



TRANSIT

The Newsletter of



05 June 2006



73/P Schwassman Wachmann 3, components b and c

Taken by Jurgen Schmolll on his telescope "Mrs Parsons",
34 x 30-sec exposures on component C, 41 at B.

(more about Jurgen's images in the Letters section)

Editorial

12 May

“Strings and Things” by Lyn Smith and Hazel Collett of York A.S.

What appeared to start off as a vaudeville act by these two accomplished ladies turned into a well presented tour de force of modern cosmology. Whichever side of the fence you belong on over the increasingly more bewildering theories of the Universe beginning and its eventual end it was a very entertaining and educating evening.

09 June

“Remotely Operated Telescopes” by our own Dr. John McCue FRAS, Honorary Vice-President of CaDAS

Letters to the Editor :

Any new observations, any comments on local or international astronomy, anything you want to share with your fellow members?

- *A note from Jurgen on his Schwassmann-Wachmann images (front page).*

Dear all,

Yesterday it cleared up in Durham after a rather rainy day. So I went out to my self-made Newtonian LAN ("Large Newtonian", 257/1140mm) waiting in the shed. Unfortunately the mount is in difficulty after not using it for a long time. I need some Teflon to fix it. Hence, “Mrs Parsons” (Skywatcher-Newtonian 200/1000mm, Coma-Corrector, EOS 300 D at 800 ISO, driven on GPDx mount) had the task to do the photography bit. How much time I had ! The dusk seems to take ages here in the North-East !

In the mean time I aligned the optics of the LAN. I started this job 4 years ago in Germany, I was eventually stopped by clouds. Yesterday I finished off the 4-year-alignment! The mount jumps awfully. A friction pad went hard, I have to replace this by Teflon.

Finally it is dark enough! I start with my Bresser Corvette 7x50, and Schwassmann-Wachmann C is relatively easy. I pointed “Mrs Parsons” to it and started to take 34 exposures of 30 seconds each. I aimed the LAN at it (not without stopping at M13, at x 325, aaaah ...), the comet was much brighter than a week ago, with a significant tail. The core is not star-like, rather a tiny disk.

Component B was not really visible in the Binoculars. There was something, but lots of faint stars as well. I found it with LAN and a bit of erratic survey techniques that are

highly non-professional. B is much fainter, the tail just recognisable. But no sign of any split, even with the Speers-Waler 5-8 mm (143 to 228x). I pointed "Mrs Parsons" at it, 41 x 30-sec. In between I enjoyed NGC2903, M51, M57. Not before burning my eyes on the moon, which cost me at least 10 minutes of re-adaptation !!!

Finally Jupiter - the main cloud stripes quite detailed for that low position in the sky ... 3 moons, but oops, a fourth coming just out of the disk. Beautiful ! Here now the images of Schwassmann Wachmann b and c component, stacked by REGISTAX, then fine-tuned with Photoshop elements.

Enjoy ! Jurgen.

-----OOOOOOOOOOOOOO-----

I was re-reading the chapters for the proposed CaDAS book on a cold wet evening and came across Darran's account of the 2001 Leonid storm. Like all memorable incidents in life I bet we can all remember our own Leonid story at that time. Darran's story was so good I hope he doesn't mind me publishing it in Transit before it eventually enters the annals of our proposed book. Because of the Leonid storm 33 year cycle it will be the responsibility of a future generation to record their own experience of the next storm. Does anyone have their own 1999 - 2001 experiences they would be willing to share with us?

- Editor

My story of the 2001 Leonid Storm

from Darran Summerfield

Almost all of my astronomical life I've wanted to see a Meteor Storm, perhaps one of nature's rarest truly spectacular spectacles. I can remember reading my 1977 Yearbook of Astronomy when I was eight, wondering if I would get to see one in 1999. As it turned out, there were predicted to be several opportunities to see a storm centred around the 1998 return of Comet Temple-Tuttle, and what was more, for the first time astronomers were able to accurately predict when these storms would occur. I missed the first couple of opportunities due to bad weather and being in the wrong place at the wrong time. This made me absolutely determined not to miss the best storm chance of the entire cycle. The only problem was the optimum viewing longitude was centred on East Asia.

