

Gnomon

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Did Exceptional Tides Sink the Titanic?

Why were there so many large icebergs so far south in the shipping lanes?

Icebergs calf from the Jakobshavn Glacier on the west coast of Greenland. They drift northwards through Baffin Bay and then southwards with the Labrador Current. On many occasions, icebergs will run aground in shallow water off the coast of Labrador or Newfoundland. There are two ways they can become free. They will melt a little or there could be a series of exceptionally high tides.

In the 1970s, Fergus Wood, working at the US Ocean Survey, showed that in early January 1912 the Moon was at its closest to the Earth for hun-

dreds of years. This coincided with a Full Moon and so created very high tides. Donald Olson and Russell Doescher of the Texas State University have gone on to suggest that the high tides could have freed many icebergs and so created the large pack that the Titanic sailed into.

Unfortunately, on the night that the Titanic struck the iceberg, there was no Moon to help the lookout. The sea was calm so there were no waves breaking to create surf around the iceberg to make it stand out in the darkness. The rest is history but the



Environment Canada

Moon played some part!

SpaceX and NASA Head for the ISS

It was a very good to watch Atlantis land safely at the end of its mission last year but it was very sad see the Space Shuttle fleet retired. America seemed to be going to be out of the space adventure for a long time. However, at the end of April, SpaceX plans to launch its Dragon spacecraft from Launch Complex 40 at Cape Canaveral Air Force Station in Florida.

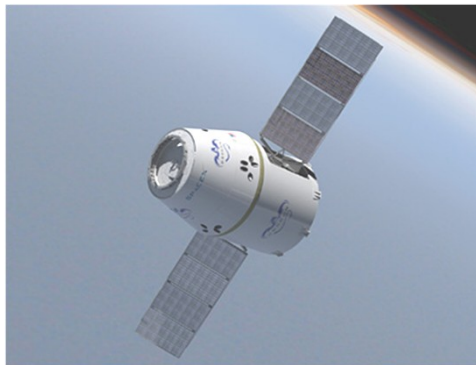
Dragon will be launched on a Falcon 9 rocket, also manufactured by SpaceX (Space Exploration Technologies). There have been two successful Falcon 9 launches so far.

The ambitious mission is to dock the Dragon spacecraft to the Space Station and return safely to Earth. The spacecraft will carry about 1,200 pounds of cargo that the astronauts and cosmonauts living on the station will be able to use.

As the mission is designated a test flight, the cargo is not material deemed critical to the crew.

Mike Horkachuck, NASA's project executive for SpaceX said "It's almost like the lead-up to Apollo, in my mind. You had Mercury, then you had Gemini and eventually you had Apollo. This would be similar in the sense that, we're not going to the Moon or anything as spectacular as that, but we are in the beginnings of commercialising space. This may be the Mer-

cury equivalent to eventually flying crew and then eventually leading to, in the long run, passenger travel in



Dragon Spacecraft with Solar Panels deployed. spacex.com

space."

Assuming the Dragon spacecraft passes about a few days' worth of equipment checks and demonstration in orbit, it will be allowed to approach the station close enough for astronauts to grab the it with the station's large robotic arm. The arm will berth the capsule to the station and astronauts will unload the spacecraft and put about 1,400 pounds of material inside the Dragon for return to Earth.

If this mission is successful, Dragon is expected to become operational and launch regular supply runs to the station. Unlike any other cargo carrier, the Dragon can bring things back to

Earth, too, a boon for scientists whose research is taking place on the orbiting laboratory.

The European Space Agency successfully docked its Edoardo Amaldi Automated Transfer Vehicle with the ISS in March. The spacecraft has supplied the ISS with propellant, water, air, and dry cargo. There are plans for just two more ATV launches, the Albert Einstein in 2013 and the Georges Lemaître in 2014.

Russia sends regular manned Soyuz and unmanned Progress missions.

In late 2012 a Cygnus unmanned resupply spacecraft being developed by Orbital Sciences Corporation and



Cygnus Spacecraft approaches the International Space Station. orbital.com

Thales Alenia Space in co-operation with NASA should reach the International Space Station.

www.spacex.com

MESSENGER Mission at Mercury

MESSENGER Mission News reports that in March MESSENGER successfully completed the first year of its campaign to perform the first complete reconnaissance of the geochemistry, geophysics, geologic history, atmosphere, magnetosphere and plasma environment of the solar system's innermost planet. The spacecraft was launched in August 2004 and entered orbit around Mercury in March 2011.

