BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 29 **FREDAGEN DEN 14 SEPTEMBER 2001**

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 20 september kl. 13.00.

Disputation i statistik

Fridtjof Thomas disputerar vid SU på avhandlingen *A Bayesian Approach to Retrospective Detection of Change-points in Road Surface Measurements* måndagen den 24 september kl. 13.00. Se sidan 6.

Money, jobs: Se sidorna 7 – 8.

SEMINARIER

Må 09–17 kl. 13.15 – 15.00. Algebraseminarium. Clas Löfwall: *Beräkningsproblem för positivt graderade algebror.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 3.

Ti 09–18 kl. 14.30 – 15.30. Mittag-Leffler Seminar. Steffen Rohde, Seattle: *SLE and conformal mappings: Part II.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

Ti 09–18 kl. 16.00 – 17.00. Mittag-Leffler Seminar. Gregory Lawler, Durham: *Introduction to Brownian motion: I.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

On 09–19 kl. 13.00. Seminarium i statistik: *Introduktionsmöte för forskarstuderande.* Dessutom berättar **Rolf Larsson, Gebrenegus Ghilagaber,** m.fl. från sina respektive sommarkonferenser. Rum B705, Statistiska institutionen, SU, Universitetsvägen 10B, plan 7, Frescati.

On 09–19 kl. 13.15. Seminarium i analys och dynamiska system. Viviane Baladi, Université Paris Sud, Orsay, och CNRS: *Dynamical determinants for surface diffeomorphisms with dominated splitting.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 28 sidan 2.

Fortsättning på nästa sida.

Crafoord Prize in Mathematics for 2001

Professor Alain Connes har fått detta pris. Se sidan 5.

Crafoord Symposium on Noncommutative Geometry and its Applications

Detta äger rum på Kungl. Vetenskapsakademien, Stockholm, tisdagen den 25 september. Se sidan 5.

Seminarier (fortsättning)

On 09–19 kl. 15.15. Seminarium i matematisk statistik. Professor Geoffrey Vining, Department of Statistics, Virginia Tech, Blacksburg, USA: *An overview of current work on industrial split-plot experiments.* Rum 306, Cramérrummet, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 3.

To 09–20 kl. 14.00–15.00. Mittag-Leffler Seminar. Antti Kupiainen, Helsingfors: *Ergodicity of second turbulence.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

Fr 09–21 kl. 15.15–16.00. Seminarium i finansiell matematik. *(Observera dagen!)* **Johan Liljefors** presenterar sitt examensarbete: *Static Hedging of Barrier Options under Dynamic Market Conditions.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 7.

Må 09–24 kl. 15.15. Seminarium i matematisk statistik. Professor Bronius Grigelionis, Institute of Mathematics and Informatics, Vilnius: *On the extreme value theory for H-diffusions.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 3.

Må 09–24 kl. 15.15. Gemensamt matematik-fysik-seminarium. Bernard Sapoval, École Polytechnique, Palaiseau: *Physical problems related to percolation and gradient percolation geometries.* Sal D3, KTH, Lindstedtsvägen 5, b.v. Se sidan 7.

Ti 09–25 kl. 15.30–17.00. Seminarium om beslutsstöd och informationsfusion i ledningssystem. *(Observera tiden!)* **Dr Gary E. Horne,** US Marine Corps Combat Development: *Project Albert and Data Farming.* Sal E2, KTH, Lindstedtsvägen 3, b.v. Se sidan 4.

On 09–26 kl. 13.00. Seminarium i statistik. Michael Hartmann, Statistiska centralbyrån: *The precision of life expectancies derived from small populations.* Rum B705, Statistiska institutionen, SU, Universitetsvägen 10B, plan 7, Frescati. Se sidan 4.

On 09–26 kl. 13.15. Seminarium i analys och dynamiska system. Artur Avila, Paris: *Statistical properties of unimodal maps (joint with C. G. Moreira).* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se nedan.

