

Society News

Garlic Festival

Thanks to everyone who helped at the Garlic Festival last weekend. Despite the windy and sometimes very wet weather we had lots of visitors to the VAS tent.

As usual we raffled a small telescope to help club funds. This year the winner was Mr David Townley and his son, Patrick from near Cambridge.



Breaking News - Earth-sized world 'around nearest star'

The nearest habitable world beyond our Solar System might be right on our doorstep - astronomically speaking.

Scientists say their investigations of the closest star, Proxima Centauri, show it to have an Earth-sized planet orbiting about it.

What is more, this rocky globe is moving in a zone that would make liquid water on its surface a possibility.

Proxima is 40 trillion km away and would take a spacecraft using current technology thousands of years to reach.

Read more at: <http://www.bbc.co.uk/>

Brian Curd
Editor New Zenith

VAS Website: wightastronomy.org

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

The Editor, New Zenith
Carpenter's Cottage
Dennett Road
Bembridge
Isle of Wight PO35 5XF

Tel: **01983 872875** or email: editor@wightastronomy.org

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

The Vectis Astronomical Society and the Editor of the New Zenith accept no responsibility for advice, information or opinion expressed by contributors.

Registered Charity No 1046091

Observatory Diary

Monday, 19.30hrs	Members Only and by arrangement Telescope and night sky training. Please contact Martyn Weaver 07855 116490
Thursday, 19.30hrs	Members and Public. Informal meeting and observing

Contents this Month

Society News	1
September Sky Map	3
September Night Sky	4
Astronomy shown to be set in standing stone	5
The Universe is our tanning bed	6
Phantoms of the Milky Way	7
The Back Page	8

2016 Monthly Meetings

Date	Subject	Speaker
Please check wightastronomy.org/meetings/ for the latest information		
26 Aug	AGM Starts at 7pm sharp William Herschel and the Rings of Uranus	Dr Stuart Eves
23 Sep	TBC	TBC
28 Oct	TBC	TBC
25 Nov	Stellar population Modelling	Dr Claudia Maraston

Observatory Visits Booked

No August bookings so far

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

40th Anniversary Event

The Breeze Island Harbour

*Saturday 12 November 2016
18:30 for 19:00*

Booking forms have been sent to all members by email or by post.

Please complete your order and return it, along with your payment, to any committee member.

Please note that only those who have booked meals will be able to attend.

VAS Contacts 2014/15

President	Barry Bates president@wightastronomy.org
Chairman	Bryn Davis chairman@wightastronomy.org
Secretary	Richard Flux secretary@wightastronomy.org
Treasurer	Simon Plumley treasurer@wightastronomy.org
Observatory Director	Brian Curd director@wightastronomy.org
Programme Organisers	Elaine Spear + Paul England progorg@wightastronomy.org
Astro Photography	Simon Plumley ap@wightastronomy.org
NZ Editor	Brian Curd editor@wightastronomy.org
Membership Secretary	Norman Osborn members@wightastronomy.org
NZ Distribution	Help Needed
Others	Mark Williams & Nigel Lee

