New Zenith

Monthly Newsletter of the Vectis Astronomical Society

Vol 22 Issue 6 — July 2014 *When Printed, this Newsletter costs VAS at least £1*

Society News

A Few Tweaks to NZ

I hope you like the changes to NZ this month?

The new format means I now have 12 pages to fill each month so HELP!

Generator Anyone?

As the Garlic Festival approaches (see page 6), we thought it would be good to make our tent a little more attractive by having power available.

We are hoping to have a couple of computers, one showing weather satellite information and another displaying live pictures of the sun.

If you have access to a small, preferably quiet(ish) generator (240V and about 2kVA capacity) and would be willing to let us use it on the weekend of 16th-17th August please contact me.

Lighting Survey

The response to the simple lighting survey sent out last month was disappointing so can I please ask again. The form is attached to this newsletter and it would be very useful if all readers could complete it.

Brian Curd

Events - Help Request

I have received a request for VAS to attend a quite large astronomy events to be held in 2014:

- **National Trust Mottistone**
  Weds 27th Aug - Start time 1930
  VAS will be one of 5 activities around the garden including bats, moths, birds and hedgehogs

The event is in a dark sky area and should be a good evening. VAS raise considerable funds through events like these so please, if you can help at Mottistone, I'd really like to hear from you. It would be good to get about 10 telescopes at the event if we can.

VAS Website: www.wightastronomy.org

Submissions or letters to New Zenith are always welcome and should be sent to:

The Editor New Zenith
35 Forest Road
Winford
Sandown PO36 0JY
Tel: **01983 864303** or email: **editor@wightastronomy.org**

Material for the next issue by the 6th of the month please.

VAS Registered Office

35 Forest Road, Winford, Isle of Wight, PO36 0JY

Registered Charity No 1046091

Observatory Diary

Monday, 19.30hrs	Members Only by arrangement Telescope and night sky training. Contact Barry Bates 01983 872979
Thursday, 19.30hrs	Members and Public. Informal meeting and observing

Contents this Month

Monthly Meeting Calendar 2014

Check the website for up to the minute information.
All details correct at time of publication.

Date	Subject	Speaker
27 June	The Radio Sky	Paul Hyde BAA
25 Jul	Exoplanets and How We Find Them (Live demo)	Jakub Bochinski, Chairman OU Astronomy Club
22 Aug	Photographing the Aurora and **AGM**	Elizabeth Cunningham
26 Sep	Mysteries of the Solar System	Dr Stuart Eves Astrium
24 Oct	Asteroids, Comets, Impacts. Should we worry?	Robin Catchpole
28 Nov	TBA	David Waltham

Telescope Training

Any member who would like training on the observatory Meade LX200 should contact **Barry Bates on 872979**

Observatory Visits Booked

None this month

It would be appreciated if members could avoid using the observatory at these times.

Important:

Members using the observatory outside normal Thursday meetings MUST enter a line or two in the Observatory Log Book.

