



Clear Skies

Volume 12, Issue 10

February 2008

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Greetings!

Welcome to the Cowichan Valley StarFinders Astronomy club's "Clear Skies" monthly newsletter.

As many of you are aware we have now fulfilled our society obligations for elected directors and at the last meeting voted for Ed Maxfield as President and Bryon Thompson as Vice-President. Here is a message from our newest elected officials:

Message from the President:

Happy New Year to everyone involved with Cowichan Valley StarFinders Astronomy Society. Let's hope the weather improves in the near future so that we may do some observing and photographing of the night sky. In the meantime let's enjoy the fellowship of the members and at least talk about the subject of astronomy (over a hot cup of coffee!).

I would like to thank Norm Willey for so ably handling the job of president. Norm took over the helm at a difficult time and his leadership has been a big asset to the society.

In the beginning, as most of you will recall, the StarFinders met at Frank Ogonoski's home. Frank was our Founding Father and built the club from nothing to a thriving, active group of amateur astronomers. Frank began the Island Star Party which has continued to this day to provide an opportunity for members and the general public to come together to enjoy the company of fellow amateurs, listen to some lectures, win some prizes and of course view the night sky.

Looking back at our 'roots' and ahead to the future we have decided to move our venue to Bryon and Freda's home in Mill Bay. Thank you Bryon and Freda for your generosity in allowing us to meet in your home. I think that this new venue will allow for much more opportunities for socializing over coffee and with some luck will allow us to do some observing after the meetings. As half of our membership is from Victoria, this location (30 minutes from Spencer Road) should encourage them to attend the meetings. I advised the members at the Astronomy Café last Monday of the changes and there was a great deal of interest expressed. Our meetings will be on the fourth Wednesday of the month.

Bryon has agreed to fill the role of Vice-President. Freda will continue to produce our newsletter. The newsletter is beautifully done and very informative. We are privileged to have such a high quality publication. Brian Robilliard will continue as the Webmaster, Gail Roberson as Secretary and Phyllis Scott will continue as treasurer.

Thanks again to all members (and potential members) and I look forward to an excellent year for the StarFinders.

Ed Maxfield, President, Cowichan Valley StarFinders Astronomy Society
president@starfinders.ca

Message from the Vice President:

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Hello everyone, I hope this short message finds you well and curious. Curiosity may have not helped the feline species any but it is a necessary ingredient to any budding astronomer! I look forward to sharing that curiosity with all of you in the months ahead.

As Ed Maxfield has stated in his message; there are a few of you who have been with the club for a number of years and will recall the meetings at Frank's house as social events with lots of sharing and conversation about the topic of our mutual interest. I am hoping we can fill our house with a continuation of that energy. We promise to have real cream for the coffee, no more glow in the dark powder (sorry Frank)!

I am sure we will have a great year of viewing and I look forward to the annual Island Star Party. My job there will be MC along with continuing Astronomy 101 (I was the guy with the loud voice and the laser pointer). I intend to continue as 'Public Outreach Officer' for the club as well as plodding along in Ed's footsteps.

The club has always benefitted from the combined energies of many members contributing to make our experience of astronomy a memorable one. We have a great group of people involved in the club and I look forward to more curious times with you all.

See you at our house on the "Fourth Wednesday", Till then Clear Skies everyone.

Bryon Thompson
Vice President, Cowichan Valley StarFinders Astronomy Society
vice-president@starfinders.ca

Many thanks to this month's contributors: Norm Willey, Bryon Thompson and Ed Maxfield

Freda Eckstein

"Shoot for the moon. Even if you miss, you'll land among the stars". ~Les Brown

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Meeting Highlights

We have now fulfilled our complement of elected Directors the list is as follows:

President: Ed Maxfield

Vice President and Public Outreach Officer: Bryon Thompson

Treasurer: Phyllis Scott

Secretary: Gail Robertson

Webmaster: Brian Robilliard

Newsletter Editor: Freda Eckstein

Thanks to Norm our past President for all his efforts during his tenure.

HOT OFF THE PRESS – MEETING DATES AND LOCATION CHANGE

Please note: our monthly meeting schedule and location **HAS CHANGED** we have found that the first Tuesday of the month is not as accessible for some members, Also, we are looking at ways to get back to some of the more social aspects of the club. Therefore, at the last meeting a proposal was put forth by the President (motioned by the members present) to change the meeting date and hold the meetings at a members house.

Bryon and Freda offered their house in Mill Bay as the new meeting place for our Victoria, Duncan and up Island members to gather and observe.

EFFECTIVE IMMEDIATELY

Meetings will be held on the **4th Wednesday** of each month at the home of Bryon and Freda. See the website for a map or follow these directions.

Island Hwy, Mill Bay

Turn on Frayne Rd towards ocean (Serious Coffee is on the corner)
Turn right on Huckleberry Rd
3rd house on the left across from Springbank road and Mail boxes.

Look or STAR signs

Please park on Huckleberry or Springbank Rd's.
Call Brian 743-6633 if you need directions

Our next meeting will be held at 7:30 on WEDNESDAY January 23rd at The home of Bryon and Freda.

Hope to see you all there.

For more information about upcoming meetings go to [Starfinders Meetings](#)

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Upcoming Events

NASA TV to Air Columbia Crew Remembrance Service - NASA Television will provide live coverage of the Astronauts Memorial Foundation's remembrance service honoring space shuttle Columbia's STS-107 crew. The ceremony will be held at the Space Mirror Memorial on the NASA Kennedy Space Center Visitor Complex at 10 a.m. EST on Feb. 1, the fifth anniversary of the Columbia accident where seven astronauts were lost during re-entry on Feb. 1, 2003, following a 16-day science mission. For NASA TV downlink information, schedules and links to streaming video, visit: <http://www.nasa.gov/ntv>

Columbus launch targeted for 7 February - NASA has announced 7 February 2008 as the target launch date for Space Shuttle Atlantis' STS-122 mission to carry the European Columbus laboratory into space.

