Written for the residents of the town of Portola Valley, a town that sits astride the San Andreas fault (not that far away from Geometrics) and which has two, locally-based, online geophysical monitors, namely, a seismograph (designed by Sheldon Breiner, a founder of Geometrics) and a Geometrics cesium magnetometer base station.

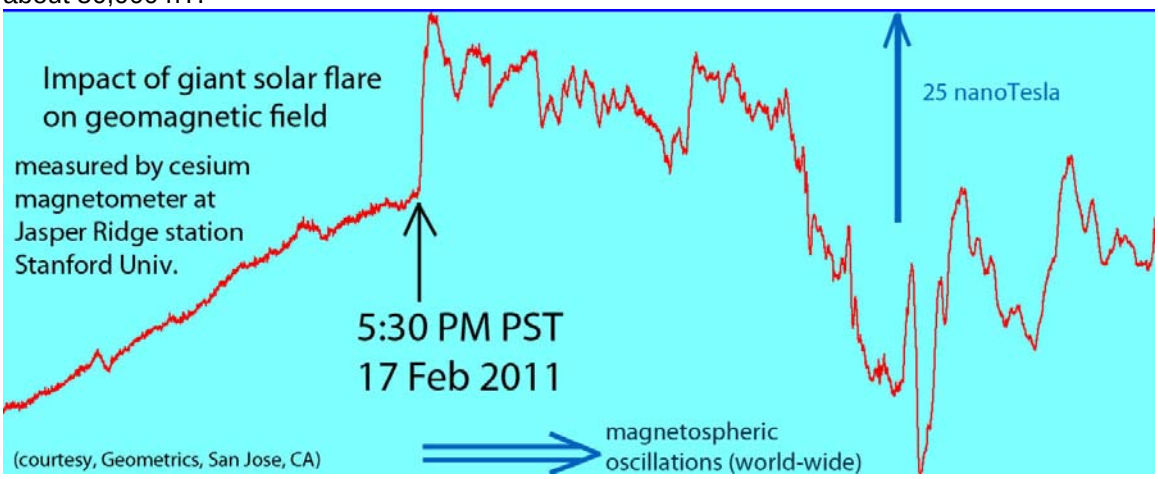
Major solar storm hits our local community

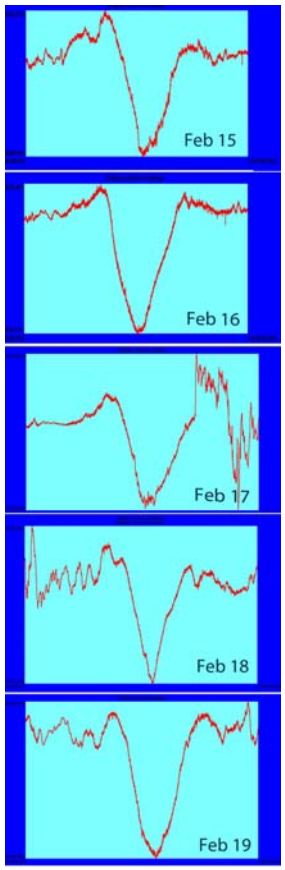
A major storm, the largest in four years, hit earth this past Thursday —and no one noticed.

Okay, this was not a meteorological one, but a solar storm, affecting the earth's magnetic field. And, it was predicted with great accuracy on Valentine's Day by sun watchers who noticed a major explosion of particles from the sun known as a corona mass ejection. Three days later, on February 17th, at 5:30 PST in the afternoon, it hit us and shook up the earth's magnetic field for more than half a day. If you noticed your compass jittering or your smart-phone's magnetometer giving an uncertain reading, this is why. (These examples are gross exaggerations, just for emphasis.)

Many of you who follow my occasional distribution of seismograms from our online Portola Valley seismograph will be surprised to learn that there is now another locally-based online geophysical instrument: a magnetometer. A cesium magnetometer was set up, with the courtesy of Stanford University, at their Jasper Ridge Biological Preserve only a mile or so from our seismograph. It was established by Geometrics, Sheldon's former company, and serves as a Western U.S base reference to reduce the effects of such magnetic disturbances on airborne, marine or land magnetic surveys.
Link to seismograph: http://www.portolavalley.net/index.aspx?page=303
Link to magnetometer: http://support.geometrics.com:8080/LiveGraph/index.html

See below, the moment of impact on the earth's magnetic field. This was seen all over the world simultaneously and particularly intense at the polar regions where such solar storms cause the Northern Lights and Southern Lights (Aurora Borealis and Aurora Australis) as the particles spiral along the magnetic field lines and excite air molecules. Also below are the previous and following two day's records to show this magnetic storm in context. The normal daily variation, the U-shaped curve, is about 80 nanoTeslas (nT) on top of the steady value of the earth's field intensity of about 50,000 nT.





In the next couple of years these solar magnetic storms are expected to increase in frequency and magnitude and may wreak havoc on our electrical grid and communication systems, peaking in 2012. (Mmmm, could that be the basis for the Mayan doomsday prediction at 12-21-2012?) The scientific literature also shows possible effects of such magnetic field changes on living creatures, including psychological effects of solar magnetic storms on humans. While such studies are not well established, all agree that without the protection afforded by the shielding effects of the earth's magnetic field against harmful particles from the sun, life on earth would not be possible.

We can put up with the occasional solar storm, don't you think?