Oberseminar Mathematische Stochastik

Mittwoch, 6. Mai 2015, 17:00 Uhr, M 6

Kilian Raschel, *Tours*

A human proof of Gessel's lattice path conjecture

Abstract:
Around 2000, Ira Gessel conjectured that the number of lattice walks in the quadrant N^2, starting and ending at the origin (0,0) and consisting of East, West, North-East and South-West steps, had a simple hypergeometric form. In the following decade, this problem became one instance in the systematic study of walks with small steps confined to the quadrant. A complete classification of these walks according to the nature of their generating function (algebraic, D-finite, non-D-finite) is now available, but Gessel's walks remain mysterious because they are the only among the 23 D-finite models that had not been given an elementary solution. Instead, Gessel's conjecture was first proved using computer algebra in 2008. A year later, the associated three-variate generating function was proved to be algebraic by a computer algebra tour de force. In this talk we will present the first human proof of Gessel's conjecture (using complex analysis).
This is a joint work with Alin Bostan (Inria Saclay) and Irina Kurkova (University Paris 6).