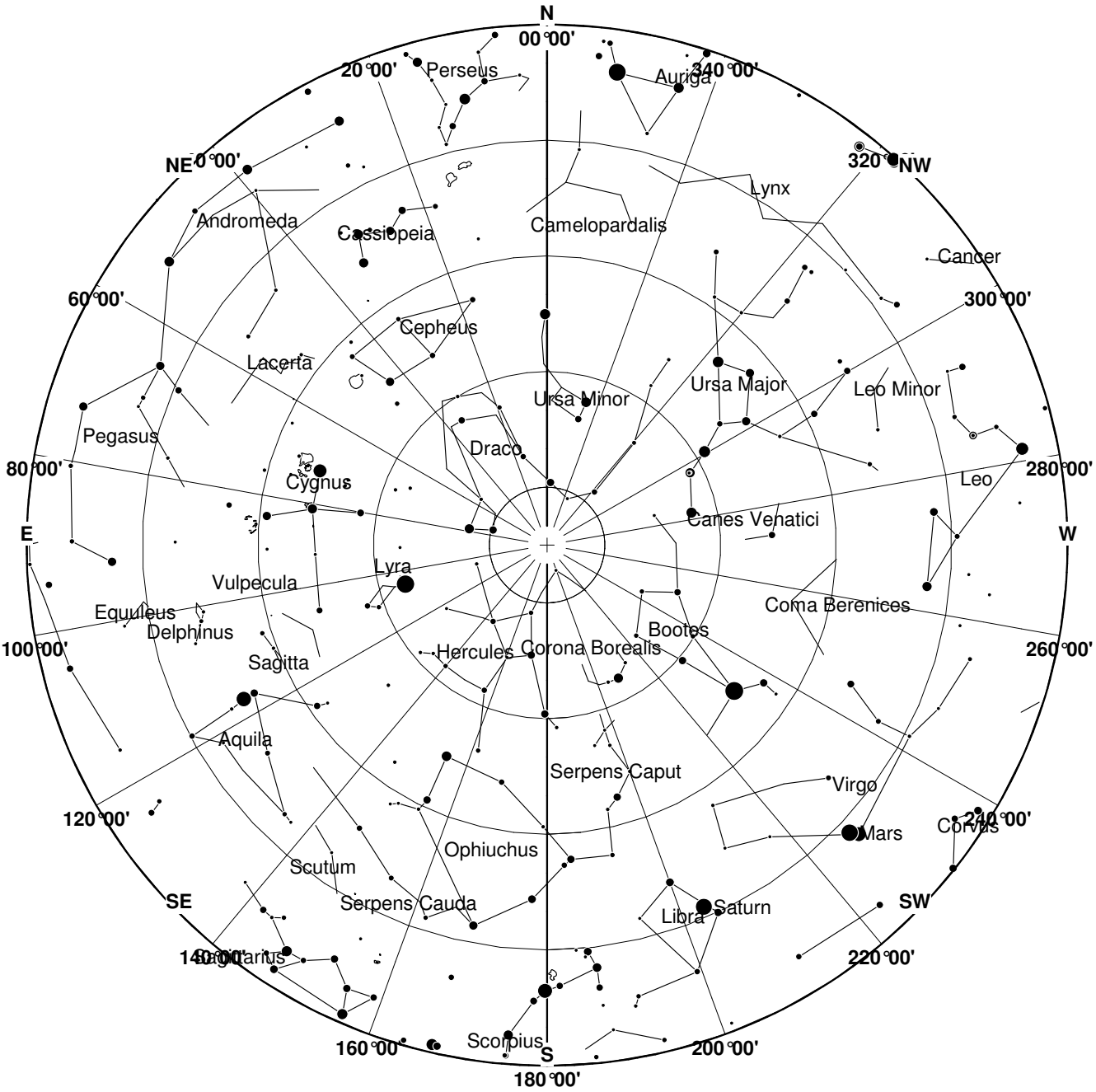
On several recent occasions,
lights, heaters and the Meade LX200
have been left on!

When you leave the observatory please ensure it is secure and all lights, heaters and telescopes are TURNED OFF.

VAS Contacts 2013/14

President	Barry Bates president@wightastronomy.org
Chairman	Bryn Davis chairman@wightastronomy.org
Secretary	Rebecca Mitchelmore secretary@wightastronomy.org
Treasurer	David Kitching treasurer@wightastronomy.org
Observatory Director	Brian Curd director@wightastronomy.org
Programme Organisers	Elaine Spear & Chris Wood progorg@wightastronomy.org
NZ Editor	Brian Curd editor@wightastronomy.org
Membership Secretary	Norman Osborn members@wightastronomy.org
NZ Distribution	Brian Bond distribution@wightastronomy.org
Others	Mark Williams Nigel Lee

July 2014 Sky Map



View from Newchurch Isle of Wight UK - 2200hrs - 15 July 2014

The Omega Nebula, also known as the Swan Nebula, Checkmark Nebula, Lobster Nebula, Horseshoe Nebula and M17 and as NGC 6618) is an H II region in the constellation Sagittarius. It was discovered by Philippe Loys de Chéseaux in 1745. Charles Messier catalogued it in 1764. It is located in the rich starfields of the Sagittarius area of the Milky Way. is between 5,000 and 6,000 light-years from Earth and it spans some 15 light-years in diameter. The cloud of interstellar matter of which this nebula is a part is roughly 40 light-years in diameter and has a mass of 30,000 solar masses. The total mass of the Omega Nebula is an estimated 800 solar masses.

It is considered one of the brightest and most massive star-forming regions of our galaxy. Its local geometry is similar to the Orion Nebula except that it is viewed edge-on rather than face-on.

July 2014 Night Sky

Moon Phases

New	First Qtr	Full	Last Qtr
			
26th Apr	5th	12th	19th

Planets

Mercury

Mercury makes a rather poor appearance in the eastern sky just before sunrise. At best it is about 5° above the horizon 30 minutes before sunrise. From mid-month, look for it about mid way between the much brighter Venus and the point where the Sun will rise.

Venus

The "Morning Star" is very close to the horizon but because of its brightness can be easily seen against the bright twighlight sky.

