CONSTELLATION

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An interesting talk by Professor Spangler

- by Gary Sprague

Kelli Spangler, Professor of Physics and Astronomy at Montgomery County Community College, gave a cosmology-related presentation at the April BMAA general meeting that was definitely a change of pace from our recent observing-related sessions.

She started by describing the standard model of astronomy, and four basic assumptions of how the universe behaves. Homogeneity, the first, assumes the universe is evenly distributed. Isotropy, the second, means the universe appears the same in all directions, from all perspectives. Universality, the third, assumes that physical laws apply everywhere. And finally, the cosmological principle assumes we are not "special."

Professor Spangler described how the laws of Isaac Newton, have applied to understanding the universe and the many changes that Albert Einstein's radical thinking introduced. Astronomical measurements and mathematical calculations have been applied to show that our universe appears to be constantly expanding, mainly through the action of yet-to-be-understood dark energy. She also described current thinking about the impact and identity of dark matter.

Kelli Spangler's talk was definitely thought provoking. If you have an opportunity to hear her give a presentation or take one of her classes at MCCC, I guarantee you'll appreciate her energetic presentation style and depth of understanding.

- Gary Sprague is current President of BMAA [-ed]

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THE PASSING OF A PIONEER

- by Gary Sprague

Did anyone notice that Normal Edmund died in January at the age of 95?. If I mention the name of the company he started I'm sure it will bring back many fond memories - Edmund Scientific!

Personally I spent many hours reading the latest catalog from Edmund Scientific longing after unobtainable scientific and astronomical equipment. I can still picture in my mind a beautiful 6 inch Newtonian on a pier equatorial mount. It never came my way but the pictures helped me modify my 3 inch reflector on a homemade pipe mount.

Edmund Scientific started selling war surplus equipment but the catalog grew to include all types of scientific equipment and gadgets. His son Robert, continues the business, I'm glad to say, but my grandchildren seem to have more sophisticated wants than I did.

Thanks Norman for endless times of enjoyment with your catalogs!

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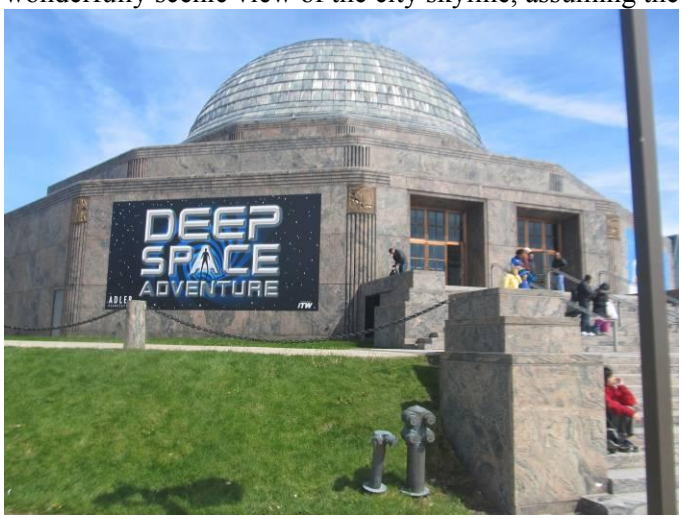
THE ADLER PLANETARIUM IN CHICAGO

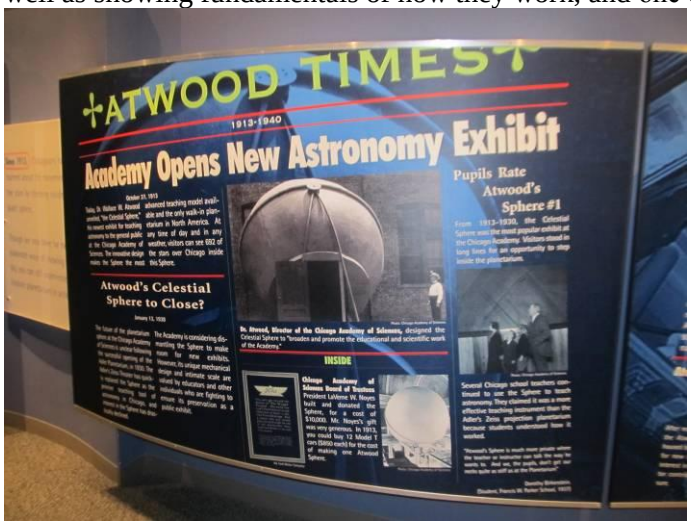
- by Gary Sprague

On a recent trip to Chicago to help with kitchen remodeling for my son, we managed to fit in a Sunday visit to the Adler Planetarium. It's located downtown right on the waterfront, providing a wonderfully scenic view of the city skyline, assuming the wind doesn't blow you into the Lake.



Although it is relatively small, by museum standards, the Planetarium has a lot to offer. My grandson enjoyed the planetarium show in one of the 3 theaters, highlighting the sun, moon and earth. It provided a wealth of practical information about the interaction of these three heavenly bodies. The other theaters had shows about deep space, 3D tours of the great observatories of the world, and the night sky around Chicago.

There were two exhibits I found especially interesting – a great historic collection of telescopes as well as showing fundamentals of how they work, and one of the first 'planetariums'.



It was a huge ball into which a car carrying about 6 people ascended. Once inside, the ball would rotate, showing constellations. It was quite ingenious.

If you ever get to Chicago, I can highly recommend a trip to the Adler Planetarium.

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Thank Goodness for Magnetism

- by Dr Tony Phillips

Only 93 million miles from Earth, a certain G-type star is beginning to act up.

