Basic Structures of Matter – Supergravitation Unified Theory. Brief introduction and potential applications

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Contemporary theoretical physics describes the physical processes by mathematical models. Some adopted formulations, however, raise a question do the derived mathematical models describe completely the reality. In the field of quantum mechanics and relativity, it is considered that human logic fails, so only mathematical logic must be used. The concepts formulated in theoretical physics are based on adopted postulates and assumptions. One of the most fundamental assumptions is the adopted space-time concept of the physical vacuum. A different space-time concept, however, will lead to different physical models. This is proofed in the treatise Basic Structures of Matter – Supergravitation Unified theory (BSM-SG), by Stoyan Sarg. It is based on a space-time concept that for the first time permits understanding the relations between Quantum mechanics, relativistic effects, and the classical Newtonian mechanics. Amongst the major derivations of the theory are the material structures of the elementary particles and atomic nuclei. They are presented in the Atlas of the Atomic Nuclear Structure (ANS) that is included as Appendix A in the BSM-SG monograph. Contemporary physics cannot answer one main question: how the quantum mechanical laws are written in the observable optical signature from distant stars and galaxies? The answer is: The record is contained in the material structures of the elementary particles and their interactions with the new space-time concept described in the BSM-SG unified theory.

The BSM-SG monograph, by Stoyan Sarg is copyrighted in 2001 and firstly published and archived in the National Library of Canada in 2002 [1]. The Atlas ANS is published also as a separate monograph [2]. The atlas provides the configuration of all stable atomic nuclei up to number 102 in a graphical form. They match perfectly the pattern of the Periodic table of elements and their chemical properties. The graphical configurations are shown by simplified symbols in 2D, from which 3D configurations could be directly made by a suitable computer program. The BSM-SG models are published in peer review journals [6], physical archives [4], a related patent [3] and reported in several international scientific conferences.

The 3D visualization of the BSM-SG atomic models will provide a new possibility of modeling and analysis of simple and complex molecules and interactions between them on a sub-nanometric scale. In such enhanced resolution, some individual 3D space properties of the atoms become apparent. This is not possible by the quantum mechanical models that operate only by energy levels but not with spatial dimensions. The new possibility of modeling and analysis could find applications in the following fields.

1. In the field of nanotechnology: for theoretical analysis in a sub-nanometric scale of some known nanostructures and creating of nanomaterials with new physical properties [15,18,20,22].
2. In the field of structural chemistry: Analysis of the chemical interactions between complex molecules [15,22].
3. In the field of cold fusion: for the realization of a low-temperature fusion reaction with efficient energy output and minimal or complete lack of radioactive waste [14,16,20,22].
4. In the field of biomolecules: a deeper understanding of the connections between the amino acids involved in codons that build the DNA, tRNA, and proteins and the energy contained in them [17].

5. In the pharmaceutic industry: For possible interactions between some proteins with known shape and some selected organic molecule used as drugs [17,21].
6. Prediction of a new method for distant space travels. Proof of the concept by Lab experiments.

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