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Des Loughney travelled to China to observe the total solar eclipse on 1st August 2008. This wide-angle shot gives an idea of what the scene looked like to the naked eye. Note Venus some distance top left of the sun, also the edge of the lunar shadow at the bottom left. The insert shows the sun and Mercury threefold enlarged. See also Des' article on page 8.

IYA astro-happening at Science Festival

I am delighted to announce that, along with Charlie Gleed and Lorna McCalman, I made a successful bid to the Institute of Physics (IoP) for funds to support a one-day professional / amateur / public astro-observing event at the Edinburgh Science Festival for the International Year of Astronomy (IYA), entitled

2009 – A Space Odyssey: from Galileo to Hubble & Backyard Telescopes

This will comprise a series of around 10 talks with question-and-answer sessions covering what can be done and how to do it in observing, from total novice to advanced amateur, set against a backdrop of professional astronomy today.



Or, in the words of the funding bid –

To celebrate IYA 400th Anniversary of Galileo's telescope and involve all attendees in getting started or progressing in the how to and joys of discovering the wonders of the sky. This will comprise talks by amateurs and professionals on: wonders of the cosmos; observing equipment and getting started with a telescope as simple as Galileo's; achievements of professional and amateur astronomers, especially in Scotland.

The day event will be free and almost certainly on Saturday April 18, 2009 – a grand finale to SciFest. Lectures will be followed by an evening special 'Galilean Orbital Ceilidh' (for a small charge) to allow informal mingling and very informal orbiting of all attendees and guests and the general public.

The event will complement other likely SciFest astro-related events/talks such as on the Crawford Collection (Gingerich and I) and on the Large Hadron Collider (LHC) / Big Bang, plus the numerous IYA events being organised across Scotland by individual AstroSocs and some other soon-to-be announced national activities. An impressive line-up of speakers is already in place, including Chris Lintott (Sky at Night), Francisco Diego (University College London), Tom Boles (of supernova fame) plus myself and many others.

Draft programme topics include some or all of

Forefronts of astronomy today; Scottish astronomy, observatories, and societies; Dark Skies Scotland; making, buying & using telescopes; using robotic telescopes; simple astro-photography; deep sky and planet imaging; variable stars; supernova searches; exoplanets & SETI

We plan to offer a poster/display area to Scottish Astro Societies and other establishments and individuals, subject to available space and costs.

We very much look forward to seeing many of you there and to your active involvement – also at other IYA events in 2009. More details in due course by email, SciFest programme and website, other websites etc etc.

I am grateful to IoP and to Lorna and Charlie for their part in the incredibly expeditious completion of this bid. From the first word of the application to award of the funds was about 2 weeks!!!

*Prof John C. Brown
Astronomer Royal for Scotland*

This item is adapted from an email of 2008-10-29. John Brown is also Honorary President of the Astronomical Society of Edinburgh. Lorna McCalman and Charlie Gleed are past President and past Vice President, resp., of the Society.

Johann von Lamont – Bavaria's Scottish Astronomer Royal

John Lamont was born on 13 Dec 1805 at Corriemulzie near Braemar, the second of 3 sons of Robert Lamont, forester, and his second wife Elspeth Swan. After his father's death in 1817, being a Catholic, he was sent to be educated at the Benedictine monastery of St James, Ratisbon (now Regensburg in Bavaria). Here he was tutored in mathematics and science by the prior, Father Benedikt Deasson, and spent his vacations as an assistant at the observatory at Bogenhausen, now a suburb of Munich. Later he became an official staff member, took his doctorate of philosophy at Munich University in 1830 and was eventually to succeed as Observatory Director when Johann Georg von Soldner died. He was elected a member of the Bavarian Academy of Sciences in 1836 and Professor at Munich University in 1852.

He was interested in the work of Gauss and Weber on the Earth's magnetic field, and devised new self-recording instruments. He had a magnetic observatory built, with the aid of Bavarian government funding, took part in an international geomagnetic

campaign 1841-45 and travelled throughout Europe promoting regular and simultaneous magnetic observations. In 1850 he announced an approximate 11 year cycle in magnetic declination which was roughly coincident with the sunspot cycle discovered by Heinrich Schwabe, and in 1862 discovered Earth currents.



