INFOMAT

September 2019

GIULIA DE NUNNO, UiO, VINNER AV ÅRETS "INTERNATIONAL SU BUCHIM AWARD" FOR SITT ARBEID FOR MATEMATISK FORSKNING I DEN TREDJE VERDEN

"Many see it as a luxury, but fundamental research is essential for the system to be self-sustaining; to contribute to a country forming its human resources is to cooperate with a long-term perspective."

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

2019:
November:
7.-8. *Nasjonalt algebramøte*, Oslo

NASJONALT ALGEBRAMØTE, Oslo, 7.-8. november 2019

Årets nasjonale algebramøte finner sted 7.-8. november 2019 i Oslo, se webside: https://www.mn.uio.no/math/forskning/grupper/algebra/arrangementer/nasjonaltmote2019/

Nye doktorgrader

M.Sc. **Marthe Måløy**, UiT, forsvarte 27. mars 2019 sin avhandling *The nonlinear nature of Biology* for graden ph.d.
Hovedveileder: Professor Per Jakobsen.

Sammendrag:

In this thesis, we explore the stability and the breakdown of stability of biological systems. The main examples are the blood system and invasion of cancer. However, the models presented in the thesis apply to several other examples. Biological systems are characterised by both competition and cooperation. Cooperation is based on an unsolvable dilemma: Even though mutual cooperation leads to higher payoff than mutual defection, a defector has higher payoff than a co-operator when they meet. It is not possible to represent this dilemma with a linear and deterministic model. Hence, the dilemma of cooperation must have a nonlinear and/or stochastic representation. More general, by using a linearised model to describe a biological system, one might lose dimensions inherent in the complexity of the system. In this thesis, we illustrate that a nonlinear description of a biological system is potentially more accurate and might provide new information. We show that even though a new type of individual is in general not advantageous when it appears in stable population, the newcomers can grow in number due to stochasticity. Moreover, the new type can only become advantageous if it manages to change the environment in such a way that it increases its fitness. We also propose a model that links self-organisation with symmetric and asymmetric cell division, and we illustrate that if symmetric stem cell division is regulated by differentiated cells, then the fitness of the stem cells can be affected by modifying the death rate of the mature cells. This result is interesting because stem cells are less sensitive than mature cells to medical therapy, and our results imply that stem cells can be manipulated indirectly by medical treatments that target the mature cells.

M.Sc. **Aihua Lin**, UiT, forsvarte 29. mars 2019 sin avhandling *The EOS Formulation for Linear and Nonlinear Transient Scattering Problems* for graden ph.d.
Hovedveileder: Professor Per Jakobsen

Sammendrag:

This thesis developed the EOS formulations of solving nonlinear transient scatterings, both for 1D case and 3D Maxwell's equations. This method can be accurately and stably implemented using one particular choice of numerical scheme for the inside of the objects and for the required integral representations of the boundary values. For a stable numerical solution, the time step needs to be confined in some range, where we have found that for 1D case, this range is determined by the internal domain-based method while for the 3D case, this range is both determined by the the internal domain-based method and the boundary integral part. Specifically, in 3D case, the lower limit of the interval is highly depended on the properties of the materials while the upper limit is determined by the internal domain-based method. This finding is believed to be related with the popular late time stabilities in community of computational electromagnetics.

M.Sc. **Eivind Schneider**, UiT, forsvarte 10. mai 2019 sin avhandling *Differential invariants of Lie pseudogroups* for graden ph.d.
Hovedveileder: Professor Boris Kruglikov.

Sammendrag:

We compute differential invariants for several Lie

pseudogroups, and use them for solving the equivalence and classification problem for a variety of mathematical structures appearing in geometry and mathematical physics. We demonstrate utility of the algebra of rational scalar differential invariants for solving these two problems, also in cases where the structures are given as solutions to a nonlinear partial differential equation and the Lie pseudogroup is infinite-dimensional. In addition to contributing to the study of important mathematical structures, our work brings new insight into the general theory of differential invariants.

