Journal Homepage: -www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI:10.21474/IJAR01/3732
DOI URL: http://dx.doi.org/10.21474/IJAR01/3732
ISSN NO. 2320-5407

RESEARCH ARTICLE

THE UNIVERSE IS IN GOOD HANDS.

***Oliver K. Manuel.**
CSSI Associate & Emeritus Professor, University of Missouri, Cape Girardeau, MO 63701 USA.

Manuscript Info

Manuscript History

Received: 15 January 2017
Final Accepted: 07 February 2017
Published: March 2017

Key words:-
Mass, Energy, Reality, Nuclear Secrets, Nuclear Binding Energy, Origin.

Abstract

On 13 June 1936, Paul Kazuo Kuroda noticed confusion about terms used in Aston's lecture on nuclear energy that would later isolate humanity from reality (God). In 1945, Kuroda secretly retained a personal copy of Japan's design for atomic bombs to finesse post-WWII standard scientific models that obscured Aston's 1922 finding of "powers beyond the dreams of scientific fiction" in rest masses (m) of atoms. Precise nuclear and space age measurements later revealed neutron repulsion as the source of energy (E) in cores of heavy elements like uranium, planets like Jupiter, the Sun, and galaxies that maintain the dynamic, cyclic, now-expanding universe through reversible transitions between two forms of one fundamental particle: Neutrons (compacted electron-proton pairs) and hydrogen (expanded electron-proton pairs), with nuclear charge densities of Z/A = 0 and Z/A = 1 and reversibly, different rest masses, are the alpha and omega of the cosmos and all other atomic matter with nuclear charge densities of $0 < Z/A < 1.0$. Weizsäcker had mistakenly assumed in 1935 that differences in rest masses of free neutrons and hydrogen atoms remained unchanged when these combine to produce atoms of heavier elements, and thus obtained misleading values of "nuclear binding energy" that obscured neutron repulsion as an important force in the origin and evolution of the cosmos and life in the solar system.

Introduction:-

Kuroda was born on 1 April 1917 and died on 16 April 2001 (Manuel 2001a,b). Kuroda noticed on 13 June 1936, and reported a serious misunderstanding of nuclear energy in his autobiography (Kuroda, 1992, page 6). BBC News (2002) reported that Kuroda had secretly retained a personal copy of Japan's design for atomic bombs, since "just before Japan's surrender in 1945."

The author does not know, but will explain why he believes, Kuroda retained the copy to show others a misunderstanding of Aston's (1922) "packing fraction" might block public acceptance of his conclusion "the beginning of the world may have been just like" Hiroshima's destruction on 6 Aug 1945 (Kuroda, 1982, page 2). Many discoveries subsequently made on the origin and early history of the solar system in fact pointed to the powerful nuclear force in the Sun that was obscured by this 1936 misunderstanding of nuclear energy (Manuel 2016a).

Corresponding Author:-*Oliver K. Manuel.
Address:-CSSI Associate & Emeritus Professor, University of Missouri, Cape Girardeau, MO 63701 USA.

The author and five students finally discovered neutron repulsion in atomic rest mass data, aka Aston's "nuclear packing fractions," (Manuel et al., 2000) and reported this as the source of solar energy at the 32nd Lunar & Planetary Science Conference (Manuel et al., 2001). A copy of the "Cradle of the Nuclides" from the LPSC abstract was sent to Kuroda, beneath the title of this paper as an encrypted message of hope, indelibly recorded in the rest masses of atoms.

This paper celebrates the centennial of Kuroda's birth on 1 April 1917 and his contributions, as a nuclear, geo-, cosmo-chemist at the University of Tokyo (1936-1949) and later at the University of Arkansas (1952-2001), to dating the geo-chronology of hot springs (e,g., Kuroda, et al., 1954), "fall-out" particles from atmospheric nuclear weapons testing (e.g., Clark et al., 1967), and the solar system's origin and chronology at the "beginning of the world" (Kuroda, 1982, page 2).

Kuroda published about 400 scholarly research papers and supervised the research of ~70 PhD students and several postdoctoral research associates (W.A. Myers, University of Arkansas, personal communication, 2002). Two of his papers were cited as Benchmark Papers in Nuclear Chemistry (Seaborg and Loveland, 1982). Rowe (1988), Braun (2013) and Manuel (2016a) summarized Kuroda's major research contributions, and the author nominated Kuroda for posthumous recognition (Manuel, 2017a). The title and first figure of this paper are from the author's last message to Kuroda in 2001.

An outline of this paper was written to confirm recent reports (Manuel 2016a, 2016b, 2016c) of "An Error in Calculated Nuclear Energy" (Manuel, 2017b), posted for public comments, corrected, expanded and retitled, "The Universe Is In Good Hands," aka "There Is A God," to convey a more appropriate message for the centennial celebration of Kuroda's birth - a message of hope for today's distressed society.

Through the throes, violence and racial nationalism in Japan during WWII, and in the United States after WWII, Kuroda developed a magnificent obsession for truth as the ultimate salvation for his own life and for society as a whole (Kuroda, 1982, 1992). Kuroda's obsession was contagiously passed to his students, who learned that rigorous adherence to basic principles of the scientific method and their own creativity and logic could also provide them meaningful lives of continuous discovery. Since Kuroda encouraged students to think for themselves, the author is therefore solely responsible for any errors in the conclusions of this paper. Kuroda did not endorse them, although many are based on Kuroda's scholarly research publications, especially those cited above and in his book, The Origin of the Chemical Elements and the Oklo Phenomenon (Kuroda, 1982), in his autobiography, My Early Days at the Imperial University of Tokyo(Kuroda, 1992), and in his summary paper with Myers published in Proceedings of the American Chemical Society symposium on Origin of Elements in the Solar System, "Xenology, FUN Anomalies and the Plutonium-244 Story" (Kuroda and Myers, 2000).