Mars

Mars is now well past its best and has faded noticeably since opposition. Look for it in the south west after sun set. On the 13th it passes by the bright star Spica in Virgo.

Jupiter

Jupiter is on the far side of the Sun this month so is not visible to us here on the Earth.

Saturn

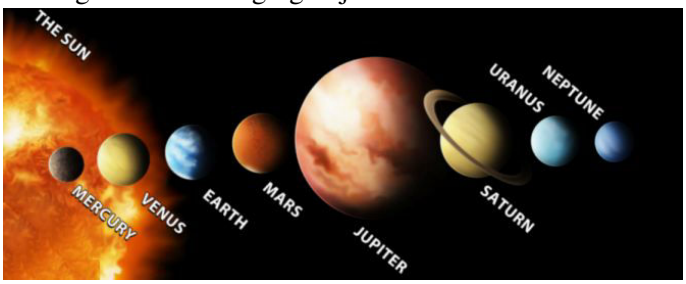
Look to the south at sunset to find the ringed planet Saturn. There is very little time available for observation between the sky darkening and before the planet gets too low down to give good viewing.

Uranus

The sky is too bright, as Uranus clears the horizon, to make observation viable.

Neptune

Neptune is in the constellation of Aquarius and is visible low in the south eastern sky. While the sky is dark enough for the planet to be visible it is still quite low down making this a challenging object.



Deep Sky

M24 Sagittarius Star Cloud
RA 18h 16m Dec 18° 43'

Probably the densest mass of stars you will ever see is contained within this 2 x 1 degree patch of sky towards the centre of our galaxy. A slight thinning in the density of gas and dust allows us a small peak towards the galactic core. This is an object for all instruments from a small pair of binoculars to a large telescope.

M17 The Omega Nebula
RA 18h 21m Dec -16° 11' mag 7

If it were not for the Orion Nebula this would be the great show piece of the sky. Binoculars show the curved shape of this giant glowing gas cloud and stellar nursery. Some times called The Swan nebula, the swan swimming upside down through the Milky Way becomes more obvious through a small telescope.

NGC6633 Open Cluster
RA 18h 28m Dec 6° 34' mag 4.5

Although it is clearly visible in binoculars it is best viewed through a rich field telescope where the brighter members of this cluster form a rather wavy looking wedge of stars. If viewed before the sky darkens too much restricting the number of visible stars the scene is reminiscent of a miniature Leo, the backward question mark is a little indistinct, but the back and haunches are easily distinguishable.

Peter Burgess

Jupiter - Triple Shadow Transit
A Mini Star Party

A small group of VAS astro-imagers gathered in the garden of Simon Plumley in Totland on the 3rd June hoping to get sight and image the triple shadow transit on Jupiter, the best in 60 years.

The rare occurrence was due to start at 7.08pm still in broad daylight and was set to continue to 8.44pm. Daylight observation and imaging of the planets is more than possible with sometimes just a little tricky bit finding them first and then establishing accurate tracking.

We were fortunate to have a roll off roof observatory from where we were able to locate Jupiter quickly because of the permanent set up and had Jupiter tracking by 5pm with camera attached and focused. Delighted with how swift this was, there was a bit of spare time for some sunbathing until the big event. The sky was clear with a few clouds and despite the forecast for this time being heavy cloud things were looking very optimistic. In addition the Moon was out and very close to Jupiter's position so this would be a great reference point assisting for people setting up their scopes from scratch.

Fellow VAS members Martyn Weaver, Simon Overton, Lee Hext, Shaun Smith and Alison Smith, joined me with their telescopes all set up by 6.30pm, albeit with clouds over head that had started to roll in. This did not dampen the excitement and anticipation as the internet satellite view showed potential gaps in the clouds to the south west. All we needed was an ideal 2 minute cloud gap but even as little as 1 minute would have been sufficient.

