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GLOBAL ASYMMETRY OF SPACE AND TIME - ARE THEY INTERRELATED?

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Deviation from perfect symmetry by reflection, termed dissymmetry or asymmetry, has been reported in the literature, primarily in assemblies of chiral molecules. It corresponds to a small preference for one type of symmetry over the other, which could be accounted for as being generated by the "parity violation" of the nuclear weak force. Calculations have shown that the interaction of the asymmetric field of this force with the asymmetric field of the electron cloud of a chiral molecule creates a miniscule difference in the ground-state energy between its isomers. It was proposed that this basic difference can be amplified to a detectable macroscopic difference when combined with autocatalytic processes in addition to interaction with a selective spin isomer of H_2O (reviewed by Deamer et al, 2007). However, for most cases of detectable physical differences between chiral isomers, in particular in chiral fluids, this putative mechanism is far from providing a reasonable explanation for such a distinct chiral discrimination. In this lecture a series of new observations will be presented which support the possibility that the global space may have deviated *a priori* from absolute symmetry, a possibility which complies with observations in atoms, molecules and may be even implicated in the asymmetrical configuration of spiral galaxies.

It was recently proposed (Shinitzky, 2013) that space asymmetry is actually a global feature which emerged at the Big-Bang and thus generated the basic laws of statistical thermodynamics in our universe. It might be further speculated that this accidental space asymmetry was essential for elimination of self annihilation which presumably occurs in abortive "symmetrical Big-Bangs". Space asymmetry can be conceptually presented as a hybrid of spaces of opposite symmetry which are unequal in mass and in addition attain

their isolated features by adopting a 4th dimension which is a prerequisite for preventing collapse by racemization. It is schematically presented in Figure 1. Such a 4 dimensional space can be extrapolated to our 3D space, where a universal definition of "right" versus "left", with respect to the traditional definition on Earth, prevails. It corresponds to an absolute difference between the relative statistical weights of the "right" versus the "left" directions, when presented in classical 3D Euclidian coordinates or, analogously, to a difference between the clockwise and anti clockwise orientations in polar coordinates. Experimental verification of this assertion can be approached by comparative determinations of physical factors like density, heat of dilution or optical activity of homogeneous chiral systems, like chiral fluids or chiral solutions. Based on published data of measurements in such model systems, a difference in the range of 0.1 to 1% of physical parameters between chiral systems of opposite handedness, is expected.

The 4th dimension of space, proposed above, may be termed as "The dimension of space asymmetry" and is analogous to time as the 4th dimension and may even overlap with it. This possibility may lead us to a somewhat bold assertion of far reaching implications that *in our 3D realm time is a feature of space asymmetry*. The implied asymmetry of time, thus suggests, an expected difference in the range of 0.1-1%, between the time-coordinate in right-handed versus left-handed matrices of chiral milieus. Experiments in this avenue are now being carried out in chiral fluids. Preliminary results will be presented.

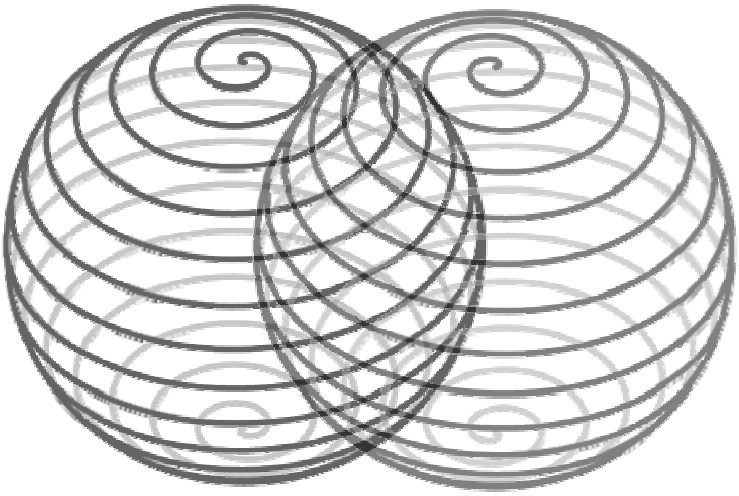

Figure 1: Schematic presentation of the proposed space-time chiral universe.

REFERENCES

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