Fortunately I'm blessed with an understanding wife who gave me her support for the whole adventure. I spent a long time researching the event, and eventually narrowed the location down to either the Gobi Desert or the Australian Outback. In the end there was actually only one realistic choice. Ulaan Baatar, the capital of Mongolia is usually snow bound in November, with average temperatures that hover somewhere around minus twenty. The Outback was therefore going to be my destination. Australia was more expensive and difficult to get to, but it afforded me the best chance of success. Once I'd

settled on the country, I undertook further research to decide the actual location for my final destination - Alice Springs in the middle of the Australian Outback. Although this wasn't actually the optimum location in Australia, it did give me the flexibility to be able to drive North or South to search for clear skies should that need have arisen.

After literally months of planning I started organising things about a year before the event. My original plan was to fly to Alice Springs and fly out again twelve hours later. The reason for such a brief visit being due to the fact that we assumed my wife would be pregnant with our second child at the time, so I didn't want to be away from home any longer than necessary. Unfortunately I missed the optimum booking and had to settle for a return flight the following day instead. As it turned out the whole trip nearly got cancelled anyway when it worked out that my wife was actually going to be eight months pregnant when I was due to go. We debated the issue right up until the very day I departed. In the end I got a 'go for launch' from maternity control and I was off on my astronomical trip of a lifetime.

On Friday the 16th November at 6 o'clock in the evening I departed for Australia.

A 1-hour flight to London, then a 2-hour wait. A 12-hour flight to Kuala Lumpur and a 4 hour wait. Then a 5-hour flight to Perth and a 10-hour wait, and finally a 3-hour flight to Alice Springs. The 36-hour journey was quite nerve wracking. My primary concern was that my baby might decide to be born early. It was also only 10 weeks after the attacks on the World Trade Centre, Deep Vein Thrombosis was big news and of course to top it all there was the issue of timing. If I missed a flight or there was a delay then there was a chance I might miss the whole show.

Since I was going, literally on a flying visit, I was travelling very lightly. Although in actual fact my luggage was far from light because along with a change of clothes, it contained my camera equipment and a camp bed ! Travelling with such a heavy burden for such a long way for such a short time did elicit some odd questions from the airport staff I met on my journey. Except that is, for the people I met in Australia, who were obviously getting accustomed to astronomers flying in to see the storm. However, they were impressed that I'd travelled all the way from England.

Sunday 18th November (Australia Time) I thankfully arrived in Alice Springs without incident. I got a taxi straight from the airport and I collected my hire car, picked up some food and drove about 10 miles out of town to a local tourist spot called Simpson's Gap. It was evening time and the wonderfully clear blue sky was already darkening. Despite being free from weather clouds, the air was not free from mosquito clouds, as I stepped out of the car to my utter dismay I then realised that despite my exhaustive planning I'd forgotten to bring insect repellent. For a few hours I happily enjoyed gazing at the stars of the Southern Hemisphere and practising my swatting. I had seen the same sky when honeymooning at Ayres Rock five years previously. Despite this earlier introduction, I still found the view confusing, the unfamiliar constellations and familiar but upside down patterns wheeled through the northern sky, apparently going backwards. It was quite a strange experience lying under an alien sky all alone, with only the bizarre noises of the local wildlife to keep me company, I was excited and very apprehensive at the same time.

At midnight (now Monday 19th Australia time), I set up my camp bed and camera. Thankfully by now the insects had decided to quit for the night and left me undisturbed. At home the Leo radiant rises at about midnight, so I was all ready for the action to begin, but nothing happened for the next hour and a half. Nervously I took a few practice photographs and noted a dozen or so sporadic meteors. Somewhere in the back of my mind the seed of doubt began to grow that nothing was going to happen. I had actually forgotten to find out one vital fact, when exactly the Leonid radiant would rise from this location, so I wasn't sure when the show would start. By 1:20 in the morning I was getting worried that I'd travelled to the other side of the world for nothing.

