BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 39 **FREDAGEN DEN 27 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 3 december kl. 13.00.

Workshop on Perfect codes and related topics

Denna skall äga rum vid KTH den 4 – 5 december. Se sidorna 5 – 6.

Analysis, probability and geometry in quantum physics and classical mechanics

Ett symposium med denna titel skall äga rum vid KTH tisdagen den 8 december. Se sidan 6.

SEMINARIER

Fr 11–27 kl. 13.00. Licentiatseminarium i datalogi. Mattias Bratt presenterar sin licentiatavhandling: *Teleoperation with significant dynamics.* Opponent: **Professor Ivan Kalaykov,** Örebro universitet. Sal D3, KTH, Lindstedtsvägen 5, b.v. Se sidan 4.

Må 11–30 kl. 11.00. Minicourse in mathematics. Kelly Jabbusch: *Positivity in Algebraic Geometry. Third lecture.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 37 sidan 4.

Må 11–30 kl. 15.15. Seminarium i matematisk statistik. Daniel Alai, ETH, Zürich: *Prediction Uncertainty in Stochastic Claims Reserving Methods.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 38 sidan 6.

Ti 12–01 kl. 13.15. Seminarium i teoretisk datalogi. Johannes Borgström: *A Refined State Monad, with applications to capability-based access control.* Rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5. Se sidan 5.

On 12–02 kl. 9.15 – 10.00. Extra kombinatorikseminarium. *(Observera tiden!)* **Ivan Mogilnykh,** Sobolev Institute of Mathematics, Novosibirsk: *Weak isometries of Preparata codes.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

Fortsättning på nästa sida.

Disputation i numerisk analys

Tomas Oppelstrup skall disputera vid KTH på avhandlingen *Simulation of relaxation processes in complex condensed matter systems: Algorithmic and physical aspects* torsdagen den 10 december kl. 10.00. Se sidan 10.

Seminarier (fortsättning)

On 12–02 kl. 10.00–11.00. Presentation av examensarbete i matematik (30 högskolepoäng, grundnivå). **Linus Nyström:** *An Introduction to Forward Backward Stochastic Differential Equations.* Handledare: **Yishao Zhou.** Sal 21, hus 5, Matematiska institutionen, SU, Kräftriket. Se sidan 7.

On 12–02 kl. 10.15–12.00. Kombinatorikseminarium. Hanna Uscka-Wehlou, Uppsala: *Some combinatorial problems related to digital straight lines with irrational slopes and to balanced aperiodic words.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 38 sidan 8.

On 12–02 kl. 13.15–14.15. Seminarium i analys och dynamiska system. Anders Öberg, Uppsala: *Uniqueness, mixing and Bernoullicity of g-measures.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

On 12–02 kl. 13.15–14.15. Algebra and Geometry Seminar. Runar Ile, Bergen: *Cohen-Macaulay approximation in cofibred categories.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 8.

On 12–02 kl. 15.15. Seminarium i matematisk statistik. Peter Hambäck, Botaniska institutionen, SU: *Spatiotemporal problems in food web ecology: modelling and empirical observations.* Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 9.

On 12–02 kl. 16.00. KTH/SU Mathematics Colloquium. Professor Laurent Bartholdi, Georg-August-Universität Göttingen: *Insanely twisted rabbits.* 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 38 sidan 5.

To 12–03 kl. 10.15. Seminarium i teoretisk datalogi. Peter Jonsson, Luleå: *Introduction to supercompilation.* Rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5. Se Bråket nr 38 sidan 8.

To 12–03 kl. 10.30. Seminar in Fluid Mechanics. Peter Davidson, University of Cambridge: *Structure formation in rotating turbulence.* Seminarierummet, Institutionen för mekanik, KTH, Teknikringen 8. Se Bråket nr 38 sidan 6.

To 12–03 kl. 13.15–14.00. ACCESS Distinguished Lecture Series. Professor Scott Kirkpatrick, The Hebrew University of Jerusalem: *Visions of the Future Internet.* Sal F2, KTH, Lindstedtsvägen 26, b.v. Se sidan 7.

