

Wadhurst Astronomical Society Newsletter September 2013

MEETINGS

SOCIETY ASTRO-BARBECUE

During August there is no meeting of the Society but we usually have a barbecue with telescopes present to look at what is in the night sky.

It was with sadness that, for the first time the Astro-barbeque had to be cancelled this year through appalling weather. We waited as late as possible to make the decision, but it became obvious that the rain wasn't going to clear up.

We would like to thank Jim Cooper for arranging for the barbeque to be held in his garden and also to those who were helping to make it the success it has been in the past and must feel very disappointed.

We must be owed to really good evening some time so we look forward to next year.

SEPTEMBER MEETING

Wednesday 18th September 2013 – Stephen Tonkin will be talking about “Binocular Astronomy”. Stephen is a freelance writer and lecturer in astronomy. He has had articles published in the Sky at Night magazine and is a keen amateur astronomer.

Later this year we are hoping to be amazed by the appearance of comet ISON in November and comets are one of the most enjoyable sights using just a pair of binoculars; even a modest pair. So this talk should be a good preparation for this event.

FUTURE MEETINGS

Wednesday 16th October 2013 – James Fradgely FRAS calls his talk “The Birth of the Solar System”

Wednesday 20th November 2013 – Tony Roberts FRAS tells us about “The History of the Telescope up to 1960”

Wednesday 11th December 2013 – (the second Wednesday of this month only) Our Director of Observations, Brian Mills FRAS takes as his theme “The Star of Bethlehem”.

SKY NOTES FOR SEPTEMBER

Planets

Mercury suffered a superior conjunction on August 24th and despite moving east of the Sun, is very poorly placed for observation this month. It lies very low down in the sky and even by month's end is only 4° above the horizon at sunset. The next apparition of Mercury is a morning one in November when the planet will be positioned far more favourably if you are an early riser..

Venus is visible low down in the west just after sunset. Although it sets soon after the Sun, it has the compensation that, at magnitude -4.0, it is very bright and therefore easy to spot when the horizon is free from cloud.



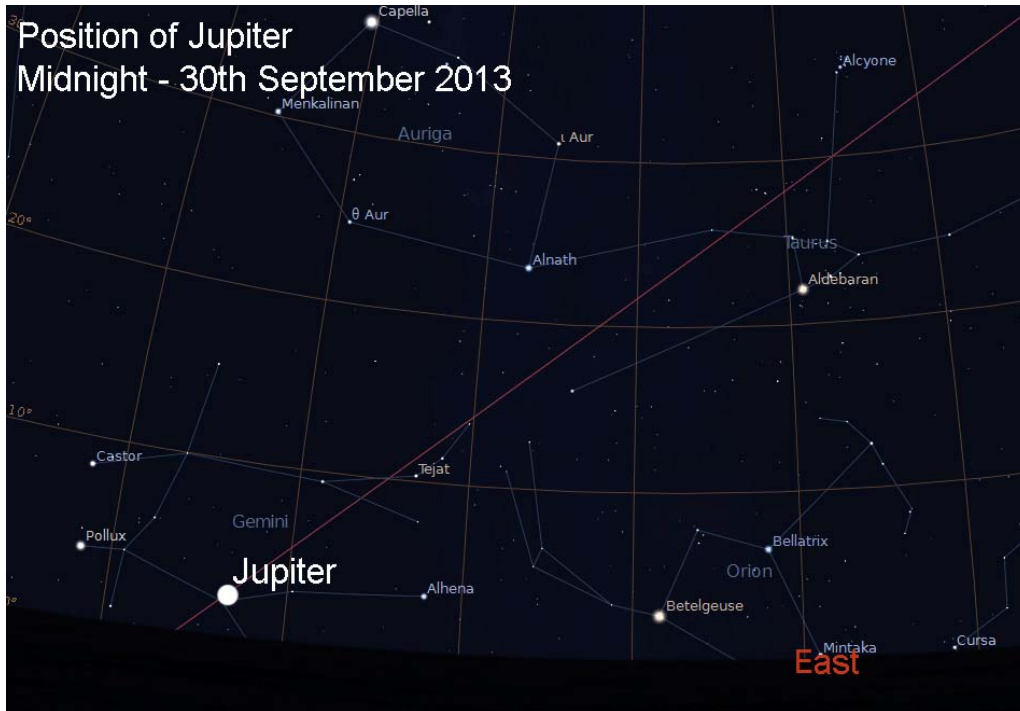
The map shows its position on September 1st with the Sun 6° below the horizon which is the end of civil twilight and the beginning of nautical twilight. The three day old crescent Moon is just south of Venus on the 8th of the month.

