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Star Points for January 2013

"Backyard Astronomy Highlights for 2013"

by Curtis Roelle

In This Issue:

Now would be a good time for looking ahead at upcoming notable sky events for the next 12 months. Let us dive into January and then take on the rest of the year in a nut shell.

Jupiter is the star of the month. Having reached opposition in December — meaning it's toward the opposite direction from us as is the Sun — Jupiter is nearly up all night. In early January it is already high in the sky at the end of evening twilight and sets shortly after 4 a.m.

To the unaided eye, at 7 p.m. as January opens, Jupiter remains in Taurus above the considerably fainter first-magnitude star Aldebaran, located 65 light-years away. Although not a true member, Aldebaran is situated among the Hyades, a V-shaped star cluster. The Hyades are about 90 light-years farther away than Aldebaran, and located along the same line of sight. If you have access to a pair of binoculars, have a good look. The planet, bright star, and star cluster form a very pretty sight.

Throughout the year the planetarium at Bear Branch Nature Center presents monthly evening programs. Weather permitting, members of the Westminster Astronomical Society (WASI) share the views through their telescopes. For schedule information check the WASI website at WestminsterAstro.org. For planetarium registration call the Carroll County Parks and Recreation at 410-386-2103.

As far as eclipses go, there are two unimpressive lunar eclipses in May and October. However, there is a notable partial solar eclipse literally coming up in the fall when the Sun rises on a weekend morning already half covered by the Moon in early November. We'll find out more about that one in October.

Shy Mercury will be best placed for evening viewing in June. Venus blazes in the evening sky from August through December. Mars has no opposition this year and will not be well placed. Saturn and its rings will be best placed in the spring.

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January Meeting: Wednesday, January 9, 2013, 7:30 p.m., at BBNC

Topic: Annual business meeting and election of officers

Star Points, *cont.*

In terms of a Moon-free sky, the best of the major annual meteor showers could be the Perseids in August. According to Guy Ottewell's Astronomical Calendar, the best of the other active showers may be the Eta Aquarids and Delta Aquarids in May and July, but we can talk about them then.

How about comets? There are two comets coming our way that could put on quite a show.

The first comet, PANSTARRS (C/2011 L4), will be coming up from the south in March. The comet is named after a telescope in Hawaii with which it was discovered in June 2011. In March, we'll discuss expectations for Comet PANSTARRS.

The other comet wild card is one discovered in Russia in 2012, Comet ISON (C/2012 S1). It is a member of a class of comets called "sungrazers" because they round the Sun in close proximity. It has been said Comet ISON may be bright enough to be visible in daylight. The last comet I was able to view during the day was Hale-Bopp in 1997.

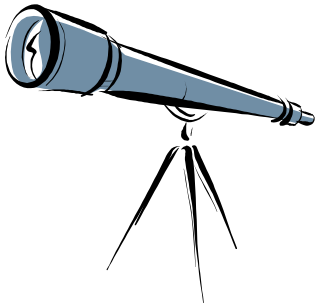
However, comets are notoriously unpredictable, so it is dangerous to overplay the possibilities. Likewise, newly discovered and underrated comets can become outstanding. Such was the case with Comet McNaught six winters ago. It made a respectable but brief appearance in evening twilight for northern hemisphere viewers over several nights. Then it headed south to become one of the greatest comets ever seen, but only for viewers in the southern hemisphere.

Comet McNaught was photographed during evening twilight in January 2007. It went on to become one of the best comets ever but only for viewers in the southern hemisphere.

Photograph by Curtis Roelle.

"Star Points" by Curtis Roelle appears in the Carroll County Times *on the first Sunday of each month. Visit the website at* http://www.starpoints.org or send email to StarPoints@gmail.com.

Upcoming WASI Events



Annual Business Meeting and Elections January 9, 7:30 p.m., at Bear Branch Nature Center (BBNC)

Soldiers Delight Public Stargazing January 12, 8 p.m., at Soldiers Delight Natural Environment Area in Owings Mills

Planetarium Show January 19, 7:30 p.m., at BBNC

Want to join the Westminster Astronomical Society?
Sign up online at *www.westminsterastro.org/members*
or bring a check for $25 made out to WASI
to our next meeting at Bear Branch Nature Center.

Partnering to Solve Saturn's Mysteries

By Diane K. Fisher

From December 2010 through mid-summer 2011, a giant storm raged in Saturn's northern hemisphere. It was clearly visible not only to NASA's Cassini spacecraft orbiting Saturn, but also astronomers here on Earth — even those watching from their back yards. The storm came as a surprise, since it was about 10 years earlier in Saturn's seasonal cycle than expected from observations of similar storms in the past. Saturn's year is about 30 Earth years. Saturn is tilted on its axis (about 27° to Earth's 23°), causing it to have seasons as Earth does.

