The Veil Nebula by LAS member Gary Garzone

Longmont Astronomy Society Newsletter
Month 2012
From the President:
It is time again to look back at the last year and reflect some on our accomplishments during this past year:

- We had more great presentations at our meetings:
  Luke Dones with SWRI gave a great talk about Cassini; Mike Hotka talked about evolution of the design of his telescope; Bill Tschumy gave presentation about "Milky Way Rising: Seeing the Forest and the Trees"; Randy Cunningham talked about advantages, disadvantages and challenges of manufacturing short focus ratio telescopes and components; Vern Raben talked about new digital cameras, intervalometers, low light video cameras, and micro-controllers and planetary imaging; Dr. Doug Biesecker, from the Space Weather Prediction Center gave a talk about space weather prediction science; Bill Tschumy talked about development of SKySafari, a planetarium program he developed that runs on iPhones, iPads, Macintosh and soon Android devices.; Robert Arn gave presentation about "nightscape" digital photography; Dan Davis gave presentation on a proposed observatory at the Sunset Golf Course.
- Brian, Gary, and Robert continue to impress us all with their excellent astronomy photos during this past year.

- We supported school star parties for Carrie Martin Elementary in Loveland, Erie High School MESA, Longmont High School, and Centennial Elementary in Firestone. Our members also supported star parties for Greeley Chamber of Commerce, Bear Creek Elementary, Sommers-Bausch Observatory, and Little Thompson Observatory star parties.

- Several of us made the long trip to the Astronomical League ALCON in Bryce Canyon, UT. It turned out to be a interesting and fun event and we treated to excellent dark skies for the entire week.

Upcoming Events
The annual banquet meeting is this Saturday, January 21st at Pinocchios, 210 Ken Pratt. Event begins around 5:30 pm, dinner at 6:15 pm. We need to have everyone signed up by Thursday noon Jan 19th so we can place the order with Pinocchios. Price is $21 per person including gratuity.

Bill Possel will talk about importance of science/engineering education and give us an update on the latest Kepler discoveries.

We will show a digital rendering by Rick Barcelow of our proposed observatory at the Sunset Golf Course in Longmont (it is impressive!!)
Note that we will not meet at the regular time or place this January.
We will have officer elections for 2012. Those nominated at the December meeting are:
School Star Parties
The 2012 school star party season is just beginning. We have a request for scopes and volunteers from the Carrie Martin Elementary in Loveland on Friday January 27th, 5:30 to 7:30 pm. Directions: From Hwy 287 heading north from Longmont, go left on CR 17 at the stop light. Take another left at the next stop light on CR 14 just past the water tower and then take your 1st right on Lissa Dr. and then 1st right on Joni Ln.

**In the sky this month:**
Meteor Showers
Long wait until April, isn't it?

**Planets**
- **Mercury:** too close to the Sun
- **Venus:** high in the west at sunset, sets at 8:08
- **Mars:** improving, rises 9:24
- **Jupiter:** champion of the skies, high in the south at sunset
- **Saturn:** rises at 12:30, high in the south at sunrise and improving

**Interesting Stars/Galaxies**

**Targets for December 22-29, 2011**
- Open cluster NGC 1624
- Emission nebula NGC 1931
- Barred spiral galaxy NGC 1964

*Listen to podcast.*

The weekly podcast is available to registered members of Astronomy.com. Registration is FREE, so sign up at [Astronomy.com/register](http://Astronomy.com/register) to make sure you don't miss an episode!

*Learn about 10 more winter binocular treats*  Control-click on that link will take you off to a 10 power tour of the night sky.
Club Calendar:
Jan 27 – Carrie Martin Science Fair and Star Party north of Berthoud
Feb 16 – monthly meeting at the IHOP. Come socialize and eat about 6, meeting at 7.

Fiske Planetarium: Admission costs $3.50 for kids and seniors and $6 for adults
CO Skies: Winter Skies (January 19, 2012, 7:30 pm)
Come join us for an evening under the planetarium dome as we talk about the winter night sky and the different stars and constellations you can see at this time of year.

Moons & Stars (January 28, 2012, 2:00 pm)
Travel into the night sky as we learn about the moon, stars, and planets. Explore constellations and their stories from many cultures. And learn about the moon as it orbits Earth.

