2002

NEXT MEETING

THURSDAY, 18th June 2015

THE ASTRONOMICAL SOCIETY OF HARINGEY

VOLUME 43 : ISSUE 8 : June 2015

www.ashastro.co.uk

SOCIETY NEWS

MEETING VENUE
Music Block, Ashmole School, Southgate, London N14 5RJ.

The day for meetings is usually the third Thursday of each month. The exceptions are August, when we do not hold a meeting, and this now currently applies to the July and December meetings, though that may alter in the future.
However, in case of changes it is always advisable to double-check the dates below.
Doors open - 7.30pm : Main speaker - 8.00pm : Finish - 10.00pm sharp!

For more on this, and general meeting information, also check the website: www.ashastro.co.uk. Latest update: June 2015.

OBSERVING EVENINGS

Regarding any changes to Observing Evening meetings, this is a continuing message to let Observing Officers Jim Webb or Alister Innes know your mobile phone number, and if not already on the list, your email address; emailing to observing@ashastro.co.uk reaches both of them. The Facebook page will now also be used.

2015

June 18th : Mat Irvine : "Once Upon A Time" or "Exploring The House On The Rock"

June 29th : Observing Evening : Observing Site, Barnet.
This is one day before the closest conjunction of Venus and Jupiter, so we hope for good viewing. Site details are on the website, but for those without Internet access, the address is : Old Elizabethans Memorial Playing Fields, Gypsy Corner, Mays Lane (Barnet Gate Lane end), Barnet, EN5 2AG. There is also a map in the Dec14/Jan15 2002 (Vol 43, issue 2-3)

July and August : No meetings these months - but there is a special event
July 28th (Tuesday) : Star Gazing Picnic, Billericay CM11 2UD - see SOCIETY NEWS for more details

September 17th : Jerry Stone : "The Race into Space"
October 8th : *Michael Franks "Who Owns the Moon?",* including AGM
November 19th : *Observing Evening*
December : No meeting this month

COVER:
You see a lot of these urns guarded by fantastical creatures, scattered around the grounds surrounding The House On The Rock. Exactly why? Well you'll have to come along to the June meeting!

Photo: Mat

SOCIETY NEWS

For up-to-date information, we are now using that 'necessary evil' - Facebook. Note as this is an Open Group you do not have to be a member of Facebook to read posts and messages, you just need some form of Internet access. Go to : www.facebook.com/groups/ASHastro/

However if you want to 'interact' (ie post messages), you have firstly to join Facebook, then on the ASH Facebook page, ask to join our Group, and you will get 'signed up'. So far we don't have that many members - and some of those aren't even members of the Society, though no problem with that. However a few more would be good!

MEETING ROOM

We currently meet on the first floor of the Main Music Block at the School. This is the two-storey building, next to our original room, the original Music Room. This is marked with the X in the photo on left, (and although it is demolished, the site is currently being redeveloped with a new structure). We hope a first floor will be suitable for all, as there isn't a lift. If anyone feels they will have difficulty, please let the Chairman know. Contact details on back page.

IMPORTANT MEMBERSHIP ANNOUNCEMENT

Since our previous Treasurer Gordon Harding sadly passed away February 2013, and until now, we've been unable to get hold of the Society's membership and payment records.

However I can now inform all members that as of Thursday 11th June the Society's bank has released all the required details. We can now see all the standing orders and other payments which have been reaching the Society.

Any members who have received a renewal notice, despite already renewing by standing order can safely disregard the renewal notice - we now know you've renewed your memberships. Thank you for bearing with us.

Any members who want to start renewing by internet banking or standing order should contact me as the Society's new Treasurer, (contact details are on the back of the magazine), and I'll provide you with instructions and bank details.