Earth

The Earth will reach the Autumnal Equinox on the 22nd of the month, when in general terms we say that day and night are of equal length.

Mars is a morning object rising a little before 03.00 BST in the constellation of Cancer, crossing the border into Leo on the 25th. It is currently at magnitude +1.6 although it will continue to brighten gradually as it approaches opposition in April 2014.

Jupiter is still visible in the morning among the stars of Gemini, although by the end of September it will rise just before midnight making it technically an evening object. It's magnitude is currently -2.1 and increasing as it moves towards opposition on January 5th 2014 when it will reach a maximum brightness of -2.7.



The map shows the planet's position on September 30th at midnight.

Saturn may still be glimpsed low down in the south west after sunset on the Virgo/Libra border at magnitude +0.7. Its position is shown on the "Venus" map above for the first of the month. The presentation of the ring system towards the Earth continues to improve throughout August reaching 18° by the end of the month. To put it another way, the north pole of Saturn is tilted towards us by this amount. The planet draws closer to the Sun as the month progresses, and on the 18th it will be 3.5° north of the much brighter Venus, as shown in the diagram. This equates to roughly seven Moon diameters.



Saturn's largest moon is Titan - a body that contains more than 90% of all the mass in circulation around the planet, including the rings. With a diameter 1½ times that of our own Moon it is the second largest satellite in the Solar System. At an average magnitude of 8.6 it is a relatively easy object in a small telescope or larger binoculars. The best time to look is when Titan is at its furthest east or west of its parent planet. In September this occurs on the 8th and 24th when Titan is at its furthest east, and on the 16th when it is at the western extremity of its orbit.

Lunar Occultations

In the table below I've listed events for stars down to magnitude 7.0 that occur before midnight although there are many others that are either of fainter stars or occur at more unsociable hours. DD = disappearance at the dark limb. The column headed "mm" (millimetres) shows the minimum aperture telescope required for each event. **Times are in BST.**

Please remember that the Society has telescopes that members can borrow, most of which are suitable for the following events.

Sept	Time	Star	Mag.	Ph	Alt °	% illum.	mm
11 th	21.01	Psi Ophiuchi	4.5	DD	8	40	40
12 th	19.49	SAO 185318	7.0	DD	17	51	70
14 th	19.16	45 Sagittarii	5.8	DD	18	73	110

Daylight Lunar Occultations

On the 8th of the month there is a daylight occultation of the first magnitude star Spica in the constellation of Virgo. Events involving such bright stars are comparatively rare, and it is rather a pity that this one occurs in daylight. However, the prediction software suggests that only a 40mm instrument is needed to see the star disappear at the Moon's dark limb, whilst 70mm is required to see it emerge at the bright limb. **Times are in BST**

Sept	Time	Star	Mag.	Ph	Alt °	% illum.	mm
8 th	14.56	Spica	1.0	DD	27	11	40
8 th	16.08	Spica	1.0	RB	26	11	60