CO Skies: Celestial Mechanics Thursday, February 2, 2012, 7:30pm (2 weeks from now)
Come join us for an evening under the planetarium dome as we talk about the night sky and the motions of celestial objects.

Many Faces of Hubble Friday, February 3, 2012, 7:30pm (2 weeks from now)
Explore the construction and use of the Hubble Space Telescope in this show about the people behind the scenes and various careers in space. From scientists to engineers to astronauts, this show contains interviews and stories that reveal the humanity behind the science and technology.

Internet Resources:
Closest type Ia supernova in decades solves a cosmic mystery
Scientists' early observations confirmed some assumptions about the physics of type Ia supernovae, but with this close-up look, they also found things nobody had dreamed. Do a search for SN2011fe for all the details. Only 21 million ly away, and spotted only hours after it lit up. http://www.bbc.co.uk/news/science-environment-14681119 is a pretty good one....


New Supernova in Leo
Update: The supernova, now dubbed SN 2012a, was most recently reported at magnitude 13.6, which should be visible through modest-sized telescopes once the Moon is out of the way. See the Bright Supernova website for more information. The explosion has been classified as a Type II supernova, caused by the core collapse of a massive star.
Still Another SuperNova (it's random):

Here in Austin, Texas, attendees at the American Astronomical Society meeting are buzzing about the discovery of a possible supernova in the irregular galaxy NGC 3239 by amateurs Bob Moore, Jack Newton, and Tim Puckett.

The discovery image, taken January 7, 2012, of a 14.6-magnitude eruption (marked with lines) in the irregular galaxy NGC 3239.

Puckett Observatory Supernova Search

The supernova showed up in this unfiltered CCD image that the trio took during an automated observing run on January 7th with a 16-inch (40-cm) reflector in Portal, Arizona. At that time the putative supernova was at magnitude 14.6; Puckett confirmed it at 14.4 the next day with the same scope. The most recent value is 13.9, and it might continue to brighten before the explosion reaches its peak.

Several professional astronomers at the meeting have already started putting out e-mails and calls for spectroscopic observations. They hope to catch the supernova early and gain important information about what kind of explosion it is and, perhaps, what its progenitor was. Nothing shows up at this position in images taken by Puckett two weeks ago — at least, nothing brighter than magnitude 19.

For now, the object’s designation is PSN J10250739+1709146. There's more info at the International Astronomical Union’s Central Bureau for Astronomical Telegrams.

NGC 3239 is roughly 30 million light-years away (estimates vary), in the constellation Leo. Puckett notes the object's position as 24.65 arcseconds east and 16.1 arcseconds south of the galaxy's center. You also can get a sense of the object’s location in this image by Australian amateur Joseph Brimacombe.

By the way, Puckett's supernova search, begun in the 1990s, involves amateurs in several countries and has more than 200 discoveries to its credit.
A tough comet survives a close encounter with the Sun

Although astronomers expected it to die a fiery death, Comet Lovejoy passed within 87,000 miles (140,000 kilometers) of our star and re-emerged on the other side videos on http://spaceweather.com and that is one tough comet!

New insight into the bar in the center of the Milky Way

Research now indicates that our galaxy's central bar developed from a massive rotating disk of stars.

A team assembled by R. Michael Rich from the University of California, Los Angeles, measured the velocity of a large sample of old red stars toward the galactic center. They did this by observing the spectra of these stars, called M giants, which allows the velocity of the star along our line of sight to be determined. During a period of four years, the scientists acquired almost 10,000 spectra with the CTIO Blanco 4-meter telescope located in the Chilean Atacama desert, resulting in the largest homogeneous sample of radial velocities with which to study the core of the Milky Way.

Analyzing the stellar motions confirms that the bulge in the center of our galaxy appears to consist of a massive bar with one end pointed almost in the direction of the Sun, which is rotating like a solid object. Although our galaxy rotates much like a pinwheel, with the stars in the arms of the galaxy orbiting the center, the scientists found that the rotation of the inner bar is cylindrical. This result is a large step forward in explaining the formation of the complicated central region of the Milky Way.