Mission Systems Engineer Eric Finnegan, of the Johns Hopkins University Applied Physics Laboratory (APL), is quoted as saying that "What MESSENGER has accomplished since its launch in August 2004 is amazing – six years of cruise operations, followed by a year of nearly flawless orbital operations. And all this in the harsh environment at 0.3 astronomical units (27,886,766 miles) from the Sun".

MESSENGER's three flybys of Mercury solved the decades-old question of whether there are volcanic deposits on the planet's surface. But the detailed character and global distribution of volcanic materials remained poorly known until the arrival of MESSENGER in orbit about Mercury.

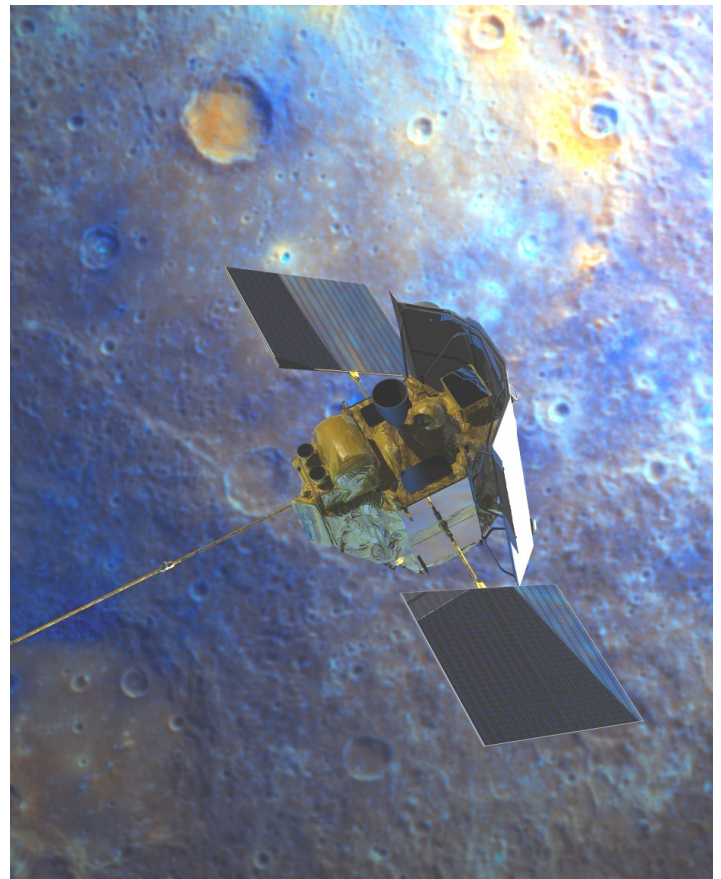
MESSENGER orbital images have revealed volcanic vents measuring up to 25 kilometres (15.5 miles) across that appear to have once been sources for large volumes of very hot lava that, after eruption, carved valleys and created teardrop-shaped ridges in the underlying terrain.

Also noteworthy is the discovery from measurements of Mercury's gravity field that the planet has an unexpectedly complex internal structure. The mission will continue to collect data for at least another year.



Crater Donne, named after John Donne was an English poet known especially for his sonnets and elegies. The image was taken by the Narrow Angle Camera (NAC) of the Mercury Dual Imaging System. The resolution is 108 metres/pixel and the crater is about 86 km (53 miles) in diameter. The crater displays a mound-like central peak that has been somewhat rounded by impact erosion and there are well-developed wall terraces. The crater has been modified by lobate scarps that cut the walls and floor.

The surface of Mercury is similar to that of the Moon but the craters are often less well-defined. This is because they are blanketed by ejecta from other near-by craters. The surface gravity of Mercury is more than twice that of the Moon and this constrains the ejecta.



Images Courtesy of
NASA/Johns Hopkins University Applied Physics Laboratory/
Carnegie Institution of Washington

MESSENGER'S orbit is highly elliptical. Not only does it have a comprehensive sunshield as shown in the image above, but it must not stay too long near the planet's surface. The hottest parts of the surface, being at about 400°C, emit so much infrared that the spacecraft would overheat.

<http://messenger.jhuapl.edu>

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Publication Dates:

These are at the equinoxes and the solstices, that is four times a year.
Copy deadlines are four weeks before these dates.