Phases of the Moon for September

New	First ¼	Full	Last ¼
5 th	12 th	19 th	27 th

ISS

Unfortunately there are no evening passes of the International Space Station during September. There are however a large number during the early hours of the morning. If you wish to look at these please go to:

www.heavens-above.com

Iridium Flares

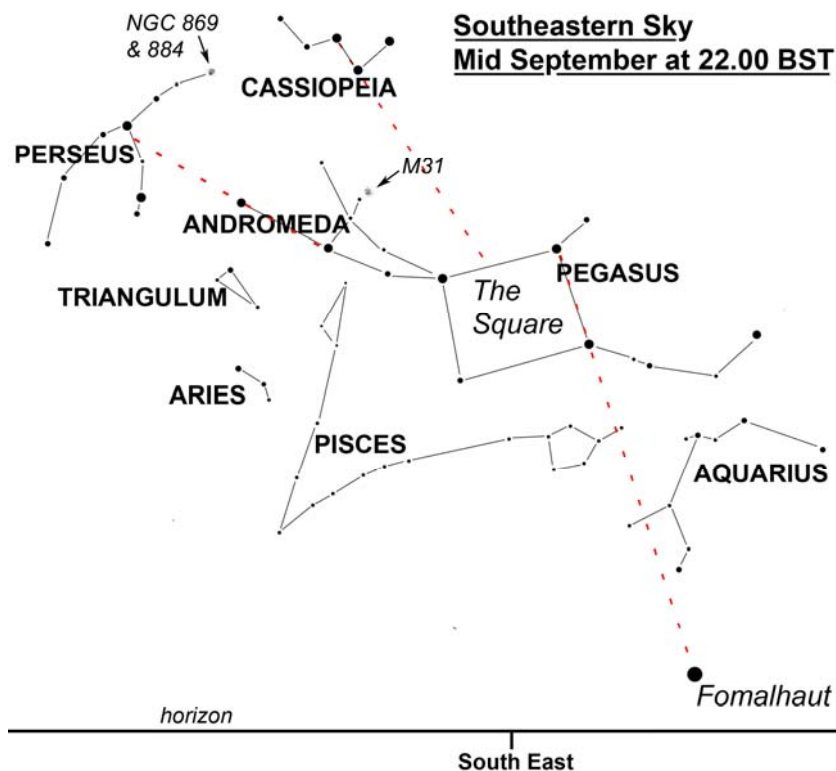
The flares that I've listed are magnitude -3 or brighter although there are a lot more that are fainter or occur after midnight. If you wish to see a complete list, or obtain timings for somewhere other than Wadhurst, go to:

www.heavens-above.com

Remember that when one of these events is due it is sometimes possible to see the satellite before and after the "flare", although of course it will be much fainter at those times. Some of those visible this month are extremely bright, with -8.4 being almost as brilliant as they can get (maximum is -8.5). Don't forget that Venus at its brightest only achieves -4.9. **Times are in BST.**

Sept	Time	Mag.	Alt°	Az°		Sept	Time	Mag.	Alt°	Az.
1 st	21.06	-4.4	57	85 (E)		14 th	20.06	-7.2	64	126 (SE)
1 st	22.31	-6.9	25	48 (NE)		14 th	21.41	-7.5	40	74 (ENE)
5 th	22.17	-7.3	30	56 (NE)		19 th	21.20	-8.1	45	84 (E)
6 th	20.45	-8.0	61	98 (E)		20 th	21.14	-5.9	45	87 (E)
7 th	20.39	-8.4	62	102 (ESE)		20 th	22.11	-5.6	12	38 (NE)
9 th	22.02	-7.5	35	64 (ENE)		21 st	19.33	-3.5	63	151 (SSE)
13 th	20.12	-4.4	64	121 (ESE)		25 th	20.53	-6.6	50	98 (E)

The Night Sky in September (Written for 22.00hrs BST mid month)



In the east the autumn constellations are already well displayed. Pegasus and Andromeda are some 40° above the horizon whilst below them; both of the "fishes" that form Pisces have risen. Also below Andromeda, in the space bounded by Perseus and Pisces, we find the small constellations of Triangulum and Aries. Of note in this general area are the Andromeda Galaxy (M31) and the double cluster in the sword handle of Perseus (NGC 869 & 884), the last of which is a lovely binocular object.