Then at 1:24 I saw my first Leonid. I've seen many Leonids over the years, they are characteristically bright and fast. However, this first Leonid was a real surprise. It slowly, almost gracefully, traversed the entire sky, a bright, magnitude zero, yellow orange teardrop leading a blue smoke like trail. It was going so slowly that it lasted more than six or seven seconds from start to finish and had literally travelled from one side of the sky to the other. A few seconds later there was another, and then more, and at one point 3 of these wonderful meteors were fanning out across the sky at the same time. It was a magical sight that reminded me of how I'd imagined the arrival of the Martians the first time I'd read 'The War of the Worlds'. These were Earth skimming meteors, their tangential paths just brushing the tenuous outer atmosphere. It was an utterly spellbinding sight. At that moment, I knew that the 2001 Leonid storm was going to happen and I was going to see it. To say I was relieved was a bit of an understatement!

After 40 minutes or so the Leonids started taking on a more normal appearance as the radiant climbed higher above the horizon. All the time I made notes and I continued to take photographs with exposures ranging from one to ten minutes. From 2:00 to about 3:30 the rate of meteors gradually increased. Between 3:30 and 4:00 the meteors literally came in a torrent. During a 2 minute period I counted at least 50 meteors. Brief moments when the sky was quiet were few and far between. Often there was more than one meteor in the sky at the same time and at one point I counted 7 meteors appearing simultaneously. My favourite was a magnitude -4 fireball that sliced right through the centre of the Southern Cross. The radiant was very apparent with shooting stars fanning from it in all directions. Turning around I could see the streaking meteors converging towards the anti-radiant on the other side of the sky, something I had never seen before. For nearly the next hour the sky continued to rain meteors, it was quite an unbelievable sight.

After 4:00 morning twilight began to interfere, at 4:45 I stopped recording but I still watched the occasional brighter one appear in the blue sky. In just over three hours and I had seen well over 1250 meteors, 28 of which I classed as fireballs (i.e. brighter than Jupiter). Until that night, I had only ever seen 2 fireballs in over 25 years of being an amateur astronomer. I would guess that the maximum Zenith hourly rate was about 4000 just before 4:00.

It was a magnificent and moving spectacle that I will never forget.

The return trip was similarly long and when I arrived back home I was very relieved to see that my wife was still keeping the baby warm. As for my photographs, sadly unbeknown to me, my camera had malfunctioned and I lost all of them. Although this was very disappointing I had still managed to achieve my primary objective, which is something I will take great pleasure telling my future great grandchildren about.

-----OOOOOOOOOOOO-----

Understanding the Ecliptic and the Zodiac

from Joe Rao

Of the imaginary coordinate lines that astronomers and navigators use in mapping the sky, perhaps the most important one is the ecliptic, the apparent path the Sun appears to take through the sky as a result of the Earth's revolution around it.

Because of the Earth's yearly revolution around the Sun, the Sun appears to move in its annual journey through the heavens with the ecliptic as its path. Technically then, the ecliptic represents the extension or projection of the plane of the Earth's orbit out towards the sky.

But since the Moon and planets also move in orbits whose planes do not differ greatly from that of the Earth's orbit, these bodies, when visible in our sky, always stay relatively close to the ecliptic line. Our solar system can be thought of as somewhat flat, with most of the planets (the exception being Pluto) moving in very nearly the same plane.

It is for this reason that most sky charts plot the position of the ecliptic; it is something of a warning to skywatchers that strange "stars" (planets) often appear near and along this path through our heavens, as well as the Moon. Usually the Moon and planets are not positioned exactly on the ecliptic (because they're not located exactly in the same orbital plane as Earth), but lie within several degrees of it and form a sort of narrow strip encompassing the entire sky which we call the Zodiac.

The ecliptic runs exactly along the middle of the Zodiac.

Twelve constellations through which the ecliptic passes form the Zodiac. The name is derived from the Greek, meaning "animal circle," also related to the word "zoo," and it comes from the fact that most of these constellations are named for animals, such as Leo, the Lion, Taurus, the Bull and Cancer, the Crab. These names, readily identifiable on sky charts, are familiar to millions of horoscope users (many of whom, ironically, would be hard pressed to find them in the actual sky).

If we could see the stars in the daytime, we would see the Sun slowly wander from one constellation of the Zodiac to the next, making one complete circle around the sky in one year.

Ancient astrologers were able to figure out where the Sun was on the Zodiac by noting which is the last constellation of the Zodiac to rise ahead of the Sun, or the first to set after it. Obviously, the Sun had to be somewhere in between. As such, each month a specific constellation was conferred the title of "House of the Sun," and in this manner each month-long period of the year was given its "sign of the Zodiac."