Spiders and Chromatic Aberration

Makers of telescopes do their best to avoid chromatic aberration. Blue light travels slower in glass than red light and so is refracted more – “blue bends best”. So in a simple lens, the blue part of the image is brought to a focus closer to the lens than the red part. This can be compensated for by using a pair of lenses of different refractive index, typically 1.5 and 1.6. This arrangement is called an achromatic doublet and is often found in the objectives of telescopes. However chromatic aberration has played a part in understanding vision in nature.



Adanson's jumping spider. Courtesy of Science/AAAS

Adanson's jumping spider has to judge the distance of its prey accurately. It does not sway from side to side to exploit parallax as some predators do. Its retina has four tiers of photoreceptors and its eye-lens has significant chromatic aberration. Green light is focussed on the deepest layer and the layer above it receives an out-of-focus image. It was proposed that the spider uses this to judge the distance of its prey. To investigate, the research team led by Takashi Nagata from Osaka City University compared the accuracy of the spider jumping in green light and then in red light. In red light the spider was not able to judge distances accurately.

In a paper published in the journal *Science*, the researchers conclude that further study of the vision system used by jumping spiders is necessary and that it could have applications in robotic and other computer vision systems.

■ www.PhyOrg.com

Google Lunar X PRIZE

The Google Lunar X PRIZE is igniting a new era of lunar exploration by offering the largest international incentive prize of all time. A total of \$30 million in prizes is available to the first privately funded teams to safely land a robot on the surface of the Moon, have that robot travel 500 meters over the lunar surface, and send video, images and data back to the Earth. Teams must be at least 90% privately funded, though commercially reasonable sales to government customers are allowed without limit.

Team registration has closed with currently 26 teams located around the world who are fundraising, mission planning, and building robots in a new race to the Moon. The teams have until the end of 2015 to get to the Moon, meet the prize objectives, and win the prize purses.

Winning the Google Lunar X Prize requires teams to land

a robot on the Moon, move at least 1,640 feet (500 meters) and beam high definition views back to Earth.

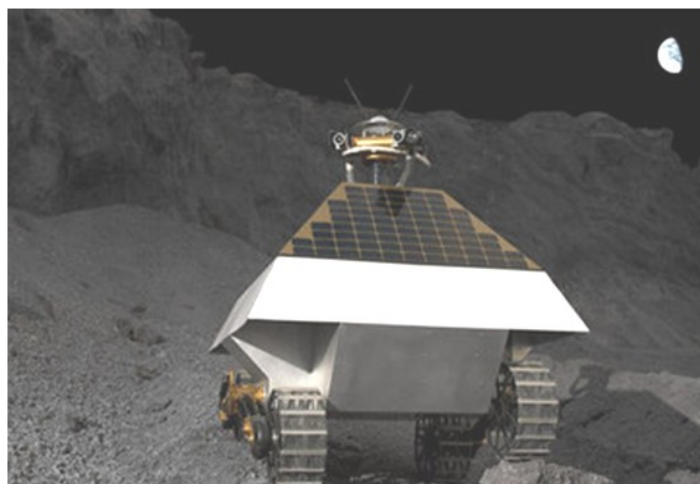
One of the teams, Red Rover from Astrobotic Technology, is planning to do a series of missions for scouting, prospecting, mining, and the sorts of things that robots can do to get ready for the human return to the Moon.

The team plans for a pinpoint landing just over a mile from the Apollo 11 site, where Neil Armstrong became the first man to walk on the Moon. Red Rover would then beam back high-definition images of the dusty footprints left by Armstrong and fellow Apollo astronaut Buzz Aldrin, all while taking care not to disturb the historical site.

The rover takes its name from team expert Red Whittaker, a famed Carnegie Mellon University roboticist who led his team to victory in the 2007 DARPA Grand Challenge, a road 'race' for autonomous vehicles.

“Unlike during the Apollo era, it's clear to many people that the future of the lunar frontier will be a mixed colony of humans and robots,” David Gump of Astrobotic explained. “Our goal is to be a company to which you can outsource things. You want to scout a landing site ahead of time, you hire us. You want to get a soil sample before sending your mining machines, you hire us. You need some electrical power supply, we'd have a service.”

The series of robotic expeditions to the Moon would also collect information to help build a lunar data library, Astrobotic announced last fall.



Depiction of Astrobotic's "Red Rover" on the Moon. Courtesy of Astrobotic.

“At that time we didn't have the credibility of Google dust sprinkled on us,” Gump said, noting a ‘sea change’ in people's perceptions of the private space industry after aerospace pioneer Burt Rutan and his Scaled Composites firm SpaceShipOne won the \$10 million Ansari X Prize for reusable suborbital spacecraft.