As we move to the southern aspect we find Deneb, the brightest star in Cygnus, lies on the meridian just 6° from the zenith, meaning that the rest of the Summer Triangle is still well presented. Below Cygnus is the small but obvious shape of Delphinus, that I will mention later, and below that is Capricornus. An indication of air quality is given by looking for the faint group of stars that form the constellation of Microscopium that lies between Capricornus and the horizon. The brightest star in Pisces Austrinus, Fomalhaut, lies just to the east of the meridian and can be found by extending a line through the two most easterly stars of the Square of Pegasus and continuing it southwards.

Towards the west the bright star Arcturus, the fourth brightest star in the night sky, is still visible low down and can be used, along with Corona Borealis, to locate the faint shape of Hercules. The rest of this part of the sky is taken up by the faint and rather indistinct constellations of Serpens and Ophiuchus.

Looking north, Ursa Major is approaching the horizon whilst its smaller namesake points roughly to the west. Cassiopeia and Cepheus are both high and to the east of the meridian whilst Draco lies just to the west of it. The bright star Capella, in Auriga, is climbing away from the horizon on its way to a near rendezvous with the zenith in early January.

Nova Delphini 2013

A nova was discovered in the constellation of Delphinus by a Japanese amateur astronomer on August 14th 2013. On August 16th it had reached magnitude 4.4. Map 1 shows the general location of the nova whilst map 2 is a more detailed finder chart with the intersection of the cross-hairs indicating its exact position.

