New Zenith

The Monthly Magazine of the Vectis Astronomical Society

Vol 20 Issue 2 — March 2012 *When Printed, this Newsletter costs VAS at least £1*

Society News

Excluding the very early days of VAS I suspect that this last month has seen the most new members choosing to join us. This sudden increase is no doubt due to the hard work of members and committee in pubicising what we do and to the increase in TV and news coverage of astronomy and science.

I remember in my early teens, the television schedule wouldn't have been complete without "The Sky at Night", "Tomorrow's World", "The Ascent of Man" and "Equinox" as well as regular appearances from James Burke, Heinz Wolf and Magnus Pike - of course there were many others but these stand out in my memory. This was a time when both the public were interested and the broadcasters made a real effort to explain science to the masses.

Fortunately we seem to be going through a similar period as hardly a week goes by without mention of the LHC at Cern or perhaps an explanation of the Northern Lights. Personally I find all this very refreshing after a long spell of phone-in celebrity nonsense interspersed with endless cookery and makeover programmes.

Anyhow, enough soapboxing and on to the point. VAS is a charitable organisation which was set up to provide facilities for both its members and the wider public. We often entertain groups from schools and other clubs, which perhaps causes a bit of inconvenience to members BUT it does help pay the bills and personally I really enjoy it.

Last Thurday we had a lot of observatory visitors and dark skies - members got stuck in, set up telescopes etc and introduced a lot of people to their first ever views of Jupiter, Venus, Mars, M42 and Andromeda. There was a real buzz around the place and I'm sure a lot of people went home very pleased they'd spotted the mention of us in the local press and in the pages of several websites. There will, no doubt, be more busy Thursdays in 2012 proving that people are still interested in science.

Many thanks to all the members that helped, you will be pleased to know that recent visits to the observatory have added some £150 to our funds. For those who were inconvenienced, if we start to get too many visitors, we will arrange an alternative club night.

Clear Skies!
Brian Curd
Observatory Director

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

Castle Haven Cottage, Castle Haven Lane, Niton Undercliff, Isle of Wight, PO38 2ND

Registered Charity No 1046091

Observatory Diary

Monday, 19.30hrs	**Members Only**. 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 2012

Check the website for up to the minute information.

Travel for our monthly speakers is sponsored by:

Date	Subject	Speaker
24 Feb	How Sir James Jeans helped lift spirits in the aftermath of the Great War	Dr Guy Moore
23 Mar	Black Holes	Prof. Ian Morrison
27 Apr	Answering the Biggest Questions with the Biggest Surveys	Dr Thomas Kitching
25 May	TBA	TBA
29 June	Member's Forum and Special Project Presentation	
27 July	TBA	TBA
24 Aug	Observing Galaxies - Faith Jordan **AGM** **Meeting Starts at 19.00hrs**	
28 Sep	TBA	TBA
26 Oct	TBA	TBA
23 Nov	TBA	TBA

All details correct at time of publication.

April's meeting is particularly interesting as Dr Kitching is an "Islander".

Do You Know a Speaker?

As you can probably see, we are having some difficulty arranging speakers at the moment.

If you know anyone who can help, or perhaps you would be prepared to have a go, please contact Elaine Spear at ***progorg@wightastronomy.org***

VAS Contacts 2012	
Chairman	**Faith Jordan** chairman@wightastronomy.org
Secretary	**Rebecca Mitchelmore** secretary@wightastronomy.org
Treasurer	**Frank Alfrey** treasurer@wightastronomy.org
Observatory Director	**Brian Curd** director@wightastronomy.org
	Barry Bates
Programme Organiser	**Elaine Spear** progorg@wightastronomy.org
Special Projects	**David Kitching** projects@wightastronomy.org
NZ Editor	**Brian Curd** editor@wightastronomy.org
Membership Secretary	**Tony Williams** membership@wightastronomy.org
NZ Distribution	**Brian Bond** distribution@wightastronomy.org

New Members

A very warm welcome to our new members:

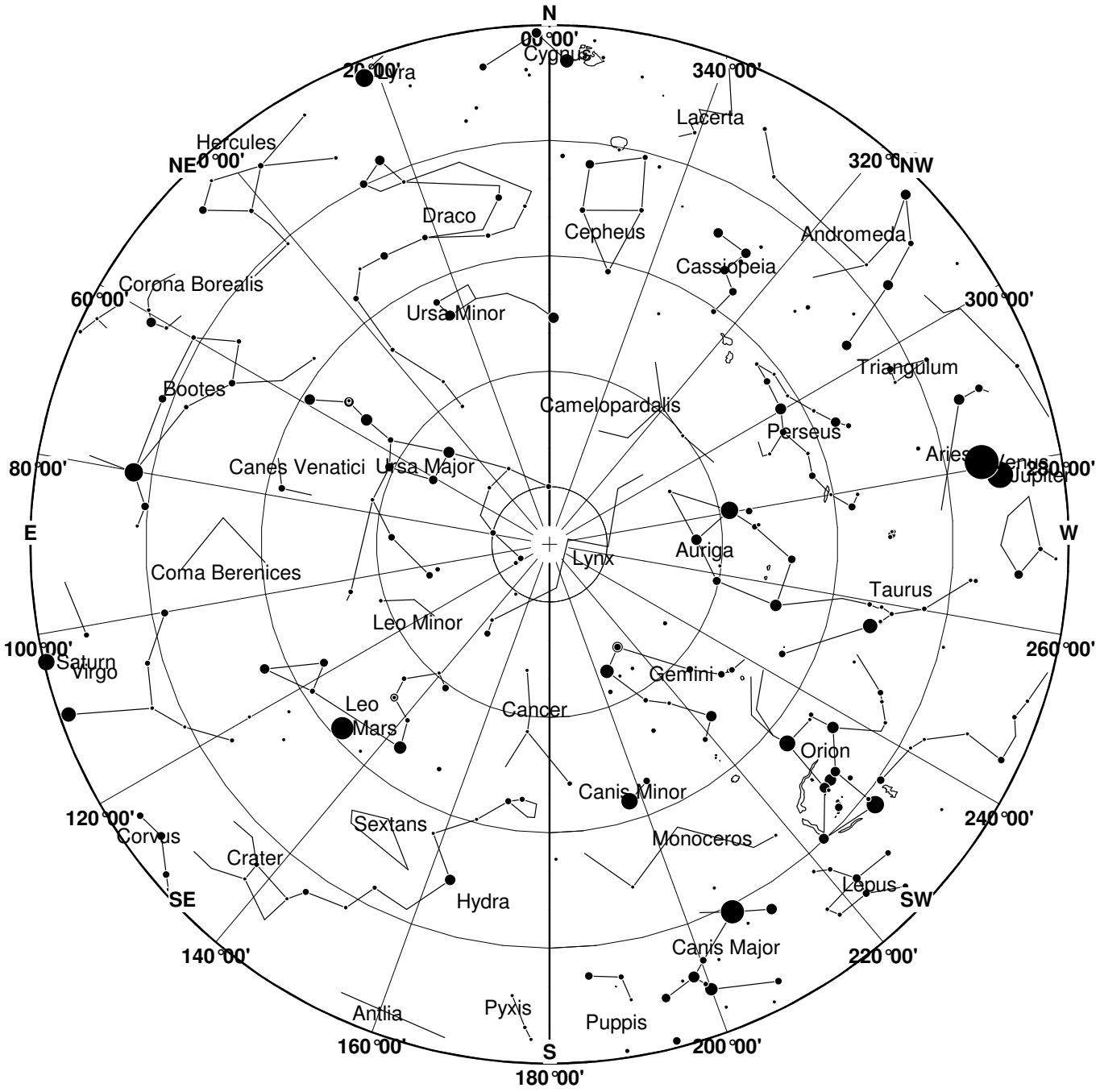
- Ian Johnson
- Fred Psyk
- Barry Brittan
- Cameron Brittan
- Tommie Venier
- Katrina Venier
- Michael Thorne
- Kev Prowse
- Steve Biggs
- Ryan Cooke
- Ashley Fisher

VAS Committee

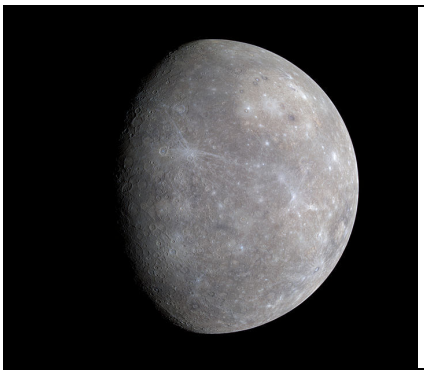
Printing Costs

Each month we print some 50-60 copies of New Zenith for those who perhaps don't, or perhaps didn't, have a broadband internet connection. I quite understand that not everyone wants or is able to take an electronic copy and I can assure everyone there is no plan to make NZ "electronic only" but, if your circumstances have changed and you would like to change to an email copy, please contact any member of the committee - as they say at a famous high street store, "*Every little helps!*".

March 2012 Sky Map



View from Newchurch Isle of Wight UK - 2100hrs - 15 March 2012



Comparatively little is known about **Mercury**; ground-based telescopes reveal only an illuminated crescent with limited detail. The first of two spacecraft to visit the planet was Mariner 10, which mapped about 45% of its surface from 1974 to 1975. The second is the MESSENGER spacecraft, which attained orbit around Mercury on March 17, 2011, to map the rest of the planet.

March 2012 Night Sky

Moon Phases

New	1st Qtr	Full	Last Qtr
22nd	1st/30th	8th	15th

The spring equinox occurs at 05:14 on the 20th the Sun crosses the equator on its way back to the northern hemisphere.

Planets

Mercury

Mercury continues its best evening apparition of the year. It starts the first week of month quite high in the western sky at sunset and this is the best time for observation. As the week progresses Mercury's phase becomes a thinner and thinner crescent that is decreasing in brightness at the same time as the evening sky is increasing in brightness with the Sun now setting later and later.