To 12–03 kl. 14.00–15.00. Institut Mittag-Leffler Seminar. Heike Mildenberger, Universität Wien: *Filters versus semifilters.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 3.

To 12–03 kl. 15.15–16.15. AlbaNova and Nordita Colloquium in Physics. Thomas Udem, Max Planck Institute for Quantum Optics, Garching: *Frequency combs for astrophysics.* Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se sidan 8.

To 12–03 kl. 15.30–16.30. Institut Mittag-Leffler Seminar. James Cummings, Carnegie Mellon University, Pittsburgh: *Recent uses of infinitary methods in finite combinatorics.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 4.

Fortsättning på nästa sida.

Seminarier (fortsättning)

Må 12–07 kl. 11.00. Minicourse in mathematics. Kelly Jabbusch: *Positivity in Algebraic Geometry. Fourth lecture.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 37 sidan 4.

Ti 12–08 kl. 9.00 – 9.05. Nobelföreläsningarna 2009. Svante Lindqvist, Kungl. Vetenskapsakademiens preses: *Introduction.* Aula Magna, SU.

Ti 12–08 kl. 9.05 – 11.05. Nobelföreläsningar i fysik. Aula Magna, SU.

Ti 12–08 kl. 12.30 – 14.30. Nobelföreläsningar i kemi. Aula Magna, SU.

Ti 12–08 kl. 15.00 – 16.20. Nobelföreläsningar i ekonomi. Aula Magna, SU.

Ti 12–08 kl. 18.00. Populärvetenskaplig föreläsning i fysik. Henrik Johansson, Fysikum, SU: *Fysik och astrobiologi: Om utvecklingen från Big Bang till livets molekyler.* Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se sidan 9.

On 12–09 kl. 10.15. Kombinatorikseminarium. Christer Kiselman, Uppsala: *Characterizing digital straightness using the chord property, word combinatorics, Diophantine inequalities, and difference operators.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 9.

On 12–09 kl. 13.15 – 15.00. Algebra and Geometry Seminar. Timur Sadykov, Siberian Federal University och SU: *Dessins d'enfants and differential operators for generic algebraic curves.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 10.

Fr 12–11 kl. 13.15 – 14.15. Graduate Student Seminar. Kathrin Vorwerk: *What is: "Combinatorial fixed point theorems"?* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 38 sidan 5.

Observera att Kathrin Vorwerks seminarium har flyttats till fredagen den 11 december. I Bråket nr 38 anges fel dag för detta seminarium.

INSTITUT MITTAG-LEFFLER SEMINAR

Heike Mildenberger: Filters versus semifilters

Abstract: The filter dichotomy principle says: For every non-meagre filter there is a finite-to-one function mapping it to an ultrafilter.

The semifilter trichotomy principle says: For every non-meagre upwards closed subset of the set of infinite subsets of the natural numbers there is a finite-to-one function mapping it to an ultrafilter or mapping it to the set of all infinite subsets of the natural numbers.

Blass and Laflamme showed: In the Blass-Shelah model and in all other models of $u < g$ the semifilter trichotomy holds, and the trichotomy is indeed equivalent to $u < g$.

Recently I found a model of the filter dichotomy in which the semifilter trichotomy does not hold. This answers Blass' 1989 question whether $u < g$ is strictly stronger than the filter dichotomy affirmatively. In the talk we will look at some of these rather combinatorial forcing steps.

Tid och plats: Torsdagen den 3 december kl. 14.00 – 15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

LICENTIATSEMINARIUM I DATALOGI

Mattias Bratt

presenterar sin licentiatavhandling:

Teleoperation with significant dynamics

Opponent: **Professor Ivan Kalaykov,** Örebro universitet.

Abstract: The subject of this thesis is teleoperation, and especially teleoperation with demanding time constraints due to significant dynamics inherent in the task. A comprehensive background is given, describing many aspects of teleoperation, from history and applications to operator interface hardware and relevant control theory concepts. Then follows a presentation of the research done by the author.