Kyri Voskou - ASH Treasurer

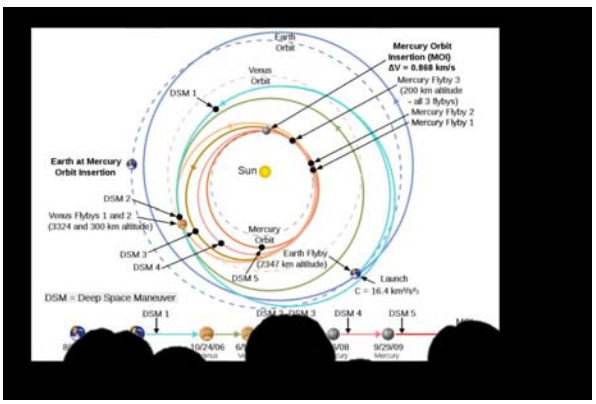
MEETING PREVIEW
18th June : Mat Irvine : "Once Upon a Time" or Exploring

In deepest Wisconsin there is a structure that almost defies description, although the name by which it is known 'The House on the Rock' does, I suppose, get close - as it is - in part - a House, and it is - in part - On a Rock'…

But there is far more to it than that! Here are few glimpses of what to expect - and true to the nature of The House on the Rock, they are chaotically scattered amongst these words - much in the same way they are scattered throughout The House on the Rock.

Spot the full size Giant Squid; the Infinity Room; the World's Largest Carousel; a full size automated orchestra; the Moon Gate; one of the over 200(!) dolls houses plus a telescope to decorate the window of a jewellers?? Come along to the next meeting as your Editor takes you on the trip of all trips…

MEETING REVIEW
21st May : Jim Webb : "MESSENGER R.I.P.



Last meeting saw an excellent slide presentation by Jim, describing the Messenger spacecraft mission to Mercury and the final moments of the craft's 'smash-down' on the innermost planet's surface. He covered topics such as how to manoeuvre into planetary orbit, and then get captured, and in a more general sense some of the problems involved of spacecraft getting around the Solar System. We concluded the very interesting evening with a short viewing session.

Kyri Voskou

28th July : The Society is organising a Star Gazing Picnic, Tuesday 28th July at Barleylands Craft Village and Farm Centre, Barleylands Road, Billericay CM11 2UD, between 7.00pm and 10.30 pm as part of the Essex Mega Geocaching Event.
The provisional programme is 19-20.00 Picnic Time: 20:00 to 21:00 Presentations and Rocket Building; 21:00 to 23.30 Star Gazing.

CHAIRMAN'S QUARTERS

For all the S.F. fans out there, 'Star Trek TOS', (it actually stands for **T**he **O**riginal **S**eries – not anything else!) is being replayed on the CBS Action TV Channel (available on Freeview) in digitally a remastered form to widescreen format. It's great to see the old series again – with pristine but wobbly sets and some very good special effects.

Featured in the series are the warp drive, phasers, the transporter and the 'food synthesizer'. The latter becomes the replicator in Star Trek TNG (**T**he **N**ext **G**eneration), also on CBS Action. The use of the replicator reminded me of an article I had read, a few years ago, about a new technology that is an embryonic form of this gadget.

NASA has developed a technology that is similar to 3D printers but could enable Lunar colonists to carry out on-site manufacturing on the Moon, or allow future astronauts to create critical spare parts during the long trip to Mars. The method is called **E**lectron **B**eam **F**ree**F**orm **F**abrication (or EBF3, don't you just love acronyms!). It uses an electron beam to melt metals and build objects layer by layer. Such an approach already promises to cut manufacturing costs for the aerospace industry, and could pioneer the development of new materials. It has also appealed to astronauts on the International Space Station by raising the possibility of designing new tools or objects.

The EBF3 requires a few crucial components: power for its electron beam, a vacuum environment (perfect in outer space), and a source of metals. While the Star Trek's replicator works without a supply of subatomic particles, reality is a different story. For EBF3, metal wires are continually fed into the tip of an electron beam. The beam then melts the wires and applies them carefully on top of a rotating plate to build an object up slowly, layer by layer. By comparison 3D printers use an easily melted plastic, but the EBF3 has several advantages. First, its electron beam requires far less power than 3D printers and produces less radiation compared to more powerful beams. Its dual wire feeders also allow scientists to create mixes of new materials that vary in strength or other properties within the same solid piece. The composition of the deposit can be changed 'on the fly'. By adding alloys of different chemistries and then adjusting the speed that you feed the wires changes the chemistry of the parts built. This flexibility of manufacturing could also embed fibre optic cables inside a solid piece of metal!