The conclusions of this paper are simply the author's own interpretation of Kuroda's actions and published reports, in view of his status as an immigrant from a former enemy nation that secretly retained a personal copy of Japan's successful design for atomic bombs (BBC News, 2002).

1. Kuroda noticed on 13 June 1936 and reported publicly in his autobiography (Kuroda, 1992, p.7) that someone "who appeared to be a physicist in his 30's" did not grasp the meaning of Aston's "packing fraction." The goal of this paper and Kuroda's nomination for posthumous recognition (Manuel, 2017a,b) is public awareness of the misunderstanding of nuclear energy that Kuroda noticed in 1936 (Kuroda, 1992, p. 7) and its long-term impact on modern science and public perception of our place in the universe.
2. While standing in the ruins of Hiroshima one day in August 1945, Kuroda was "overwhelmed by the power of nuclear energy. The sight before my eyes was just like the end of the world, but I also felt that the beginning of the world may have been just like this" (Kuroda, 1982, p. 2).
3. As a research mentor, Kuroda demonstrated and taught his students to appreciate the scientific method as the design for a meaningful life of continuous discovery.
4. In a series of papers with W.A. Myers in the 1990s, Kuroda dated the geo-chronology of the early solar system's formation from a supernova explosion, like fallout particles from a nuclear weapons explosion, using a combination of ^{26}Al, ^{238}U and ^{244}Pu age dating to show that refractory silicon carbide (SiC) and graphite/diamond (C) grains in primitive meteorites formed ~1-10 Ma after a supernova explosion (Kuroda and Myers, 1996) made the solar system's actinide elements ~5.1 Ga ago (Kuroda and Myers, 1994).

In 1961 the author independently noticed the error in Weizsäcker's concept of "nuclear binding energy" (Weizsäcker, 1935) and reported the error at the 1966 Annual Meeting of the American Physical Society (Manuel, 1966). Kuroda did not identify the name of the physicist who misunderstood Aston's talk on "nuclear packing fractions" at the Imperial University of Tokyo on 13 June 1936, except by approximate age. Three possible candidates, whose research achievements also reflected a misunderstanding of Aston's (1922) "nuclear packing fractions," are:

- Hideka Yukawa (born 1907) received the 1949 Nobel Prize in Physics for a model of the nucleus that overlooks neutron repulsion (Yukawa, 1949);
- Hans Bethe (born 1906) received the 1967 Nobel Prize in Physics for a solar model based on hydrogen-fusion, rather than neutron repulsion, as the primary source of energy production in stars (Bethe, 1967).
- Carl von Weizsäcker (born 1912) received the 1957 Max Planck Medal for extra-ordinary achievements in theoretical physics. Noting that modern science "has given us the power of Greek gods" (Drieschner, 2014, page 173), Weizsäcker established the Carl Friedrich von Weizsäcker Society in 1994 to promote "wissen und verant-wirtung," aka "knowledge and responsibility," in the areas of "Physics, philosophy, theology, economics and altered awareness" (Drieschner, 2014, page 173-174).

Publication of Weizsacker's (July 1935) neutron-proton model of the nucleus may have influenced Chadwick's (Dec 1935) Nobel Lecture, or visa versa. Chadwick (1935) assumed the validity of the "scheme of quantum mechanics" as reason to alter his earlier conclusion the neutron consists of "a proton and an electron in close combination" (Chadwick, 1932, pages 697 and 708), as had been suggested earlier in Rutherford's Bakerian Lecture (Rutherford, 1920).

Scientists more qualified than the author to evaluate quantum mechanics (Weinberg, 2017, Weinberg et al, 2017) continue to express doubts about the validity of quantum mechanics, but there is no reasonable doubt calculated values of "nuclear binding energy" (Weizsacker, 1935) consistently disagree with observed values of beta-decay by 0.782 MeV (Manuel, 1966) - the exact rest mass difference between the free neutron and the hydrogen atom - and obscure the powerful force of neutron repulsion in ordinary atoms (Manuel at al., 2000), in the Sun (Manuel at al., 2001), in changing Earth's climate (Manuel, et al., 2002), and in the cosmos (Manuel, 2011, 2012, 2016a,b,c, 2017b, and reference cited therein).

Adherence to theoretical models of reality, over experimental measurements of reality, may also explain current unrest over government-funded science in Washington, DC, with the US NAS supporting ScienceDebate.org (2017), a private 501c3 organization calling for a public "March for Science" in Washington, DC next month in response to President Trump concerns about the validity of scientific evidence for human-induced global warming (AGW).

Publication of this paper – as first outlined and posted for public comment as "An error in calculated nuclear energy" (Manuel, 2017b) – will offer "March for Science" promoters an opportunity to consider first evidence the error in calculated nuclear energy (Manuel, 2017b) has altered awareness of evidence the Sun made our elements (Manuel and Sabu, 1975; Sabu and Manuel, 1976a; Manuel et al., 1977; Toth, 1977; Manuel, 1978; Manuel et al., 1979; Sabu and Manuel, 1980; Manuel and Hwaung, 1983), birthed the solar system in a supernova explosion ~5.1 Ga ago (Kuroda and Myers, 1994), controls Earth's climate (Manuel et al., 2002), now holds Earth in continuous harmonic vibration with the Sun (Thomson et al., 2007) and has sustained the origin and evolution of life on Earth for ~4 Ga ago (Michaelian and Manuel, 2011).