Two prototypical highly dynamic teleoperation tasks have been attempted: high speed driving, and ball catching. Systems have been developed for both, employing operator interfaces tailored to facilitate perception of the remote scene and including assistive features to promote successful task completion within the required time frame. Prediction of the state at the remote site as well as of operator action has been applied to address the problem of delays arising when using the Internet as the communication channel.

Tid och plats: Fredagen den 27 november kl. 13.00 i sal D3, KTH, Lindstedtsvägen 5, b.v.

EXTRA KOMBINATORIKSEMINARIUM

Ivan Mogilnykh:
Weak isometries of Preparata codes

Abstract: The talk is about some structural properties of one important class of error-correcting codes, namely Preparata codes.

Let C_1 and C_2 be codes with code distance d. A mapping $J : C_1 \to C_2$, such that for any x, y from C_1 the equality $d(x, y) = d$ holds if and only if $d(J(x), J(y)) = d$ is called a *weak isometry.* Obviously two codes are weakly isometric if and only if the minimal distance graphs of these codes are isomorphic.

We prove that any weak isometry of two (punctured) Preparata codes is an isometry. As a consequence, two Preparata codes of length n, $n \geq 2^{12}$, have isomorphic minimum distance graphs if and only if these codes are equivalent. The analogous result is obtained for punctured Preparata codes of length at least $2^{10} - 1$.

Tid och plats: Onsdagen den 2 december kl. 9.15 – 10.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

INSTITUT MITTAG-LEFFLER SEMINAR

James Cummings:
Recent uses of infinitary methods in finite combinatorics

Abstract: Over the past few years there have been some striking new applications of infinitary methods in finite combinatorics. I will describe one of these methods, Razborov's "flag algebras". This is primarily a survey talk.

Tid och plats: Torsdagen den 3 december kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

SEMINARIUM I TEORETISK DATALOGI

Johannes Borgström:
A Refined State Monad, with applications to capability-based access control

Abstract: Behavioural type and effect systems regulate properties such as adherence to object and communication protocols, dynamic security policies, avoidance of race conditions, and many others. Typically, each system is based on some specific syntax of constraints, and is checked with an ad hoc solver.

Instead, we advocate types refined with first-order logic formulas as a basis for behavioural type systems, and general purpose automated theorem provers as an effective means of checking programs.

To illustrate this approach, we give type systems for two related notions of permission-based access control: stack inspection and history-based access control. These type systems are both instances of a refined state monad.

Our main technical result is a safety theorem stating that no assertions fail when running a well-typed program.

Tid och plats: Tisdagen den 1 december kl. 13.15 i rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5.

WORKSHOP ON PERFECT CODES AND RELATED TOPICS

There will be a workshop with the title given above at the Department of Mathematics, KTH, on Friday, December 4, and Saturday, December 5. All lectures will be given in seminar room 3721, Department of Mathematics, KTH, Lindstedtsvägen 25, floor 7.

The schedule is given below. For more information, see
http://www.math.kth.se/~olohed/perfectcodes09.html.

Friday, December 4

10.00 – 11.00 **Faina I. Solov'eva,** Sobolev Institute of Mathematics, Novosibirsk: *Perfect codes and related topics (introduction lecture).*

11.00 – 11.30 Coffee.

11.30 – 12.30 **Patric R. J. Östergård,** Helsinki University of Technology: *Classification of the perfect binary one-error-correcting codes of length 15.*

12.30 – 14.00 Lunch.

14.00 – 14.40 **Olli Pottonen,** Finnish Defence Force Technical Research Centre, Riihimäki: *Properties of the perfect one-error-correcting codes of length 15.*

14.40 – 15.20 **Ivan Mogilnykh,** Sobolev Institute of Mathematics, Novosibirsk: *On perfect 2-colourings of Johnson graphs.*

15.20 – 16.00 **Svetlana Puzynina,** Sobolev Institute of Mathematics, Novosibirsk: *Equitable partitions as a generalization of perfect codes.*

16.00 – 16.30 Coffee.