Gump has said that smaller entrepreneurial teams may yet capture the prize, but the team would continue with its larger-scale effort.

ALMA Under Way

The ALMA radio telescope array has produced its first images. It now has 20 of the 66 dishes in place and connected to the computer system. The astronomers have just released an amazingly detailed image of a ring of dust orbiting a star, about 25 light-years from Earth. The image shows that both the inner and outer edges of the thin, dusty disk have very sharp edges. It is likely that the dust particles in the disc are kept organised by the gravitational effect of two planets - one closer to the star than the disc and one more distant, like the small moons in Saturn's rings.

■ www.almaobservatory.org **3**

Photographing the International Space Station from Your Back Garden



Multiple images of the International Space Station flying over the Houston area have been combined into one composite image to show the progress of the station as it crossed the face of the Moon. Photo credit: NASA

Photographing the International Space Station seems like something that could be done only from space, but taking a picture from your own back garden actually is easier than you might think.

If you have the right equipment, capturing your own photo of the space station from your back garden can be almost as easy as tracking it, and definitely more satisfying. NASA photographer Lauren Harnett, who took these photos, explained her technique for photographing the station with the Moon as the background. But you can choose just about any landmark that is special to you to put in the foreground, as long as you're careful to ensure the lighting conditions are right.

Camera Equipment Needed:

- Digital Single-Lens Reflex (DSLR) camera
- 600 mm lens (or the longest focal length you have)
- 2X telephoto lens converter if available (doubles the focal length of the lens)
- Trigger cable (minimises camera shake)
- Tripod (heavy duty works best)
- Sandbag (keeps tripod stable)

Photographing the Space Station with the Moon

First, determine when the space station is flying over your area and decide where to set up your equipment to take the photos. It is helpful to know from which direction the station is coming. Sightings information and exact dates and times are available on NASA's SkyWatch website or from www.heavens-above.com.

Allow plenty of time for set up at your chosen location, as it may take some time to get the tripod perfectly adjusted. Make sure you check where the Moon is and that it is in the phase (full, crescent, etc.) you want. Set up the tripod and camera pointing toward the Moon. Adjusting the tripod may be tricky as tripod heads are not designed to tilt back to extreme angles for overhead shots. You may need to extend the two back legs of the tripod while keeping the front leg shorter to achieve the desired angle. Tie the **4** sandbag to the front leg to help balance the tripod.



The International Space Station can be seen as a small object in upper left of this image of the Moon in the early evening in the skies over the Houston area flying at an altitude of 390.8 kilometres (242.8 miles). Photo credit: NASA

Find the Moon in the camera viewfinder, adjusting the tripod as needed. Harnett said, "Clouds can make it tricky!"

Harnett set her camera's shutter speed to 1/1600 of a second, aperture at f/8 and ISO to 2500. You may need to adjust your settings to let in more or less light depending on the size and brightness of the Moon or your foreground object, but this is a good starting-point.

Use the High Continuous Burst setting to capture the maximum number of images per second. Setting the camera to save the photos in raw image format is best. Be sure to use the manual focus.

It is a good idea to take a few test shots to ensure everything is set as you want. A few minutes before the station is expected to fly over, check the viewfinder again to ensure the Moon is still in the shot, as it also is moving across the sky.

The station will be easy to identify when it comes into view as it is extremely bright and moves rather quickly. It looks like an aircraft with its landing lights on full.

Once the space station is in the field of view of the camera (or close to it), press and hold down the cabled trigger release until the station leaves your field of view a few seconds later. Then check the photos on your camera to see if they turned out the way you wanted.

You are now ready to experiment with taking your own photos of the space station. If they don't turn out the way you want the first time, you can always try again. Then again, your photos may turn out so well that you'll want to take more at every chance you get!

**Adapted from a web page by Lori Keith
NASA's Johnson Space Center**

New observatory to inspire pupils at Long Eaton school

A new £60,000 observatory has opened to students at a comprehensive school in Derbyshire.

The Malcolm Parry Observatory at The Long Eaton School took six months to build and was paid for by private grants.

The school said it would help and inspire students who have taken GCSE and A-level courses in physics and astronomy.

National Space Academy

The National Space Centre will lead the programme using space as the inspiration for learning. A new academy has been set up to enable teachers to use space as a theme in their core subject lesson plans.

The National Space Centre in Leicester is to lead the programme to promote excellence in science, technology, geography and maths. Teachers will be able to access training and work alongside scientists to deliver space masterclasses.



