

Abstract

“Symmetry and Minimum Principle at the Basis of the Genetic Code” Paul SORBA (LAPTH, CNRS, France) [†]

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The importance of the notion of symmetry in physics is well established: could it also be the case for the genetic code? In this spirit, a model for the Genetic Code based on continuous symmetries and entitled the “Crystal Basis Model” was proposed a few years ago and applied to different problems, such as the elaboration and verification of sum rules for codon usage probabilities, relations between physico-chemical properties of amino-acids and some predictions [1]. Defining in this context a “bio-spin” structure for the nucleotids and codons, the interaction between a couple of codon-anticodon can simply be represented by a (bio) spin–spin potential. Then, imposing the minimum energy principle, an analysis of the evolution of the genetic code can be performed with good agreement with the generally accepted scheme. A more precise study of this interaction model provides information on codon bias, consistent with data [2].

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Frappat, L.; Sciarrino, A.; Sorba, P. Crystalizing the Genetic Code. *J. Biol. Phys.* **2001**, *27*, 1–34.
2. Sciarrino, A.; Sorba, P. A minimum principle in codon-anticodon interaction. *BioSystems* **2012**, *107*, 113–119.



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