TAURANGA ASTRONOMICAL SOCIETY NEWSLETTER

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In This Issue:

July Meeting

The speaker for July's meeting was Andrew Walker who recounted the highlights of the RASNZ 2007 conference and the first Trans Tasman symposium on occultation timings.

Note: An occultation is when one body passes in front of another. Typically these events involve the moon blocking out a background star (Lunar Occulatation) or an asteroid blocking out a distant star (minor planet occultation). Sometimes the moon appears to pass a back ground star at the very edge of it's disk and the star appears to wink on and off as it's light is blocked by alternate mountains and hills on the moon (grazing Lunar occulation).

The conference was held from June 29 – July 2 at the Quality Inn on Great South road in Manukau, Auckland. This was the first time I had attended and did not really know what to expect. What I found was a nice mix of professional astronomers and academics as well as many other amateurs like myself from around the country.

The speakers were many and varied with presentations running for about 40 minutes. The over seas speakers included David Burnham from the John Hopkins Lab in the United States of America. Mr Burnham has been involved in the field of both lunar and minor planet occultations for many years. He was a founder of the International Occultation Timing Association (IOTA) and has been its president since formation in 1975. He spoke of IOTA and their work including his earliest experiences observing grazing lunar occulations. Also included in this presentation were details of his professional career including work on a number of NASA missions. These included the NEAR mission to the asteroid 433 Eros. When the first attempt to orbit the spacecraft around the asteroid failed in 1998 David and his team came up with corrections that could be made to the spacecrafts trajectory to allow it to attain orbit in 2000. This work led to the first time a successful orbit was achieved for a man made object around a minor planet. Once a stable orbit had been achieved around the 33km long asteroid the science mission proper began and much information was obtained. The mission drew to an end as the crafts fuel supply was used up. At this point it was decided to use the last of the fuel reserves in another first, landing a spacecraft on an asteroid. It is believed that this was achieved however communication with NEAR was lost as the spacecraft's antenna pointed away from Earth when it landed on 433 Eros.

Other missions he has had an involvement in includes the current STEREO mission that is monitoring the sun using almost identical space craft thousands of kilometres apart to produce three dimensional images of phenomena on the sun. See www.nasa.gov/mission_pages/stereo/main/index.html for updates on this mission and images they have sent back. They also have some fantastic video footage at the site. His team has also been involved with NASA's current MESSENGER mission to Mercury. This is the first mission to the innermost planet since the Mariner mission of the 1960's.

Another speaker from overseas was Australia's Munya Andrews. She is of aboriginal decent and spoke of astronomy from an indigenous people's perspective. Her recently published book "The Seven Sisters of the Pleiades" focuses on the Pleiades and how this open cluster features in the mythology of many peoples. She concentrated her presentation around the contents of her books and sparked a short debate with a slide that showed a "bear" chasing seven maidens, the bear in the slide had a tail, it was pointed out that bears do not

have tails. Someone else pointed out that Ursa Major is sometimes portrayed as having a tail. This debate made an interesting aside and I think Ursula's daughter had the right idea when she pointed out that a wolverine looks like a bear with a tail.

Also with an anthropological bent was the talk from Dr Paul Tapsell, who is the Director Maori, at the Auckland War Memorial Museum and is a senior lecturer at the University of Auckland. His presentation was centered on Captain Cook's first voyage to NZ and the role played by Tupia, a priest and navigator from Tahiti who came along for the voyage as part of Joseph Bank's entourage. Mr Tapsell explained that as a priest in Tahiti he would have learned how to navigate around the pacific using the position of certain stars as markers of location.

Carter observatory in Wellington was well represented with John Field giving a presentation on the education program carried out by the observatory. This included the purchase of a portable inflatable planaterium that uses a curved mirror and a laptop with projector to run various astronomy programs that can be delivered to students and the public.

