



TRANSIT

The Newsletter of



05 June 2008



The RSC Energia Museum's pride and joy is the Vostok 1 capsule– the actual spacecraft in which Yuri Gagarin flew!

Front Page Image – Moscow, While Gagarin's capsule is the RSC Energia Museum's really iconic exhibit, the most fascinating are the Voskhod capsules; both of them are there. 20 years ago, I would never have believed it possible, that one day I'd see *those* with my own eyes!!!!!!!!!!!! Voskhod 2, shown here, is the real capsule, with a replica of the airlock, as the real one was jettisoned after use. Though I knew the story well, it was quite an eye-opener, to see just how Heath-Robinson'ish the contraption really was! Leonov was a brave man!!!!!!!!!!!!

- Neil Haggath

Last Meeting. 09 May 2008. Dr John McCue described his visit to the Baja Peninsula, Mexico. His talk covered astronomy, natural history and just having a great time in the Sun.

Next meeting : 13 June 2008. Dr Jim Wild of Lancaster University will give a talk on "The Aurora Borealis" as part of the International Heliophysical Year (IHY) programme.

What a great Transit this month! Every article has been written by a Society member !

A Trip Into Space History: My Moscow Adventure

by Neil Haggath

At the beginning of May, I spent three days in Moscow. The way in which I did this - I booked my own flights and hotel through the Internet, found my own way from the airport to the hotel, and walked around the city alone for my sightseeing – this is a sign of the “new Russia! Up to about 1990, no-one was allowed to visit the former Soviet Union, except through the official government tourist agency; you had to be chaperoned everywhere, and got to see exactly what they wanted you to see! Thankfully, things are now very different.

Naturally, I did all the “standard” sightseeing, such as Red Square and St. Basil’s Cathedral (Fig 1.) – but you won’t be surprised to learn that the primary purpose of my visit was very much space-related!

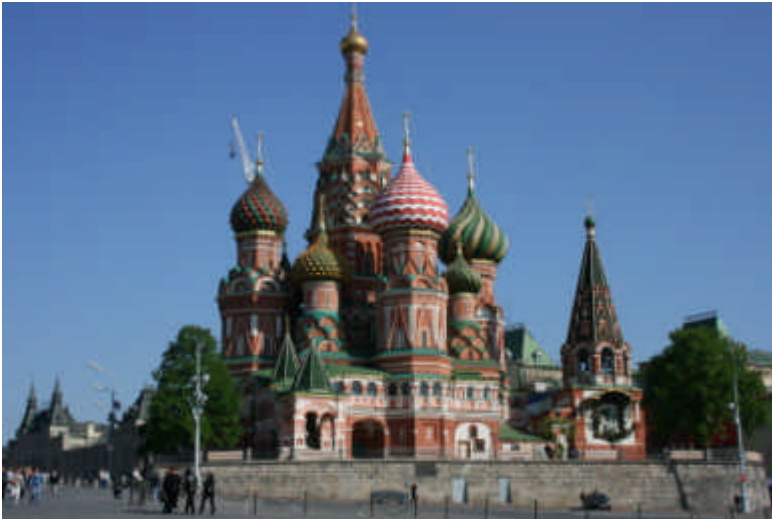


Fig. 1

I planned to visit several places connected with Russian space history – but in some of these, I was disappointed.

The first failure was in Red Square itself. In the Soviet era, when people died who had been given the ultimate honour of “Hero of the Soviet Union”, their ashes were placed in the Kremlin Wall, on the side facing Red Square, and near Lenin’s tomb. Usually, this meant politicians and generals – but some of the early cosmonauts also received this honour. Yuri Gagarin himself is there (he was killed in a plane crash in 1968); so are Vladimir Komarov, the first man to be killed on a space mission – on Soyuz 1 in 1967 – and the three cosmonauts who died in the Soyuz 11 accident in 1971. Also there is Sergei Korolev, the “Chief Designer”, about whom I’ll say more later.

I hoped to find these burial places – but I couldn't, as that side of the Square was closed off, due to the preparations for the May Day parades.

On Prospekt Mira (Peace Avenue) in the suburbs of Moscow, is the Monument to the Conquerors of Space (Fig. 2), erected in 1964; it's a pretty impressive sculpture, 300 feet tall!



Fig. 2

Below it is the Memorial Museum of Cosmonautics, which was originally another of my objectives. Unfortunately, the Museum is currently closed for renovation; I knew this before I went, but not until after I had booked the flight and hotel!

But the highlight of my trip came on the third day, with a visit to another museum – the private one of RSC Energia, the company which builds many of Russia's spacecraft and rockets. This museum, located in the company's headquarters a few miles outside Moscow, is certainly *not* open to the public; it can only be visited by prior arrangement and by means of organised tours.

I discovered this museum during my initial internet research before I booked the trip. I also discovered a specialist Moscow-based tour company called Rusadventures (www.rusadventures.com), which runs a variety of space-related tours – after you make your own way to Moscow. Some of their offerings truly justify the “adventures” in the name; if you have about US\$5000 to spare, they can actually take you to Baikonur to witness a Soyuz launch! On a more modest

scale, they take private group bookings to visit the RSC Energia Museum, on any working day of your choice.

Their standard price for this activity is based on groups of three or more. I initially booked my own private tour with them; I'm not going to tell you the price they were going to charge me as a single person, but it could fairly be described as extortionate, even for a man of my far from modest earnings! But I was willing to pay it, for such a once in a lifetime experience. (It had to be paid in cash on the day, in US dollars)

Then I had a stroke of luck. Just a few days before I left for Moscow, Rusadventures e-mailed me; they said that two people from Switzerland had asked to do the tour on the same day for which I had already booked, and asked whether I would mind sharing the tour with them – which would bring the price down to the standard “group of three or more” price per head. As this reduced the price to only 40% of what I had been expecting to pay, I replied that I didn't mind at all!