16.30 – 17.30 **Denis S. Krotov,** Sobolev Institute of Mathematics, Novosibirsk: *On the binary codes with parameters of doubly shortened 1-perfect codes.*

17.30 – 18.10 **Thomas Westerbäck,** KTH: *On the existence of extended perfect binary codes with trivial symmetry group.*

(Continued on the next page.)

Saturday, December 5

9.00 – 10.00 **Thomas Ericson,** Linköping: *Preparata codes over the GF(4).*

10.00 – 11.00 **Kevin T. Phelps,** Auburn University, USA: *An enumeration of Kerdock codes of length 64.*

11.00 – 11.30 Coffee.

11.30 – 12.30 **Mercè Villanueva,** Universitat Autonoma de Barcelona: *Z_2Z_4-additive (extended) perfect codes: intersection problem.*

12.30 – 14.00 Lunch.

14.00 – 14.40 **Martin Hessler,** Linköpings universitet: *On linear equivalence and Phelps codes.*

14.40 – 15.20 **Danyo Danev,** Linköpings universitet: *Families of quasi-perfect codes.*

15.20 – 16.00 **Fabio Pasticci,** Università di Perugia: *Quasi-perfect linear codes with minimum distance 4.*

16.00 – 16.30 Coffee.

16.30 – 17.10 **Faina I. Solov'eva,** Sobolev Institute of Mathematics, Novosibirsk: *Partitions of F_q^n into perfect codes.*

17.10 – 18.10 **Victor A. Zinoviev,** Institute of Problems of Information Transmission, Moscow: *On Preparata-like codes and 2-resolvable Steiner quadruple systems.*

Everyone is welcome to attend!
Olof Heden and Faina I. Solov'eva

ANALYSIS, PROBABILITY AND GEOMETRY IN QUANTUM PHYSICS AND CLASSICAL MECHANICS

A symposium in honour of Torbjörn Kolsrud's 60th birthday

The symposium will take place on Tuesday, December 8, 2009, at the Department of Mathematics, KTH. All talks will be given in seminar room 3721, Lindstedtsvägen 25, floor 7.

Organizing committee: **Boualem Djehiche** and **Anders Karlsson.**

Programme

9.30 – 10.00 Coffee.

10.00 – 10.45 **Nail Ibragimov,** Blekinge Tekniska Högskola: *Use of Lie group analysis in metallurgical industry.*

10.55 – 11.40 **Olle Stormark,** KTH: *Local solvability of PDE systems by means of singular vector fields.*

11.40 – 13.30 Lunch.

13.30 – 14.15 **Tom Lindstrøm,** Oslo: *The discrete beyond the continuous: On nonstandard models in stochastic analysis.*

14.15 – 14.45 Coffee.

14.45 – 15.30 **Ana-Bela Cruzeiro,** Lisbon: *Stochastic Lagrangian Navier-Stokes flows on manifolds.*

15.40 – 16.30 **Jean-Claude Zambrini,** Lisbon: *Title to be announced.*

PRESENTATION AV EXAMENSARBETE I MATEMATIK

Linus Nyström:
An Introduction to Forward Backward Stochastic Differential Equations

Handledare: **Yishao Zhou.**

Abstract: The aim of this paper is to introduce the reader to the concept of Forward Backward Stochastic Differential Equations (FBSDEs). We begin with an overview of some theoretical preliminaries and a formal presentation of our problem. We then proceed to study the solvability of FBSDEs through the use of mathematical control theory.

This will subsequently lead us to a method for explicitly solving FBSDEs. We investigate when this method is applicable and what restrictions it brings. Finally, we conclude the text with two examples of applications of our theory.

Tid och plats: Onsdagen den 2 december kl. 10.00 – 11.00 i sal 21, hus 5, Matematiska institutionen, SU, Kräftriket.

