Mahler measures are everywhere

Riccardo Pengo

Università di Messina

The geometric average of a polynomial on the real analytic unit torus yields a real number, studied by Pierce and Lehmer for univariate polynomials, and by Mahler in general. In this talk, we will see how this number, whose small values still remain mysterious, can measure the growth of different kinds of objects, such as homology groups of knot complements, Picard groups of curves or sandpile groups of graphs. Furthermore, we will see how this number can often be linked to various constants of interest, such as entropies of algebraic dynamical systems and special values of L-functions. The talk will be based on joint works with François Brunault (ENS Lyon), Antonin Guilloux (IMJ-PRG, Paris), Mahya Mehrabdollahei (GAU, Göttingen) and Daniel Vallières (CSU, Chico).