A Common Misconception

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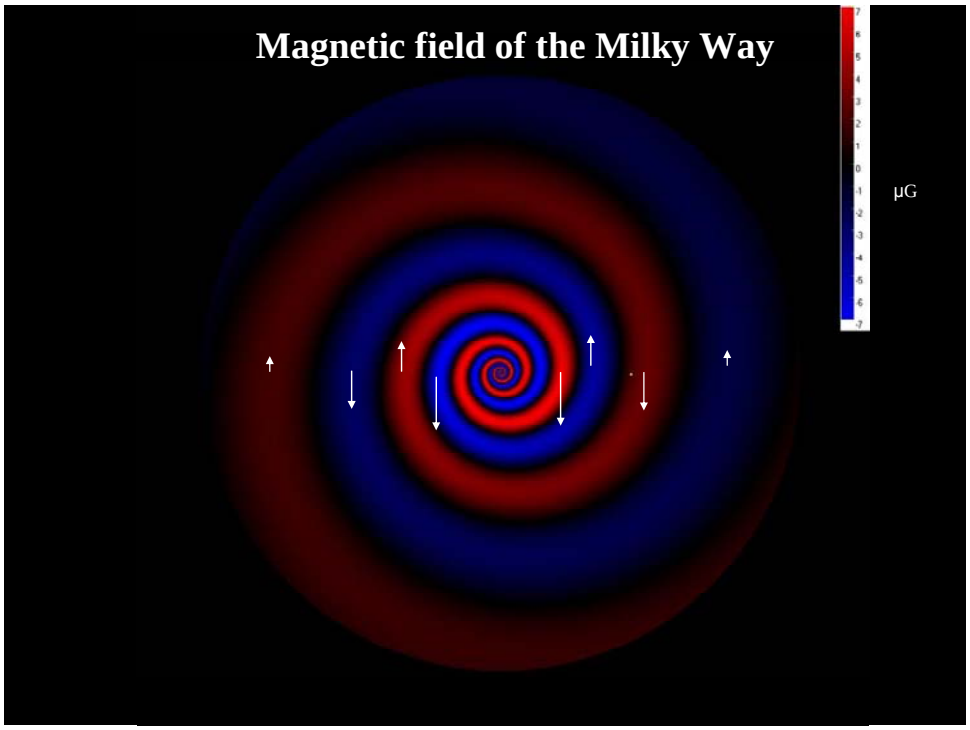
There is a common misconception concerning supernova explosions than can lead to an underestimation of the danger they pose to planet Earth and its inhabitants. Galactic cosmic rays (GCR) are believed to be the by-products of an exploding star, called a supernova. GCR consists of 98% baryons and 2% electrons. The baryons comprise 87% protons (hydrogen nuclei), 12% alpha particles (helium nuclei) and about 1% heavier nuclei.

In general, supernova explosions are viewed as an expanding spherical wave in 3-dimensional space. And thus, the concentration of GCR should fall off as a function of the inverse cube of the distance from the supernova event. But this is a common misconception. GCR are charged particles. When charged particles pass through a magnetic field, their path is deflected. Even though the galactic magnetic field strength is fairly weak ~1.4 micro Gauss (μG) near our solar system, this galactic field has the ability over time to deflect GCR path in the direction of the galactic magnetic field lines.

The following drawing depicts the magnetic field of the Milky Way. The magnetic field lines flow in one direction within the spiral arms and in the opposite direction between the spiral arms.



Source: Andrii Elyiv and Bohdan Hnatyk, *The Propagation of Ultra High Energy Cosmic Rays in the Galactic Magnetic Fields*, 2-13 July 2004, International School of Cosmic Ray Astrophysics, 14th Course: "Neutrinos and Explosive Events in the Universe", A NATO Advanced Study Institute

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The concentration of GCR radiation from a supernova event will take on the shape similar to a high-powered flashlight or more exactly a particle beam many light years across in width as it travels out of the pipe of the spiral arm. As a result, the burst of GCR radiation from a supernova can travel vast distances within the Milky Way without significantly diluting its concentration. GCR radiation can be viewed in geological time as a steady state background of low-energy radiation (100 MeV - 10 GeV), a period of relative calm, with intermittent large bursts of high-energy radiation triggered by supernovae that quickly taper off in energy levels within years/decades.