Fr 09–28 kl. 11.00–12.00. Optimization and Systems Theory Seminar. Sven Leyffer, University of Dundee: *Title to be announced.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

Artur Avila: Statistical properties of unimodal maps (joint with C. G. Moreira)

Abstract: We consider analytic families of unimodal maps (the main example being the quadratic family). We aim at a thorough description of 'typical' parameters (typical meaning full measure in the family). An unexpected relation is given between hyperbolic sets, the physical measure and the kneading sequence. As a consequence we deduce a topological formula for periodic orbits. In particular, this implies a rigidity theorem: two typical maps (as described) which are topologically conjugate are analytically conjugate.

Tid och plats: Onsdagen den 26 september kl. 13.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

ALGEBRASEMINARIUM

Clas Löfwall:
Beräkningsproblem för positivt graderade algebror

Sammanfattning: Givet en presentation med generatorer och relationer av en positivt graderad algebra över en kropp, så uppkommer problemet att finna vektorrumsbaser och multiplikationstabeller för algebran upp till en viss grad. Det omvända problemet är också intressant att studera. Vi skall med elementär linjär algebra visa hur dessa problem kan lösas om algebran är associativ (och peka på svårigheter som uppstår i liealgebrafallet). Vidare skall vi se hur man kan få en gröbnerbas (upp till en viss grad) genom att välja baserna lämpligt.

Som förkunskaper räcker det att ha läst algebra fdk.

Tid och plats: Måndagen den 17 september kl. 13.15 – 15.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

SEMINARIUM I MATEMATISK STATISTIK

Geoffrey Vining: An overview
of current work on industrial split-plot experiments

Professor Vining has recently been the editor for the Journal of Quality Technology. He is particularly interested in use of experimental designs for quality improvement, response surface methodology, statistical quality control, and regression analysis.

Abstract: Industrial practitioners often face restrictions on how they can randomize the order of their experimental runs. Some factors are truly "hard-to-change", while others are "easy-to-change". Such a division of the factors leads naturally to "split-plot" experiments, often used in agriculture. This talk examines the recent work on industrial split-plot experiments and attempts to place this work into an appropriate context.

The talk will only presume that the audience has a basic knowledge of experimental design.

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

SEMINARIUM I MATEMATISK STATISTIK

Bronius Grigelionis:
On the extreme value theory for H-diffusions

Abstract: The ergodic strictly stationary diffusion processes on an open interval with the predetermined stationary distribution H, named H-diffusions, are considered. The analogues of the Gnedenko and von Mises theorems from the classical extreme value theory are presented. Some examples, including well-known diffusion models from population genetics, population growth, neurobiology, mathematical finance, etc., are discussed. Sufficient conditions for vague convergence of the time-normalized point measures of ε-upcrossings of H-diffusions to the Poisson one are also discussed.

Tid och plats: Måndagen den 24 september kl. 15.15 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM OM BESLUTSSTÖD OCH INFORMATIONSFUSION I LEDNINGSSYSTEM

Gary E. Horne: Project Albert and Data Farming

Abstract: Project Albert is an initiative of the US Marine Corps Combat Development Command (MCCDC) that uses a series of new models and tools, multidisciplinary teams, and the scientific method to explore questions of interest to military planners. Project Albert attempts to address three key areas that traditional modelling and simulation techniques often cannot capture satisfactorily: non-linearity, intangibles, and coevolving landscapes.

Data Farming involves the investigation of a wide number of variables, across a wide range of values. In essence, the user is attempting to model many combinations and variations within the data space and "grow" data in an iterative process attempting to answer questions at hand. Data Farming is applied to distillations (models that can be used to abstract the essence of a situation), that have been developed specifically for Project Albert, and uses high performance computing assets to run these distillations many times.

Tid och plats: Tisdagen den 25 september kl. 15.30 – 17.00 i sal E2, KTH, Lindstedtsvägen 3, b.v.

För mer information, se http://www.nada.kth.se/theory/decision_support_seminars/program_autumn_01.html.

