



L. Da Vinci's Turbulence, Multi-Dimensional Golden Spinors, Prandtl's Boundary Layer and Quantum Mechanical Spin are All Implied by the Golden Number System

Dip. Ing. Professor Dr. M. S. Elnaschie

Distinguished Fellow of the Frankfurt Institute
for the Advancement of Science, Frankfurt, Germany
Distinguished Professor of Physics
Faculty of Science, Alexandria University, Alexandria, Egypt

ABSTRACT

The present short paper proposes a new elucidation of quantum spin as a higher dimensional golden spiral akin to da Vinci's fluid turbulence and various related nonlinear dynamic subjects. In particular and as an extension of the Fibonacci spinor all the obtained conclusions are almost a trivial consequence of taking the limit of iterating the said Fibonacci spinor and are thus implied as part and parcel by the use of the E-Infinity golden mean number system developed in the Greek-Egyptian Alexandria school of science by the dedicated work of Plato, Pythagoras, their followers and disciples.

Keywords: da Vinci's turbulence, Golden spirals, boundary layer Theory, quantum spin, Golden mean number system.

INTRODUCTION. A SKETCH OF A ROAD MAP AND A LOGICAL ANALYSIS

Recalling the fascinating history of introducing quantum spin into the fundamental equations of the quantum theory [1-5] which included luminous names of quantum pioneers [1-9] such as W. Pauli and P. Dirac to mention only two of many [9], we propose to introduce here yet another possibly new elucidation of the deep meaning of quantum spin [1-4],[9].

To put the main gist of the new idea in as a short but a clear manner as humanly possible, we will venture to connect numerous ideas presented in many of our previous publications [6-20] to form a coherent unit. Subsequently, we connect once more our said coherent unit with the present day mainstream state of the art of our current generally accepted views of quantum spin [1,2,9]. The above sketched road map means that we will have a second look at our work on turbulence, boundary layer theory and the E-Infinity wave particle duality [12-15]. Subsequently, we will connect these ideas with mainstream orthodoxy and latest understanding of the present main subject namely the quantum spin [1,2,3,9].

Looking at the present work in the above framework, it becomes an almost triviality that all our obtained results and conclusions are a natural consequence of the use of the golden mean number system [5-9] which extend the Pauli, Dirac and Fibonacci spin-off to a golden spinor hidden inside the very golden mean based computations [14,15].

DISCUSSION

Noting the long history of integrating quantum spin into quantum theory [3,4,8] which included contributions by many leading theoretical and experimental physicists such as Einstein, Zeeman, Dirac, Gerlach [1,2,3] and notably in this respect Wolfgang Pauli who could never accept that quantum spin is a simple classical rotation and introduced ideas related to Dirac's and came to think of spin as specific quantum phenomenon with nothing classical in it whatsoever [2,4,9]. In that respect we beg to differ with these overpowering great minds. The main central ideas presented here is that the golden mean number system unites the ununitable [6,14,15] and hence spinors, E7 exceptional Lie group [16,17] are included as in the majestic scheme with unheard of simplicity. In fact all this sophisticated mathematics is partially successful because it represents various facets of the real fundamental and all-encompassing computational [14,15], philosophical [5,18], numerical, theoretical and even aesthetical as well as musical [13] devices, namely the golden mean based number system [18].

CONCLUSION

At the beginning there was the word and the word was expressed in numbers as envisaged long ago by the deep philosophy of Plato and Pythagoras in the World Capital of science, art and philosophy of that time namely, the Greek Egyptian city of Alexandria. This incredible wisdom was somewhat lost but it was found again in the very system of computations, aesthetics, physics and beyond i.e. the mathematical physics of E-Infinity theory. The Golden mean number system is the simplest and thus the optimal road to unify all things and reach the ultimate truth as well as the real meaning of the quantum spin to say the least.