Azimuth & Elevation for Mercury at 18:00		
Date	**Az**	**El**
2 March	255	13
4 March	256	14
6 March	257	15
8 March	258	15
10 March	260	15

Venus

Venus is the star of the early evening this month. During the first fortnight it races up to meet the much dimmer, but still bright Jupiter. They are all but the same distance apart on the 12th & 13th; just a few minutes of arc closer on the13th. There is a photo opportunity with the crescent moon and Jupiter on the 25th and 26th.

Mars

As Venus and Jupiter sink into the west Mars will be high enough for observation in the east. It is the brightest object in that part of the sky and with its distinctly ruddy colouring is easily found. Opposition is on the 4th; this is as good as Mars will get for the next two years so grab the opportunity to observe it now. It will be noticeably smaller and the surface features more difficult to see by the end of the month.

Jupiter

Slowly but surely Jupiter is slipping into the evening twighlight. By the end of the month it will be getting too low down for detailed observation.

Saturn

From midnight onwards Saturn is high enough for observation. It is located close to Spica the brightest star in Virgo. They are easily distinguished Spica is a blue star and Saturn is a little brighter noticeably yellow in colour by comparison.

Uranus & Neptune

Both the outer planets are too close to the glare of the Sun for observatio this month

Deep Sky objects

M108 Galaxy RA 11h 12m Dec 55° 38' mag 11.0
Follow from Merak, just below the line of the bottom of the bowl of the Big Dipper for about 1.5 degrees to find this edge on galaxy. Like M82 it shows signs of disturbance with a similar mottling of new star formation along its length.

M97 The Owl Nebula RA 11h 15m Dec 54° 58' mag 12
Continue along the Dippers bowl for another degree to find this faint planetary nebula. To become a planetary nebula is the fate that awaits our own star as it runs out of fuel, casts off its outer layers and contracts into a white dwarf. For a brief period the ultra violet radiation from the star causes the shell of gas to glow at it disperses into space and eventually fades away. A large telescope and dark skies are needed to see the owl's eyes, two dark voids in the gas.

NGC2392 Eskimo Nebula RA 7h 29m Dec 20° 54' mag 9.9
First discovered over 200 years ago by William Herschell and made into a spectacular image by the Hubble space telescope, a large telescope and dark skies are needed to see any detail in this planetary nebula.

Peter Burgess

ISLE OF WIGHT STAR PARTY
22nd - 26th March 2012
Come and Enjoy Some of the Darkest Skies in the South
http://www.iowstarparty.org/ for more details

Lecture report 27 January 2012

Europe's First Mission to the Moon

Barry J Kellett, D-CIXS Project Scientist, Rutherford Appleton Laboratory

As with all adventures requiring meticulous planning, including into space, the excitement provided by luck grabs attention - especially that of a full house of VAS members, privileged to hear firsthand what people in a top laboratory have achieved, are doing, testing and planning. This lecture covered the project, 'Demonstration of a Compact Imaging X-ray Spectrometer', a new generation instrument - part of the scientific package of SMART-1, an evaluation spacecraft using Ion Propulsion, breaking the record for the longest duration and least fuel usage flight to the Moon, completed within the planned three years. And what a 'fun story' it proves to be, when the Sun fails to follow activity predictions, the new Swept Charge Device Detectors (SCDs) yield amazing data on the fluorescence of argon in the Earth's atmosphere, and just when the spacecraft was approaching the Sea of Crises, the Sun, acting like a flashgun, suddenly obliged with an intense flare, allowing elemental X-ray fluorescent snapshots of the basin and highlands, demonstrating the usefulness of remote sensing and its potential for studying planets, such as Mercury in the upcoming BepiColombo mission.

After the lecture, much interest was shown in a piece of Moon rock, a piece of Mars (meteoritic origin), a tube of simulated easy-flowing lunar dust, electronic circuit boards and X-ray collimation parts relating to the three-million pound 24-pixel camera, built at the RAL. The sketches here relate to just a few of the very interesting things seen on screen.

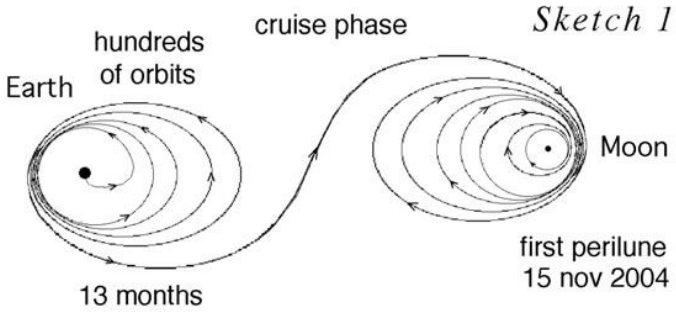
Element key: Al aluminium, Ca calcium, Fe iron, Mg magnesium, Si silicon, Ti titanium.

