INFOMAT

JUNI 2021

INFOMATs REDAKSJON ØNSKER ALLE EN RIKTIG GOD SOMMER!

INFOMAT kommer ut med 11 nummer i året og gis ut av Norsk Matematisk Forening. Deadline for neste utgave er alltid den 15. i neste måned. Stoff til INFOMAT sendes til

arnebs at math.uio.no

Foreningen har hjemmeside http://www.matematikkforeningen.no/
Ansvarlig redaktør er Arne B. Sletsjøe, Universitetet i Oslo

Matematisk kalender

På grunn av den pågående pandemien kan flere av arrangementene bli utsatt eller avlyst. Følg med på web-sidene.

2021

Nasjonalt matematikermøte, Trondheim
[UTSATT TIL SOMMEREN 2021]
<https://www.ntnu.no/imf/matematikermote>

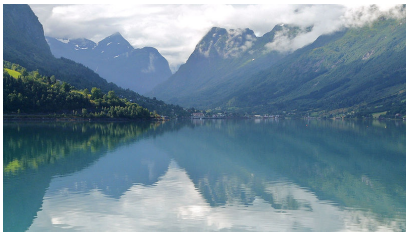
September:
27.-28.Mathematics without Borders, IMU 100 år, Strasbourg

2022

Juni:

12.-19. juni. Seminar Sophus Lie, Nordfjordeid <https://www.mathematik.uni-marburg.de/ agricola/SSL2021/>

SEMINAR SOPHUS LIE, Nordfjordeid, 12.-19. juni 2022



Seminaret er utsatt til 12.- 19. juni 2022.

Nye doktorgrader

Silvia Lavagnini ved UiO forsvarte 18. juni 2021 sin avhandling *Stochastic Modelling in Energy Markets - From the Spot Price to Derivative Contracts* for graden PhD.
Veiledere har vært Professor Fred Espen Benth, Universitetet i Oslo og Associate Professor Luca Di Persio, Università di Verona.

Sammendrag:

The production of renewable energy is growing world-wide, and – as a result – power production is becoming increasingly dependent on weather factors such as temperature, wind and precipitation. All of these factors are hard to predict, and this causes power prices to change rapidly and unpredictably, and makes the modelling of financial risk in energy markets particularly challenging. This thesis develops new models and tools to be used in this direction.

Energy markets can be divided into three main sectors: there is (1) a spot market for short-term delivery contracts, (2) a forward market for delivery in a future time at a price set today, and (3) an option market where the contracts traded allow, but not oblige, the buyer to buy or sell the asset in a future time at a price set today. Buying and selling electricity in these markets, while managing the financial risk, requires accurate mathematical models.

This thesis is concerned with the modelling of these markets. It both develops concrete models and more abstract mathematical tools which can be used for this challenging task. In particular, it focuses on spot price modelling, by taking into account the dependence between spot price behaviour and weather variables such as wind speed. Moreover, it focuses on forward price modelling and pricing of options written on forward contracts with delivery period, which are typical in the energy markets. Two central challenges which are addressed in this thesis are model accuracy and computational complexity, both of which are improved upon by using deep learning.

Ada Johanne Ellingsrud ved UiO forsvarte 23. juni 2021 sin avhandling *Computational modelling of electrodiffusion and osmosis in cerebral tissue* for graden PhD.
Veiledere har vært Chief Research Scientist/Research Professor Marie Elisabeth Rognes, Simula Research Laboratory, Professor Gaute Einevoll, Norwegian University of Life Sciences, CEO Klas Pettersen, Norwegian Artificial Intelligence Research Consortium og Professor Kent-Andre Mardal, Universitetet i Oslo.

Sammendrag:

Complex interactions between billions of nerve cells control our thoughts, emotions and behavior. Nerve cells communicate via electrical signals generated by molecules and ions moving over and between brain cells. In her dissertation, Ellingsrud, together with colleagues, has developed mathematical and numerical models for interactions between electrical and chemical processes in the brain. The models can potentially contribute to new insights in brain processes associted with altered ion concentrations.