Lamont's tomb at Bogenhausen, note the coins in his open hand. Photo: D. Gavine.

With the 11.25 inch refractor by the famous firm of Utzschneider & Fraunhofer he made systematic observations of the satellites of Saturn and Uranus in the late 1830s to ascertain their orbital elements and obtained an estimate for the mass of Uranus. He observed Halley's Comet at its 1836 appearance, and carried out a long series of positional measurements leading to the publication of the places of 34,647 stars in 10 catalogues and a later Supplement. He was the first in Europe to use a recording chronometer to time the meridian transit of stars. He published *Handbuch des Erdmagnetismus* (Berlin 1849) and *Astronomie und Erdmagnetismus* (Stuttgart 1851). By chance, he observed Neptune in 1845 and 1846 and recorded it as a star. This was before its actual discovery, and the observations were later used to help determine its orbit. He also observed eclipses, clusters and nebulae. His works extend to some 107 papers not including the reports in the circulars and journals.

He was also interested in meteorology, proposing a network of weather stations for Bavaria, founded a Meteorological Association in 1842 and from 1842 to 1844 published records in *Annalen für Meteorologie und Erdmagnetismus*. His many other interests included writings on population statistics, law, health, royal genealogy and land surveying.

He received many honours including the Order of the Crown of Bavaria, a title of nobility from the King, so that his name became "von Lamont", he was a Foreign Member of the Royal Society, Fellow of the Royal Astronomical Society and of the Royal Society of Edinburgh. A crater on the Moon and a crater on Mars are

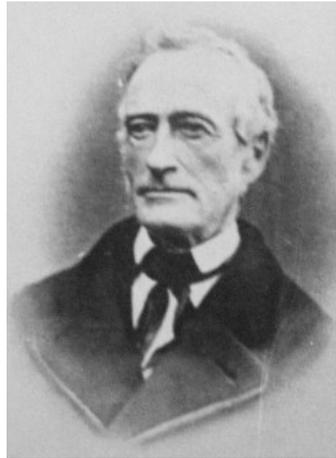
named after him. He never married and led a solitary life, died at the observatory on 6 Aug 1879 after 51 years of work there, and left a fortune to be used for scholarships in astronomy and mathematical physics.

He was buried in the small churchyard of St Georg in Bogenhausen, a baroque church of ornate beauty, and there is a strikingly lifelike bronze effigy. Storm Dunlop drew my attention to it so I had to make a visit in September while on holiday in Bavaria. The locals, knowing him to have been a Scotsman, put small coins into his open hand: there must have been about a euro there when I saw him. I wonder what he does with the money?

The inscription reads “Et coelum et terram exploravit” (He explored the sky and the Earth) and

Hier ruhet Johann von Lamont, Professor der Astronomie und Direktor der k. Sternwarte. Geb. Zu Braemar in Schottland 13. Dez 1805. gestorben 6. August 1879 auf der k. Sternwarte zu Bogenhausen nach 51 jähriger Thätigkeit an dieser Anstalt.
R.I.P.

Here rests Johann von Lamont, professor of astronomy and director of the royal observatory [k. for königliche], born at Braemar in Scotland 13 December 1805. died 6 August 1879 at the royal observatory at Bogenhausen after 51 years' work at this institution.
R.I.P.



Lamont aged about 50, from J. MacPherson, “Johann von Lamont, Astronomer Royal of Bavaria”.

A plaque opposite, on the church wall, has the same inscription in Latin.

In 1934 Sir James Jeans unveiled a memorial cairn to Lamont at Inverey near Braemar, placed there by the Deeside Field Club.

Sources

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- D. B. Herrmann, *Dictionary of Scientific Biography*, **7**, 607.
- *Monthly Notices of the Royal Astronomical Society*, **40**, (1880), 208-212.

- J. MacPherson, *Johann von Lamont, Astronomer Royal of Bavaria*, Aberdeen 1929.
- Ann F. C. Lamont, “Unveiling of the Lamont Memorial” *Deeside Field Club*, Aberdeen 1935.
- Much information can be found on Lamont on the Internet. Google “Johann von Lamont”.

David Gavine

Never the TWAN shall meet?