The academy is being sponsored by a number of hi-tech firms to promote careers in the aerospace industry. The National Space Academy will be supported by scientists from the University of Leicester, the University of Nottingham and the STFC Rutherford Appleton Laboratory in Harwell, Oxfordshire.

They will be responsible for training teachers to use space concepts in their lessons, providing careers events and organising a bespoke space engineering apprenticeship at Loughborough College.

A spokesman for the National Space Centre said the courses were designed to address the shortage of trained people entering the aerospace industry. He said the feedback from a pilot project in the East Midlands had been very positive and teachers had successfully used space and the planets as a way of teaching complex theories such as the laws of motion.

Teachers can apply to the National Space Centre in Leicester to take part in the programme, which they can use to enhance learning for GCSE and A-level students.

Sir Martin Sweeting, chairman of the National Space Centre's board of trustees, said: "Students respond very positively to the subject of space as a context for their learning. We have evidence of improved attainment in exam results and teacher effectiveness and a greater likelihood of students choosing science and engineering related subjects at the next stage in their education".

The space academy is backed by leading technology firms and will run alongside other space inspired initiatives to improve the skills of students in secondary schools and colleges.

Minister for Universities and Science David Willetts said: "Space captures the imagination of people of all ages and the National Space Academy will use the UK's world-class expertise in space research and technology to inspire the next generation of scientists and engineers."

www.nssc.co.uk

Amazing BBC Web Resources

Navigating the BBC Science pages is not easy so this is the address to start at:

www.bbc.co.uk/science/space/universe/exploration

There is a mass of material on exploration of the Universe. Try out these excellent resources!

- Australian Astronomical Observatory – The AAO hunts exoplanets.
- Chandra X-ray Observatory – This space telescope measures the Universe's high energy objects.
- Compton Gamma Ray Observatory – Compton tracks gamma ray bursts from orbit.
- Cosmic Background Explorer (COBE) – Found important evidence supporting the Big Bang.
- Herschel Space Observatory – The largest telescope ever launched into space.
- Holmdel Horn Antenna – This device was used to discover the cosmic microwave background radiation.
- Hubble Space Telescope – This famous telescope makes beautiful images of the Universe.
- Jodrell Bank Observatory – Home to one of the world's largest radio telescopes.
- Kepler Mission – Hunts for exoplanets similar to the Earth.
- Kitt Peak National Observatory – Kitt Peak is the national observatory of the United States and its astronomers have made many important discoveries.
- Large Hadron Collider (LHC) – The LHC investigates the first moments after the Big Bang.
- Leviathan of Parsonstown – 19th century astronomers used this great telescope to study spiral galaxies.
- Mount Wilson Observatory – Key discoveries have been made here.
- Planck mission – This satellite captured a stunning image of light from the early Universe.
- Sloan Digital Sky Survey – This project produces 3D maps of the Universe.
- Spitzer Space Telescope – Spitzer studies the infrared Universe.
- Swift mission – Swift aims to discover more about gamma ray bursts.
- Telescopes – Astronomy's most important tool continues to evolve.
- The Keck Observatory – There are twin telescopes on Mauna Kea, Hawaii.
- UK Dark Matter Collaboration – An underground lab is part of the dark matter search.
- UKIRT – Observes the infrared sky. It was the first large infrared telescope and was a UK first.
- Very Large Telescope (VLT) – This powerful telescope is located in Chile.
- William Herschel Telescope – This European telescope is located on La Palma.

Recent Discoveries Relating to the GCSE Astronomy Syllabus

Graben on the Moon

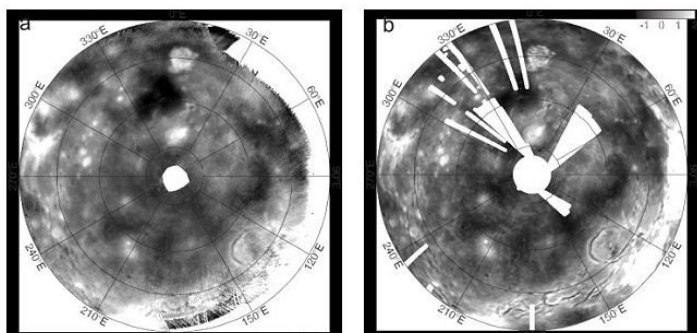
Graben are geological features created when a planetary surface is stretched, and the terrain slumps, forming narrow valleys. These graben, imaged by the Lunar Reconnaissance Orbiter satellite in the Virtanen region on the far side of the Moon, shown that parts of its surface are still active.