Interestingly, the "sign" which has been assigned for a given month in the horoscope that you'll find in your daily newspaper is not where the Sun actually is that particular month, but *where it would have been* thousands of years ago! This is due to the "wobble" of the Earth's axis (known as precession) which alters the direction in the sky to which the North Pole points, also changing over time the relative positions of all the stars. Yet today's astrologers, who believe that the Sun, Moon and planets mysteriously direct our lives, continue to adhere to star positions that for all intents and purposes are out of date by thousands of years.

The ecliptic also passes through the constellation of Ophiuchus, which is not included among the so-called signs of the Zodiac. In fact, the Sun spends more time traversing through Ophiuchus than nearby Scorpius. During 2003, the Sun officially resides in Scorpius for less than a week: from Nov. 23-29. It then moves into Ophiuchus on Nov. 30 and remains within its boundaries for more than two weeks -- until Dec. 17. Yet the Serpent Holder is not considered a member of the Zodiac and so must defer to Scorpius.

In addition, because the Moon and planets are often positioned either just to the north or south of the ecliptic, it allows them to sometimes appear within the boundaries of several other non-zodiacal star patterns. For instance: from May 15 through June 5 of 2003, the planet Saturn will officially be within the boundaries of Orion, (passing across the Hunter's club). Other constellations that can be visited by the Moon and planets include Auriga, the Charioteer, Cetus, the Whale, and Sextans, the Sextant.

Because the Moon's orbit is inclined 5 degrees to the Earth's orbital plane, periodically it crosses over the ecliptic. Should this happen when the Moon is at new phase -- positioned between Earth and the Sun -- it will cross directly in front of the Sun causing a solar eclipse.

If the Moon crosses over the ecliptic when the Moon is at Full phase, while it is opposite the Earth in relation to the Sun, it will pass into the shadow of the Earth resulting in a lunar eclipse.

Usually when the New Moon is in the vicinity of the Sun it appears to pass above or below it and no eclipse occurs. Similarly, the Full Moon usually misses the Earth's shadow by sweeping above or below it. Only when all three bodies (Sun, Earth and Moon) are on a straight line occupying the plane of the ecliptic can an eclipse occur. Hence the name ecliptic (the place where eclipses occur).

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A total solar eclipse in the Sahara

from Rod Cuff

My partner Brenda and I experienced our first total solar eclipse in Mozambique on 2001 June 21 – Brenda’s birthday (thank you, Solar System). This magical event left me wanting to see another one whenever the chance arose – so we ended up on March 29 this year (as did Juliet and Stephen Goudge from CaDAS) 50 km from the oasis settlement of Jalu in the Libyan Sahara.

Why Libya and not Turkey, as most eclipse-chasers seem to have visited this time? Several reasons, the most compelling being that climatic conditions virtually guaranteed no cloud in that part of Libya (I hadn’t considered sandstorms! Fortunately all was calm on the day), whereas there was said to be a 40% chance of cloud along the Turkish sector of the path of totality. In the event, of course, watchers in Turkey had a perfect view too – but we could revel in a full 4 mins 2 secs of totality, close to the maximum for this eclipse: another reason for choosing Libya.

And then there was the romance of the thing: not only did it feel (in prospect ...) peculiarly satisfying to go to ‘the ends of the earth’ for such an experience, but there was also the attraction of the rest of the package put together by the Explorers travel company. We were based on a Greek cruise ship, the M.V. *Perla*, which took us from Heraklion in Crete to Benghazi and Tripoli in Libya, and on to the volcanic island of Santorini before arriving in Piraeus, the port of Athens. On the way we were to have trips by coach to the ruins of Knossos, Cyrene and Leptis Magna, ending up with a lightning (literally – it thundered) visit to the Acropolis of Athens.