So on the day, the group consisted of myself, this young Swiss couple, Markus and Lucia, and our guides from Rusadventures, Sergei and Lydia. Lydia spoke excellent English; Sergei didn't, but was extremely knowledgeable about the space programme, and Lydia translated for him. We were picked up at our hotels, and driven to the Energia headquarters, in a small town called Korolev, about 12 miles outside Moscow.

The full name of the company is Raketno-Kosmicheskaya Korporatsiya Energiya imeni S. P. Koroleva – the S. P. Korolev Energia Rocket and Space Corporation. Sergei Pavlovich Korolev, for whom both the company and the town are named, was the genius behind Russia's early space programme; he began his career by building ballistic missiles, then persuaded the government that the rockets could be adapted to launch satellites. He led the team which gained the Soviet Union the lead in the early Space Race, and which came remarkably close to achieving their own Moon landing – but he never received the fame or recognition due to him during his lifetime. During those early years of Cold War paranoia, he was known to the outside world, and to the Russian people, only as “The Chief Designer”; as daft as it seems today, his identity was kept secret, due to fears that the Americans might try to assassinate him! Only after his premature death in 1966 was his identity revealed; then he was declared Hero of the Soviet Union, and his ashes placed in the Kremlin Wall.

We were shown around the Museum by Aleksandr, one of the Energia staff, who also spoke excellent English. He was also very witty, with lots of stories and anecdotes, and taught me quite a few details which I hadn't previously known.

We began with the unmanned spaceflight gallery, which contains replicas of some of the historic early satellites and probes (obviously replicas, as the real

things never returned to Earth!). These include Sputnik 1 itself, and Sputnik 2, which carried poor Laika the dog on her one-way mission. Also represented are Luna 2, the first probe to impact the Moon, Luna 3, which gave us the first pictures of its far side, and Luna 9, which achieved the first soft landing.

But far more impressive are the manned spaceflight exhibits. As well as various mockups, including one of the Mir space station, there are on display several real descent modules from the early manned missions – the actual capsules which flew and returned to Earth. The Museum’s pride and joy is the Vostok 1 capsule (Fig. 3) – the actual spacecraft in which Yuri Gagarin flew!



Fig. 3

Now that’s what you *call* a piece of history! We all approached it with an air of reverence; this, for me, was a moment to rank alongside shaking the hands of men who walked on the Moon! (Needless to say, I delighted in telling my hosts that I had done that!)

Also on display are the Vostok 6 capsule, which carried Valentina Tereshkova, the first woman in space, and the capsule which carried Belka and Strelka, the first two dogs to be flown and returned to Earth.

But while Gagarin’s capsule is the truly iconic exhibit, the most fascinating are the actual capsules from the two Voskhod missions. Twenty years ago, I would never have believed it possible, that I would one day see these with my own eyes!

For the uninitiated, Voskhod was a mysterious programme which followed the Vostok missions, in 1964-65. There were only two flights, both of which achieved spectacular “firsts” for the Soviet Union. Voskhod 1 was the first “multi-man spacecraft”, which carried three cosmonauts, before the Americans had flown their two-man Gemini; Voskhod 2 was the mission on which Alexei Leonov made the first spacewalk.

At the time, no details or photos of the Voskhod spacecraft were ever released to the West; the details were kept secret for the next two decades. Only in 1985, when the Russians finally came clean, under Gorbachev's new policy of openness, did we find out why; both missions had been done purely for the political propaganda value of "beating the Americans to it", and had been done in such a crude and dangerous manner that the cosmonauts were lucky to come back alive.



Fig. 4

The Voskhods were nothing more than modified Vostoks. The "first three-man spacecraft" consisted of three men crammed into a capsule designed for one – with the huge risk of flying without spacesuits. Voskhod 2 carried two men with spacesuits; Leonov's spacewalk was done by means of a crudely improvised inflatable airlock, attached to the outside of the hatch (Fig. 4). The story is now well-known; Leonov's scheduled EVA lasted only 12 minutes, but he then spent twice as long, struggling to get back into the spacecraft, as his spacesuit had expanded, preventing him from squeezing back into the airlock. He managed it only by deflating his suit to a dangerous level, and then performing contortions to turn around inside the airlock; he was very lucky to get away with it!

The Voskhod 2 exhibit in the Museum consists of the real capsule, fitted with a replica of the airlock – as the original was jettisoned after use. Even though I was familiar with the story, it was quite an eye-opener, to see close-up just how Heath-Robinsonish this contraption really was!

Lydia, the lady from Rusadventures, is slightly older than me – so like me, she grew up with the Space Age. Unlike me, she is just old enough to remember Gagarin’s flight; she was a very small girl at the time – whereas I wasn’t born until a few months later. When I told her that we in the West had never known any details of the Voskhod missions for twenty years after the events, she replied, “Neither did we!” The Russian public were never told any more than we were; the Americans always knew more, through their intelligence, about what was going on in the Soviet space programme, than the Russian people did!

The Museum’s biggest exhibit is a full-scale mockup of the Apollo-Soyuz Test Project of 1975 (Fig. 5).



Fig. 5

Again for the uninitiated, this was the first political exercise in cooperation between the space powers, in which an American Apollo spacecraft docked with a Soviet Soyuz, and the crews visited each other’s spacecraft. The Russian crew was commanded by none other than Alexei Leonov, of first spacewalk fame – who, by the way, had also been scheduled to command the first Soviet Moon landing mission, before the programme was cancelled.

The black structure, between the two spacecraft, was a special docking module, carried into orbit by the Apollo. This served two purposes. Firstly, of course, it enabled the two vehicles, with incompatible docking mechanisms, to be linked. But it was also a compression/decompression chamber, which was necessary for the crews to transfer between the two spacecraft. The Apollo was pressurised with pure oxygen at low pressure, while the Soyuz used normal air – so if the cosmonauts had gone directly from their vehicle into the Apollo, they would have got the bends! Transferring in either direction was a lengthy process, involving a couple of hours in the chamber.