Page 13 of the GCSE Astronomy textbook illustrates wrinkle ridges on the lunar surface, which are evidence of cooling and contraction over long periods of time. By contrast, these graben demonstrate that some regions of the Moon are being stretched; and, with an estimated age of 50 million years, show that our nearest celestial neighbour is still active, (albeit on geological timescales!).



Venus' Rotation

As the table on page 26 of the GCSE textbook illustrates, the planet Venus has unusual rotation characteristics. Unlike most of the planets, its rotation is retrograde, and it takes 243 Earth days to complete one slow revolution.



If recent results from the European Space Agency's Venus Express satellite are accurate, the planet's motion is anomalous in another way – it is changing very quickly.

Maps of the planet compiled by the Magellan satellite's radar sensor (left) in the 1990s can only be reconciled

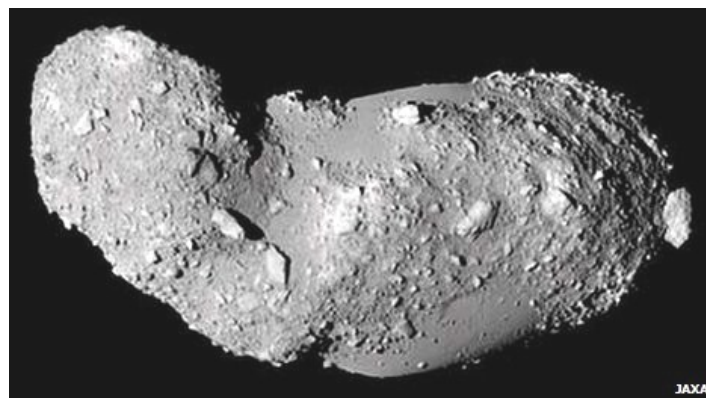
with recent infra-red maps from Venus Express (right) if the planet's rotation has changed by 6.5 minutes in the intervening 16 years.

By comparison, the Earth's rotation changes only by milliseconds over a comparable period. This change may eventually reveal something fundamental about the interior composition of Venus, or the interaction between its surface and its atmosphere.

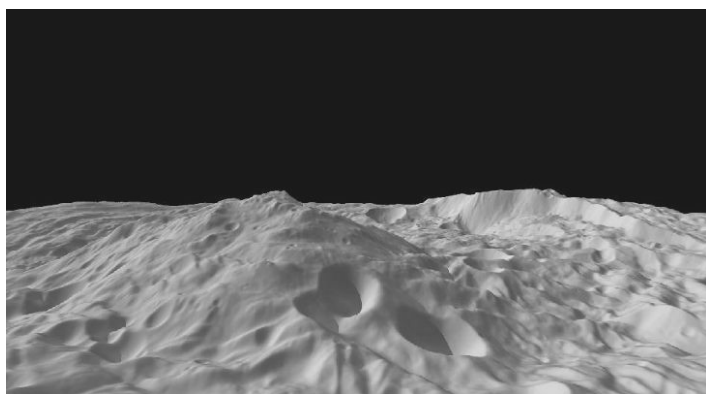
The Age of Near Earth Objects

In common with most texts on asteroids, the Astronomy textbook implies on page 34 that these objects have remained "virtually unchanged" since the beginning of the solar system.

Images captured by satellite missions to asteroids have now started to call this assumption into question. The Hayabusa satellite mission to the asteroid Itokawa showed smooth areas which imply that some areas on the asteroid are very young in solar system terms.



Now the Dawn spacecraft is also providing evidence of surprising features on the surface of the asteroid Vesta, including a mountain near its South pole that is two and half times higher than Mount Everest. Based on cratering evidence, some areas on the southern hemisphere of Vesta are now thought to be only 1-2 billion years old.



Dr Stuart Eves
Lead Mission Concepts Engineer
Surrey Satellite Technology

GCSE Astronomy: A Guide for Pupils and Teachers by Nigel Marshall. Mickledore Publishing; 4th Revised edition (1 Sep 2009) ISBN-13: 978-0953634576. £12.95.

For your Library

“Turn Left at Orion: Hundreds of Night Sky Objects to See in a Home Telescope – and How to Find Them” by Guy Consolmagno and Dan M Davis. Cambridge University Press ISBN 9780521153973. £22.99 (\$28.99) pp256. Spiral bound.

