



INFOMAT

August 2011



Kjære leser!

Vårt eldste universitet fyller 200 år den 2. september. Det er lagt opp til en omfattende markering av jubileet, med utstillinger, faglige arrangementer og en storlagen bursdagsfeiring på dagen. En av de beste bursdagspresangene var kanskje offentliggjøringen av en (av mange) internasjonale rangeringer av verdens universiteter. UiO kommer ut på en meget hederlig 75. plass. En flott spore for alle norske forskningsmiljøer; målrettet innsats gir resultater.

hilsen Arne B.

Universitetet i Oslo feirer 200års-jubileum 2. september 2011

UiO feirer 200 år og ønsker velkommen til storslagen 200-årsfeiring i begynnelsen av september. Det legges opp til et omfattende og variert jubileumsprogram, og alle som er i hovedstaden på denne tiden bør ta en kikk på lista over arrangementer.

<http://www.uio.no/om/aktuelt/uio200/>

INFOMATs redaksjon gratulerer!

INFOMAT kommer ut med 11 nummer i året og gis ut av Norsk Matematisk Forening. Deadline for neste utgave er alltid den 10. i neste måned. Stoff til INFOMAT sendes til

infomat at math.ntnu.no

Foreningen har hjemmeside <http://www.matematikkforeningen.no/INFOMAT>

Ansvarlig redaktør er Arne B. Sletsjøe, Universitetet i Oslo.

ARRANGEMENTER

Matematisk kalender

2011:

November:

2.-4. NORsMA6: *New trends in Special Needs Education in Mathematics. Problems and Possibilities*, Kristiansand

2012:

August:

2.-7. 6ECM, Krakow, Polen

21.-24. Abelsymposiet: *Operator Related Function Theory and Time-Frequency Analysis*, Oslo

Arrangementer



NEW TRENDS IN SPECIAL NEEDS EDUCATION IN MATHEMATICS. PROBLEMS AND POSSIBILITIES **Kristiansand, 2.-4. november 2011**

The conference will provide rich opportunities for researchers and professionals working within special needs education in mathematics to present and discuss their research or developmental work. Furthermore, the conference will be open for discussions and constructive meetings of researchers, teachers, teacher educators, graduate students and others interested in research and development concerning special needs education in mathematics.

Web: <http://www.uia.no/en/div/conferences/norsma6>

Nye doktorgrader

M.Sc. **Asma Khedher** ved UiO forsvarte 24. juni 2011 sin avhandling for graden PhD: *Sensitivity and Robustness to Model Risk in Lévy and Jump-Diffusion Setting*. Veiledere har vært Førsteamanuensis Giulia Di Nunno og Professor Fred Espen Benth.

The models that describe the financial market rely on many choices. The structure of the model, the interpretation of uncertainty, and the number and type of parameters included. Different traders may have different perceptions of the market data and modelling. Recently, the dynamics of asset prices seem to be well modelled by Lévy noise and most of current research in mathematical finance is focused around this class. These models generalize the classical continuous type models based on the Brownian motion to include possible jumps of the market prices. The jumps may also be of infinitely small size and occur with high intensity. Furthermore, it is a philosophical question whether asset prices are driven by pure-jump noise, or if there is a diffusion in the non-Gaussian dynamics. From a statistical point of view it may be very hard to determine whether a model should have a diffusion term or not.

In this thesis we consider the problem of robustness of the option price and the sensitivity parameters to model choice. Considering exponential Lévy models, we prove the robustness of option price after a change of measure. The measures that we considered are selected among the most popular choices of risk neutral equivalent martingale measures. Moreover, we prove the robustness of the sensitivity parameter delta of options written in such models. Dealing with Lévy models, we introduce the conditional density method. The latter provides the existence of a density of an independent variable in the underlying model. We also derive expressions for the delta of options written in a general jump-diffusion model using the Malliavin calculus. We apply our methods for the computation of the delta to power and commodity market models as well as to stochastic volatility models and we illustrate our results with several numerical examples.

NYHETER

Nytt fra Universitetet i Tromsø

Professor **Valentin Lychagin** har forskningspermisjon 1/8-31/12-2011. Han vil oppholde seg ved Independent University, Moskva.

Førsteamanuensis **Per Jakobsen** har forskningspermisjon 1/8-2011-31/7-2012. Han vil oppholde seg ved University of Arizona, College of Optical Sciences.

Jan Nyquist Roksvold starter som stipendiat i ren matematikk 5/9-2011 og er ansatt for fire år.

Nytt fra Universitetet i Oslo

Elin Røse Engen er ansatt som stipendiat fra august 2011.