The author first met Kuroda in May 1960, two years after Kuroda returned to the University of Arkansas from a personally challenging and professionally unsuccessful year (1957-1958) at Argonne National Laboratory studying radioactive fallout from a series of "nuclear weapons tests being recklessly conducted in the South Pacific" (Kuroda, 1996, p. 64) - a study that "has remained unpublished in scientific journals up to the present time" (Kuroda, 1996, p. 65).

Four years earlier, Kuroda's suggestion of natural, self-sustaining nuclear fission reactors in the early Earth (Kuroda, 1956) had been criticized as impossible at the 1956 National Meeting of the American Geophysical Union (AGU). The author was nevertheless convinced of Kuroda's genius and intellectual integrity and gratefully accepted Kuroda's PhD research assignment on the "Origin of the solar system and its elements" after discussing these recent findings with him:

- Reynolds' (1960a) discovery that the Richardton meteorite contained excess radiogenic ^{129}Xe from in situ decay

of extinct, 17-Ma year ^{129}I, synthesized just before the meteorite formed;

- Reynolds' (1960b) report that the overall abundance pattern of all nine stable isotopes of primordial xenon in meteorites is distinct from that in air; and
- Kuroda's (1960) suggestion that spontaneous fission of extinct 82-Ma year ^{244}Pu, made just before the Earth formed, generated excess heavy xenon isotopes (^{131}Xe-^{136}Xe) in air.

These 1960 discoveries were all later confirmed, the last in 1972 by observing an anomalous mix of xenon isotopes (xenon-**X**) released from primitive carbonaceous meteorites at ~800^{o} C (Manuel et al., 1972) that would cause the overall isotopic abundance pattern of primordial xenon in meteorites to be distinct from that in air (Reynolds, 1960b).

Xenon-**X** had properties expected in fresh supernova debris, with "the greatest enrichment in the lighter isotopes, ^{124,126}Xe, and the heavier isotopes, ^{134,136}Xe, relative to ^{130}Xe. These are the isotopes expected to be produced in supernova explosions," (Burbidge et al., 1957) "the ^{124,126}Xe isotopes by the p-process and the ^{134,136}Xe by the r-process" (Manuel et al., 1972, page 100). It was therefore concluded that "no known nuclear or physical process is capable of producing both anomalies in situ" (Manuel et al., 1972, p. 101), within the meteorite itself.

Scientists at the University of Chicago separated mineral fractions of the Allende carbonaceous meteorite, better isolating the fraction containing "strange xenon" (Lewis et al., 1975), or xenon-**X** (Manuel et al., 1972), and concluded in situ fission of an unknown super-heavy element made "strange xenon" ("xenon-**X**") inside the meteorite itself.

However the University of Chicago analysis revealed that essentially all primordial helium and neon in the meteorite was trapped in the mineral fraction that trapped "strange xenon," whereas mineral fractions of the Allende meteorite that trapped "normal xenon" had little or no primordial helium or neon (Manuel et al., 1975).

This observation of primordial He and Ne – trapped only in mineral fractions of the primitive Allende meteorite that trapped "strange xenon" (aka, "xenon-**X**"), and not in the mineral fractions that trapped xenon of "normal" isotopic composition (Lewis et al., 1975) – matched the prediction by Burbidge et al. (1957) that fusion reactions would have depleted light elements from the interior of a star that evolved to the terminal supernova stage, when r- and p-processes of explosive nucleo-synthesis might produce "strange xenon," aka "xenon-**X**" in outer layers of the exploding star - where light elements like hydrogen, helium, carbon and neon remained.

Being convinced that linked, elemental and isotopic anomalies in the Allende meteorite (Lewis et al., 1975) were nucleogenetic, D.D. Sabu and the author wrote and submitted three papers saying a single, local supernova explosion at the birth of the solar system made strange "xenon-**X**" (Manuel et al., 1972), primordial helium and neon, ^{244}Pu and perhaps some other isotopic anomalies and decay products of short-lived radioactive isotopes that had been observed in meteorites (Sabu and Manuel, 1976a, Sabu and Manuel, 1976b, Manuel and Sabu, 1975) – before going to the 1976 Annual Spring Meeting of the American Geophysical Union to present the first paper.

A protracted discussion of events that occurred there and in other open discussions of the supernova beginning of the solar system in 1976-77 would only distract from the central purpose of this paper and its outline (Manuel, 2017b):

1. Identification of the logical error in Weizsäcker's (1935) definition of "nuclear binding energy" that isolated humanity from reality after WWII (Manuel, 2017b);
2. Celebration of the centennial of Kuroda's birth on 1 April 1917; and
3. Gratitude that we were anyway able to confirm Aston's report of "powers beyond the dreams of scientific fiction" in atoms (Aston, 1922, page 20): Neutron repulsion - indelibly recorded in rest masses of atoms (Manuel et al., 2000, 2001, 2016a,b,c) – powers the Sun, the cosmos and offers humanity a rational scientific explanation for the simple, logical sequence of events that:

- Made our elements and birthed the solar system in a supernova explosion (Sabu and Manuel, 1976a,b; Manuel and Sabu, 1975; Manuel et al., 1977; Ballad et al, 1979).
- Condensed highly refractory "fallout" grains of silicon carbide (SiC) and graphite- diamond (C) within the first 1-10 Ma (Kuroda and Myers, 1996) after the supernova exploded, ~5.1 Ga ago (Kuroda and Myers, 1994).
- Accreted terrestrial planets in layers from heterogeneous supernova debris, beginning with formation of iron

cores from Fe-rich debris near the pulsar (Manuel and Sabu 1981).