The exhibit also includes the actual capsule of Soyuz 19, the Russian half of the ASTP (Fig. 6).

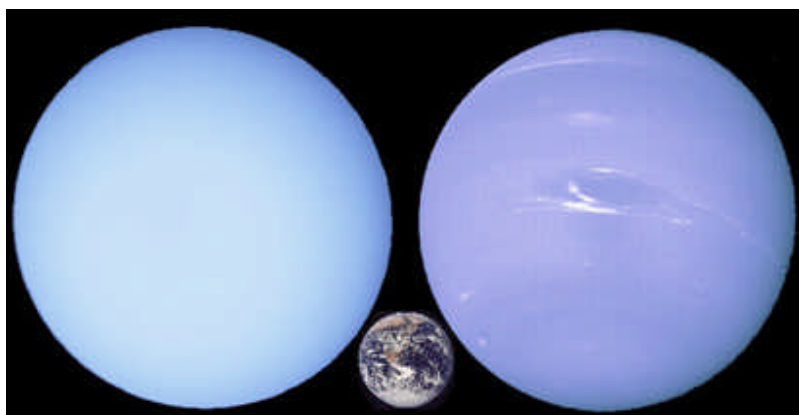


Fig. 6

I'll tell you more about these historic missions, and especially the bizarre goings-on behind the Voskhod missions, in a talk which I plan to give next season, about my Moscow adventure.

The Forgotten Twins

by Michael Roe



above - Uranus, Neptune, Earth to same scale

These 'Forgotten Twins' are Uranus and Neptune, the two blue planets in the outer part of the Solar System, both are small cold gas giants, smaller than Jupiter and Saturn and with less surface activity. Their surfaces are the top of a deep methane-tinged atmosphere, making both planets blue. The gas planets are made mainly of hydrogen and helium. Uranus is peculiar because it has an almost 90 degree axial tilt, probably caused by an early collision with another planetesimal in the past. Its moons orbit perpendicular to the plane of the planet's orbit.

Not much can be seen visually on either planet through a telescope. My old Celestron handbook claims that a Celestron 14" aperture telescope can sometimes reveal tiny white spots on Uranus. I know my Celestron 8" shows a tiny yellowish-green disk, my 12" Dobsonian telescope reveals a disk more clearly and more green in colour. Neptune is so dark and distant that just seeing it as a disk is an achievement. Larger telescopes in better seeing conditions see little more except perhaps the satellites.

Uranus has five main moons – Ariel, Umbrial, Oberon, Titania and tiny Miranda. Neptune has one large satellite, Triton, the coldest place in the Solar System, and tiny Nereid in a long elongated orbit. Many other tiny moons have been discovered by the Voyager 2 spacecraft and advanced telescopes since 1986.

So, until 1986 for Uranus and 1989 for Neptune little was known about these two planets. Then due to a rare once in 200 year alignment in relative planetary positions, Voyager 2 was able to observe both Uranus and Neptune. This unmanned spacecraft, which still transmits information, gave us close-ups of these planets. Uranus was difficult, an almost smooth turquoise ball but image enhancement revealed a few bright clouds around the equator, the thin dark rings around Uranus were seen too. Also features were seen on the satellites, especially tiny Miranda with its chevrons, huge squarish features and 20 mile high mountain ridges. Ariel had great grooved valleys, Umbrial was a dark cratered world. Oberon and Titania were brighter crater -pocked worlds.

Neptune showed more activity than Uranus, a blue world with white swirls of cloud here and there and the Great Dark Spot , an ongoing storm. It also had partial ring-arcs. But its largest satellite, Triton, had a strange surface of low depressions, ridges, long clefts and a few craters on a surface, pink on one side and green-blue darker areas on the other side. Strange geysers were seen to erupt, an amazing place.

Sadly these planets and their moons have been neglected since. A few Hubble Space Telescope images have shown more bright clouds and that's it! No space craft has returned to these 'Forgotten Twins' after 19 years and no more even planned, so with a long flight time of 10 to 15 years it will be many years before anyone sees new close-up images of Uranus or Neptune.

Pelican Astronomy

From John Crowther

Once more from me, a strange title. I'm referring to Pelican books. They are recognised by their pale blue border and pelican motif, they dealt with natural history and science in the thirties, forties, fifties and sixties.

Pelican books are an offshoot of Penguin books. These are said to originate from the Antarctic expeditions of the early twentieth century. Then during the isolation and dark winters there was plenty of time for budding authors to publish news-sheets or even write books. There wasn't even a radio link to Antarctica in those days.

Old hardbacks fetched big prices nowadays but it is still possible to find Pelicans dealing with astronomy at a bargain price.

In those days of black and white photography the books had an interesting diagrams and photographs.

Some of my own Pelicans are :-

"A Star Called the Sun", George Gamow, 1963

"The Size of the Universe", F.J. Hargreaves, 1948

"The Stars in the Courses", Sir James Jeans, 1931

I paid between ten and fifty pence for these books. My latest book is in very good condition - "The Origin of the Earth", W.M. Smart. Despite its title ninety six pages out of two hundred and twenty deal with the Solar System. The book was written in 1950 and the following excerpt from the Introduction gives a different approach to science than we have nowadays.

From the "**The Origin of the Earth**" :-

"Let us not then exalt the scientific method unduly as the close preserve of the scientist nor, which is much more important, as the only means by which we attempt to discover the secrets of nature. It is easy for the Scientist to be a materialist, if he sees only in the Universe the apparently relentless unfolding of the natural law and forgets that there are domains where the laws of physics are irrelevant. But, more and more, scientists are realising that they are exploring only one section of the great world of Nature in all its manifold complexity; beauty, moral conduct, spiritual values, religious experience are all outside their domain, yet all come necessarily within man's scrutiny when he attempts to interpret the Universe as a whole and strives to discern purpose therein.

