the Webfooted Astronomer
News from the Seattle Astronomical Society
February 2009

Severe space weather

by Dr. Tony Phillips

Did you know a solar flare can make your toilet stop working?

That's the surprising conclusion of a NASA-funded study by the National Academy of Sciences entitled Severe Space Weather Events—Understanding Societal and Economic Impacts. In the 132-page report, experts detailed what might happen to our modern, high-tech society in the event of a "super solar flare" followed by an extreme geomagnetic storm. They found that almost nothing is immune from space weather—not even the water in your bathroom.

The problem begins with the electric power grid. Ground currents induced during an extreme geomagnetic storm can melt the copper windings of huge, multi-ton transformers at the heart of power distribution systems. Because modern power grids are interconnected, a cascade of failures could sweep across the country, rapidly cutting power to tens or even hundreds of millions of people. According to the report, this loss of electricity would have a ripple effect with "water distribution affected within several hours; perishable foods and medications lost in 12-24 hours; loss of heating/air conditioning, sewage disposal, phone service, fuel re-supply and so on."

"The concept of interdependency," the report notes, "is evident in the unavailability of water due to long-term outage of electric power—and the inability to restart an electric generator without water on site."

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NEXT MEETING

February 18 — 7:30 p.m.
University of Washington
Physics/Astronomy Building,
Room A-102

Get your constellation groove on!

Can you tell the difference between your Boötes and your Apus? Prove it! At our February meeting Maxine Nagel will present her "constellation quiz." It's a two-part quiz: identify the constellation, then learn some fun facts, including Greek and Roman stories on how the constellations came about and interesting items in the constellation to observe. The presentation is interactive, so come ready with your own stories or facts regarding your favorite constellations. Don't worry, you won't be graded!

This presentation was first scheduled for our December meeting, which was snowed out, so you've had plenty of time to bone up on the constellations. It's not as if you've been out observing!

SAS Calendar

February 16 — just before sunrise
Jupiter and Mars will be less than a degree apart in the east/southeast, with Mercury a bit higher and further south.

February 18 — 7:30 p.m.
Seattle Astronomical Society Meeting
Guest speaker: Maxine Nagel, constellation quiz. Details on page 1.

February 21 — 6 p.m.
Tiger Mountain Star Party (members only)

February 21-23 — just before sunrise
Jupiter, Mars, Mercury, and the waning crescent Moon dance in the east/southeast.

February 24 — New Moon

February 27 — dusk
Crescent Moon less than two degrees from Venus.

February 28 — 7 p.m.
Seattle Astronomical Society Star Parties
- Green Lake, Seattle
- Paramount Park, Shoreline

March 4 — First quarter Moon

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We promise you the Sun, the Moon, and the stars... and we deliver!

The Seattle Astronomical Society is an organization created and sustained by people who share a common interest in the observational, educational, and social aspects of amateur astronomy.

Established in 1948, the SAS is a diverse collection of over 200 individuals. A variety of programs and activities is presented by the SAS throughout the year. Monthly meetings feature speakers on a wide range of topics, from the Hubble Space Telescope to electronic imaging to personal observing experiences. The club holds public observing "star parties" at Green Lake and Paramount Park every month, dark sky observing parties outside Seattle, plus such activities as meteor watches, public telescope and astronomy displays, National Astronomy Day, and an annual Awards Banquet.

Light-pollution legislation under consideration in Washington legislature

By David W. Ingram

Legislation aimed at restricting light pollution is under consideration in the Washington State Legislature again this year. On Feb. 5 Substitute House Bill 1069 passed out of the Local Government Committee on a 7 to 3 vote.

In 2008, now retired Rep. Patricia Lantz sponsored HB 2534, but that measure did not get out of committee.

Rewritten and sponsored in January 2009 by Rep. Sam Hunt (and seventeen other legislators) as House Bill 1069, this new bill was recently, dramatically redrafted as Substitute House Bill 1069. That bill declares an intent to reduce energy consumption and protect the nighttime environment, and a requirement that the Washington state building code council work with interested parties to develop recommendations for a draft code addressing light pollution. The group is to present a report on findings to the Legislature by Nov. 25, 2009.

