

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

9th February 2009

Pat Irwin (Oxford University)
'Cassini Observations of Saturn and Titan'

Well, between the snow showers there have been several very cold clear nights. If you can stop your toes getting frostbite, you may have been able to do some observing. Watch out for Comet Lulin. You should be able to spot it in binoculars soon and follow its track across the sky from night to night as it swings in past the Sun.

THE NIGHT SKY THIS MONTH

Mercury: Still in the morning sky, Mercury continues to stay close to the horizon throughout this very poor apparition. Greatest elongation west is on 13th February at 26° but the planet will be barely 8° high at sunrise. If you like a challenge, then on the morning of 23rd February Mercury, Jupiter, Mars and a thin crescent Moon will all be very close together extremely low in the south east. Be warned though, you will need a very clear horizon as they rise just 20 minutes before the Sun so it will be a very difficult observation. The following morning Mercury and Jupiter will be just 0.6° apart, but just 6° above the horizon at sunrise.

Venus: While very easy to see in the south west after dark, Venus is now starting to move back towards the Sun. Its elongation decreases from 44° in February to 26° by mid March but it will still be setting a good 3 hours after the Sun giving you plenty of time to make some observations. From an observers point of view, the planet now becomes very interesting as it is approaching the visually attractive thin crescent phase. By mid March, a pair of decent binoculars will show the crescent phase quite easily. On the evening of 27th February a nice crescent Moon will be just below Venus which is always a pleasant sight. As Inferior Conjunction takes place on 27th March this is your last chance to see Venus this apparition.

Saturn: This planet reaches opposition on 8th March which means it is rising in the east as the Sun sets in the west. In mid February Saturn rises about 19.30 UT while by mid March that time becomes 17.30 UT. This means you have most of the night to watch the planet. However, do not expect a great view of the ring system as their angle from Earth is a paltry 2° so seeing them at all is the observing challenge at the moment. Saturn itself is easy to see at +0.6 magnitude in eastern Leo.

Jupiter: For early risers, Jupiter just about comes into view by mid March very low in the south east. It has now moved into the constellation of Capricornus as it starts its slow climb to higher declinations.

Mars: While very difficult to see, Mars is actually low in the south east at sunrise. At +1.2 magnitude it is not that bright, but between 17th and 19th February it passes the much brighter Jupiter which you could perhaps use as a guide to find Mars.

Uranus + Neptune: You have just about a week left to see Uranus before twilight finally consumes it. Neptune is already out of sight in the Sun's glare.

Occultations: There is an interesting occultation on the morning of 17th February. The 3rd magnitude star, Pi Scorpius, will be occulted by the Moon at 06.35 UT and should reappear at 07.07 UT. From some parts it will not be an occultation, but a graze, as the star will appear to skim along the edge of the lunar limb, perhaps blinking in and out of view as it passes behind mountain peaks. The Moon will be 12° high in the south at the time so make sure you have a clear enough horizon.

A normal occultation involves watching the Moon approach a star until the star instantly disappears behind the lunar limb. However, if the star involved is a double star then there is a split second delay between the Moon reaching the star and it finally disappearing. This is because the Moon has to cover two stars instead of one. Such an event occurs at 22.50 UT on 3rd March. The star, Chi Taurus, is a double made up of +5.4 mag and +8.4 mag stars which means the occultation should be visible in a small telescope.

Asteroids: Yet again it is the same two asteroids on view this session.

1 Ceres continues to get brighter as it crosses Leo. Rising from +7.1 to magnitude +6.9 Ceres is an easy binocular target. This is the brightest it is going to get this time around.

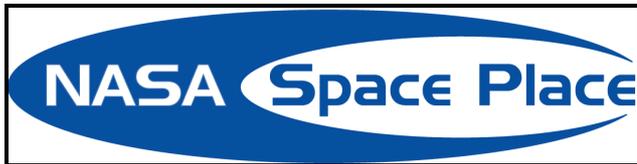
4 Vesta, on the other hand, is past its best now, fading to +8.4 by mid March, crossing from Cetus into Aries.