Twain derives from the Old English twegen, meaning two. The phrase ‘never the twain shall meet’ was used by Rudyard Kipling, in his *Barrack-Room Ballads*, 1892: ‘Oh, East is East, and West is West, and never the twain shall meet.’ There, Kipling is lamenting the gulf of understanding between the British and the inhabitants of the Indian subcontinent. But enough of that!

Whereas, according to Google, the above suggests ‘two things which are so different as to have no opportunity to unite’, TWAN (The World At Night) encourages us to expand our astronomical interests into a blend of the celestial and the terrestrial. I enjoy it very much! I’m not suggesting a falsification of the images. Digital imaging makes that all too easy. In that case two (or more) images, potentially from entirely different locations or times can be merged into stunning, almost surrealistic images. But there’s the rub! As astronomers I suspect that most of us would agree that authenticity in our observations, our note-taking and recording and notably our astronomical imaging should be paramount.

Image-processing packages such as Photoshop – the best known – and others a little less versatile but available for much less money, offer a range of tools with which to tweak – in the ‘digital darkroom’ – the ‘raw’ images that our digital cameras produce ... ‘Levels’, ‘Contrast’, ‘Saturation’, ‘Curves’, etc. There are also specialist astronomy imaging packages available.

Maybe we shouldn’t worry too much about this ... as the professionals do it too! There is however the concern that beginners drawn into the challenge of digital astro-imaging might be disappointed with their efforts when ‘old hands’ at the game criticise them as ‘going too far’. But what are the limits to this genre of digital imaging? Are there any? Should there be limits? For those of us who are amateur astronomers/astro-imagers, are we not free to produce the images our digital equipment enables us to do, regardless of matters of authenticity? Anyway ... who sets the limits on what we amateurs – even serious amateurs – produce? There is no ‘authenticity police’! We can produce the images we want. We might even rival the Hubble

images in glorious, saturated hues and colours! After all, we are amateurs pursuing our hobby/passion for fun ... or do we still have aspirations for scientific authenticity ... whatever that is, in our context?



The most stunning images that I've seen in the TWAN website achieve that scientific/authenticity balance very well. A few astro-imagers, stretch things perhaps a little too far ... in my humble opinion. Their images are awe-inspiring and might be compared with some of the illustrations that adorn the covers of science fiction magazines and books ... but then, so long as the authors of these images 'admit' to that then is there really any problem? In my own efforts at this TWAN genre I *do* use the 'controls' that Photoshop gives me. I do get twinges of guilt when I 'tweak up the saturation' ... but should I worry?

If you feel your astronomical interests could make connections with the beauty of landscapes and or townscapes then TWAN is something you certainly should make acquaintance with!

Reference

- The World At Night, <http://www.twanight.org>

Total eclipse of the sun on 1st August 2008

Earlier this year I travelled to China to see the total eclipse of the sun from a site in the Gobi desert. It was my first total eclipse. I travelled all that way because, apart from visiting China for the first time, the site had the best chance of being cloud free over the whole path of the eclipse. The path stretched from the Canadian Arctic Islands, over Greenland, the Arctic Ocean, through Siberia and into China.

The point of longest eclipse was a remote spot in northern Siberia. There totality could be experienced for 2 minutes and 27 seconds. At our spot in the Gobi desert totality was estimated to last 1 minute and 54 seconds.

On 31st July we arrived in Jiuquan – our base for the eclipse. This city is situated on the edge of the Gobi and is famous as a tourist spot because it is at the western end of the Great Wall. That evening we enjoyed an open air ‘Total Eclipse’ concert laid on by the local Council which, I reckon, five thousand people attended.



Totality could be experienced at the city but as it was on the edge of the track of the umbra this would only be for a few seconds. On the morning of the 1st the assembled UK groups – totalling three hundred people – were given a presentation on the eclipse including tips on photography. After the presentation and lunch we were driven fifty kilometres, in a convoy of coaches, across the desert to the exact point where the

middle of the totality track crossed the road. There we were joined by parties from Holland and people from all over China.

Our viewing spot was at $40^{\circ}18'$ N and $99^{\circ}30'$ E. First contact would be at 18:16 local time, second contact at 19:13, third at 19:15 and fourth contact (when the moon finally moved off the sun's disk) at 20:08. We were going to be looking at an evening eclipse.

