

Conceptual dualities at the interfaces Mathematics/Physics/Biology

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ABSTRACT

The very rich history of interactions between mathematics and physics has had a “constitutive” role for both disciplines. An “extraction of physical invariants” proposed core notions for mathematics, where invariance preserving transformations provided the fundamental structures from Euclid's geometry to contemporary mathematics. On several occasions, the autonomous invention of mathematical concepts and spaces has had a positive “feed back” on physical conceptualization and further enriched this discipline. The shared principles of conceptual construction marked their historical trajectories.

Well established and remarkable tools from this story are often transferred to biology (but also towards a “meteorology of social dynamics”). Is there a comparable co-constitutive venture? And, if not, why? What is the role of theory building in the biology/mathematics interface? A few hints will be given both for a possible history and towards tentative explorations of new theoretical settings for some dynamics of life.

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