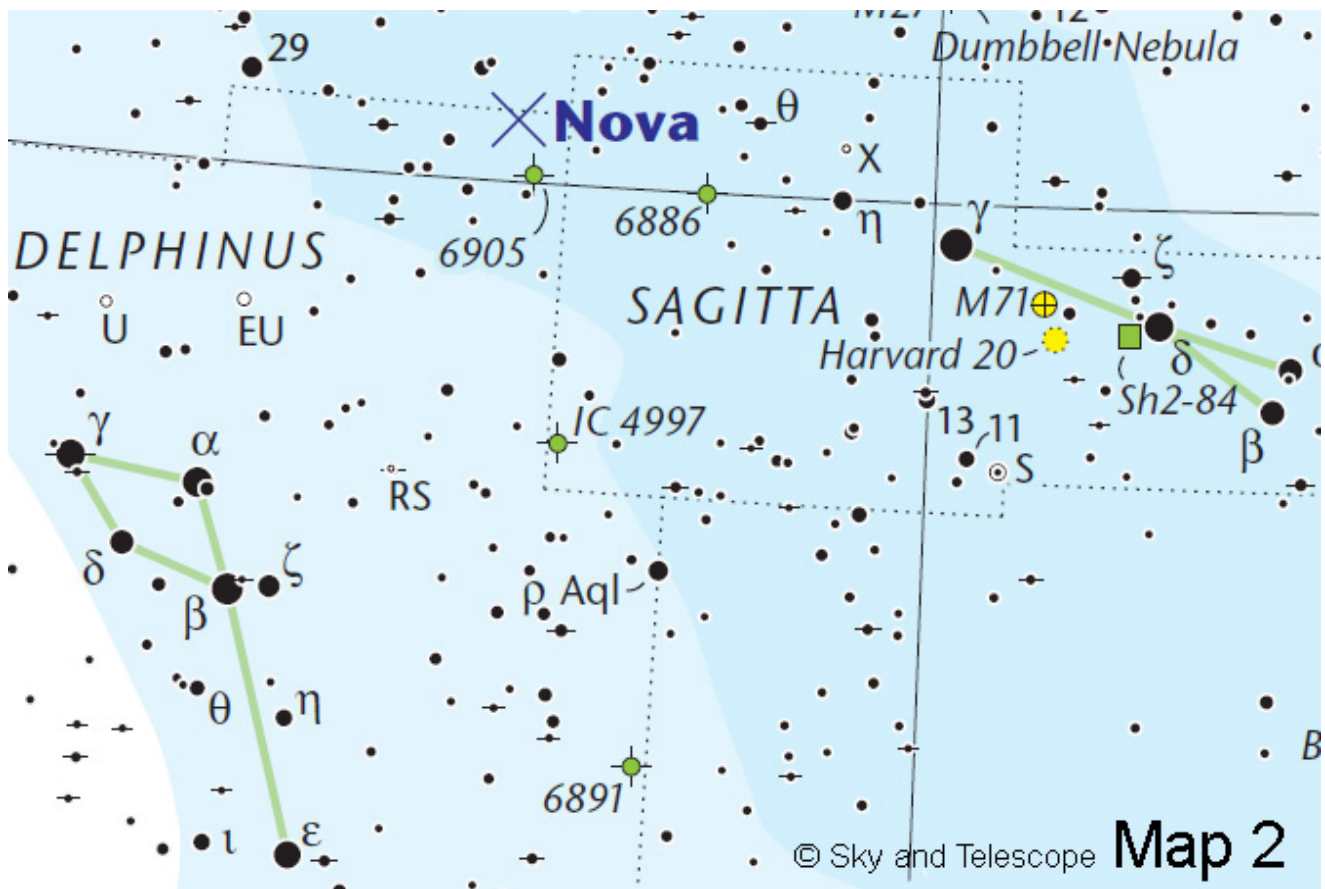
Nova Delphini 2013

30 sec driven exposure
ISO 400
70mm telephoto
22/8/2013
22.52 BST
© B W Mills



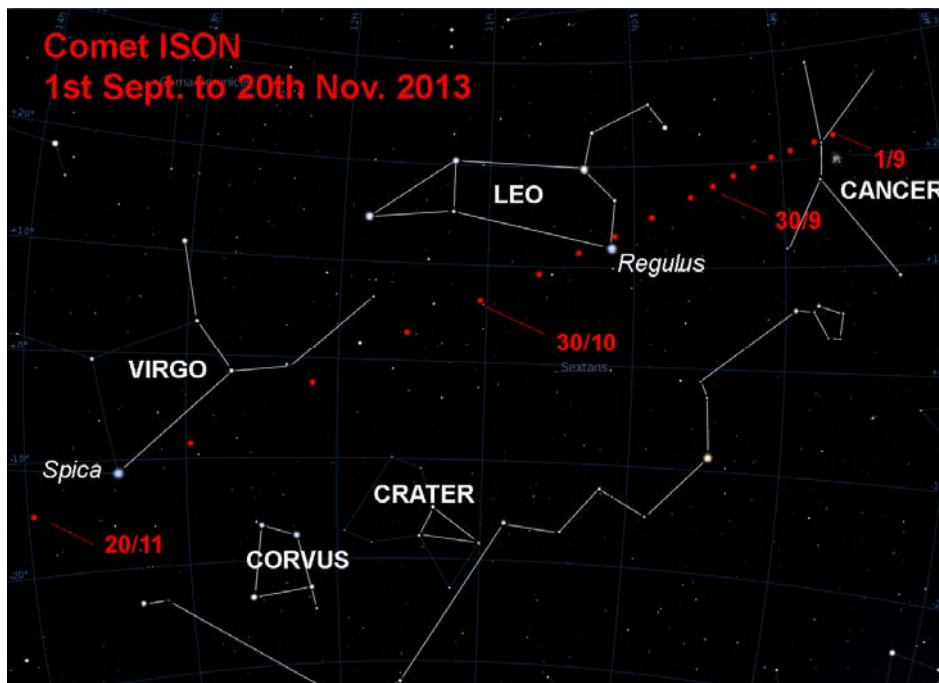
Sagitta

Map 1



© Sky and Telescope Map 2

Comet C/2012 S1 (ISON)



