

Ostrowski prize 2007 for Oded Schramm

The Ostrowski foundation has awarded the Ostrowski Prize 2007 to Professor Oded Schramm of Microsoft Research for his development and application of the Stochastic Loewner Application.

Schramm's research interests include conformal mappings and probability. In 2000 he invented the Stochastic Loewner Evolutions, abbreviated as SLE, and now sometimes called Schramm Loewner Evolutions, to describe some increasing set valued processes such as loop erased random walks and the boundaries of percolation clusters. Schramm described such processes by means of curves in the complex plane which satisfy Loewner's differential equation with some boundary condition and some driving process. It was Schramm's unique insight that if his processes had conformally invariant scaling limits, then the limit processes had to be driven by some Brownian motion depending on a parameter κ which is different for different processes.

Lawler and Werner characterized SLE processes with a specific value of the parameter κ by means of a locality property or a restriction property. Using the results of Schramm, and of Lawler and Werner, Smirnov identified the limit distribution of the 'outer boundary' of a certain percolation cluster with an SLE process. These four authors have used their methods to deal with diverse problems which seemed intractable before. Smirnov and Werner established power laws and confirmed the values of several critical exponents for two-dimensional percolation on the triangular lattice which had been predicted by physicists. Lawler, Schramm and Werner also found the critical exponents for intersection probabilities for several Brownian motions and described the scaling limit of two-dimensional loop-erased random walks in terms of SLE. Schramm and his coauthors further confirmed a conjecture by Mandelbrot giving the Hausdorff dimension of the frontier of two-dimensional Brownian motion with the help of SLE.

SLE has proven to be extremely useful for computing explicit values for critical exponents. Although these arguments apply only for critical percolation on the two-dimensional triangular lattice, this represents phenomenal progress on a significant problem in statistical physics for which there had been no idea how to proceed. It has led to a large number of exciting developments from pure probability to statistical physics. Wendelin Werner has received a Fields Medal for his contribution to these breakthroughs. Not being hindered by age limits the jury of the Ostrowski prize wants to honour the founder of this impressive development in the person of Oded Schramm.

Oded Schramm was born in Israel in 1961. He received his undergraduate education in Jerusalem and pursued graduate studies at Princeton University with W.P. Thurston as advisor. He held positions at the University of California at San Diego (1990-1992) and the Weizmann Institute (1992-1999), and joined Microsoft Research at Redmond, Washington, in 1999. He is recipient of the Anna and Lajos Erdős Prize in Mathematics, the Salem prize, Clay Research Award, Henri Poincaré Prize, and the Loeve Prize.