ACCESS DISTINGUISHED LECTURE SERIES

Scott Kirkpatrick:
Visions of the Future Internet

Speaker: Scott Kirkpatrick is Professor of Engineering and Computer Science at the Hebrew University of Jerusalem, Israel. His research in recent years has focused on understanding the structure and dynamics of large scale distributed systems, and the growth of living engineering organisms such as the Internet. He directed the EVERGROW integrated project, which mapped the physical Internet from thousands of lightweight software clients, and participates in the OneLab2 project, part of the FIRE federation of testbeds for future Internet research. Professor Kirkpatrick received his Ph.D. in Physics from Harvard University. He was a researcher and manager in physics and computer science at the IBM TJ Watson Research Center from 1971 until 2000, when he moved to his present position.

Abstract: While cries that "The Internet is broken!" are not new, the level of effort around the world to define and at least prototype various visions of a future Internet is unprecedented. But GENI in the US, AKARI in Japan, FIRE in Europe as well as various national efforts, and several interesting activities to assemble ultra-high bandwidth and large computing resources for specific purposes do not represent a single vision of future connectivity to serve the world's need. They certainly do not constitute a complete picture of the problems to be solved but rather address several points of consensus, mostly relating to increasing the capacity and flexibility of the high-performance Internet backbone.

My own belief is that the explosion in content creation and new application development is occurring in all parts of the Internet, affecting all scales, from the nucleus of the network out to its edges, and that this has outstripped the growth of raw bandwidth. The problems of federating very heterogeneous resources across this wide range of scales are critical. I will describe some of the recent work done in Europe to make measurement and prototyping of the Future Internet possible, and sketch some ways in which insights from other complex, long-scale systems may be found to apply.

Tid och plats: Torsdagen den 3 december kl. 13.15 – 14.00 i sal F2, KTH, Lindstedtsvägen 26, b.v.

ALGEBRA AND GEOMETRY SEMINAR

Runar Ile:
Cohen-Macaulay approximation in cofibred categories

Abstract: Let A be a noetherian (and commutative) ring and N a (finite) A-module. If A is regular, then N has a finite projective resolution. Unfortunately this does not hold if A is singular. However, if A is Cohen-Macaulay the (sufficiently iterated) syzygy modules of N are maximal Cohen-Macaulay (MCM) modules. Hence N has a finite resolution with MCM modules. Auslander and Buchweitz's theory for Cohen-Macaulay approximation of modules over Cohen-Macaulay rings with a canonical module gives a somewhat different solution to this problem. In particular they show that there is a short exact sequence $0 \to L \to M \to N \to 0$ where M is MCM and L has finite injective dimension. After recapitulating their result, the talk will give an answer to the question:

If parameters are introduced in the equations defining N (and A), is there a natural way to introduce these parameters in M and L? Then conditions on N are given, which ensure stronger relations between the sets of parameterizations.

Tid och plats: Onsdagen den 2 december kl. 13.15 – 14.15 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

ALBANOVA AND NORDITA COLLOQUIUM IN PHYSICS

Thomas Udem:
Frequency combs for astrophysics

Abstract: A femtosecond frequency comb is a simple and compact tool that allows the phase coherent connection of the radio frequency domain with the optical domain. It greatly simplifies high precision optical frequency measurements of lasers and provides the long awaited clockwork mechanism for an all-optical atomic clock. Another emerging application of frequency combs is the calibration of conventional spectrographs for high precision measurements that cannot be performed by direct laser excitation.

Maybe the most prominent examples are in astronomy, where tiny Doppler shifts of stars are used to detect the recoil motion caused by planets in orbits. The current measurement accuracy is sufficient to detect "hot Jupiters" but fails for Earth like planets. Very sensitive velocity measurements are also required to directly probe the accelerating expansion of the Universe. Observing the acceleration directly rather than deriving it from other observations, assuming the validity of General Relativity, can be help to learn more about the nature and the existence of dark energy.

