE and in 2005 he was elected Fellow of IFAC. He is listed in the Highly-Cited database (http://isihighlycited.com) among the top most-cited authors in Engineering. He is currently President of the International Federation of Automatic Control.

Abstract: Recent advances on the problem of output regulation for nonlinear systems repose on a newly-developed notion of steady state behaviours of a nonlinear system. This notion, which utilizes an enhanced version of the concept of limit set, provides a natural tool for the extension to nonlinear systems of a very classical notion in linear feedback design. Forcing a prescribed steady-state response in a given nonlinear system can be cast as a problem of robust stability of an augmented system consisting of the controlled plant and of an internal model of the exogenous inputs. This robust stabilization problem becomes particularly challenging if the controlled plant is minimum phase and even in the case of linear systems is largely unsolved. The present lecture describes a newly proposed, unified, approach to the design of the feedback law, by means of which some relevant classes of non-minimum phase systems can be handled. The core of the method is a reduction procedure, in which certain degrees of freedom in the design of the internal model are conveniently exploited to the purpose of simplifying the resulting stabilization task.

Tid och plats: Torsdagen den 19 november kl. 10.15 – 11.00 i sal M3, KTH, Brinellvägen 64.

INSTITUT MITTAG-LEFFLER SEMINAR

Juha Kontinen:
Regular representations of uniform TC0

Abstract: The circuit complexity class DLOGTIME-uniform AC0 is known to be a modest subclass of DLOGTIME-uniform TC0. The weakness of AC0 is caused by the fact that AC0 is not closed under restricting AC0-computable queries into AC0-computable substrings of the input. Analogously, in descriptive complexity, the logics corresponding to DLOGTIME-uniform AC0 do not have the relativization property and hence they are not regular. This weakness of DLOGTIME-uniform AC0 has been elaborated in the line of research on the Crane Beach Conjecture. The conjecture (which was refuted by Barrington, Immerman, Lautemann and Schweikardt in 2001) was that if a language L has a neutral letter, then L can be defined in FOB, first-order logic with the collection of all numeric built-in predicates B, iff L can be already defined in FO{<}, first-order logic with order. We consider logics in the range of DLOGTIME-uniform AC0 and TC0. First we show that DLOGTIME-uniform TC0 can be logically characterized in terms of quantifier logics with cardinality quantifiers FO{<}(C_S), where S is the range of some polynomial with positive integer coefficients of degree at least two. In the second part of the seminar we first adapt the key properties of general logics to accomodate built-in relations. Then we define the regular interior R-int(L) and regular closure R-cl(L), of a logic L, and show that the Crane Beach Conjecture can be interpreted as a statement concerning R-int(FO_B). In particular, by the result of Barrington, Immerman, Lautemann and Schweikardt, if B contains only unary relations (besides <) then R-int(FO_B)=FO{<} on strings. In contrast, if B contains < and the range of a polynomial of degree at least two, then R-cl(FO_B) includes all languages in DLOGTIME-uniform TC0.

The talk is based on joint work with Lauri Hella and Kerkko Luosto.

Tid och plats: Torsdagen den 12 november kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

KTH/SU MATHEMATICS COLLOQUIUM

Alexander Gorodnik:
Arithmetic geometry and dynamical systems

Abstract: A fundamental problem in arithmetic geometry is to describe the structure of the sets of integral/rational solutions of polynomial equations. In particular one is interested in the number of solutions, distribution of solutions, and Diophantine approximation by solutions. In this talk we explain how these questions can be approached using techniques from the theory of dynamical systems.

Tid och plats: Onsdagen den 18 november 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.

DISPUTATION I MATEMATIK

Jakob Erik Björnberg

skall disputera på avhandlingen

**Graphical representations of Ising and Potts models:
Stochastic geometry of the quantum Ising model
and the space-time Potts model**

onsdagen den 18 november 2009 kl. 13.30 i sal F3, KTH, Lindstedtsvägen 26, b.v. Till opponent har utsetts *professor Jeff Steif,* Chalmers tekniska högskola, Göteborg.