Major aerospace manufacturers have already begun running thousands of strength tests with the EBF3 to see whether it can produce certified parts for engines and airframes. Tests have also been carried out in 'zero-g' on NASA's C-9 aircraft. The results have encouraged researchers to plan sending the device to the ISS, in the near future, so that space trials can commence. Going into space means that EBF3 can take advantage of the vacuum of space, and sit on an outside rack, ready for test runs to see what can actually be manufactured in weightless conditions.

The hope is that beyond low-Earth orbit, this new manufacturing technology could enable space colonists to use local metal resources mined from the Moon, Mars or even in the Asteroid Belt. Simulations have shown that spaceships would require many spare parts for the long journey to Mars, because different parts had failed during each simulation. Taking a large stock of spare parts on such a voyage will require substantially more fuel, which suggests a Mars mission could simply take along some metal feedstock and an EBF3. If you have a broken part, you could even recycle it into feedstock during the long journey. At the destination one can mine new material for required parts. The short term solution is that you bring along the material you need, but you don't need to bring all the parts that you need.

The EBF3 'replicator' probably won't churn out spare parts immediately, if it reaches the ISS. However, astronauts who have seen it in action have expressed excitement over the idea of making their own tools, 'Star Trek-style'.

See you at the meeting

JIM

NEWS - compiled by Kyri Voskou

Australian Space Scientists Baffled by Kitchen Microwaves

After 17 years of fruitlessly searching the heavens, Australian scientists have discovered the source of mysterious radio signals hitting a telescope - it turns out the source was their own kitchen microwave oven.

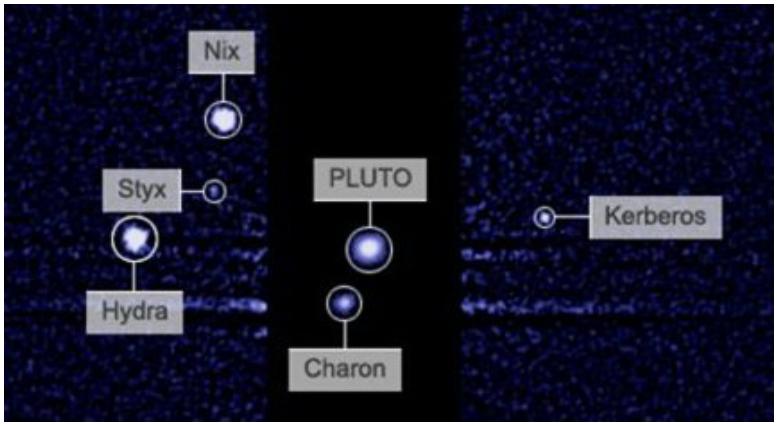
PhD student Emily Petroff made the discovery at the Parkes telescope, after noticing that the signals were only received during business hours.

The rays, known as 'perytons', were emitted when impatient staff opened the microwave door prematurely. The revelation came to light after Ms Petroff published her paper, "Identifying the Source of Perytons at the Parkes Radio Telescope. "She concluded that, "Tests revealed that peryton events can be generated under the right set of circumstances with on-site microwave ovens....and can account for bimodal DM distribution of the known perytons."

Or in layman's terms, as Ms Petroff told ABC News, "It turns out that you can generate these particular local signals by opening the door of the microwave to stop the microwave, and that produces these weird bursts that we're seeing at Parkes."

"It was kind of a surprise to all of us," she added.

Hubble Studies Pluto's Wobbly Moons



The Hubble Space Telescope has revealed fascinating new details about Pluto's four smaller moons.

At a distance of five billion km, the Telescope only sees the satellites as faint pinpricks of light, and yet it has been able to discern information on their size, colour, and rotational and orbital characteristics.