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Web News

Would you like to take a journey to the edge of space or a flight on a sub-orbital spacecraft? In this section you will find various Space Planes ranging from studies to spaceplanes in development and more

<http://www.aerospaceguide.net/spaceplanes/index.html>

Want to know where the ISS is at all times? Then you need to use the The ESA Spacecraft Tracker. The ESA Spacecraft Tracker is a web "gadget" that combines real-time satellite position data with maps provided via Google Maps to deliver a dynamically updated image showing the ground track of several ESA and ESA-related missions. Watch it at work

http://www.esa.int/SPECIALS/Track_ESA_missions/index.html

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Cool Pics

Want to show off your latest pics? Well here's your chance; email the editor at [My Cool Pics](#) and we will try to post them in the next edition of "Clear Skies".

Check out our NEW Photo gallery on the website where you can find pics from the Island Star Party (ISP) 2007. Quick link is <http://starfinders.ca/photos.htm>

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Featured Articles

Baffling Cosmic Explosion Comes Out of Nowhere - December 18
Credit LiveScience

A cosmic explosion that seems to have come out of nowhere—thousands of light-years from the nearest collection of stars—has left astronomers baffled.

The blast, one of the brightest this year, was detected by spacecraft from the Inter-Planetary Network on Jan. 25 and satellites were used to pinpoint its location to a region of the sky in the constellation Gemini.

The explosion was a type called a long-duration gamma-ray burst (GRB), which are thought to be powered by the death of a massive star. But images taken after the glow of the burst, dubbed GRB 070125, had faded away showed no galaxy at the location.

"Here we have this very bright burst, yet it's surrounded by darkness on all sides," said team member Brad Cenko of the California Institute of Technology. "The nearest galaxy is more than 88,000 light-years away, and there's almost no gas lying between the burst and Earth."

Scientists used telescopes at Palomar Observatory and on Hawaii's Mauna Kea to examine the burst's spectrum, which revealed no signs of gas and dust absorbing the light of the afterglow. A trace of magnesium in the spectrum indicated that the burst took place more than 9.4 billion years ago.

Because the massive stars believed to produce GRBs live fast and die young, they don't have time to wander from their birthplace, which is usually dense clouds of gas and dust inside of galaxies. So the explosion raise the perplexing question of how a massive star could be found so far from a galaxy.

"If a massive star died far away from any galaxy, the key question is, how did it manage to be born there?" said team member Derek Fox of Penn State.

One possibility is that the star formed in the outskirts of an interacting galaxy. To test this idea, astronomers will have to take a long exposure of the area with the Hubble Space Telescope to see if they can find the tidal tail of an interacting galaxy there.

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Shot in the Dark - December 18/07 credit NASA's Goddard Space Flight Center

A team of astronomers has discovered a cosmic explosion that seems to have come from the middle of nowhere, thousands of light-years from the nearest galaxy-sized collection of stars, gas, and dust. This "shot in the dark" is surprising because the type of explosion, a long-duration gamma-ray burst (GRB), is thought to be powered by the death of a massive star.

"Here we have this very bright burst, yet it's surrounded by darkness on all sides," says Brad Cenko of the California Institute of Technology in Pasadena, California and lead author. "The nearest galaxy is more than 88,000 light-years away, and there's almost no gas lying between the burst and Earth."

The blast was detected on January 25, 2007, by several spacecraft of the Inter-Planetary Network. Observations by NASA's Swift satellite pinpointed the explosion, named GRB 070125 for its detection date, to a region of sky in the constellation Gemini. It was one of the brightest bursts of the year, and the Caltech/Penn State team moved quickly to observe the burst's location with ground-based telescopes.

Using the team's robotic 60-inch telescope at Palomar Observatory in California, the astronomers discovered that the burst had a bright and fast-fading afterglow

in visible light. This prompted them to observe the afterglow in detail with two of the world's largest telescopes, the 8-meter Gemini North telescope and 10-meter Keck I telescope, both near the summit of Hawaii's Mauna Kea.

What came next was a total surprise. Contrary to experience with more than a hundred previous GRBs, Gemini spectra revealed no signs of dense gas and dust absorbing the light of the afterglow. A trace of magnesium revealed that the burst took place more than 9.4 billion years ago, as deduced by the shift in wavelength of the afterglow's light, and that the surrounding gas and dust was more tenuous than the environment around any previous burst.

To further pin down the environment that could produce such an unusual explosion, the group obtained Keck images of the location of GRB 070125 long after its afterglow light had faded away. Surprisingly, the resulting images showed no galaxy at this location.

Astronomers have amassed a great deal of evidence that GRBs are triggered by the explosive deaths of massive stars, which live very short lives. Because of their short lifespans, massive stars don't have time to wander far from their birthplaces, usually dense clouds of gas and dust inside respectable-size galaxies. So GRB 070125 raises the perplexing question of how a massive star could be found so far away from any galaxy.

"Big stars live fast and die young, without much time to move around," says coauthor Derek Fox of Penn State. "So if this massive star died far away from any galaxy, the key question is, how did it manage to be born there?"

The formation of massive stars requires similarly massive aggregations of gas and dust, which are usually found in bright galaxies.

One possibility is that the star formed in the outskirts of an interacting galaxy, as seen in the famous Hubble Space Telescope picture of the "Tadpole" galaxy, UGC 10214.

"In the local universe, about one percent of star formation happens in tidal tails, on the outskirts of two interacting galaxies," says Cenko. "So it might even make sense to find one in 100 gamma-ray bursts in such an environment."

If this idea is correct, it should be possible to detect the tidal tail hosting GRB 070125 by taking a long exposure with the Hubble Space Telescope, which is the team's next step.

