SKYWATCHER

THE NEWS LETTER OF THE GUILDFORD ASTRONOMICAL SOCIETY

http://www.guildfordas.org/

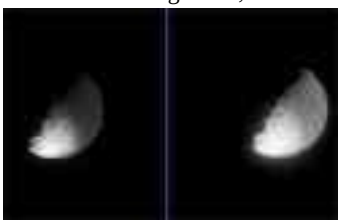
FROM THE EDITOR…..

Well folks that's Kelling Heath over for another year, and well what can I say about it other than……it was windy, but fun.
For those of you who could not make it this year or have never been to Kelling Heath before, I have one thing to say to you all…. wrap up warm next year?
For those of you who did not go I hope that you had better skies than we did, as it was cloudy most of the weekend.
As you may have noticed, I have changed the logo…Again, but for the last time I hope.
What I hope to do over the next year is to get Skywatcher back to monthly issues, but to do this I would like to ask all the members & non-members to help me?
You can do this by sending me ANYTHING you think other members might be interested in, for example, you might have something to sell or need, or read something and thought it would be of interest to the society, like I say ANYTHING.
Well that's it form me for this issue, other than to wish you all clear skies, and also my deepest apologies go out to David Reynolds and John Axtell as I did not place there articles in the last issue….. Sorry chaps!!!!

Neil Ross
Editor

Cassini spacecraft spies Saturn's moon Iapetus

CASSINI PHOTO RELEASE
Posted: August 22, 2004



Credit: NASA/JPL/University of Arizona

The dark material that coats one hemisphere of Saturn's moon Iapetus is very dark, as these two processed views of the same image demonstrate.

The image on the left has been cleaned of cosmic rays and magnified; in this otherwise un-enhanced view, only a small part of the moon's surface, at the bottom, is visible because it is part of the bright side of Iapetus. (Only the right hand side of Iapetus is illuminated by sunlight.) The same image, shown on the right, has been contrast-enhanced to make visible the part of the illuminated side of Iapetus that is coated with dark material.
The image was taken in visible light, with the Cassini spacecraft narrow angle camera from a distance of 2.9 million kilometers (1.8 million miles) from Iapetus, and at a Sun-Iapetus-spacecraft, or phase angle of 89 degrees. The image scale is 17 kilometers (11 miles) per pixel. The image has been magnified by a factor of four to aid visibility.

(P.T.O)

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the Cassini-Huygens mission for NASA's Office of Space Science, Washington, D.C. The Cassini orbiter and its two onboard cameras, were designed, developed and assembled at JPL. The imaging team is based at the Space Science Institute, Boulder, Colo.

The Fourth European Dark-Sky Symposium, Paris 2004

ASTRONOMY NOW SPECIAL REPORT

Posted: September 30, 2004

Where are the stars? Fortunately, local authorities are becoming increasingly aware of light pollution issues. Image credit: Bob Mizon.

Set in the venerable surroundings of the Paris Astrophysical Institute in the grounds of the old Paris Observatory on September 24th and 25th, this symposium was hosted by the Association Nationale pour la Protection du Ciel Nocturne (ANPCN) and the Société Astronomique de France (SAF), with the collaboration of the International Dark-Sky Association (IDA). Delegates were given a tour of the buildings (with instruments and images from the seventeenth to the nineteenth centuries), and mounted the great spiral staircases to the dome where Cassini, Le Verrier and Arago observed in their time.

About 70 delegates from dark-sky movements in ten European countries, and a contingent from the International Dark-Sky Association (IDA), came together with environmentalists, biologists, local government officers and lighting professionals, to discuss progress and challenges in the international dark-skies debate, and to plan future campaigning. The well-known French-Canadian astrophysicist Hubert Reeves, who specialises in the effects of human activities on the world's fauna, chaired the first session.

Seven members/supporters of the BAA Campaign for Dark Skies (CfDS) attended. Among the many subjects discussed were: the impact of night-time lighting on flora and fauna (Florent Lamiot, Nord/Pas de Calais Regional Environment Manager); the massive environmental impact of light escaping from greenhouses in the Netherlands (Wim Schmidt); and the highly successful activities of the Flemish night-sky campaigners who have persuaded 160 Belgian towns to participate in "Nights of Darkness", switching off numbers of lamps to facilitate observing. U.K. delegates told the assembly about the positive Select Committee report of 2003, and the new ODPM planning regulations now in the pipeline.