Radio astronomy is alive and well in NZ with two speakers giving presentations on two separate programs currently underway. Tim Natusch from the Auckland University of Technology gave a presentation entitled "Radio Astronomy for the masses: Radio Jove". This is an international radio astronomy program co-ordinated by Nasa and run in our part of the world by AUT. It involves using lengths of cable to act as an antenna and an electronics package that is available for USD$100. AUT has used this system to detect solar flares as well as monitoring the radio output of Jupiter (hence the name).

Also from AUT is Sergei Gulyaev who discussed the recent purchased and future installation of a 12m radio telescope north of Auckland. Another similar instrument will be installed in Southland with the two working in unison on various projects. These will include some truly huge undertakings such as participating in the "Square Kilometer array" project and VLBI (Very Long Baseline Interferometer) project with radio astronomers from Australia and Japan.

There were many other speakers covering topics from preserving dark skies to photometry of over-contact eclipsing binary stars. It was great to soak in the atmosphere at this very interesting a friendly occasion. The next RASNZ conference will be held at Lake Tekapo in the South Island. Details can be found at www.rasnz.org.nz

Immediately after the conference the first trans tasman Symposiun on Occultations was held. This ran for a day and a half from Sunday afternoon through to Monday evening. The meeting was well attended with approximately a dozen people making the trip from Australia to attend.

A Lunar occultation is when the moon passes in front of a star as viewed from a point on the earth and a minor planet occultation is when an asteroid passes in front of a background star as viewed from a point on earth. By using video cameras attached to telescopes and a GPS time base, these events can be timed to a small fraction of a second. The video is then analysed on a computer to produce a light curve that can be used to further refine the orbit of the asteroid or give information about the background star. Binary asteroids were first discovered through this type of observation as well as the discovery of Pluto’s atmosphere. A large number of possible binary stars have also been discovered by observing the light curves as the star has been covered or uncovered by the moon.

This was a very hands on and practical symposium with all the big names in the science from Australasia there, as well as Dr David Dunham from the United States. Presentations were given by Kiwi and Australian Astronomers with the emphasis on the practical aspects of planning and making observations as well as analysing the data obtained.

I was amazed at the accuracy of the data obtained using relatively inexpensive equipment. The overriding

impression I got was that this was a great way for backyard astronomers to contribute to the science of astronomy without a huge investment of capital or time. It was clear that a lot of very clever people all contributed their time and skills for the benefit of the larger group and science.

Graham Blow from Wellington deserves much praise for running a very successful symposium enjoyed by all who attended. Anyone interested in getting involved or learning more should look at the Occultation Section of the Royal Astronomical Society of New Zealand's web site www.rasnz.org.nz

August Meeting

During the August meeting Roy Tallon (at left) gave a Power Point presentation on **Astrobiology.** He describes the presentation below.

The purpose of the talk was to give an overview of this huge subject, but mainly concentrating on the features required for a planet to be able to support "animal" life.

Origin of Life theories remain purely speculative, but serious research is probably only now beginning. That simple life arose quickly once the Heavy Bombardment period eased about 3.8 Billion years ago suggests that life could arise easily and therefore be ubiquitous in the Universe. The paradox is - why then is there no evidence that life arose more than once on Earth?

Extremophiles need to be highly adapted to cope with their extreme environments, suggesting that primitive organisms still needed a benign environment to originate in. However the genetic closeness of extremophiles to primitive organisms suggests that these adaptations developed quickly.

Recognition of the immense size of the universe led in the 1960's to the popular concept of the **Copernican Principle** - or Principle of Mediocrity - that there is nothing special about our planet, our sun, or our galaxy; and that life having arisen here is likely to be common in the universe. How justifiable is such a paradigm now?

The **Drake Equation** was developed to estimate the approximate number of advanced civilisations in our galaxy. Carl Sagan used this to propose that the Milky Way would be "pulsing and humming with advanced societies" - possibly millions of them. Current estimates of the probabilities of requisite factors reduce the outcome drastically.

Habitability Requirements.