- Separated d- and l-forms of amino acids (that would later become precursors to life) in primitive carbonaceous chondrites with CP-circularly polarized light from the pulsar (Cronin and Pizzarello, 1997), before a
- Gravitationally trapped photosphere of waste products, mostly H and He (Manuel, 2012), accumulated over the pulsar and moderated the energy of solar radiation to allow the origin and evolution of life to begin on Earth, ~4 Ga ago, when intense UV radiation from the evolving Sun were first absorbed by primitive molecules of life, like RNA or DNA (Michaelian and Manuel, 2011).
- Sustained the evolution of life into humans, with incredible talents, ~79 year life spans, and inalienable rights to self-governance on the water-covered planet orbiting only 1 AU (one astronomical unit) from the supernova pulsar remnant that birthed the solar system.

Results and Discussion:-

Before considering the figures posted below, readers are encouraged to **read carefully** and **consider thoughtfully** two figures in the outline (Manuel, 2017b) showing

- The consistent error, and
- The way it was obscured

In values of nuclear binding energy Weizsacker (1935) calculated for the neutron-proton model of a nucleus composed of two, always distinguishable forms of nucleons: Neutrons and Protons.

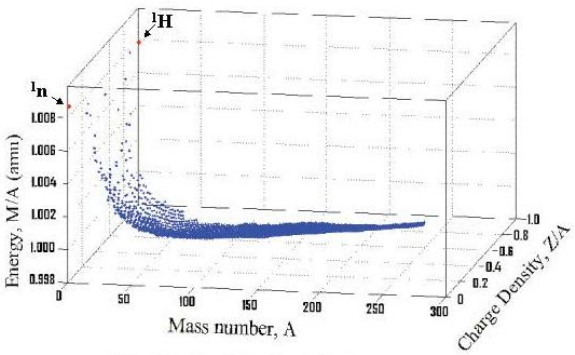
The consistent discrepancy between real nuclear stability observed in the ordinary beta-decay of isobars – as measured by Aston's "nuclear packing fractions" (Aston, 1922) and always calculated incorrectly, by exactly 0.782 MeV (the difference in rest masses of the neutron and the hydrogen atom), in Weizsacker's values of "nuclear binding energies" – shows neutrons and hydrogen atoms simply become two, reversibly interchangeable forms of one fundamental particle when combined to make heavier atoms with mass number, A>1 (Manuel, 2011).

Widespread adoption of Weizsacker's (1935) flawed model of the nucleus after WWII blocked serious consideration of Kuroda's realization, standing in the ruins of Hiroshima in August 1945, "the beginning of the world may have been just like this" nuclear explosion (Kuroda, 1982, p. 2).

Kuroda probably retained a personal copy of Japan's atomic bomb design after WWII (BBC News, 2002) to show others that the same source of energy that destroyed Hiroshima made our elements, birthed the solar system and began a measurable geochronology for the formation of the solar system, its elements and the beginning of the world (e.g., Kuroda, 1982; Kuroda, 1992; Kuroda and Myers, 1994; Kuroda and Myers, 1996; Manuel et al., 2000; Manuel et al., 2001).

Figure 1 shows the message the author sent shortly before Kuroda died in April 2001, a message of hope, indelibly recorded in rest masses of the ~2,850 distinct types of atoms that comprised all known matter in 2000 (Manuel et al., 2000). The author had just returned from the 32nd Lunar and Planetary Science Conference in March (Manuel et al., 2001) where the "Cradle of the Nuclides" was presented to show that neutron repulsion powered the giant nuclear explosion that triggered the formation of the solar system and sustained the current operation of the Sun:

"The Universe Is In Good Hands"



The Cradle of the Nuclides*

Each dot represents one of the 2,850 nuclides listed in *Nuclear Wallet Cards*, 6th edition (2000) National Nuclear Data Center, Brookhaven National Laboratory, 74 pp.

Figure 1:- The above message of hope for humanity was sent to Kuroda in April 2001. This "Cradle of the Nuclides" had been published in research papers. It was published on the front cover and inserted in the front flyer pages of the Proceedings of the 1999 ACS Symposium on the Origin of Elements in the Solar System as it was going to press (Manuel, 2000). Combined U/Pb, Pu/Xe and Al/Mg age dating of primitive meteorites and their refractory inclusions by Kuroda and Myers (1994, 1996) showed that a supernova exploded shortly before the oldest meteorites formed, about five billion years (~5.1 Ga or ~5,100 My) ago. Five students enrolled in a graduate course, Special Topics in Nuclear Chemistry, at the University of Missouri-Rolla in the spring semester of 2000 helped the author use computer-assisted 3-D images of atomic rest masses to identify neutron repulsion there (Manuel et al, 2000)

Figure 2 shows how the discovery and confirmation of decay products from 82 My ^{244}Pu in the Earth, in meteorites and in man-made ^{244}Pu (Kuroda, 1960; Rowe and Kuroda, 1965; Alexander et al., 1971) was used to determine and illustrate the geo-chronology and early history of the solar system's formation.

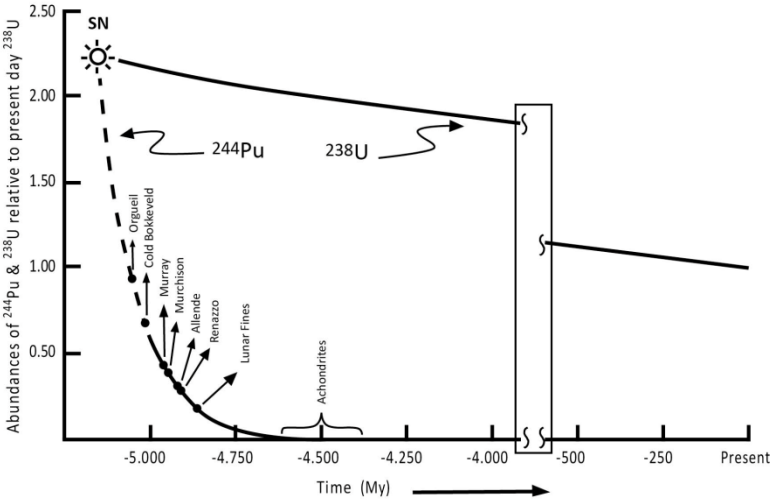


Figure 2:- Combined U/Pb and Pu/Xe age dating of primitive meteorites, dated back from the present by Kuroda and Myers (1994), show the geochronology of primitive meteorites in the early solar system after a supernova explosion birthed the solar system, shortly before the oldest meteorites formed about five billion years (~5.1 Ga or ~5,100 My) ago.

