

---

**ALEXANDRU NICA**, Dept. of Pure Mathematics, University of Waterloo  
*Eta-series and a Boolean Bercovici–Pata bijection for bounded  $k$ -tuples*

Let  $D$  be the set of (non-commutative) distributions of  $k$ -tuples of selfadjoint elements in a  $C^*$ -probability space. On  $D$  one has an operation of free additive convolution; let  $D'$  be the set of distributions in  $D$  which are infinitely divisible with respect to this operation.

In this talk I will describe a bijection  $B: D \rightarrow D'$ , obtained in joint work with Serban Belinschi, and which is a multi-variable version of a bijection studied by Bercovici and Pata in the case when  $k = 1$ . The bijection  $B$  is found by looking in parallel at two “transforms” for non-commutative distributions, the eta-series and the  $R$ -transform. We prove a theorem of convergence in moments which parallels the Bercovici–Pata result from the case  $k = 1$ . On the other hand we prove that, quite surprisingly,  $B$  is a homomorphism for the operation of free *multiplicative* convolution. An interpretation of this fact is that eta-series share the nice behaviour which  $R$ -transforms were known to have in connection to the multiplication of free  $k$ -tuples of non-commutative random variables.