A. Planet Factors.

1. Terrestrial Planet. Rather than a Gas or Ice Giant.

2. Water. In the right quantity. Stabilises climate. Water cycle.

3. Circumstellar Habitable Zone. In the "Continuous Habitable Zone".

4. Circular Orbit. To stay in the CHZ and avoid perturbations.

5. Moon. Large. Formation effects on Iron Core, Crust and Atmosphere.

6. Size of Planet. Gravity effects on Atmosphere and Land Elevation.

7. Plate Tectonics. Elevates mountains. Recycles CO2 etc. May be rare.

8. Atmosphere. Radiation and meteor protection. Right O2 levels.

9. Magnetosphere. Radiation protection. Convecting molten Fe core.

10. Rotational period. Moderate for Fe core convection and wind strength.

11. Stable Climate. Axis Tilt. Orbital rate. Air and ocean effects.

B. Associated Planets Factors.

1. Near-Circular Orbits. To avoid perturbation or collisions. May be rare.

2. Asteroid and Comet Factors. Early impacts supplied H2O.

3. Comet and Asteroid Scavenging by outer Gas Giants.

C. Host Star Factors.

1. Type, Size and Age similar to our G2V Sun. 1% of stars.

2. Red Dwarf M Stars excluded. Flare activity high. Close HZ. Tidal locking.

3. Binary System mostly excluded. Most larger stars are multiple.

4. "Metallicity" of Star. /// our sun. Excludes 1st and ?2nd generation stars.

D. Galaxy Factors.

1. Spiral Galaxies only. 5% of galaxies. Others old stars - low metallicity.

2. Galactic Habitable Zone. Midway out, between spiral arms.

3. Sizes of Galaxy and Galaxy Cluster. Moderate - to avoid high density effects.

In Conclusion - It is clear that many special features are required for a planet to be able to support animal life, and therefore the Copernican Principle is no longer a valid concept.

For many of the required factors their probabilities will remain rough estimates only for a number of years yet. Estimates have become more realistic than when the Drake Equation was first conceived with a much more conservative outcome. For example if 11 of the above factors had a probability of 1:10 then only one habitable planet could be expected in our Milky Way Galaxy.

Recognition of these limiting factors is starting to influence where SETI and Space Missions search for signs of life in our galaxy.

Recommended reading: **"Rare Earth" Peter Ward and Donald Brownlee.**

www.SPACE.com

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September Meeting

On Wednesday September 26 we were fortunate enough to have John Drummond as our guest speaker for the monthly meeting. The meeting had been advertised in local papers and a large crowd turned out including a contingent from Rotorua.

John is a well known and respected astrophotographer and runs the astrophotography section of the Royal Astronomical Society of New Zealand and is also an editor and regular contributor to the Australian Sky and Telescope magazine. John's talk was entitiled "Catching those faint photons" and covered building an observatory, getting started in astrophotography and also some more advanced aspects of the art.

Note: A photon is a particle that the eye sees as light. A CCD chip in a modern camera counts the number of photons hitting each pixel on the chip during a given exposure. It then assigns brightness to each pixel based on the number of photons hitting it. This data is used to form the image.

John does most of his astrophotography from his observatory on a small farm located on the outskirts of Gisborne. Known as "Possum Observatory", John gave a recount of the colourful history of this building and its instruments. Originally the observatory had been known as "Te Whare Whetu" or "The Star House" and had been built and used by Bill MacLachlan, a good friend of John's. It measured roughly 2 metres on each side and housed an 8 inch Schmitt Cassegrain telescope. The unusual thing about the observatory was that the whole building rotated on a 5 ft diameter ring allowing observers access to the entire sky. When the observatory passed to John it underwent quite a transformation. This was brought about due to the larger instrument it needed to house (a 16 inch Newtonian on a german equatorial mount) and the size of the new owner (John is a lot taller that the previous owner).

In 2000 with help from friends the observatory was rebuilt. The walls were extended to the new dimensions of 3.4 x 3.1 meters and the building was relocated to the back yard of John's mothers house in Gisborne. With the purchase of his rural property the observatory had to be moved again and with no room down the side of this mother's property a crane was used to lift the observatory over his mother's house! This must have been a hair raising few minutes and the photo of the observatory suspended over the family home was really impressive. From there it was onto the back of a truck and driven out to the new location.