"Many Swift discoveries have left astronomers scratching their heads in befuddlement," adds Swift lead scientist Neil Gehrels of NASA Goddard Space Flight Center in Greenbelt, Maryland. "But this discovery of a long GRB with no host galaxy is one of the most perplexing of all."

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Anatomy of a bird— Dec 21, 2007 credit ESO

Using ESO's Very Large Telescope, an international team of astronomers has discovered a stunning rare case of a triple merger of galaxies. This system, which astronomers have dubbed "The Bird," is composed of two massive spiral galaxies and a third irregular galaxy.

The galaxy ESO 593-IG 008, or IRAS 19115-2124, was previously known as an interacting pair of galaxies at a distance of 650 million light-years. But surprises were revealed by observations made with the NACO instrument attached to ESO's Very Large Telescope, which peered through the all-pervasive dust clouds, using adaptive optics to resolve the finest details.

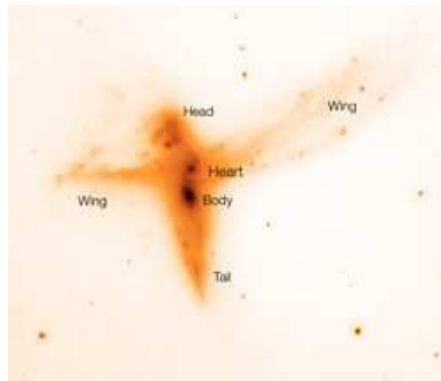
Underneath the chaotic appearance of the



optical Hubble images, retrieved from the Hubble Space Telescope archive, the NACO images show two unmistakable galaxies, one a barred spiral while the other is more irregular. 6

The surprise lay in the clear identification of a third, clearly separate component, an irregular, yet fairly massive galaxy that seems to be forming stars at a frantic rate.

"Examples of mergers of three galaxies of roughly similar sizes are rare," says Petri Vaisanen, lead author of the paper reporting the results. "Only the near-infrared VLT observations made it possible to identify the triple merger nature of the system in this case."



This image was taken with the NACO instrument on ESO's Very Large Telescope in the K-band and indicates the different parts of the Bird. Because of the resemblance of the system to a bird, the object was dubbed as such, with the "head" being the third component, and the "heart" and "body" making the two major galaxy nuclei in-between of tidal tails, the "wings." The latter extend more than 100,000 light-years, or the size of our own Milky Way.

Subsequent optical spectroscopy with the new Southern African Large Telescope, and archive mid-infrared data from the NASA Spitzer space observatory, confirmed the separate nature of the head, but also added further surprises. The head and major parts of the "Bird" are moving apart at more than 400 km/s (1.4 million km/h). Observing such high velocities is very rare in merging galaxies. Also, the head appears to be the major source of infrared luminosity in the system, though it is the smallest of the three galaxies.

"It seems that NACO has caught the action right at the time of the first high-speed fly-by of the 'head' galaxy through the system consisting of the other two galaxies," says Seppo Mattila, member of the discovery team. "These two galaxies must have met earlier, probably a couple of hundred million years ago."

The head is forming stars violently, at a rate of nearly 200 solar masses per year, while the other two galaxies appear to be at a more quiescent epoch of their interaction-induced star formation history.

The Bird belongs to the prestigious family of luminous infrared galaxies, with an infrared luminosity nearly 1000 billion times that of the Sun. This family of galaxies has long been thought to signpost important events in galaxy evolution, such as mergers of galaxies, which in turn trigger bursts of star formation, and may eventually lead to the formation of a single elliptical galaxy.

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Jet Power and Black Hole Assortment Revealed – January 9, 2008
credit Chandra Press Room

A dramatic new Chandra image of the nearby galaxy Centaurus A provides one of the best views to date of the effects of an active supermassive black hole. Opposing jets of high-energy particles can be seen extending to the outer reaches of the galaxy, and numerous smaller black holes in binary star systems are also visible.

The image was made from an ultra-deep look at the galaxy Centaurus A, equivalent to more than seven days of continuous observations.



Centaurus A is the nearest galaxy to Earth that contains a supermassive black hole actively powering a jet.

A prominent X-ray jet extending for 13,000 light years points to the upper left in the image, with a shorter "counterjet" aimed in the opposite direction. Astronomers think that such jets are important vehicles for transporting energy from the black hole to the much larger dimensions of a galaxy, and affecting the rate at which stars form there.

High-energy electrons spiraling around magnetic field lines produce the X-ray emission from the jet and counterjet. This emission quickly saps the energy from the electrons, so they must be continually reaccelerated or the X-rays will fade out. Knot-like features in the jets detected in the Chandra image show where the acceleration of particles to high energies is currently occurring, and provides important clues to understanding the process that accelerates the electrons to near-light speeds.



The inner part of the X-ray jet close to the black hole is dominated by these knots of X-ray emission, which probably come from shock waves -- akin to sonic booms -- caused by the jet. Farther from the black hole there is more diffuse X-ray emission in the jet. The cause of particle acceleration in this part of the jet is unknown.

Hundreds of point-like sources are also seen in the Chandra image. Many of these are X-ray binaries that contain a stellar-mass black hole and a companion star in orbit around one another. Determining the population and properties of these black holes should help scientists better understand the evolution of massive stars and the formation of black holes.