Comets: Perhaps the highlight of the session will be comet 2007 N3 Lulin. If it performs as predicted it should be an easy binocular object. Remember however, comets are not always as predictable as we would like, so it might not be as bright as expected, or, better still, it might even be brighter than hoped. Starting in Libra at about +6.9 magnitude, the comet crosses into Virgo on 11th February, then into Leo about the 23rd, and then Cancer on 2nd March. Of course, by this time Lulin has moved from the morning sky into the, more accessible, evening sky. By 23rd February it will be rising about 19.00 UT Hopefully it will have brightened to about +6.1 magnitude by late February (it is actually closest to Earth on the 21st), thereafter fading to +7.4 by 9th March. The comet will appear to pick up speed as it crosses the sky through February so it will move several degrees each day. Comet

Lulin will pass about 2° south of Saturn on 22nd/23rd February while on the 27th/28th it will cruise past Regulus, just 1° south of the star.

MOON PHASES:

Full: 9th Feb.; Last Qtr: 16th Feb.; New: 25th Feb.; 1st Qtr: 4th Mar.; Full: 11th Mar.



SEVERE SPACE WEATHER

by Dr Tony Phillips

Did you know a solar flare can make your toilet stop working? [Ed. Now, Stuart never mentioned that last month!]

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.”

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!

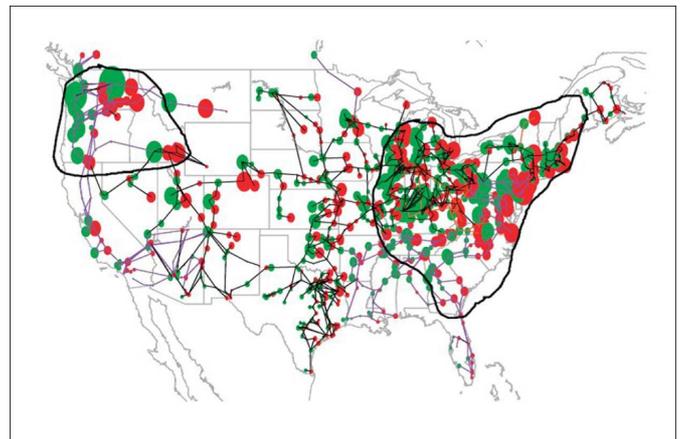
“A contemporary repetition of the Carrington Event would cause ... extensive social and economic disruptions,” the report warns. Widespread failures could include telecommunications, GPS navigation, banking and finance, and transportation. The total economic impact in the first year alone could reach \$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.

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. And 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.



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.

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LAST MEETING'S TALK

by Gwyneth Hueter

Last month's talk was given by Stuart Clark of the University of Hertfordshire.

His talk was essentially a very entertaining plug of his book 'The Sun Kings', which recounts how the Victorians tried to make sense of solar activity, especially the aurorae, sunspots and solar magnetic storms.

He explained how there was an increased burst of research, inspired by an incredibly powerful solar event on the night of 1st Sept 1859, which produced aurorae that made the sea look red. There was a lot of electrical activity which interfered with telegraph communications and compass readings. He says it was the most widely observed event, ever.

Among the people whose research Dr. Clark covered was Richard Carrington, an amateur astronomer at Redhill, and he dwelled on the suspicious circumstances of his wife's death in November 1875 and his own death ten days later. Read the book!

One thing he described, which has left a lasting memory, is his description of a spell of high solar activity starting at the end of October 2003. It caused tremendous disruptions, electrical and radio blackouts, aircraft diversions, the lot! The SOHO satellite monitors were saturated with radiation. However, on November 4th 2003 a huge flare erupted on the limb, probably the largest ever recorded. 'What if that had hit us?', he said. Yes, what if!