Pictures were shown of the observatory at it's new location were there are dark skies and reasonably clear horizons. The property also features a large shed where John hosts meetings for fellow astrophotographers and a roll off roof observatory christened "Cockroach Observatory". Cockroach Observatory is set up for visual observing and houses a 16 inch Dobsonian telescope.

John started his astrophotography using a "box brownie" camera, a camera that was remembered by a number of the audience. He progressed to an Asahi Pentax SLR camera the moved on to the Canon 10D when Digital cameras revolutionised photography. His main camera on the telescope is an SBIG CCD. This is a dedicated astronomical CCD (charge couple device) camera with a large chip that can produce stunning images of faint galaxies, nebulae, clusters and stars.

The most basic form of astrophotography is done by simply placing a camera on a tripod and opening the shutter. Using a wide angle lens this can produce pleasing portraits of night time landscapes or constellations and the like. By varying the length of exposures images with pinpoint stars or "star trails" can be achieved.

To prevent the stars from trailing with longer exposures a way must be found to counter act the rotation of

the earth. This is done by attaching the camera to a telescope with a powered right ascension drive (either AC, battery or hand). An alternative method is to construct a purpose built platform such as a "barn door tracker". A camera with a standard lens mounted this way is able to take long exposures that allow the film or chip to pick up faint sky details and can make for some stunning images.

The natural progression from here is to ditch the lens and use the telescope in its place. This is called "prime focus" photography and puts some serious demands on the telescope, mount, drive, camera and the astrophotographer. Having said this John was keen to point out the basics are easy to pick up but the finer points of astrophotography may take a lifetime to master.

John showed us how he takes his images and explained how important it is to achieve a sharp focus. A slide was shown that explained why it is harder to get an exact focus with faster optical systems (those with lower focal ratios).

A few handy tools were explained to make focusing easier including using a photocopied ruler, a needle and "blue-tak" attached to the telescopes focuser to make exact focusing positions repeatable and accurate. A "Hartman mask" was another method explained that employs an aperture mask placed over the telescope tube with two smaller apertures in the front. When observed through the eyepiece two images appear and when these merge true focus has been achieved. The need for accurate tracking and how "auto guiding" works were also explained.

Filters allow light to be examined at different wave lengths. For example a Hydrogen Alpha filter blocks out all light except for a narrow band width within the electromagnetic spectrum that corresponds to the part of the spectrum (656.281 nanometres) that ionised Hydrogen emits light. John showed how images of the same object can be taken using filters then combined or "stacked" using a computer program to produce an image with more detail than the raw image alone.

The basics of image processing were explained along with slides that showed how an image taken with a cover over the telescope can show "hot pixels" and electronic "noise". These show up as spots of light on the image. This "dark frame" is electronically subtracted from the image taken to produce a shot free of these aberrations.

Stacking images together to bring out more details is another tool used by astrophotographers. This involves taking numerous short exposures of the same object then stacking them one on top of the other to produce a sharp image with all the detail available shown. The best thing about this is that only images taken during moments of good seeing can be selected for image processing. These techniques and technologies were unavailable to astrophotographers 15 years ago and today an amateur with a small scope and a digital SLR can take images that rival, and in some cases surpass, the best images taken with the largest telescopes a generation ago.

John’s presentation was well received by all present. It was a privilege to have someone with his knowledge and experience, share with us some of his expertise. Hopefully the seed has been sown to encourage a few more budding astrophographers to turn their cameras skyward.

Building a 10 inch telescope

By Andrew Walker

Before I completed this telescope last year, my primary instrument had been a 6 inch f9 Newtonian. This was a very good telescope with an excellent mirror that I had ground and polished in 2004. The thing was that I

wanted more aperture, and I was also looking for a new project. I decided to try my hand at a 10inch scope as I felt that it would give me a reasonable increase in aperture while hopefully not taxing my limited mirror making skills. I am very glad I did!