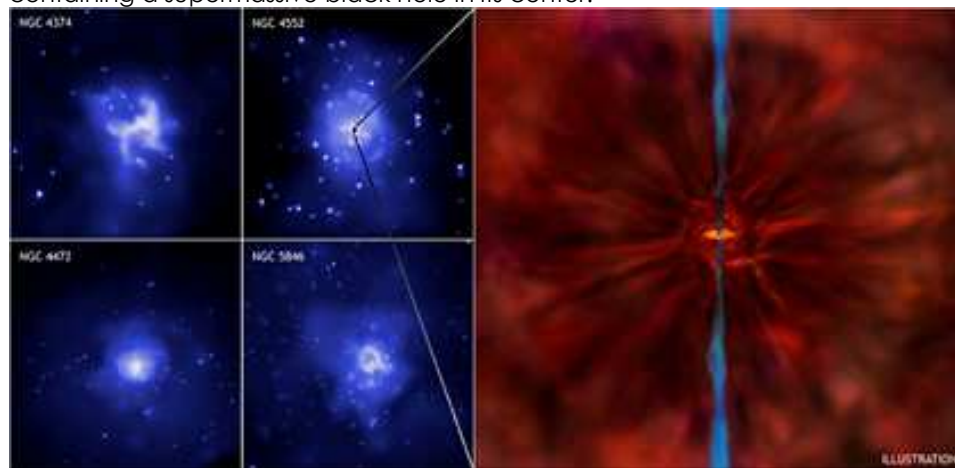
Another surprise was the detection of two particularly bright X-ray binaries. These sources may contain stellar mass black holes that are unusually massive, and this Chandra observation might have caught them gobbling up material at a high rate.

In this image, low-energy X-rays are colored red, intermediate-energy X-rays are green, and the highest-energy X-rays detected by Chandra are blue. The dark green and blue bands running almost perpendicular to the jet are dust lanes that absorb X-rays. This dust lane was created when Centaurus A merged with another galaxy perhaps 100 million years ago.



Spinning Black Holes Survey– January 10, 2008 credit Chandra Press Room

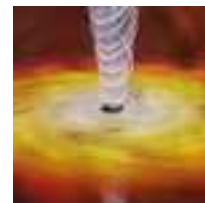
Results from NASA's Chandra X-ray Observatory, combined with new theoretical calculations, provide one of the best pieces of evidence yet that many supermassive black holes are spinning extremely rapidly. The images on the left below show 4 out of the 9 large galaxies included in the Chandra study, each containing a supermassive black hole in its center.



The Chandra images show pairs of huge bubbles, or cavities, in the hot gaseous atmospheres of the galaxies, created in each case by jets produced by a central supermassive black hole. Studying these cavities allows the power output of the jets to be calculated. This sets constraints on the spin of the black holes when combined with theoretical models.

Illustration of Black Hole EngineThe Chandra images were also used to estimate how much fuel is available for each supermassive black hole, using a simple model for the way matter falls towards such an object.

The artist's impression on the right side of the main graphic shows gas within a "sphere of influence" falling straight inwards towards a black hole before joining a rapidly spinning disk of matter near the center. Most of the material in this disk is swallowed by the black hole, but some of it is swept outwards in jets (colored blue) by quickly spinning magnetic fields close to the black hole.



Previous work with these Chandra data showed that the higher the rate at which matter falls towards these supermassive black holes, the higher their power output is in jets. However, without detailed theory the implications of this result for black hole behavior were unclear. The new study uses these Chandra results combined with leading theoretical models for the production of jets, plus general relativity, to show that the supermassive black holes in these galaxies must be spinning at close to the maximum rate. If black holes are spinning at this limit, material can be dragged around them at close to the speed of light, the speed limit from Einstein's theory of relativity.

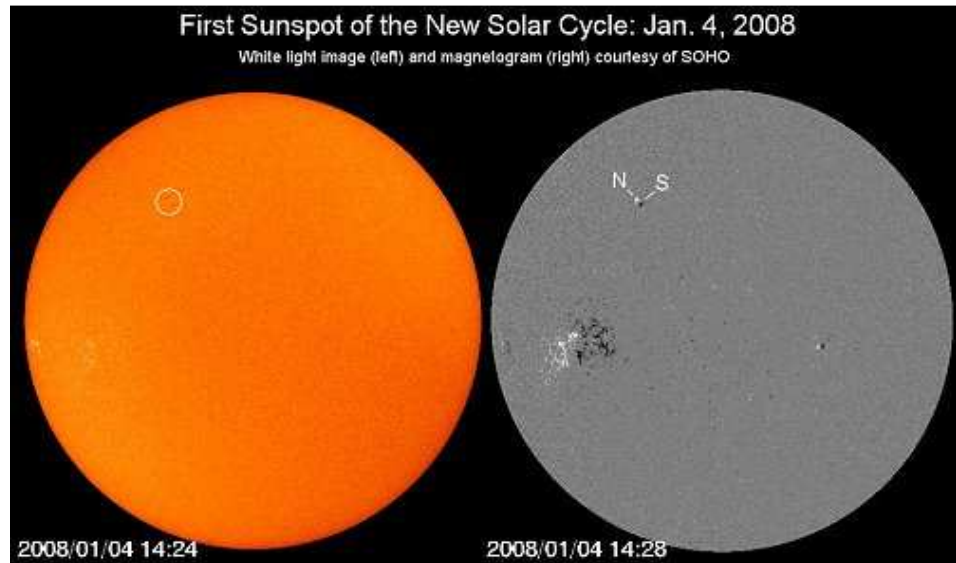
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Solar Cycle 24 Begins– January 10, 2008 credit Science@NASA

Hang on to your cell phone, a new solar cycle has just begun.

"On January 4, 2008, a reversed-polarity sunspot appeared—and this signals the start of Solar Cycle 24," says David Hathaway of the Marshall Space Flight Center.

Below: Images of the first sunspot of Solar Cycle 24 taken by the NASA/ESA Solar and Heliospheric Observatory (SOHO). [Larger image] [Movie]



Solar activity waxes and wanes in 11-year cycles. Lately, we've been experiencing the low ebb, "very few flares, sunspots, or activity of any kind," says Hathaway. "Solar minimum is upon us."

The previous solar cycle, Solar Cycle 23, peaked in 2000-2002 with many furious solar storms. That cycle decayed as usual to the present quiet leaving solar physicists little to do other than wonder, when would the next cycle begin?

The answer is now.