Brief Summary of SHB 1069

- Declares an intent to require the best technology available in all exterior lighting in order to reduce energy consumption and protect the nighttime environment.
- Requires the State Building Code Council to work with interested parties to develop recommendations to address light pollution and present findings to the Legislature.

You can follow the full history at the Web site at the top of the next column. Read the "Bill Reports" down to the "House Bill Report".

http://apps.leg.wa.gov/billinfo/summary.aspx?bill=1069&year=2009

While the scope of the original bill was reduced considerably, the substitute provides an opportunity for all stakeholders to contribute value to the SBCC recommendation and hopefully to take full advantage of the "soon to be approved" Model Lighting Ordinance. This looks like real progress to this amateur astronomer.

I know from experience they will respond quickly and positively to your show of concern. Now, as you read this message, will you take a moment to drop a note to your legislator? Tell them how important you feel their continued support of SHB1069 is. You can be a direct contributor to making our Washington state skies just a little darker for yourself, for your community and for all of our children.

More light-pollution resources

International Dark Sky Association
www.darksky.org

Washington Light Pollution Working Group
groups.google.com/group/light-pollution

Dark Skies Northwest
www.scn.org/darksky/

Dave Ingram is a member of the Boeing Employees' Astronomical Society, the Northwest Section of IDA, and the Washington Light Pollution Working Group.

Severe space weather

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It takes a very strong geomagnetic storm to cause problems on this scale—the type of storm that comes along only every century or so. A point of reference is the "Carrington Event" of August-September 1859, named after British amateur astronomer Richard Carrington who witnessed the instigating solar flare with his unaided eye while he was projecting an image of the Sun on a white screen. Geomagnetic storms triggered by the flare electrified telegraph lines, shocking technicians and setting their telegraph papers on fire; Northern Lights spread as far south as Cuba and Hawaii; auroras over the Rocky Mountains were so bright, the glow woke campers who began preparing breakfast because they thought it was morning!

"A contemporary repetition of the Carrington Event would cause … extensive social and economic disruptions," the report warns. Widespread failures could include telecommunications, GPS navigation, banking and finance, and transportation. The total economic impact in the first year alone could reach $2 trillion (some 20 times greater than the costs of Hurricane Katrina).

The report concluded with a call for infrastructure designed to better withstand geomagnetic disturbances and improvements in space weather forecasting. Indeed, no one knows when the next super solar storm will erupt. It could be 100 years away or just 100 days. It's something to think about … the next time you flush.

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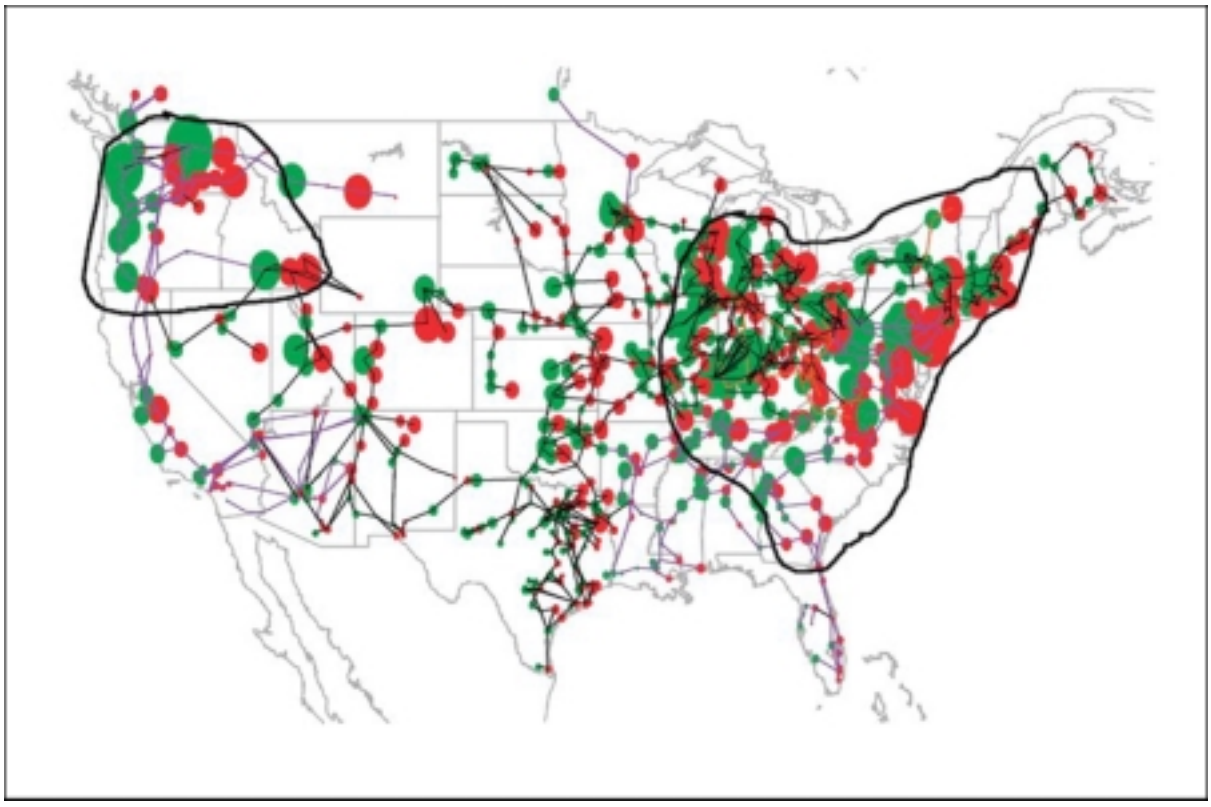

