INITIATING A HYPOTHETICAL UPGRADE TO MAGNECULES WITH TOPOLOGICAL DEFORMATION ORDER PARAMETERS FOR MAGNEGAS FUEL AND WARM NUCLEAR FUSION

Nathan O. Schmidt
Department of Mathematics
Boise State University
1910 University Drive
Boise, ID 83725, USA
nathanschmidt@u.boisestate.edu

Reza Katebi
Department of Physics
California State University, Fullerton
800 North State College Boulevard
Fullerton, CA 92831, USA
rkatebi.gravity@gmail.com

Christian Corda
Institute for Theoretical Physics and
Advanced Mathematics Einstein-Galilei (IFM)
Via Santa Gonda 14
59100 Prato, Italy
cordac.galilei@gmail.com

April 4, 2014

Abstract

In this preliminary work, we initiate an upgrade to Santilli's cutting-edge model of magnecules by further equipping it with order parameters of fractional statistics to encode the topological deformations, spontaneous superfluidic symmetry breaking, correlated helices with long range order, and wavepacket wavefunctions for the iso-electronium's toroidal polarizations. If this hypothesis is proven to be correct, then it should be feasible to apply these constructs to assist in the conceptual, theoretical, and experimental development of Santilli's new, sustainable, efficient, clean energy systems such as the MagneGas Fuel (MGF) and Intermediate Controlled Nuclear Fusion (ICNF)—also called "warm fusion"—in the near future. The initial results for the singlet planar coupling of two interlocked protium atoms support the hypothesis, which should be subjected to additional rigorous scrutiny and improvement via the scientific method.

Keywords: Geometry and topology; Topological deformations; Spontaneous symmetry breaking; Superfluids; Magnecules; Iso-electronium; Hadronic mechanics; Nuclear fusions; Exotic fuels.

1 Introduction

As the cutting-edge discipline of iso-mathematics [1, 2, 3, 4, 5] continues to develop and expand, it relentlessly paves the way for state-of-the-art innovations in science, technology, and engineering. For example, R.M. Santilli and his team have successfully identified, designed, and implemented groundbreaking applications of *hadronic mechanics* [6, 7], such as *sustainable* clean energy systems known as the MGF [8, 9, 10, 11, 12, 13, 14, 15, 16] and ICNF [17, 18, 19, 20], which *do not* emit waste with harmful toxins and/or dangerous levels of radiation. At the heart of MGF, ICNF, and hadronic mechanics is the new iso-chemical species of *magnecules* with *strong magnetic binding*, the hadronic interlocking "gear" model, and *iso-electronium* [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20].

These intriguing discoveries and experimental realizations have a *significant* degree of application potential in the industrial and technological sectors and, if properly implemented, may have a *profoundly beneficial* impact. However, to date, hadronic mechanics [6, 7] and magnecules [8, 12, 15] are still relatively young frameworks, where only a few scientists are actively engaged in the analysis and advancement of the discipline. Hence, this frontier remains largely unexplored, untapped, and unconquered so a boost in the degree of theoretical, mathematical, conceptual, and experimental treatment should be in order. Indeed, as our global civilization continues to develop, advance and grow in numerous sectors, the demand for truly sustainable sources of clean energy and exotic fuels increases—we must be able to efficiently power our loads and stay warm during cold winters. Thus, from a scientific standpoint, pioneering topics such as MGF [8, 9, 10, 11, 12, 13, 14, 15, 16] and ICNF [17, 18, 19, 20] must be rigorously scrutinized, developed, expanded, and enhanced via the scientific method for the general protection and benefit of the planet.

In this preparatory paper, we deploy the topological deformation order parameters from the Inopin-Schmidt quark confinement proof [21] as a tool to spark a hypothetical upgrade to the magnecules [8, 12, 15], with an introductory focus on the iso-electronium of two protium atoms interlocked in the singlet planar coupling of the hadronic gear model. More precisely, we propose the following hypothesis: *Santilli's model of magnecules may be upgraded with topological deformation order parameters of fractional statistics to encode spontaneous superfluidic symmetry breaking, correlated helices with long range order, and wavepacket wavefunctions for the toroidal polarizations of the iso-electronium.* So, in Section 2, we launch a step-by-step thought experiment to systematically illustrate, quantify, and formalize some fundamental features of this conjecture, which ultimately aims to assist in the advancement and innovation of Santilli's magnecules, MGF, and ICNF [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]. Finally, we conclude with Section 3, where we briefly recapitulate the obtained results, consider some possible implications, and discuss future modes of research.

