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On The Birth of The Iida Physics(GUFP) which has surpassed The Achievements of the Newton or the Einstein

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Since 1970's, the Iida physics has experienced a long history of publication difficulties. Almost all documents on the Iida physics, both in English and in Japanese, are located at the reception desk of the library of the Department of Physics, the University of Tokyo as the donated documents from the Emeritus Professor Shuichi IIDA. Therefore, every visitor there can read or copy them. In the October of 2008, we had the 10 th International Conference on Ferrites in Chengdu China. As the scientists of China have not been spoiled by the polarized various spirits against the Iida physics that the theoretical groups in Japan, USA and Europe on magnetism, elementary particles and high energy physics have, the author could present the review paper on the Iida physics there safely and the paper is in the process on the official publication for the Proceedings of ICF10, probably, having published before the new year 2009. This article will have become an additional complementary article to that paper[1]. .

I was born in 1926, incidentally being coincided with the birth of the quantum physics. In 1947, I was graduated from the University of Tokyo for the field of physics, in the miserable ruin of the country just after the second world war. At that time, Japan had been regarded as the fourth class country, but, I had determined my mind to rebuild the country by our efforts. I had an interest to the basic theories of physics, such as the theory of elementary particles, but, in order to rebuild the country, there would be no other way than to develop the technical industries in the country. In these backgrounds, I had chosen the field of experimental magnetism, but, at the same time, would like to keep my mental level on the theoretical physics similarly to the level of my colleagues in the field of the theoretical physics. The initial subject had been the origin of the magnetic annealing effect of $Co_xFe_{3-x}O_4$ and the last subject in the Tokyo University was the structure of the electronic order in Fe_3O_4 at low temperatures. These situations were fortunate because it had turned out that the territory of my research area has been obliged to be extended into the theory of the elementary particles and cosmology and the most difficult and delicate parts of the new physics are located in the magnetism related structures of the objects. In 1986, I thought that I had already become the first class physicist in the field of magnetic materials with the ferrites and the magnetic oxides as the major. By the traditional social system of Japan, however, I had to retire from the University of Tokyo, so that it had become impossible to continue the first class experimental research. By using my home as the office for research, however, it has been possible to continue the theoretical research, which, after the severe and long struggles against the theoretical people in the world who had wished to keep the old style wrong standard theoretical framework for physics, has been developed into the stage of announcing the establishment of the entirely new framework for physics, i.e., the Iida Physics(GUFP: Grand Unifying Frame for Physics). It should be mentioned here that, in 1961~3, I was invited to the Bell Telephone Laboratories at Murray Hill, N.J., USA, the best laboratories in the world at that time, where I had learned the top knowledge on physics as well as the highly intelligent spirits of the top scientists in the world.

Now, more than 20 years have passed since 1986. During this period, in the field of elementary particles and nuclei, there had been the construction of many high energy particle accelerators with huge budgets, but, the scales of both the necessary budgets and the size of the area for the equipments had arrived at the possible limit for the human being and for the size of the earth. Therefore, the main methods for the research had to change into the observation of the cosmological events and its theoretical understandings. Of course, it is impossible to control the experimental conditions of the cosmological phenomena, so that the only possible method is to select the objects of the observation from the miscellaneous phenomena, which are occurring in the huge cosmological universe. Fortunately, however, my brain, which had been trained by both the experimental and the theoretical researches in the field of the physics of the materials, had turned out to be the only brain in the world which can resolve the frontier of the very complicated cosmological physical phenomena. In this way, in 2007, we had greeted the Birth of the Iida Physics, which surpasses the Achievements of the Newton or the Einstein.