The first consideration after settling on a 10 inch aperture was what focal ratio? The focal ratio is the number of times the diameter of the objective mirror or lens in an optical system can be divided by the focal length and is expressed as an f# (for example a 200mm diameter mirror with a 1200 mm focal length is and f6 mirror). There is a lot to consider when answering this question. Firstly fast focal ratios (smaller f#) and short focal lengths make for nice compact telescopes. They are also harder to figure accurately, exhibit more coma (an aberration where off axis stars start to look like comets) and require larger secondary mirrors.

Larger secondary mirrors lead to lower contrast due to increased diffraction. Diffraction "washes" out the image and is caused by objects in the light path (secondary mirror and spider). The best way of thinking about this affect is to imagine light waves like waves on a lake. They travel in lines until they have to bend around an object. A small stick in the lake causes very little bending where as a thick post causes greater bending and disruption to the wave, The same thing happens to light as it makes it way past the secondary mirror and it's supports. Telescope making literature usually advises an obstruction of 20% by diameter or less, and 15% or less for those primarily interested in observing the planets, in order to obtain the most contrast as possible in the final image.

In slower systems coma all but disappears and smaller secondary mirrors can be used increasing contrast. On the down side the tube starts getting uncomfortably long (a 10inch f8 will have a tube 2 metres long). They can also get heavy and a ladder or stool may be required to reach the eyepiece when pointed at higher elevations.

For this reason I decided to aim for f6.5, this would give me a tube length around 1650mm long (being 180cm tall I would be able to view objects at the zenith without needing a step ladder). This focal ratio would mean I would be more likely to turn out a very good mirror and I could use a 40mm minor axis secondary mirror. This would give 16% obstruction by diameter. With the specifics of the mirror settled on, I set about making the primary mirror.

The mirror blank is a disk of 19mm plate glass (also known as float glass). These make excellent mirror blanks for smaller mirrors. The tool used to grind and smooth the mirror was made from plaster of paris sealed with epoxy resin and uses pieces of 10mm plate glass on top to act as a grinding surface.

The mirror was ground in the traditional manner using successively finer grades of silicon carbide from 80 down to 500 then finished off with 12 and 5 micron aluminium oxide. This involved mounting the tool securely on top of a cabinet, sprinkling abrasive and water on it then working the mirror on top until the correct depth is reached. By altering the length of stroke used and constantly walking around the tool a smooth and accurate surface is generated. Work continued on each grade until all the pits left from the previous grade had been removed. After finishing with the 5 micron the mirror was ready for polishing.

A second disk is cast in plaster and sealed. This is then coated in pitch made by melting pine rosin and adding Stockholm tar to temper. It is then moulded to the shape of the mirror and channels cut to allow the polishing compound to spread evenly. I used a very fine cerium oxide as the polishing compound. Polishing took around 20 hours though I am sure if I were to do it again this time would be dramatically reduced through better technique.

The project stalled for around a year as I moved from Auckland to Tauranga and work and family commitments meant I did not have as much free time as before. After moving once again, this time to a rural property in Te Puke, I had time to pick up where I had left off and to get on to the figuring of this mirror.

At the same time I started building the rest of the telescope. Jim generously gave me some old tube that had

been used to ship a microlight aircraft. This was 12 inches in diameter and made from cardboard. It was perfect for the job. This was sealed and painted. The inside was painted flat black with sawdust mixed into the paint. This gives a good rough surface that baffles the tube and prevents internal reflections. A standard Dobsonian mount was constructed and the tube was fitted with a 2 inch rack and pinion focuser and 60x11 straight through finder scope made from a broken pair of binoculars purchased on "Trade Me". The mirror cell was made from particle board and had 9 points of contact for the mirror made from foam rubber. The mirror is held around the edge by a strip of formica. Collimation is achieved through three bolts that attach the cell to the back of tube with three motorcycle valves springs and wing nuts.

Before figuring I had a basically spherical mirror with a few minor zones. The problem with a spherical mirror is that it will not bring star light to a sharp focus and must be polished into a very accurate parabola to function properly. Figuring took several months and was done in the laundry of our home. I used the 10inch diameter lap as well as a 4 inch star lap to figure the mirror. I used a light source and knife edge to make a very basic Foucault tester. Once the general parabolic figure was achieved and the surface was found to be smooth I tested the mirror by placing it in the telescope and studying the surface of the mirror with a Ronchi screen.