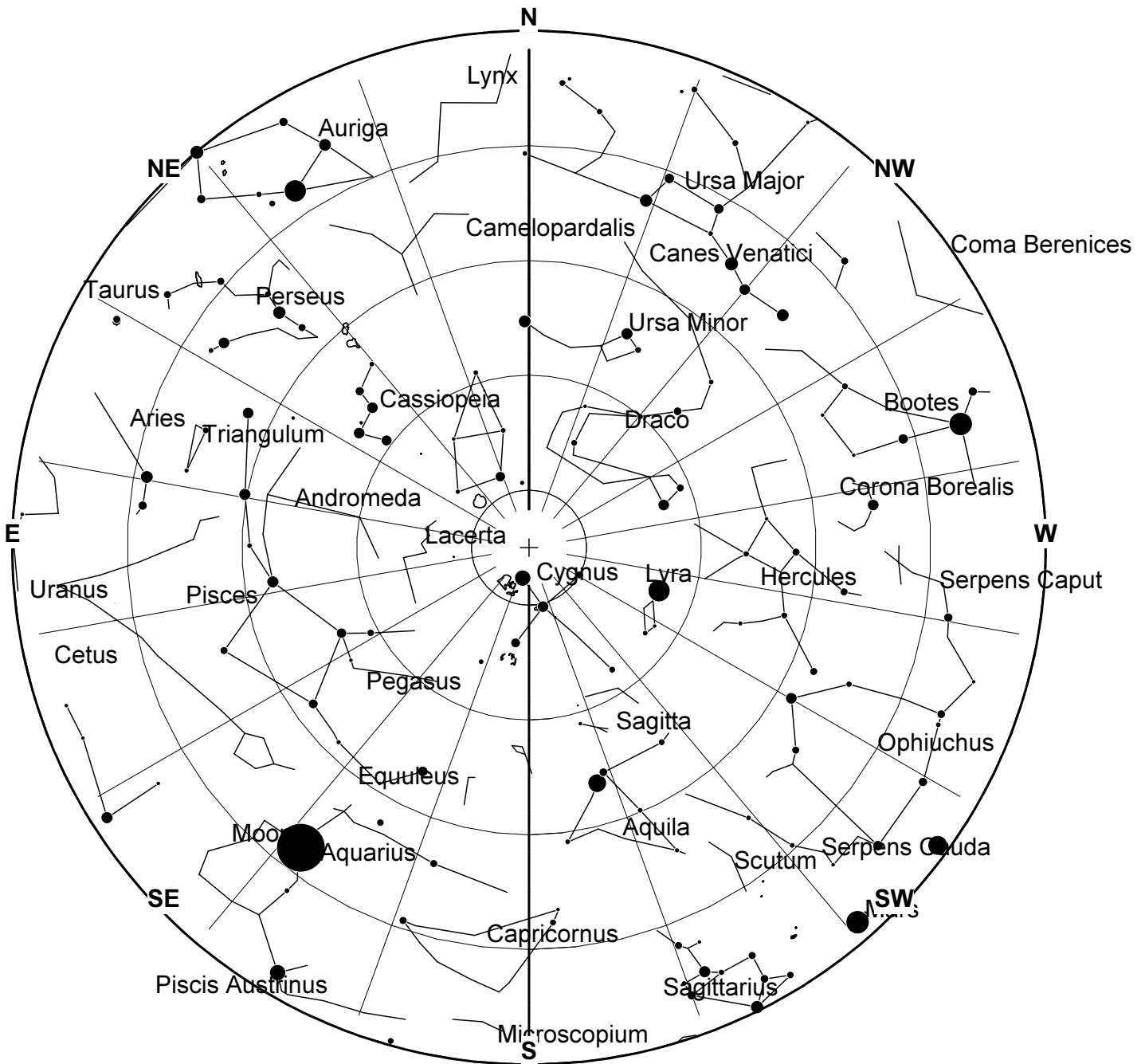
Important

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

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

When leaving, please ensure all is secure and all lights, heaters and telescopes are **TURNED OFF**.

September 2016 Sky Map



View from Newchurch Isle of Wight UK - 2200hrs - 15 September 2016

Equinoxes - The equinoxes are the only times when the solar terminator (the “edge” between night and day) is perpendicular to the equator. As a result, the northern and southern hemispheres are equally illuminated.

In other words, the equinoxes are the only times when the subsolar point is on the equator, meaning that the Sun is exactly overhead at a point on the equatorial line. The subsolar point crosses the equator moving northward at the March equinox and southward at the September equinox.

The equinoxes, along with solstices, are directly related to the seasons of the year. In the northern hemisphere, the vernal equinox (March) conventionally marks the beginning of spring in most cultures and is considered the New Year in the Persian calendar or Iranian calendars as Nouroz (means new day), while the autumnal equinox (September) marks the beginning of autumn.