One of the characters of GUFP is that it has established a strictly consistent new framework for classical electromagnetism[2]. This electromagnetism employs the MKS rationalized gaussian unit system, in addition to the SI practical unit system. GUFP regards the co-use of these double unit systems as essential. We call this additional unit system MKSP unit system, where P stands for Physical and, in short, SP unit system, in contrast to the SI unit system. Fortunately, our world is so simple mathematically and, unlike the other sciences, physics appreciates the mathematical simplicity of its framework. Under the assumption that SI unit system is popular, SP unit system is the only one related unit system which can represent distinctly clearly the simple and beautiful structure of the physical world. One focal point will be the expression of the Maxwell-Lorentz microscopic magnetic field. In SP unit system, it is $\boldsymbol{h}$ but in SI unit system there are three choices, $\boldsymbol{b}$, $\boldsymbol{h}$, and $\mu_o\boldsymbol{h}$, which have to introduce the conceptional confusion. The mutual conversion between SI and SP unit systems are very easy. GUFP regards the vector potential as the real physical entity. This is also an essential part of the electromagnetism of the new physics. In the old framework the gauge freedom has been emphasized too much. In the new physics, there is almost no gauge freedom. The only freedom contained in the free wave packet or the radiation is safely disregarded. We know that the elementary particle physicists use the natural unit system. But, it is too much simplified and it is difficult to understand the underlying physical structure of its equations and, also, to catch directly the related components of its numerical values. The physical reality in GUFP is defined as the object which is needed for the simple, selfconsistent, and convenient (SCC) description of the physical phenomena.

In this short article, we shall present only the easily understandable side view of the new physics. The first one may be the finding of the transient energy principle, i.e., the fourth law in the thermodynamics. The principle states $[\text{T.E.}] + T\,\delta S > 0$ (1) is the requirement that the process can happen. Here, [T.E.] indicates the Transient Energy, which is macroscopic and in a transient state, and is impossible to return to its original state. This principle can guarantee the perfect diamagnetism of the classical perfect conductors. Namely, if the material becomes perfectly conductive and can keep the persistent currents, then, automatically, it should show the Meissner-Ochsenfeld effect. If the perfectly conductive material is in a magnetic field, diamagnetic current occurs automatically and it pushes out the magnetic flux outside. Historically, the start of the study on the classical derivation of the Meissner effect had introduced the world-wide debates against GUFP. The old incomplete physics, however, did not take into account the magnetic field energy properly. In addition, there is a very critical situation for which only the transient energy principle, or, the fourth law in thermodynamics, which had not been known at that time, can judge [3]. In addition to its importance for the physics of superconductors, it had been pointed out that a part of the biological organ, e.g., flagella motor, ATP synthase, and muscle are utilizing this principle and get the additional energy microscopically from the thermal motion of the environments. We predict that use of this principle will have become important for the nano-technology in the near future.

Next clew of the Iida Physics may be the finding of the very strict classical structures for all the elementary particles. This includes the clarification of the so-called strong and weak interactions in the field of the elementary particles and nuclei. They are strictly explainable in terms of both the classical electromagnetism and these classical structures. The Iida physics had established the simplest consistent framework for the physics of elementary particles and nuclei with no divergence difficulty. The Iida physics has made the complicated and intricate renormalization procedure as a relic of the theoretical physics of the previous Century. The theoretical study of this domain had started in 1970s in parallel to the study of the classical derivation of the Meissner-Ochsenfeld effect. The classical structure of the electron has been obtained in the framework of the classical electromagnetism and published in 1974 in the Journal of the Physical Society of Japan[4], just before the start of the publication difficulty against the Iida physics. The classical electron is a ring-like negative electric charge density and the electric current density created by the light velocity running of the charge density. The radius of the ring is rather large such as $(\hbar / m_{\mathrm{e}} c)2(1+\alpha/2\pi) \sim 0.7\times 10^{-12}$ m (2) but the radius of the cross section of the ring is awfully small such as $(\hbar / m_{\mathrm{e}} c)16(1+\alpha/2\pi)\exp[-(2\pi/\alpha-2)] \sim 10^{-386}$ m (3). This extremely fine string segment may be called “the Iida line element” or the “livelex f^3 ” (light velocity extremely fine filamentary flow). This extremely fine string is necessary for obtaining the electromagnetic energy of $m_{\mathrm{e}} c^2$. The electromagnetic angular momentum is $\hbar$ (not $\hbar/2$ the factor 1/2 is the result of the quantum fluctuations.) . This had been the first finding for the classical structures of the elementary particles. In this analysis, the vector potential, being regarded as the real physical entity, has the indispensable role. No need is the old complicated “renormalization” procedure.

