Molecular Clock on Earth and Exoplanets as Entropy: Changing Linearly in Time

Claudio Maccone, INAF (Istituto Nazionale di Astrofisica - Italy) and International Academy of Astronautics (IAA), E-mail: clmaccon@libero.it

ABSTRACT: To a series of recent papers (ref. [1] through [9]) and a book (ref. [6]), this author gave a mathematical model that may be applied to the analysis of major extinctions as a stochastic process of the time. His work is based on a lognormal distribution, b-Lognormals, i.e. lognormals starting at a time b>0 higher than zero and the stochastic process called Geometric Brownian Motion (GBM). The key feature of GBM is that its mean value increases exponentially in time. Thus, GBM may be applied to represent the number of living species on Earth at a certain time, the number of living species living on Earth for the last 3.5 billion years ago, and the number of living species on Earth before the last 3.5 billion years ago. The result is that the number of species on Earth is just in this scenario a stochastic one, rather than a deterministic one, and certainly does not exclude temporary setbacks, like the one of civilisations due to causes as diverse as natural and cosmic impacts, rogue planets or stars, active volcanoes, etc. In this paper, the Darwinian Selection and the quantity of species existing on Earth at the beginning of the Universe, i.e. the species rooted in the first atomic nuclei. In conclusion, we have provided a new mathematical model capable of accounting for the evidence of the The One Particular Realization of Geometric Brownian Motion in the number of living species on Earth that occurred over the last 3.5 billion years of life. In this view, THE SAME MUST HAVE HAPPENED ON ALL OTHER EXOPLANETS, thus restricting the search for Alien Civilizations in SETI and possibly explaining the Fermi paradox.