The viewing place was very scenic. It was stony desert, with a few low hills in the middle distance, at an altitude of 4,000 feet. This was unusual enough for someone from Scotland – but, in the further distance was the Qilian Shan, a mighty rampart of snow covered mountains with glaciers. The highest peaks reach 19,000 feet (5,800 metres).

We arrived about an hour before first contact, which gave us enough time to get our equipment set up. This was achieved without any hitches probably because of the many rehearsals in my back garden in Edinburgh. I had the specific objective of imaging the outer corona of the sun and had assembled the gear to do that. I would be using a Canon DSLR, a 400 mm Canon lens and a Mylar filter. The Mylar filter was for imaging the sun outside totality. It would not be required during totality.



The author and equipment.

The trickiest part of the whole exercise was to remove the filter at the onset of totality and putting it back at the end of totality. This had to be done quickly but without disturbing the system so that the sun remained in focus. There would be no time to adjust the focus during totality. In any case I just wanted to actually watch the eclipse while doing the images with a remote switch. This was possible because in the short time the image of the eclipsed sun would remain within the field of view of the camera. I found that my settings did capture structure in the outer corona but the inner corona was overexposed. I could see why people used two cameras!

I took the advice of veterans and spent some time during the hour of preparation to make sure that the camera and lens were exactly focussed on infinity. You cannot assume that the infinity mark on the lens is precisely right because the setting is affected by temperature (expansion or contraction of the lens and lens mounting). Otherwise conditions for observing at our site were very good. No obstructions, a gentle breeze and little turbulence.

Up to totality the sun was successfully imaged with settings of f 5.4, ISO 200 and an

exposure of 1/1200 second. During this phase of the eclipse we were considerably worried by the presence of some cumulus clouds. Fortunately the clouds, while still around, never interfered with observations. During totality the exposure was switched to 1 second. This was not satisfactory for imaging the outer corona. A 0.25 second exposure was better. In all 16 quality images were taken during totality, which was a good outcome. These will end up in the database of the BAA's Solar Section.

It was an exciting experience just watching the eclipse. In the half hour before totality the temperature noticeably cooled. The sun could not be observed with the naked eye until the onset of totality itself. The cover image gives an idea of what the scene looked like to the naked eye. In addition to the eclipse sun you could see Venus and Mercury and the edge of the umbra in the distance.

The total eclipse was over all too quickly. We retired to a picnic in the desert while the coaches started taking people back to Jiuquan. We thought that this pleasant moment had gone on too long when we found ourselves on the last bus that would only get back at midnight. Yet, when it got dark, we were still driving across the desert under a clear sky. We persuaded the driver to stop and had a wonderful look at the constellations from a dark sky site at an unfamiliar latitude. It was nice to see Scorpius and the centre of the Milky Way in Sagittarius.

Des Loughney

Forthcoming events

2008-12-05	20:00	David Gavine, ASE The astronomy of sundials
2009-01-09	20:00	The way forward Discussion about the state of the City Observatory
2009-02-06	20:00	<i>speaker TBD</i> Title TBD
2009-03-06	20:00	<i>speaker TBD</i> Title TBD

Our meetings are open to the public (unless otherwise stated). We are always happy to see new faces. Ordinary meetings take place at 20:00 (Civil Time) in the City Dome of the City Observatory, Calton Hill (usually on the first Friday of the month). Any changes to our meeting arrangements will be put on our website <http://www.astronomyedinburgh.org>

Exoplanets come into view

As I was waiting for the No 41 bus, I watched two Nos 42 pass each other, and I thought to myself: “This is like exoplanets – first you wait for years for someone to take a picture of them, then three pictures turn up within a single month.”

First off, at least in terms of page numbers in *Science* (*Science Express* of 2008-11-14, *Science* of 2008-11-28), is a US/Canadian team who used the Hubble Space Telescope to obtain visible-light coronagraph images of Fomalhaut, 25 light years away and brightest star in the constellation Piscis Austrinus. They find one planet of about 3 Jupiter masses 115 AU from the star. This is present in images from 2004 and 2006 and has moved during that interval. The coronagraph is needed to block out the 1000 million times brighter star.