*This article is licensed under the [GNU Free Documentation License](#).
It uses material from the Wikipedia article “[Equinox](#)”.*

September 2016 Night Sky

Autumnal Equinox

The autumnal equinox; the time at which the Sun is above the equator on its way south giving equal hours of day and night occurs this year on September 22nd at 15:18.

Moon Phases

New	First Qtr	Full	Last Qtr
			
1st	9th	16th	23rd

Planets

Mercury

From the 24th look due east at about 10° above the horizon at 6:30am to find Mercury. It may be visible as day or so beforehand, though it is unlikely; it increases in brightness quite quickly making it easier to spot with every day that passes. It will be visible during the first week of October although it is getting rather close to the horizon.

Venus

Despite being the brightest of the planets Venus will be a challenge to spot this month. It is close to the horizon at sunset, setting only about 30 minutes after the Sun. The tilt of our axis means that planetary observation in the western evening sky is poor in the autumn and good in the spring, and similarly observation during the autumn is good in the eastern sky in the morning and poor during spring.

Mars

Look low in the sky to the west of south as the sky darkens; the bright red coloured object you will find there is Mars. It is well past its best from the opposition in the spring, but is still brighter than anything else in that part of the sky. The view through a telescope shows it as having a distinctly gibbous phase. It is now very small, only about 15 arc seconds across, this and the atmospheric turbulence from its low altitude will make the surface markings difficult to resolve.

Jupiter

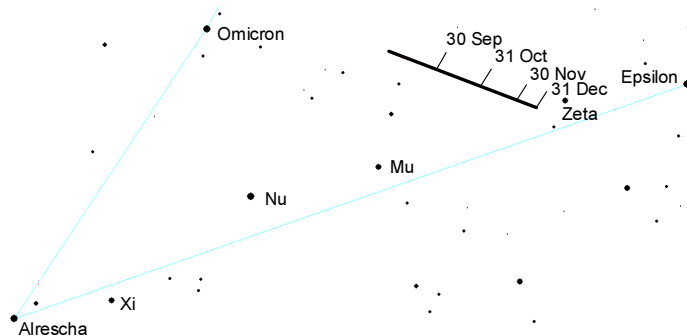
While it may be possible to spot Jupiter after the Sun has set, it will be just a few degrees above the horizon and almost certainly lost in the still bright sky. It will start to become visible again in the morning sky during October.

Saturn

Saturn can be found low in the south-southwest after sunset. After Mars it is the next brightest object in that part of the sky. It is now rather too low down for any serious observation.

Uranus

With few nearby guide stars Uranus is a little tricky to find. Fortunately it is relatively bright being just below naked eye visibility, this makes it an easy binocular object, if you know just where to look. This month it is between the stars Omicron and Zeta Piscium. The finder chart shows the path of Uranus across Pisces until the end of the year. It shows stars down to about magnitude 8.



Path of Uranus through Pisces September to December 2016

Neptune

Neptune is about 1.5° south west of Lambda Aquarius. It is about magnitude 8, easily found with a small telescope, and with a little patience visible with a pair of 10x50 binoculars. Use the finder chart in last August NZ to help find this ice giant.

Deep Sky



Collinder 399 The Coat Hanger Cluster
RA 19h 26m Dec 20° 12'
mag 3.6

The universe really does have a sense of humour; this is a coat hanger, floating above the starry background out there in the Milky Way. It can be seen with the naked eye as a brighter knot in the Milky Way just on the Vulpecula side of the border with Sagita. Any optical aid shows the coat hanger with its rather oversized hook. A telescope may be too much for this cluster unless the magnification can be kept very low. If a telescope is available try to spot NGC6802, this rather small magnitude 8.8 cluster would make the seventh and most eastward star in the bar of the hanger.