FURTHER DISCUSSION

If you are not already on our internet mailing list, then why not log on to YahooGroups. The list is called 'abingdonas'. Members use the list to alert each other about celestial events and to chat

about amateur astronomy. The list is quite active, with several messages most weeks. To read through previous messages click on:

<http://groups.yahoo.com/group/abingdonas/>.

To join the abastro list, please go to <http://www.yahogroups.com>. You can also unsubscribe from the list here. To post messages to the list, please send them to abingdonas@yahogroups.com. Please note that you will need to sign up with a YahooID if you do not already have one. You can do this on the above page.

Further information about the mailing list can be found on the abingdonas webpage at :

<http://groups.yahoo.com/group/abingdonas/>.

Further discussion on astronomy and many other topics takes place at the Spread Eagle pub in Northcourt Road after the meeting. You are most welcome to join us.

DATES FOR YOUR DIARY

16th Feb. 8pm. Beginners' Meeting in the Perry Room.

23rd – 25th Feb. (first clear night) 8pm. Observing Evening at Frilford Heath. Contact Ian Smith for details.

9th Feb. 8pm Speaker meeting: Paul Read (Oxford University) 'Climate Change and Ice Ages on Mars and Earth'.

The editor of "SpaceWatch" is Andrew Ramsey, who would very much appreciate your stories & contributions. Please send any news, observations, photos, etc. to:

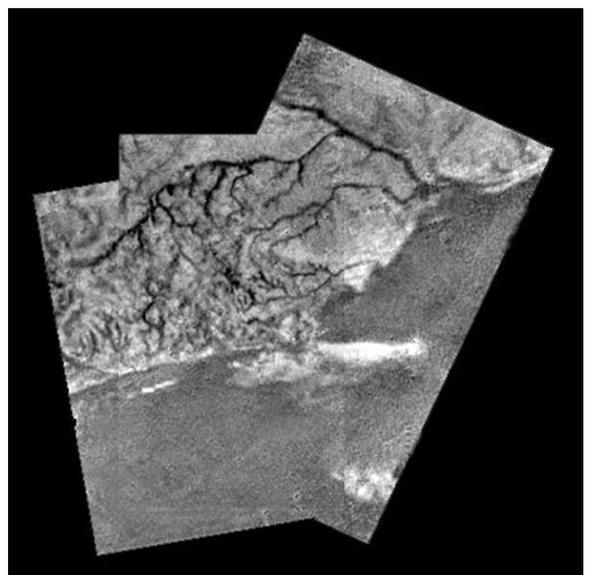
Mail: A.T.Ramsey, 35 Cope Close, OXFORD, OX2 9AJ.