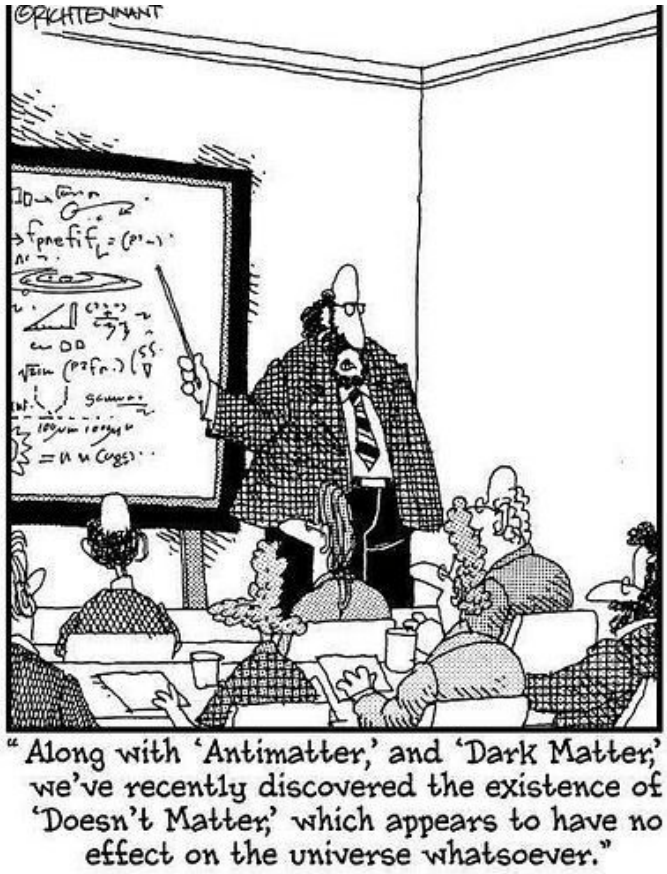
We were teased with cloud gaps in the wrong places and even the waxing crescent 41% illuminated Moon came out to play later, at which point a few scopes swung over to view it. The cloud started to thin by 8pm with blue sky and thin white cloud fading and hopes were still alive. However the clouds came back in with a stormy look and Jupiter was never seen again and the triple transit was lost above the clouds.

Despite the lack of imaging and observing everyone had a great time and I think everyone gained a little more experience from talking to each other and discussing their set ups and gear. A typical British mini star party!

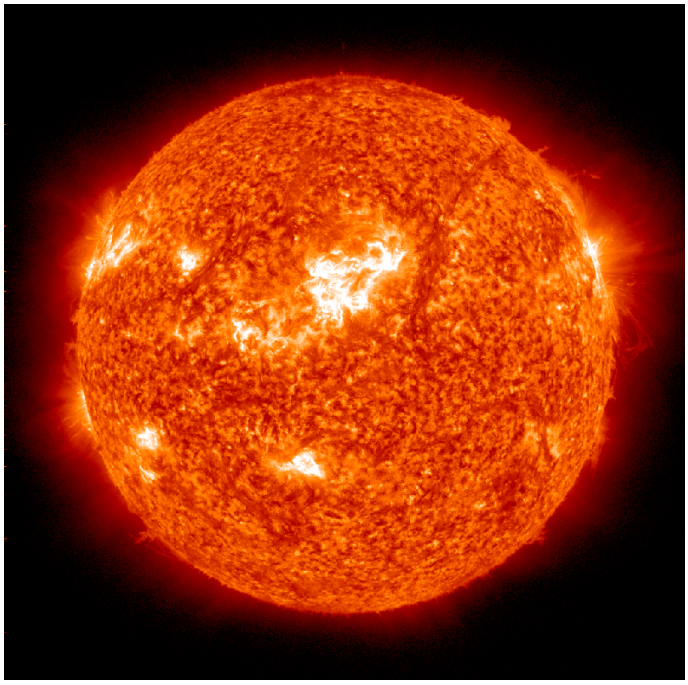
The 24th January 2015 will see a return of a triple shadow transit on Jupiter which will not be as long starting at approximately 6am. Unfortunately Jupiter's great red spot will not be on show but after this the next one is due in 2032!

Anyone keen on getting into astro-imaging is always welcome. There is normally a member at the VAS Thursday weekly gatherings at the observatory dome or you can get in touch by joining the Facebook VAS group on line just search "Vectis Astronomical Group".

Simon Plumley



Telescope News



Some years ago a member left us a Vixen 80mm refractor on an early Polaris mounting. I have recently carried out my long held intention to convert this instrument into a dedicated solar telescope. The advantages of this conversion are - the Vixen is smaller and lighter than the 125mm Meade hitherto used for solar observing, so easier to move to where the sun can be accessed. The mounting is equipped with slow motion controls so following the sun is much enhanced.

If you have never seen the sun in h-alpha come along to the observatory on a Thursday evening (the clouds dissipate sometimes!) and see sunspots, surface filaments and prominences etc. It does have to be fairly early though as the western horizon is hampered by tall trees.

Finally a warning:

A point we constantly make, but its importance cannot be overstressed, is that you should never look at the sun through any ordinary telescope or optical device - serious eye damage will result.

