Whitehead Prize: citation for Agelos Georgakopoulos

Short citation:

Dr Agelos Georgakopoulos of the University of Warwick is awarded a Whitehead Prize for his contributions to long-standing problems in probability and graph theory, using methods from combinatorics as well as probability, topology and geometry.

Long citation:

Dr Agelos Georgakopoulos of the University of Warwick is awarded a Whitehead Prize. Georgakopoulos is a highly original young mathematician who has solved long-standing problems in probability and graph theory using methods from combinatorics as well as probability, topology and geometry. He has authored about 50 research articles in the 13 years since his PhD.

In his article on square tilings of planar graphs, he introduced a general method for understanding the Poisson boundaries of graphs and solved a problem posed by Benjamini and Schramm in 1996.

A few years ago, Georgakopoulos also wrote a long memoir on planar Cayley graphs. The study of groups with planar Cayley graphs goes back to Poincaré. In this memoir, Georgakopoulos gave a complete description of all the cubic infinite planar Cayley graphs. This is a rich class comprising 37 infinite families, many with unexpected properties that enable the construction of counterexamples to conjectures of Mohar, Bonnington and Watkins. In joint work with Hamann, Georgakopoulos extended the methods of this memoir to graphs of higher degree and they proved that these graphs can be effectively enumerated.

In his article on Bernoulli percolation, joint with Panagiotis, Georgakopoulos answered a question of Kesten from 1981 by proving that the percolation density is analytic in the supercritical regime. The article also gives the best available bounds in the direction of conjectures by Benjamini and Schramm concerning the percolation threshold for planar triangulations.