SMART 1, an ESA spacecraft assembled by SAAB in Sweden, was a 'small mission' costing 110 million euros, launched from Kourou aboard an Arianne. It had a mass of 367 kg, contained 82 kg of xenon for the ion propulsion unit, plus 19 kg total of scientific projects including D-CIXS, of mass less than 5 kg.

The Ion Propulsion Engine produced a gentle 7 grams of thrust. The Soviets were the first to develop these units, possibly consisting of a ring cathode firing electrons axi-symmetrically towards a tubular cavity. In it, xenon, sixty-five times denser than hydrogen, enters through holes in the anode, is ionized by electrons moving radially in a near axial magnetic field and accelerated by 300 volts. The Hall effect of 1879 and Fleming's left-hand rule are mentioned in this mechanism. The xenon ions pick up stray electrons, giving an electrically neutral jet shooting out at tens of kilometres per second, and a reaction force making a highly efficient solar-powered rocket needing no chemical energy. Solar panels 10 metres long supplied 1.5 kW.

Timetable:

27 Sept 2003: Launch from Kourou to geocentric orbit, then thirteen months with the 7 gram thrust operated for one third to a half of each of hundreds of orbits, swinging the craft to greater heights, see *Sketch 1*.



July 16, 2004: A 2-hour X-class solar flare occurred. It was proved that the fluorescence of Earth's atmospheric argon (oxygen and nitrogen do not show up), correlated with the solar flares.

2 Nov 2004: Last perigee.

11 Nov 2004: Passed through Lagrange point L1.

15 Nov 2004: First periselene (lunar nearest point, also called 'perilune'). Thirteen months of diminishing orbits, using solar electric propulsion as a brake.

Mid-November 2004: arrived at the Moon.

Mid-January 2005: the Sun makes M and X-class flares, 3 weeks of observations during commissioning.

Feb-March 2005: polar elliptical orbit 300 km to 3000 km above surface, period five hours.

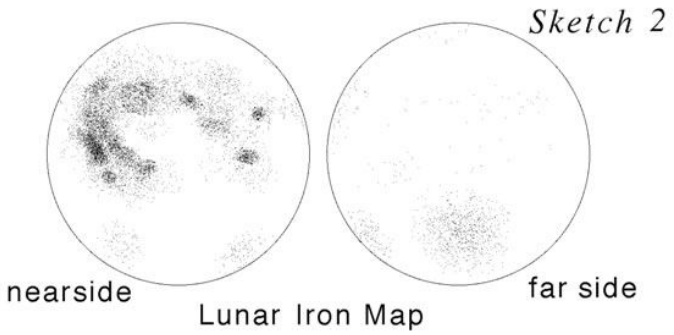
27 July 2005: South Pole Aitken Basin studied.

November 2005: seven C and M-class solar flares, southern highlands of the lunar nearside observed, including Apollo 12 landing site - plus many months more of observations.

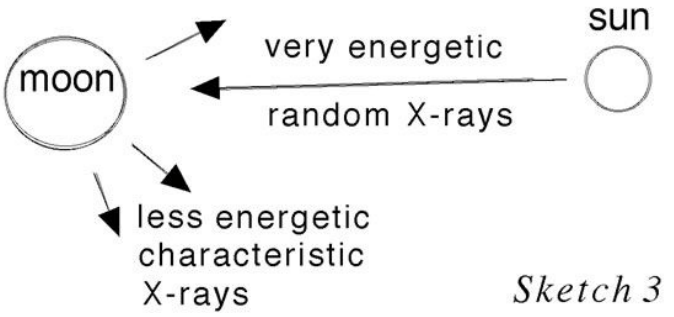
3 Sept 2006: Impact experiment, crashes into the Moon at 2 km/sec.

The Moon is either black or white, but what is it made of? 380 kg of Moon rocks were collected during Apollo missions, but it turns out that the astronauts visited specialized places (in the anomalous Procellarum basin, reprocessed by a massive impact) - a bit like aliens arriving on Earth, selecting a flat landing site in the Sahara and

setting off home with samples of sand. Apollo missions were near the lunar equator and the Clementine iron map of 1994, *Sketch 2* (only approximate), indicated that the Apollo samples relate to the last big object to hit the Moon. More data is needed. The difficulties of analysis were demonstrated with a piece of concrete - handling it you could analyze it with test-tube chemistry but place it 10 metres away, and it's not so easy. Dealing with the Moon at a range of 60 miles, top to bottom and side to side, is a bigger problem. However a 'magic torch' (emitting uv) caused the concrete to glow various colours (the concrete contained fluorescent patches - a great demo for kids!) indicating how substances can be analyzed at a distance.