Important steps towards better night skies are being taken in many other countries. The IDA section leaders also debated strategies and successes in a separate session.
The next Dark-Sky Symposium will be in Belgium in April 2005, and it has been decided that CfDS will host the 2006 event. Further details from Bob Mizon via the Campaign Web site, http://www.dark-skies.org/.

Brightest supernova in a decade captured by Hubble

UNIVERSITY OF CALIFORNIA-BERKELEY NEWS RELEASE

Posted: September 4, 2004

A University of California, Berkeley, astronomer has turned the NASA Hubble Space Telescope on the brightest and nearest supernova of the past decade, capturing a massive stellar explosion blazing with the light of 200 million suns.

The supernova, called SN 2004dj, is so bright in the Hubble image that it easily could be mistaken for a foreground star in our Milky Way Galaxy. Yet it lies 11 million light-years from Earth in the outskirts of a galaxy called NGC 2403, nestled in a cluster of mostly massive bright blue stars only 14 million years old.

"This has to be a massive star to explode at such a young age," said Alex Filippenko, professor of astronomy at UC Berkeley, who estimates the star's mass at 15 times that of our sun. Massive stars live much shorter lives than the sun; they have more fuel to burn through nuclear fusion, but they use it up at a disproportionately faster rate. The sun, for example, is only halfway through its expected lifetime of about 10 billion years.

"There are probably hundreds of other stars in the cluster ready to blow up, though not in our lifetime," said Filippenko.

Japanese amateur astronomer Koichi Itagaki discovered the supernova on July 31, 2004, with a small telescope. Additional observations soon showed that it is a "Type II supernova," resulting from the explosion of a massive, hydrogen-rich star at the end of its life. Filippenko then used his time on the telescope to take an image of the supernova on Aug. 17, plus spectra using the Advanced Camera for Surveys. Filippenko is principle investigator for a big program to use the Hubble telescope to study nearby Type Ia supernovas to better understand their properties and thus reduce uncertainty in measurements of the acceleration of the universe.

A team of astronomers led by Jesus Maiz of the Space Telescope Science Institute discovered that the supernova was part of a compact cluster of stars known as Sandage 96, whose total mass is about 24,000 times the mass of the sun. The image shows many such clusters ‹ the blue regions ‹ as well as looser associations of massive stars. The large number of massive stars in NGC 2403 leads to a high supernova rate. Two other supernovae have been seen in this galaxy during the past half-century.

The explosion of a massive star blazes with the light of 200 million Suns in this NASA Hubble Space Telescope image. The arrow at top right points to the stellar blast, called a supernova. Credit: NASA, ESA, A.V. Filippenko (University of California, Berkeley), P. Challis (Harvard-Smithsonian Center for Astrophysics), et al.

The image at left represents a small region of NGC 2403, a galaxy located 11 million light-years from Earth. The photo was taken two months before a massive star exploded. The image pinpoints the location of the stellar blast, known as supernova 2004dj, within a cluster of massive, generally blue (but some red) stars called Sandage 96. This image was taken May 8, 2004, with the WIYN 0.9-meter mosaic camera at Kitt Peak National Observatory in Arizona. The image at right from Hubble Space Telescope's Advanced Camera for Surveys pinpoints the supernova blast. The photo was taken on Aug. 17. The light from this outburst outshines every star in the massive cluster. Credit for ground-based image: WIYN/NOAO/AURA/NSF, T. Rector (University of Alaska, Anchorage), Z. Levay and L. Frattare (STScI) Credit for Hubble image: NASA, ESA, A.V. Filippenko (University of California, Berkeley), P. Challis (Harvard-Smithsonian Center for Astrophysics), et al.