A great work of pictorial art could be analysed by the scientist in terms of chemical constitution, atomic and molecular structure, the laws of physical optics,

and all the rest; he might reduce Beethoven's Fifth Symphony to a collection of mathematical formulae in the theory of vibrations; in neither case would his interpretation be more than bare bones, incomplete and unsatisfying.

Even to the scientist the sense of beauty is as real as an atom or a star; he can explain the phenomenon of Saturn's Rings by means of a complex formulae without ever having seen that wonder of the skies; but when he applies his eye to the telescope, he sees more a collection of mathematical symbols, for then he sees beauty and, unless he be very dull indeed, he sees mystery and he experiences the feelings of awe and wonder. So too, for example, he can measure the relative positions of the two stars forming the twin –star gamma Andromedae, he can ascertain their motions and calculate the masses and temperatures of the two stars and determine how far away the system is; but all these things do not specify the twin-star completely, for who can forget the beauty of colour – the rich yellow of one star and the wonderful blue of the other...

... It is suggested than, that the reader should bear in mind the incompleteness of the picture which science gives of the beginnings of things; as we shall see, it can accounting a surprisingly successful way for several elements in the story but it fails to discern any motive behind Creation, any omnipotent Mind, any guiding hand in the evolutionary process; that this is so is not a fault of the scientific method but of its limitations in a critical survey of the Universe from the every possible angle”.

Those Old Lamp Lighters

by Alex Menarry

Reading Pat Duggan's account of her conversation with Jack on the Hydraulic Bean-stalk has inspired me to publish the following experiences I had with the Road-Lamp Men of Darlington. For a couple of years I had been hearing of the helpful attitude of the road lighting engineers in Chilton, from Keith Johnson, so I thought I would write to their colleagues in Darlington. I was going to write it all up as a comedy show (or even a Jack-and-the Beanstalk pantomime) but decided to present the correspondence and let you draw your own conclusions. I first wrote on January 29th, 2007 but two letters were needed to elicit a reply :-

“22nd February, 2007.

I refer to your letters of January 29th and 12th February regarding the possibility of fitting louvres to several lanterns adjacent to your property. I apologise for the

delay in replying due to my being on holiday. I regret I cannot agree to your request for two reasons:

- i. the reduced levels of lighting affecting the safety and security of other road/footpath users; and
- ii. the cost implications

If it is any consolation, I will consider the possibility of fitting “cutoff” lanterns as and when the existing lanterns need replacing. However, it will be some time before this is required. I realise this is not the response you were hoping for and regret I am unable to assist further at this time

Yours sincerely,
Tom Russell Street Lighting Engineer.”

I pondered how to respond to this flat, implacable rejection and decided to try again.

“15th March, 2007
Dear Mr Russell

Light Pollution and Astronomy

Thank you for your letter replying to my query of 29th January. I hope you enjoyed your holiday. Since the arrival of modern, efficient lanterns in this area will be some time in the distant future, the only solution at present would seem to be small, sheet metal shields.

Would it be possible to meet you, or one of your staff, to discuss the situation – either here or in your offices? Astronomy is really very difficult on the corner here. It seems feasible that the lights nearby could be effectively shielded very easily and cheaply, with no effect on security at all. The aim would be to shield against what is called “spill light” or “direct glare” or “light trespass”. The House of Commons Science and Technology Committee report of October, 2003 “Light Pollution and Astronomy” (HC 747-1) has a very good diagram on page 18 defining the problem.

Although I haven’t seen what was done, as I intimated in my letter, friends in other Boroughs have told me they managed to come to a mutually acceptable arrangement in their area. I hope we can, too. In the current climate of Government wishing to cut down on pollution of all sorts, there may be an untapped budget available. We may even be able to begin a revolution!

Yours sincerely,”

This letter did not elicit a reply. After some thought, I decided to contact my Local Councillor to enquire what the Borough Council’s policy was on light pollution.

“29th June, 2007
Dear Mr Galletley,
Light Pollution and Astronomy

In connection with my hobby of amateur astronomy, I have been in correspondence with the Darlington Borough Council Street Lighting Engineer, with a view to shielding my back garden from the glare of the adjacent street lights. Enclosed are copies of two of the letters we exchanged. I have not had a reply to my last letter, of 15th March.

Would it be possible to have a talk to you about the Borough's policy on implementing the implications of the House of Commons Science and Technology Committee Report of October, 2003 and section 102 of the Clean Neighbourhoods and Environment Act of 2005, which came into force on 6th April, 2006? As you are probably aware, many people, including astronomers both professional and amateur, are very concerned about the effects and the waste of badly designed public lighting polluting the skies.

For a town the size of Darlington, 18,000 street lamps are on for 4000 hours per year, consuming 11 million kilowatt-hours of electricity. Half to a third of this lights the sky. The savings in directing the light to where it is needed must be in the millions of pounds.

The local Astronomy Society has a presentation on light pollution, which they have given to Stockton Borough Council. Stockton are very sympathetic to amateur astronomers and are most co-operative in mitigating the effects of pollution and light trespass by street lighting. If you are interested and have the time, I could arrange a visit to Wynyard Planetarium in Thorpe Thewles to see this presentation.

Yours sincerely,"

The Councillor and I spent a morning at the Planetarium, where Jurgen and Ed gave Ian a tour of the facilities and Jurgen's excellent Powerpoint presentation on Light Pollution. Ian investigated and then contacted me, saying that he had had a conversation with Tom Russell, who was "intransigent". He then sent me copies of the following series of communications, with an added note to indicate that he thought it had been worthwhile..

"02 August, 2007.

