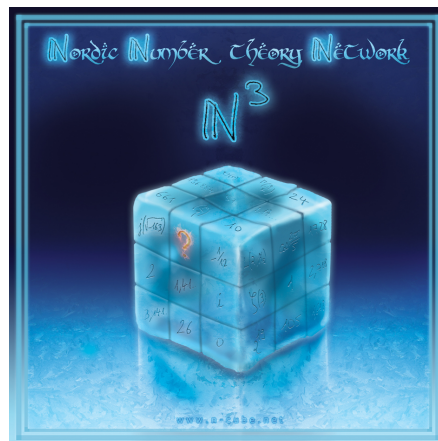


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## Denmark Australia Diophantine Approximation Day 2017

Aarhus University,  
December 8, 2017  
organised by Simon Kristensen and Fabien Pazuki,  
with the support of the Niels Bohr Professorship  
of Lars Hesselholt.



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## Program

	Friday 8.12
09:30-10:30	<b>Michael Coons</b>
10:45-11:45	<b>Fabien Pazuki</b>
11:45-13:30	<i>Lunch</i>
13:30-14:30	<b>Evgeniy Zorin</b>
14:45-15:45	<b>Alex Ghitza</b>
15:45-16:30	<i>Coffee break</i>
16:30-17:30	<b>Simon Kristensen</b>
18:30	<i>Dinner</i>

## Abstracts

Time: Friday 8, 9:30-10:30.

Room: Aud D1.

Speaker: **Michael Coons** (Univ. Newcastle, Australia).

Title: *2-automatic sequences, Lyapunov exponents and a dynamical analogue of Lehmer's Mahler measure problem.*

Abstract: We show that the Mahler measure of every height-one polynomial can be expressed as the maximal Lyapunov exponent of a matrix cocycle that arises in the spectral theory of 2-automatic sequences. In this way, one comes up with a sort of dynamical analogue of Lehmer's problem on minimal Mahler measures. This is joint work with Michael Baake and Neil Manibo (University of Bielefeld, Germany).

Time: Friday 8, 10:45-11:45.

Room: Aud D1.

Speaker: **Fabien Pazuki** (Univ. Copenhagen, Denmark).

Title: *Elliptic curves and isogenies.*

Abstract: Two elliptic curves  $E$  and  $E'$  defined over a number field  $K$  are isomorphic over the algebraic closure of  $K$  if and only if they have the same  $j$ -invariant. A natural question is: how is this invariant transformed by general isogenies? We prove a new height bound on the difference of heights of the  $j$ -invariants of isogenous elliptic curves, and derive several consequences, for instance bounds for the height of modular polynomials and for Vélu's formulas. If time permits, we will add a remark on Mordell-Weil ranks of elliptic curves.

Time: Friday 8, 13:30-14:30.

Room: Aud D1.

Speaker: **Evgeniy Zorin** (Univ. York, UK).

Title: *Diophantine approximations to automatic numbers.*

Abstract: There exists a deep interplay between Diophantine properties of real numbers and computational complexity of their  $b$ -adic expansions, for any integer  $b \geq 2$ , or also their continued fractions. I am going to present this area of research and discuss in particular details my recent results, joint with Badziahin (University of Sydney), on Diophantine exponents of automatic numbers.

Time: Friday 8, 14:45-15:45.

Room: Aud D1.

Speaker: **Alex Ghitza** (Univ. Melbourne, Australia).

Title: *Numerical evaluation of Hecke eigenvalues.*

Abstract: I will discuss the efficient computation of eigenvalues for the Hecke operators acting on spaces of modular forms. This is a problem that has attracted lots of attention and, lately, lots of heavy algebraic-geometric machinery. In contrast, I wish to describe an elementary, simple-minded numerical-analytic method and discuss its performance for various types of modular forms.

Time: Friday 8, 16:30-17:30.

Room: Aud D1.

Speaker: **Simon Kristensen** (Aarhus Univ., Denmark).

Title: *Irrationality of series via uniform distribution.*

Abstract: Building on a method of Schlage–Puchta, we investigate the use of uniform distribution theory in proofs of the irrationality of real numbers represented by series. We describe a general method for proving irrationality via uniform distribution and give some (hopefully new) applications. This is joint work in progress with Jaroslav Hančl.