Example of article review on when stars go bang

Literature

The term ‘ nova’ is the Latin name for a new star and was first used in 1573 by Tycho Brahe, a Danish astronomer. No matter how bright a new star can be, its brightness lasts for a span of weeks and then fades to obscurity. A novae normally occurs in binary systems where a normal star transfers matter onto a white dwarf. One of the major processes that occur is the piling of hydrogen onto the dwarf an aspect that generates heat. The heating continues especially on the outer layer as the dwarf ignites in a runaway. This causes a thermonuclear reaction that blows off the accumulated hydrogen gas-a nova outburst. This process does not alter the composition or even the shape of the white dwarf as it remains intact.

The ability to differentiate between the different types of stars or rather ‘ novae’ has been a challenge to most of the astronomers. For instance, due to lack of enough features to characterize the ‘ supernovae’, some of the renowned astronomers, Fritz Zwicky and Walter Baade, referred to the most resistant ‘ novae’ as the ‘ supernovae’. The discovery of neutron stars had not yet been done an aspect that would have enabled them to have a clear understanding about the difference between the two types of stars. One of the characteristic features of novae is the emission of a gamma-ray burst (BRB). One of the historical emissions occurred on 19 March 2008. The event was captured by spacecrafts e. g. the NASA’s Swift Satellite and two robotic high-resolution cameras-TORTORA and Pi located in Chile.

The visible spectra of supernova can be divided into two depending on amount of hydrogen it contains at its peak brightness. Type I has little evidence of the presence of hydrogen while type II has significantly high amounts of the gas. The Type I supernovae are further divided into three groups namely Ia, Ib, and Ic. Ia arises from the total destruction of the white dwarf and has no GRBs. The process involves a matter-transferring binary system with a normal star, which is not the case with types Ib and Ic. They result from stars that become unstable, collapse and explode over the course of time. Other aspects help in the determination of the different type of supernova. They include its spectrum, light curve as well as the graph of brightness changes. The driving energy for a supernova comes from the radioactive decay of freshly synthesized elements specifically nickel-56, the shock wave generated by the heating of the star's accumulated hydrogen and the star's ejecta and the hydrogen gas in vicinity.

The type of supernova are further characterized by their brightness and uniformity. The Type Ia is the brightest and most uniform an aspect that results to its large deposits of radioactive elements. However, it is not easy to differentiate between type I and type II supernova because the spectra of their light curves all show nitrogen. There are four types of Type II supernova: II-P, II-L, IIb and IIn. They differ in their brightness, the time they remain bright, the type of decay after their peak brightness and the concentration of both hydrogen and helium as indicated by their lines of the respective gases. For proper differentiation of the supernova, one has to be able to read the supernova spectrum through the various processes involved.

A star with much lower mass like the Sun can live for billions of years. Additionally, when the hydrogen and helium fuel is over, they become dimmer and dimmer and finally die because they cannot get hot enough to fuse carbon. It dies by puffing out its external layers to create intensifying planetary nebulae. They develop dead iron cores that explode to supernova. The outermost shell increases to assist the heat from the core escape into the space while the core of helium begins contracting, and the external layers swell and chill, becoming redder as they glow. The star becomes red giant at this stage, which happens to be its initial stage of old age and formed when hydrogen-burning process completes of eight and below solar masses. Every star regardless its size must run out of fuel and collapse. This happens because of the core running out of helium fuel and for it to maintain equilibrium; the core contrasts to instigate the last type of fusion called carbon burning. When carbon burning takes place iron is formed and the most stable of all the nuclei that takes away energy. The rate of collapsing increases with decrease in temperature and fusion fuel. The pressure and energy compress the central part further thus forming a rapidly spiraling ball of neutrons that brings about neutron stars. Generally, stars undergo several changes in their life time that not only change their appearance but also their composition. The processes entail the transfer of energy from one body to the other.