

Re: EM pollution threatens with breakdown of Earth's magnetic field

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On Jul 10, 3:20 am, jonas.thornv...@xxxxxxxxxxx wrote:

Do we know if the total amount of cosmic radiation and particles that hit earth change from time to time?

Yes, we know this sort of thing for about the last fifty years or so by direct measurement. We suspect it for much longer in the past but have very little physical record of it. By "physical record" I mean tree rings, ice cores, and sea and lake sediments and such which can tell us about rainfall and other climatic factors for very long times into the past but as far as I know do not show any clear correlation with cosmic ray variations although there have been suggestions that metal isotope ratios in deep rock strata could be affected by supernovae.

As for other kinds of radiation, most that we get is from the sun. Its magnetosphere generally shields the whole Solar System from radiation from other stars. However, the Solar System is currently traveling through a sort of bubble apparently blown in the interstellar gas and dust by a supernova 443 million years ago which may have been close enough to overcome the Sun's and the Earth's magnetospheres' shielding effects, causing the great extinction at the end of the Ordovician Age via gamma ray irradiation followed by global cooling.

Do scientist have possibility to measure these things, satellites?

Some can be measured on the ground, and some from satellites. Unfortunately there is very little instrumentation in place to measure these things because they are not considered to be "important" except as basic science, which always gets the least funding.

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If a nearby star was in late stage of red giant would that change the amount of infalling radiation, or does it not change until it goes nova?

Not so much from an ordinary nova, but from a supernova if it were close enough, and generally speaking the first radiation issue would be neutrinos which could do enormous damage to living things but only if it were very close; say within 50 light years. Remember it like other forms of radiation is subject to inverse-square attenuation with distance. A supernova would have to be within roughly 100 light years to be considered a threat to life on Earth. This would vary with the orientation of the star's spin axis with respect to Earth because such supernovae can spew jets of particle radiation along their axes and if we were in the way it could affect us from much farther away than if we were not.

Is there evidence to support disturbance of the magnetic field or global warming effects, from stars going nova in ancient time?

As far as I know, no ancient climatic global warming trends have been correlated with supernovae, conversely above I mentioned a supernova possibly causing global cooling. Notice that for most of Earth's history it's been warmer than it is now; for the 160 million years the dinosaurs ruled the Earth the average temperature was ten or more degrees warmer than now.

Also, as far as I know there's not much a supernova could do to our magnetic field directly. The most direct effects from nearby supernovae would be gamma rays which can strip off much of our ozone layer in a matter of minutes. On the other hand the Sun would also intercept considerable radiation flux which might upset its function, and that might have an effect on Earth's magnetic field. But that requires several "mights" in a row so I give it a low probability.

I am not an expert in this area, but then there really aren't any at all since it's such a new area of study. The mere idea that forces outside the Earth can affect its climate and weather is actually fairly recent and we are just beginning to understand a few of the possible ways we can be affected.

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