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Stellar Electron and Proton Shells
An Addendum to A New Cosmological Model?

by A.C. Sturt

This is an addendum to the note which I wrote after the one-day symposium held at the Royal Society on 20 November 2013 in partnership with the Norwegian Academy of Sciences. The symposium was entitled Frontiers in Astronomy: from the beginning of the Universe to the outer reaches of the Solar System. My thesis was that the destruction of heavy nuclei which had been achieved in the Large Hadron Collider showed that this process would also be possible in stars, which are known to have comparable conditions. In that case the abundances of heavy metallic nuclei observed in stars would be the result of a dynamic equilibrium in which they are both formed and destroyed. As I pointed out, this would lead to a complete revision of the current cosmological model.

On reflection, there are a number of other significant conclusions, which may chime with recent observations.

Gravitational forces in stars generate the pressures and temperatures which cause nuclear fusion, but stars are not homogeneous entities. For instance, the conditions in the interior are different from those on the surface, where their ‘atmospheres’ meet the void of space and where there are known to be intense magnetic fields. There may also be heterogeneity within the body of the star through turbulence and poor ‘mixing’. It may be that this heterogeneity provides the loci for nuclear destruction.

Matter is continually erupting into the surrounding space from the ‘cauldron’ which is the star, whether as bulk material or as individual particles. Gravitational attraction causes most or perhaps all of this to fall back into the star. Primary particles which fall back could undergo fusion, and if the bulk material is also reduced to primary particles, these too could undergo fusion to start the cycle of nuclear fusion followed by destruction again. This is all part of the dynamic equilibrium of the stellar system along with the destruction of nuclei and fusion of primary particles which never left the body of the star.

The trajectory of particles ejected from the star would be radially out into space. They would not be in orbit like the rocks in the Kuiper belt, so that there would be no component of centrifugal force to offset gravitational attraction to the star. It would be straight ‘up’ and ‘down’ to the centre of gravity of the star, and this would occur independently of any rotation of the star itself.

The products of destruction of nuclei in this way would be mainly individual electrons and protons. The force which ejected them would be the greatest force known to physics, the strong nuclear force. The ejected particles would travel to very great ‘heights’ above the surfaces of the stars, much further than the Oort cloud at 40,000 AU. Electrons would travel furthest because they have the lowest mass.
They would be slowed down during transit by the star’s gravitational pull, until they eventually came to a ‘standstill’ before beginning their fall back to the star.

The result would be an entire shell of electrons surrounding the star at a distance which could be calculated by Newtonian mechanics, given a few simple measurements of their velocities at various points. Between the electron shell and the star would be a proton shell formed by the same process. This would be much closer to the star than the electron shell because of the much greater mass of the proton, again a calculable distance. There might also be 'hybrid' particles made from bits of protons with charge, which would enable them to be accelerated magnetically. There would be a constant flow of particles out from the star, and a constant flow back again of those which failed to reach escape velocity. The distances of these shells from their stars would vary according to the mass of each star in accordance with Newton's law of gravitation.

There are a number of observations which may support the model:

Particles on their way back to the star would be 'cosmic rays', or particles of unknown origin. There is a suggestion that the direction of origin of cosmic rays as observed on Earth tends to be towards the east, which would fit the model. Material is seen to fall back into the Sun after particularly violent eruptions, and it has been reported that material has been observed falling back into the star after a supernova explosion.

The entire surface of the Sun has been reported to be covered in magnetic 'fields', which would support the idea of accelerator processes. In addition, the Sun's corona is very much hotter than its surface, with a temperature of 5 million ºK compared with 6000º K. This indicates that some kind of process must be occurring above the surface. An explanation of this could be that particles free of the bulk would be able to accelerate to much higher velocities, which according to my analyses would produce much higher electromagnetic frequency radiation, the indicator of higher temperature. If particles at these higher velocities underwent further acceleration again, the electromagnetic frequency and the temperature it indicates would be higher still.

These are also conditions, according to the structure of nuclei which I have proposed, in which collisions might occur that could result in unzipping of metallic nuclei into free electrons and protons. These would then be propelled into space by the strong nuclear force which had bound them in the nuclear structure. In support of this, it has been reported that, when bursts of electrons are received from the Sun, which might result in Northern lights on Earth, they are followed by protons at a measurable interval of time. This is in agreement with my model.

Finally a graph was presented at Astrofest 2014 which showed that Voyager 1 has encountered a sharp increase in the particle count as it enters interstellar space. The conventional explanation, if I understood it correctly, is that the spacecraft was leaving the calm waters of the Solar System for the rough weather of the interstellar ocean. In fact the opposite seems to me to be true; it is stars which cause disturbances by definition, and interstellar space should be dead calm. My explanation would be that Voyager 1 has encountered a shell of particles ejected from the Sun, as I describe above.

The picture which emerges is of a star encapsulated in a negative shell of electrons with a positive shell of protons at a distance inside it, a sort of giant capacitor arrangement. Both shells are manufactured and replenished by the star itself, and they are quite separate from the rubble left over from the formation of the Solar System, which orbits the Sun in the plane of the ecliptic. This is almost a self–perpetuating system, sustained by its dynamic equilibrium, but stars come in all sorts of different masses and colours, and so there must be a way of introducing change into the system, which is evolution of the star. This is caused therefore by gaining mass from, or losing mass to, other celestial bodies outside its influence. Such a process is driven by the ceaseless relative motion of stars circulating within galaxies which brings some of them into close enough proximity to interact. The ultimate fate of any particular star would then depend on stochastic encounters determined by the motions of stars within the whole system. In the infinity of time, all would suffer this fate.
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This analysis applies to all stars; there is no reason to believe that our Sun is unique in this respect. It follows that electromagnetic radiation from all stars has to pass out through the electron/proton shells on its way to other stars. Moreover, all starlight which penetrates the Solar System has to pass through the Sun's electron/proton shells in the reverse order to be observed on Earth. Such processes might lead to distortion, refraction and even diffraction effects in observations.

Furthermore, if all stars approach each other wrapped in shells of electrons/protons, this may affect their relative motions. An electron shell would be easily deflected by the approach of another. Like negative charges on bar magnets, they would be chased to the 'other' side of the star. Protons would be much more difficult to shift, because of their much greater masses. It is possible that a significant fraction of a star's mass might be tied up in such shells, which would incidentally be invisible. If the shells stretch far enough out from a star, they may even form labile connections between stars in the form of the interaction of overlapping shells, as they follow their own paths inside galaxies. This may even be what distinguishes galaxies from ransom collections of stars, since galaxies also move as entities relative to each other.

One final thought concerns neutron stars. These are extremely dense bodies, and some rotate at scarcely credible speeds. It is doubtful whether valid conclusions can be drawn on the basis of Doppler shifts, which according to my analyses do not apply to particles of light. However, measurements would make much more sense if what was rotating was an electron shell held close to the surface of the body. Electrons could move at anything up to the speed of light, given the appropriate magnetic fields. This would also fit my model of a neutron as essentially a proton with an electron in close orbit around it. A neutron star would be a very large neutron indeed!

This is all very speculative of course, but the model could be tested by direct measurements of particle velocities in space. It would be worth the patience and resources to launch a thirty year experiment to settle the questions remaining of the expanding Universe and the Standard Model of physics, rather than looking for ever more mysterious particles to solve their problems.

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