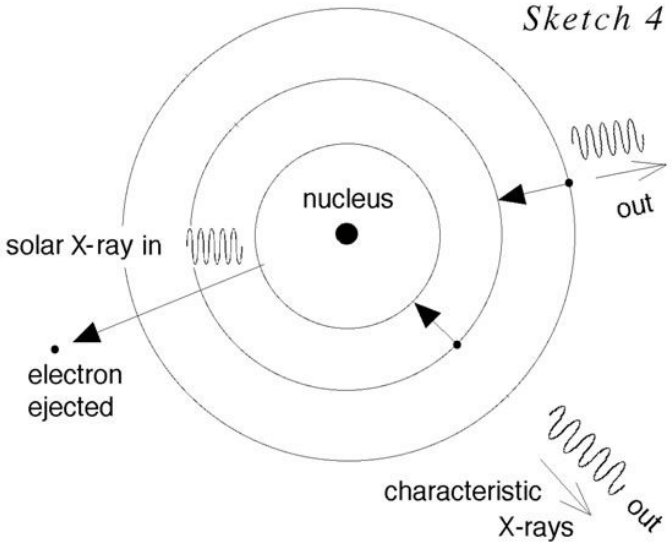


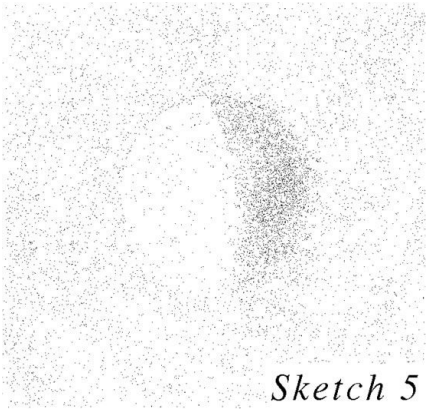
X-ray spectrometry: the solar system behaves likewise, *Sketch 3,* the Sun is the 'magic torch' emitting X-rays causing elements on the Moon to fluoresce and emit their own diagnostic X-rays.



The lecturer likes to treat X-rays classically, nevertheless illustrating the quantum electronic structure of magnesium. ('electronic' is the adjective from 'electron' - do not think of atoms as made of components connected by wires!) The atom of every element has a fixed number of protons in the nucleus (the atomic number), and an equal number of electrons around it in the neutral atom. Bohr's atomic theory places the electrons in permitted orbital shells, see simplified *Sketch 4*, the outermost ones determine how an element behaves chemically. But if a random solar X-ray of enough energy ejects an inner electron, outer electrons fall inwards in discreet jumps, from shell to shell, emitting X-rays of smaller but particular energies, especially during strong solar flares. These can be detected to identify elements. The trick lies in:-

1. measuring the energies of the received X-ray quanta with enough resolution to detect the elements separately, such as the rock forming elements: Mg (1.25 keV), Al (1.49 keV), Si (1.74 keV) and at higher energies: Ca (3.69 keV), Ti (4.7 keV), and Fe (6.4 keV).
   The figures in brackets are the energies of the major fluorescent emissions in kilo-electron-volts. (Minerals give superimposed spectra in proportion to the elements they contain.)
2. in collimating the X-rays to give an angular field of view, so that the composition of the Moon can be mapped, including ratio-between-elements maps, like Mg-to-Fe.
3. in measuring the strength of the 'input' radiation from the Sun to achieve absolute calibration using the Finnish X-ray solar monitor (XSM) part of the SMART-1 scientific package.

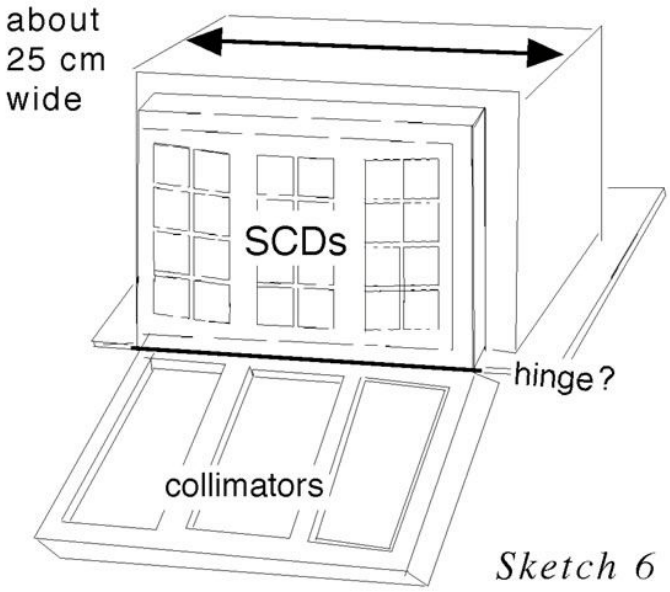




Rosat (1990-99): A lot of experience and data has already been obtained observing X-rays with energies up to 0.21 keV, doing an all-sky survey of 150,000 objects, looking at supernovae remnants, finding comets emit X-rays, and generally opening the X-ray window on the Universe. X-rays have much potential. *Sketch 5* is the X-ray fluorescing Moon, occulting the background and glowing on the 'sunny' right-hand side.

