

- ▶ GIUSEPPE LONGO, *Schroedinger (1944) and Turing (1952) on the Logic of Life: from the “coding” to the “genesis” of organization and forms.*
CNRS, CREA, Ecole Polytechnique et CIRPHLES, Ecole Normale Supérieure, Paris.
E-mail: longo@ens.fr.
URL Address: <http://www.di.ens.fr/users/longo>.

Schroedinger’s and Turing’s analyses of life phenomena have a twofold aspects. They both follow, first, a “coding paradigm”, of embryogenesis or of human computations and deductions respectively, and then move towards a more “dynamicist” approach. Schroedinger, in the second part of his 1944 book, hints to biological organization as negentropy - a variant of Gibbs dynamical analysis of energy - that we revitalized as anti-entropy, see references. Turing, after stressing that “the nervous system is surely not a Discrete State machine” (1950), invents the mathematics for an action/reaction/diffusion process, a “continuous system” (1952), where chemical matter (an hardware with no software) organizes itself along morphogenesis.

We will hint to the paths for thought opened along the lines of Turing’s dynamics by continuous deformations at the core of Turing’s pioneering paper of 1952, where symmetry breakings are a key component of the dynamics.

[Sch44]ERWIN SCHROEDINGER, *What Is Life?* , Cambridge University Press, 1944.

[Tur52]ALAN M. TURING, *The Chemical Basis of Morphogenesis*, *Philosophical Trans. Royal Soc.*, vol. B237, 37-72, 1952.

[BL11]FRANCIS BAILLY, GIUSEPPE LONGO, *Mathematics and Natural Sciences : the Physical Singularity of Life*, Imperial College Press, London, 2011.

[BL09]FRANCIS BAILLY, GIUSEPPE LONGO, *Biological Organization and Anti-Entropy*, *J. Biological Systems*, Vol. 17, No. 1, pp. 63-96, 2009.

[LM11]GIUSEPPE LONGO, MAL MONTÉVIL, *From Physics to Biology by Extending Criticality and Symmetry Breakings*, *Progress in Biophysics and Molecular Biology*, vol. 106(2):340-347, 2011.