



INFOMAT

FEBRUAR 2021



HVEM BLIR ÅRETS ABELPRISVINNER?

Onsdag 17. mars klokken 12.00 blir det klart hvem som får Abelprisen for 2021. Kunngjøringen vil i år avholdes uten publikum, men den blir live-streamet på Abelprisen.no. Prisen kunngjøres av preses i Akademiet, Hans Petter Graver, og leder for Abelkomiteen, Hans Munthe-Kaas, presenterer prisvinneren(e). Den britiske forfatteren og kunnskapsformidleren Alex Bellos gir oss en populærvitenskapelig presentasjon av prisvinneren(es) arbeide.

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.

Mars:

17.. Abelprisen 2021, annonsering, DNVA
<<http://www.abelprisen.no/>>

Mai:

24.-26.. Abelpris-uka 2021, DNVA/UiO
<<http://www.abelprisen.no/>>

Juni:

7.-11.MEGA (effective methods in algebraic geometry), Tromsø
<<https://puremath.no/mega2021/>>

20.-26.. The 8th European Congress of Mathematics (8ECM), Portorož, Slovenia and Online <<https://www.8ecm.si/news/79>>

27.-3. juli. Seminar Sophus Lie,
Nordfjordeid <<https://www.mathematik.uni-marburg.de/agricola/SSL2021/>>

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

September:

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

MEGA, Tromsø, 7.-11. juni 2021

MEGA is the acronym for Effective Methods in Algebraic Geometry. This series of biennial international conferences, with the tradition dating back to 1990, is devoted to computational and application aspects of Algebraic Geometry and related topics, over any characteristics.

Plenary speakers:

Alicia Dickenstein, Universidad de Buenos Aires
Ana Romero Ibañez, Universidad de La Rioja
Gleb Pogudin, École Polytechnique
Greg Smith, Queen's University
Gretchen L. Matthews, Virginia Tech
Gunnar Fløystad, Universitetet i Bergen

Kathlén Kohn, KTH

Karin Baur, University of Leeds

Mohab Safey El Din, Sorbonne Universités

Ragni Piene, Universitetet i Oslo



SEMINAR SOPHUS LIE, Nordfjordeid, 27.juni -3. juli 2021



Dear Colleagues.

We are hoping for a good summer 2021, and a possibility for traditional meetings. The Seminar Sophus Lie is no exception. The next meeting of this seminar is June 27 - July 3, 2021, at Nordfjordeid. Recall that Sophus Lie was a famous Norwegian mathematician affiliated for an essential part of his career in Leipzig. It is not a surprise that Seminar Sophus Lie, a biannual meeting of mathematicians, was organized by German colleagues. It is however for the first time that the seminar comes to the Norwegian soil. The venue of the seminar will be the birthplace of Sophus Lie.

The conference center at Nordfjordeid allows for meetings with at least 50 participants (with pandemic restrictions, but once these are done the number can be increased). Local expenses will be covered, there are also limited resources to help with travel expenses. Information on the Sophus Lie Conference Center can be found on the conference web page: <https://www.mathematik.uni-marburg.de/agricola/SSL2021/>.

Lie theory has a wide range of applications in different branches of mathematics, and we encourage the Norwegian colleagues to participate in this event. We will try to keep the meeting broad. Therefore we ask everybody who is interested in attending the meeting to send us a noncommittal email saying so. Please use the address: Irina.Markina@math.uib.no. This will help us to make sure we use the facilities in an optimal way. We also want to give young researchers a chance meet other mathematicians in person and to present/discuss their work.

Sincerely yours.

Boris Kruglikov and Irina Markina.

Nye doktorgarder

Rasmus Erlemann ved NTNU forsvarer 28. januar 2021 sin avhandling *Contribution to the Theory of Goodness-of-Fit Testing and Change Point Detection* for graden PhD.

Veiledere har vært Professor Bo Henry Lindqvist (hovedveileder) og Professor Gunnar Taraldsen (biveiledere), begge NTNU.

Sammendrag:

We are given a data set. A typical question to ask is if a chosen distribution fits this data set. It is called goodness-of-fit testing and in my thesis this question is answered using the hypothesis testing framework. We defined new test statistics that specialize in specific types of goodness-of-fit testing situations. Also, we used conditional distributions in calculating the test statistic distribution. In some situations it has various advantages over the alternative approaches, like asymptotic methods or parametric bootstrapping. We tested our new methods on real life data sets and conducted power studies to see how it performs against specific types of data sets.