SMALE PRIZE AWARDED TO SNORRE CHRISTIANSEN, UiO

The Society for the Foundations of Computational Mathematics awarded the first Smale Prize to Pro-



fessor Snorre Christiansen at its FoCM'11 meeting in Budapest on July 14, 2011. Symbolic of the prize, Professor Christiansen was given a Gömböc, the first known homogeneous object with one stable and one unstable equilibrium point.

The Smale Prize recognizes major achievements in furthering the understanding of the connections between mathematics and computation. The award is named after Stephen Smale who contributed greatly to this understanding and many other fields of mathematics as well as being key to the founding of the Society. The prize is awarded to a researcher having received a doctoral degree within the 10 years prior to the award.

Professor Christiansen of the University of Oslo, Norway, was awarded the prize for his contributions to computational mathematics of partial differential equations. Most of Professor Christiansen's work is motivated by the design of numerical methods for various equations arising in physics. The citation made particular note of his use of Calderon's formulas to construct preconditioners for the electric field equations, his contributions to the development of exterior calculus and cohomological analysis of finite element methods, and his convergence results for lattice gauge theory. Further information concerning Professor Christiansen and the award ceremony can be found at

http://www.damtp.cam.ac.uk/user/na/FoCM11/smale_prize.html.

The Society for Foundations of Computational Mathematics (FoCM) is a nonprofit organization founded in 1995 that supports and promotes research on foundations of computational mathematics. It fosters interaction among mathematics, computer science and other areas of computational science through its conferences, workshops and publications. More information concerning the Society can be found at <http://www.focm.net/>.

SHAW PRIZE AWARDED TO CHRISTODOULOU AND HAMILTON

The Shaw Prize in Mathematical Sciences 2011 goes to Demetrios Christodoulou and Richard Hamilton for their highly innovative works in nonlinear partial differential equations in Lorentzian and Riemannian geometry and their applications to general relativity and topology.

The Shaw Prize Award Presentation Ceremony will be held on 28 September 2011.

<http://www.shawprize.org/>

Since Riemann's invention of a geometry to describe higher dimensional curved spaces and Einstein's introduction of his equations to describe gravity, the theory of the associated non-linear partial differential equations has been a central one. These equations are elegant but in general they are notoriously difficult to study. One of the key issues is whether the solutions develop singularities.

Demetrios Christodoulou has made fundamental contributions to mathematical physics and especially in general relativity. His recent striking dynamical proof of the existence of trapped surfaces in the setting of Einstein's equations in a vacuum demonstrates that black holes can be formed solely by the interaction of gravitational waves. Prior to that he made a deep study of this phenomenon in symmetrically reduced cases showing that unexpected naked singularities can occur but that they are unstable. In joint work with Klainerman he established the nonlinear stability of the Minkowski spacetime. His work is characterized by a profound understanding of the physics connected with these equations and brilliant mathematical technique.

Richard S Hamilton introduced the Ricci flow in Riemannian geometry. This is a differential equation which evolves the geometry of a space according to how it is curved. He used it to establish striking results about the shape (topology) of positively curved three and four dimensional spaces. During the last three decades he has developed a host of original and powerful techniques to study his flow; for example a technique called surgery allowing for the continuation of the evolution should singularities form. A primary goal of his theory was to classify all shapes in dimension three and in particular to resolve the Poincare Conjecture. Hamilton's program was completed in the brilliant work of Perelman. With his Ricci flow, Hamilton has provided one of the most powerful tools in modern geometry.



Universitetspionerene – Universitetet i Kvadraturen (1811 - 1852) Utstilling i Gamle Rådhus, Oslo, 18. aug.-18. des. 2011.

I år er det 200 år siden det ble besluttet å opprette et universitet i Norge. I 1812 ble Christiania utpekt som byen hvor universitetet skulle ligge, og i 1813 tok det imot sine første studenter. Storstilte planer om å bygge et idealuniversitet på Tøyen måtte oppgis på grunn av manglende ressurser. I stedet fikk universitetet tilhold inne i Kvadraturen, i byen som var anlagt under Akershus i 1624.

Etter 1814 fikk universitetet sentrale oppgaver for den nye norske staten. Universitetet utdannet landets embetsmenn, som både ble statens og folkefrihetens bærere. Universitetet ble en kilde til kunnskap som ble brukt til mange praktiske formål for landet og for byen, som nå var Norges hovedstad.

Studentene satte sitt preg på hovedstadens kulturliv med litterær virksomhet, studentteater og sangkor. De gikk foran i feiring av 17. mai. Studentene hadde de høye ambisjoner: å reise et norsk åndsliv. Men hvilke ideer det skulle tuftes på, ble et stridstema.