More videos on Astronomy Magazine:

* NEW Easy-to-find objects in the 2011/12 winter sky, with Richard Talcott, senior editor
* NEW! Astronomy 101: Supernovae, with Bill Andrews, associate editor


http://saturn.jpl.nasa.gov/photos/halloffame/ While you're at it, why not look at the Cassini 'Hall of Fame” images for the even better bunch.
Black Hole Breakfast En Route

Astronomers have a problem with the Milky Way’s central beast, dubbed Sagittarius A* after a radio source that may be in the black hole’s accretion disk. They know the creature eats — observations at various wavelengths suggest as much — but it does so with little fanfare, unlike other leviathans researchers have caught munching a meal.

Astronomer have spotted a gas cloud (red-yellow blob above center, with orbit shown in red) that’s zooming toward the supermassive black hole in the Milky Way’s core. The stars orbiting the black hole are also shown along with blue lines marking their orbits. The stars and the cloud are shown in their actual positions in 2011.

But the chance to watch the beast scarf some cake may actually be on the horizon. An international team at the ESO reports online December 14th in the journal *Nature* the discovery of a clump of dusty, ionized gas heading almost straight for the black hole. In 2013 the cloud will reach its closest approach to the beast — a mere 260 times the Earth’s average distance from the Sun, closer than all but two stars have come since astronomers started watching in the 1990s.

Any flaring could be seen by the Event Horizon Telescope, a planet-wide array of antennas gearing up to actually image the black hole’s silhouette amidst the glow of its accretion disk (see *S&T*’s February 2012 cover story). The EHT has already observed a previous shift in Sgr A*’s accretion, notes project leader Sheperd Doeleman (MIT Haystack Observatory). By 2013 enough stations could be up and running to take full advantage of what could be a feast for our fasting black hole.

[http://us.mg6.mail.yahoo.com/neo/launch?.rand=18e2ahg1medbu](http://us.mg6.mail.yahoo.com/neo/launch?.rand=18e2ahg1medbu) video showing 55 Cancri E and its planetary properties (discovery of Kepler mission)

**January 11, 2012:** Peering deep inside the hub of the neighboring Andromeda galaxy, NASA’s Hubble Space Telescope has uncovered a large, rare population of hot, bright stars. While Hubble has spied these ultra-blue stars before in Andromeda, the new observation covers a much broader area, revealing that these stellar misfits are scattered throughout the galaxy’s bustling center.

Astronomers used Hubble's Wide Field Camera 3 to find roughly 8,000 of the ultra-blue stars in a stellar census made in ultraviolet light, which traces the glow of the hottest stars. The study is part of the multi-year Panchromatic Hubble Andromeda Treasury survey to map stellar populations across the Andromeda galaxy. The team's results are being presented today at the American Astronomical Society meeting in Austin, Texas.
This month's field trip:

Off to LASP! We've all been there, done that, and heard the tales of the CU students that are running the space missions. Colorado Matters radio show last week on NPR about the student controllers at LASP who give orders to the satellites. How come they didn't have this when I was in college? Oh, yeah.... ECHO, Explorer, and Vanguard didn't need any controlling...... http://www.cpr.org/#load_article
CU_Students_at_Spacecraft_CONTROLS

Current Space Missions:

Twin Gravity Spacecraft Set to Enter Lunar Orbit

Dec. 30, 2011: NASA's twin GRAIL spacecraft, on a mission to study the moon's gravitational field, are nearing their New Year's Eve and New Year's Day main-engine burns to place the duo in lunar orbit.
Named Gravity Recovery And Interior Laboratory (GRAIL), the spacecraft are scheduled to be placed into orbit beginning at 1:21 p.m. PST (4:21 p.m. EST) for GRAIL-A on Dec. 31, and 2:05 p.m. PST (5:05 p.m. EST) on Jan. 1 for GRAIL-B.