On this power-grid map of the United States, the black-circled areas are regions especially vulnerable to collapse during an extreme geomagnetic storm. Inside those boundaries are more than 130 million people. Credit: National Academy of Sciences report on severe space weather.

Severe space weather

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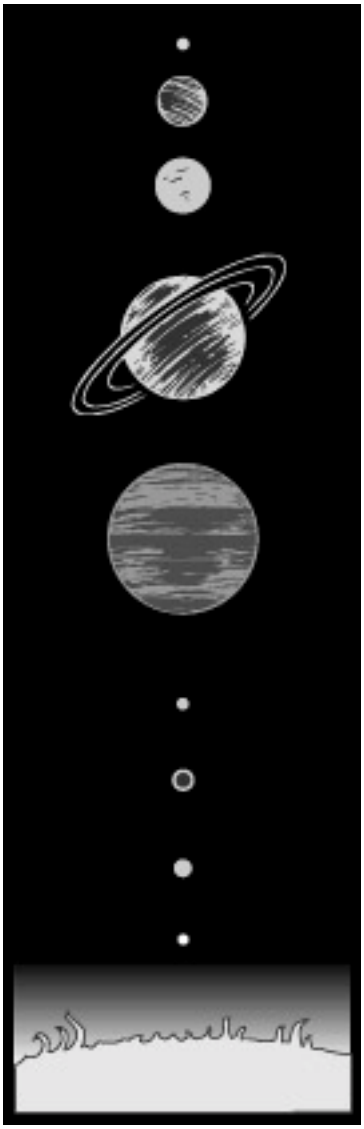
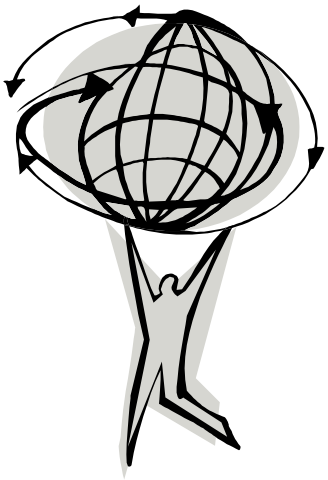
One of the jobs of the Geostationary Operational Environmental Satellites (GOES) and the Polar-orbiting Operational Environmental Satellites (POES) operated by NOAA is to keep an eye on space weather and provide early warning of solar events that could cause trouble for Earth.

You can keep an eye on space weather yourself at the National Weather Service's Space Weather Prediction Center, **www.swpc.noaa.gov**.