Abstract of the thesis

Statistical physics seeks to explain macroscopic properties of matter in terms of microscopic interactions. Of particular interest is the phenomenon of phase transition: the sudden changes in macroscopic properties as external conditions are varied. Two models in particular are of great interest to mathematicians, namely the Ising model of a magnet and the percolation model of a porous solid. These models in turn are part of the unifying framework of the random-cluster representation, a model for random graphs which was first studied by Fortuin and Kasteleyn in the 1970's. The random-cluster representation has proved extremely useful in proving important facts about the Ising model and similar models.

In this work we study the corresponding graphical framework for two related models. The first model is the transverse field quantum Ising model, an extension of the original Ising model which was introduced by Lieb, Schultz and Mattis in the 1960's. The second model is the space-time percolation process, which is closely related to the contact model for the spread of disease. In Chapter 2 we define the appropriate space-time random-cluster model and explore a range of useful probabilistic techniques for studying it. The space-time Potts model emerges as a natural generalization of the quantum Ising model. The basic properties of the phase transitions in these models are treated in this chapter, such as the fact that there is at most one unbounded FK-cluster, and the resulting lower bound on the critical value in $\mathbb{Z}$.

In Chapter 3 we develop an alternative graphical representation of the quantum Ising model, called the random-parity representation. This representation is based on the random-current representation of the classical Ising model, and allows us to study in much greater detail the phase transition and critical behaviour. A major aim of this chapter is to prove sharpness of the phase transition in the quantum Ising model — a central issue in the theory — and to establish bounds on some critical exponents. We address these issues by using the random-parity representation to establish certain differential inequalities, integration of which gives the results.

In Chapter 4 we explore some consequences and possible extensions of the results established in Chapters 2 and 3. For example, we determine the critical point for the quantum Ising model in $\mathbb{Z}$ and in 'star-like' geometries.

MINIWORKSHOP IN PDE AND POTENTIAL THEORY

The workshop will take place on Wednesday, November 18, 2009, in rooms Q11 and Q13, the Q-building, KTH, Osquldas väg 6B.

Schedule

10.10 – 11.00 **Gianni Arioli,** Politecnico di Milano: *A functional analytic approach to computer assisted proofs.* (Room Q11.)

Abstract: In this talk I describe a rather generic approach to computer assisted proofs of the existence of solutions for differential equations. Many examples to both ordinary differential equations (Fermi-Pasta-Ulam model, 3-body problem) and partial differential equations (the Gelfand problem and its 4th order extension, Kuramoto-Sivashinski equation) are provided. I will discuss the main features of this approach, comparing its performance and effectiveness with those of traditional analytic methods and also with other computer assisted methods.

11.10 – 12.00 **Håkan Hedenmalm,** KTH: *Boundary properties of Green functions in the plane.* (Room Q11.)

Abstract: We discuss the methods of conformal mappings, such as the area theorem, Grunsky inequalities, etc., in terms of integral operator identities. We apply one of these identities to obtain boundary control on the Green function, generalizing a method introduced by Carleson and Makarov (which was later refined by Jones and Makarov).

12.00 – 13.30 Lunch.

13.30 – 14.20 **Anna-Karin Tornberg,** KTH: *A numerical method for two-phase flows with insoluble and soluble surfactants.* (Room Q13.)

Abstract: Surfactants, or surface reacting agents, are present in many practical multiphase flow problems. Surfactants are absorbed from the bulk as a monomolecular layer to the interfaces between fluids, modifying the surface tension at these interfaces. The effect of surfactants is important in many real world applications including problems dealing with gas emboli, micro fluidic applications, and electrical components, in which the surface tension plays a signicant role.