M15 Globular Cluster
RA 21h 30m Dec 12° 10'
mag 7.5

This impressive globular is quite bright and very easily found in binoculars. Follow the line from Baham to Enif, about 4 degrees beyond the horses nose to find this rather large fuzzy looking star. Through a telescope it reveals its self as a bright core surrounded by a halo of much fainter stars. As with all globulars the view becomes more impressive with increasing aperture. This is one of only a few globular clusters to contain a planetary nebula, it is however about 14th magnitude and for visual beyond all but those with the largest telescopes and best eyes.



M39 Open Cluster
RA 21h 32m Dec 48° 32'
mag 4.5

The Milky Way is full of star clusters, many are dimmed by intervening dusts or are so surrounded by other stars that it can be difficult to identify them. M39 can be spotted with the naked eye under good conditions, it is large, about the size of the full moon, so binoculars or a rich field telescope are the best instruments to use to observe this triangular shaped cluster.

Peter Burgess

Astronomy shown to be set in standing stone



University of Adelaide research has for the first time statistically proven that the earliest standing stone monuments of Britain, the great circles, were constructed specifically in line with the movements of the Sun and Moon, 5000 years ago.

The research, published in the Journal of Archaeological Science: Reports, details the use of innovative 2D and 3D technology to construct quantitative tests of the patterns of alignment of the standing stones.

“Nobody before this has ever statistically determined that a single stone circle was constructed with astronomical phenomena in mind – it was all supposition,” says project leader and University of Adelaide Visiting Research Fellow Dr Gail Higginbottom, who is also a Visiting Research Fellow at the Australian National University.

Examining the oldest great stone circles built in Scotland (Callanish, on the Isle of Lewis, and Stenness, Isle of Orkney - both predating Stonehenge’s standing stones by about 500 years), the researchers found a great concentration of alignments towards the Sun and Moon at different times of their cycles. And 2000 years later in Scotland, much simpler monuments were still being built that had at least one of the same astronomical alignments found at the great circles.

The stones, however, are not just connected with the Sun and the Moon. The researchers discovered a complex relationship between the alignment of the stones, the surrounding landscape and horizon, and the movements of the Sun and the Moon across that landscape.

“This research is finally proof that the ancient Britons connected the Earth to the sky with their earliest standing stones, and that this practice continued in the same way for 2000 years,” says Dr Higginbottom.

Examining sites in detail, it was found that about half the sites were surrounded by one landscape pattern and the other half by the complete reverse.

“These chosen surroundings would have influenced the way the Sun and Moon were seen, particularly in the timing of their rising and setting at special times, like when the Moon appears at its most northerly position on the horizon, which only happens every 18.6 years,” Dr Higginbottom says.

“For example, at 50% of the sites, the northern horizon is relatively higher and closer than the southern and the summer solstice Sun rises out of the highest peak in the north. At the other 50% of sites, the southern horizon is higher and closer than the northern, with the winter solstice Sun rising out of these highest horizons.

“These people chose to erect these great stones very precisely within the landscape and in relation to the astronomy they knew. They invested a tremendous amount of effort and work to do so. It tells us about their strong connection with their environment, and how important it must have been to them, for their culture and for their culture’s survival.”

Links etc at: <https://scienceblog.com/>

10-trillionths of your suntan comes from galaxies beyond the Milky Way - The Universe is our tanning bed

Astronomers have accurately measured the amount of light that makes it to Earth's surface from outside of the Milky Way, and have found that we are bombarded with about 10 billion intergalactic photons per second every time we go outside - no matter if it's day or night.

While that might sound like a lot, most of the photons we absorb come from the Sun, with about 10-trillionths of your summer suntan being the result of radiation from elsewhere in the Universe.

"Most of the photons of light hitting us originate from the Sun, whether directly, scattered by the sky, or reflected off dust in the Solar System," said lead researcher Simon Driver, from the International Centre for Radio Astronomy Research (ICRAR).