Dear Mr Brownbridge, I hope that I am addressing the right person in writing to you. Mr Menarry, of Abbey Road in my ward, has been in touch with your office about light pollution from council street lights affecting his chosen interest of astronomy. I believe that you or a colleague has said there is no chance for the foreseeable future of replacing the lights which affect him but that you might install more appropriate lights in the normal pattern of replacement in many years time. Since Mr Menarry is an elderly gentleman, this is small consolation to him. I wonder if you are aware that Durham County Council area officials have agreed to paint out the edges of offending lights so that the road and footpath is unaffected but astronomers are able to enjoy their pastime. This is all that is required in Mr Menarry's case and could be arranged at no cost to the authority. I do hope that you will agree to this compromise, since it seems a matter of common sense and could be achieved in a few minutes by a man with a ladder. Since authorities are required by law to minimize light pollution, I hope to hear

positively from you. If you are not the officer who has been in correspondence with Mr Menarry please be kind enough to forward this email to whoever that person is.

Cllr Galletley”

“03 August 2007.

Cllr Galletley, This matter was handled by Tom Russell, Street Lighting Engineer, so I will forward your email onto him for you. Masking out the back of lanterns is ALWAYS the first choice for us, as like you say, it is a cheaper option than replacing columns/lanterns etc and we always try to accommodate residents requests if our street lights are shining through windows etc. However, only so much of the lantern can be masked out before the masking has a detrimental effect on the amount of light hitting roads and footpaths. Generally, only the rear of the lantern, to stop the light going back over, can be masked out. If the front of the lantern is masked the light will not reach the footpath on the other side of the road and if the sides are masked out then the light will not reach along the road to the next column and dark areas are introduced on the ground. I’m sure Tom considered this as the first option but there must have been a reason why it was not possible in this case. Like I said I am forwarding this to Tom for his consideration.

Best regards, Paul”

“06 August, 2007

Councillor, I wrote to Mr Menarry some six months ago, the gist of my reply being that I could not agree to reducing the levels of lighting, both on safety grounds and due to the cost implications. Mr Menarry requested five lights in total to be masked. I am still of the opinion that this is unreasonable and unfair to other road and footpath users. I am willing to compromise and mask out the two lanterns nearest to Mr Menarry’s yard and hope this will help improve the quality of his observations. I will arrange for this to be done in the near future, regretfully not with a man with a ladder, H&S dictates this is no longer an option.

Kind Regards, Tom”

“07 August, 2007

From Cllr Galletley to Tom Russell.

Thank you very much. I’m sure the compromise will satisfy Mr Menarry. No, I expect ladders are no longer possible- is it H and S or PC?

Ian G.”

I wrote the following in appreciation of the efforts Ian Galletley had made on my behalf.

“12 August, 2007

Dear Ian,

Light Nuisance at 23 Abbey Road

Many thanks for your efforts on my behalf. You unearthed the fact that the fitting of the standard masks, at the back of the lanterns, is a quick and cheap job. The two nearer lights were done in about ten minutes, once the order was given. The result of Mr Russell's reluctant, even petulant, knee-jerk reaction is that light number 4143 now has a back-shield, which has cut down on some of the glare. Light number 4144 has been fitted with a back reflector, which sends even more light nuisance into my garden – whether by intent or omission. The nett result is about zero, so Mr Russell has achieved his stated aim of doing nothing. You have also found that the standard shield can and will be fitted very easily if other residents find that street lights are causing a nuisance in their windows, which is worth knowing.

It was a surprise when I met a brick wall and was refused any direct communication or intelligent discussion, even though I suggested an exploratory meeting in my letter of 15th March, 2007. It has been interesting to watch the workings of Darlington Borough Council Public Service employees and their attitudes to the democratic process and the paying customer. If they have not found it possible to meet their statutory requirements of Section 102 of the Clean Neighbourhood and Environment Act, 2005, so be it. The contrast with other local Councils has been instructive. These events have provided me with material for an amusing article for the Astronomy Society magazine.

I don't think it is worth pursuing the matter further with the current personnel in charge. One very pleasant outcome has been to meet my very likeable Councillor (not counsellor!) and spend an enjoyable morning with you. If there is anything with which I can assist you in the future, I will be pleased to do so.

Yours sincerely,"

And that's where the matter stands. Maybe it is unreasonable to expect intelligent lighting in an urban situation in the modern world. The pollution comes from so many sources, including street and building lighting, as well as neighbour's uncurtained windows and "security" lights. Asking neighbours to reduce their pollution is not a viable option, I decided. Whenever Michael Gregory and I meet, we commiserate with one another about it all and threaten to "pack the whole thing in – it's just too difficult". But Michael goes on producing great observation reports and I go on buying more expensive astronomy gear! Are we barmy? No! Never! The sky is always worth marvelling at, even when the naked eye limit of visible magnitude is about 4, plus a ghastly yellow glow all around. Maybe pollution will be brought under control for future generations – who may or may not be in the slightest interested in double stars, eclipsing binaries and all the wonders of the skies.

Do you remember those far-off golden days when Council Officers used to sign off their letters as "Your obedient servant" - Editor

Early Telescope Observations Saturn: Lord of the Rings, Lord of the Skies

by Andy Fleming

If there is one celestial object that is both readily visible in even the worst light polluted skies, and yet full of the astronomical “wow” factor, it has to be Saturn, our solar system’s beautiful ringed gas giant planet.

For anyone new to telescopic observing (like myself), Saturn is usually an early and easy target. The planet has fascinated me for a long time, revealing an interesting bright disk when viewed through my 10x50 binoculars, but definite tantalising “handles” or “ears” when viewed with some old 12x50s - very much in accordance with Galileo’s findings in the early seventeenth century. It yearns for greater magnification...