As the comet approaches perihelion on November 28th, it seems that our expectations of how it will appear are receding subtly. The reason for uncertainty is that early magnitude estimates are made by comparing data such as brightness, distance and size with comets that have gone before. A large body such as ISON, which is in the region of 5 to 6 km across, would have been expected to behave in the same way as similar bodies such as Comet Hale-Bopp, but this seems not to be happening. The way that its brightness has not increased as it makes its way in from the Oort Cloud has lead astronomers to believe that the amount of material that is available to sublimate out is much less than expected. However, as you can see from the photograph, ISON already has a tail as seen by both the Hubble and Spitzer space telescopes. At the time of writing (late August) it is some 200 million miles from the Sun and travelling inbound at more than 61,000 mph. On September 27th the comet is in conjunction with Mars and will be just 2° north of the Red Planet. In case you missed it I have reproduced the diagram from the last newsletter indicating the position of ISON

until the third week of November after which it will be too close to the Sun for observation. If it survives the close encounter with its parent star it should re-appear a few days into December. By December 13th or 14th it should be visible as an evening object at an estimated brightness of +3.0.

After it has rounded the Sun on November 28th it moves northwards to eventually pass close to Polaris. From December 13th/14th until the 24th it will have two periods of visibility each day. This is because it will dip below the north-western horizon only to rise later in the night in the north-east. After 24th December it becomes circumpolar and will be visible throughout the hours of darkness.

Brian Mills

NASA SPACE PLACE

Size Does Matter, But So Does Dark Energy

By Dr. Ethan Siegel

Here in our own galactic backyard, the Milky Way contains some 200-400 billion stars, and that's not even the biggest galaxy in our own local group. Andromeda (M31) is even bigger and more massive than we are, made up of around a trillion stars! When you throw in the Triangulum Galaxy (M33), the Large and Small Magellanic Clouds, and the dozens of dwarf galaxies and hundreds of globular clusters gravitationally bound to us and our nearest neighbors, our local group sure does seem impressive.

Yet that's just chicken feed compared to the largest structures in the universe. Giant clusters and superclusters of galaxies, containing thousands of times the mass of our entire local group, can be found omnidirectionally with telescope surveys. Perhaps the two most famous examples are the nearby Virgo Cluster and the somewhat more distant Coma Supercluster, the latter containing more than 3,000 galaxies. There are millions of giant clusters like this in our observable universe, and the gravitational forces at play are absolutely tremendous: there are literally quadrillions of times the mass of our Sun in these systems.

The largest superclusters line up along filaments, forming a great cosmic web of structure with huge intergalactic voids in between the galaxy-rich regions. These galaxy filaments span anywhere from hundreds of millions of light-years all the way up to more than a billion light years in length. The CfA2 Great Wall, the Sloan Great Wall, and most recently, the Huge-LQG (Large Quasar Group) are the largest known ones, with the Huge-LQG -- a group of at least 73 quasars -- apparently stretching nearly 4 billion light years in its longest direction: more than 5% of the observable universe! With more mass than a million Milky Way galaxies in there, this structure is a puzzle for cosmology.