SEMINARIUM I STATISTIK

Michael Hartmann: The precision of life expectancies derived from small populations

Abstract: When life tables are estimated for large national populations, the aspect of random variation due to sampling is rarely relevant; usually the life expectancy at any given age is established with a degree of precision that does not invite discussion concerning random variation due to sampling. However, when life tables are estimated either from survey data or for small national or regional populations, random variation attributable to sampling must often be taken into consideration. This, of course, is especially the case when it is contemplated how large an exposed to risk population must be in order to estimate the life expectancy at birth with a reasonable degree of precision. Here, however, the problem surfaces that the "standard estimator" usually applied for estimating the standard deviation of the life expectancy assumes approximate normality of the mortality rates, something that is only achieved when the risk population is large (Chiang, 1968, pp. 189 – 241).

This paper focuses, among other things, on a simple simulation technique for estimating the standard deviation of the life expectancy when the exposed to risk population is small. More generally, the paper discusses simulation techniques suitable for small and large populations as well as the "standard estimator" for estimating the standard deviation of the life expectancy (Chiang, 1968, pp. 189 – 241). The model mortality rates used in this study are for Swedish males during 1995 – 1999.

Tid och plats: Onsdagen den 26 september kl. 13.00 i rum B705, Statistiska institutionen, SU, Universitetsvägen 10B, plan 7, Frescati.

Crafoord Prize in Mathematics for 2001

The Royal Swedish Academy of Sciences has decided to award the Crafoord Prize in Mathematics for 2001 to *Alain Connes,* Professor at Institut des Hautes Études Scientifiques (IHES) and Collège de France, Paris, *for his penetrating work on the theory of operator algebras and for having been a founder of the non-commutative geometry.*

Prize awarding ceremony

On Wednesday, September 26, at 17.00, His Majesty the King of Sweden will present the Crafoord Prize in Mathematics for 2001 to Professor Alain Connes, who after the ceremony will hold a lecture on his research.

Place: The Beijer Hall, the Royal Swedish Academy of Sciences (Kungl. Vetenskapsakademien), Lilla Frescativägen 4, Stockholm.

Dress: Lounge suit (kavaj).

Crafoord Symposium on
Noncommutative Geometry and its Applications

The Symposium will take place on Tuesday, September 25, 2001, from 9.00 at the Beijer Hall, the Royal Swedish Academy of Sciences (Kungl. Vetenskapsakademien), Lilla Frescativägen 4, Stockholm. Nearest underground station: Universitetet. Bus: 40.

All interested are welcome! For more information, please contact Kerstin Gunnarson, telephone 08-673 95 05, e-mail kerstin@kva.se.

Programme

Chairperson for the morning lectures: **Torsten Ekedahl,** Member of the the Royal Swedish Academy of Sciences, Professor of Mathematics at Stockholm University.

9.00 – 9.05 **Erling Norrby,** Secretary General and Member of the Royal Swedish Academy of Sciences: *Opening of the Symposium.*

9.05 – 9.45 **Sir Michael Atiyah,** Member of the Royal Swedish Academy of Sciences, Department of Mathematics and Statistics, University of Edinburgh, UK: *The geometry of manifolds in dimensions 6 and 7.*

10.00 – 10.45 **Alain Connes,** Crafoord Laureate 2001: *Noncommutative geometry.*

11.00 – 11.45 **Nigel Higson,** Department of Mathematics, Pennsylvania State University, USA: *The Baum-Connes conjecture.*

Chairperson for the afternoon lectures: **Jan-Erik Roos,** Member of the the Royal Swedish Academy of Sciences, Chairperson in the 2001 Crafoord Committee, Professor of Mathematics at Stockholm University.

13.00 – 13.45 **Jean-Louis Loday,** Institut de Recherche Mathématique Avancée, CNRS, and Université Louis Pasteur, France: *Algebraic K-theory and cyclic homology.*

14.00 – 14.45 **Henri Moscovici,** Department of Mathematics, Ohio State University, USA: *Cyclic cohomology and Hopf-algebraic symmetry.*

15.00 – 15.45 **Dirk Kreimer,** University of Boston, USA: *Feynman diagrams: on residues and numbers.*

16.00 – **Uffe Haagerup,** Department of Mathematics and Computer Sciences, University of Odense, Denmark, and **Erling Størmer,** Department of Mathematics, University of Oslo, Norway: *Problem session.*

DISPUTATION I STATISTIK

Fridtjof Thomas

disputerar på avhandlingen

A Bayesian Approach to Retrospective Detection of Change-points in Road Surface Measurements

måndagen den 24 september 2001 kl. 13.00 i De Geersalen, Geovetenskapens hus, Stockholms universitet, Frescati. Till fakultetsopponent har utsetts *docent Urban Hjorth,* Chalmers tekniska högskola, Göteborg.

