Supernovas, supervolcanos... nuclear reactors. An unpredictable wide-scale destruction of nuclear power plants from relativistic neutrons

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Abstract : ***Recent astrophysical discoveries, including actinid-rich stars and protostars close to a black hole, as well as geophysical research (for instance the proximity of zirconium and barytine mines, stable decay products of major fission products, to volcanic areas), allow to confirm, rearrange and expand the hypothesis first developed by J M Herndon in the 1990s by adaptating it fully to star cores and linking it to volcanism. I offer a contradiction of the R-process and of the chondritic model for the Earth s composition: I claim that U and Th chains are not synthetized in supernovas, but at the origin of stars and planetary cores, offer a link between nuclear fission and fusion through ternary fission processes, claim that supernovaes are the main factor for super volcanic eruptions (explaining volcano clusters) and suggest that neutrons expelled by supernovas, accelerated by the disappearance of attraction forces, constitute accelerated matter explaining gravitational waves. These neutrons are obviously able to destroy as well nuclear plants on a large perimeter.***

The « actinid boost » is a long-time issue which can be resolved – so is the issue of "volcano clusters". Some stars have been confirmed to be uranium and thorium-rich. The ash of the St Helens volcano was depleted in U238 and Th232 (Strauss, Sherman, Pehl 1981). This is confirmed by spectral research, see for instance Hill et al (2017) as well as Barbuy et al (2011). Both teams found U and Th – rich stars and used the classical theory to assess that these stars are very old. They may on the contrary be extremely *recent* agglomerates of matter.

Type 1A supernovas are evidence : the passing of a big star close to a very small one mean that the small one will receive much more neutrons as well as hydrogen captured by gravity than it is accustomed to in its internal nuclear equilibrium ; thus it reacts extremely violently, and goes hypercritical. The bright light of Type 1A supernovaes confirms that dwarf stars are mostly made of U & Th (as well as of the Bi209 from the Np237 chain), failed to light up and thus did not accumulate the much needed hydrogen moderator and fusion fuel. The amount of unfissioned U and Th explains extremely well the brightness of these supernovaes which are highly dominated by fission whereas other supernovaes are more equilibrated between fission and fusion (as the internal U and Th core collides with the outer sphere at detonation, compressing it and fusing it).

R. J. De Meijer and W. van Westrenen 2008 note that « *The KamLAND collaboration presented the first evidence for geoneutrinos (antineutrinos produced within the Earth) in July 2005. Development of direction-sensitive antineutrino detectors should provide a means for a critical test of our hypothesis. The first step in the development of this type of detector has recently been completed with success. Measurements with an array of these detectors could reveal whether elevated concentrations of U and Th are present in the CMB, and if so, could identify the process by which heat is produced.* ». G. V. Domogatsky et al (2004) also note a possible antineutrino confirmation of fission in the Earth's core. G.J. MacDonald (1988) also notes findings of dihydrogen gas in the Kola borehole in Russian territory. Last point, the findings that zirconium and barytine mines are concentrated near old extinct volcanoes or hydrothermal areas are a good confirmation that these elements are the stable decay products of nuclear fissions underground. This is also shown by the explosive nature of “tornillos” associated with magma production in subduction areas that can easily be compared to the typical signal of underground nuclear tests. These element can allow us to reconstitute a planetary and stellar motor for temporary increases of fission and fusion, where the fuel for fusion is provided by ternary fission processes, explaining the accumulation of dihydrogen as well as other light elements close to the Earth’s surface. The discovery that barytine and zirconium mines are located close to old volcanoes confirms that nuclear fission is the motor for magmatic formation and explains the contribution of water to explosive increases of magma in subduction magmatic chambers, as water brought by subduction is the perfect incident neutron moderator for nuclear fission supercriticities propped up sometimes by the impact of neutrons from nuclear supercriticities in stars. It suggests a direct link between novas, supernovas and volcanism. This is also confirmed by the high intensity of the antineutrino flux in KamLAND, close to a subduction area of the Pacific belt.

