

# DNA coding analogies in particle physics

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We suggest that our physical reality can be described in the language of division algebras [1] [2], which dictates that their symmetries must be manifested in the coding systems of different structures of nature. We compare structures of DNA and fundamental fermions of the standard model. In both cases we are able to observe three and four-element divisions which come from the symmetry of 8-dimensional split-algebra. The analogies between the genetic code (given by codons containing three nucleotide bases) and the properties of the structures of all possible baryons (quark triplets) are discussed – just as we have the degeneration of 20 fundamental codons in the genetic code, also in the case of hadrons, there are 20 major baryons with the degeneration of their spin values. We also note that visible matter, which is given by particles and allows us to study the information in terms of countable sets, represents a total of 5% of the universe. This percentage corresponds to the amount of information in DNA, responsible for creating life in a form that is familiar to us today.

## References

- [1] Merab Gogberashvili, Otari Sakhelashvili, "Geometrical Applications of Split Octonions," *Advances in Mathematical Physics*, 2015.
- [2] M. Gogberashvili, "Observable Algebra," <https://arxiv.org/abs/hep-th/0212251>, 2018.