Abstract of the thesis

First-order autoregressive processes are analysed for sudden changes in parameter value. In its most general form, a multivariate vector of measurements is allowed, and no prior knowledge about the involved parameters is required. Furthermore, no distributional assumptions about the nature of the sudden change are made, and arbitrary prior distributions over the space of all possible change-points are allowed. The change may be in level, variance, or autocorrelation, or in some combinations of these.

Posterior probability distributions are derived for the location of a change-point, conditional on the existence of such a change-point somewhere. The question whether or not there is a change present somewhere in the series is addressed in terms of posterior odds.

The Bayes factors, needed for the posterior odds, are only defined up to an arbitrary constant, due to the use of improper prior distributions on most of the model parameters. This indeterminacy is resolved by the use of minimal imaginary training samples.

The emphasis is on analytical solutions based on an approximate version of the likelihood in order to allow for fast algorithms. Nevertheless, details for a Gibbs sampler are given based on the exact model, assuming that the unobserved initial conditions come from the stationary distributions of the involved processes. This sampler employs conditional conjugacy when possible. However, the full conditionals of the autoregressive coefficients are not of standard form, and a slice sampler is implemented.

The motivating application is in the field of road maintenance, where pavement surfaces are frequently measured and the need arises to partition roads into parts, which can be considered homogeneous with respect to the measured characteristics. In Sweden, the international roughness index (IRI — a measure of a road's longitudinal unevenness) and rutting are the two measurements of foremost interest. The use of the developed theory is exemplified throughout by these measurement series, which are collected by so-called Laser-RST-vehicles. A well-motivated segmentation of a road is a prerequisite for a successful handling of the road sections in a pavement management system, which ultimately aims at efficiently providing road infrastructure of high quality.

In order to make this work accessible to others than professional statisticians, the basic concepts involved in the analysis are described in the introductory section.

SEMINARIUM I FINANSIELL MATEMATIK

Johan Liljefors

presenterar sitt examensarbete:

Static Hedging of Barrier Options under Dynamic Market Conditions

Abstract: The purpose of this thesis is to study the efficiency of the Derman-Engener-Kani hedging strategy and to extend it to more complicated securities and dynamic conditions. As foundation and benchmark, the original Derman-Engener-Kani strategy will be used.

The first part of the paper focuses on the theory behind the Derman-Engener-Kani model, and the second part implements and extends it to more general conditions. It is shown that its high dependency on constant market parameters can be reduced, and that it can be applied to more complex barrier securities.

Tid och plats: Fredagen den 21 september kl. 15.15 – 16.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

GEMENSAMT MATEMATIK-FYSIK-SEMINARIUM

Bernard Sapoval: Physical problems related to percolation and gradient percolation geometries

Abstract: Critical percolation, a fundamental probability problem, is rarely realized in physical systems as it exists only for one precise value of the occupation probability. On the opposite, gradient percolation is a very common situation. It was introduced in 1985 to describe the geometry of diffusion fronts, that is the geometry obtained through the soldering of two materials. Since that time it has been observed experimentally in several situations. Some corrosion experiments even indicate the existence of self-organized gradient percolation. The talk will present experimental videos showing the existence of self-organized fractal geometries.

Tid och plats: Måndagen den 24 september kl. 15.15 i sal D3, KTH, Lindstedtsvägen 5, b.v.

MONEY, JOBS

Columnist: Pär Holm, Department of Mathematics, SU. E-mail: pho@matematik.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.
Unless stated otherwise, a given date is the last date (e.g. for applications), and the year is 2001. A number without an explanation is a telephone number.