Did a Supernova cause the Collapse of Civilization in India?

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Did a supernova cause the collapse of an early civilization in India around 2500-3000 BC and also halt construction of the Tower of Babel? I reviewed ancient writings from two civilizations that appear to describe the effects of an ancient supernova in the Northern Hemisphere. These were ancient texts of India and those contained in the Bible. (This theory should be considered a radical theory. Currently no physical evidence supporting this supernova exists beyond the accounts in ancient writings.)

Professor R. N. Iyengar published a paper discussing several ancient writings from India, which described an early natural disaster associated with a supernova in the Pleiades star cluster. The paper titled "Profile of a Natural Disaster in Ancient Sanskrit Literature" was published in the India Journal of History of Science, 39,1 (2004) pp 11-49, INSA, N. Delhi. Pleiades also referred to as the Seven Sister; is a nearby open star cluster, only ~400 light years from Earth. This position is very close to Earth and a supernova from this open star cluster would be very energetic to the planet. Pleiades' position is +24 degrees declination. This means that direct radiation damage from a supernova in this open star cluster would primarily affect the Northern Hemisphere. Pleiades contains approximately 500 stars. Professor Iyengar estimates this supernova took place c. 2500-3000 BC.

The Aranya-parvan text describes a strange fire associated with the Pleiades, indicating an exploding or brightening star that was said to grow bigger day by day for five days. The fire was described as a huge metallic glow and lightning. It shined in the reddish sky like the rising sun. It was equivalent to the Sun in its light. It hit the sky several times with its two hands. When it made a loud sound, a large number of people fell down.

This passage appears to describe a nearby supernova, which produces several energetic bursts, which caused many people to instantly drop down dead. A burst of very high-energy Galactic Cosmic Rays (GCRs) could kill individuals exposed in the open. The loud sound did not cause people to fall down; rather the pulse of radiation locally ionized the atmosphere producing thunderclaps.

A burst of GCR radiation will give the sky a reddish tint. [99.03% of the air in the atmosphere is composed of nitrogen and oxygen. Generally these exist in a stable form of nitrogen (N_2) and oxygen (O_2) molecules. GCR collisions with these molecules as they cascade down through the atmosphere would break apart and disassociate the molecules into ions. Many of these ions will recombine to form nitric oxide (NO). Nitric oxide can quickly combine with oxygen to form nitrogen dioxide (NO_2). Nitrogen dioxide is a reddish brown gas.] This reddish tinting of the sky as reported in early text from India is another visible warning sign.

The Adi Parvan text describes this fire as taking the form of a fiery horse head that spews fire from his mouth and drinks water in the ocean.

The supernova producing a star as bright as the sun would produce a great amount of thermal energy. The Earth would essentially have two suns for a short period. The energy would generate considerable heat. The Earth would tap into a natural heat transport mechanism (water) for relief. Elevated evaporation rates would significantly reduce water levels in the oceans, rivers and lakes, carrying the heat high into the atmosphere to be vented into deep space. Massive cloud cover and mist would form, turning the sky opaque and dark. This would limit further supernova observations. The reflective cloud cover would also limit the effects of further planetary surface heating.

The Verdic text reads "Out of fear for you, the dark-skinned tribes went away helter-skelter, abandoning their possessions when you blazed forth."

Perhaps this is not driven by fear but dementia.

What would happen to those that survived a massive GCR burst? It is known that strong nuclear particle radiation can adversely affect the brain by producing delayed cognitive impairment including memory loss, personality changes, and dementia. (HealthAtoZ.com) Dementia is linked to madness, insanity, and a marked decline from the individual's former intellectual level and often is coupled with emotional apathy. Dementia in its mild stage produces dysfunctions in memory, attention and abstract reasoning. It begins to produce mild language impairments. As dementia progresses to moderate levels, it produces a variety of language disorders (the loss of the ability to use words as symbols of ideas, the inability to speak fluently, selecting the wrong words or bizarre word combinations). In a severe state of dementia, speech becomes non-fluent, repetitive and largely non-communicative, auditory comprehension becomes very limited and many individuals become mute.