The window to obtain a stunning view of this gaseous behemoth and its rings is rapidly closing, and it will be well worth making an effort before the end of July, while it graces our late evening skies in the constellation of Leo. Indeed, at present it is very easy to find, even by the naked eye, being the brightest object visible in that constellation at magnitude 0.7 (it outshines the constellation’s brightest star Regulus (a Leonis) at magnitude 1.3). Saturn’s rings are now closing, and for the next couple of years will become more or less edge-on from our perspective.

Saturn is like an old friend to me, both often gracing our skies and never failing to impress when other planets, like Mars, often fail. Having borrowed fellow member Alex’s 8.5” Newtonian reflector, and having had an hour observing the Moon, I simply couldn’t wait any longer to observe Saturn. Although I’d previously had some practice locating objects (including Saturn) in a very small and rather awful Bushnell reflector (far too small at 70mm aperture!) in early 2007, I was unprepared for my recent awesome views of the planet as revealed through a large, quality telescope with a sturdy mount.

Through a 26mm Plossl eyepiece, the planet is small, very bright, with clearly visible rings, and at least one of its family of moons is visible (Titan, of course). Using the x2 Barlow and Plossl, the whole system becomes much more striking, with another couple of specks of moons coming into view (Rhea, the planet’s second largest and Tethys). Saturn has a family of nearly sixty moons in tow, and to really enjoy this “mini solar system” it was time to put a 9mm eyepiece through its paces, when the Cassini Division and the A and B rings came clearly into view. Close inspection of the planet itself shows a slight shadow on the disc, cast by its beautiful ring system. There are a few cloud bandings visible on the planet’s disc – these bands however, are much less pronounced than those of Jupiter.

It is truly amazing to think, as you view the solar system's second largest planet that it is a staggering 1.3 billion kilometers away – indeed the light reaching your eyes from Saturn has taken over an hour and a half to reach Earth. It kind of gives you some idea of astronomical distances, as in cosmic terms, Saturn isn't even next door – it's in another room in our house!

Returning to its moons, the largest, Titan has already been visited by a robotic emissary from Earth, in the form of the ESA Huygens lander, which along with NASA's Cassini spacecraft has revealed an amazing world of orange skies, ice rock, mountains and possible liquid ethane lakes, that starting with the great Carl Sagan has fascinated astronomers for years. This enigmatic tiny little world appears to have a definite brownish hue through the telescope using the Barlow and 9mm eyepiece, due to its bizarre hydrocarbon atmosphere. Indeed, it is the only moon in the Solar system with a dense atmosphere (ten times as dense as that of the Earth) – a pre-biotic atmosphere of tholins in icy stasis – an almost Earth atmosphere, frozen in time before life got going.

Titan has weather too – it rains liquid ethane and methane on Titan – yes it's that cold! Observing Titan, you envisage those boulders and rocks of solid ice from the Huygens photographs, and you think about Cassini's scans of this tiny world. You suddenly realise Titan is not just a small disk in your telescope - it's a place - we've been to Titan!

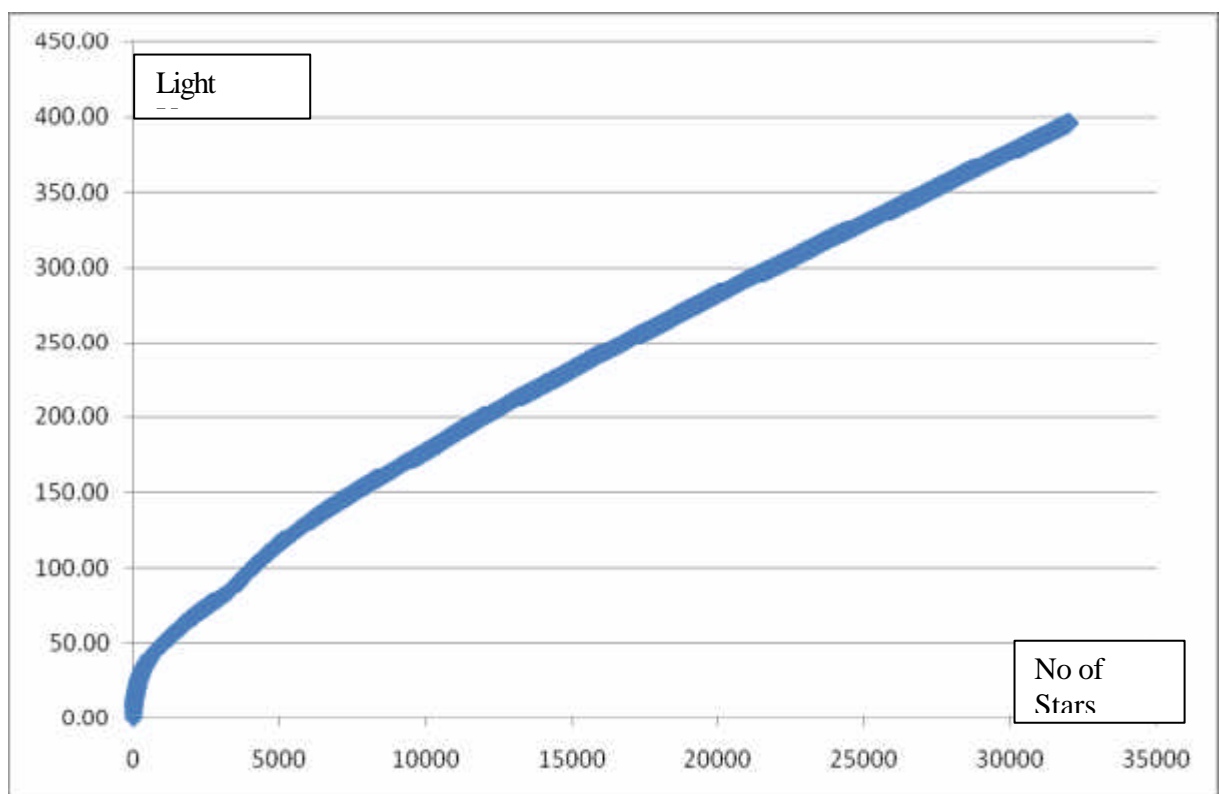
The air is starting to chill, but before I pack away the equipment, I observe other minute specks of light around Saturn. Averted vision shows them to be even brighter – they are more of Saturn's family of moons, including Rhea and Tethys again, and Dione and possibly Enceladus – the Ying Yang moon! I think of venting water and ice inhaled by Cassini, and I wonder how liquid water possibly exists within such a deep freeze as the Saturnian system. I think of Cassini's evidence for a deep subsurface water ocean on Titan, kept liquid by the immense gravitational tidal forces of Saturn. And I think how the Lord of the Rings has wonders aplenty to keep mankind fascinated for decades and centuries to come...