Figure 3 shows how Kuroda and Myers (1996) used the discovery of excess ^{26}Mg from the decay of extinct ^{26}Al in the Allende meteorite (Gray and Compston, 1974) to demonstrate the geo-chronology of formation of silicon carbide and graphite-diamond refractory grains in primitive meteorites with the physical properties of single fallout particles after nuclear detonation (Clark et al., 1967).

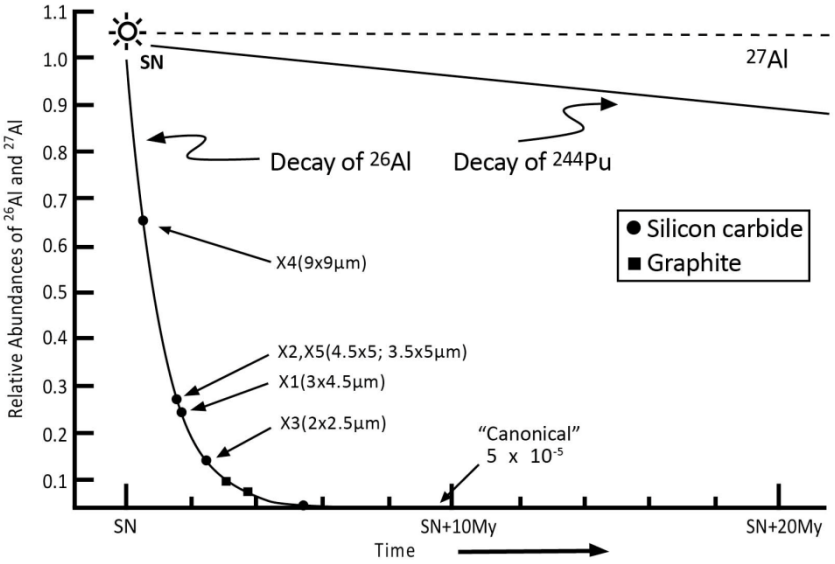


Figure 3:- $^{26}Al/^{26}Mg$ age dating of refractory meteorite inclusions of silicon carbide and graphite (diamond) show their formation within the first 1-10 My after the supernova, with physical properties like those of "fall-out" particles from nuclear explosions (Kuroda and Myers, 1996). Grains that formed first grew larger and trapped higher levels of radioactive ^{26}Al ($t_{1/2}$ = 740,000 yr or 0.74 My), like the fractionation of fission products in single fallout particles after a nuclear detonation (Clark et al, 1967).

We cannot see the Sun's core, but it may be indistinguishable from this Chandra x-ray image of the pulsar formed in 1054 AD by the supernova explosion that produced the Crab Nebula.

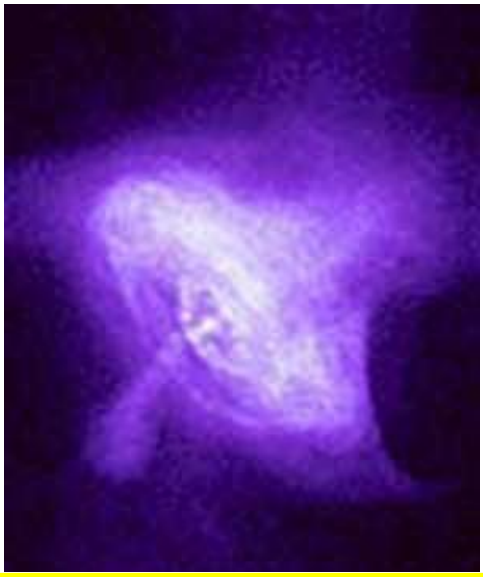


Fig. 4:- The creator, destroyer and sustainer of every atom, life and planet in the solar system is a pulsar like the one above that birthed the Crab Nebula in 1054 AD. Toth (1977) proposed a solar pulsar, Kotov (1996) measured and confirmed the 160 minute solar pulse Toth (1977) had noted earlier as the forth of regular, 40-minute pulses, Manuel et al. (2002) noted the implications for solar eruptions and Earth's climate, Thomson et al. (2007) demonstrated the effects of solar vibrations on engineering and scientific systems, interplanetary magnetic fields,

atmospheric pressure, induced voltages on ocean cables, and terrestrial seismic data, and Karoff et al. (2016), Clery (2016), Persson (2016) note abrupt solar eruptions may periodically reset civilization.

Conclusion and Acknowledgements:-

The author is honored to write this manuscript to celebrate the centennial of the birth of Paul Kazuo Kuroda on April 1, 1917. Kuroda risked his life and the wrath of united world governments after WWII so humanity might know the simple sequence of geo-, cosmo- chronological events that produced life from highly radioactive debris of a supernova that exploded here five billion years (~5.1 Ga) ago, sustained the origin and evolution of life into humans, and endowed them with remarkable talents and inalienable rights to self-governance on a water-covered planet orbiting ~1 AU (one astronomical unit) from the pulsar remnant that was, and still is, powered mostly by neutron repulsion, the mysterious source of energy Aston discovered and reported as "powers beyond the dreams of scientific fiction" in "nuclear packing fractions" of ordinary atoms (Aston, 1922).

