

## Svenska matematikersamfundets höstmöte i Luleå, den 23 november 2012, Program med abstracts

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13.05–13.50: **Kristian Bjerklov** (KTH): *Dynamiken hos ett kvasi-periodiskt stört system.*

Abstract: Under de senaste 30 åren har teorin för en-dimensionell dynamik utvecklats mycket framgångsrikt. En stor utmaning ligger nu i att försöka bygga upp en teori för högre-dimensionella system. Ett första steg är att undersöka vilka fenomen som kan uppstå i olika klasser av system, hitta rätt objekt att beskriva dynamiken med, samt förklara bakomliggande mekanismer. En naturlig klass av system fås genom att låta ett känt en-dimensionellt system driva ett annat. Med andra ord, man använder ett system för att generera störningar hos det andra. Det man vill förstå är dynamiken hos det drivna (eller störda) systemet. Vi kommer att visa några ganska märkliga saker som kan inträffa då ett visst en-dimensionellt system kopplas till en irrationell rotation på cikeln.

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14.00–14.20 **Peter Helgesson** (Göteborg): *The N-player War of Attrition in the limit of infinitely many players*

Abstract: The War of Attrition is a classical game theoretic model that was first introduced to mathematically describe certain non-violent animal behavior. The original setup considers two participating players in a one-shot game competing for a given prize by waiting. This model has later been extended to several different models allowing more than two players. One of the first of these N-player generalizations was due to J. Haigh and C. Cannings, where two possible models are mainly discussed; one in which the game starts afresh with new strategies each time a player leaves the game, and one where the players have to stick with the strategy they chose initially. The first case is well understood whereas, for the second case, much is still left open. In this talk we consider the asymptotic behavior of these two models as the number of players tend to infinity and show that they, in a certain sense, coincide in the limit. By analysing the war of attrition with infinitely many players we find new results for the N-player second model.

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14.30–14.50 **Martin Křepela** (Karlstad): *Convolution inequalities in weighted Lorentz spaces*

Abstract:

For a measurable function (“kernel”)  $g$ , the convolution operator  $T_g$  is defined by

$$T_g f(t) := (f * g)(t) = \int_{\mathbb{R}} f(x)g(t-x) dx,$$

if the integral is well-defined for almost every  $t \in \mathbb{R}$ .

We give sufficient and necessary conditions for boundedness of  $T_g$  between the Lorentz spaces  $\Lambda$  and  $\Gamma$  with general nonnegative weights. We provide corresponding Young-type inequalities in the form

$$\|f * g\|_{\Gamma^q(w)} \leq C \|f\|_{\Lambda^p(v)} \|g\|_Y$$

and characterize the norm of the greatest rearrangement-invariant space  $Y$  for which this inequality is satisfied.

The technique used to obtain these results is based on known Hardy-type inequalities with general weights which have not been used for such purpose before. It may be also shown that the same method works even for convolution of periodic functions defined by an integral over a finite-measure interval.

15.20–15.40 **Johannes Lundqvist** (Stockholms universitet): *An effective uniform Artin-Rees lemma*

Abstract: In this talk we describe an effective version of the uniform Artin-Rees lemma for the polynomial ring. We relate the result to various effective versions of the Nullstellensatz and to the theorem of Briançon-Skoda.

15.50 – 16.10 **Adam Andersson** (Göteborg): *Weak convergence analysis of numerical schemes for stochastic PDEs*

Abstract: Stochastic PDEs is a growing field that has drawn the attention from mathematicians from different fields. While classical PDE theory and that for stochastic ODEs are quite mature this is not the case for stochastic PDEs regarding theory, numerics and modeling. It is therefore a vital area of research and it occupies the attention of a couple of hundred researchers, including PhD students, mostly in Europe. In this talk I will focus on the non-linear stochastic heat equation. The noise enters via a stochastic integral. An introduction to Gaussian stochastic integrals in Hilbert spaces, based on the Malliavin calculus will be given. After that I will present my own results on weak error analysis of numerical schemes for this equation. Weak convergence is here understood in the probabilistic sense, i.e., it deals with the convergence of the probability law, as the numerical solution is refined.

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16.20–17.05 **Frank Wikström** (Lund): *Pluripotentialteori — potentialteori med förbundna ögon och händerna bakom ryggen.*

Abstract: Pluripotentialteori — studiet av plurisubharmoniska funktioner — spelar en central roll för komplex analys i flera variabler och har utvecklats stort sedan 50-talet. Ämnet har stora likheter med klassisk potentialteori, men eftersom den underliggande differentialoperatören är fullt icke-linjär, så har man inte tillgång till alla verktyg från den linjära teorin, vilket gör livet svårare (och intressantare?) Jag kommer att ge en kortfattad översikt av ämnet, i synnerhet några metoder som jag själv använt för att till exempel studera randvärden av plurisubharmoniska funktioner. Jag avslutar med ett par olösta problem som förhoppningsvis kan inspirera till fortsatt arbete.

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