The telescope is aimed at a bright star so that when you look down the focuser you see the image of the primary mirror flooded with star light. You then place a screen made from fine wire (a Ronchi, pronounced Ron-Kee) in front of your eye. What you see is the mirror with a series of dark lines on its surface. Rack the focuser with the screen on it in or out until you are inside focus with around 5 lines on the mirror. You then study the lines. In a perfect parabolic mirror the lines will appear dead straight. It took many attempts to get the lines as straight as I could. I then turned the uncoated mirror on Saturn and was nearly bowled over by the beauty of the image on that night. I had never seen so many cloud bands on the disk and the Cassini division was nice and wide at 200x with pencil sharp edges. It also passed the very accurate "star test" showing only very minor differences between the inside and outside of focus images.

A fellow telescope maker in Christchurch kindly agreed to double check my mirror using several other test methods. It passed with flying colours (surface accurate to 1/16 wave). Shortly after this I sent the mirror off to Canterbury to be coated by Clive Row who lives outside of Christchurch. It came back with a nice aluminised surface and was placed in the scope and saw "First Light" on the next clear evening.

I used this scope for a few months and noticed that it occasionally showed signs of astigmatism (where stars look elongated). This had not been present in any tests prior to sending the mirror off for coating. I thought that my mirror cell might not be up to scratch so I rebuilt it with a 9 point floatation cell based on a design in Richard Berry's book "How to build a Telescope" (the Tauranga Library has a copy).

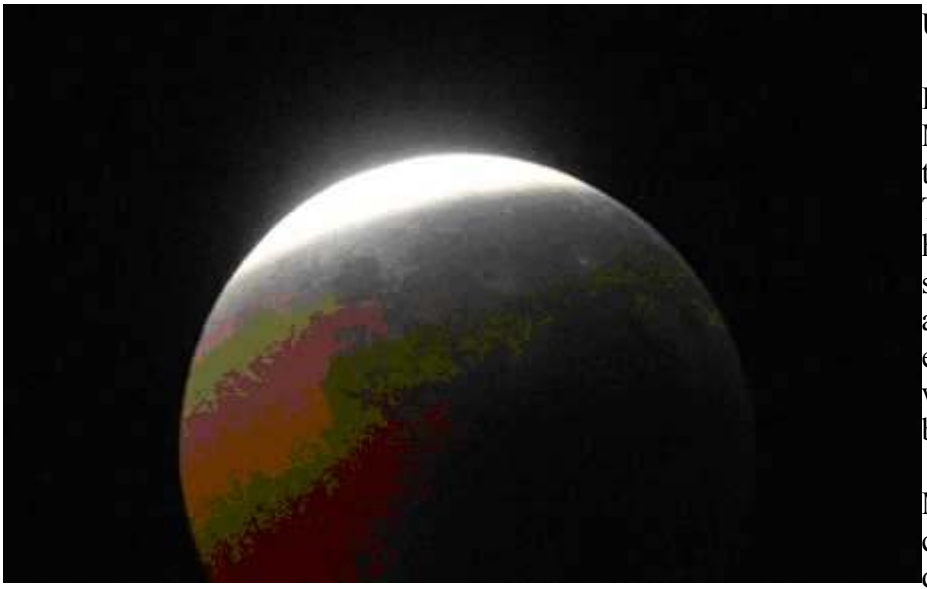
This scope also suffered from tube currents caused by warm air from the mirror (the glass is slightly warmer that the outside air when first taken outside and heats the air slightly as it sheds its heat) billowing up the tube like a chimney and ruining the image. I had read an article claiming that a small muffin fan behind the mirror could help it cool much quicker by actively blowing ambient air onto the mirror. This also had the effect of pushing the warm air out of the tube and breaking up the tube currents. Once the mirror is the same temperature as the surrounding air all currents disappear. I invested in a small computer fan and mounted this at the rear of the mirror mounted on foam rubber to prevent any vibration from the fan being transmitted to the telescope. This works well and I noticed an instant improvement in the image.