For young people, space weather is explained and illustrated simply and clearly at the SciJinks Weather Laboratory, **scijinks.gov/weather/howwhy/spaceweather**. ★

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





SAS banquet: Celebrating 60 years and the IYA

by Connie Griffith

The Seattle Astronomical Society held its annual banquet on Sunday, January 11, at Rock Salt and a grand time was had by all! Nearly 50 people helped celebrate both the 60th anniversary of the organization, which was founded in 1948, and 2009: The International Year of Astronomy (IYA). The IYA is being observed this year in the 400th anniversary of Galileo's first celestial observations. Dava Sobel, author and scientific journalist extraordinaire, was the featured speaker.

Karl Schroeder, SAS President, thanked Mike Langley, Loren Busch, Andrea Torland and others who worked on the banquet. He also remembered those members who had contributed much to the organization and had passed on during the last year: Ed Barnes, Pat Lewis and Jim Nathan.

Karl talked about his interest in having SAS become more active and involved again with the public. SAS will be contacting other organizations like the Pacific Science Center, University of Washington (UW), and the Museum of Flight to see how we can participate with them in IYA activities. We are involved with the Seattle Parks Department on the moon viewing festival August 1 at the Arboretum.

The SAS is continuing to work with the UW in support of the Theodor Jacobsen Observatory. As part of the IYA, the Observatory is doing a telescope project for students to get them involved with astronomy. The Observatory asked SAS to help with funding of the telescope kits which is going to cost around $1,100. Karl asked for donations which would be matched by SAS and many at the banquet contributed enthusiastically and without hesitation. Karl also indicated that the observatory relies on a number of SAS members to keep its doors open. These include Mike Langley, Rod Ash, Mark Larotta, Scott Cameron, Randy Johnson, and Jim Peterson.

Another IYA activity will be happening at the Museum of Flight on February 16, the day after Galileo's 445th birthday. The museum is one of 100 sites nationwide selected by NASA to celebrate its great observatories – the Hubble Space Telescope, the Spitzer Space Telescope, and the Chandra X-Ray Observatory – and to display multi-wavelength views of our universe created by these observatories.

Maxine Nagel received the Messier Certificate from Mike Langley. This is quite an accomplishment. Congratulations, Maxine!

Judy Schroeder introduced Dava Sobel. A former *New York Times* science reporter, Sobel is the author of *Longitude*, *Galileo's Daughter*, and *The Planets*. In her thirty years as a science journalist, she has written for many magazines, including *Audubon*, *Discover*, *Life* and *The New Yorker*, served as a contributing editor to *Harvard Magazine* and *Omni*, and co-authored five books, including *Is Anyone Out There?* with astronomer Frank Drake.

Since this is the International Year of Astronomy which celebrates Galileo's observations, Sobel talked initially about writing her book, *Galileo's Daughter*. Sobel translated the daughter's letters herself. Both of Galileo's daughters became nuns and Sobel received much assistance from the sisters at the Poor Clare Monestary in Roswell, New Mexico. Sobel discussed Galileo's observations and the ongoing issues between science and religion. She answered numerous questions about all of her works. She was one of seven people in the room when the IAU declared, after two days of deliberation, that Pluto is not a planet. For

the last three years, she has been working on a play about Copernicus. Sobel was a gracious speaker who presented us with some unique and interesting insights to Galileo's world at the time and to the astronomical world in general since then.

The final event of the evening was the introduction of the current year's officers, the presentation of certificates to the prior year's officers who were not continuing and most importantly, the drawing for the numerous door prizes Karl had collected. There were several books and gift certificates from Aurora Astro Products, JMI, Scope City, Karl himself, and Orion Telescopes and all recipients were pleased with their prizes. ★

Dava Sobel, below, was the keynote speaker at the Seattle Astronomical Society's annual banquet Jan. 11. Karl Schroeder, above, is the new president of the society. Photos by Maxine Nagel.

The Webfooted Astronomer
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RETURN SERVICE REQUESTED

NEXT MEETING
February 18

Maxine Nagel's constellation quiz

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☐ New member ☐ Renewal ☐ SAS may publish info in membership directory

☐ Individual membership – $25	**$** _____
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