It is over twenty years since this indispensable guide to the night sky was first published. This latest edition is thoroughly revised and updated and includes extra sections for use if you have a 200mm to 300mm Dobsonian. Every object described here has been re-observed by the authors, mostly under suburban skies.

The introductory chapters contain very straightforward advice on owning and using amateur telescopes, both refractors and reflectors; there are sections on magnification, collimation and dew-caps. Following this there are sections on observing the Moon and naked-eye planets with descriptions of interesting features on the lunar surface at different phases and a list of apparitions of the planets until the year 2024.

The main part of the book is devoted to the four “Seasonal Skies”. Following the pattern of earlier editions, you begin with finding a really easy bright star or constellation, for example Orion in Spring or Vega in Summer. Then other exciting objects are tracked down using these as starting points. Illustrations are provided of the naked-eye view of the field, the finderscope view and then the low-power and high-power telescope views.

Objects include double stars, nebulae, planetary nebulae, star clusters and galaxies. These simple black and white illustrations of what you expect to see are a much better guide than the lovely Hubble photographs that we have come to know well, but which do not look like the views from our back gardens!

The drawings also show up well in the light of a red torch while observing so that you do not spoil your night vision. A wealth of background information is provided on these objects to whet the appetite so that using this book is just like having a friend looking over your shoulder, guiding you to exciting objects and then telling you all about them. You feel warmly encouraged to gain experience in observing.

In this new edition, the view in a medium-sized Dobsonian is also drawn and described so that there are additional objects that are beyond the reach of the typical 90mm telescope (that was the main focus of earlier editions). This has led to an increase in the page size in this edition but the volume is spiral bound and lies flat for easy use “in the field”.

Since the authors are firmly rooted in the USA, some of the objects, for instance those low in Sagittarius, will be very difficult to observe from UK skies. Also some of the spellings (donut, neighbor) reveal the book’s origins. This in no way detracts from the book – indeed the more southerly objects could be observed on your holidays! For this very purpose, a short section is given to the southern skies for those of you who would like to see Eta Carina, 47 Tuc and the Magellanic Clouds.

This edition will certainly enjoy the success of previous editions, if not more so, as it offers so much more. Everyone needs a copy beside them in their back garden.

Anne Urquhart-Potts

Astronomical Observations in the Early Middle Ages

In a recent paper for *The Antiquarian Astronomer*, Heinrich Härke describes observations in the *Anglo-Saxon Chronicle*. The *Chronicle* is a list of annals reporting events between 60 BC and AD 1154. It becomes detailed from the arrival of the first Anglo-Saxons, Hengist and Horsa in AD 449. Härke points out that there was no significant literacy in England during the fifth and sixth centuries AD and so all material for that period had to be taken from folk memory or writings from continental Europe.

A considerable contribution to the *Chronicle* came from writings of the Anglo-Saxon monk, Bede. He completed a great work, the *Ecclesiastical History of the English People*, in AD 731.

A sample of the 40 observations are listed below:

AD 538 16 February - An eclipse of the Sun from day-break until nine o'clock in the morning.

AD 678 The star called a ‘comet’ appeared in August and shone every morning for three months, like a sun-beam.

AD 734 In this year the Moon looked as if it were suffused with blood and Tatwine (Archbishop of Canterbury) and Bede died.

AD 806 1 September - There was an eclipse of the Moon. In this year, Eardwulf, king of Northumbria, was driven from his kingdom. On the 30 August a wonderful circle was revealed around the Sun.

AD 926 There appeared fiery lights in the Northern quarter of the sky.

AD 1066 Then all over England there was seen a sign in the skies such had never been before. Some said it was the star ‘comet’ which some call the long-haired star, and it first appeared on the eve of the Greater Litany that is 24 April, and shone all the week.

AD 1078 The Moon was eclipsed three nights before Candlemass (agrees with a lunar eclipse of 30 January 1078).

AD 1110 On the fifth night of the month of May, the Moon appeared in the evening shining bright, and then little by little its light faded until early in the night it was quenched entirely, so much so that neither light nor circle nor anything of it was seen; and so it continued until nearly day, and then it appeared full and brightly shining - it was a fortnight old that same day. All that night the sky was very clear, and the stars all over the heaven shining very bright, and fruits were badly damaged by frost that night.

AD 1131 This year after Christmas on the Sunday night at first sleep, the sky in the North was all as if it was a burning fire, so all who saw it were afraid as they had never been before - that was on the 11 January.