So how did it all go? Well, the eclipse itself was everything one could ever have wished. Seasoned observers of many eclipses said it was one of the best they’d experienced, not least because just about every hoped-for phenomenon duly pitched up. The viewing site was perfect – completely flat for miles around, with a base of firm, neutral-colour sand. These two aspects led directly to a couple of observations that weren’t possible on our Mozambique trip. We saw magnificent shadow bands on the sand in the last minute or so before totality – clear bands of light and dark, less than a foot apart, moving rapidly across the expanse of the desert at our feet, from the direction from which the Moon’s shadow was rushing towards us. Moreover, they *wiggled* along their lengths, like an army of snakes rushing by: I was just open-mouthed. The bands are an interference phenomenon caused by the thin crescent of sunlight being refracted through the turmoil of the atmosphere just above ground level – see www.strickling.net/shadowbands.htm for more about this.

The second plus about the location was that during totality we could look around the entire 360° horizon and see an unbroken ring of the extraordinary orange light refracted from areas just beyond the umbra, like an unearthly all-round sunset and contrasting with the dark blue of the umbra in the atmosphere itself.

I caught only a short glimpse of Baily's Beads at second contact, as I was so distracted by the shadow bands. But as they winked out, to a growing roar of excitement from the several thousand Libyans and foreign visitors spread over a couple of kilometres of sand, a seriously beautiful solar corona appeared in an instant, just as if a switch had been thrown. One moment it's a weird light all around and a tiny, dazzling point of light in the sky; the next, this extraordinary sight leaps out, unlike anything else anywhere. The 2001 corona, not far from solar maximum, was fine enough, but this solar-minimum example was beautifully symmetrical, with lengthy equatorial streamers extending for several solar radii on either side, and with filigree-detailed lines emanating from the solar magnetic poles. This level of detail isn't fully picked up in even the best photographs.

The Moon was moving from 4 o'clock on the Sun's face to 10 o'clock, so the first prominences to be seen were those in the 9-12 o'clock region – several deep red/purple 'flames' extending beyond the dark disk, a beautifully satisfying sight in binoculars. As the eclipse progressed, these were overlaid by the Moon, but a new set was uncovered in the 2-5 o'clock region.

There is so much to look at and to take in in such a short time, and there's almost a sense of panic as you become aware that the area around the trailing edge of the Moon is getting brighter – totality is nearly over. But one more stunning sight remains: as the first point of the Sun's photosphere strikes through a lunar valley and strikes your dark-adapted eye, the dazzling diamond-ring effect hits you with full force. Absurdly, but quite spontaneously, we and the others around us burst into applause as the Sun reappeared. I'm told the shadow bands reappeared too, but by that stage I was watching the light-levels change all around us – less dramatic, though, than the precipitous plunge when totality was about to start.

It was all over. There's no denying that post-totality is a definite downer, though the pleasure then is in sharing the excitement and comments with other watchers – and vowing to catch another total eclipse *soon*.

So, a great experience, and one that spawned many excellent photos, videos and scientific observations from the experienced and not so experienced people on our trip. Dr John Mason (BAA Public Relations Officer) masterminded a computer slide show of some of the best of them a couple of days later back at the ship. One that particularly struck me was an exposure showing Earthshine on the Moon during totality, a tour de force that enabled the principal maria to be picked out easily. Many of these recordings, along with others from watchers in Turkey, are being compiled onto a DVD to be sold through the BAA website (see <http://britastro.org/baa/content/view/82/2>). There is a nice coverage, too, at http://skyandtelescope.com/observing/objects/eclipses/article_1706_1.asp, from a *Sky & Telescope* group who were also near our viewing area, which had been impressively fashioned out of nothing by the Libyan Ministry of Tourism.

I won't dwell too much on the (non-astronomical) downside aspects of the trip, reserving most of them for a letter to Explorers. The chartered ship was excellent, but once we were on shore, Explorers' arrangement seemed to dissolve. Moving 500-750 people around in coaches when arrangements with the Libyan police were inadequate resulted in a string of bad experiences. We were convoyed everywhere by the police, with mysterious halts

for no obvious reason and ludicrously prolonged refuelling stops. Most coaches had been procured in (and driven from) Cairo with non-local drivers; had no on-board Explorers person; had a local guide with very poor English (so communication within the convoy was non-existent); and had no working loo. In one 48-hour period, which included the return desert trip of over 1,000 km in total, we spent 24 hours on coaches. When I related this to a friend back in the UK, he summed it up very nicely if a little inaccurately:

“Rod had seen quite sufficient of Mars.
He set off on a trip to Benghazi.
To see the eclipse,
But one of the trips
Was 24 hours without a khazi!”