The filter set we have is a very sophisticated piece of equipment removing 99.9% of solar emissions.

Our outfit was made by Solarscope on the Isle of Man, full details can be found on their website.

http://www.solarscope.co.uk/

Richard Flux

The Garlic Festival

The Garlic Festival, one of the largest events on the Island will be held on August 16/17th.

Almost from its inception, in the era when John Smith and Ken Clayden were influential in both camps the VAS has enjoyed a symbiotic relationship with the show - the VAS supplying a strong contingent of marshals and in return our payment is a very important part of our annual income.

The task is not onerous, mostly directing the public and generally assisting the organisation and is actually great fun! There are some stalwarts who attend year after year - but I need more! The benefits include free admission, free refreshments in a dedicated staff tent and the chance (but no guarantees!) of encountering the odd celebrity.

The VAS benefits greatly from this event as our main fund raising activity, the revenue raised all helps with hall hire, speakers expenses, running the observatory etc. and helps keep your subscription down.

We also exhibit, having a display and a telescope or two in a small tent which needs personnel to staff.

So please, please if you can spare at least half a day over the weekend I would be delighted to hear from you. See me at meetings, at the observatory or contact me on 883062 or richard.flux@iow.nhs.uk.

The VAS has a long history of successful involvement with the Festival - please contact me and make 2014 a record year!

Richard Flux

Groundbreaking for the E-ELT

Ceremony marks next major step forward for the world's largest optical/infrared telescope
19 June 2014

Today a groundbreaking ceremony took place to mark the next major milestone towards ESO's European Extremely Large Telescope (E-ELT). Part of the 3000-metre peak of Cerro Armazones was blasted away as a step towards levelling the summit in preparation for the construction of the largest optical/infrared telescope in the world.

The groundbreaking ceremony at Paranal Observatory, 20 kilometres away from the blasting, was attended by distinguished guests from both Chile and the ESO Member States, as well as representatives of the local communities, senior officials from the project and ESO staff. The event was also streamed live online and a recording of the event ***can now be viewed.***

The order to proceed with the blasting was given by the Chilean Vice Minister of National Assets, Jorge Maldonado.

During the groundbreaking ceremony the Chilean company ICAFAL Ingeniería y Construcción S.A. blasted part of the top of Cerro Armazones and loosened about 5000 cubic metres of rock. This is just one part of an elaborate levelling process which will help landscape the mountain, so that it can accommodate the 39-metre telescope and its huge dome. A grand total of 220 000 cubic metres will need to be removed to make room for the 150 metre by 300 metre E-ELT platform.

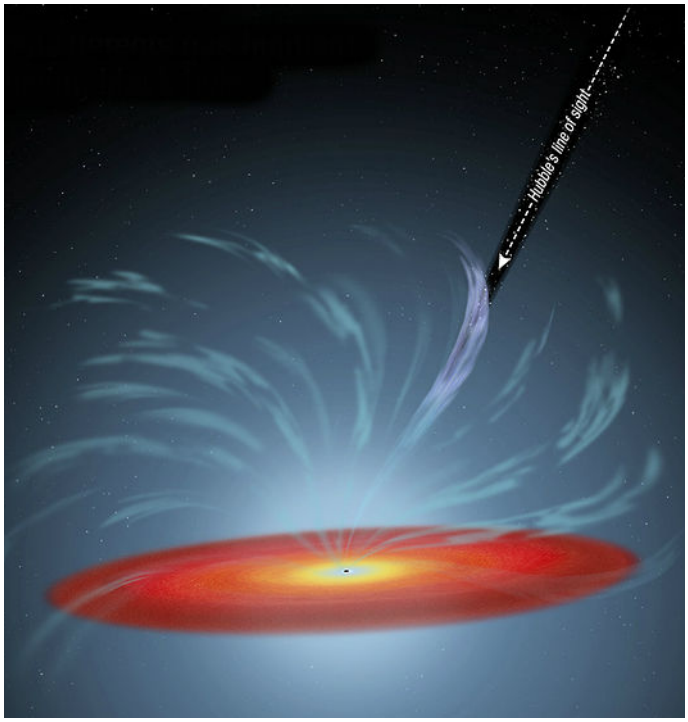
The Cerro Armazones civil works started in March 2014 and are expected to take 16 months. These include the laying and maintenance of a paved road, the construction of the summit platform and the construction of a service trench to the summit.[1]

The E-ELT first light is planned for 2024, when it will begin to tackle the biggest astronomical challenges of our time. The giant telescope is expected to allow the exploration of completely unknown realms of the Universe — it will be: "the world's biggest eye on the sky".