Every 11 years or so, the solar cycle brings a period of high solar activity. Giant islands of magnetism—"sunspots"—break through the stellar surface in increasing numbers. Sometimes they erupt like a billion atomic bombs going off at once, producing intense flares of X-rays and UV radiation, and hurling massive clouds of plasma toward Earth.

This is happening right now. Only a few years ago the Sun was in a state of deep quiet, but as 2012 unfolds, the pendulum is swinging. Strong flares are becoming commonplace as sunspots once again pepper the solar disk. Fortunately, Earth is defended from solar storms by a strong, global magnetic field.

In March 2012, those defenses were tested.

At the very beginning of the month, a remarkable sunspot appeared on the Sun's eastern limb. AR1429, as experts called it, was an angry-looking region almost as wide as the planet Jupiter. Almost as soon as it appeared, it began to erupt. During the period March 2nd to 15th, it rotated across the solar disk and fired off more than 50 flares. Three of those eruptions were X-class flares, the most powerful kind.

As the eruptions continued almost non-stop, Earth's magnetic field was buffeted by coronal mass ejections or "CMEs." One of those clouds hit Earth's magnetosphere so hard, our planet's magnetic field was sharply compressed, leaving geosynchronous satellites on the outside looking in. For a while, the spacecraft were directly exposed to solar wind plasma.

Charged particles propelled by the blasts swirled around Earth, producing the strongest radiation storm in almost 10 years. When those particles rained down on the upper atmosphere, they dumped enough energy in three days alone (March 7-10) to power every residence in New York City for two years. Bright auroras circled both poles, and Northern Lights spilled across the Canadian border into the lower 48 states. Luminous sheets of red and green were sighted as far south as Nebraska.

When all was said and done, the defenses held - no harm done.

This wasn't the strongest solar storm in recorded history - not by a long shot. That distinction goes to the Carrington Event of September 1859 when geomagnetic activity set telegraph offices on fire and sparked auroras over Mexico, Florida, and Tahiti. Even with that in mind, however, March 2012 was remarkable.

It makes you wonder, what if? What if Earth didn't have a magnetic field to fend off CMEs and deflect the most energetic particles from the Sun.

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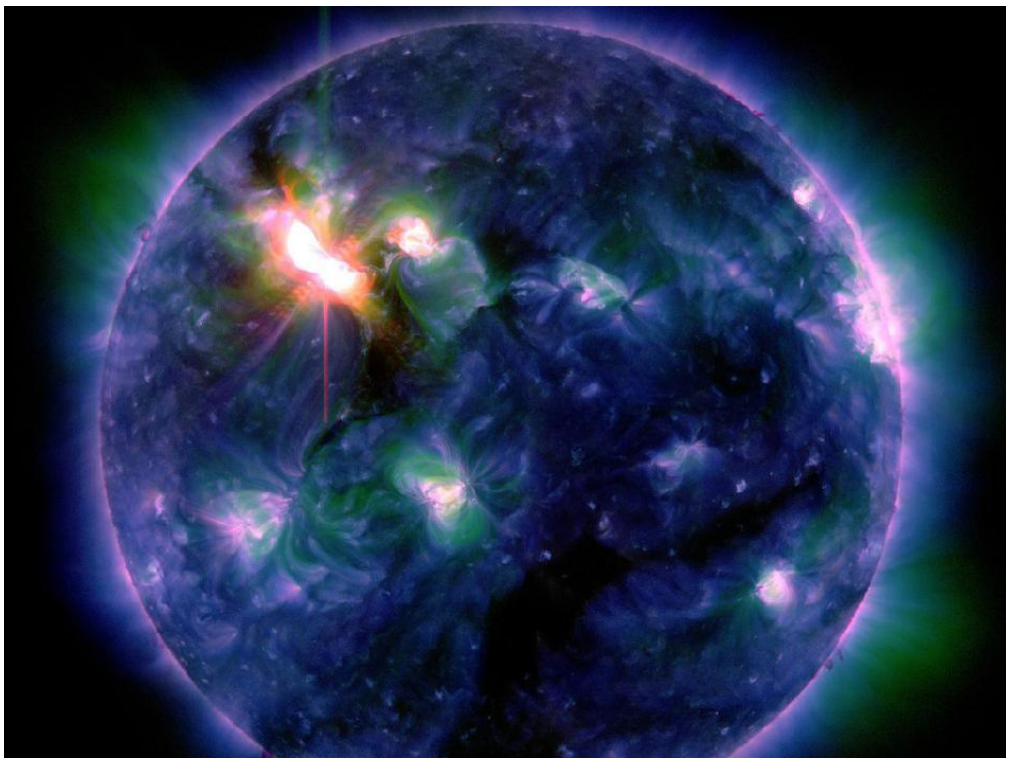
The answer might lie on Mars. The red planet has no global magnetic field and as a result its atmosphere has been stripped away over time by CMEs and other gusts of solar wind. At least that's what many researchers believe. Today, Mars is a desiccated and apparently lifeless wasteland.

Only 93 million miles from Earth, a G-type star is acting up. Thank goodness for magnetism.

With your inner and outer children, read, watch, and listen in to "Super Star Meets the Plucky Planet," a rhyming and animated conversation between the Sun and Earth, at http://spaceplace.nasa.gov/story-superstar.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Multiple-wavelength view of X5.4 solar flare on March 6, captured by the Solar Dynamics Observatory (SDO) in multiple wavelengths (94, 193, 335 angstroms). Credit: NASA/SDO/AIA

Download this image from http://spaceplace.nasa.gov/news-images/sdo-march-solar-flare.jpg

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