Hubble finds the little objects to be somewhat chaotic in their behaviour. They are very likely wobbling end over end as they move through their orbits. "If you can imagine what it would be like to live on [these moons], you would literally not know where the Sun was coming up tomorrow," said Mark Showalter from the SETI Institute in the USA. "In fact, if you had real estate on the north pole, you might discover one day you're on the south pole."
The assessment will be verified on 14th July when the moons are passed by NASA's New Horizons spacecraft. It will gather a mass of data on the dwarf planet and its largest moon, Charon, but in addition should also get a decent view of the smaller bodies - Styx, Nix, Kerberos and Hydra.

Nix and Hydra are the bigger of that quartet at about 50km in their longest dimension. These two are determined to be quite bright, akin to dirty snowballs. The surprise is Kerberos which orbits between them. It is really dark, not dissimilar to a charcoal briquette, which is strange. Theory holds that all the moons, including Charon, were formed from the debris that resulted when the early Pluto was struck by an object of near comparable size. "And if they all formed together, they all formed out of the same stuff. It is extremely hard to understand how one of them is a charcoal briquette and it's orbiting between two snowballs," commented study co-author Douglas Hamilton, from the University of Maryland.

New Horizons should provide some answers, along with a whole new series of questions.

Magellan Super-Scope Gets Green Light for Construction

Construction of the Giant Magellan Telescope has been given the go-ahead.

One of the largest optical observing systems ever conceived, the GMT will sit atop Cerro Las Campanas in Chile. With its 24.5m-diameter primary mirror system, astronomers should be able to see the first objects to emit light in the Universe, investigate dark energy and dark matter, and identify potentially habitable planets.

The GMT's international partners have all approved the $500m assembly phase. The mountain ridge of Las Campanas itself, which is in the Atacama Desert, is ready to receive the observatory's components. Two-and-a-half-thousand cubic metres of rock have been removed from its southern end to create a flat surface the size of four football fields. A road is in place to take all the elements to the summit when they become available. Chief among these, of course, will be the seven 8.4m mirrors that comprise the GMT's primary reflecting surface. Three are already at various stages of production, one is actually finished; the other four will begin their manufacture very soon. Use of adaptive optics, together with its great aperture size, should enable the GMT to capture images that are 10 times sharper than those from the Hubble Space Telescope.

"We expect in late 2021, possibly in early 2022, we will put three or four primary mirrors in the telescope, start doing some engineering, start doing some astronomy, and by that point we will have the largest (optical) telescope on the planet by a good margin," said GMT director, Pat McCarthy. "We'll then slowly integrate the rest of the mirrors as they come along so that by 2024 or 2025, we should have all seven mirrors in the telescope."

LHC Restart Sees First collisions

Recently the Large Hadron Collider smashed protons together for the first time since early 2013.

Proton beams circled the LHC and collided at an energy of 450 gigaelectronvolts (GeV) per beam with a second run of the LHC planned to stage collisions at 7,000 GeV per beam.

According to the current schedule, collisions will first take place at those new, historic energies in the week commencing June 1st. Even those will only be used for calibration; 'physics collisions', with usable results will start some time after that.

"These are the first colliding beams in the machine for over two years, and it brings home that physics collisions are close," said Prof Tara Shears from the University of Liverpool, who works on LHCb - one of four big experiments, spaced around the LHC's ring, where the collisions occur.

She said these early collisions are very valuable, even though they are only happening at injection energy, which means the LHC itself isn't adding any acceleration to the protons. They simply circulate and collide with the energy already delivered by the accelerators that feed protons into the main ring.

This early data is used to fine-tune their experiments. "This time, we used the data to make sure sub-detectors are time-aligned with each other," she explained.