When science collection begins, the spacecraft will transmit radio signals precisely defining the distance between them as they orbit the moon. As they fly over areas of greater and lesser gravity, caused both by visible features such as mountains and craters and by masses hidden beneath the lunar surface, they will move slightly toward and away from each other. An instrument aboard each spacecraft will measure the changes in their relative velocity very precisely, and scientists will translate this information into a high-resolution map of the Moon's gravitational field. The data will allow mission scientists to understand what goes on below the surface. This information will increase our knowledge of how Earth and its rocky neighbors in the inner solar system developed into the diverse worlds we see today. For more information about GRAIL, visit: http://www.nasa.gov/grail

This month’s Wacky Idea:

Farewell to Rossi’s Explorer

Here's an irony for you: This week, during a meeting of the American Astronomical Society, researchers described an intriguing black hole dubbed H1743-322 that burped up two massive blobs of superhot matter in 2009. Key to the finding were observations from NASA's Rossi X-ray Timing Explorer — which ground controllers had shut down for good just days before the meeting, on January 5th, after 16 years of dependable operation.

With a mass of 3½ tons, NASA's Rossi X-ray Timing Explorer circles Earth in an orbit 375 miles (600 km) high. It ceased operation in early 2012 after 16 years of observations. NASA / GSFC

As project scientist Tod Strohmayer explains in NASA's announcement, "The spacecraft and its instruments had been showing their age." Launched in December 1995, the 1½-ton RXTE was renamed a few months later to honor Bruno Rossi (1905-93), a pioneer in
the fledgling field of X-ray astronomy during the 1960s.

RXTE was one of those workhorse spacecraft that you rarely hear about. It was tasked with recording very short variations in the output of cosmic X-ray sources. RXTE's three instruments allowed high-energy specialists to monitor even relatively weak events that varied as rapidly as a few microseconds. The spacecraft kept an X-ray eye on large swaths of sky over a wide range of energies, from 2,000 to 250,000 electron volts (a typical dental X-ray is around 60,000 eV).

These capabilities might not sound very exciting — it's not the kind of mission for which NASA's public-relations team spends big bucks to create slick artist's concepts and dramatic videos. But they were crucial to understanding the detailed workings of white dwarfs, neutron stars, and black holes — and the spacecraft could be slewed quickly to observe an outburst as it happened.

The first big news coming from the RXTE mission came in 1997, when astronomers used RXTE's timings to show that the gravitational attraction of spinning black holes is strong enough to drag along the very fabric of space and time in its vicinity. This relativistic "frame dragging" had been predicted in 1918 but never before observed.

In the late 1990s, NASA scientist Chryssa Kouveliotou and others used RXTE to confirm the existence of magnetars, rapidly spinning neutron stars with magnetic fields more than 100 trillion times stronger that the Sun's. Those observations garnered Kouveliotou, along with Robert Duncan and Christopher Thompson, who predicted the existence of magnetars, the 2003 Bruno Rossi Prize for high-energy astronomy.

A frequent target for this timing machine was Eta Carinae, the southern sky's famously supermassive star that flared to prominence in the mid-1800s, getting so bright that it rivaled Sirius. RXTE observations offered the first hints that Eta Carinae might actually be two closely paired giant stars, suspicions that were confirmed a few years later by another space observatory, the Far-ultraviolet Spectroscopic Explorer.

In fact, RXTE observations have been used in more than 2,000 refereed articles over the years — not bad for a craft that cost only a few million dollars per year to operate. A fuller list of the mission's scientific highlights is here.

**Member Input:**
From Paul Robinson: I have a recent (Jan 6) stack of pictures of Comet Gerradd from a dark site near Saratoga WY. I used an 80mm scope with my Nikon DSLR at 3200 iso. Most exposures were 60 sec. You can see the dust tail pointing down and the ion tail to the left.
LAS History Lesson by Mike Hotka:

LAS 10 Years Ago:

Gary Garzone had a nice article about the Leonid Metwor shower and the outing to the Pawnee Grasslands by severan people. Lots of pictures. Dave Street was president. There is a picture at the end of the newsletter or Fox Park's fox.

LAS 18 Years Ago:

Bob Noble was the president. Dawson Park was designated as the official site for Longmont Public Star parties. Dues were still $20 per year. Gemini was the featured constellation of the month. There is a nice finder chart for objects in Gemini along with a writeup to aid you in observing these objects.
And some member pictures from this month:

![M38 by Brian Kimball](image)

![M42 by Gary Garzone](image)