2 Magnecule upgrade procedure and thought experiment

Here, we propose the following step-by-step procedure which aims to illustrate, quantify, and formalize the fundamental aspects of the said hypothesis:

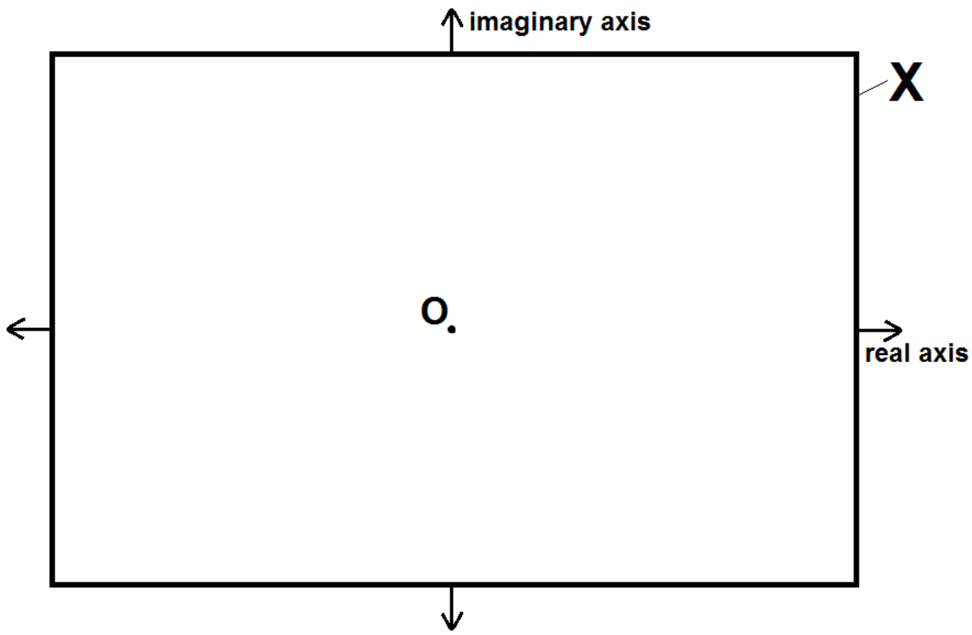

Fig. 1: The Euclidean complex/2D topological space X equipped with the synchronized, generalized complex-coordinate-vector system [21], where $X \subset Y$ is a "complex slice" of the triplex/3D topological space Y as in [22].

1. First, let there exist a Euclidean complex/2D topological space X, where a complex number $x \in X$ identifies a distinct position-point in X, such that $|x| \in [0, \infty)$ is the *complex amplitude-radius* (or "modulus") and $\langle x \rangle \in [0, 2\pi]$ is the *complex azimuthal-phase* for the "synchronized, generalized complex-coordinate-vector-number system" [21], which was subsequently upgraded, refined, and clarified in [22, 23]. Following [21, 22, 23], let the position-point $O \in X$ be the origin-position-point of X with the zero-amplitude of $|O| = 0$ for the 2D polar coordinate-vector $(0, 0)_P$ with the corresponding 2D Cartesian coordinate-vector $(0, 0)_C$, where $O = 0 + 0i$ is the origin's complex number—see Figure 1. Moreover, we briefly note that X is a "complex slice" of the triplex/3D topological space Y as in [22], such that $X \subset Y$, but for the scope of this paper we need only to focus on X.

2. Second, suppose there are *two hydrogen atoms* located on X with centers-of-mass that are equidistant from O, where $X \subset Y$ represents the topological space of an environment filled only with vacuum energy. In this step, we will construct the Inopin Holographic Confinement Ring (IHCR) based topology for the dual atomic nuclei with confined quarks [21]. For now, we assert that the hydrogen