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Uncovered crater solves mystery

from Laura Layton

Discovery of the Kebira impact crater confirms silica glass strewn over southwestern Egypt formed when a meteor collided with Earth millions of years ago.

Scientists combing through satellite images of Egypt's Western Desert made a surprising discovery: the largest impact crater found to date in the Sahara. The find confirms what many scientists have suspected for the last 75 years — a meteorite more than half a mile (1.2 kilometers) wide struck southwestern Egypt's vast sea of shifting sand dunes tens of millions of years ago.

Farouk El-Baz, director of Boston University's (BU) Center for Remote Sensing, named the double-ring impact crater Kebira, the Arabic word for "large." The name also refers to the crater's Gilf Kebir region location. The crater El-Baz and his BU colleague Eman Ghoneim found is 19 miles (31 km) in diameter. "Kebira may have escaped recognition because it is so large — equivalent to the total expanse of the Cairo urban region from its airport in the northeast to the pyramids of Giza in the southwest," says El-Baz.

Kebira dwarfs 0.7-mile-wide (1.2 km) Meteor Crater in Arizona; Kebira is more than 25 times Meteor Crater's width. The chunk of rock that carved Kebira out of desert sandstone was likely larger than the whole of Meteor Crater.

Wind and water also helped obscure the crater's features. "The courses of two ancient rivers run through it from the east and west," says Ghoneim. However, scientists suspected an impact had occurred in the region long before Kebira was discovered. Fragments of yellow-green silica glass found strewn across the desert floor, called Desert

Glass, suggested an impact took place sometime in the past. High temperatures, like those produced during an asteroid impact, transform sand to silica glass. An examination of images snapped from a satellite's vantage point revealed the crater.

Kebira is the largest impact crater found to date in the Sahara Desert, but at least 20 other impact craters on Earth are even bigger. The three largest are Chicxulub Crater in Mexico's Yucatan at 112 miles (180 km) wide; Sudbury Crater in Ontario, Canada, at 155 miles (250 km) in diameter; and South Africa's enormous Vredefort Crater, which spans 186 miles (300 km) rim to rim.

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Its all in the exposure settings

from Bob Mullen

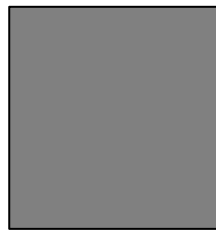
Having rubbed shoulders with some of the leading members of the PPPC, the "Pretty Planetary Picture Club" and being left with the distinct impression the air they breathe is far too pure for the likes of me I decided to form a new astro- imaging club the FFFFC, the "Fab Fotos of Faint Fuzzies Club, with an initial membership of one.

Before venturing out into the Faint Fuzzie firmament I thought I would actually give the easier (?) Planets a try with my equipment just to rule out any obvious errors incurred by the usual beginners mistakes such as a) forgetting to insert the film (no easy-peasy CCD'ing for me thank you), b) leaving the lens cap on and c) the most likely error of choosing the wrong exposure setting.

On a clear and freezing night having a) forgot to put in the film and b) forgot to take off the lens cap I finally aimed my telescope/camera assembly at Saturn. Prior to attaching the camera I ensured I could see the Planet through the telescope. Below are the results for three exposure settings.



Saturn 1 sec.



Saturn 3 secs



Saturn 5 secs

I decided I had definitely taken the right decision not to pursue Planetary photography.

I now moved onto the more arcane techniques of capturing Faint Fuzzies.

Choosing a first Deep Sky object is always difficult. Should I stick to the popular Messier objects, go for the more difficult to remember NGC objects, try my hand at the galactic contents of the Virgo cluster or even pursue those astonishing-full-of-captivating-interest Open Clusters. I now realised what a difficult task I had set myself.

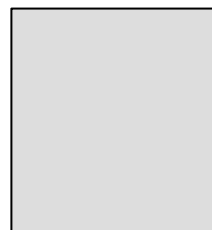
After a fruitless three-week period of telescopic searching for any Faint Fuzzie in a sky which was either covered in cloud or suffered the effects of a hitherto inconsequential Moon dominating all the faint photons incoming from the depths of space I finally lucked in with a clear sky. On a beautifully dark night with excellent seeing and stability I placed my telescope objective on the Orion Nebula – OK, no points for imagination or facing the challenge of a really difficult Deep Sky object - I captured the following images at the stated exposure times.