AD 1140 In the spring the Sun grew dark, and the day, about midday when people were eating, so that they lit candles to eat by. That was 20 March, and the people were very much astonished. After that the Archbishop of Canterbury died.

Härke points out that three total solar eclipses are missing as is the supernova of AD 1054 that produced the Crab Nebula.

Astronomical and Atmospheric Observations in the Anglo-Saxon Chronicle and in Bede. The Antiquarian Astronomer. Issue 6, January 2012.

What Can I See Tonight?

Welcome to “What Can I See Tonight?”, a feature designed to answer that question and to give a few simple observing tasks for homework.

The descriptions are set for one hour after Sunset in the middle of each month. In the winter this will be just as the pupils arrive home. Specific events are given their date in the month.

The Moon is best observed when the terminator, the line between the Sunlit and shadowed parts, is in the centre of its face. The craters on the terminator show up spectacularly well when observed with even the most inexpensive binoculars. It is time to get that telescope down from the top of the wardrobe or from under the bed, where it has been collecting dust!

Meteor showers are generally disappointing unless there is no Moon. Even then you might have to wait several minutes to see even one event. Good for the enthusiasts. Best observed from a garden chair or a sun-bed!

April. Observe at 21:00

- * Mars is high in the South
- * Venus is in the West. Capella is above Venus
- * Arcturus is in the East
- * Saturn is low in the South-East
- * Ursa Major is overhead

Interesting Events

- * 21 + 22 Lyrid Meteor Shower (20 per hour) – No Moon, so excellent observing conditions

The Moon

- * 29 First quarter (Best for observing detail)

May. Observe at 22:00

- * Mars is in the South-West
- * Saturn is in the South
- * Venus is low in the North-West. Above Venus, Capella is to the right and the twins, Pollux and Castor (that way round!) are to the left
- * Arcturus is quite high in the South-East
- * Ursa Major is overhead
- * The W of Cassiopeia is in the North
- * Cygnus the Swan is in the North-East

Interesting Events

- * 31 The Moon and Saturn are on either side of the first magnitude star Spica

The Moon

- * 6 Full
- * 12 Last Quarter Rises 03:00 (Best for observing detail)
- * 23 Venus and the Crescent Moon low in the North-West
- * 28 First quarter (Best for observing detail)

June. Observe at 22:30

- * Mars and Saturn are low in the South-West. Mars should be visibly red and Saturn creamy-yellow
- * Saturn is close to Spica
- * Vega, Deneb and Altair form the Summer Triangle in the East. Vega is at the top and Deneb to the left. Albireo is at the head of the Swan. In a small telescope Albireo is a stunning double star with one star yellow like the Sun and the other sapphire blue
- * The W of Cassiopeia is in the North
- * Arcturus is above Saturn in the South-West

Interesting Events

- * 20 The Summer Solstice. The longest day

The Moon

- * 4 Full
- * 11 Last Quarter Rises 01:00 (Best for observing detail)
- * 27 First Quarter (Best for observing detail)

Public survey shows little improvement on light pollution

A survey conducted by the Campaign to Protect Rural England (CPRE) and Campaign for Dark Skies (CfDS) has found no real improvement in the amount of wasted light being pumped into Britain’s skies. Findings show more than half the population still experience severe light pollution. Just over half (53 per cent) of the people taking part could see 10 stars or fewer within the constellation of Orion - indicating severe light pollution in their area.

The results suggest that, despite good initiatives to reduce light pollution in some places, the contamination of Britain’s night skies continues largely unchecked.

Emma Marrington, CPRE Rural Policy Campaigner, says: “When we saturate the night sky with unnecessary light, it damages the character of the countryside and blurs the distinction between town and country. But this isn’t just about a spectacular view of the stars; light pollution can also disrupt wildlife and affect people’s sleeping patterns.”

Bob Mizon, Campaign for Dark Skies Coordinator, says: “Light pollution is a disaster for anyone trying to study the stars. It’s like a veil of light is being drawn across the night sky, denying many people the beauty of a truly starry night. Many children growing up today will never see the Milky Way.”

CPRE has welcomed the inclusion in the new planning reforms (National Planning Policy Framework) that local councils are to be encouraged to plan to reduce light pollution, by promoting good design, planning policies and decisions to control lighting. With such national guidance in place, and with a number of councils now providing good ‘best practice’ examples of how to limit light pollution, more local authorities can now take action to limit the impact from artificial light on urban and rural communities, intrinsically dark landscapes and the natural environment.