"New solar cycles always begin with a high-latitude, reversed polarity sunspot," explains Hathaway. "Reversed polarity" means a sunspot with opposite magnetic polarity compared to sunspots from the previous solar cycle. "High-latitude" refers to the sun's grid of latitude and longitude. Old cycle spots congregate near the sun's equator. New cycle spots appear higher, around 25 or 30 degrees latitude.

The sunspot that appeared on January 4th fits both these criteria. It was high latitude (30 degrees N) and magnetically reversed. NOAA named the spot AR10981, or "sunspot 981" for short.

Sunspot 981 was small--only about as wide as Earth, which counts as small on the grand scale of the sun--and it has already faded away. But its three day appearance on Jan. 4-6 was enough to convince most solar physicists that Solar Cycle 24 is underway.

Doug Biesecker of NOAA's Space Weather Prediction Center in Boulder, Colorado, likens sunspot 981 "to the first robin of spring. There's still snow on the ground, but the seasons are changing." Last year, Biesecker chaired the Solar Cycle 24 Prediction Panel, an international group of experts from many universities and government agencies. "We predicted that Solar Cycle 24 would begin around March 2008 and it looks like we weren't far off," he says.

Right: The first auroras of the new solar cycle, photographed Jan. 4, 2008, by Calvin Hall of Palmer, Alaska. [more]

The onset of a new solar cycle is significant because of our increasingly space-based technological society.



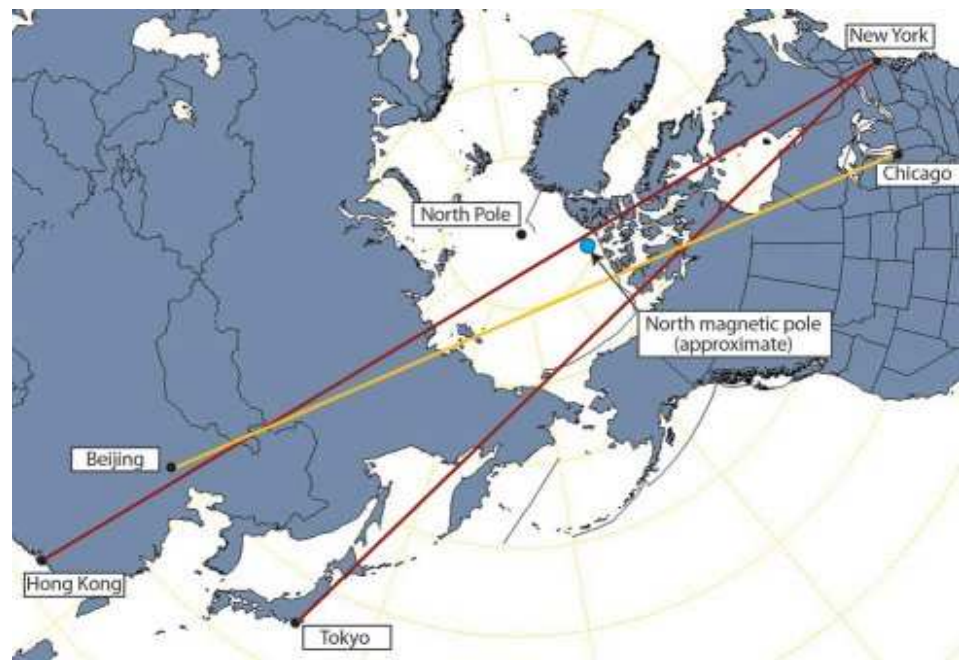
"Solar storms can disable satellites that we depend on for weather forecasts and

GPS navigation," says Hathaway. Radio bursts from solar flares can directly interfere with cell phone reception while coronal mass ejections (CMEs) hitting Earth can cause electrical power outages. "The most famous example is the Quebec outage of 1989, which left some Canadians without power for as much as six days."

Air travel can be affected, too.

Every year, intercontinental flights carry thousands of passengers over Earth's poles. It's the shortest distance between, say, New York and Tokyo or Beijing and Chicago. In 1999, United Airlines made just twelve trips over the Arctic. By 2005, the number of flights had ballooned to 1,402. Other airlines report similar growth.

"Solar storms have a big effect on polar regions of our planet," says Steve Hill of the Space Weather Prediction Center. "When airplanes fly over the poles during solar storms, they can experience radio blackouts, navigation errors and computer reboots all caused by space radiation." Avoiding the poles during solar storms solves the problem, but it costs extra time, money and fuel to "take the long way around."



Above: An increasing number of international business flights cross Earth's Arctic to save time, fuel and money.

Now for the good news: More solar storms also means more auroras—"the greatest show on Earth." During the last solar maximum, Northern Lights were spotted as far south as Arizona, Florida and California. Not so long ago, only visitors to the Arctic regularly enjoyed auroras, but with increasing attention to space weather and constantly improving forecasts, millions of people at all latitudes will know when to go out and look.

Much of this is still years away. "Intense solar activity won't begin immediately," notes Hathaway. "Solar cycles usually take a few years to build from solar minimum (where we are now) to Solar Max, expected in 2011 or 2012."

It's a slow journey, but we're on our way.

More information

Strange but True: While Solar Cycle 24 has begun, Solar Cycle 23 has not ended. Both cycles will coexist for a period of time, perhaps a year or more, as one dies down and the other comes to life. In the months ahead we may see old-cycle sunspots and new-cycle sunspots on the sun at the same time.

NASA is gearing up to study the active sun during Cycle 24 with the launch of a new spacecraft, the Solar Dynamics Observatory. "SDO is a very special observatory," says project scientist Dean Pesnell at NASA's Goddard Space Flight Center, Greenbelt, Md. "Using a technique called helioseismic imaging, the spacecraft will be able to look inside the sun where solar activity begins. SDO will join SOHO, STEREO, Hinode and other missions already in orbit to improve our understanding of solar storms and lay the groundwork for better space weather forecasts."