Starting from this c-number electron, by applying the covariant(relativistic) Lagrangian and the least action principle, it has been possible to derive the kinematical equations for the electron with the spin angular and magnetic moments. Then, by replacing the energy-momentum four vector and the spin angular momentum tensor with the quantal time and space operators and the Dirac γ–matrixes, GUFP can derive the quantal equations for the electron with the highest accuracy including the anomalous magnetic moment in the second order perturbation[5] (It is easy to get the next term by introducing the zero-point photon effect to the mass.[6])

Since then, however, these land-marking findings have been left behind with no progress. In 1996 in ICF7 in Bordeaux, however, American and French physicists had declared to the author that, in order to accept the Iida physics, it should clarify its standpoint to the quark theory. This had taken off the etiquette border on my research territory and have triggered the extension of the Iida physics to the whole field of elementary particles and nuclei. The findings are amazing. The Iida physics has clarified that all the important elementary particles (electron, muon, tau, and their neutrinos, pions, and proton) have their own stable classical structures with their definite geometrical configurations and sizes. Electron, muon, and tau have the same configuration with the electron, having the difference only in the mass, being called the singlon. When there are two parallel rings with different signs of the charges located very very closely with the runnings in the same direction, we have the classical structure of the neutrino, being called the pairon. When one more negative charge ring is added to the pairon, running in the opposite direction and having cancelled out the electromagnetic momentum, we have the classical structure of the Iida pion, which is most important for the structure of the nuclei. The Iida pion is equivalent to the Yukawa meson. But, according to the advice of Nishijima, who has suggested to use the simplest and clearest expression for such naming problems, we use the name of Iida pion. As we know the observed mass of the Iida pion is about $273\, m_{\mathrm{e}}$. It is noted that, equally to the current physics, GUFP cannot predict the mass of the elementary particles.

The old Century concept of the sizeless point charge, having the problems of infinite electromagnetic energy and the complicated renormalization procedure, has now been replaced by the new Century concept of the extremely fine line charge densities and the line electric current densities having strict electromagnetic stability with respect to the Lorentz electric and magnetic forces(together with the extremely small assistance of the gravitational attractions). The striking facts are the strictly electromagnetic mathematical derivation of the strong and weak interactions that have bothered the theorists of the old Century so much. When the two Iida line elements are located in parallel very very closely, and, if the signs of the electric charges of the two are different and the directions of the electric currents are the same, we have the strong attractive interaction. If either of the postulates is

different, namely, the signs of the charges are the same, or, the directions of the electric currents are different, the electric and magnetic forces have just cancelled out mutually, to have the states of the stable weak interaction. When the Iida element has formed the closed string with a knot, it represents the classical structure of the proton, being called the tfc(trefoiled c-number) structure. GUFP have required the quantized electromagnetic angular momentum to all of these classical structures. In addition, we found that the magnetic fluxes penetrating through any of the surfaces bounded by the closed Iida string loop or loops are quantized, i.e., equal to the integral number of the magnetic fluxoid, $hc/2e$ [7].

In the case of the electron, GUFP cannot predict the observable size of the electron, in agreement with the experimental observations. When the two electrons have the parallel spin, the Pauli principle prohibits the overlapping of the two electrons. When the two electrons have the antiparallel spins, they can overlap, but, since the thickness of the c-number electron is extremely small (such as $\sim 10^{-386}$ m) and they can rotate freely, they can cross over without the collision.

In the case of the proton, as the c-number configuration extends three dimensionally, the situation is entirely different. The calculated radius of the classical configuration is in the order of 1×10^{-15} m [8], which is in excellent agreement with the radius of the proton observed experimentally. These agreements between the theory and the experiment will be the strong supports to GUFP. The similar calculation for the Iida pion predicts 5.7×10^{-15} m [8] for the radius of the circular pion which is several times larger than that of the proton. We should notice that, as the pion has no angular momentum, it is quite flexible and deformable.