The discovery by the team of James Head (2011) of an intense volcanism on Mercury also confirms the heavy interaction between solid U/Th planetary cores and neutrons from the permanent fission processes in stars. Mars, where iron oxyde is significant, can be opposed to Venus, with a lot of basalt and volcanoes (where the planet seems an immense volcano bubble), and thus Mercury certainly was even more active but has, in a way, “expired” because of too much neutron fallouts from the Sun burning fast its actinids. The organisation of the Solar System seems in a way to show that in the proto disk, much more compressed, iron separated the dense U and Th chains on one side and the lighter elements on the other (reproducing in reverse the Aston curve), where actinids have likely accumulated in the planets closer to the Sun (this is also confirmed by research by Laura Schaefer and Bruce Fegley Jr (2003) showing lead and bismuth snow on Venus). Mars is in an intermediary position, where iron from fusion processes in the proto disk would have already accumulated. Gases, partly fused, from ternary fission processes, have been mostly expelled beyond, on the form of giant gas planets. The chondritic asteroid belt would represent a rupture zone (for instance from the impact of an massive object like a very small star) where iron would have been the interface in the proto disk, explaining thus that the iron-rich chondrites do not match the content of planetary cores closer to the Sun. This again suggests a vast amount of U and Th in the cores of planets (as suggested initially by J M Herndon[1]).

It is obvious that gas bubbles would not alone survive close to a black hole. A much heavier star core, made with actinids, would however resist the permanent attraction of the black hole. The recent discovery of proto stars close to a black hole is an excellent confirmation that stars are not made with light elements but with heavy, radioactive actinids, compressed up to a permanent fission reactor thanks to the strength of gravity, where complex nuclear reactions create the hydrogen fuel (tritium for instance is an unfrequent fission product from ternary fission) for the parallel nuclear fusion process and the thermalisation of neutrons, whereas gravity also slows down neutrons.
Positrons from the capture of helium-4 nucleii of actinid decay and ternary fission products (where lighter elements capturing an alpha particle decay by emitting a positron) are one element as they conjoin with neutrons and beta particles of fission products to create hydrogen. Fission products beta particle decay is also crucial and demonstrates here its “usefulness” in the global star cycle. Tritium from ternary fission also is a source for helium-3 which then produces protons through neutron impacts, an explanation for protons in cosmic rays. Ternary fission also rarely produces mere protons which may directly combine with electrons to produce hydrogen. Fission products and their transmutation are a key in production of other elements together with nuclear fusion of for instance helium-4 from ternary fission products (in combination with the electrons of fission

[1] I discard any relation with his claims on « chemtrails » and « geoengineering »...

products beta decay). Hence ternary fission is key in providing the usual nuclear fusion cycle with its fuel. I claim that light elements in stars are solely the product of nuclear fission, ternary fission products and radioactive decay, through combinations of the elementary particles in a context of high gravity forces and temperature, and of course slow capture of neutrons, which also contributes obviously to the diversity of heavy elements beyond the iron limit of the Aston curve, from fission product activation combinated with radioactive decay.
Neutron stars are also an excellent way to see the expulsion of all fission product matter outwards in violent hypercriticity events where only neutrons remain at the end, agglomerated and compressed by their own gravity forces.
A thermonuclear reactor at equilibrium is obvious, where interactions with nearby supernovas are a major and essential factor in star divergence onto supernova through intakes of neutrons and other elements (hydrogen and helium gas for instance) disrupting the internal equilibrium, and “waves of supernovaes” from one star to another (one future example could be Saiph, variable supergiant red star near Barnard’s Loop, where the variations of magnitude are a good indicator of the recent impact of neutrons from the supernova that created Barnard’s Loop, or maybe another cloud of gas in the Orion constellation). These neutrons are major constituents of the masses of accelerated matter that explain gravitational waves (which is also confirmed by the recent confirmation of gravitational waves in association with the collision of neutron stars, likely to expel a lot of neutrons at impact and implosion under themselves).

It also appears that supernovas close to Earth like the one giving birth to Barnard’s Loop are linked to supervolcanoes, in this case the Huckleberry Ridge Tuff and Cerro Galan supervolcanos. Neutrons from the Lagoon Nebula may also be linked. It may be possible to envision a better datation by linking Lagoon Nebula initial blast to Barnard’s, which could have happened closer to each other than thought until now, and a method for predicting supervolcanoes from supernovaes. The high temperature of stars around SN1987A even more suggests that the dramatic event provided neutrons to the fission core of these stars. The sudden relapse of gravity when a star explodes could act as a propulsive power for its own fission and fusion neutrons, which may gain speed up to close to the speed of light. All the VEI 6 volcanic eruptions in the 20th Century can be linked to supernovas which happened close to Earth in recent times : G1.9+0.3 happened approximatively in 1898 according to recent research and this event can be linked to the Santa Maria (VEI 6) and Montagne Pelée (VEI 4) eruptions of 1902 as well as the beginning of the activity of Novarupta (1912, VEI 6[2]) and of the Cerro Azul (1903, which led to a VEI 6 eruption in 1932 after a succession of volcanic events). SN 1987A may be linked to the Pinatubo eruption of 1991 (VEI 6), Hudson in Chile (1991, VEI 5+) as well as Rabaul (1990 - 1995) and Unzen volcanos (1991). For the Samalas supervolcano in 1257 (see Lavigne et al (2013) as well as Oppenheimer (2003)), SN1006 could be the ideal explanation (in which the magma would have accumulated during a longer period than usual, leading to a bigger eruption than in the VEI 6 cases discussed above). SN1054 and SN1181, after SN1006, may also have contributed if the Indonesian archipelago was on their side at impact. SN 1604 may be linked to a lengthy accumulation of magma leading to the Mount Tambora supereruption (with the possible supplementary contribution of Cas A), and can even be linked locally to events such as the small volcanic eruptions that actually took place in the granitic – uraniferous-rich Mercantour massif in the French Alps, recorded in 1612 after the disappearance of an entire village into a crater of “flames” (a plaque still commemorates the event in the Cians with the inscription “Hic omnes disparuerunt recquiesant in pace – 1612”) and another lava flow recorded at the same time (again in the Cians in the Raton mountain near the Dôme du Barrot) – see Rossi (2017). SN1604 also coincides with highly destructive eruptions in the Mediterranean area (Vesuvius 1631, Kolumbo (Santorini area) 1650 and Etna 1669). It actually makes sense that light may be refracted and slowed down for instance in the Milky Way because of clouds of refractive materials with no similar effect on fast neutrons so that neutrons come *earlier*,