This paper is meant to be suggestive only. We are at the beginning of a new awakening to reality and know only a little. More will be revealed if we selflessly practice the basic principles of science for the benefit of humanity, as exemplified by the life and career of Paul Kazuo Kuroda.

Numerous friends, anonymous scientists and bloggers encouraged publication of this summary of the heroic efforts of the late Professor Paul Kazuo Kuroda (1917-2001) to prevent the misuse of nuclear secrets to isolate humanity from reality, including two well-known geo-ethicists, Drs. Nils-Axel Mörner and VáclavNěmec .

References:-

1. Alexander, E.C., Jr., Lewis, R.S., Reynolds, J.H. and Michael, M.C. (1971): Plutonium-244: Confirmation as an extinct radioactivity. Science, 172: 837-840. http://science.sciencemag.org/content/172/3985/837
2. Aston, F.W. (1922): Mass spectra and isotopes, 1922 Nobel Lecture in Chemistry. http://www.nobelprize.org/nobel_prizes/chemistry/laureates/1922/aston-lecture.pdf
3. Ballad, R.V., Oliver, L.L., Downing, R.G. and Manuel, O.K. (1979): Isotopes of tellurium, xenon and krypton in Allende meteorite retain record of nucleosynthesis. Nature, 277: 615-620. http://www.nature.com/nature/journal/v277/n5698/abs/277615a0.html
4. BBC News (2002): Atomic plans returned to Japan. In: News Front Page, World Edition (3 Aug 2002) http://news.bbc.co.uk/2/hi/asia-pacific/2170881.stm
5. Bethe, Hans (1967): Energy production in stars, 1967 Nobel Lecture in Physics https://www.nobelprize.org/nobel_prizes/physics/laureates/1967/bethe-lecture.pdf
6. Braun, T. (2013): A nuclear chemist who foresaw the past: Paul Kazuo Kuroda and the OkloPaleoreactors (A nukleáriskémikus, akielőrelátta a múltat. Paul Kazuo Kuroda ésazoklóiősreaktorok) VEGYIPAR- ÉS KÉMIATÖRTÉNET (4 pages) http://www.mkl.mke.org.hu/2013-evi-szamok/2013-marcius/313-2013-marcius-tartalom.html or see https://dl.dropboxusercontent.com/u/10640850/A_nuclear_chemist_who_foresaw_the_past_Paul_Kazuo_Kuroda.pdf
7. Burbidge, E.M., Burbidge, G.R., Fowler, W.A. and Hoyle, F. (1957): Synthesis of the elements in stars. Reviews of Modern Physics, 29: 547-650. http://adsabs.harvard.edu/abs/1957RvMP...29..547B
8. Chadwick, J. (1932): The existence of a neutron. Proceedings Royal Society London A: Mathematical, Physical and Engineering Sciences, 136 (830): 692-708. http://rspa.royalsocietypublishing.org/content/royprsa/136/830/692.full.pdf
9. Chadwick, James (1935): The neutron and its properties, 1935 Nobel Lecture in Physics. https://www.nobelprize.org/nobel_prizes/physics/laureates/1935/chadwick-lecture.pdf
10. Clark, R.S., Yoshikawa, K., Rao, M., Pa;mer, B.D, Thein, M. and Kuroda, P.K (1967): Time interval between nuclear detonation and formation of single fallout particles. J. Geophysical Research Letters, 72 (6): 1793-1796. http://onlinelibrary.wiley.com/doi/10.1029/JZ072i006p01793/full
11. Clery, D. (2016): Could Earth be fried by a 'superflare' from the Sun? Science News.http://www.sciencemag.org/news/2016/03/could-earth-be-fried-superflare-sun
12. Cronin, J.R. and Pizzarello, S. (1997): Enantiomeric excesses in meteoritic amino acids. Science, 275 (5302): 951-955. http://science.sciencemag.org/content/275/5302/951
13. Drieschner, M., ed. (2014): Carl Friedrich von Weizsäcker: Major Texts in Physics, Springer-Briefs on Pioneers in Science and Practice (Springer Cham, Heidelberg, Michael Drieschner, editor, 189 pages)

