

# CONFORMALITY IN PROBABILITY AND DISCRETE MATHEMATICS

Geoffrey Grimmett

(Cambridge University)

Lecture given at Kuwait University

Self-avoiding walks, percolation, Ising/Potts models, and Brownian Motion, these are some of the basic processes in what might be termed probabilistic physics. A collection of beautiful and easy-to-state conjectures has emerged over the last 30 years about such processes in two dimensions, and particularly about their behaviour at ‘critical points’.

The theory of conformal maps of the half-plane turns out to be the key, in conjunction with a differential equation due to Loewner. In the limit of large-space, the geometry of such processes coincides with that of members of a canonical class of processes called ‘stochastic Loewner evolutions’, and explored by Schramm, Lawler, and Werner. There is much to be done.

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