Nearby Stars

by Alex Menarry

My letter to the Editor last month brought some very helpful replies from several members – Ed, Bob, Rod, Rob – with excellent suggestions for tackling the problem. You may remember that it was difficult to find information on how many stars are within a reasonable distance to our Sun. For any chance of two-way contact with other civilisations, we need a large number to plug into Drake's Equation to produce a reasonable probability. I chose 50 light years as an arbitrary figure and was looking for a graph of distance against number of stars.

One very interesting web site Bob sent me was An Atlas of the Universe www.atlasoftheuniverse.com which had a link to The Astronomy Nexus <http://astronexus.com>. Both have data on the distance of stars, which allows a graph to be drawn. Surprisingly, I couldn't find anyone who had actually drawn such a graph. Surprise because I thought if I wanted to do it, thousands of others would have, too. Anyway, Rob had this great idea to download the Hipparcos catalogue data into a spreadsheet, from which graphs of various kinds can be drawn. Below is a graph using the full memory capacity of my Excel spreadsheet. Strangely, I had to delete very odd entries from Hipparcos, indicating negative parallaxes and other curious results. There is more to Hipparcos than just measuring parallaxes, apparently, which I must get to the bottom of, one day.



This graph unfortunately raises as many questions as it answers. Firstly, there are very few stars within 50 light years, so the conclusion is “forget the possibility of having a two-way conversation with another civilisation”. Secondly, the graph is not a cubic function. You would expect that the density of stars in our neighbourhood (up to 500 light years, anyway) would be roughly constant, resulting in the number increasing as the cube of distance. The beginning of the graph shows a sort of tendency for that shape but not very convincingly.

My conclusion for the shape of the graph is that there is something strange in the Hipparcos data. This will need a bit of further investigation and, if I find anything interesting, I will write it all down for an article. For now, I think Hipparcos is

limited in the magnitudes it observed – to mag 8? If this is so, then the number observed would fall off as the distance squared, resulting in a linear number against distance.

Things arising from all this: - 1) There is no graph on the web of number of stars against distance – why not? 2) The available data results in an unexpected and unexplained shape of graph. Any ideas on this would be welcome. 3) Data from The Atlas of the Universe and other sources do not match. 4) One source, I can't remember which, said that 90% of stars in our neighbourhood are red dwarfs (little chance of life around those!). 5) Oh dear, have I uncovered a subject which may take several lifetimes to solve?

A life Under the Stars Part 6

by David Blenkinsop

On 01 May 2008 the weather forecast looked promising for a night under the stars. I phoned Steve and Colin. We met and went to our observing site beyond Bishopton.

Steve and I had our 70mm refractor also my 10" Dobsonian.

The first object we looked at was ss Virgo, a carbon star, we like red stars!

I found NGC 2903 in Leo, it looked good and bright in the 10". We had a look at Saturn with my 70mm refractor using a 2X Barlow and a Meade 4000 15mm eyepiece just to see what the refractor can do. Steve was pleased with that image.

We had a look at M53, a Globular Cluster in Coma Berenices. It was just resolving at 210X, with a star a bit brighter than the rest on the north side.

I turned the telescope to epsilon Virgo then west to NGC 4754 and NGC 4762. The latter is a nice edge-on galaxy but it did need a bigger scope.

We looked at delta Corvus, an easy wide double, then three stars north east of delta Corvus is a group of stars someone named Stargate, then a thin Y shape on its side called Jaws. Near by is M104, the Sombrero Galaxy, good and bright. By now Lyra was high up, I pointed the scope at M57, the Ring Nebula, with 210X.

I also had a look at M3 with 210X, it was well resolved. Steve and Colin were in Colin's van for a rest and a talk so they missed that one. I went for M63, a galaxy

in Canes Venatici. It took me ages to find it and it was bright! We then had a look at M5, a Globular Cluster, it appeared well resolved.

At about 1.0 am Colin had to go home. Steve and I carried on viewing. I showed Steve M5 in the 10x50 binoculars. I found M56, another Globular. I often find this one difficult to find, I used 105x but was unable to resolve it.

We looked at the star map and decided to go for M10, this was probably the best I saw that night because I had not observed it before in a good dark sky. It was found with 80X and at high power, 160x or 210x it looked like an Open Cluster and not a Globular Cluster. Next I tried M12 but couldn't find it, I had better look on another night. We viewed Jupiter with the 10" and saw the moons and the belts, we also had a look with the refractor at 47x.

The telescopes had started to dew up so we had a rest in the car and then used a hair dryer that plugs into the car cigar lighter and demisted the refractor. We then tried M13 but couldn't resolve it into stars. The next object was a big star cluster IC 4665 near beta Ophiucus, it looked good with the 20mm eyepiece at 35x but not so good with the 40mm at 17.5x. We looked at 67, 68 and 70 Ophiucus, nice double stars and then another big Cluster NGC 6633, normally a binocular cluster of 30 stars we saw it through the 10" and also with the refractor. We had a look at Albireo in Cygnus with the refractor.

We had a look at the Teapot in Sagittarius with the 10x50 binoculars but could only see the top part above the horizon. We had a look at M92, another Globular with the 10" at high power, it looked great and also delta Scorpius , a wide double star. It was now 4.00 am and becoming light.