The compact imaging spectrometer. A new generation lightweight camera was needed with no active cooling,

covering X-ray energies up to 10 keV to detect a bigger range of elements, needing good resolution and enough detector area to gather plenty of signal, allowing collimation and mapping. The camera built at RAL "about the size of a toaster" had three facets of eight SCD sensors each, *Sketch 6*, with outer facets aimed ten degrees outwards off-centre. Collimators (possibly honeycomb tubular) made of copper-gold with rough walls, absorb sufficiently off-axis incident X-rays, thus defining the field of view of 8 degrees - that's a 42 km lunar patch observed from a height of 300 km. The collimators, plus other elemental filters to distinguish between X-rays from Mg, Al and Si , assemble in front of the SCDs already protected by thin filters from light and protons. The system was calibrated using X-rays from the Crab nebula. High resistivity silicon in the SCD devices, using deep channels, gives radiation robustness.

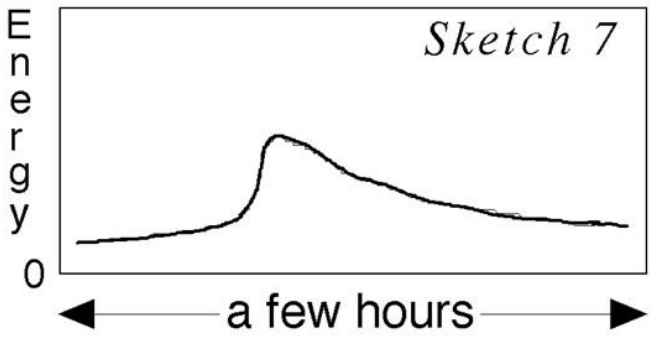


Sketch 6

Solar flares, detected with the XSM, are categorized according to intensity, A-class being weakest, followed by B, C, M, and X-class can be strong enough to blow power stations, each category is subdivided by nine numbers. What the Moon emits depends on what it receives, so the XSM records the energy of the X-rays versus time, they can suddenly peak and decay within a few hours, *Sketch 7*.

What was detected on the Moon?

Clementine maps suggest the Russian missions Luna 20 and 24 in the 1970s which gave sample data for the Sea of Crises basalts and highlands material, are representative, tallying with the D-CIXS observations of more Fe associated with black mare basalts, and more Ca and Al associated with the whiter highlands. One facet of D-CIXS traversed the Apollo 12 landing site. Data has been obtained for several rayed craters such as Tycho, and near to the Tranquillitatis Apollo 11 landing site. A swath of data on the far side of the Moon, including entry into the South-Pole Aitken basin, will help to decide if the floor is made of exposed upper mantle, or has been volcanically resurfaced. Solving this will contribute to understanding solar system history. There are composition problems with the theory of a Mars-sized planet colliding with the Earth, forming the Moon. D-CIXS has made the first unambiguous remote sensing of calcium on the Moon. One and a half years of observing will improve estimates of bulk lunar composition, tightening constraints on lunar origin models.



Sketch 7

Finale: SMART-1 was sent into a glancing one-degree crash into a white mountain in the Lake of Excellence, all amateurs in the Pacific region were alerted. Viewed from Hawaii, the impact was very faint, making a plume visible for 130 seconds, leaving a 10 metre hole. In this area, two lunar maps disagree by some five miles, the predicted crash site occurred approximately half-way between the predicted positions on the two maps.

Future: As a precursor to the exploitation of the Moon as a base, information on minerals, on polar areas in permanent sunlight and darkness, is vital. The lecturer reminded us that lunar rocks (see data on Luna missions) contain more than 40 per cent oxygen. ESA's first mission to the Moon was a great success, demonstrating the use of new lightweight robust technology using X-ray flares from the sun for elemental analysis. The camera, which can take X-ray snapshots quick enough not to be fogged by spacecraft motion, is the only one in the world which can see Mg, Al and Si separately, already helping in the design of the Indian mission Chandrayaan-1 to the Moon. Much new technology has been validated for future missions, many European research centres have successfully worked together and the contribution to solar system science will continue as the data is further evaluated. All this was achieved despite the period 2004-6 turning out not to have been ideal.

Everyone was bowled over by this very entertaining, fact-packed lecture and thanks were expressed in the usual way, followed by considerable one-to-one discussions.

To research this lecture, enter 'google scholar' into 'google' and go to 'advanced search' to find articles with 'D-CIXS' in the title and papers by the lecturer.

Dr.Guy Moore

Essays from a beginner

On porches

While removing black slime from the plughole of the bath this morning, I meditated upon porches (my exciting menage - so unlike the home life of our own dear Queen).

I will never have an observatory; I can't afford it, and there is nowhere to put it. The garage is no substitute - it's full of glazes and clay and my kiln. Firing releases chemically bound water from clay, plus a cocktail of dubious gases and, occasionally, smoke - it's fairly toxic to humans, rots kiln elements, and goodness knows what it would do to telescopes.