atoms are in fact *protium* atoms [24] in a *non-Riemannian-specific* IHCR-based topology [21, 22, 23] because we wish to illustrate the simplest "base case" of a nuclei with one proton—however, as we will see in future research, this also applies to deuterium, carbon, and so on for direct application to Santilli's new MGF [8, 9, 10, 11, 12, 13, 14, 15, 16] and ICNF [17, 18, 19, 20] clean energy systems. Thus, let $O_1 \in X$ and $O_2 \in X$ be the exact centers-of-mass for the first and second hydrogen atoms (and their nuclei), respectively: the atomic center-of-mass complex-coordinate-vectors $O_1, O_2 \in X$ share the equidistant *amplitude-radii* $|O_1| = |O_2| \sim 1$ femtometer and the counterbalancing *azimuthal-phases* $\langle O_1 \rangle = \pi = \langle O_2 \rangle \pm \pi$: using the synchronized 2D complex-coordinate-vector notation of [21, 22], the corresponding 2D Cartesian coordinate-vectors are $(-|O_1|, 0)_C$ and $(|O_2|, 0)_C$, while the respective 2D Polar coordinate-vectors are $(|O_1|, \pi)_P$ and $(|O_2|, 0)_P$ for the atomic and nucleic centers-of-mass. Moreover, in accordance to the Inopin-Schmidt quark confinement proof [21], let there exist the topological 1-spheres $P_1 \subset X$ and $P_2 \subset X$ with the proton's amplitude-radii $|P_1| = |P_2| = R_{proton}$ that are respectively centered on $O_1, O_2 \in X$ to encode the confinement zone boundaries and IHCRs in the upgraded Gribov vacuum [21, 25] of the two pertinent protons of the hydrogen pair, where the comprising *quarks are massless point-particles that are confined to the red-green-blue triangular lattices as coupled harmonic parametric oscillators that circulate at the speed-of-light along the surface orbits of P_1 and P_2 and spontaneously generate effective mass* (in this case, this "effective mass" is generated by the *scalar amplitude-radius excitations* of the order parameters in [21]): the first hydrogen's quarks are located at $r_1, g_1, b_1 \in P_1$ and the second hydrogen's quarks are located at $r_2, g_2, b_2 \in P_2$—see Figure 2.

3. Third, let there exist the topological 1-spheres $E_1 \subset X$ and $E_2 \subset X$ with amplitude-radii $|E_1| = |E_2| = R_{iso-electron}$ that are centered on $O_1, O_2 \in X$, respectively, to encode the orbits of the two pertinent valence iso-electrons located at $e_1 \in E_1$ and $e_2 \in E_2$ that pair to form the iso-electronium quasi-particle with the Santilli-Shillady strong valence bond [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]. The amplitude-radii $|E_1|$ and $|E_2|$ precisely comply with Santilli's iso-electronium wavepacket overlapping constraint for the "oo-shaped orbital" [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]—see Figure 3. Hence, the two hydrogen atoms acquire parallel-but-opposite magnetic polarities (with a null value at sufficient distance) to permit the characteristic diamagnetic alignment under an external strong magnetic field [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]. Therefore, the two hydrogen atoms form a *singlet planar coupling* on X—see Figure 4.

4. Fourth, upon recalling the work of [21], we equip the quarks of the two hydrogen atoms in the singlet planar coupling with topological deformation order parameters of fractional statistics for spontaneous superfluidic symmetry breaking to emphasize this initiated establishment in Santilli's magnecule model [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]. Thus, starting with the quarks, we take the "Cooper paired"

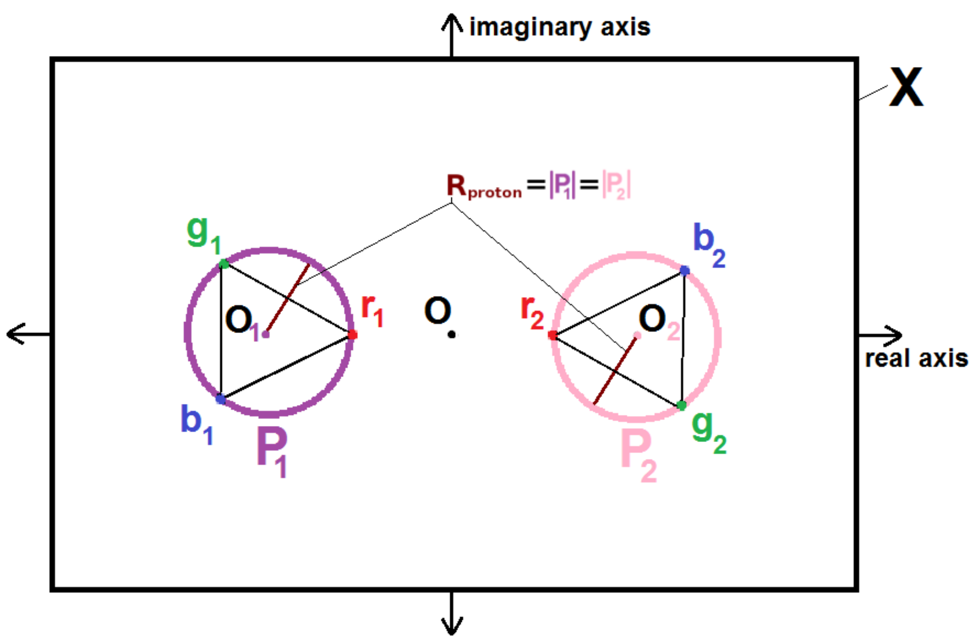

Fig. 2: The IHCR topology of the Inopin-Schmidt quark confinement proof [21] is applied to the two hydrogen atoms with centers-of-mass located at $O_1, O_2 \in X$ that are equidistant from O. The first hydrogen's quarks are located on the first triangular lattice at $r_1, g_1, b_1 \in P_1$ confined to the first IHCR $P_1 \subset X$ and the second hydrogen's quarks are located on the second triangular lattice at $r_2, g_2, b_2 \in P_2$ confined to the second IHCR $P_2 \subset X$, which both have the amplitude-radius $|P_1| = |P_2| = R_{proton}$.