Standard information channels

1. A channel to information from Vetenskapsrådet: http://www.vr.se/NaturTeknik/naturvetenskap.htm.
2. A channel to information from the European Mathematical Society: http://www.emis.de.
3. A channel to information from the American Mathematical Society: http://www.ams.org.
4. KTH site for information on funds: http://www.kth.se/aktuellt/stipendier.
5. Stockholm University site for information on funds: http://www.su.se/forskning/stipendier/databas.php3.
6. Umeå site for information on funds: http://www.umu.se/umu/aktuellt/stipendier_fond_anslag.html.

(Continued on the next page.)

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. Matematikcentrum vid Lunds universitet söker en doktorand i matematik, särskilt operatorteori och komplex analys, 1 oktober. Info: Per-Anders Ivert, 046-222 86 08, Per-Anders.Ivert@math.lu.se. Web-info: http://www.maths.lth.se/JobsInLund/studiest512.html.

Old information

Money, to apply for

12. Magn. Bergvalls Stiftelse utlyser anslag till svenska vetenskapsmän samt vetenskapliga och kulturella institutioner. Med "svenska vetenskapsmän" avses personer med svenskt medborgarskap. Sista ansökningsdag är 17 september. Info: 08-763 68 97.
13. Kungl. Vetenskapsakademien utlyser ur stiftelsen P. E. Lindahls fond sex forskningsstipendier om vardera cirka 80 000 kr, varav två inom de naturvetenskapliga ämnena. Sökande skall ha avlagt doktorsexamen 1995 eller senare eller vara behörig att antagas till forskarutbildning inom någon av de filosofiska eller medicinska fakulteterna i riket och får inte inneha tjänst hos stat eller kommun, 30 september. Info: Sascha Edblad eller Sophia Westlund, 08-673 95 00, stipendier@kva.se. Web-info: http://www.kva.se/sve/pg/stipendier/host/lindans.asp.
14. Wenner-Gren Stiftelserna utlyser följande stipendier:

    Resestipendier för kortare tids besök utomlands, t.ex. för deltagande i internationella kongresser eller symposier. Behörig att söka är svensk forskare som avlagt doktorsexamen och ej fyllt 40 år.

    Postdoktorstipendier för forskning i utlandet. Dessa är avsedda att möjliggöra för svensk disputerad forskare att verka vid utländsk vetenskaplig institution. Behörig att söka är svensk medborgare som avlagt doktorsexamen inom fem år före ansökningstillfället.

    Gästforskarstipendier för att möjliggöra för utländska forskare att verka vid svensk vetenskaplig institution. Behörig att söka är svensk forskare som är värd för utländsk disputerad forskare.

    Gästprofessorsstipendier för att underlätta för framstående utländska forskare att förlägga sabbatsperioder i Sverige. Behörig att söka är svensk forskare som är värd för utländsk forskare.

    Sista ansökningsdag är 1 oktober. Web-info: http://www.wenner-grenstift.a.se.
15. Anslag ställs, från Knut och Alice Wallenbergs Stiftelse, till rektors för KTH förfogande för att "i första hand användas till bidrag för sådana resor, som bäst befordrar ett personligt vetenskapligt utbyte till gagn för svensk forskning. Bidrag skall främst beviljas till yngre forskare." Ansökan om resebidrag skall ställas till rektors kansli. Bidrag kan sökas när som helst under året. Info: se punkt 4 ovan.
16. Wenner-Gren Stiftelserna utlyser gästföreläsaranslag, avsedda att möjliggöra för svenska forskare eller institutioner att inbjuda utländska gästföreläsare. Anslag sökes av den inbjudande forskaren eller institutionen. Ansökan kan inlämnas när som helst under året. Web-info: http://www.wenner-grenstift.a.se.

Jobs, to apply for

17. Institutionen för matematik och naturvetenskap vid Högskolan i Kristianstad söker en professor i de naturvetenskapliga ämnenas didaktik, 21 september. Info: Magnus Thelaus, 044-20 34 01. Web-info: http://www.hkr.se.