References

- [1]. Penrose, R., 2004. *The Road to Reality*: Jonathan Cape - London [2004]. (see in particular fig. 22-7 page 547 and spin and spinors pp. 549-559 as well as High spin Majorana picture. pp 559-562. Finally see Relativistic quantum angular momentum and Pauli-Lubanski spin vector. pp 556-570.
- [2]. Gottfried K, Yan TM. *Quantum Mechanics: Fundamentals*. Springer Science & Business Media; 2003. (See in particular pp. 120-164)
- [3]. Milner, R.G., 2013. A Short History of Spin. *Proceedings of Science [Physics - hist- Ph]* 20 November [2013]. pp 1-15
- [4]. Coddens, G., 2015. *From Spinors to Quantum Mechanics*. World Scientific. Imperial College Press, Covent Garden, London [2015]
- [5]. El Naschie, M.S., 2004. A review of E-infinity theory and the mass spectrum of high energy particle physics. *Chaos, Solitons & Fractals*, vol. 19(1) [2004]. pp. 209-236.
- [6]. El Naschie, M.S., 1998. Superstrings, Knots, and Non-commutative Geometry in E-infinity Space. *International journal of theoretical physics*, vol. 11 No. 14 [2000]. pp. 2397-2402.
- [7]. El Naschie, M.S., 2009. The theory of Cantorian spacetime and high energy particle physics (an informal review). *Chaos, Solitons & Fractals*, 41(5), pp.2635-2646.
- [8]. El Naschie, M.S., 2006. Elementary prerequisites for E-Infinity:(recommended background readings in nonlinear dynamics, geometry and topology). *Chaos, Solitons & Fractals*, 30(3), pp.579-605.
- [9]. PBS Space Time, *Electrons DO NOT Spin*, <https://www.patreon.com/pbsspacetime>, July 7 - [2021]. (Youtube excellent Presentation Video)
- [10]. El Naschie, M.S., 2002. Wild topology, hyperbolic geometry and fusion algebra of high energy particle physics. *Chaos, Solitons & Fractals*, 13(9), pp.1935-1945 [2002].

- [11]. El Naschie, M.S., 2016. On a fractal version of Witten's M-theory. *International Journal of Astronomy and Astrophysics*, vol 8 No. 2 [2006], pp.135-144.
- [12]. El Naschie, M.S., 2021. Fuzzy Wilson Loops, Witten's Topological Field Theory and the Golden Mean Number System Theory as the Deep Roots of Hardy's Quantum Entanglement. *International Journal of Innovation in Science and Mathematics*, Volume 9, Issue 4 [2021], pp 70-77.
- [13]. El Naschie, M.S., 2019."On the Fractal Counterpart of C. Vafa's twelve-Dimensional F-theory and the A. Schoenberg Twelve-tone Music Implicit in the Standard Model of High Energy Elementary Particles". *International Journal of Innovation in Science and Mathematics*. Volume 7, Issue 5, pp. 222-230, [2019].
- [14]. El Naschie, M.S., 2017. Elements of a new set theory based quantum mechanics with applications in high energy quantum physics and cosmology. *International Journal of High Energy Physics*, 4, pp.65-74.
- [15]. El Naschie, M.S., 2016. High energy physics and cosmology as computation. *American Journal of Computational Mathematics*, 6(03), pp.185-199.
- [16]. El Naschie, M.S., 2007. Exceptional Lie groups hierarchy and the structure of the micro universe. *International Journal of Nonlinear Sciences and Numerical Simulation*, 8(3), pp.445-450.
- [17]. El Naschie, M.S., 2008. Exceptional Lie groups hierarchy and some fundamental high energy physics equations. *Chaos, Solitons & Fractals*, 35(1), pp.82-84.
- [18]. Olsen, S., Marek-Crnjak, L., He, J.H. and El Naschie, M.S., 2020. A Grand Unification of the Sciences, Art & Consciousness: Rediscovering the Pythagorean Plato's Golden Mean Number System. *Journal of Progressive Research in Mathematics*, 16(2) pp 2888-2983.
- [19]. El Naschie, M.S., 2020. Fluid Turbulence Batchelor's Law Implies Spacetime Unification of Classical and Quantum Physics. *International Journal of Applied Science and Mathematics*, 7(3), pp.85-91.
- [20]. El Naschie, M.S., 2020. Cantorian Micro-type Black Holes as the Fundamental Building Blocks of Spacetime. *International Journal of Innovation in Science and Mathematics*, 8(6) pp 259-261.
- [21]. El Naschie, M.S., 2020. Fluid Turbulence Road to Quantum Cantorian Spacetime Via Nested Solitonic Golden Eddies Chaos Implied by Batchelor's Law-A Possible Rationale for the Mysterious Fine Tuning of the Cosmos. *International Journal of Applied Science and Mathematics*, 7(4).