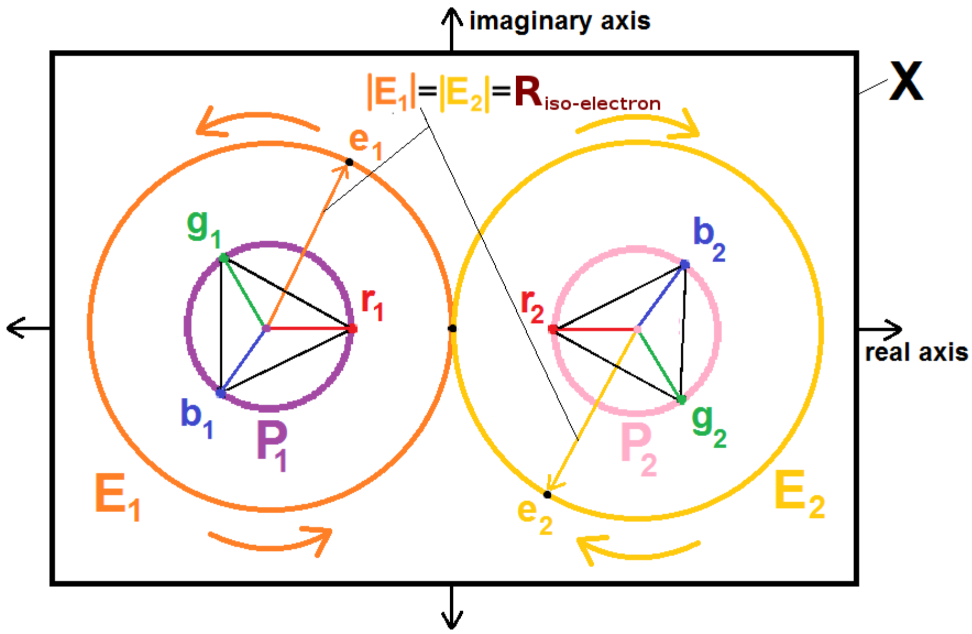

Fig. 3: The topology of the two hydrogen atoms: the two valence iso-electrons pair to form the iso-electronium quasi-particle with the overlapping constraint for the oo-shaped orbital [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]. The first hydrogen's iso-electron is located at $e_1 \in E_1$ and the second hydrogen's iso-electron is located at $e_2 \in E_2$.

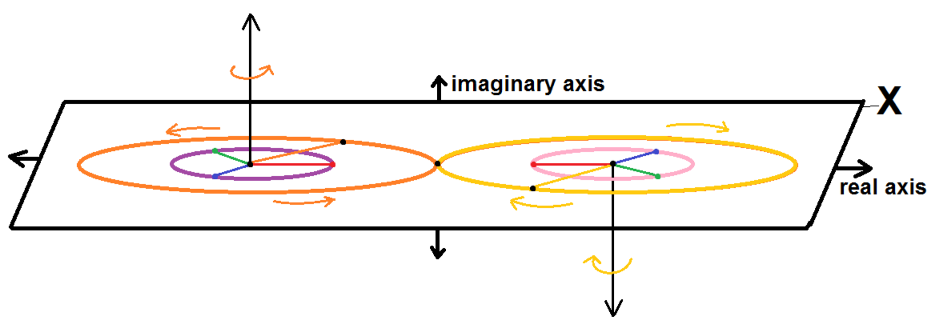

Fig. 4: The two hydrogen atoms form a singlet planar coupling on X because they acquire parallel-but-opposite magnetic polarities (with a null value at sufficient distance) to permit the characteristic diamagnetic alignment under an external strong magnetic field [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20].