For more information see: ***http://www.eso.org/public/news/eso1419/***

1. All of the structures that will later be erected at the site are specified in the E-ELT Construction Proposal, a 264-page comprehensive book with details of all aspects of the project, along with an executive summary. In June 2011, ESO Council endorsed the revised baseline design for the telescope and in December 2012 they fully approved the E-ELT Programme (see also ann13019, ann13033 and ann13042).

Swiftly Moving Gas Streamer Eclipses Supermassive Black Hole



In this illustration, the position of a dark, absorbing cloud of material is located high above the supermassive black hole and accretion disk in the center of the active galaxy NGC 5548. Numerous other filaments twist around the black hole as they are swept away by a torrent of radiation "winds."

Image Credit: NASA, ESA, and A. Feild (STScI)

An international team of astronomers, using data from several NASA and European Space Agency (ESA) space observatories, has discovered unexpected behaviour from the supermassive black hole at the heart of the galaxy NGC 5548, located 244.6 million light-years from Earth. This behaviour may provide new insights into how supermassive black holes interact with their host galaxies.

Immediately after NASA's Hubble Space Telescope observed NGC 5548 in June 2013, this international research team discovered unexpected features in the data. They detected a stream of gas flowing rapidly outward from the galaxy's supermassive black hole, blocking 90 percent of its emitted X-rays.

"The data represented dramatic changes since the last observation with Hubble in 2011," said Gerard Kriss of the Space Telescope Science Institute (STScI) in Baltimore, Maryland. "I saw signatures of much colder gas than was present before, indicating that the wind had cooled down due to a significant decrease in X-ray radiation from the galaxy's nucleus."

The discovery was made during an intensive observing campaign that also included data from NASA's Swift spacecraft, Nuclear Spectroscopic Telescope Array (NuSTAR) and Chandra X-ray Observatory, as well as ESA's X-ray Multi-Mirror Mission (XMM-Newton) and Integral gamma-ray observatory (INTEGRAL).

After combining and analyzing data from all six sources, the team was able to put together the pieces of the puzzle. Supermassive black holes in the nuclei of active galaxies, such as NGC 5548, expel large amounts of matter through powerful winds of ionized gas. For instance, the persistent wind of NGC 5548 reaches velocities exceeding 621 miles (approximately 1,000 kilometers) a second. But now a new wind has arisen, much stronger and faster than the persistent wind.

"These new winds reach speeds of up to 3,107 miles (5,000 kilometers) per second, but is much closer to the nucleus than the persistent wind," said lead scientist Jelle Kaastra of the SRON Netherlands Institute for Space Research. "The new gas outflow blocks 90 percent of the low-energy X-rays that come from very close to the black hole, and it obscures up to a third of the region that emits the ultraviolet radiation at a few light-days distance from the black hole."

The newly discovered gas stream in NGC 5548 -- one of the best-studied of the type of galaxy know as Type I Seyfert -- provides the first direct evidence of a shielding process that accelerates the powerful gas streams, or winds, to high speeds. These winds only occur if their starting point is shielded from X-rays.

It appears the shielding in NGC 5548 has been going on for at least three years, but just recently began crossing their line of sight.

"There are other galaxies with similar streams of gas flowing outward from the direction of its central black hole, but we've never before found evidence that the stream of gas changed its position as dramatically as this one has," said Kriss. "This is the first time we've seen a stream like this move into our line of sight. We got lucky."

Researchers also deduced that in more luminous quasars, the winds may be strong enough to blow off gas that otherwise would have become "food" for the black hole, thereby regulating both the growth of the black hole and that of its host galaxy.