But even more surprising than the unseasonal storm was the related event that followed. First, a giant bubble of very warm material broke through the clouds in the region of the now-abated storm, suddenly raising the temperature of Saturn's stratosphere over 150 °F. Accompanying this enormous "burp" was a sudden increase in ethylene gas. It took Cassini's Composite Infrared Spectrometer instrument to detect it.

According to Dr. Scott Edgington, Deputy Project Scientist for Cassini, "Ethylene [C_2H_4] is normally present in only very low concentrations in Saturn's atmosphere and has been very difficult to detect. Although it is a transitional product of the thermochemical processes that normally occur in Saturn's atmosphere, the concentrations detected concurrent with the big 'burp' were 100 times what we would expect."

So what was going on?

Chemical reaction rates vary greatly with the energy available for the process. Saturn's seasonal changes are exaggerated due to the effect of the rings acting as venetian blinds, throwing the northern hemisphere into shade during winter. So when the Sun again reaches the northern hemisphere, the photochemical reactions that take place in the atmosphere can speed up quickly. If not for its rings, Saturn's seasons would vary as predictably as Earth's.

But there may be another cycle going on besides the seasonal one. Computer models are based on expected reaction rates for the temperatures and pressures in Saturn's atmosphere, explains Edgington. However, it is very difficult to validate those models here on Earth. Setting up a lab to replicate conditions on Saturn is not easy!

Also contributing to the apparent mystery is the fact that haze on Saturn often obscures the view of storms below. Only once in a while do storms punch through the hazes. Astronomers may have previously missed large storms, thus failing to notice any non-seasonal patterns.

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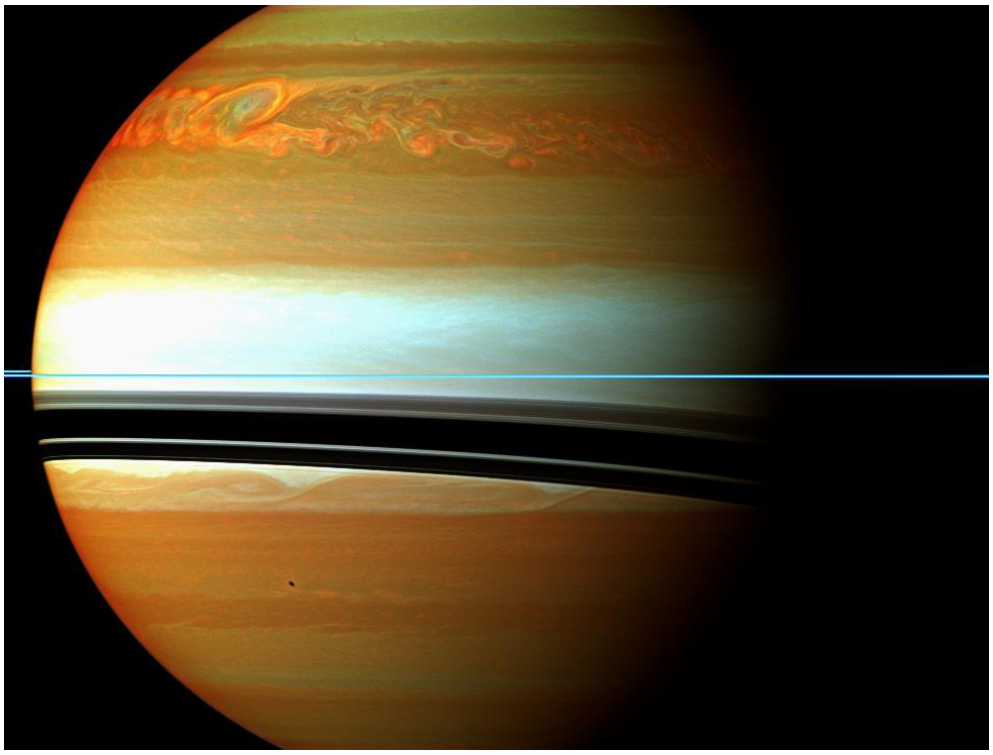
As for atmospheric events that are visible to Earth-bound telescopes, Edgington is particularly grateful for non-professional astronomers. While these astronomers are free to watch a planet continuously over long periods and record their finding in photographs, Cassini and its several science instruments must be shared with other scientists. Observation time on Cassini is planned more than six months in advance, making it difficult to immediately train it on the unexpected.

That's where the volunteer astronomers come in, keeping a continuous watch on the changes taking place on Saturn.

Edgington says, "Astronomy is one of those fields of study where amateurs can contribute as much as professionals."

Go to http://saturn.jpl.nasa.gov/ to read about the latest Cassini discoveries. For kids, The Space Place has lots of ways to explore Saturn at http://spaceplace.nasa.gov/search/cassini/.

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



This false-colored Cassini image of Saturn was taken in near-infrared light on January 12, 2011. Red and orange show clouds deep in the atmosphere. Yellow and green are intermediate clouds. White and blue are high clouds and haze. The rings appear as a thin, blue horizontal line.