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Note: Use bookmark panel in Adobe Reader.

A Recommendation

There is no picture of the month this month. I highly recommend perusing the Astronomy Pictures of the Day for the month of February. Within, there is wonderful photography both astro and planetary, as well as multiple videos of the Chelyabinsk incident and a video of the path of Asteroid 2012 DA 14. There is a double transit of Jupiter's natural satellites, Ganymede and Io; an excellent reflective image of the aurora borealis; and a hand tinted rendition of the Meteor Procession of 1913. One can start at the link below and go back day by day. <http://apod.nasa.gov/apod/astropix.html> You will not be disappointed.

GENERAL MEMBERSHIP MEETING

FEBRUARY 15, 2013

MAIN LECTURE HALL - UCC CAMPUS

8:00 p.m.



Exploding Black Holes!

Dr. Jenny Greene,
Princeton University

We look at the lifecycle of growing black holes and galaxies.

PLEASE JOIN US!!!

Supermassive black holes, containing the mass of millions to billions of suns, lurk at the centers of most galaxies. Usually, the black holes are quiet, but every once and a while they send copious energy out into the surrounding galaxy.

New Members

Amateur Astronomers, Inc. welcomes **Elena Burg** of **Cranford**, **Damani Parren** of **Westfield**, **Alison Fraser** of **Westfield**, **Daniel Silber** of **Denville**, and **Jeremy Silber** of **Denville**.

We hope you enjoy using Sperry Observatory, know that as a member other opportunities are available such as seminars, lectures, training, observing, and research all at no or minimal cost. Our Qualified Observer course is a great place to start. It is equivalent to a college-level introduction to Astronomy, and it includes hands-on training on our 24-inch reflecting telescope. For all opportunities check the **Club Activities** section of the website.

Irene Greenstein, Membership Chair

**MEMBER ONLY STAR PARTY
JENNY JUMP STATE PARK
HOPE, NJ
SATURDAY MAR 9, 7:30PM**

**STAR PARTY
SPERRY OBSERVATORY
FRIDAY MARCH 8
at 7:30 p.m.**

Recently, there has been discussion in astronomy news circles of a comet, Comet PanSTARRS (C/2011 L4) and its visibility as seen from Earth. As you will be reading this article shortly before the time it is supposed to be at its best, the comet is the subject of this column.

Comet With an Odd Name

Comet PanSTARRS was discovered on the night of June 6th, 2011 by astronomers involved in the Panoramic Survey Telescope And Rapid Response System (PanSTARRS <http://panstarrs.ifa.hawaii.edu/public/home.html>) operated by the University of Hawaii at Mount Haleakala. Hence the unusual name. However as more and more comets are discovered by such automated surveys, we may expect more odd comet names in the future. Once there were enough observations, an orbit was calculated. The calculations project that the comet originated, not in the relatively nearby Kuiper Belt (the region just beyond the orbit of Neptune that is home to icy objects such as Makemake, Eris, and Pluto as well as a large number of potential comets), but rather from the Oort Cloud, a region of space that extends beyond the Kuiper Belt out to about one light year from the Sun. Based on the orbit, it is possible that this is either PanSTARRS' first visit to the inner solar system or, if not, its first return in thousands of years.

How Bright?

As soon as the orbit was calculated, interest naturally turned to its visibility to Earthly observers. Comet PanSTARRS will pass within .3 AU (Astronomical Units) of the Sun on March 10th and it is thought that the comet will be at about 0 magnitude around this time and be visible in the Northern hemisphere, low in the west from about March 8th through early April, climbing higher each night and gradually fading. Finder charts for Comet PanSTARRS can be found at the websites of the major astronomy magazines (<http://www.skyandtelescope.com> and <http://www.astronomy.com>) as well as other sites. If you have astronomy software that can access comet orbital elements, you can create your own charts.

If Comet PanSTARRS was a simple object like an asteroid with a known albedo (reflectivity), calculating how bright it would appear from Earth would be a snap. However, it is a comet, and comets start out as objects composed of water ice, frozen gases, dust, and rocky materials. The ices and

This variable composition makes it rather difficult to accurately predict how bright a new comet will be in advance. The brightness estimate in the previous paragraph could be a rose-colored glasses optimistic estimate. Over the years, there have been quite a few comets that have failed to live up to their predicted glory.

Kohoutek

Probably the most infamous comet of the 20th century, Comet Kohoutek (C/1973 E1) could be considered the poster child for comets behaving badly. Discovered on March 18, 1973 by Czech astronomer Lubos Kohoutek, the comet was at about 5 AU from the Sun and appeared exceptionally bright. This prompted Kohoutek and other astronomers to claim that the comet would continue that trend and become an impressive sight to the unaided eye when it reached perihelion at the end of December 1973 and the mainstream media got caught up in the excitement. The comet did indeed follow its predicted orbit. Unfortunately, the comet's brightness did not follow predictions. Despite passing by the Sun at only .14 AU, the brightest Comet Kohoutek ever got was about 4th magnitude. It did sport a 25-degree long tail and even an anti-tail (an illusion caused by dust in the plane of the comet's orbit). But, the damage was done.