strongly conserved order parameters ψ_J ("total angular momentum" for spin-orbit coupling), ψ_I ("iso-spin"), and ψ_C ("color charge") from eq. (26) of [21] and, in accordance to eqs. (32–36) of [21] to define the (complex-valued) *full proton wavefunction states* of the two hydrogen atoms as

$$\begin{aligned} \Psi_{total}(r_1, g_1, b_1) &\equiv \Psi(r_1) \times \Psi(g_1) \times \Psi(b_1) \\ \Psi_{total}(r_2, g_2, b_2) &\equiv \Psi(r_2) \times \Psi(g_2) \times \Psi(b_2), \end{aligned} \tag{1}$$

where the comprising *quark wavefunction states for the first hydrogen's proton* are

$$\begin{aligned} \Psi(r_1) &\equiv \psi_J(r_1) \times \psi_I(r_1) \times \psi_C(r_1) \times r_1 \\ \Psi(g_1) &\equiv \psi_J(g_1) \times \psi_I(g_1) \times \psi_C(g_1) \times g_1 \\ \Psi(b_1) &\equiv \psi_J(b_1) \times \psi_I(b_1) \times \psi_C(b_1) \times b_1 \end{aligned} \tag{2}$$

and the comprising *quark wavefunction states for the second hydrogen's proton* are

$$\begin{aligned} \Psi(r_2) &\equiv \psi_J(r_2) \times \psi_I(r_2) \times \psi_C(r_2) \times r_2 \\ \Psi(g_2) &\equiv \psi_J(g_2) \times \psi_I(g_2) \times \psi_C(g_2) \times g_2 \\ \Psi(b_2) &\equiv \psi_J(b_2) \times \psi_I(b_2) \times \psi_C(b_2) \times b_2. \end{aligned} \tag{3}$$

In eqs. (1–3), just as in the said quark confinement proof [21], we re-iterate that the quarks are massless point-particles that circulate at the speed-of-light (along P_1 and P_2) and spontaneously generate effective mass for the simultaneous breaking of multiple gauge symmetries, where the topological deformation order parameters rotate freely in 2D and/or 3D space and exhibit *long range order* in the shape of superfluidic toroidal helices, such that the *Leggett superfluid B phase* [21, 26] (the azimuthal-phase specific to the quark's position-point) between them remains constant and serves as an additional wavepacket wavefunction constraint [21]. For eqs. (1–3), the *amplitude-radius variations* in the underlying order parameters correspond to *scalar amplitude-excitations*, while the *azimuthal-phase variations* correspond to *pseudo-scalar phase-excitations* [21]. The spinon, holon, and orbiton excitations of eqs. (1–3) are spontaneously generated and confined to P_1 and P_2, which both simultaneously acquire *geometric phases*, where such perturbations are propagated across the *micro space branes* (the superluminal and non-local zones that are "inside" of P_1 and P_2, and correspond to Santilli's interior dynamical systems) and the *macro space brane* (the non-superluminal and local zone that is "outside" of both P_1 and P_2, and corresponds to Santilli's exterior dynamical system) in topological accordance to [21, 22, 23, 24]—see Figure 5.

5. Fifth, upon recalling the work of [21, 22, 24], the iso-electrons of the two hydrogen atoms in the singlet planar coupling are equipped with topological deformation order parameters of fractional statistics to encode the iso-electronium's toroidal distribution of the orbital [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20], which is due to Santilli's iso-uncertainty principle of hadronic mechanics [6, 7, 9]. So, similarly to the hydrogen's quark case of eqs. (1–3), we *hypothesize* that the *full*