"However, we're also bathed in radiation from beyond our galaxy, called the extragalactic background light. These photons are minted in the cores of stars in distant galaxies, and from matter as it spirals into supermassive black holes."



The team - consisting of astronomers from the University of Western Australia, Arizona State University, and Cardiff University - examined data collected by NASA's Galaxy Evolution Explorer and Wide-field Infrared Survey Explorer telescopes alongside the Spitzer and Hubble space telescopes, the ESA's Herschel observatory, and Australia's Galaxy and Mass Assembly survey.

Using data from so many high-profile telescopes and observatories meant that the team was able to accurately measure the amount of light - in the form of photons -

hitting Earth at various wavelengths from microns to millimetres.

In the end, they found that, at any given moment, Earth is bombarded with about 10 billion photons of intergalactic light.

That sounds pretty intimidating, but the team says it would take you trillions of years of exposure for that amount of light to harm you, because dust clouds throughout the Universe provide protection from most of the harmful rays.

"The galaxies themselves provide us with a natural suntan lotion with an SPF of about two," said one of the team, Rogier Windhorst, from Arizona State University.

Though understanding how much outside light is hitting Earth is cool in itself, the study is only one part of the team's overall mission: to understand how the Universe's energy, mass, and structure have evolved.

"The processes which shape and shuffle mass generate vast quantities of energy, dwarfed only by the vastness of space," Driver said. "The precise physics as to how this energy is released is still not fully understood and work continues to build numerical models capable of explaining the energy that we've now measured."

Hopefully, as telescope technology continues to advance, the team will be able to use their newly collected data to answer some of the biggest mysteries of the Universe. Until then, remember your sunscreen.

The team's work was published in *The Astrophysical Journal*.

More links etc at: <http://www.sciencealert.com/>



Phantoms of the Milky Way -- "Galactic Quakes Reveal Invisible Starless Galaxies Orbiting Our Galaxy"

The outer edges of the Milky Way's appear to be orbited by innumerable invisible galaxies. Three bright pulsating stars on the outskirts of the Milky Way galaxy could be beacons from an invisible dwarf galaxy that astronomers predicted was there based on its effects of galactic quakes in our galaxy. These galactic quakes, ripples in gas at the outer disk of our galaxy, have puzzled astronomers since they were first revealed by radio observations a decade ago. Now, astronomers believe these stars mark the location of a dark matter-dominated dwarf galaxy far beyond the edge of the Milky Way disk, which terminates at 60,000 light-years.

The research, led by Sukanya Chakrabarti of the Rochester Institute of Technology, presents the first plausible explanation for the galactic ripples. "It's a bit like throwing a stone into a pond and making ripples," said Chakrabarti.

"Of course we aren't talking about a pond, but our galaxy, which is tens of thousands of light years across, and made of stars and gas, but the result is the same – ripples!" Chakrabarti adds that this work is part of a new discipline called galactoseismology, "This is really the first non-theoretical application of this field, where we can infer things about the unseen composition of galaxies from analyzing galactic-quakes."

The prediction was the first to come out of the new field of galactoseismology, which uses ripples in the distribution of hydrogen gas in the plane of the Milky Way to infer the presence of invisible satellite galaxies, thousands of which may be buzzing around or through the Milky Way. The technique was pioneered by former UC Berkeley postdoctoral fellow Sukanya Chakrabarti, now an assistant professor of astronomy at the Rochester Institute of Technology, and her UC Berkeley mentor, Leo Blitz, a professor of astronomy.

While some of the Milky Way's unseen satellite galaxies are hidden from view by dust, many are invisible because they're composed mostly of dark matter, a so-far mysterious substance that dominates the matter in the universe: 85 percent of all matter in the universe is dark matter. Where it concentrates, normal matter – mostly gas – congregates and condenses into stars and galaxies that can be seen. While the normal matter in the Milky Way is large enough to produce hundreds of billions of bright stars, however, the normal matter in dark matter-dominated galaxies is apparently too small to produce enough stars to be visible over large distances.