Since then this telescope has provided many hours of pleasure observing the wonders of the universe from

home. One night I remember well, was when I was able to view Jupiter at 500x magnification and saw its moons as small disks for the first time (previously they only ever appeared as "stars"). It has lived up too and exceeded my expectations and provides very sharp high contrast views. I would encourage anyone looking for a project that is a little different, to try their hand at telescope making.

Total Lunar Eclipse August 2007

On the evening of Tuesday 28th of August we were treated to the rear event of a total Lunar eclipse. This event was well publicised in the media and was observed by a large percentage of the population (It was certainly the main talking point at work the next day). The main event appeared to start around 9pm with the earths shadow casting a deep coppery huge that started at the south eastern corner and moved up towards the northeast until the moon was totally covered by around 10pm.



Ursula recounts the event as follows:

It was touch & go during the day, but MetVUW satellite pics spoke for themselves.
There was a dicey moment in the half hour leading up to totality when a swathe of fairly thick cloud swam across..... .....TOTALLY clear on each side - west & east, but the moon was covered. After that though it, was beautiful all the way through.

My daughter tried out her new digital camera - a little Olympus FE-10 down the (25mm) eyepiece of my telescope, and came up with some pretty good images (see below). I was very impressed, and so was she.

The kids had invited their friends, who had come with parents, so it was nice and cosy in our back garden. They all disappeared pretty sharpish after the main event, but the die-hards and brain dead (me) stayed up till one-ish to see it all through to the glorious end.
Wonder if this is where those ridiculous hoax stories come from - you know - about Mars being as big as the moon?? Certainly there were similarities, especially when the merest sliver of the lit satellite was showing.
A great night!

Astronomy Talk to students at Matahui Road School

On August 28th. 07, Jim Barrowclough drove out to Matahui Road school, just a little way before Katikati, to give an illustrated talk on astronomy to 55 students which was well received as stated in an email later by a member of the staff. Matahui Road school is a privately run school which has as its mission statement – to foster in all students high self esteem, creativity and a love of learning.

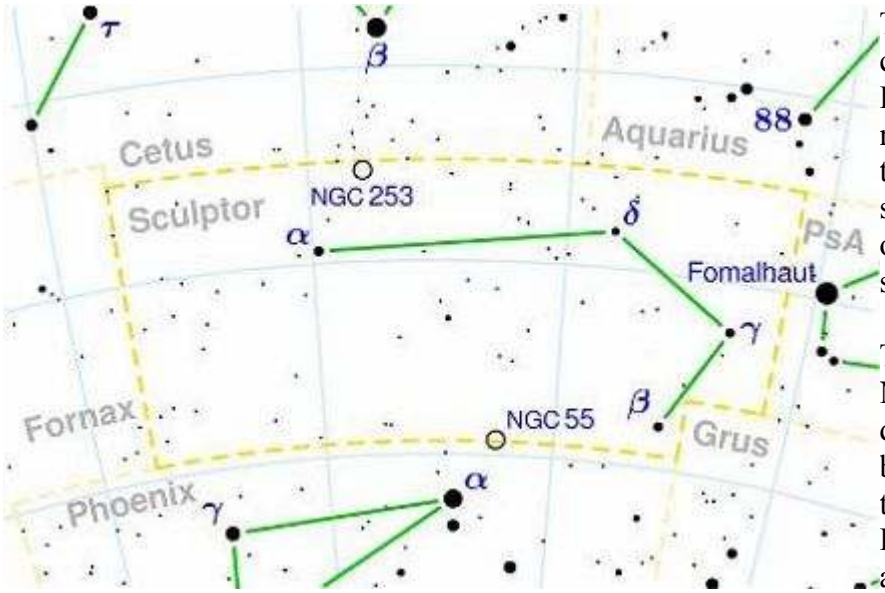
The accompanying photo encompasses just about all of the very well behaved children from that school who heard the address on what really is up there among all those stars.