While it was extensively studied by professional astronomers, the amateur community and the general public were quite upset by the comet's failure to perform. This would lead to a serious public backlash against comets that would persist for years. Upon further investigation, it was believed that Kohoutek was misled because the comet nucleus had a fairly large concentration of frozen gases that could vaporize at rather low temperatures, such as those found out around the orbit of Jupiter. But, once those gases were gone, the nucleus did not have huge amounts of water ice and dry ice (frozen carbon dioxide) that would vaporize in the temperatures found in the inner solar system. This explained the poor visibility.

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Trouble Coming Twice

Alas, Comet Kohoutek was not the only cometary epic fail. By the start of the 21st century, a number of automated telescopic surveys were set up. The purpose of these was to detect asteroids, especially those that could potentially hit Earth. But the technology that could detect small asteroids can also find comets.

One of these comets was Comet NEAT (C/2001 Q4), which was discovered by the Near Earth Asteroid Tracking survey (NEAT) at Palomar Observatory on August 21, 2001. Astronomers had predicted that Comet NEAT would become bright and easily visible without optical aid.

The other comet was Comet LINEAR (C/2002 T7) and was discovered by the U.S. Air Force's Lincoln Near Earth Asteroid Research telescope at White Sands, New Mexico. It too was also predicted to be a bright comet.

In a rare coincidence, both comets would be visible at almost the same time and would even be close to one another in early May of 2004. As the comets drew near the inner solar system, their brightness estimates became lower and lower. Instead of being easy targets for non-telescopic observations, both wound up being comets that were best observed with at least binoculars. While they were of interest to amateur astrophotographers with telescopes, they were not the visual spectacles predicted.

Elenin

On 2010, Leonid Elenin, a Russian amateur, discovered a comet on December 10, 2010. This comet (C/2010 X1) was initially predicted to be visible to the unaided eye in the early fall of 2011. As the comet neared the inner solar system, the brightness estimates were lowered to 6th magnitude. Then, on August 19, Comet Elenin was struck by a coronal mass ejection: a literal mortal blow. Comet Elenin began to disintegrate and was a mere cloud of dust by October when it would have been at its closest to Earth. The cloud then dissipated further and the comet was no more.

Space restrictions prohibit me from describing in detail other recent cometary duds such as Comet Austin (C/1989 C1) and Comet LINEAR (C/2002 O7), but the examples I cited should prove the point

that comet brightness predictions are hit and miss (mostly miss) in terms of accuracy.

Exceptions

Even with this list of cometary duds, it should be remembered that there have been some good comets in recent years that impressed the public and astronomers alike by exceeding expectations.

Comet West (C/1975 V1): This great comet of the winter of 1975-1976 received much less press than it should have as a result of the backlash against Comet Kohoutek. A pre-dawn object at its brightest, West was visible to the unaided eye as an object with a bright, star-like head and a tail that resembled a silver gray glowing version of a smoke trail one sees from a plane that is shot down in war movies. In fact, untrained observers were able to follow the comet for a short time after sunrise, a testimony to its brightness.

Comet Hyakutake (C/1996 B2): Discovered in January of 1996 by a Japanese amateur, Hyakutake became rather bright in March as it passed less than 10 million miles from Earth. As an added bonus, the comet was a circumpolar object in the Northern hemisphere at that time and observers with dark skies reported seeing a long blue tail about 75 degrees in length. To observers in less dark areas, Hyakutake resembled a glowing blue blob in the sky.

Though discovered earlier (July 22, 1995 by Alan Hale – not the actor who portrayed the Skipper on “Gilligan’s Island” - and Thomas Bopp) than Comet Hyakutake, Comet Hale-Bopp (C/1995 O1) put on its best show after Hyakutake left the scene. Unlike the previous comet, which owed its brightness more to proximity to the Earth than anything else (Hyakutake’s nucleus was only about half a mile in size, quite small even by cometary standards), Hale-Bopp’s brightness was due to the impressive size of its nucleus (almost 25 miles across) and its copious supplies of dust and sublimating ices. What was even more impressive was that Hale-Bopp came no closer than 1.32 AU from Earth. Hale-Bopp was visible without a telescope from May of 1996 to December of 1997, beating the record of nine months set by the Great Comet of 1811.

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Will Comet PanSTARRS Pan Out?

Now we return to the comet that started this article. The question is: Will this comet be a success or will it be yet another epic fail? As of this writing (early February), the comet appears to be at about 8th magnitude. However, there is now some debate as to how bright it will become. The original estimate was that it would peak at magnitude 0. Now, there is talk from some comet experts that peak brightness might be anywhere between magnitude 1.5 and 3. Who is right? Looks like we will find out one way or the other in March.

Comet ISON: Kohoutek II?