The cataclysm probably occurred when the evolved star's central core, consisting of iron, suddenly collapsed to form an extremely dense object called a neutron star. The surrounding layers of gas bounced off the neutron star and also gained energy from the flood of ghostly "neutrinos" (tiny, almost non-interacting particles) that may have been released, thereby violently expelling these layers.
This explosion is ejecting heavy chemical elements, generated by nuclear reactions inside the star, into the cosmos. Like other Type II supernovas, this exploding star is providing the raw material for future generations of stars and planets. Elements on Earth such as oxygen, calcium, iron and gold came long ago from exploding stars such as this one.
Astronomers will continue to study SN 2004dj over the next few years, as it slowly fades from view, in order to gain a better understanding of how certain types of stars explode and what kinds of chemical elements they eject into space.
This color-composite photograph was obtained by combining images through several filters taken with the Wide Field Camera of the Advanced Camera for Surveys. The colors in the image highlight important features in the galaxy. Hot, young stars are blue. Older stars and dense dust lanes near the heart of the galaxy are red. The hydrogen-rich, star-forming regions are pink. The dense concentration of older stars in the galaxy's central bulge is yellow.
The Space Telescope Science Institute (STScI) is operated by the Association of Universities for Research in Astronomy, Inc. (AURA), for NASA, under contract with the Goddard Space Flight Center, Greenbelt, MD. The Hubble Space Telescope is a project of international cooperation between NASA and the European Space Agency (ESA).

Large asteroid will zoom safely past Earth

NASA/JPL NEWS RELEASE

Posted: September 28, 2004

A mountain-sized asteroid will make its closest approach to Earth at 9:35 a.m. EDT Sept. 29. Although asteroid 4179 Toutatis will come no closer than four times the distance between Earth and the Moon (approximately 1.5 million kilometers or 961,000 miles), this will be the closest approach of any known asteroid of comparable size this century.

"This is the closest Toutatis will come for another 500 years, and its orbit is very well known," said Dr. Don Yeomans of NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., manager of NASA's Near Earth Objects Program Office. "What this fly-by provides is an opportunity to study one of our closest solar system neighbors," he said.

"While we have done radar observations on this particular asteroid before, this is the closest it has come since at least the twelfth century " said Dr. Steve Ostro, a scientist at JPL. "We will use the huge dish in Arecibo, Puerto Rico, to refine our knowledge of its physical characteristics and its trajectory," he said.

Named after an obscure Celtic and Gallic god, Toutatis, the yam-shaped space rock measures 1.92 kilometers (1.2 miles) by 2.29 kilometers (1.4 miles) by 4.6 kilometers (2.9 miles). Toutatis has one of the strangest rotation states observed in the solar system.

Instead of spinning around a single axis, as do the planets and the vast majority of asteroids, it "tumbles" somewhat like a football after a botched pass. Its rotation is the result of two different types of motion with periods of 5.4 and 7.3 Earth days that combine in such a way that Toutatis's orientation, with respect to the solar system, never repeats.

When the asteroid flies past Earth, it will be traveling at approximately 39,600 kilometers per hour (24,550 mph). Toutatis has not passed this close to Earth since the twelfth century, and it will not be this close again until 2562. Toutatis was discovered in 1989.

Arecibo Observatory is operated by Cornell University, Ithaca, N.Y., under a cooperative agreement with the National Science Foundation, with support from NASA.

Cassini yields new knowledge of Saturn's rings

LOS ALAMOS NEWS RELEASE

Posted: October 17, 2004

University of California scientists working at Los Alamos National Laboratory have begun to analyze data from an instrument aboard the joint U.S.-European spacecraft Cassini. Although Cassini has only been orbiting the planet Saturn since July 1, data from the Cassini Plasma Spectrometer (CAPS) has already begun to provide new information about the curious nature of Saturn's space environment. CAPS had been detecting advance readings for several days before Cassini finally crossed the bow shock that exists in the solar wind ahead of the magnetosphere, a huge magnetic field bubble produced in the solar wind by Saturn's strong magnetic field. On June 28, the spacecraft entered into the magnetosphere itself and began taking data. From this very preliminary set of measurements, it is apparent that the outer reaches of Saturn's magnetosphere are probably populated by plasma captured from the solar wind, but closer to the planet the plasma comes primarily from the rings and/or the inner icy satellites.

According to Michelle Thomsen, the current Los Alamos CAPS project leader, "After many years of design, development and testing, and then the seven-year journey across the solar system, CAPS is finally doing the job it was built to do. We are quickly learning much, but I think we have only begun to understand what CAPS can teach us about Saturn and its space environment over the next few years."

CAPS consists of three separate analyzers designed to measure the electrically charged particles trapped within Saturn's magnetosphere. Los Alamos played a major role in the design and construction of two of them: an ion mass spectrometer (IMS), which incorporates a novel design developed at Los Alamos to identify the different atomic species in Saturn's magnetospheric plasma, and an ion beam spectrometer (IBS), which is based on a design used by Los Alamos scientists on several previous solar wind research missions.

