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Cellular automaton eco-systems the simple way to simulate macroevolution

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In this short talk I will present a simple lattice, cellular automaton like model of a multi-species ecosystem suitable for the study of emergent properties of macroevolution. In this model the number of species is not fixednew species continuously emerge by mutation from existing species, then survive or extinct depending on the energetic balance between local ecological interactions. The Monte-Carlo numerical simulations show that this model is able to qualitatively reproduce phenomena that have been empirically observed, like the dependence between size of the isolated area and the number of species inhabiting there or between primary production and complexity of food network. The model allows also studying formation and transformation of food-networks, influence of general factors (like intensity of primary productions) and possible causes of mass extinctions, and more generally, the role of ecological rules and pure chance in macroevolution. Some results were published jet (see below), some new will be presented.

HOMEPAGE: www.iss.uw.edu.pl/borkowski/

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