NOAA: Solar Cycle 24 Prediction

NOAA: Sunspot is Harbinger of New Solar Cycle, Increasing Risk for Electrical Systems

NASA's Future: The Vision for Space Exploration

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Google's Space-Exploration Vision: From Virtual 3-D Travel to the "People's Telescope"- January 14, 2008 Credit The Daily Galaxy



One of the early trends of the 21st Century is the sense that science and space exploration and its expression in film, video, news and events will dominate popular culture as the Internet has during the past decade.

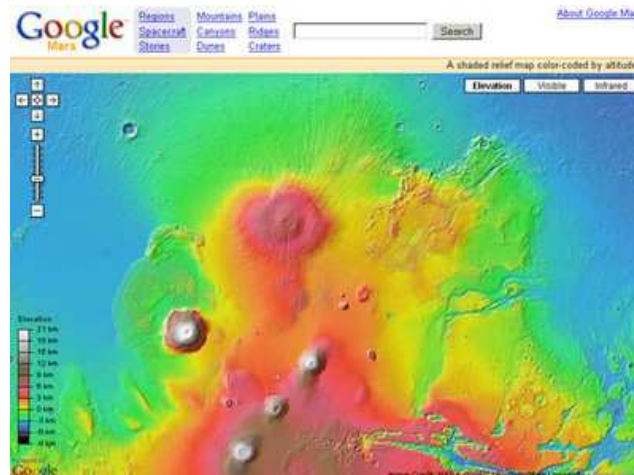
Leading this cultural shift is Google. The search-giant has announced several major initiatives with NASA that have positioned the company as the Space Age leader in information-delivery.

One of Google's first projects was to partner with NASA's Ames Research Center to produce high-resolution 3D maps of Mars and the Moon in the same detail as Google Earth. Users will experience a virtual flight over the surface of the Moon or through the

canyons of Mars.

The collaboration will also seek to make NASA data available on the internet, including live weather maps and forecasts, plus real-time tracking of the International Space Station and shuttle. Google will also assist NASA in managing the vast amounts of information held across the agency's network of computers.

As the first in a series of joint collaborations, Google and Ames will focus on making the most useful of NASA's information available on the Internet. Real-time weather visualization and forecasting, high-resolution 3-D maps of the moon and Mars, real-time tracking of the International Space Station and the space shuttle will be explored in the future.



"This agreement between NASA and Google will soon allow every American to experience a virtual flight over the surface of the moon or through the canyons of Mars," said NASA Administrator Michael Griffin at Headquarters in Washington. "This innovative combination of information technology and space science will make NASA's space exploration work accessible to everyone," added Griffin.

Google has struck a partnership with scientists building a huge sky-scanning telescope, the Large Synoptic Survey Telescope (LSST), on a mountaintop in Chile, with hopes of helping the public with a "people's telescope" to provide access to real-time digital footage of asteroids, supernovas and distant galaxies. Officials say the telescope will open "a movie-like window" on nearby asteroids and far-off exploding stars, and help explore the mysterious "dark energy" believed to fuel the universe's expansion.

Officials say the telescope will open "a movie-like window" on nearby asteroids and far-off exploding stars, and help explore the mysterious "dark energy" believed to fuel the universe's expansion.

It is assumed the company that already offers detailed online maps of the Earth, the Moon and Mars will help analyze massive amounts of data - up to 30 terabytes a night - generated by the telescope.

It will be fitted with a three billion pixel digital camera capable of detecting so-called near-Earth asteroids as small as 100 yards wide.

The telescope, which can view a chunk of sky seven times the width of the Full Moon at any one time, is also expected to spot exploding supernovae and new dwarf planets, or Kuiper Belt objects, beyond Pluto. It will also check billions of galaxies for the effects of those invisible forces dark matter and dark energy.

Scheduled to begin operations in 2013, the 8.4-meter telescope will survey the entire visible sky every week investigating Dark Matter and Dark Energy and opening a movie-like window on fast-changing objects such as exploding supernovae, near-Earth asteroids and distant Kuiper Belt Objects beyond Pluto.

More immediately, Google Earth is launching a new feature called Sky, a "virtual telescope" that will allow millions of Internet users to become full-fledged stargazers. Supernovas and the most remote, ancient galaxies are now just a mouse click away through Sky in Google Earth.

The old Google Earth gave Internet users an "astronaut's view" that can zoom in all the way to street level. Google says the new service also provides a reversed outlook that will let us look out into space in the opposite direction—giving user's an "astronomer's view", as well. The hope is to turn millions of Internet users into stargazers by giving them a fun 'playground' for discovering not just our earth, but the entire universe.

"Never before has a roadmap of the entire sky been made so readily available," said Dr. Carol Christian an astronomer at the Space Telescope Science Institute, who co-lead the institutes's Sky team.

"Sky in Google Earth will foster and initiate new understanding of the universe by bringing it to everyone's home computer."

"You have seen the Hubble images of objects such as the Eagle Nebula, the so-called pillars of creation," said Christian. "With Sky in Google Earth you can see where the objects are located in space, including the constellations in which they reside. Then you can discover other cool objects in nearby regions of the sky. And you don't have to know anything about astronomy to use the program."

Similar to Google Earth, Sky will enable users to float and zoom in on over 100 million individual stars and 200 million galaxies. Users will view the sky as seen from earth.

The backyard astronomy layer lets users click through stars, galaxies and nebulae visible to the eye, binoculars and small telescopes. Users can also delve into deeper layers, which will show the life of a star, constellations, and high-rez images provided by the Hubble Space Telescope along with a "users guide to galaxies".

The imagery was compiled from numerous third parties including the Digital Sky Survey Consortium, the United Kingdom Astronomy Technology Center and the Anglo-Australian Observatory. The imagery will be updated over time as new visual discoveries come to light.

"We're excited to provide users with rich astronomical imagery and enhanced content that enables them to both learn about what they're seeing and tell their own stories," said Google Product Manager Lior Ron in a statement.