Near the end of 2013, Comet ISON will be entering our neck of the solar system. Russian astronomers discovered this comet and they are predicting that it could exceed the brightness of the full moon when it reaches perihelion. This announcement should raise some red flags. Given the past history of comets, it looks like Comet ISON could become the Comet Kohoutek of the 21st century. The only way we will know for sure is to wait until its coming November and December.



IF YOU WROTE AN ARTICLE IT COULD HAVE BEEN HERE

EMAIL CONTACTS

president@asterism.org

President of AAI

editor@asterism.org

Editor of *The Asterism*

Joe Ascione & Janyce Wilson, Editors
Deadline for submissions to each month's newsletter is the first Friday of that month.

membership@asterism.org

AAI Membership Chair

trustees@asterism.org

All three Trustees of AAI

ray@asterism.org

Ray Shapp for the website

exec@asterism.org

Executive Committee plus
 Trustees

QOs@asterism.org

All Qualified Observers

info@asterism.org

AAI president, corresponding secretary,
 and computer services chair

research@asterism.org

Research Committee

technical@asterism.org

Technical Committee

DOME DUTY

Feb	15	Team E
Feb	22	Team A
Mar	1	Team B
Mar	8	Team C
Mar	15	Team D

FRIDAYS AT SPERRY

Mar 1, 2013

What's Up? A Down to Earth Sky Guide Kathy Vaccari
Space Missions Briefing Bill Whitehead

Mar 8, 2013

A Brief History of Stellafane 1923 to Present Wayne Zuhl

Mar 22 2013

Stalking the Wild Paraboloid Bill Whitehouse

All schedules above were accurate at time of publication. Please check www.asterism.org for latest information (click on "Club Activities")

☆☆☆

MEMBERSHIP DUES

Regular Membership:	\$21
Sustaining Membership:	\$31
Sponsoring Membership:	\$46
Family Membership:	\$5
First Time Application Fee:	\$3
<i>Sky & Telescope:</i>	\$32.95
<i>Astronomy</i> subscription:	\$34

(Subscription renewals to *S&T* can be done directly. See "Membership-Dues" on website for details.)

AAI Dues can be paid in person to our Membership Chair, or by mail to: AAI, PO Box 111, Garwood, NJ 07027-0111

The next **General Membership Meeting** is the third **Friday, March 15, 2013**. Our speaker is Dr. Peter Kurczynsky, his topic is **The Evolution of Galaxies**.

Please join us.

Theaterⁱⁿthe Sky

by Ron Ruemmler

March 2013 finds most of the planets hiding near the **Sun**. Only **Jupiter** and **Saturn** remain to rule the darkness.

The two gas giants share this duty fairly. **Jupiter** is high in the south at sunset and sets soon after midnight. By then **Saturn** has already risen and is still high in the south at dawn.

The **Moon** visits **Saturn** twice this month, being just past full both times. **Jupiter** gets only one visit but it is spectacular. The waxing crescent **Moon** passes through the five degree gap between **Jupiter** and Aldebaran, the orange eye of Taurus, the Bull. An ironic way to celebrate St. Patrick's Day!

Comet ISON is expected to make a spectacular appearance around Thanksgiving, but its little brother PANSTARRS shows up this month. Use binoculars and the thin crescent **Moon** to help find it around the 12th.

Although totally unobservable, the closest conjunction of two planets between the years 1942 and 2022 occurs this month. At only six degrees from the **Sun**, **Mars** and **Uranus** pass just 39 *arcseconds* from each other. This is about the apparent diameter of **Jupiter**! **Mars** might be barely visible through the solar glare, but **Uranus** is hopeless. To see what the **Sun** has stolen from us, picture a bright orange nickel about eight inches from a dim green dime.

If your imagination is not sufficiently stretched by that, consider the 0.66 degree conjunction of **Uranus** and **Venus**. This happens only one degree from the **Sun**! As you might expect, **Venus** and **Mars** also have a close conjunction near the **Sun**, but we will have to wait until early April not to see that.

March (times are PM unless noted)

- 1 Fri 12:00 AM **Moon** just below Spica; occultation from Latin America
- 2 Sat 5:30 AM **Saturn** above the **Moon**
- 4 Mon 8:00AM **Mercury** in conjunction with the **Sun** enters the morning sky
- 4 Mon 4:53 Last Quarter **Moon**
- 10 Sun 2:00AM Change clocks ahead one hour for Daylight-Saving Time
- 11 Mon 3:51 New **Moon**
- 12 Tue 7:45 Comet PANSTARRS 4 degrees left of very thin crescent **Moon**
- 13 Wed 7:45 Comet PANSTARRS below thin crescent **Moon**
- 17 Sun 10:00 Crescent **Moon** passes between **Jupiter** and Aldebaran
- 19 Tue 1:27 First Quarter **Moon**
- 20 Wed 7:02AM Vernal Equinox; Spring begins
- 22 Fri 2:17 **Mars** 39" above **Uranus** (unobservable)
- 27 Wed 5:27AM Full **Moon**
- 28 Thu 6:00AM Spica upper left of **Moon**