During Cassini's first brief pass over Saturn's rings, CAPS identified a previously unknown low-energy plasma trapped on the magnetic field lines threading the Cassini Division, the name given to the gap between the main A and B rings. With the four-year mission just beginning, including more than 70 orbits of the planet, CAPS is poised to provide scientists with a new level of understanding about Saturn's space environment, as well as clues about some of the space physics processes that operate more universally in the solar system.

The CAPS team involves scientists and engineers from 14 institutions and six countries, including Dave Young, the Principal CAPS Investigator at the Southwest Research Institute in San Antonio, Texas. At Los Alamos, the CAPS effort was made possible by the work of numerous members of International, Space and Response Division and its predecessor organizations. The IMS was designed by Los Alamos staff member Beth Nordholt and former staff member Dave McComas.

In addition to Thomsen, current members of the team include Bruce Barraclough (lead investigator for the IBS), Dot Delapp, Jack Gosling, Dan Reisenfeld, John Steinberg, Bob Tokar and summer student Brian Fish.

Los Alamos National Laboratory is operated by the University of California for the National Nuclear Security Administration (NNSA) of the U.S. Department of Energy and works in partnership with NNSA's Sandia and Lawrence Livermore national laboratories to support NNSA in its mission.
Los Alamos enhances global security by ensuring the safety and reliability of the U.S. nuclear deterrent, developing technologies to reduce threats from weapons of mass destruction, and solving problems related to defense, energy, environment, infrastructure, health and national security concerns.

Guildford AS magazine April 2004
David Reynolds

Surface Brightness of Galaxies

I was discussing with John the reasons why he had trouble seeing the large galaxy M101 in Ursa Major, even in a large telescope. Readers might be interested in the explanation and a few facts and figures.
Messier 101(NGC 5457) in Ursa Major is a very large face on spiral galaxy. I think this is one of the hardest of the Messiers to see along with M74 (galaxy in Pisces), if not the hardest. Transparent skies are required to see it at all in my experience. I have checked Uranometria (second edition) for some information about M101.
Uranometria quotes M101 having a magnitude of 7.9 and surface brightness of 14.9. In contrast, M51 The Whirlpool Galaxy in Ursa Major (also a face on spiral), is 8.4 and 12.9. So although M51 is fainter it is much easier to see because it has a much higher surface brightness. The reason for this is related to the size of the objects. M101 is much larger at 29' x 27' whereas M51 is 11' x 7'. So the light from M101 is spread out over a much larger area, hence the 'light density' - called surface brightness – is much much lower. As with magnitude, the larger the number the fainter (lower) is surface brightness.

I would guess that on 50% of occasions here in the southeast, I can't see M101. But I have seen it
almost naked eye is mid France, and it was very easy with binoculars. A good sky transparent sky is more important than the instrument you look through for this object.

I have checked through Uranometria, and M101 has the lowest surface brightness of all the NGC galaxies on that page (~50 galaxies). An SB of 14.9 is typical of a UGC or MCG galaxy, although M101's magnitude is much higher than galaxies in those catalogues of course.

David Reynolds
Woking

Kelling Heath September 2004

Pic1 John , Becky, Chris,
Gavin & Ted

Pic 2
As my wife Becky and I were staying in a lodge, we thought it would be nice to do a meal for some of the G.A.S members, and I think it went down very well?

Pic3 Neil , Becky, Chris,
Gavin & Ted

SPRING EQUINOX STAR PARTY – KELLING HEATH MARCH 2004-04-04

Last year saw a successful pilot run with about 30 pitches taken, so expectations were high for the first full Star Party to be held at Kelling Heath, at Holt on the North Norfolk coast. About 100 pitches had been booked, including four by Guildford AS. Sadly these expectations were not to be realised, as this was the weekend of the March gales! Gavin & I arrived in strong winds at about 3 p.m. on Saturday 20th and the sight that greeted us was dire – several vehicles loaded up and clearly leaving, a 10" Mead blown over and several tents just completely flattened, several of which were Kendrick observatory tents. I later learned that the total count of dead Kendricks was eight! (All ripped in exactly the same place, so perhaps a bit of a design flaw?) Our three GAS colleagues (Adrian, David & Tony had arrived on Thursday, but by this time had given up and gone home. We found that Owen Brazell (frequent speaker at various Astronomical Societies) was on the next pitch to us – he too suffered tent damage and spent Saturday night sleeping in his car. Robin survived along with some of his Castle Point colleagues.