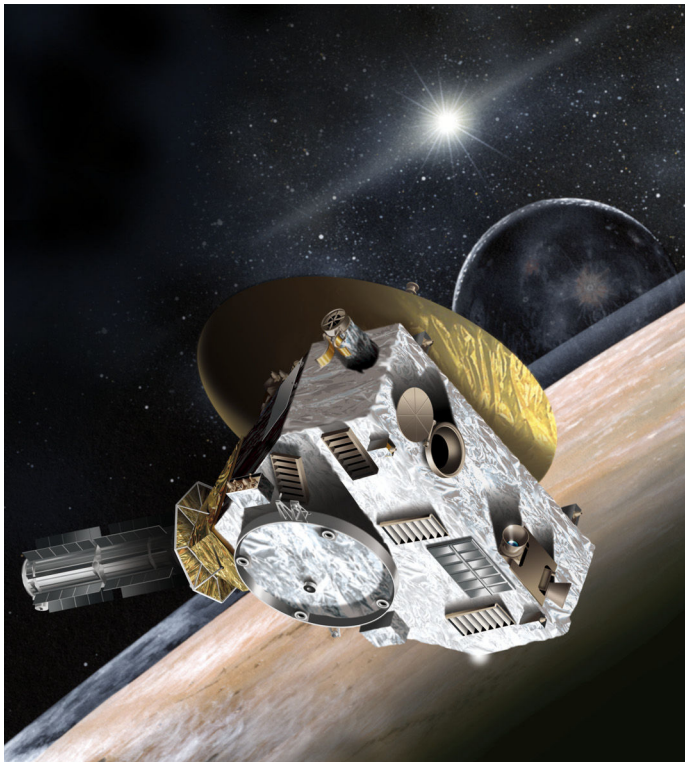
These results are being published online in the Thursday issue of Science Express.

For images and more information about Hubble, visit:

http://www.nasa.gov/hubble

NASA Bolsters Pluto-bound Spacecraft for 2015 Visit

Mission operators at Johns Hopkins University give New Horizons probe annual update, check-up



Artist concept of New Horizons spacecraft. Credit: Johns Hopkins University Applied Physics Laboratory/ Southwest Research Institute (JHUAPL/SwRI)

When you are on a 3 billion mile trip through the universe at over 34,000 mph, you might need a check-up or two to make sure everything is functioning right.

That's exactly what's going on this week as NASA said it will soon update and checkout its Pluto-bound spacecraft known as New Horizons.

Mission controllers at the Johns Hopkins Applied Physics Laboratory will begin the spacecraft's eighth check-up since the satellite launched in 2006. It will be the last before next year's rendezvous with Pluto.

NASA said that flight controllers have configured their ground systems to receive telemetry from the spacecraft as it transitioned out of its low-activity hibernation mode, where it had been since mid-January.

From NASA: "Over the next few days the team will transmit more commands through the Deep Space Network – NASA's worldwide network of large-antenna stations – to configure New Horizons for the checkout. Initial activity ranges from refreshing the processors on the spacecraft's computers, to testing the sun sensors New Horizons uses to automatically determine its position in space, to enabling the small thrusters that position New Horizons for observations and other operations. Additionally, over four intense days in late June, the final planned version of the autonomy software that guides collection of and protects the data collected during Pluto close approach will be uploaded into the spacecraft's memory."

NASA said that over the next 11 weeks it will check out the spacecraft's primary and backup operating systems as well as all seven scientific instruments – the instruments will also be calibrated and set to gather "cruise science" data that includes a distant examination of the surfaces of Pluto and its moons. On e camera, know as the LORRI will also be used to carry out the first optical navigation campaign – snapping images that will help the team home in on Pluto – and the navigation team will track the spacecraft to refine its orbit, NASA said.

A trajectory correction manoeuvre is tentatively scheduled for July 15 – if needed – to keep New Horizons on a straight path toward the Pluto system. New Horizons will cross the orbit of Neptune on Aug. 25.

Once arriving near Pluto - or actually within 6,000 miles of the dwarf planet and its largest moon, Charon -- New Horizons will take close-up pictures in visible and near-infrared wavelengths. The best pictures of Pluto will depict surface features as small as 200 feet across, NASA said.

NASA said the spacecraft will look for ultraviolet emissions from Pluto's atmosphere and make the best global maps of Pluto and Charon in green, blue, red and a special wavelength that is sensitive to methane frost on the surface. The satellite will also take spectral maps in the near infrared, offering up details about Pluto's and Charon's surface compositions and locations and temperatures of these materials.

NASA also said last week it would use the Hubble Space Telescope to explore a small area of the Kuiper Belt is a vast debris field of icy bodies left over from the solar system's formation 4.6 billion years ago where the agency might send New Horizons after it visits Pluto.

Specifically NASA said it was looking for what's known as a Kuiper Belt object (KBO) for the outbound spacecraft to visit. A KBO has never been seen up close because the belt is so far from the sun, stretching out to a distance of 5 billion miles into a never-before-visited frontier of the solar system.

Read more at: ***Network World***

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

CubeSat

Ncube-2, a Norwegian Cubesat

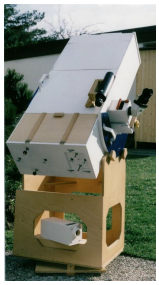
A CubeSat is a type of miniaturized satellite for space research that usually has a volume of exactly one litre (10cm cube), has a mass of no more than 1.33 kilograms, and typically uses commercial off-the-shelf components for its electronics.