Traditionally, ion concentrations between cells have been considered more or less constant during normal brain activity. Recent research efforts, however, show that these concentrations are not static, but change across brain states (e.g. sleep). Further, breakdown of ionic homeostasis in the brain is associated with pathologies such as migraine and epilepsy.

Mathematical models describing the interaction between ions and electrical activity typically consist of non-linear and coupled partial and ordinary differential equations that are challenging to solve numerically. Ellingsrud has considered two such models. In the first model, the cells are represented as a continuum, and is suitable for looking at waves of hyperactivity in epilepsy and migraine. The second model is more detailed and represents the cells explicitly, and is well suited for looking at local phenomena.

Nyheter

STUBBANS MATEMATISKE PRIS TIL JACOB FJELD GREVSTAD

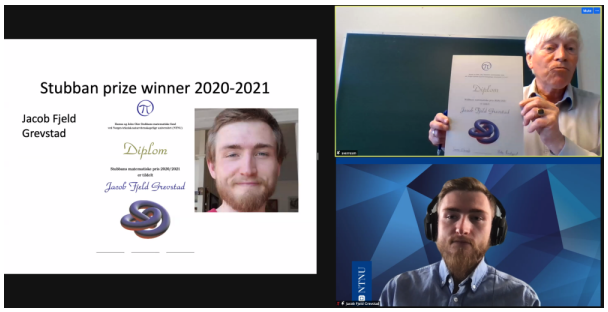
Hanna og John Olav Stubbans matematiske fond ved NTNU (se www.math.ntnu.no/stubban) ble opprettet i 2001, og fra fondet deles det hvert studieår ut en pris til den eller de masterstudentene som har oppnådd de beste karakterene innen matematiske fag. Årets pris består av diplom og 50.000 kr. Årets Stubbanprisvinner er **Jacob Fjeld Grevstad**.

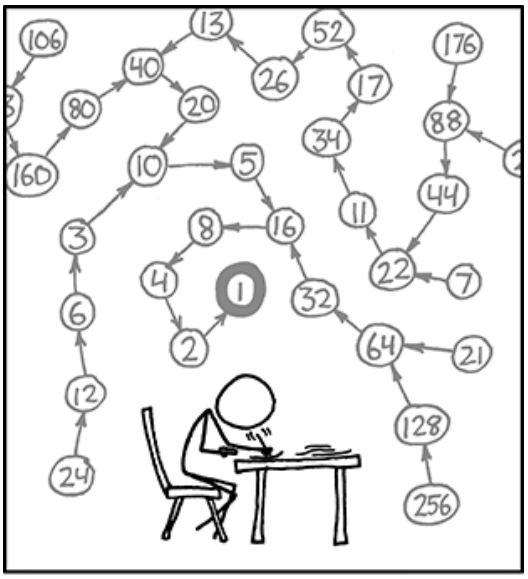
Jacob kommer fra Bærum og er master i matematiske fag ved IMF. Masteroppgaven har han skrevet innen representasjonsteori i fagfeltet algebra.

Veileder har vært Professor Øyvind Solberg, og Professor Aslak Bakke Buan har vært biveileder.

Jacob startet på integrert phd-utdanning ved IMF høsten 2020, og fortsetter som phd-student høsten 2021.

Stubbanfondets styre består av Peter Lindqvist, Sverre Smalø og Mette Langaas. Prisen ble utdelt på zoom onsdag 9. juni 2021.





THE COLLATZ CONJECTURE STATES THAT IF YOU PICK A NUMBER, AND IF IT'S EVEN DIVIDE IT BY TWO AND IF IT'S ODD MULTIPLY IT BY THREE AND ADD ONE, AND YOU REPEAT THIS PROCEDURE LONG ENOUGH, EVENTUALLY YOUR FRIENDS WILL STOP CALLING TO SEE IF YOU WANT TO HANG OUT.