M42 10 secs



M42 20 secs



M42 30 secs

I seemed to have discovered a vague similarity between the problems facing both a Planetary imager and a Deep Sky imager.

Unfortunately over the last few days the clouds have re-gathered even obscuring the previous nuisance of the Moon so I have had very little chance to refine my techniques. In the meantime I have reverted to taking photographs of my family. Here below are recent images of the two grandchildren taken at different times of the day and with different exposure times.



Nevin at Alnwick Castle



Seth outside Edinburgh Station

I think its time to tell the world the acronym FFFFC is now available for re-use.

Tailpieces from John Crowther

The first super-intelligent machine that man invents will be the last invention he will be allowed to make.

Arthur C. Clarke, many years before inventing HAL in "2001"

There is no way in the Universe to get more bang for your buck than to take a particle and annihilate it with an antiparticle to produce pure radiation energy. It is the ultimate rocket-propulsion technology, and it will surely be used if we ever carry rockets to their logical extremes.

Lawrence M Krauss, "The Physics of Star Trek"

Every technological and scientific step undertaken now and in the future, no matter how seemingly trivial, is another mark on the road to practical interstellar flight. In fact, virtually the entire scientific-technological enterprise is already unwittingly contributing to the goal of starflight.

Eugene Mallove and Gregory Matloff, "The Starflight Handbook"

I have a dream that someday we'll build a telescope powerful to photograph the surface of an Earth-like planet, orbiting a distant star, with enough resolution to distinguish clouds, continents and oceans.

Dan Goldin, ex-Administrator of NASA

If we planted a living organism in a box... one could arrange that the organism, after an arbitrarily lengthy flight, could be returned to its original spot in a scarcely altered condition, while other organisms, which had remained in their original positions, had long since given way to new generations. In the moving box, the length of time the journey was a mere instant, provided the motion took place with approximately the speed of light.

Albert Einstein 1905.

(Ah! so that's what the Special Theory of Relativity was all about! So now I understand it – I don't think. Ed)

The Big Sleep

They made themselves air, into which they vanished.

William Shakespeare, "Macbeth"

I don't want to achieve mortality through my works, I want to achieve immortality through not dying.

Woody Allen (who else?)

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CaDAS Website Don't forget to visit our very own website at www.wynyard-planetarium.net.

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 25th of each month.

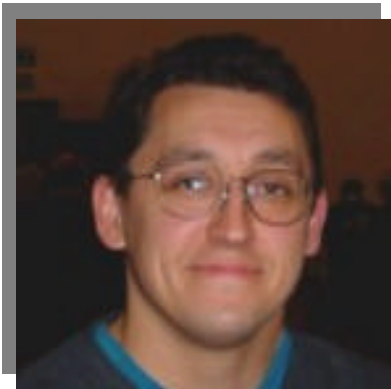
The Society Library – kept at the Planetarium – has a new copy of The Canopus Encyclopaedia of Astronomy. A superb book donated by the publisher to the Society. You can have your own copy for £25 if two or more CaDAS members place an order via the Society Treasurer Ian Miles. Why not pop into the Planetarium to view the book and obtain contact details for Ian.

There are three principal ways to spend money - they are wine, women and being an amateur astronomer. While the first two are very pleasant the third is by far the most certain – paraphrasing Lord Rothschild.

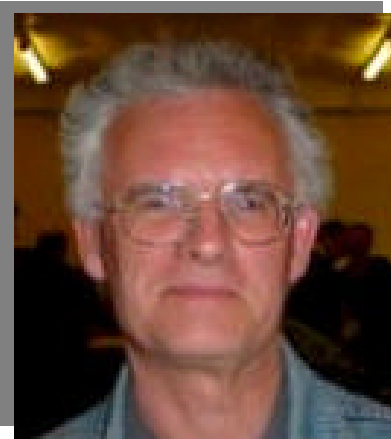
- *Editor*



Not quite what Darran saw in Oz – but it could have been!
(woodcut of a 19th Century Leonid storm)



Darran Summerfield



Rod Cuff