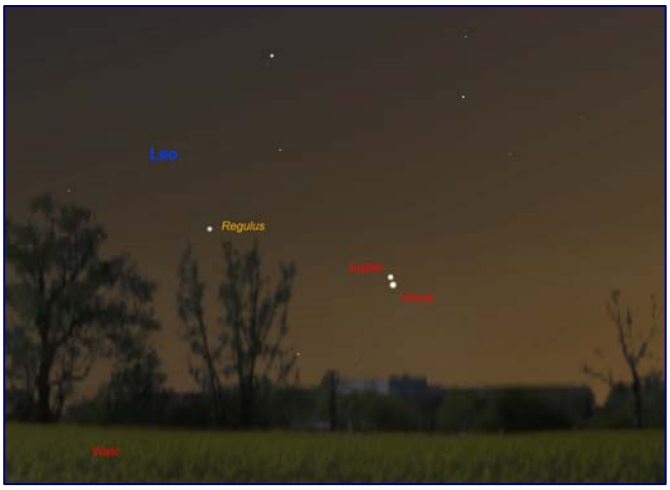
The LHC was the scene for the famous discovery of the Higgs boson in 2012, towards the end of the first run. In its second tilt, researchers hope that the almost doubled energy levels will yield new insights beyond the Standard Model of particle physics.

THE NIGHT SKY : THE PLANETS : June - July 2015

Besides currently being the two brightest objects in the night sky, (apart from the Moon), Jupiter and Venus are rapidly approaching. They will be close on 20th June, with the crescent Moon, and over the next 10 days, even closer - closest approach is 30th June/1st July

MERCURY : Was at inferior conjunction, between Earth and the Sun, on 30th May, so now in the pre-dawn sky, but not well-placed for viewing. The planet will reach greatest elongation west on the 24th June, around magnitude +0.5. Possibly visible with binoculars low above the east-northeast horizon around dawn, though the usual warning to be very careful with the Sun potentially rising if you are using any optical device! Brightening - slightly - throughout the month, to around -0.1. Last day Moon, before new, close on 15th June.

VENUS : Still dominant in the western skies after sunset, shining at an increased magnitude, -4.6. Started June in Gemini and moved into Cancer, when it was at greatest elongation on June 6th, 45.5 degrees away from the Sun. The angular size increases from 22 to 32 arc seconds during June and the planet becomes an increasingly narrow crescent. There is a close conjunction with Jupiter on the 30th/1st July. Moon close on 20th/21st June,



EARTH : 21st June - Summer Solstice

MARS : Just at superior conjunction, passing behind the Sun on 14th June and so not visible at this time.

JUPITER : Past its glorious best from earlier in the year, but still prominently standing out in the south to south-west at nightfall, rivalled only by Venus to its right. Its brightness falls slightly from magnitude -1.9 to -1.8 whilst its angular size drops from 35 to 32.5 arc seconds. Jupiter started the month in Cancer but moved into Leo on the 9th of June in its eastwards progress towards the star Regulus. A small telescope should still pick out the equatorial bands and the four Galilean moons. Moon close on 20th/21st and in conjunction with Venus on the 30th/1st.

SATURN : In late May the planet reached opposition, when it was due south at 01.00 BST/midnight UT. The planet will consequently now be visible for most of the hours of darkness, so seen in the southeast at dusk, and not setting until the following dawn. It is moving slowly in retrograde motion in the eastern part of Libra, close to the fan of three stars that makes up the head of Scorpius and is only three degrees away from the double star Beta Scorpii. Still a good time for viewing the rings, tiled at some 24 degrees, almost as open as they can be when viewed from Earth. Moon to the north on 29th June.

URANUS : Moon to the north on 11th June and 9th July .
NEPTUNE : The planet is stationary on 12th June. Moon close on 6th July
PLUTO : The Space-probe New Horizons reaches what was the 'outermost planet' on 14th July