Chakrabarti thought of looking for the effects these galaxies have on the gas distribution in the galaxy, and using this to pinpoint their location. Just as seismologists analyze waves traveling through the earth to infer properties of our planet's interior, she uses waves in the galactic disk to map the interior structure and mass of galaxies.

"We have made significant progress into this new field of galactoseismology, whereby you can infer the dark matter content of dwarf galaxies, where they are, as well as properties of the interior of galaxies by looking at observable disturbances in the gas disk," she said.

In 2009, Chakrabarti and Blitz used these techniques to predict the existence of a dwarf satellite galaxy in the direction of the constellation Norma, and last year she and her team used the Gemini South Telescope in Chile and Magellan telescopes to search for stars in that region that might be part of the galaxy. They found three pulsating stars called Cepheid variables, typically used as yardsticks to measure distance, that are at approximately the same distance from the sun: 300,000 light-years.

Using spectroscopic analysis, they were able to show that the stars also have about the same velocity and that they are moving too fast to be part of our galaxy. They are racing away from the center of the galaxy at 450,000 miles per hour (200 kilometers per second), whereas the average Milky Way star has a radial velocity of only about 25,000 miles per hour (12 kilometers per second).

Lots more at: <http://www.dailygalaxy.com/>

Island Planetarium @Fort Victoria

The Island's Telescope Professionals

Photo Perfection

TAL 200mm Klevtsov-Cassegrain OTA
£750 ono

Deep Sky & Planetary Delights

Skywatcher 180mm Maksutov OTA
£600 ono

+

EQ5 mount and drives - £200

ETX 's & various scopes

Call Paul England, VAS member

on 07771550893

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

From Now On You'll Be Able to Access NASA Research for Free

Fancy some super nerdy bedtime reading? NASA has announced that it will now provide public access to all journal articles on research funded by the agency.

Any scientists publishing NASA-funded work will be required to upload their papers to a free, online database called PubSpace within a year of publication.

PubSpace is managed by the National Institutes of Health (NIH) PubMed Central, which archives biomedical research. You can see NASA-funded studies here, with recent examples including a paper on cardiovascular disease in Apollo astronauts and one on Martian tsunamis caused by meteor impacts.

NASA explains that the new web portal is a response to a 2013 government request for federally-funded research to be more accessible. There are a few obvious exceptions to what's included, such as and material that's related to national security or affected by export controls.

More at: <http://motherboard.vice.com/>

A New Goldilocks for Habitable Planets

The search for habitable, alien worlds needs to make room for a second "Goldilocks," according to a Yale University researcher.

For decades, it has been thought that the key factor in determining whether a planet can support life was its distance from its sun. In our solar system, for instance, Venus is too close to the sun and Mars is too far, but Earth is just right. That distance is what scientists refer to as the "habitable zone," or the "Goldilocks zone."

It also was thought that planets were able to self-regulate their internal temperature via mantle convection — the underground shifting of rocks caused by internal heating and cooling. A planet might start out too cold or too hot, but it would eventually settle into the right temperature.

A new study, appearing in the journal Science Advances on Aug. 19, suggests that simply being in the habitable zone isn't sufficient to support life. A planet also must start with an internal temperature that is just right.

More at: <https://scienceblog.com/>

National Trust Event 2016

The National Trust are holding

A Night event at Mottistone Manor on 31st August

Please let me know if you can help

Observatory

When visiting the VAS observatory, for your own safety, 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 astronomy. Contributions to the Editor at the email or postal address on the front page.

"I love deadlines. I like the whooshing sound they make as they fly by"
Douglas Adams

"By all means let's be open-minded, but not so open-minded that our brains drop out"
Richard Dawkins

"The chief function of the body is to carry the brain around"
Thomas Edison

"If it's the Psychic Network why do they need a phone number?"
Robin Williams