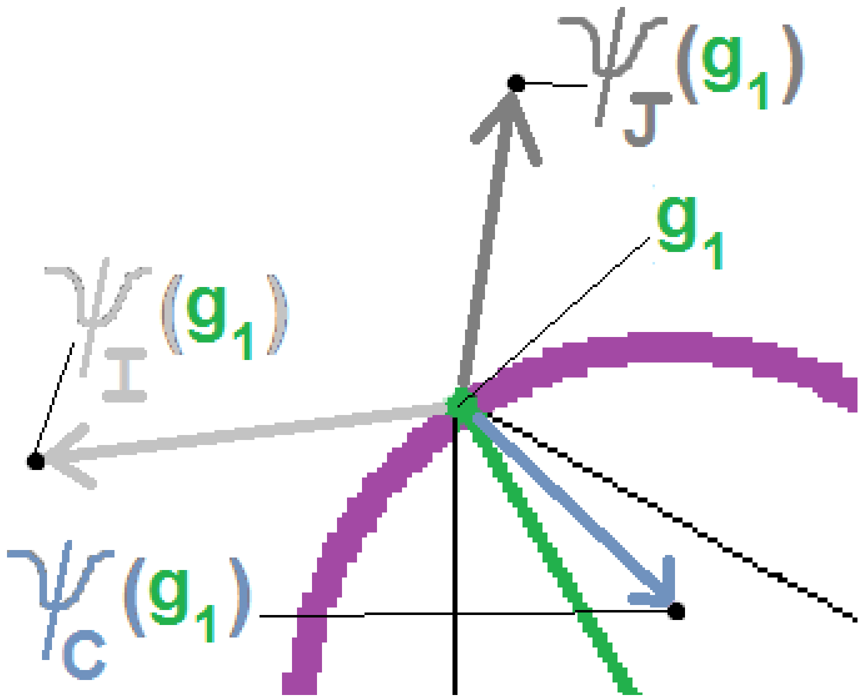

Fig. 5: In accordance to the Inopin-Schmidt quark confinement proof [21], the massless quark point-particles (of the two hydrogen atoms in the singlet planar coupling) are confined to the horizon surfaces of P_1 and P_2 as coupled harmonic parametric oscillators, and circulate at the speed-of-light while spontaneously generating effective mass as P_1 and P_2 simultaneously acquire geometric phases. The quarks are equipped with order parameters to encode topological deformations for the wavepacket wavefunctions [21]. This important mechanism is directly connected to scalar amplitude-excitations and pseudo-scalar phase-excitations [21]. Note: for the sake of illustration simplicity, only $g_1 \in P_1$ is shown.

iso-electron wavefunction states for the iso-electronium of the two hydrogen atoms may be defined as

$$\begin{array}{lllll} \Psi_{total}(e_1) & \equiv & \Psi(e_1) & \equiv & \psi_J(e_1) \times e_1 \\ \Psi_{total}(e_2) & \equiv & \Psi(e_2) & \equiv & \psi_J(e_2) \times e_2, \end{array} \tag{4}$$

where only the ψ_J for spin-orbit coupling applies to the iso-electronium because the comprising iso-electrons have neither iso-spin (ψ_I) nor color charge (ψ_C)—see Figure 6. Therefore (similarly to P_1 and P_2 of the quarks), the iso-electronium's E_1 and E_2 are assigned spinon, holon, and orbiton excitations of fractional statistics for eq. (4) and simultaneously acquire geometric phases for the oo-orbital, where such perturbations are propagated across both the micro and macro space branes of [21, 22, 23, 24] and are inferred from the states of P_1 and P_2 because they are dual. Hence, as the massless iso-electron point-particles of the iso-electronium circulate along the oo-orbit of E_1 and E_2 at the speed-of-light, the ψ_J-type order parameters of eq. (4) vary to spontaneously generate scalar amplitude-excitations and pseudo-scalar phase-excitations as in [21] to form Santilli's iso-electronium's toroidal polarization distribution [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]—see Figure 6.

At this point, we've completed the initial step for our topological deformation order parameter upgrade of a magnecule comprised of dual protium atoms that are interlocked with the singlet planar coupling, which is consistent with our hypothesis and the limited scope of this paper. Consequently, we will use these preliminary outcomes as a platform to launch subsequent papers that aim to further revise, scrutinize, develop, and improve this emerging model of magnecules. For example, it will be important to consider the possibility of adding one or more magnecule constraints to eq. (4) that further quantify the iso-electronium's characteristic diamagnetic alignment and oo-orbit of the iso-electron $e_1 \in E_1$ and $e_2 \in E_2$ positions and/or ψ_J-type order parameters in the singlet planar coupling.

3 Conclusion and discussion

In this work, we deployed some pertinent aspects of the IHCR topology and order parameter implementation of the Inopin-Schmidt quark confinement proof [21] as tools to forge a hypothetical upgrade to Santilli's iso-electronium model of magnecules [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]—features of the quark implementation of [21] were applied directly to the iso-electronium implementation of [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]. For this research, the ultimate objective is to rigorously investigate this topic via the Scientific Method to enhance the representational accuracy and predictive capability of the model in order to theoretically, conceptually, and experimentally advance the *striking* innovations of MGF [8, 9, 10, 11, 12, 13, 14, 15, 16] and ICNF [17, 18, 19, 20] to new heights. It is undeniable that the experimental confirmations of MGF [8, 9, 10, 11, 12, 13, 14, 15, 16] and ICNF [17, 18, 19, 20] exemplifies a *revolution* in the sector of sustainable, efficient, clean fuels and over-unity power sources that do not