Gavin and I struggled unsuccessfully to erect my steel-framed tent. We learned later via Tony Martin that a local meteorological station had measure the wind peaking that very afternoon at 77mph! Small wonder then that several of my tent poles got severely bent in the attempt. At that point we retired to the bar for a few pints whilst watching England beat Wales at Twickenham. In the bar we met a couple whose tent had been retired hurt and we decided that between the four of us we might be able to manage to erect the tent. This we did, albeit at the expense of some more bent poles and one metre rip in the canvas, which was later patched. My 4x4 was parked at the rear and windward side of the tent, my camping trailer at the front and the tent was lashed to both to hold it in place – it wasn't going to take off with those as anchors!

The clouds disappeared during the evening, and that night the sky was like crystal. Sadly the wind had abated but little. There was no chance of using a dobsonian in those conditions, it would have spun like a top, so I set up my 5" refractor - a Sky-Watcher Evostar 120. Despite being fairly heavy and being mounted on a reasonably hefty EQ5 mount, the scope could not hold a steady image in those winds. After about one hour's worth of Jupiter, Saturn, M13, M57, Pleiades, Praesepe and Perseus Double Cluster, I gave up. Gavin in the meanwhile had installed his huge Telescope House 25x100 binoculars onto a Benbo tripod, which with its legs widely splayed allowed this heavy instrument to be held still, even when observing at the zenith. With relatively little surface area to catch the wind, the image was relatively stable and M51, M101, M81 and M82 were seen to good effect. It was surprising how the binocular vision gave a hint of M81's spiral arms, and also the bridge linking M51 to neighbouring NGC5195. The following night was totally clouded out, and no observing was possible – although the winds had dropped a little.

The weekend was however very successful in one way – with the combined efforts of Gavin and our lodgers in the tent we were able to complete the installation of the primary mirror into my new 15" Obsession and get it properly adjusted using my Kendrick laser collimator. The weekend had been planned for its first light, hopefully doing my first ever Messier Marathon - but sadly this was not to be. Still the scope was now all ready for use – given the opportunity. All that was left to do on Monday morning was for Gavin to cook the traditional huge breakfast and then to pack up the kit and consign my tent to the skip. It had enjoyed a good innings as I had purchased it in the early 70's.

The organising committee are rumoured to be planning a T-Shirt stating “I survived Kelling Heath March 04” with the footnote – “This T-Shirt is stronger than a Kendrick!” As has oft been said in the past, British Astronomy is the triumph of optimism over experience, and so I have already booked for the next Star Party at Kelling, the weekend of 10-12 September. There are 13 pitches booked for GAS, so it bodes well as an enjoyable social event, as well as a great astronomical one. Hope to see you there!

Footnote – our guests in the tent were Rob Greaves and his fiancé, Jess. Rob has an excellent website at www.warboysastro.com where you can see not only his own report of Kelling, but pictures of his observatory, telescopes, some excellent CCD deep-sky images, and even of aurora seen from his back garden in Cambridgeshire. Oh, for skies like that in Surrey!

John Axtell
Pyrford.

GAS Observing Reports

Total solar eclipse from Zambia - 21 June 2001

By John Axtell.

I remember that I was a boy of about 10 when I became aware that only Total Solar Eclipse to occur in England during my lifetime was going to be in Cornwall in 1999. All through the years I remained determined since that age to see that event, and as we all know in the event it was a cloud-covered washout. We actually did better than most, with wife Sue and daughter Jenny and some family friends we were lucky enough to get a partial gap in the clouds and saw something of the eclipse through thin higher clouds. To be honest I thought that was it and was at least partially satisfied.

I have made several trips to Africa to perform IT consultancy and training. Early in 2001 I was asked to run a two-week course for IT staff from the Cabinet Office of the Government of the Republic of Zambia. Imagine my delight to discover that my fortnight there would coincide with the June 2001 Total Eclipse of the Sun, with the path of totality passing directly through the capital Lusaka, where the course was being held. It was winter there (it being in the Southern Hemisphere) and my first week there saw considerable cloud - I got a distinct feeling of déjà vu. However as the days rolled by the weather just got better and better. The students and I agreed that we would halt the course for an hour either side of totality, so we could pop out and watch. Then a big extra surprise - at very short notice President Chiluba declared Eclipse Day to be a public holiday!