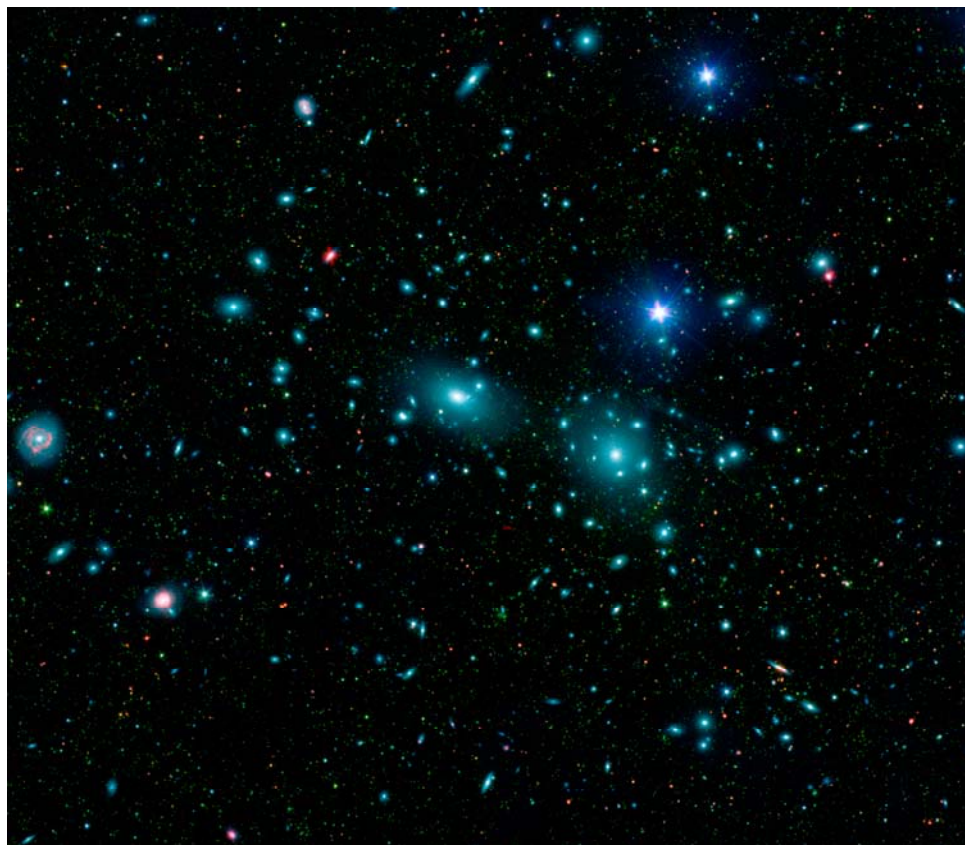
You see, with the normal matter, dark matter, and dark energy in our universe, there's an upper limit to the size of gravitationally bound filaments that should form. The Huge-LQG, if real, is more than double the size of that largest predicted structure, and this could cast doubts on the core principle of cosmology: that on the largest scales, the universe is roughly uniform everywhere. But this might not pose a problem at all, thanks to an unlikely culprit: dark energy. Just as the local group is part of the Virgo Supercluster but recedes from it, and the Leo Cluster -- a large member of the Coma Supercluster -- is accelerating away from Coma, it's conceivable that the Huge-LQG isn't a single, bound structure at all, but will eventually be driven apart by dark energy. Either way, we're just a tiny drop in the vast cosmic ocean, on the outskirts of its rich, yet barely fathomable depths.

Learn about the many ways in which NASA strives to uncover the mysteries of the universe:

<http://science.nasa.gov/astrophysics/>

Kids can make their own clusters of galaxies by checking out The Space Place's fun galactic mobile activity:

<http://spaceplace.nasa.gov/galactic-mobile/>



Digital mosaic of infrared light (courtesy of Spitzer) and visible light (SDSS) of the Coma Cluster, the largest member of the Coma Supercluster. Image credit: NASA / JPL-Caltech / Goddard Space Flight Center / Sloan Digital Sky Survey.

CONTACTS

General email address to contact the Committee

wadhurstastro@gmail.com

Chairman John Vale-Taylor

Secretary & Events Phil Berry
01892 783544

Treasurer Mike Wyles

Editor Geoff Rathbone
01959 524727

Director of Observations Brian Mills
01732 832691

Committee Member **Paul Treadaway**

Wadhurst Astronomical Society website:

www.wadhurstastro.co.uk

SAGAS web-site www.sagasonline.org.uk

Any material for inclusion in the October 2013 Newsletter should be with the Editor by September 28th 2013