But we do have a porch, with a sliding glass door in front. It contains a light bulb and a shoe rack and, when I haven't been shouting recently, about twenty-seven pairs of shoes. It is six feet wide and three foot six deep. (Digression: I've often mocked the deathless lines in Wordsworth's poem, 'The Thorn', in which he celebrates "a little muddy pond" -

"I've measured it from side to side:
'Tis three feet long, and two feet wide."

How odd to suddenly resemble Wordsworth ;)

To look at, the porch is utterly insignificant. But all along, it was hiding secret virtues: it is not in direct view from the front gate; it has a modest lock; it faces south; and there is a small apron of paving in front of it.

I can put both telescope tubes in the porch to cool for an hour as it gets dark, while I get on with domestic stuff. I can lock my children out so they can't trample over my kit (what's wrong with using the back door, anyway?) There is just room to set up telescopes in front of the porch, on one of the better sightlines to the sky, but again, somewhat hidden from the road. The top of the shoe rack lets me lay out eyepieces, torches, compass, glasses etc. so I can put a hand on the right thing in the dark. Once the telescopes are out, I can sit in the porch, sheltered and drinking tea, and still keep my night sight, until I am warm enough to observe some more. If it clouds over or begins to rain, the sensitive equipment can be inside in minutes. And when I go to bed, the whole 5" setup can be left assembled in the porch, cold and secure, and, if I should happen to wake at 4 a.m. and look out to a great sky, I can be out in the time it takes to put on thermals.

I chose the house twelve years ago, focusing as one does on bedrooms, enough toilets to prevent civil war breaking out, and the age of the boiler. How little did I know.

Rebecca Mitchelmore

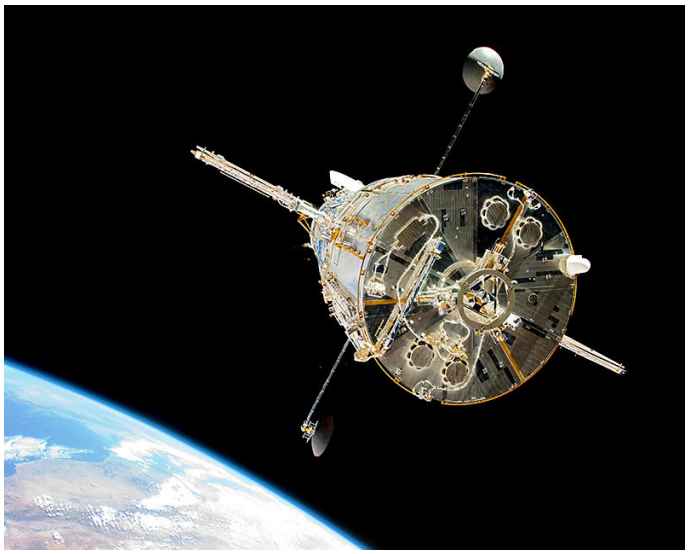
Trivia

Saturn's moon Titan has hundreds of times more oil and natural gas than all the known reserves on Earth.

Venus and Uranus are the only planets that rotate clockwise (retrograde rotation.)

It would take more than 150 years to drive a car to the sun. (*I used to have a car like that! Ed*)

HubbleSite Reference Desk



Extracted from the Frequently Asked Questions on the Hubblesite Reference Desk at ***http://hubblesite.org/reference_desk/faq/***

Can Hubble take pictures of Earth?

The surface of the Earth is whizzing by as Hubble orbits, and the pointing system, designed to track the distant stars, cannot track an object on the Earth. The shortest exposure time on any of the Hubble instruments is 0.1 seconds, and in this time Hubble moves about 700 meters, or almost half a mile. So a picture Hubble took of Earth would be all streaks.

To find images of Earth from other sources in space go to The Gateway to Astronaut Photography of the Earth: ***http://eol.jsc.nasa.gov/sseop/***

What are constellations?

The entire sky (half of which is above the horizon at any moment) is divided into 88 constellations. The constellations and their borders have nothing to do with science. The stars in a particular constellation are not necessarily related to one another, nor are they even near each other in space. The constellations recognized by astronomers in the northern sky come from ancient Greek and Roman mythological star-pictures. The southern constellations were named by the first Western mariners to explore southern waters. Other cultures have their own constellation patterns, which do not necessarily match "classical" ones. Constellations cover much too broad an area of space to be imaged by the Hubble Space Telescope (HST), and there really is no reason for HST to photograph constellation patterns even if it could be done.

Can I get a star named after someone I know?

The International Astronomical Union is the only sanctioned body that has the authority to name celestial bodies. Any names that you or any commercial enterprise should care to attach to a celestial body would not be recognized, nor would they be used by the astronomical community in technical journals, etc. Naming conventions for both solar system and deep space objects are strictly adhered to.

For more information on this subject, you can go to the International Astronomical Union Web site at: ***http://www.iau.org/public_press/themes/buying_star_names/***

Are the colors in Hubble images real?

There are no "natural color" cameras aboard the Hubble and never have been. The optical cameras on board have all been digital CCD cameras, which take images as grayscale pixels.

