

**A GENERAL MODEL OF SELF-ORGANIZATION AND DEVELOPMENT OF COMPLEX
SYSTEMS ACROSS THE DISCIPLINES**

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ABSTRACT

We are presenting a model of continuous self-organization, which treats physical, biological, technological and social systems in the same formalism. It is general, about the dynamics of self-organizing developing and evolving complex systems, and aims to explain the mechanisms of self-organization and development of any system independent of its constituent elements. We give examples of stellar self-organization and rolling Rayleigh-Benard convection in physics, biological, ecological, technological (CPUs, power plants and machines) and social systems, such as cities. We argue that the underlying dynamics can be derived from a variational principle and review some recent attempts to formulate non-equilibrium thermodynamics and the treatment of dissipative systems in general from expanded Hamilton's, Lagrangian and Generalized Hergholtz principles.

Keywords: self-organization, variational principle, Lagrangian, Generalized Hergholtz principle