http://link.springer.com/book/10.1007/978-3-319-03668-7https://www.kobo.com/us/de/ebook/carl-friedrich-von-weizsacker-major-texts-in-physics
14. Gray, C.M. and Compston, W. (1974): Excess ^{26}Mg in the Allende meteorite. Nature, 251: 495-497. http://www.nature.com/nature/journal/v251/n5475/abs/251495a0.html
15. Hwaung, G, and Manuel, O.K. (1982): Terrestrial-type xenon in meteoritic troilite. Nature, 299: 807-810. http://www.nature.com/nature/journal/v299/n5886/abs/299807a0.html
16. Karoff, C., Knudsen, M.F., Cat, P.D., Bonanno, A., Fogtmann-Schulz, A., Fu, J., Frasca, A., Inceoglu, F., Olsen, J., Zhang, Y., Hou, Y., Wang, Y., Shi, J. and Zhang, W. (2016): Observational evidence for enhanced magnetic activity of super-flare stars. Nature Communications, 7:11058 doi:10.1038/ncomms11058 http://www.nature.com/ncomms/2016/160324/ncomms11058/pdf/ncomms11058.pdf
17. Kotov, V.A. (1996): A pulsar inside the Sun? Radiophysics and Quantum Electronics, 39: 811-814. http://link.springer.com/article/10.1007%2FBF02120961
18. Kuroda, P.K. (1956): On the nuclear physical stability of the uranium minerals. Journal of Chemical Physics, 25: 781. http://aip.scitation.org/doi/10.1063/1.1743058https://www.researchgate.net/publication/234550793_On_the_Nuclear_Physical_Stability_of_the_Uranium_Minerals
19. Kuroda, P.K. (1960): Nuclear fission in the early history of the Earth. Nature, 187: 36-38. http://www.nature.com/nature/journal/v187/n4731/abs/187036a0.html
20. Kuroda, P.K. (1982): Origin of the Chemical Elements and the Oklo Phenomenon (Springer, 165 pp) http://www.amazon.com/Origin-Chemical-Elements-Oklo-Phenomenon/dp/3540116796
21. Kuroda, P.K. (1992): My Early Days at the Imperial University of Tokyo (1936-1949). University of Missouri-Rolla (editor, O. Manuel) 69 pp.http://www.omatumr.com/abstracts2005/PKKAutobiography.pdf
22. Kuroda, P.K., Damon, P.E., and Hyde, H.I. (1954): Radioactivity of the spring waters of Hot Springs National Park and vicinity in Arkansas. American Journal of Science, 252: 76-66 http://www.ajsonline.org/content/252/2/76.extract
23. Kuroda, P.K. and Myers, W.A. (1994): Plutonium-244 in the most primitive meteorites. RadiochimicaActa, 64: 167-174. https://www.degruyter.com/view/j/ract.1994.64.issue-3-4/ract.1994.64.34.167/ract.1994.64.34.167.xml
24. Kuroda, P.K. and Myers, W.A. (1996): Aluminum-26 in the early solar system. J. Radio-analytical and Nuclear Chemistry, 211: 539-555. https://link.springer.com/article/10.1007/BF02039715
25. Kuroda, P.K. and Myers, W.A. (2000): Xenology, FUN Anomalies and the Plutonium-244 Story. In: Proceedings of the American Chemical Society symposium on Origin of Elements in the Solar System: Implications of Post-1957 Observations (edited by O. Manuel, Kluwer Academic/Plenum Publishers) pp. 431-499.
26. Lewis, R.S., Srinivasan, B. and Anders, E. (1975): Host phase of a strange xenon component in Allende. Science, 190: 1251-1262.http://www.sciencemag.org/content/190/4221/1251.extract
27. Manuel, O.K. (1966): Binding energy of the nucleus. In Programme of the 1966 Annual APS Meeting in New York (26-29 Jan 1966), abstract EB1, Bulletin of the American Physical Society, 11 (1): page 82.
28. Manuel, O.K. (1978): How a single supernova made the solar system. In: Proceedings of the Robert Welch Foundation Conference on Chemical Research **XII**. Cosmochemistry, pages 263-272. https://dl.dropboxusercontent.com/u/10640850/Cosmochemistry.pdf
29. Manuel, O.K., ed. (2000): Proceedings of the American Chemical Society symposium: Origin of Elements in the Solar System - Implications of Post-1957 Observations (Edited by O.K. Manuel/ Held August 22-26, 1999 in New Orleans, Kluwer Academic/Plenum Publishers) 646 pages. http://www.springer.com/us/book/9780306465628
30. Manuel, O.K. (2001a): Memorial: Paul K. Kuroda. Meteoritics& Planetary Science, 36: 1409-1410: http://www.omatumr.com/abstracts2005/KurodaWriteupMeteoritic.pdf
31. Manuel, O.K. (2001b): Professor Paul Kazuo Kuroda 1917-2001. Geochemical Journal, 35 (3): 211-212. http://www.omatumr.com/abstracts2005/KurodasWriteupGeochem.pdf
32. Manuel, O.K. (2011): Is the Universe Expanding? The Journal of Cosmology **13**, 4187-4190 (2011):http://journalofcosmology.com/BigBang102.html
33. Manuel, O.K. (2012): Neutron repulsion. The Apeiron Journal 19: 123-150 http://redshift.vif.com/JournalFiles/V19NO2pdf/V19N2MAN.pdf
34. Manuel, O.K. (2016a): PAUL KAZUO KURODA. International Journal of Advanced Research, 4 (12): 975-979. https://dl.dropboxusercontent.com/u/10640850/TRIBUTE_TO_KURODA.pdf