"By working with some of the industry's leading experts, we've been able to transform Google Earth into a virtual telescope."

Google Earth soon became a hit after launching in June 2005 to combine its search service with satellite imagery, maps and 3D building to display the world's geographical information.

According to Google, over 250 million people have already downloaded it.

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The Sky service will soon be available on all Google Earth domains, in 13 languages. Users will need to download the newest version of Google Earth, which can be found at www.earth.google.com

It's hard not to hate Google sometimes. It's easy to get jealous of the company's unbridled success—not to mention how their employees get free gourmet meals, while the rest of us are eating 3 day old leftovers. But when something like "Sky" comes along—you just have to hand it to them—they come up with some pretty cool ideas. Rock on, Google. Rock on.

On Thursday, Jan. 17, the chairman and chief executive officer of Google, Eric Schmidt, will discuss the benefits of technology, innovation and space exploration. NASA television will broadcast the event live at: <http://www.nasa.gov/ntv>

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Buy and Sell

Here's your chance to clean out the closet and find a home for your slightly used treasures. Post your buy and sell items by emailing the [Editor](#) with your details.

Newtonian for Sale

Good permanent Newtonian scope (not portable) with 13 1/2 inch mirror, 4" Steel Alt Azimuth mount with concrete counter balance. Includes various eyepieces. More info contact John MacArthur at jandlmac@shaw.ca

Single 8" Meade Looking for an Astronomer

Lonely 8" Meade Newtonian with motorized German equatorial steel post mount is looking for a pair of lovely eyes to spend long nights gazing at the stars together. Includes homemade Dobsonian mount, one 40 mm eyepiece and telescope carrying bag. Asking \$750.00 OBO contact Bryon Thompson at bryonjt@shaw.ca.

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Ask an Expert

Have you been thumbing through the Astronomy or Sky and Telescope magazine and have some questions on the latest and greatest in astronomy gear? Or maybe you're narrowing down your search for just the right telescope and want to know the difference between Dobsonians, Schmidt-Cassegrains, Reflector and Refractors. Well wonder no more, email [Brian Robilliard](#) our resident expert to get the "inside scoop" on what's hot or not in astronomy gear.

Are you seeing double or unable to focus? Chances are you need to collimate your scope. Are you looking for a good eyepiece? Why do you need to know the focal length of your telescope's mirror and how do you determine the focal length? For answers to these and other telescope questions email [Ed Maxfield](#) our expert on telescope tips, hints and suggestions.

Are you new to astronomy? Want to know the how to find objects in the sky? Or just wondering what that bright object in the evening sky is? Well wonder no more; email [Bryon Thompson](#) our Public Outreach Officer and master of Astronomy 101 basics.

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Kids Korner

For the younger astronomers. We want your input on what you would like to see happening at the club. Tell us a bit about yourself and why you love astronomy. Email the [Editor](#) with your submissions.

For the older folks, if you have any ideas that might spark the interest of a young

Did you Know..... here's some great stuff, Try testing your parents on these didya know's courtesy of ESA Kids.

1. The furthest spacecraft which is still in touch with Earth is NASA's Voyager 1. In 2006, Voyager 1 was more than 14,700 million km away (98 times the Earth's distance from the Sun). A signal from the spacecraft takes more than 13 ½ hours
2. The world's heaviest communications satellite was placed into orbit on 11 August 2005 by Europe's Ariane 5. The THAICOM 4 satellite weighed nearly 6,500 kg – almost as much as a London bus.
3. Comet Hyakutake had the longest comet tail ever recorded. The tail stretched for more than 570 million km away from the Sun. It was detected by ESA's Ulysses spacecraft on 1 May 1996.
4. The tallest astronaut to fly in space was American Jim Wetherbee, who was 1.93 m (6 feet 4 inches) high. The shortest was American astronaut, Nancy Currie, who measured just 1.52 m (5 feet).
5. The first communications satellite was the Moon. US Army engineers bounced signals off the Moon in 1951. They did so again in 1955, during a communications blackout caused by a solar storm. Two of the first artificial communications satellites were large, shiny balloons that reflected radio signals. They were called Echo 1 and 2.

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RASC News

By Ed Maxfield

Royal Astronomical Society of Canada, Victoria Centre

Meetings

Meetings are held on the second Wednesday of each month except July and August downstairs in the Elliot Bldg at U of Vic.

Astronomy Café

The Astronomy Café Meets on Monday evenings at Sir James Douglas School on Fairfield Road. This is a really fun meeting where anything astronomical can be discussed.

New Observatory

The observatory project is really coming together. The mount, a Paramount ME fully robotic mount, has been purchased. The roll-off roof observatory is being built. The walls have been framed and covered and the roof is currently being constructed. The extension for the roll-off roof has been built. Things are really coming together. For pictures, see the website below.

Check out the web site at <http://victoria.rasc.ca> for further information and to see some really awesome images taken by our very active astrophotographers.

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The Sky This Month

By Bryon Thompson

Observing Site: **Duncan, 48.783°N, 123.700°W**

There are a number of good things to look at this month providing our questionable February skies cooperate.

The big show this month is the total lunar eclipse on the 20th . The eclipse starts at 5:43pm PST on the 20th and reaches totality at 7:01pm. The penumbra which is the lighter part of earth's shadow takes 78 minutes to cover the moon completely. The darkest part of the earth's shadow, the Umbra, covers the face of the moon for 51 minutes finishing by 7:52pm. Then the penumbra takes

another 78 minutes to completely leave the moon, the whole event lasting until 9:10pm. The reason the moon looks reddish- orange has to do with the earth's atmosphere. Just like a prism in your window can break light into it's component colours; the atmosphere acts like a prism and bends the light from the sun into the shadow that the earth projects out into space. The red wavelengths of light are bent the most and hence when the moon is in the earth's shadow it is bathed in a reddish hue.