2 « However, there are also abundant data for magma interactions leading to disequilibrium assemblages over a range of time scales leading up to the 1912 eruption. » Hammer et al (2002)

hence linking Type 1a SN1006 with the Mount Baekdu supervolcano in 946 (where the magnitude of a Type 1A supernova explains the magnitude and quickness of development of the event). Of course as always it is a precise side of the planet that is blown and thus a cluster of eruptions in a localized area, e.g. one continent, ensue. Spontaneous fission of U238 underground, as well as the periodic increases of solar activity, should be related to less powerful eruptions...

The SN1987A-triggered wave of eruptions in the Pacific matches the K431 accident in Vladivostok area in August 1985. Light from the supernova could easily have been slowed down for a few years by refractive material. We see the first seismic activity in the Nevado del Ruiz in early September 1985 (yet it can be expected that underground nuclear fission, propped up by supernova neutrons, takes nevertheless months or years to diverge to above criticity threshold, because molten down matter will go up, reducing pressure and thus increasing critical mass, every time the natural reactor accelerates). The K431 nuclear attack submarine was, according to reports, surfacing and in refueling at the moment of the blast, and hence unshielded from fast neutrons by layers of water. A bad manipulation in refueling would have officially triggered the supercriticity, nevertheless a simple melting down of the core could have been expected, yet the supercriticity was explosive. For that reason, and because it is in the target area for SN1987A and matches the beginning of volcanic activity in the Nevado del Ruiz, I suggest that fast neutrons coming from SN1987A came on August 10 and destroyed the K431 reactor.

Conclusion :

The cross section for fission at very elevated neutron speeds of all actinids including U238, Th232 are rising due to second-chance fission, i.e. (n, 2nf), third-chance fission, etc. and giant dipole resonance. It is obvious that the impact of a significant neutron wave will result in the destruction of all working nuclear reactors in a wide area. SN1987A was, compared with Kepler's Star or Tycho's Star, magnitudes less powerful. Nuclear reactors can be expected to be destroyed by the impact, not simply molten down, and the catastrophe should happen simultaneously in reactors on a wide area, e.g. continent-wide.
Such waves cannot be predicted. Clouds of dark matter may make it for instance impossible to see dwarf stars that are in the path of giant red stars, and Type 1A are the most neutron-rich supernovas. It is impossible to shield completely nuclear reactors but building very large pools of water above and on top of current nuclear plants could be a partial remedy, yet the structure must be solid enough to avoid any chance of an explosion bringing flows of water on a molten nuclear core. It is a good for a bad. The alternative is to use dihydrogen tanks all around confinment areas, with the obvious fire risk and the clear target it represents for terrorism, yet that light gas should not totally enter in contact with the core in case the confinment is broken by a blast and the moderating effect on neutrons would be much more limited. In future times all new nuclear plants should be built deep underground and all employees should control the plant from a significant distance, allowing that any explosion of the plant be solely an underground earthquake without any human casualty (and I also personally campaign for the generalization of subcritical designs, cooled with helium, using U238 and its decay products, i.e. mine tailings U234, Th230...). The costs for building underground plants will be very significant, reducing significantly the competitiveness of nuclear energy. States using nuclear energy for e.g. aircraft carriers should look for alternatives, e.g. low energy nuclear reactions and lasers, and the same comment applies for space missions with onboard nuclear reactors.

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