The concentration of the surfactant on an interface separating the fluids can be modelled with a time-dependent differential equation defined on the moving and deforming interface. When the surfactants are soluble and therefore exist in the bulk fluid, this equation is coupled with a partial differential equation modelling the soluble surfactant concentration in the bulk fluid. In the Navier-Stokes equations the surface tension forces from the interface depend on the surfactant concentration along the interface.

We develop a second order numerical method based on an explicit yet Eulerian discretization of the interface. An embedded boundary method is used to enforce the boundary conditions for the soluble surfactants at the time-dependent interface. We use a finite difference method to solve the Navier-Stokes equations for the fluid flow.

Results for drops deforming in a linear shear flow in two dimensions are presented for both insoluble and soluble surfactants. We discuss the effect of different parameters on the surfactant distribution, the capillary and Marangoni stresses, and finally the obtained drop deformation.

(Continued on the next page.)

14.30 – 15.20 **Elaine Crooks,** Swansea University: *On fronts in a vanishing-viscosity limit.* (Room Q13.)

Abstract: Scalar balance laws with monostable reaction, possibly non-convex flux, and viscosity epsilon are known to admit so-called entropy travelling fronts for all velocities greater than or equal to an epsilon-dependent minimal value, both when epsilon is positive, when all fronts are smooth, and for epsilon = 0, when the possibly non-convex flux results in fronts of speed close to the minimal value typically having discontinuities where jump conditions hold. I will discuss the vanishing-viscosity convergence of these fronts.

Welcome!

Sara Maad Henrik Shahgholian Andrzej Szulkin

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 2009. 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

Money to apply for

11. Uppsala universitet ledigkungör stipendier ur Lennanders stiftelse för främjande av naturvetenskaplig och medicinsk forskning, 5 st à 150 000 kr och 10 st à 100 000 kr. I första hand delas stipendier ut till nydisputerade forskare som saknar försörjning eller doktorander som befinner sig i slutfasen av sin utbildning. Sista ansökningsdag är den 29 januari 2010. Web-info: http://www.uu.se/node399.

Old information

Money to apply for

12. Stiftelsen G. S. Magnusons fond utdelar stipendier inom matematik med bland annat följande ändamål: Stöd till doktorander, stöd till den som önskar ytterligare meritera sig efter doktorsexamen och bidrag för att kvarhålla forskare inom landet. Sista ansökningsdag är den 1 februari 2010. Web-info: http://www.kva.se/Documents/Utlysningar/Stipendier/sarskilda/info_stip_Magnuson_sv_10.pdf.

(Continued on the next page.)

13. Kungl. Vetenskapsakademien utlyser stipendier och anslag inom matematik enligt följande: Till doktorander utdelas stipendier med ett maximibelopp på 100 000 kr, och till forskare som avlagt doktorsexamen år 2004 eller senare utdelas forskningsanslag med ett maximibelopp på 300 000 kr. Anslag utgår under högst ett år. Sista ansökningsdag är den 1 februari 2010. Web-info: http://www.kva.se/sv/utlysningar/stipendier-och-anslag/Matematik/.

Jobs to apply for

14. Københavns Universitet söker doktorander i matematik, statistik, försäkringsmatematik och finansmatematik. Sista ansökningsdag är den 1 januari 2010. Web-info: http://www.math.ku.dk/english/programmes/ph.d/apply/.
15. Københavns Universitet utlyser flera postdoktorala tjänster, placerade vid Institut for Matematiske Fag (Department of Mathematical Sciences). Tjänstetiden är minst ett och högst tre år. Sista ansökningsdag är den 1 december. Web-info: http://www.math.ku.dk/english/research/postdoc_apply/.
16. Linköpings universitet söker en professor i matematisk statistik med inriktning mot området beräkningsmatematik. Sista ansökningsdag är den 27 november. Web-info: http://www.liu.se/jobbdb/show.html?3080.
17. Linköpings universitet söker en professor i tillämpad matematik med inriktning mot området beräkningsmatematik. Sista ansökningsdag är den 27 november. Web-info: http://www.liu.se/jobbdb/show.html?3082.