Starting early in the day, you can see the morning jewels Venus and Jupiter. They start by gracing the pre -dawn sky a full moons width from each other early in the month, around 5:00am PST. They will lie low in the eastern sky and shine like the beacons they are, Venus at magnitude -3.9 and Jupiter at -1.9. They are closest on the 1st of the month and then start to go their separate ways. Jupiter will continue to rise a little earlier each morning and Venus will fall closer to the rising sun and become lost to view.

Saturn is the best performer of the distant planets this month. It rises early in the evening and moves toward opposition (it lies on the opposite side of the earth from the sun) by the end of the month. It is also closest to the earth this year at this time, only 771 million miles. Just a lazy jaunt to the corner store in galactic terms! The previous two planets mentioned are closer of course, Jupiter at only 562 million miles and Venus at a very close 127 million miles. My goodness, It's just across the street! Anyway the big gas giant can be found in Leo and is best seen before midnight when it is highest in the sky. This is the best time to view the apparent disk of the planet as it will cover 20" at opposition and because the rings are tilted only 8 degrees from our line of site they block out less of the face of the planet. February 10th and 11th promise a good telescopic view of some of the moons of Saturn. Four of the moons, Iapetus, Tethys, Dione and Rhea can be found on Saturns western side 20" from each other on the 10th. Three moons, Tethys, Rhea and Enceladus lie within 13" of each other on the 11th.

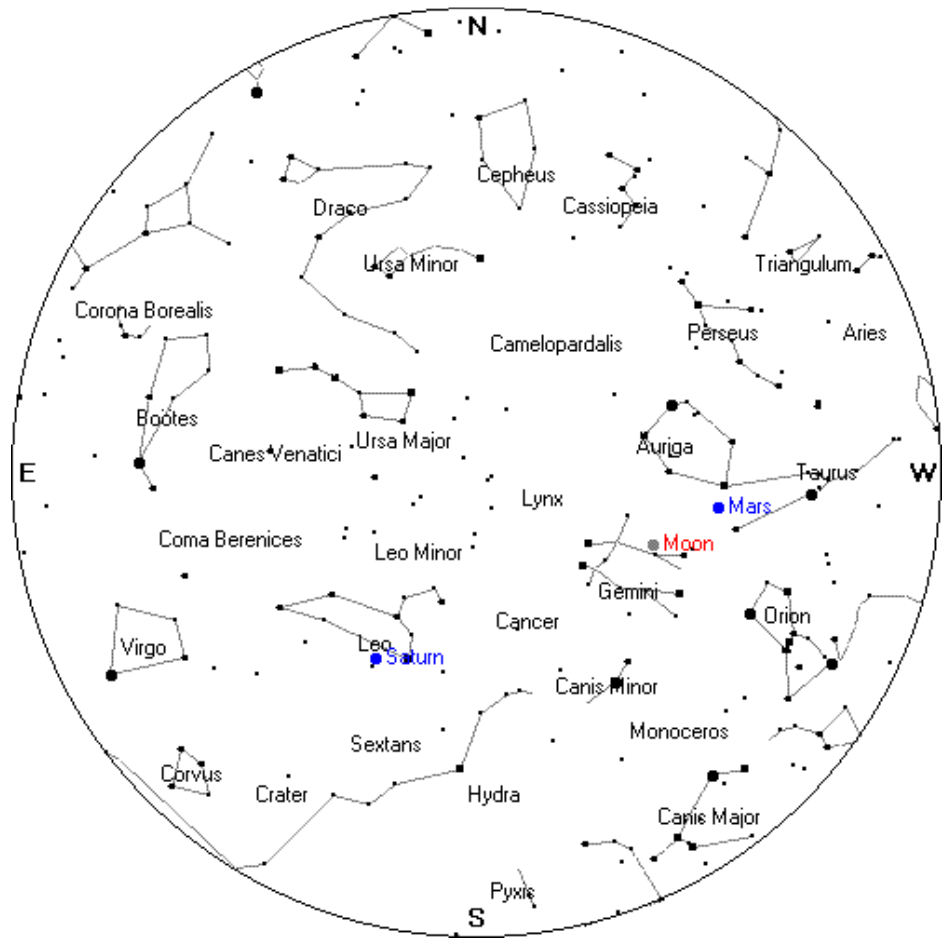
Mars, the star of the last few months nightly shows, is still a good a good bet as far as a telescopic target but it is slowly fading in brightness and apparent size. The 1st of the month is when Mars reaches the furthest in its retrograde motion. Mars now returns to its eastern movement across the sky. Its apparent diameter is 12" at the start of the month and by the end of February it is only 9" across.

During the first and last weeks of the month when the moon is at its darkest look for comet 46P/Wirtanen, a short period comet that takes only 5.4 years to circle the sun. Look towards Pices and Aries for an 8.5th magnitude smudge with a tail in the sky. On February 5th it passes very close to NGC 524, a 10th magnitude spiral galaxy in Pices.

If the weather cooperates, February can provide some great views of wonder and mystery. I hope you get a chance to get outside and do just that. Till next month, remember things are looking up in Astronomy!

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|-------------|------------|---|
| February 01 | 05:00amPST | Venus and Jupiter are close and share the morning sky |
| February 06 | 07:44pmPST | New Moon |
| February 13 | 04:56pmPST | Moon at Perigee (230,043 miles from earth) |
| February 20 | 07:30pmPST | Full Lunar Eclipse |
| February 24 | 02:00amPST | Saturn at Opposition |

Sky Chart —Here's your mid-February midnight sky chart. In order to use the sky chart properly remember the centre of the chart is the sky directly above your head (or the Zenith). Turn the chart so that the direction you are facing is at the bottom of the chart (or pointed toward your toes). The star field directly in front of you will be between the bottom of the chart and the centre.



Sky Chart Courtesy of Heavens-Above

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