This meant I could not run the course that day and just had nowhere else to go but the pool, have a few beers and get ready with my camera for the eclipse!!

There wasn't a cloud in the sky, conditions were perfect. As totality neared the temperature dropped noticeably, the light levels began to fall and all the neighbourhood dogs began barking and rushing around.
When totality began the sky became indigo, with a great number of stars clearly visible, and Jupiter was prominent only a few degrees away from the black sun. The corona was absolutely magnificent, interestingly a translucent pearly white and irregular in shape. This created an image twice the size of the moon's disk, at the edge of which solar prominences could easily be seen, an angry orange-red in colour. Whilst this was going on the dogs' barking was drowned out by the cheering coming from miles around - the whole country was yelling and whooping - me amongst them! At the very end of totality we saw the "Bailey's Beads", momentary glimpses of the edge of the moon as light poured down valleys and between mountain crags on the edge of the lunar disk. And when it was over, it only needed a tiny bit of the sun to reappear to wash out the glowing corona, and to banish the stars once more until true night time.
When it was over all I could do was grab another beer (or three!), and sit and contemplate my luck. Talk about being in the right place at the right time, and being paid to be there into the bargain!
Camera: Olympus OM2N, Bell & Howell 650mm Mirror lens plus Tamron 2x converter - turning camera almost into a small telescope! Kodak ASA 1000 film

Theft of the Night

For three million years, the human race has been able to look skywards on clear nights, and wonder at the starry vault, crossed by the Milky Way (our own galaxy seen from inside), the slowly moving planets and the occasional flash of a meteor ploughing through the atmosphere high above. These sights have been, since about 1950, gradually taken away from us by the baleful glow of wasted light, escaping from poorly aimed and often over-bright artificial lamps, to be scattered by airborne particles and aerosols. Over great cities, towns and even small villages, light pollution robs us, in the last millisecond of its journey, of light which may have travelled for hundreds, thousands or even millions of years to reach our planet.
There is a trend nowadays for road lighting to be better directed, not least because of the efforts of concerned bodies of astronomers such as the International Dark-Sky Association and the British Astronomical Association's Campaign for Dark Skies. But most private lighting is not designed to restrict emissions to the premises to be lit, causing light trespass and nuisance to many non-astronomers, too. The fact that light is not legally considered a pollutant like noise and smoke means that victims of light pollution have little redress, and the stars have no protection in law. Here is a modern irony: spacecraft and telescope technology can deliver breathtaking views of the near and far universe, while the technology which lights our nights simultaneously draws a veil across the night sky.
Are we cutting ourselves off from the direct experience of the rest of the universe?
Bob Mizon

Light Pollution Filters

For those who want to take astro-photographs or observe faint night-sky objects in a light polluted area, where the light pollution is mainly from low pressure sodium lights, it is possible to use a filter on the camera or telescope. Although not ideal it may be the only way you have to improve visibility without travelling great distances to find a darker sky.

There are a few types of filter available. The one described here is a Lumicon low pressure sodium Filter. The filter works by blocking the narrow wavelengths of light produced by low pressure sodium lighting. High pressure sodium lighting has many more and broader bands which can't be so easily filtered out without stopping the light that we want to record from the stars or nebulae.

There are two problems with using such filters: they can be quite expensive and they are usually only available in small sizes, which means you can't place them over the objective of the telescope. You are restricted to using them between the eye/camera and telescope.

Below are two photographs showing the effect of using the filter. The difference is quite marked. These photographs are of a low pressure sodium light against the night sky.

Without the filter

With the filter

Photographs from IDA slide set

Forthcoming meetings

November 4th

Micheal Maunder

"Astronomy-How it has influenced Scoentific Development

December 2nd

Prof Jack Cohen

"Aliens-more than biology 1.01"

(or what Does a Martian look like)

Astronomy Picture of the Day

A year to the day of the meeting?

Aurora Over Edmonton

Credit & Copyright: Lance Taylor (Edmonton RASC)

Explanation: Pictured above, the Clover Bar Power Plant was photographed from the banks of the North Saskatchewan River in Edmonton, Alberta, Canada. A small pond in the foreground reflects predominantly green aurora light far in the distance. Two days ago, again unexpectedly, another large solar flare occurred from sunspot group 10486, the site of other recent major flares.