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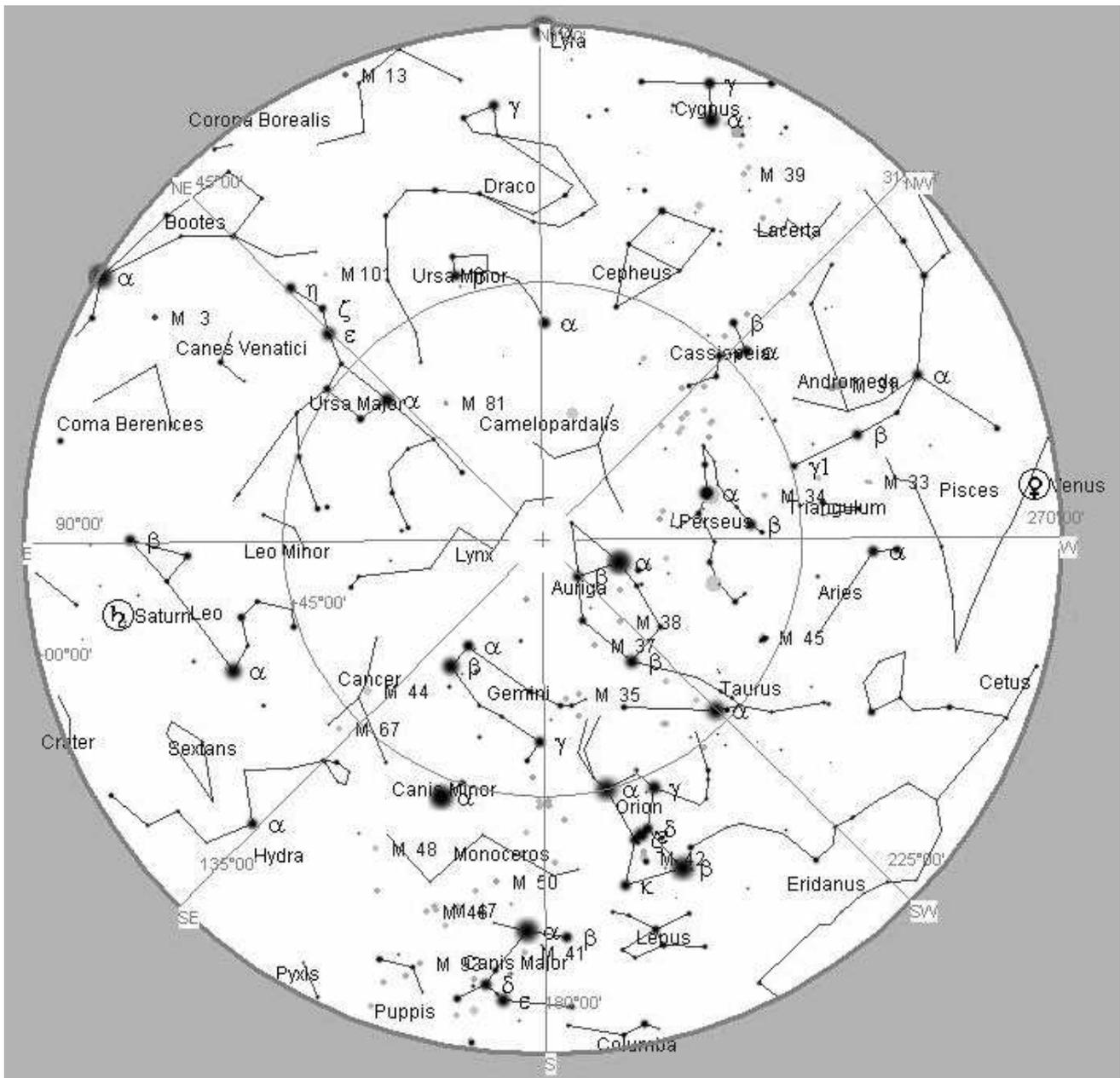


*Artist's impression of the Huygens lander descending on to Titan.
Photo courtesy of the Lunar and Planetary Institute, Houston, Texas.*



Aerial photo of river-like terrain on Titan.

STAR CHART



The Night Sky at 9pm (GMT) next Saturday (14th February)

This is what the night sky will look like at 9pm next Saturday 14th February, so if you're not having a romantic candlelit dinner for two, go out and have a look! Orion is still high in the south. Venus has still not yet set, but is very low in the west. Saturn has risen, but you won't see the rings at the moment as they are edge-on to us. Take a look at M44 in Cancer, the Crab – the open cluster otherwise known as the Beehive Cluster or Praesepe (= Latin for "manger"); or why not observe the Orion Nebula, M42, just below the three stars of the belt. Then of course, there is the Hyades near Aldebaran, the eye of the bull in Taurus, and M45, the Pleiades. By now you are well started on your Messier Marathon – three down, only another 106 objects to go!

See http://en.wikipedia.org/wiki/List_of_Messier_objects for more details.

Early spring is the best time of year to do a Messier Marathon, so if you are thinking of holding one, then good luck!