35. Manuel, O.K. (2016b): Solar energy. International Education & Research Journal, 2 (5), pp. 30-35. http://ierj.in/journal/index.php/ierj/article/download/272/256
36. Manuel, O.K. (2016c): Neutron repulsion - Powers beyond the dreams of scientific fiction. International Education and Research Journal, 2 (8): 43-45. http://ierj.in/journal/index.php/ierj/article/view/409/386
37. Manuel, O.K. (2017a): Nomination of Paul K. Kuroda for posthumous recognition. https://realclimatescience.com/2016/09/climate-fraud-whistleblower-rewards-program/ - comment-46193
38. Manuel, O.K. (2017b): An error in calculated nuclear energy. Outline of manuscript posted for comments and corrections before submission for publication here. https://dl.dropboxusercontent.com/u/10640850/Nuclear_Energy_Error7.pdf
39. Manuel, O., Bolon, C., Katragada, A. and Insall, M. (2000): Attraction and repulsion of nucleons: Sources of stellar energy. Journal of Fusion Energy, 19 (1): 93-98. https://link.springer.com/article/10.1023/A:1012290028638 and/or see the preprint at http://www.omatumr.com/abstracts/jfeinterbetnuc.pdf
40. Manuel, O.K., Bolon, C., Zhong, M. and Jamgam, P. (2001): The Sun's origin, composition and source of energy. 32nd Lunar & Planetary Science Conference, Abstract #1041 http://www.omatumr.com/lpsc.prn.pdf
41. Manuel, O.K., Hennecke, E.W. and Sabu, D.D. (1972): Xenon in carbonaceous chondrites. Nature, 240: 99-101. http://www.omatumr.com/archive/XenonInCarbonaceousChondrites.pdf http://www.nature.com/nature-physci/journal/v240/n101/abs/physci240099a0.html
42. Manuel, O.K. and Hwaung, G. (1983): Solar abundances of the elements. Meteoritics**18**, 209-222 (1983) http://tinyurl.com/224kz4
43. Manuel, O.K., Ninham, B.W, and Friberg, S.E. (2002): Superfluidity in the solar interior: Implications for solar eruptions and climate. Journal of Fusion Energy, 21 (3): 193-198.https://link.springer.com/article/10.1023%2FA%3A1026250731672
44. Manuel, O.K. and Sabu, D.D. (1975) Elemental and isotopic inhomogeneities in noble gases: The case for local synthesis of the chemical elements. Transactions of the Missouri Academy of Sciences, 9: 104-122. https://dl.dropboxusercontent.com/u/10640850/Trans_MO_Acad_Sci_9_104_(1975).pdf
45. Manuel, O.K. and Sabu, D.D. (1981): The noble gas record of the terrestrial planets. Geochemical Journal, 15: 247-267.https://www.jstage.jst.go.jp/article/geochemj1966/15/5/15_5_245/_pdf
46. Michael, K. and Manuel, O.K. (2011): Origin and evolution of life constraints on the solar model. Journal of Modern Physics, 2: 587-594 https://dl.dropboxusercontent.com/u/10640850/JMP20112600007_31445079.pdf
47. Myers, W.A. (2002): Students and associates of P. K. Kuroda (personal communication)
48. Persson, C.P. (2016): Sun can emit super-flares every 1000 years. Nordic Science http://sciencenordic.com/sun-can-emit-superflares-every-1000-years
49. Reynolds, J.H. (1960a): Determination of the age of the elements. Phys. Rev. Letters, 4: 8-10. https://www.osti.gov/scitech/biblio/4210488-determination-age-elements
50. Reynolds, J.H. (1960b): Isotopic composition of primordial xenon. Phys. Rev. Letters, 4: 351-354. http://adsabs.harvard.edu/abs/1960PhRvL...4..351R
51. Rowe, M.W. (1998): Essays in Nuclear, Geo- and Cosmochemistry. Symposium proceedings of the 1987 Southwest Regional Meeting of the American Chemical Society in honor of Dr. Paul K. Kuroda (Burgess International Group, Inc., Bellwether Press Division, 539 pp).
52. Rowe, M.W. and Kuroda, P.K. (1965): Fissiogenic xenon from the Pasamonte meteorite. Journal of Geophysics Research, 70: 709-714. http://onlinelibrary.wiley.com/doi/10.1029/JZ070i003p00709/full
53. Rutherford, E. (1920): Bakerian Lecture: Nuclear Constitution of Atoms. In: Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 97 (686): 374.
54. Sabu, D.D. and Manuel, O.K. (1976a) The xenon record of element synthesis. Paper presented at the Annual Spring Meeting of the American Geophysical Union. Transactions of the American Geophysical Union, 57: page 278.
55. Sabu, D.D. and Manuel, O.K. (1976b) Xenon record of the early solar system. Nature, 262: 28-32. http://www.nature.com/nature/journal/v262/n5563/abs/262028a0.html
56. Sabu, D.D. and Manuel, O.K. (1980): Noble gas anomalies and synthesis of the chemical elements. Meteoritics, 15 (2): 117-138. http://tinyurl.com/yqdafh
57. ScienceDebate.org (2017): March for Science: https://sciencedebate.org/march; Board: http://sciencedebate.org/board; Organizations: http://sciencedebate.org/organizations
58. Seaborg, G. T. and Loveland, W. D. (1982): Benchmark papers in physical chemistry and chemical physics, 5.

Nuclear chemistry (Hutchinson Ross Pub. Co., 488 pp.)
59. Thomson, D.J., Lanzerotti, L.J., Vernon, F.L., Lessard, M.R. and Smith, L.T.P. (2007): Solar modal structure of the engineering environment. Proceedings of the IEEE, 95 (5): 1085 - 1132. See also the report in ESA Space Science News, Moving to the rhythm of the Sun. http://www.esa.int/esaSC/SEMJJYUL05F_index_0.html
60. Toth, P. (1977): Is the Sun a pulsar? Nature, 270: 159-160. http://www.nature.com/nature/journal/v270/n5633/abs/270159a0.html
61. Weinberg, S. (2017): The trouble with quantum mechanics. In: The New York Review of Books, January 19, 2017 issue, 7 pages http://www.nybooks.com/articles/2017/01/19/trouble-with-quantum-mechanics/
62. Weinberg, S., Mermin, N.D, Berstein, J., Nauenberg, M., Bricmont, J. Goldstein, S. et al. (2017): Steven Weinberg and the puzzle of quantum mechanics. In: The New York Review of Books, April 6, 2017 issue, 5 pages. http://www.nybooks.com/articles/2017/04/06/steven-weinberg-puzzle-quantum-mechanics/
63. Weizsäcker, C.F. von (1935): ZurTheorie der Kern-massen. ZeitschriftfürPhysik A: Hadrons and Nuclei, 96: 431-458.
64. Yukawa, Hideki (1949): Meson theory in its developments, 1949 Nobel Lecture in Physics. http://www.nobelprize.org/nobel_prizes/physics/laureates/1949/yukawa-lecture.pdf