Natural Radio

News, Comments and Letters About Natural Radio

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We are finally seeing sunspots on a somewhat regular basis – hopefully some geomagnetic activity will follow. I am feeling somewhat guilty for not having evaluated the loop receiver sent to me by Edgar Greene several months ago, but it's a little tough to evaluate a receiver with just sferics. Maybe one of these days we'll get enough activity to produce some nice morning chorus.

My aging HP Celeron office computer has been sluggish and despite every optimization trick in the book, finally slowed down to the point of almost being useless. I replaced it earlier this month with an Acer quad-core system running Windows 7, which I am very happy with so far. As these things go, the switch was not pleasant. Fortunately, the machine had Windows 7 pre-installed so I was spared the pain of an upgrade. But moving, re-registering, upgrading and reconfiguring software took two full days and I still have a couple of software packages to re-install.

Being a glutton for punishment, I then built a custom computer for video editing as I was worried about my 5 year old Pentium 4. This one got a clean install of XP Pro, since that's what my video editing software requires (Avid Liquid). I spent a bit extra for a cabinet with the large fans and a super-quiet power supply, but it was worth it as the machine is totally quiet until the DVD reader/burner comes on. Again re-configuring and re-registering took a couple of days and there is still more software to re-install and debugging to be done.

November has been dry and with the temperatures above average. I was able to do my two fall gutter cleanings with only a leaf blower before freezing rain permanently affixed them to the roof and the insides of the gutters as it had the previous two years.

I am looking forward to Thanksgiving this week. There are some snow flurries in the forecast which seems appropriate for the season. While the turkey is cooking outside on the Weber, I'll be putting away the patio furniture, doing my final cleanup of the yard and a little antenna repair on my sagging long-wire.

There have been some interesting discoveries related to Natural Radio and the sun over the past couple of months. Here are a couple of the most interesting ones.

Cosmic Rays – Besides aggravating those of us that like solar activity, the lack of sunspots tends to cause other effects. Cosmic rays are subatomic particles made up mostly of protons and some other heavy nuclei accelerated to almost the speed of light by distant supernovae explosions. When they impinge on the atmosphere the create "air showers" which emit more cosmic rays. We're protected by the atmosphere, but they threaten the health of astronauts. A single cosmic ray can wipe out a satellite if it hits the right Integrated Circuit.

Because of the weakening solar magnetic field and declining speed of the solar wind, our first line of defense is slipping. The level of cosmic rays has jumped 19% over the

previous Space Age high according to data from the Cosmic Ray Isotope Spectrometer on NASA's ACE spacecraft.

We need not worry as we are protected by our atmosphere and the magnetic field of the earth. But I do wonder about the demise of my computer. Maybe a stray cosmic ray zapped a memory chip.

Gamma-Rays and Anti-Matter – So, while we're dodging cosmic rays, the Large Hadron Collider is up and running again and has beams circling around in both directions. If you are reading this, we haven't collapsed into a black hole yet. But there are even bigger dangers lurking closer to home!

Back in the early 1990s, NASA's Compton Gamma-ray Observatory pointed its sensors at earth and found gamma rays being emitted by lightning. Later, NASA's RHESSI satellite, which primarily looks at X-ray and Gamma-ray emissions from the sun, found some 800 terrestrial gamma-ray flashes.

Several years ago, a theory was proposed that these gamma rays might be triggered by the constant bombardment of cosmic rays. But earlier this month new findings were announced. During its first 14 months of operation, the Fermi Gamma-ray Space Telescope detected 17 Gamma-ray flashes from terrestrial thunderstorms.

During two recent electrical storms, Fermi recorded an energy signature of the Gamma-ray emissions that could have only come from the decay or positrons, the anti-matter form of electrons. So if you need another reason to avoid close contact with lightning, use this one.

Michael Briggs of the University of Alabama in Huntsville announced these puzzling findings November 5 at the 2009 Fermi Symposium. Scientists are trying to create a model that would explain this, and Briggs stated that the unusual positron signature seen by Fermi suggests that the normal orientation for an electric field associated with a lightning storm somehow reversed.

So might this be related to sprites and jets? And of course, is there a different VLF signature? Lightning might turn out to be a "poor man's" particle accelerator.

Solar Rotation & VLF – There is an ongoing discussion on the VLF_Group list regarding a paper written by Prof. Colin Price, head of the Department of Geophysics and Planetary Science at Tel Aviv University.

His group discovered an anomaly in lightning data due to the changes in Earth's ionosphere -- signals varied on a 27-day cycle. Prof. Price was able to show that this variability in the data wasn't due to changes in lightning activity, but to changes in Earth's ionosphere, suspiciously in sync with the rotation of the Sun. Price, an acclaimed climate change scientist, stated: "Our data may help researchers examine short-term connections between weather, climate, and Sun cycles."

There isn't a theory for why this happens as yet, but in the absence of other VLF activity this might be an interesting one to look at. Several members of the VLF_Group are monitoring in noise around 2 kHz. It might be interesting to check out the thread on this topic at http://tech.groups.yahoo.com/group/VLF_Group/