Next up is a Canadian/US/Exeter team who find no less than three planets around HR 8799, a 6.0 mag star in Pegasus, 129 light years away and not really better known as BD+20 5278. This team used the 10-metre Keck and 8-metre Gemini telescopes in infrared, where adaptive optics are employed to make good use of the aperture superior to the Hubble. The three planets are 10, 10 and 7 Jupiter masses and at distances of 24, 38 and 68 AU from the star.

On 2008-11-21 the European Organisation for Astronomical Research in the Southern Hemisphere – formerly known as European Southern Observatory and still known as ESO – made a press release announcing a likely image of a planet around β Pictoris, 70 light years from Earth and well known to have a circumstellar disc. A French team used one of ESO’s four 8-metre VLT telescopes, and again adaptive optics at infrared wavelengths was employed. This planet has 8 Jupiter masses, but at about 8 AU it is rather closer to the star than in the cases of Fomalhaut and HR 8799.

In all three cases, dust discs were known before the search for the planets began, and indeed detail in these discs had hinted at the presence of planets.

These were in fact not the first images of exoplanets. In 2004 the VLT had taken an image of 2M1207, 170 light years away. That was rather simpler to do, since the central object is not a star, but a brown dwarf only 100 times brighter than the planet. That planet is between 3 and 10 Jupiter masses and 40 AU from the brown dwarf. This object is at -40° declination and not visible from Scotland. The brown dwarf is 20 mag, well beyond most amateur telescopes, anyway.

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- Wikipedia, 2005-2008, *2M1207b*,
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Horst Meyerdierks

Recent observations

Fireball 2008-09-22

A fireball was seen by a number of observers in Scotland, including several of the audience at the October ordinary meeting. Darren Moody of Aberdeen Astronomical Society writes:

Fireball report 22nd Sept. - eastern Scotland

I've been getting reports about a fireball sighting on the evening of 22nd Sept at 9:30pm [BST, ed.]. There have been four independent sightings in Aberdeen, one in Edzell, one in Edinburgh and one in Fife (the last 3 from the IMO [International Meteor Organization, ed.]). All report a bright object streaking across the sky from west to east. Just wondered if any of your members had reported anything?

Regards, Darren Moody, President, Aberdeen Astronomical Society

If you have seen this fireball, contact the Editor for Darren's email address and let Darren know what you saw.

Perseids

Horst Meyerdierks spent most of August in Germany and so missed much of the bad weather and was able to observe some Perseid meteors and the partial lunar eclipse on 2008-08-16. In three one-hour watches on 2008-08-08, -10 and -11 he counted three, nine, and five Perseids, resp. Once these counts are corrected for the altitude of the radiant and for the limiting magnitude of the sky the zenithal hourly rates work out as 10, 45 and 70, resp.

Lunar eclipse

Horst's image of the lunar eclipse is a complex composite. All exposures are aligned on the Earth's shadow. A composite of short exposures shows the Moon moving from bottom left to top right, leaving a circular black area that is the Earth's umbra. Superimposed in this area is a composite of longer exposures, revealing the reddish-brown colour of the small amount of light that is refracted into the umbra by the Earth's atmosphere.



Sun

Horst Meyerdierks takes an image of the Sun whenever possible and averages his spot counts in 30-day intervals. He reports the following R numbers (number of spots plus ten times the number of spot groups):

2008-07-03 / -08-01	1.1	2008-09-01 / -09-30	1.8
2008-08-02 / -08-31	0.0	2008-10-01 / -10-30	2.8

SAG observes at Pearie Law

The Scottish Astronomers Group held an observing session on 2008-09-27 at our dark site, Pearie Law, a few kilometres south of West Calder. Among the less expected results were a number of meteors, including several α Aurigids.

Variable star observing workshop

The Variable Star Section of the British Astronomical Association (BAA) held a workshop on observing variable stars on 2008-10-18. This was aimed both at newcomers and at more experienced observers wishing to learn more about the current observing campaigns. The venue was the James Clerk Maxwell Building of the University of Edinburgh. Roger Pickard, Director of the Section, welcomed everyone and began the day with an introduction to variable stars, what types there are and why we should keep an eye on them. The BAA keeps a continuous record of observations starting in the early 20th century. Roger then gave an introduction to CCD observing of variables. The precision of CCD observations is very high; the process is computerised and can be automated.