Its good to do an observing night with friends sharing the night sky and our telescopes..



David Blenkinsop

Transit Tailpieces

For Sale :

1) **Opticron 15x70mm binoculars, mint condition** http://www.binoculars-uk.co.uk/acatalog/opticron_Oregon_Observation.html

These binoculars are virtually brand new. Why am I selling? Unfortunately the eye relief is not sufficient enough for me to wear spectacles, and since I'm no longer considering laser correction, I can't use them. Make me an offer...

2) **Meade LX200 7inch maksutov.**

They don't make them like this anymore! A truly magnificent instrument, planetary viewing is spellbinding. I will be having the telescope refurbished before I sell it so it will be good as new. 20mm, 26mm and 32mm Meade Plossl eyepieces, electric focuser, flexible dewshield, field tripod.

Why am I selling? I don't want my kids learning their way around the sky from a computer, I have a larger Dobsonian and the Maksutov isn't being used as much. It deserves a good home where it will gather photons – not dust. Make me an offer... both above items available at :- darran.summerfield@ntlworld.com

Articles : Please send contributions for the newsletter to Bob Mullen,

18 Chandlers Ridge, Nunthorpe, Middlesbrough, TS7 0JL, 01642 324939
(b2mullen@hotmail.com) Copy deadline date is the 20th of each month.).

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A man and a woman go camping. They put up their tent and go to sleep.
A few hours later the man wakes the woman and says: Look up at the sky, what do you see?
She says: I see a million stars.
He: And what does that tell you?
She: Well, astronomically it tells me that there are millions of undiscovered worlds and planets out there! Astrologically it tells me that Saturn is in the sign of the lion! Meteorologically it tells me that we will have a very nice day tomorrow! Timewise it tells me that it's about 3.15 am! Theologically it tells me that that God is almighty and we are unworthy! And what does it tell you?
He is quiet for a moment and then says: Well, practically it tells me that someone has nicked our tent...

For Sale : from Mark Dubbleadam, Durham University

Due to a recent serious attack of upgrade fever, I have for sale the following items:

- **Celestron C5 Schmidt Cassegrain Optical Tube Assembly (OTA): D = 127 mm (5 inch), F/10 (i.e. F = 1270 mm).**

This is the old-style orange tube variety which I believe is far superior (with the exception of perhaps the coatings) to anything that has recently been produced by Celestron.

Optically and mechanically in good condition; cosmetically the tube looks a bit tatty due to a sticky label which was attached to the tube and didn't peel off cleanly.

This can probably be cleaned off quite easily, however it doesn't affect the scope's performance so I never bothered.

The OTA comes with the original 5 x 25 finderscope, and a piggy-back bracket for mounting e.g. a camera. No tube rings are included; I used the camera mounting bracket to attach the scope to the mount, which was good enough for visual use.

There is no dew shield, and the original visual back has gone missing. I replaced this by a custom made adaptor (supplied, however needs blackening) which screws onto the standard SCT thread and accepts 24.5 mm accessories.

However, the scope would benefit from a decent 2 inch SCT diagonal, which can be found quite cheaply nowadays.

Price: £ 175 + 15 P&P.

- **Custom built achromatic refractor: D = 76.2 mm (3 inch), F/4.725 (i.e. F = 360 mm).**

This telescope uses a fully coated Melles Griot industrial grade lens in a package which is similar to the various (e.g. SkyWatcher, Helios, etc.) Chinese short-tube refractors which flood the market these days. The lens cell has been threaded and blackened, and the tube and draw tube are fully baffled to minimise stray light. The draw tube was shortened to prevent vignetting. All in all a decent scope giving pleasant low-power views, but the visual appearance of the tube has been affected by a painting flaw. However, this is purely cosmetic and doesn't affect the performance. Complete with tube rings and 1¼ inch diagonal.

Price: £ 65 + 15 P&P.

- **SkyView DeLuxe Mount.**

Equatorial mount with single (RA) axis motor drive. Similar to the well-known EQ-3 mount. Complete with aluminium tripod, polar finder scope and counter weight.

Price: £ 95 + 25 P&P.

- **EQ-5 / CG4 Mount.**

Equatorial mount with single (RA) axis motor drive. Complete with aluminium tripod, polar finder scope and counter weight. One of the tripod legs is damaged (i.e. the clamp which fixes the legs when extended is broken) which happened before when I bought the mount. However, this never bothered me as I always used the mount on a Meade Field Tripod.

Price: £ 135 + 30 P&P.

- **Meade Giant Field Tripod.**

As supplied with the 12" and 14" LX200 models. This is a HUGE tripod with 3 inch stainless steel legs providing a rock-steady base for any mount.

These tripods are currently being advertised for £ 750 by Green Witch.


I will ship, but please bear in mind that the cost of shipping may be very high.

Sensible offers will be considered.

Contact [Ir. C.M. Dubbeldam](mailto:c.m.dubbeldam@durham.ac.uk) at c.m.dubbeldam@durham.ac.uk

And now, here's the weather report from the Phoenix landing site on Sol 2: check NASA site for updates

MARS WEATHER REPORT – SOL 2



Sunny with dust activity


PRESSURE:
8.5 millibars / 0.1 psi

WIND:
No wind measurements today

VISIBILITY:
Moderate (Optical depth ~0.5)

MAX
-30 °C / -22 °F

MIN
-80 °C / -112 °F



Skies were clear and sunny on Sol 2 on Mars. The temperature varied between minus 112 degrees Fahrenheit in the early morning and minus 22 degrees Fahrenheit in the afternoon. The average pressure was 8.55 millibars, which is less than a 1/100th of the sea level pressure on Earth.

The weather station was activated in the first hour after Phoenix landed on Mars. Measurements are being recorded continuously.

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