Here GUFP presumes that there are two protons with different parities. Experimental verification may be possible if two protons are participated, e.g., in the case of the deuteron. Whether the mass or the magnetic moments of the deuteron can be separated into two is a fundamental question of GUFP, leaving the problem in the accuracy of the future measurements. (The author may mention the name of Dr. Hayano on this proposal.)

GUFP has introduced an essential change to the understanding of the structure of the nuclei. Namely, it has concluded that the nuclei are composed not of the atomic number protons and the neutrons, but, of the nucleon number protons and “the neutron number” Iida pions. This result is quite important because this has to introduce an essential change to all the existing theories on the atomic nuclei, which are seriously important for the huge energy sources to the human being for both the civil and military uses. By this, we have to revice the contents of almost all text books for physics from the level of the high school. In this new understanding, the neutron is an unstable nucleus with the atomic number or the electric charge number zero. It is noted that, although the mass of the neutron is very close to the mass of the proton, this only means that the binding energy of the proton and the Iida pion in the neutron has happened to be nearly equal to the self-energy of the Iida pion itself. GUFP can explain semiquantitatively all the self-energies of the light nuclei, including the binding energy between the protons and the Iida pions, in terms of the classical electromagnetism[7]. Not only the electrostatic energies but also the magnetic field energies are equally important, and the transfer of the electromagnetic energies by induction has an indispensable role.

In the old Century, as proton and neutron are both fermions, Fermi-Dirac statistics has been used for them, The situation is similar in the new physics because the nucleon number protons are all fermions. But there are Iida pions which are Boson particles for which the Bose-Einstein statistics should be applied. This means that all the Iida pions can share a single lowest energy, i.e., zero kinetic energy, quantal state function in terms of the Bose-Einstein condensation. The mutual interaction between the Iida pions and the nucleon number protons must take into account this quantal situation. Since the Iida pion has negative electric charge but the proton has positive charge, there must also be the electrostatic attractive interactions. In addition, there must be the strong interactions between the Iida line elements of the Iida pions and the protons. In these considerations, the magnetic field energies must be involved, as we know from the observed magnetic moments of the light nuclei[7], the magnetic moments of the Iida pion(although it has no spin angular momentum) is about 1.7 times of the magnetic moment of the proton, and, it has the character to couple to the magnetic moment of the proton antiferromagnetically, or, ferrimagnetically, probably in order to reduce the magnetic field energies.

In these situations, we don’t know how the electromagnetic energy transfer by induction will play its role inside the nucleus. We know that the Iida pions are condensed to its lowest energy state in terms of the Bose-Einstein statistics, and they will form the Yukawa potential effectively for the positive charge protons. Since the protons will follow the Fermi-Dirac statistics, they will fill the orbital states with the kinetic energies two by two.

GUFP has created a new view for the nuclei and the neutron stars. Namely, the nuclei are the so-called “nano-molecule” composed from the protons and the Iida pions, and, in contrast, the bulk crystals composed of the same constituents are the neutron stars. In the neutron star, since the Iida pions are the Boson particles, they have degenerated to their lowest energy single state, which would be the three dimensional plane wave. If this bold assumption is effective, we have the sea of the Iida pions, where the protons, since they are Fermions, are making the Fermi distribution, with their kinetic energies and magnetic moments (and their spins) anti-parallel to the magnetic moments of the Iida pions(in order to reduce the magnetic field energies). Then, there might be a huge cooperative phenomenon in which all the magnetic moments of the Iida pions have aligned to a single direction and all the magnetic moments of the protons have also aligned inversely to have created a huge nuclear ferrimagnet and produces the huge magnetic fields of $10^{15\sim16}$G . GUFP proposes that this is the only mechanism for having such a tremendous magnetic field. GUFP states clearly that the fluid dynamical mechanism where some charged particles flow to create such a huge magnetic field is definitely impossible. The charged particles can only make the cyclotron motions with the radius of infinitely small magnitudes.