The school's newsletter recorded the event as follows:

SPACE VISITOR TALKS TO STUDENTS

Year 3-8 students were fortunate to benefit from the knowledge of local astronomical society member, Jim Barrowclough, yesterday afternoon at school. Jim presented a slide show and short video clips about our solar system and the technology used to explore and learn about it. It was a very informative session and our children will have added to their expanding understanding of our space topic. Thank you Jim and the astronomical society for this opportunity. On the topic of space, I hope many of you were able to view the lunar eclipse last night. It was certainly a stunning sight and I'm sure your children were able explain to you the principles behind the event!

Constellation up close: SCULPTOR



This time of the year sees the constellations of Grus the crane and Piceas Australias (the Southern Fish) rising in the East. Also in this region is the fainter constellation of Sculptor and several bright galaxies that can be made out in 50mm binoculars and are beautiful sight's through the telescope eyepiece.

The brightest of the Sculptor galaxies is NGC253. Also known as the "silver dollar" galaxy it is first recorded as being discovered by Caroline Herschel, the sister and colleague of William Herschel (discoverer of Uranus in 1781 and Astronomer royal). She made the discovery on September 23 1783 from the Cape of Good Hope in Africa. It has been estimated to lie approximately 12 million light years from earth and to be roughly 60,000 light years across. This object appears as a faint elliptical glow through binoculars but really shows it's true colours through the telescope eyepiece. In a six inch scope the edge on spiral nature of the galaxy can be seen and a slight "mottling" can be detected. This shows clearly in photographs as thick dust lanes. This galaxy is listed as magnitude 7 and has a very bright surface. I find it a very pleasing object to the eye in my 6 inch f4.7 Newtonian.

Near by is another galaxy within easy reach of modest scopes. NGC55 is also an edge on spiral galaxy in Sculptor. It is listed as being Magnitude 8.4 and is bright enough to be easily found when sweeping the area with binoculars or a telescope with a low power eyepiece. To my eye it is not as compact as NGC253 but is a stunning object in its own right. A lot of the impact for me comes from contemplating the number of stars in such an object and their distance from us. NGC55 is reported as being roughly 5 million light years away and extends over an angular distance of half a degree. This is about the same size as the full moon!

I have observed both of these galaxies from urban Auckland so they should be well visible under the darker skies of Tauranga. If you have access to a telescope, use the chart to find them. Take your time and see what detail you can see. Over time and with experience you will learn to "see" more. Objects that at first appear as nothing more than a smudge can start to give up some of their finer detail. Occasionally an object just appears to reach out and grab you when the conditions and equipment are just right. These are the images that linger on the mind long after the nights observing is over.

BACK PAGE

The Tauranga Astronomical Society holds a monthly meeting on the fourth Wednesday of each month at the Otumoetai Soccer Club rooms, Fergusson Park, Tilby Dr, Matua. The meeting begins at 7.30pm and all are welcome.

New comers are invited to attend two meetings free of charge, however, after this a charge of $5.00 per meeting will apply if membership of the society is not taken up.

Current membership fees are below and may be paid to the treasurer on any club night.

Full Time Student $15

Ordinary Membership $20

Family $30

Meetings consist of a presentation of roughly one hour either by a society member or an invited guest on an astronomical subject. After light refreshments this is followed by viewing through one of the society's telescopes, weather permitting, or the screening of an Astronomical DVD.

The Tauranga Astronomical Society Newsletter is published quarterly each January, April, July and October. The editor welcomes contributions from members provided they are on an Astronomy related subject and are original. Articles for the newsletter may be submitted electronically by email too:
andrew32walker@yahoo.com

T.R.O.G (Tauranga Roving Observers Group)

TROG is a list of persons interested in observing from a dark sky site. We have been currently meeting approximately once a month at the editor's home in rural Te Puke. Another location previously used is Bell Road Papamoa and other sites are welcomed.

If interested in observing contact either Ursula Macfarlane 5767283 or Andrew Walker 5738550. The group is informal and no previous experience is required. Just bring along a telescope or binoculars if you have them, any star charts you might need and your enthusiasm.

Your Committee is:

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