The second part of my thesis is about change point detection. The main question this field of study answers is if the distribution of the data changes at some index. We defined new nonparametric tests and found their asymptotic distributions. The power study showed that the new tests

are able to detect very subtle changes in distribution. Some open questions remained in our research. For example, the AMOC (at most one change) model could be generalized to multiple change points. We pointed out a couple of interesting ideas for further research in this field.

Siv.ing. Audun Reigstad ved NTNU forsvarer 1. februar 2021 sin avhandling *A Regularized System for the Nonlinear Variational Wave Equation* for graden PhD.

Veiledere har vært Professor Katrin Grunert (hovedveileder) og Professor Helge Holden og Professor Peter Lindqvist (biveiledere), alle NTNU.

Sammendrag:

The main topic of this thesis is a nonlinear variational wave (NVW) equation, which appears in the study of nematic liquid crystals. Solutions of the NVW equation can lose regularity in finite time, which is due to the formation of singularities in the first order derivatives. Continuation of the solution after the time when a singularity appears leads to different solution concepts. Our focus is on conservative solutions, where the energy remains unchanged after singularity formation. We present a regularized system for the NVW equation, which consists of two transport equations coupled with the NVW equation. Given that the initial data satisfies certain conditions, we prove local existence of smooth solutions to the system, and also local convergence of a sequence of smooth solutions of the system to a weak solution of the NVW equation.

In the second part of the thesis, we show how to obtain global, bounded, weak traveling wave solutions of the NVW equation from local, classical ones.

In the last part, we consider models that describe plant stems competing for sunlight. We solve an optimization problem which yields the optimal shape of a single stem, then investigate a competitive equilibrium among plants with optimal shape and prove uniqueness of the equilibrium.

Nyheter

LEDIGE STIPENDIAT-STILLINGER VED UiO

Det er utlyst en rekke stipendiat-stillinger ved UiO, 9 PhD og 4 Post.doc. Søknadsfrist 28. februar 2021.

<https://www.mn.uio.no/math/om/jobb/>



In 2021 the theme of the IDM is Mathematics for a Better World. Create a poster that shows one way to make the world a little bit better using mathematics. Instead of words, use pictures combined with numbers, formulas, geometric shapes, and other mathematical elements to express your idea. Use mathematics so people worldwide can understand it, even if they don't speak your language.

You have extra time to join our challenge

Our Poster Challenge invites you to communicate an idea to make the world a little bit better by using mathematics as a universal language. The guidelines, tips, and examples are now available in Spanish, and six other languages (Arabic, English, French, German, Portuguese, and Turkish), so we decided to provide some extra time for the new participants.

You can submit your poster until **March 1, 2021**, see:

<https://www.idm314.org/2021-poster-challenge.html>

Discover our 2021 theme

We prepared a mini-website dedicated to the 2021 theme: Mathematics for a Better World. Explore it, share it, and discover some ways in which mathematics improves the world.

<https://betterworld.idm314.org/>

Get together on March 14

This year many IDM events will take place online. Connect with your classroom, colleagues, friends, or fellow math lovers and celebrate mathematics together. Have a day of mathematical games and puzzles, prepare a talk, or take a look at our activity ideas.

<https://www.idm314.org/organize.html>

Once your plans are set, put your event on our map and let the world know!

<https://www.idm314.org/index.html#event-map>

ISADORE M. SINGER (1924-2021)



Isadore Singer, who unified large areas of mathematics and physics in becoming one of the most important mathematicians of his era, died on February 11 at his home in Boxborough, Massachusetts.

Isadore M. Singer was the recipient of the Abel Prize in 2004, together with Sir Michael Atiyah. They received the prize for their discovery and proof of the index theorem, one of the most significant discoveries in 20th century mathematics.

Singer is widely regarded as one of the central figures of 20th century mathematics. His deep mathematical insights unearthed fundamental connections between analysis, geometry and topology and later with theoretical physics. The archetype of these connections was the Atiyah-Singer Index Theorem. Proved in the early 60s, the Index theorem had a profound influence on mathematics and high-energy physics. The legacy of his impeccable mathematical taste is very broad, resulting in nearly 100 publications. Among these, the Kadison-Singer problem - originally formulated in an attempt to formalize the foundations of quantum mechanics - was found to be equivalent to key problems in applied mathematics, engineering and theoretical computer science and only resolved over fifty years after it was initially posed.

Singer was Emeritus Institute Professor at the Department of mathematics at MIT.