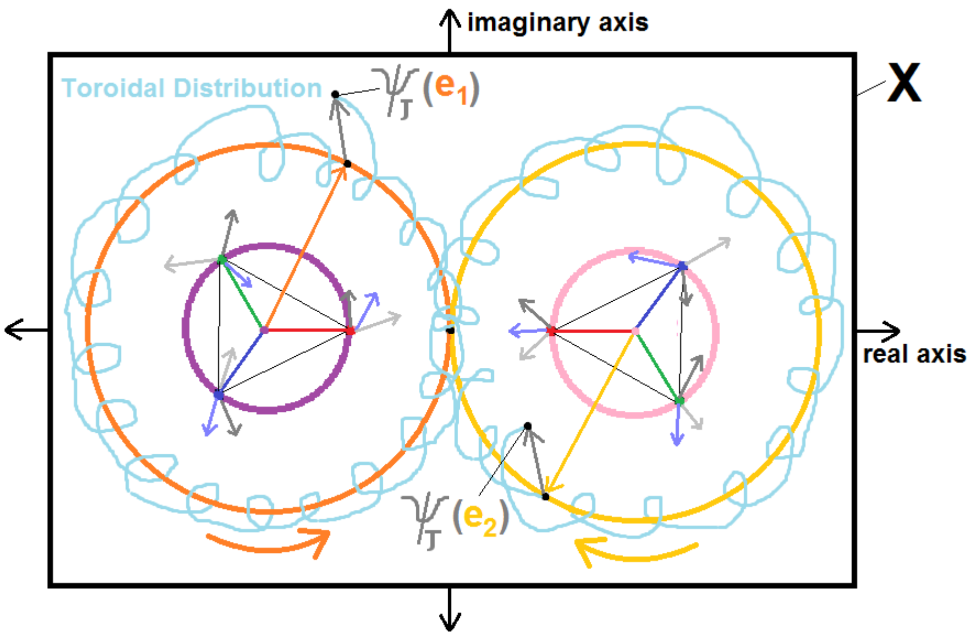

Fig. 6: The circular iso-electron orbits of the iso-electronium are equipped with order parameters of fractional statistics to encode the topological deformations for the toroidal polarization and the wavepacket wavefunction. Similarly to the quarks of the P_1 and P_2, the iso-electronium's iso-electrons at $e_1 \in E_1$ and $e_2 \in E_2$ are massless point-particles that circulate at the speed-of-light along the oo-orbit while spontaneously generating effective mass as E_1 and E_2 simultaneously acquire geometric phases. This important mechanism is directly connected to scalar amplitude-excitations and pseudo-scalar phase-excitations for the iso-electronium, like in the quark's case [21].

emit harmful toxins or radioactive waste. So as scientists, it is absolutely critical that all such avenues are explored to unlock such capabilities by actualizing and maximizing the technological and industrial applications. Therefore, it is the opinion of the authors that any work in this realm is significant.

The preliminary theoretical, conceptual, and mathematical outcomes of this work exhibit a promising degree of support for the said conjecture. For this, we presented initial results that support the idea that the oo-shaped iso-electron orbit of the iso-electronium [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20] can be equipped with topological deformation order parameters of fractional statistics for the quasi-particle, which become excited (or de-excited) as the orbit iteratively acquires a geometric phase [21]. More specifically, we illustrated that the toroidal polarization of the iso-electronium can be further encoded with topological deformation order parameters for spontaneous superfluidic symmetry breaking, where the parameters are correlated with Leggett's superfluid B phase [21, 26] and generate correlated helices with long range order [21]; it is these spontaneously generated correlated helices that may effectively represent the states and transitions of the iso-electronium's toroidal polarization for the magnecules [8, 12, 15]. Moreover, we utilized the order parameters to construct a preliminary set of *iso-electronium wavepacket wavefunctions*, where amplitude-radius and azimuthal-phase variations in the (complex-valued) order parameters are connected to *scalar amplitude-excitations* and *pseudo-scalar phase-excitations*, respectively [21]. Thus, in our opinion, the hypothetical merger and consolidation of these constructions is compelling.

In upcoming future research, this hypothesis must be subjected to additional rigorous scrutiny via the scientific method, which is surely necessary in order to permit the general advancement of these systems. In this paper, we considered the simple base case of dual protium atoms interlocked in the singlet planar coupling, so the next logical steps should include an analysis of generalized atomic structures that may also be interlocked in the triplet axial coupling, combined with the relevant experimental assessments to ensure that this hypothetical model is indeed compliant with Nature.

4 Acknowledgment

We wish to thank the R.M. Santilli Foundation for funding our trip to the 2013 ICNAAM in Rhodes, Greece and Professor R.M. Santilli for his discussions on MGF and ICNF.

References

[1] R. M. Santilli. Isonumbers and genonumbers of dimensions 1, 2, 4, 8, their isoduals and pseudoduals, and "hidden numbers" of dimension 3, 5, 6, 7. *Algebras, Groups and Geometries*, 10:273, 1993.