It was then John Toone's turn to present the more traditional side that is visual observing of variables. The precision and accuracy of visual magnitude estimates is only 0.1 or 0.2 magnitudes, but observing is much simpler and a variety of instruments from naked eye through binoculars to a telescope can be used. More observers are likely to take up visual than CCD observing. In some ways CCD and visual observations complement each other, the CCD giving high precision and time resolution, the visual observations more likely to cover longer time intervals more evenly.

Then it was time for some hands-on experience. Using slide projections of the night sky John Toone took us through the magnitude estimate from two comparison stars by the fractional method. We also learnt how to record the observations and how to report them to the Section. The question was raised whether one could use survey data available on the Internet instead of the actual night sky. Such data mining would be useful, but visual observing of the real sky should continue at any rate in order to continue the existing record of visual observations.

After lunch, Robin Leadbeater opened another dimension – wavelength – with his talk about spectroscopy and variable stars. With a reasonably good grating mounted like a filter, and given a CCD or digital camera, useful results can be achieved. Higher resolution spectrographs are now also available to the more serious amateur.

Des Loughney spoke about eclipsing binaries. He is also pioneering the use of a digital SLR. Ten short exposures without tracking can reach 10 mag, and a precision of about 0.03 mag is possible. More generally, a campaign is ramping up to observe the forthcoming eclipse of the bright variable ϵ Aurigae in 2009 and 2010.

The programme concluded with Melvyn Taylor's talk on binocular observing. This included tips on choosing good binoculars, choosing stars to observe, and using finder and comparison charts. The binocular observer can make use even of very short periods of good weather. As with all visual observing of variables, it is important to leave 10 or 15 min for dark adaptation.

Everyone had an enjoyable and educational day. Many of the participants came from various parts of Scotland. Our thanks go to the organiser Des Loughney, Tania Johnston of the Royal Observatory Edinburgh, and also to those who made the journey from further south and who contributed to the programme of the workshop.

Horst Meyerdierks

Society news

As part of Edinburgh's Doors Open Day, the Astronomer's House was open to the public on 2008-09-27. This is the house that is part of the Calton Hill observatory, perched on the edge of the hill overlooking Waterloo Place and Princes Street. In the Doors Open programme, this is called the James Craig House after its architect, who won the competition to design the First New Town in 1767. The House is depicted on the title page of *ASE Journal* **37** after a drawing from around 1845. Thanks to Graham Rule, Iain McEachran, Peter Mulholland, Alan Ellis, Danny Gallacher, and Ken and Rachel Thomas, the Society also opened the Playfair building, including the Cooke refractor dome. Over 2000 visitors passed through both the Astronomer's House and the Playfair building that day.

At the ordinary meeting on 2008-09-05 Gerry Taylor gave a talk entitled "Twenty bright stars"; your Editor was unfortunately overseas once again and missed this meeting. On 2008-10-03, the speaker was Des Loughney with an illustrated report of his travel to China to see the total solar eclipse on 2008-08-01. In November Ken Thomas stepped in at short notice to give a talk on 2008-11-07 on the 18th century York astronomer John Goodricke, best known for his observations of variable stars.

At most ordinary meetings Alan Pickup gives a presentation about the sky in the forthcoming month, usually including snippets of recent news in the fields of observational astronomy and spaceflight.

Following the talk at the October meeting, the President and Secretary brought up the subject of the state of Calton Hill. There are too many facets to the issues to discuss here in sufficient detail, but it would appear that the Society is slowly edging towards extracting itself from Calton Hill. The Council of the Society intends to complete a discussion paper in time for distribution to Members at the December ordinary meeting. Further copies would then be sent out with the *Journal* or by email. The January ordinary meeting would then be dedicated to discussion and feedback from Members to the Council.

Contents of this issue

Total solar eclipse (cover photograph)	1
IYA astro-happening at Science Festival	2
Johann von Lamont – Bavaria’s Scottish Astronomer Royal	3
Never the TWAN shall meet?	6
Total eclipse of the sun on 1st August 2008	8
Forthcoming events	10
Exoplanets come into view	11
Recent observations	12
Variable star observing workshop	14
Society news	15

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