

# Program, SMS höstmöte, 22 november 2019

Mötet äger rum på KTH i sal D3.

Titlar och sammanfattningar till föredragen finns på annan sida.

- 13.15–13.55 Andreas Strömbergsson,  
presentation av Michael Björklunds arbeten.
- 13.55–14.00 Prisutdelning, Wallenbergpriset.
- 14.10–14.30 Jonas Nordqvist
- 14.35–14.55 Jacob Muller
- 15.00–15.20 Tomas Berggren
- 15.20–15.45 Kaffe
- 15.45–16.05 Julian Mauersberger
- 16.10–16.30 Gustav Zickert
- 16.35–16.55 Samu Potka
- 17.00 Medlemsmöte. Dagordning finns i separat dokument.
- 19:00 Middag på för ändamålet lämplig plats.

Jonas Nordqvist, Linnéuniversitetet, *Residue fixed point index and wildly ramified power series*

Jacob Muller, SU, *Spectra of higher order differential operators on graphs and almost periodic functions*

In this talk, we study the spectra of self-adjoint  $n$ -Laplacian operators  $(-d^2/dx^2)^n$  on compact finite metric graphs. We derive an effective secular equation and analyse the spectral asymptotics, exploiting the fact that the secular function is close to a trigonometric polynomial. The notion of the quasispectrum is introduced and its uniqueness is proved using the theory of almost periodic functions. For this purpose, new results concerning (classical) almost periodic functions are proved. In particular we study the roots of functions which are close to almost periodic ones and show that their roots are asymptotically close to each other. One can prove an equivalence relation of sorts between sets of roots of such functions, which has the consequence that two  $n$ -Laplacians are asymptotically isospectral if and only if they have the same quasispectrum. The results on almost periodic functions have wider applications outside the theory of differential operators.

(Joint work with Pavel Kurasov, Stockholm University)

Tomas Berggren, KTH, *Domino tilings of the Aztec diamond with doubly periodic weightings*

This talk will be centered around random domino tilings of the Aztec diamond with doubly periodic weightings. In particular asymptotic results of the  $2 \times k$ -periodic Aztec diamond will be discussed, both in the macroscopic and microscopic scale. The macroscopic picture is described using a close connection to a Riemann surface. For instance, the number of smooth regions (also called gas regions) is the same as the genus of the mentioned Riemann surface.

Julian Mauersberger, KTH, *Large gap asymptotics for determinantal point processes*

I will present joint work with Christophe Charlier and Jonatan Lenells on the large gap asymptotics of certain determinantal point processes. Such point processes often arise as extreme eigenvalue distributions of random matrix ensembles. We are particularly interested in the probability that there is no eigenvalue on an interval  $[0, s]$ , the so-called gap probability at the hard edge, as the size of the matrix approaches infinity. It turns out that the large gap asymptotics, i.e. the asymptotic behavior of the gap probability as the parameter  $s$  becomes large, can be studied via tools of complex analysis. By applying such tools, we compute the constant terms in

the large gap asymptotics for two types of point processes. Deriving similar constants has a long history in random matrix theory.

Samu Potka, KTH, *The Cyclic Sieving Phenomenon on Circular Dyck Paths*

The cyclic sieving phenomenon (CSP) was defined by Reiner, Stanton, and White in 2004. The ingredients are a finite set  $X$ , a cyclic group  $C$  acting on  $X$ , and a polynomial  $f(q)$  with nonnegative integer coefficients and satisfying  $f(1) = |X|$ . The triple  $(X, C, f(q))$  is said to exhibit the CSP if  $f(q)$  evaluated at certain roots of unity gives the number of elements of  $X$  fixed by powers of a generator of  $C$ . We will discuss an example instance on circular Dyck paths, which were recently studied by Alexandersson and Panova. We  $q$ -enumerated them and proved that they exhibit the CSP under shifting their area sequences. This is joint work with Per Alexandersson and Svante Linusson.