Sometimes the color is as natural as possible. However, the color given to the images is not just "artistic embellishment." The images are, indeed, downloaded as black and white, and color is added for a number of different reasons – for example, to show the dispersion detail of chemical elements and highlight features so subdued that the human eye cannot see them.

Galaxy names are identified by a group of letters and numbers. What do they stand for?

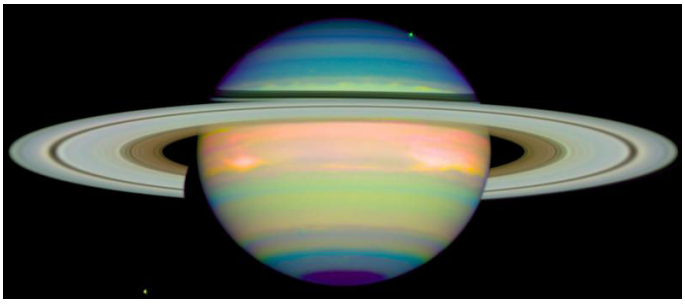
The letters indicate the catalog listing of the galaxies. Galaxies are listed in several different catalogs. The most common catalog is NGC, which stands for New General Catalog. Other catalogs include M (Messier), ESO (European Southern Observatory), IRAS (Infrared Astronomical Satellite), Mrk (Markarian), and UGC (Uppsala General Catalog).

The numbers following the letters, such as Mrk 917 or NGC1433, indicate a galaxy's entry in the catalog and are often related to the galaxy's relative position in the sky.

Sometimes a galaxy appears in more than one catalog and can have more than one name.

Can I have Hubble images or news e-mailed to me?

Yes. Please join our ***e-mail list***. You can also stay connected with Hubble through our ***Facebook page*** or ***YouTube channel***, our find us on ***Twitter @HubbleTelescope*** and ***@HubbleDaily.***



THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

Black Hole Came From Shredded Galaxy

First intermediate-mass black hole ever discovered

Astronomers using NASA's Hubble Space Telescope have found a cluster of young, blue stars encircling the first intermediate-mass black hole ever discovered. The presence of the star cluster suggests that the black hole was once at the core of a now-disintegrated dwarf galaxy. The discovery of the black hole and the star cluster has important implications for understanding the evolution of supermassive black holes and galaxies.

"For the first time, we have evidence on the environment, and thus the origin, of this middle-weight black hole," said Mathieu Servillat, who worked at the Harvard-Smithsonian Center for Astrophysics when this research was conducted.

Astronomers know how massive stars collapse to form stellar-mass black holes but it's not clear how supermassive black holes, which weigh billions of times the mass of our sun, form in the cores of galaxies. One idea is that supermassive black holes may build up through the merger of smaller, intermediate-mass black holes weighing hundreds to thousands of suns.

Lead author Sean Farrell, of the Sydney Institute for Astronomy in Australia, discovered this unusual black hole in 2009 using the European Space Agency's XMM-Newton X-ray space telescope. Known as HLX-1 (Hyper-Luminous X-ray source 1), the black hole weighs in at 20,000 solar masses and lies towards the edge of the galaxy ESO 243-49, which is 290 million light-years from Earth.

http://news.harvard.edu/gazette/story/2012/02/black-hole-came-from-shredded-galaxy/

Planck All-Sky Images Show Cold Gas and Strange Haze in Milky Way Galaxy

ScienceDaily (Feb. 13, 2012) — New images from the Planck mission show previously undiscovered islands of star formation and a mysterious haze of microwave emissions in our Milky Way galaxy. The views give scientists new treasures to mine and take them closer to understanding the secrets of our galaxy.

Planck is a European Space Agency mission with significant NASA participation.

"The images reveal two exciting aspects of the galaxy in which we live," said Planck scientist Krzysztof M. Gorski from NASA's Jet Propulsion Laboratory in Pasadena, Calif., and Warsaw University Observatory in Poland. "They show a haze around the center of the galaxy, and cold gas where we never saw it before."

The new images show the entire sky, dominated by the murky band of our Milky Way galaxy. One of them shows the unexplained haze of microwave light previously hinted at in measurements by NASA's Wilkinson Microwave Anisotropy Probe (WMAP).

"The haze comes from the region surrounding the center of our galaxy and looks like a form of light energy produced when electrons accelerate through magnetic fields," said Davide Pietrobon, another JPL Planck scientist.

"We're puzzled though, because this haze is brighter at shorter wavelengths than similar light emitted elsewhere in the galaxy," added Gorski.

http://www.sciencedaily.com/releases/2012/02/120213143016.htm

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 welcomes letters, articles or pictures related to all aspects of astronomy. Contributions to the Editor at the email or postal address on the front page.

"Shall I refuse my dinner because I do not fully understand the process of digestion?"

Oliver Heaviside (1850-1925)

Quotations

"To define it rudely but not inaptly, engineering is the art of doing that well with one dollar which any bungler can do with two after a fashion"

Arthur M. Wellington

The Economic Theory of Railway Location

"Chance favors the prepared mind"

Louis Pasteur