

SELF – ORGINIZING TILINGS**James Gary Propp**

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Mathematicians and physicists have a compellingly simple definition of what it means to choose "randomly and fairly" from a finite number of possibilities: to select one of the possibilities in such a way that each of the possibilities has an equal chance of being chosen. This definition leads to some surprising phenomena when the "possibilities" in question are the different ways of tiling a particular finite two-dimensional region with tiles of a particular kind. Specifically, one finds in many cases that order spontaneously aggregates near the boundary, while disorder aggregates in the center, with a sharply - defined, predictable, and unaccountably symmetric boundary between the orderly and disorderly regions. There are beautiful laws governing the transition from order to disorder, but much that we still do not understand. One way of getting insight into these phenomena are to add a dimension, and to view these two-dimensional tiling as projections of surfaces in three dimensions.