

## The magic of dimensions 8 and 24

Maryna Viazovska

*Ecole Polytechnique Federale de Lausanne*

viazovska@gmail.com

This talk is about two exceptional mathematical objects: the E8 lattice and the Leech lattice. These two lattices are extraordinary tight and symmetric. They satisfy many extremal properties, in particular provide the densest sphere packings in their respective dimensions and are universally optimal. This lecture is an attempt to answer the question: what is so unusual about dimensions 8 and 24 and why they host these two "magic" lattices?