[2] R. M. Santilli. Rendiconti circolo matematico di palermo. *Supplemento*, 42:7, 1996.

[3] C. X. Jiang. Fundaments of the theory of Santillian numbers. *International Academic Presss, America-Europe-Asia*, 2002.

[4] C. Corda. Introduction to Santilli iso-numbers. In *AIP Conference Proceedings-American Institute of Physics*, volume 1479, page 1013, 2012.

[5] C. Corda. Introduction to Santilli iso-mathematics. In *AIP Conference Proceedings-American Institute of Physics*, 2013.

[6] R. M. Santilli. *Elements of hadronic mechanics*, volume 3. Naukova Dumka, 1995.

[7] R. M. Santilli. Hadronic mathematics, mechanics and chemistry. *Volumes I, II, III, IV and V, International Academic Press*, 2008.

[8] R. M. Santilli. Theoretical prediction and experimental verifications of the new chemical species of magnecules. *Hadronic Journal*, 21:789–894, 1998.

[9] R. M. Santilli. Physics of new clean energies and fuels according to hadronic mechanics, paper v: Structure of molecules, new, clean, fuels, and new energies of class iii. *Journal of New Energy*, 4(1):205–313, 1999.

[10] R. M. Santilli and D. D. Shillady. A new iso-chemical model of the hydrogen molecule. *International Journal of Hydrogen Energy*, 24(10):943–956, 1999.

[11] R. M. Santilli and A. K. Aringazin. Structure and combustion of magnegases. *arXiv preprint physics/0112066*, 2001.

[12] R. M. Santilli. The new chemical species of magnecules. *Foundations of Hadronic Chemistry*, pages 303–389, 2002.

[13] R. M. Santilli. Apparatus for making a novel, highly efficient, nonpollutant, oxygen rich and cost competitive combustible gas and associated method, Jan " 6" 2004. US Patent 6,673,322.

[14] R. Perez-Enriquez, J. Marin, and R. Riera. Hydrogen molecule in the frame of the three-body Santilli-Shillady model. In *APS Meeting Abstracts*, volume 1, page 43002, 2006.

[15] Y. Yang, J. V. Kadeisvili, and S. Marton. Additional experimental confirmations of the new chemical species of Santilli magnecules. *Open Physical Chemistry Journal*, 7(1), 2013.

[16] I. B. D. Sarma. Santilli's new fuels as sources of clean combustion. In *ICNAAM 2013*, volume 1558, pages 680–684. AIP Publishing, 2013.

[17] R. M. Santillia. Experimental confirmation of nitrogen synthesis from deuterium and carbon without harmful radiations. *New Adv. Phys*, 4:29, 2011.

[18] R. M. Santilli. Method and apparatus for intermediate controlled fusion processes, Aug " 4" 2011. US Patent App. 13/197,836.

[19] R. Brenna, T. Kuliczkowski, and L. Ying. Verification of intermediate nuclear fusions without harmful radiation and the production of magnecular clusters. *New Advances*

in Physics, 5(1), 2011.

[20] J. V. Kadeisvili, C. Lynch, and Y. Yan. Confirmations of Santilli's intermediate controlled nuclear fusion of deuterium and carbon into nitrogen without harmful radiations. *Open Physical Chemistry Journal*, 7(1), 2013.

[21] A. E. Inopin and N. O. Schmidt. Proof of quark confinement and baryon-antibaryon duality: I: Gauge symmetry breaking in dual 4D fractional quantum Hall superfluidic space-time. *Hadronic Journal*, 35(5):469, 2012.

[22] N. O. Schmidt. A complex and triplex framework for encoding the Riemannian dual space-time topology equipped with order parameter fields. *Hadronic Journal*, 35(6):671, 2012.

[23] N. O. Schmidt and R. Katebi. Initiating santilli's iso-mathematics to triplex numbers, fractals, and inopin's holographic ring: preliminary assessment and new lemmas. *Hadronic Journal (in press)*, 36, 2013.

[24] N. O. Schmidt and R. Katebi. Protium and antiprotium in Riemannian dual space-time. *Hadronic Journal (in press)*, 36, 2013.

[25] F.E. Close, Y. L. Dokshitzer, V. N. Gribov, V. A. Khoze, and M. G. Ryskin. f0 (975), a0 (980) as eye-witnesses of confinement. *Physics Letters B*, 319(1):291–299, 1993.

[26] A. J. Leggett. A theoretical description of the new phases of liquid He 3. *Reviews of Modern Physics*, 47(2):331, 1975.