Beginning in 1999, California Polytechnic State University at San Luis Obispo (Cal Poly SLO) and Stanford University developed the CubeSat specifications to help universities worldwide to perform space science and exploration.

While the bulk of development and launches comes from academia, several companies build CubeSats such as large-satellite-maker Boeing, and several small companies. CubeSat projects have even been the subject of Kickstarter campaigns. The CubeSat format is also popular with amateur radio satellite builders.

Read more at ***http://en.wikipedia.org/wiki/CubeSat***

Weird Telescopes



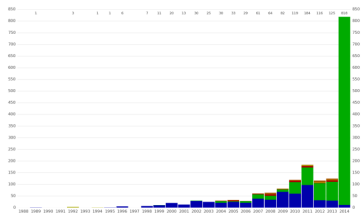
If you are bored with the standard reflector or refractor telescopes, why not have a go at a "Schiefspiegler", a "Yolo", a "Schupmann Medial" or perhaps a "Folded Stevick-Paul"?

http://bhs.broo.k12.wv.us/homepage/alumni/dstevick/weird.htm has a selection of unusual designs, many with complete building instructions.

http://starizona.com/acb/basics/equip_telescopes_other.aspx also has some unusual designs

http://stellafane.org/misc/links.html has many links to lots of useful information for anyone thinking of building their own telescope.

Discoveries of Exoplanets



An exoplanet (extrasolar planet) is a planet located outside the Solar System. The first confirmation of an exoplanet orbiting a main-sequence star was made in 1995, when a giant planet was found in a four-day orbit around the nearby star 51 Pegasi. Some exoplanets have been imaged directly by telescopes, but the vast majority have been detected through indirect methods such as the transit method and the radial-velocity method.

As of June 20, 2014, astronomers have identified 1797 such planets (in 1116 planetary systems and 461 multiple planetary systems).

More at ***http://en.wikipedia.org/wiki/Discoveries_of_exoplanets***

Observatory

For your own safety, when visiting the VAS observatory, please bring a torch. Also, please make sure you close and lock the car park gate if you are the last to leave - if you need the combination to the lock, please contact a member of the committee.

Articles Needed

New Zenith needs letters, articles, reviews or pictures related to all aspects of astronomy.
Contributions to the Editor please at the email or postal address on the front page.

"A mathematician is a device for turning coffee into theorems"
Paul Erdos

"Sometimes it is useful to know how large your zero is"
Unknown

"Would it save you a lot of time if I just gave up and went mad now?"
Douglas Adams

"If life is going to exist in a Universe of this size, then the one thing it cannot afford to have is a sense of proportion"
Douglas Adams

VAS Officers and Committee Nominations 2014/15

For those wishing to stand for election at the AGM of the Society to be held on Friday 22Nd August 2014 at 7.00pm.

Name and Address of Nominee:

Standing for

- Chairman ..... ❑
- Treasurer ..... ❑
- Secretary ..... ❑
- Observatory Director ..... ❑
- Membership Secretary ..... ❑
- Programme Organiser ..... ❑
- Committee ..... ❑

Proposed by: .....

Seconded by: .....

Signature of Nominee: .....

Notes

1. No person can be elected to more than one position.

2. Only adult fully paid-up members may stand for election (or propose or second).

3. All completed nomination forms to be received by the Secretary in writing at least 7 days before the AGM.

4. The Committee consists of not less than six members.

VAS External Lighting Survey 2014

As part of our Dark Sky project we are about to distribute an external lighting survey to as many households on the IW as we can. We are hoping for a large response so would like to use NZ and VAS members as a test before the final survey is released. Could you please spend a few minutes auditing your own property?

Type of Light	How Many?	Does any light spill upwards? (Yes or No)	How do they operate? (Manual/Timer/PIR)	Are they on all night? (Yes or No)	What is the typical wattage?	Is it energy saving? (Yes or No)
Security						
Ornamental						
Flood						
Round or Globe						
Bollard						
Fluorescent						
Up-Lighter						
Strip LED						
Ceiling						
Sidewall						
Downlight						

Security

Ornamental

Flood

Round or Globe

Bollard

Fluorescent

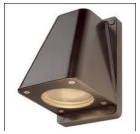
Up-Lighter

Strip LED

Ceiling

Sidewall

Downlight



Does your neighbour have intrusive lighting which affects your property? **Yes/No** (delete as appropriate)

Postcode?.....