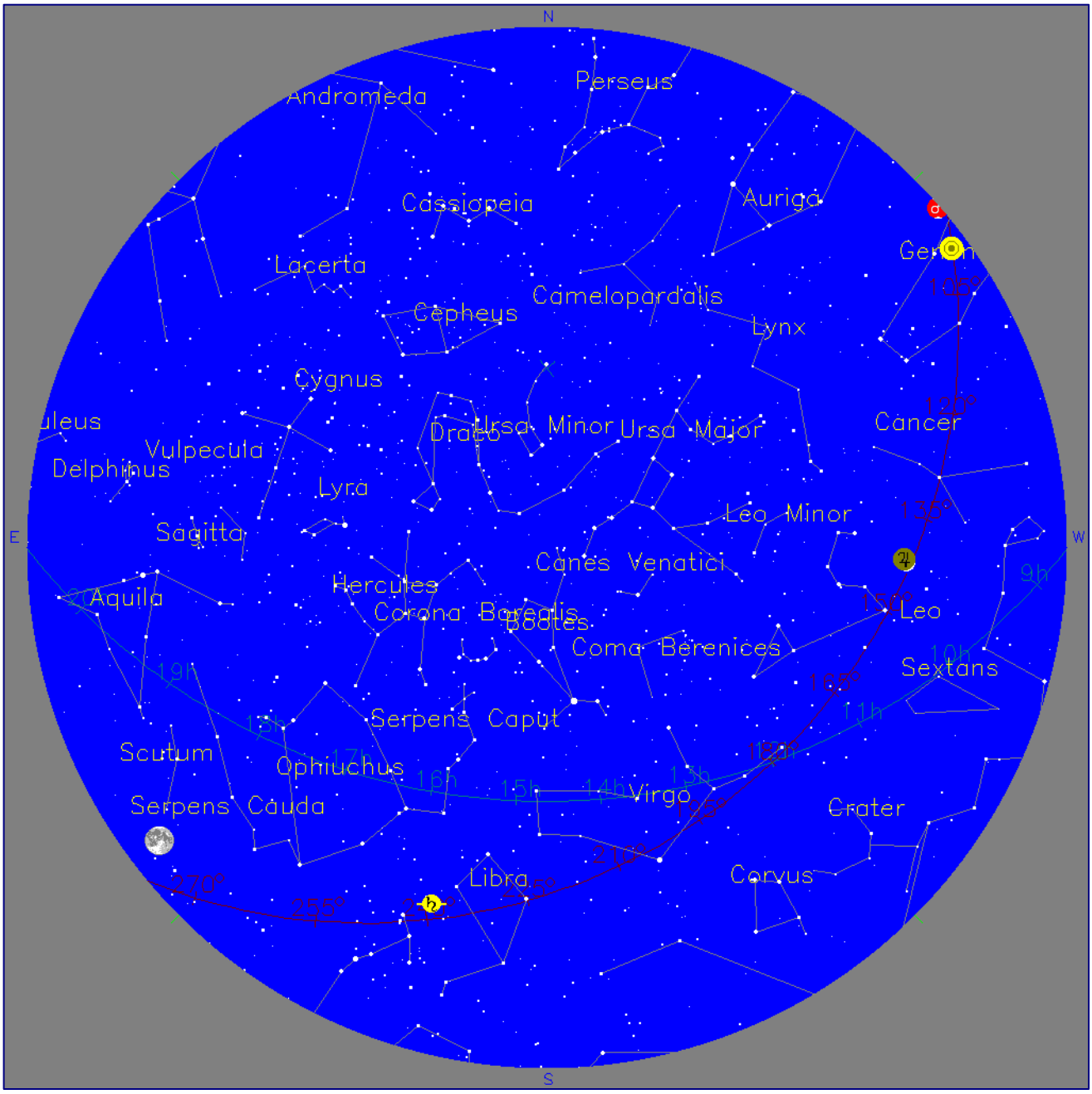
THE MOON

New 16th June First 24th Full 2nd July Last 8th New 16th

THE NIGHT SKY : MAP

1st July 2015 : 20.00hrs GMT- UTC / 21.00hrs BST

With the close conjunction of Jupiter and Venus, here Venus is hidden directly behind the Jupiter symbol!



KEY	
MERCURY	SATURN
VENUS	URANUS
MARS	NEPTUNE
JUPITER	PLUTO

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TREASURER : Kyriakos Voskou : email treasurer@ashastro.co.uk

MEMBERSHIP SECRETARY: Alister Innes : email memsec@ashastro.co.uk

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GENERAL INFORMATION : info@ashastro.co.uk

OBSERVING INFORMATION : observing@ashastro.co.uk

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