Tid och plats: Torsdagen den 3 december kl. 15.15 – 16.15 i Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum.

SEMINARIUM I MATEMATISK STATISTIK

Peter Hambäck:
Spatiotemporal problems in food web ecology:
modelling and empirical observations

Abstract: In this talk, I will present a couple of important problems in contemporary ecology, where I believe that improved model analysis is greatly needed. The discussion will mainly focus on two aspects: the role of spatial structure and the role of food web connections. Both these aspects have consequences for the strength of species interactions and for the evolution of species traits, and I will provide examples from my own research that illustrate these consequences. I will also describe some modelling approaches used by myself and by other researchers.

Tid och plats: Onsdagen den 2 december kl. 15.15 i rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket.

POPULÄRVETENSKAPLIG FÖRELÄSNING I FYSIK

Henrik Johansson:
Fysik och astrobiologi:
Om utvecklingen från Big Bang till livets molekyler

Sammanfattning: Fysik bidrar till att förstå de fundamentala processer som livet är beroende av och är därför en viktig del av astrobiologi — ”läran om livet bland stjärnorna”. Denna presentation kommer att ta er med på en resa via kärnfusionsprocesser och interstellär kemi till atomer och molekyler som livet behöver för att kunna uppstå. Den tar även upp experimentella anläggningar vid Stockholms universitet som används för att studera interstellära reaktioner.

Tid och plats: Tisdagen den 8 december kl. 18.00 i Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum.

KOMBINATORIKSEMINARIUM

Christer Kiselman:
Characterizing digital straightness
using the chord property, word combinatorics,
Diophantine inequalities, and difference operators

Abstract: The notion of digital straightness has been studied since Azriel Rosenfeld's seminal paper of 1974. In particular, characterizations using the chord property, word combinatorics, and double Diophantine inequalities have been investigated. To these I will add characterizations using difference operators and show how these four aspects relate to each other. If time permits, I will also discuss the related, more general notion of digital convexity — as is to be expected, convexity and concavity jointly is equivalent to straightness.

Tid och plats: Onsdagen den 9 december kl. 10.15 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

ALGEBRA AND GEOMETRY SEMINAR

Timur Sadykov:
Dessins d'enfants and differential operators for generic algebraic curves

Abstract: My talk will be based on a joint work with F. Larusson.

We state and solve a discrete version of the classical Riemann-Hilbert problem. In particular, we associate a Riemann-Hilbert problem to every dessin d'enfants and show how to compute the solution for a dessin that is a tree. This amounts to finding a Fuchsian differential equation satisfied by the local inverses of a Shabat polynomial.

We classify those plane trees that have a representation by Moebius transformations and those that have a linear representation of dimension at most two. As a corollary, we obtain a computationally efficient method for constructing the linear differential operator with polynomial coefficients whose space of holomorphic solutions is spanned by all the branches of a function defined by a generic algebraic curve. The proposed method does not require solving the algebraic equation and can be applied in the case when its Galois group is not solvable.

Tid och plats: Onsdagen den 9 december kl. 13.15 – 15.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

DISPUTATION I NUMERISK ANALYS

Tomas Oppelstrup

skall disputera på avhandlingen

Simulation of relaxation processes in complex condensed matter systems: Algorithmic and physical aspects

torsdagen den 10 december 2009 kl. 10.00 i sal D3, KTH, Lindstedtsvägen 5, b.v. Till opponent har utsetts *professor Göran Wahnström,* Chalmers tekniska högskola, Göteborg.

Abstract of the thesis

This thesis summarizes interrelated simulation studies of three different physical phenomena. The three topics are: simulation of work hardening of materials using dislocation dynamics, investigation of anomalous diffusion in supercooled liquids using molecular dynamics, and kinetic Monte Carlo simulation of annealing of radiation damaged materials. All three topics require special algorithms in order to enable physically relevant simulations. The author's contribution consists of development, implementation, and optimization of these algorithms, as well as interpretation of simulation results.