The explosion of the supernova SN1987A has been concluded to be not due to the shock wave repulsion, i.e., the old mechanism, but due to the third fire, or, the cooperative elementary particle chain reaction in which the electrons and the protons have united

and changed into the huge electromagnetic energies[9]. We call the chemical reaction as the first fire, the cooperative explosion of the nuclear fission or the nuclear fusion(hydrogen bomb) as the second fire. GUFP regards the GRBs(Cosmic huge γ–ray bursts) as the phenomena when a normal star has approached or collided to the neutron star. Then, when the neutron star has grown into a huge mass, such as by the enormous number accumulation of the residues of the GRBs, there would be a possibility of the new explosion in which the two protons and two Iida pions have united and have transformed into the huge electromagnetic energies. GUFP calls this proposed explosion as the fourth fire, by which a galaxy may be born. By this the transmigrating universe has become a possible reality in the scope of the physical astronomy of the universe in the theoretical framework of GUFP. This assumption has a reason that the overall figures of many galaxies look as if they are the residues of some explosions. Of course, these new theories cannot exist in the old framework of physics of the previous Century.

From the point of view of GUFP, the quark theory is a defect theory having no electromagnetic stability, as a result of neglecting the divergence difficulty of the point charges. The so-called string theory, as viewed in the present form, is a fruitless speculation without any observational evidences. Its smallest distance, the so-called Planck length is only a mathematical figure, which has the dimension of the length, being obtained from the known physical constants, simply by multiplication and division, including the root operation. In the Iida physics, 10^{-35} m is not the smallest distance but, for instance, the classical structure of the electron in the Iida physics is a circular ring with the radius of about 0.007 Å made of livelex f^3 element, whose radius of the cross sectional is $\sim 10^{-386}$ m (3) which is unimaginably smaller than the so-called smallest distance, or, the Planck length in the string theory. It is noted that these lengths have been derived strictly theoretically mathematically from the mass of the electron, the amount of the electric charge, and its quantized angular momentum, in the framework of classical electromagnetism. If an essential modification would have been applied to the string theory and has regarded the closed circuit of GUFP composed of the livelex f^3 element as “the super string” and has amalgamated with the Iida physics, the theory may have become the theory that the Iida physics can admit.

GUFP has concluded clearly that both the Big Bang and the Black Hole theories are wrong[10]. The Hubble constant can be deduced quantitatively by the successive reduction of the photon energy by means of the very small interaction to the electrons in the universe (10^0~$10^6 m^{-3}$). Since the Einstein equation is only the first order approximate equation, it can not predict 0 or ∞. The Schwarzschild solution is mathematically correct for the Einstein equation but not correct physically. GUFP has found a rigorous solution which has no black hole singularity. The Big Bang and the Black Hole are the two essential falsehood of the Previous Century Physics.

At the present moment, due to the retarded social system of Japan, although the founder of the new physics, Iida, has the name of the emeritus professor of the University of Tokyo, there is no support from the Government or from the University of Tokyo. Accordingly, the development of the new physics and its effect for the education and research for the Japanese society are still entirely dependent on the small personal private efforts of Iida himself. This is the present poor situation of Japan to the research and education for the sciences, although the government states loudly that the future of Japan depends on her level of sciences and technologies. It is, however, still better than the case of Galileo Galilei in 1632.

The most recent result of the research of the Iida physics is that it has succeeded in deriving the fluid dynamical equation to the constituent gas molecules of the halos of the galaxies. By manipulating the Iida equation and, using the data of the cosmological temperature and the transversal velocities of the visible stars in the galaxies, GUFP has succeeded in deriving the molecular mass of the constituent particles, approximately $10^{-3}\ m_e$, being identified to be that of the muon neutrino, in the first time in the history of physics. We are in the dense sea of the muon neutrinos as our galaxy has also the muon neutrino gas as its halo. Furthermore, by utilizing these knowledge and using the observed experimental data of the supernova SN1987A, GUFP has succeeded in deriving the molecular mass of the electron neutrino as $1.4\times10^{-5}\ m_e$, precisely, and, furthermore, it had rejected the neutrino oscillation concept. Since there has been no oscillation in between the electrons and the muons, there is no reason to expect the oscillation only to the electron neutrinos and the muon neutrinos.

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