The Salya-parvan text describes what happened next: a severe drought occurred for a period of twelve years. Lakes, rivers, wells and springs with no water were not seen due to nature's wrath. Reservoirs dried up, assemblies (of people) dissolved, and scholarly studies, sacrifices and celebrations were withdrawn. Agriculture, dairy, and commerce were given up. Empty cities and burnt down villages filled with the cries of goblins, became collecting places of bones.

If whole societies were inflicted with dementia, these events would come to past. If a severe famine swept an area, society would rely heavily on commerce. Is it not strange that commerce was given up?

Ancient Greek mythology also refers to the mysterious Pleiades. Why is the Pleiades referred to as the Seven Sisters when only 6 stars are easily visible? Could it be that the missing star was destroyed in a supernova explosion? According to Greek legend, the Pleiades were 7 sisters, all which were originally visible. But the 7th sister became invisible due to her shame of having fallen in love with a mortal man.

There are two passages in the Bible that instill a sense of wonder pertaining to this event. The first reads:

> **He who made the Pleiades and Orion**
> **And changes deep darkness into morning,**
> **Who also darkens day into night,**
> **Who calls for the waters of the sea**
> **And pours them out on the surface of the earth,**
> **The Lord is His name.**
> **It is He who flashes forth with destruction upon the strong,**
> **So that destruction comes upon the fortress.** Amos 5:8-9

What would happen if this passage were interpreted though the lens of a supernova event? A light from a supernova in the Pleiades (a second sun) could turn darkness into morning. As the supernova event progressed over several days, the cloud cover and mist would block sunlight, darkening day into night. The intense thermal energy from the supernova combined with that from the sun would cause significant evaporation, essentially removing large quantities of water from the sea. This water would eventually fall back to Earth as rainfall producing great floods. While other areas of the Earth because of deformed weather patterns would experience great droughts. The term "flashes forth with destruction" is an interesting choice of words.

This passage also mentions the constellation Orion. A published paper describes a supernova event occurring in the Orion constellation within the last 10,000 years. Refer to "Nuclear and Gamma-ray Production by Supernova Ejecta" *Astro-Physics*, 9601032 Vol.1 of 9 January 1996 by Brian D. Fields, Michel Casse, Elisabeth Vangioni-Flam and Ken'ichi Nomoto.

Referring to another passage in the Bible:

> **Now the whole earth used the same language and the same words.**
> **And it came about as they journeyed east, that they found a plain in the land of Shinar and settled there.**
> **And they said to one another, "Come, let us make bricks and burn them thoroughly." And they used brick for stone, and they used tar for mortar.**
> **And they said, "Come, let us build for ourselves a city, and a tower whose top will reach into heaven, and let us make for ourselves a name; lest we be scattered abroad over the face of the whole earth."**
> **And the Lord came down to see the city and the tower which the sons of men had built.**
> **And the Lord said, "Behold, they are one people, and they all have the same language. And this is what they began to do, and now nothing which they purpose to do will be impossible for them.**
> **"Come, let Us go down there and confuse their language, that they may not understand one another's speech."**
> **So the Lord scattered them abroad from there over the face of the whole earth; and they stopped building the city.**
> **Therefore its name was called Babel, because there the Lord confused the language of the whole earth, and from there the Lord scattered them abroad over the face of the whole earth.** Genesis 11:1-9

What if this passage is viewed through the prism of a supernova event? Particle radiation from a nearby supernova could generate dementia across many peoples damaging their ability to communicate effectively and years later when language is reconstituted by their children, it would vary like the colors of a rainbow. The construction of the Tower of Babel is believed to have occurred between c. 2300-3000 BC.