Nyheter

GIULIA DE NUNNO, WINNER OF THE INTERNATIONAL SU BUCHIM AWARD

Giulia de Nunno, University of Oslo, is the winner this year of the international Su Buchim award for high-level mathematical research in developing regions, an award granted by the International Council of Industrial and Applied Mathematics.
de Nunno is Professor at the University of Oslo, and promoter of programs to strengthen mathematics in Africa through the European Mathematical Society (EMS) and the International Center for Pure and Applied Mathematics (CIMPA).
Di Nunno asks for more visibility for scientists from developing countries. Also, cooperation actions that promote the most basic science: *"Many see it as a luxury, but fundamental research is essential for the system to be self-sustaining; to contribute to a country forming its human resources is to cooperate with a long-term perspective."*

Klippet fra El Pais

FRA IMU:

Dear colleagues,
This letter is about the International Congress of Mathematicians to be held in the year 2026 (ICM 2026).
One of the objectives of the International Mathematical Union defined in the IMU Statutes is
"... To support and assist the International Congress of Mathematicians ...",
The IMU Executive Committee (EC) cordially invites all Adhering Organizations and national mathematical societies in IMU members to submit bids for hosting the International Congress of Mathematicians in the year 2026 and the IMU General Assembly meeting prior to this Congress.
Only electronic submissions are accepted. Submissions should be sent to

secretary@mathunion.org.

For a bid to be considered by the Site Selection Committee it must be received no later than **30 November 2021**.
The Site Selection Committee will evaluate all bids received, taking into account, but not restricted to, the mathematical ambience, the infrastructure and the economic conditions offered by each bidder, as well as the accessibility of the proposed site, the involvement of the local mathematical community, and the geographical distribution of places where ICMs took place in the past.
The IMU EC will prepare a recommendation based on the SSC's advice and refer this recommendation to the 19th IMU General Assembly (GA), which will take place in St. Petersburg, Russia, on 3–4 July 2022 prior to the ICM.
The GA will make the final decision on the location of ICM 2026.
Every country interested in making a bid for ICM 2026 is strongly encouraged to do so.

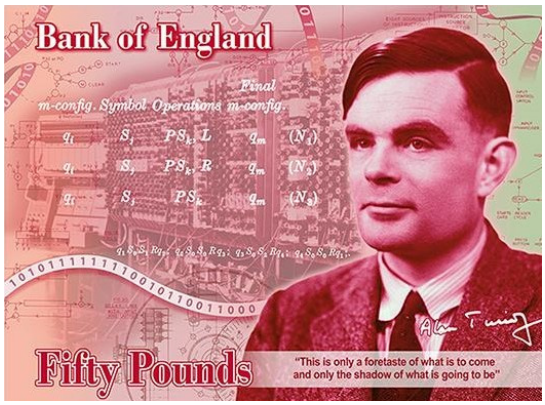
Sincerely
Helge Holden,Secretary General of the IMU

NYHETER

FRA EMS:

Dear EMS members,
Let me welcome you all back after a hopefully relaxing summer, with hopefully also a lot of great scientific activities. A mathematical highlight this summer was definitely the ICIAM congress in Valencia, see www.iciam2019.org/ , which had approximately 4000 participants and was opened by the King of Spain. The congress covered all areas of Industrial and Applied Mathematics, and clearly showed the importance of mathematics in society.
The EMS publishing house has now moved to Berlin, see www.ems-ph.com, and is still very busy with the legal and administrative tasks of this transition. At the same time a lot of discussions are underway to change current publishing models to ensure that academic publishing is of the highest quality, sustainable, openly available, and a joint endeavour of the mathematical community including the library associations. This initiative is also a reaction to Plan S of the European Commission, which threatens the existence of community publishing houses.
A worrying recent development concerns the European commission's attitude to research. It is not only the new name of the portfolio that is of concern ("education" and "research" are no longer explicitly represented but instead are subsumed into "innovation and youth"), but also the potential budget for the coming years. There is a major protest campaign against these developments. Please see www.futureofresearch.eu. I really hope that the mathematical community will stand together in sailing through these difficult waters.

Volker Mehrmann
EMS President



- Alan Turing will appear on the new £50 banknote. The LMS contributed to the design of the banknote and gave approval for two mathematical excerpts from Turing's seminal article in Proceedings of the LMS to be featured on the new banknote.
https://www.lms.ac.uk/alan-turing-banknote

FRA REDAKSJONEN:

Redaksjonen i INFOMAT ønsker seg flere bidrag til meldingsbladet. Ikke vær beskjedne, send en e-post dersom dere har noe på hjertet eller kommer over noe som det kan passe å dele med andre matematikere i Norge.
Redaksjonens adresse er
arnebs@math.uio.no