

TAURANGA ASTRONOMICAL SOCIETY NEWSLETTER

Issue No. 17 - July 2007 www.tauranga-astro.150m.com

In This Issue: ★ [April Meeting](#) ★ [May Meeting](#) ★ [Public Meeting Presentation June](#)
★ [President's Report](#) ★ [From the President](#) ★ [Building a German Equatorial Mount - Part 2](#) ★ [Waharau](#)
[Dark Sky Weekend June 07](#) ★ [Coming Up](#) ★ [Back Page](#)

April Meeting

'Target Earth. They have already arrived. Where do they come from?'

- was the title of the presentation given to the Tauranga Astronomical Society in April by Stuart Murray.

With well over a hundred slides in a Power Point programme using both scanned pictorial and graphic items, this presentation set out to show the sources and distribution of many of the asteroids and comets in our solar system - not as extra terrestrial aliens as could be interpreted from the title.

A reference was made as to how helpless and defenceless we are as inhabitants on this planet. For billions of years, planetary bodies with their associated satellites have been bombarded with this extra terrestrial material. The results of any collisions of course, particularly on earth are almost beyond our imagination and there were many pictures showing newly found impact sites here on earth. These pictures have generally been discovered over the last 2 decades with the advent of satellite surveillance photography.



What is of interest, although many of these disastrous impacts have occurred way back in time, is that there are sites of more recent collisions well within the time span of homo sapiens. The 1908 Tunguska event in north eastern Russia was not a collision as such but an explosion in the atmosphere from just a small body but the effect, fortunately, on the uninhabited surrounding country side, was stupendous.

Included in the presentation were new pictures available now from many space craft, showing evidence of heavy concentration of impact sites. These are not only on all of the rocky planets, but virtually on all

viewed/pictured satellites, all indicating numerous impacts. Many of them are of interesting shapes, giving perhaps some indication of the impacted bodies' makeup. No doubt the earth has been bombarded in a similar manner. The effect from a volatile and mobile atmosphere combined with wind and water causing huge erosion over millions of years along with tectonic plate movements, has greatly reduced their visibility today. Some pictures viewed did show crater impacts 2 billion years old, in central Africa. When we consider the earth is covered by more water than land, then we become very conscious of both the past and now potentially new threats. Some of these earlier events must have produced enormous mega tsunamis. We examined both the impact point on the sea bed crustal rock and the resultant huge displacement of water. Also the major impact area in the Yucatan peninsula was looked at. This was hit by an asteroid, or even a comet, of up to 16km in diameter, only 65 million years ago, and now with radar data collected by satellites the colossal crater can be mapped. Not only is it surmised that this event caused the demise of dinosaurs, it left a rare element as an earth-coating around the planet - iridium. Photos taken on a personal recent visit to Meteor crater in Arizona showed evidence of what a small body, perhaps 40 metres in diameter can create in what is a well formed impactor site (see cover of the newsletter). Again fairly recently at 49,000 years ago and also only within the last 50 years proved conclusively to be a crater site because of the discovery of tektites, small strange abnormal pieces of rock, the result of massive impacts and part of the ejecta.

Generally asteroidal material travels around the ecliptic in the same plane as all the planets etc, so either these bodies side swipe or rear end each other. Comets originating out in the Oort belt, way beyond Pluto, can on their path around the sun, approach earth or any other planet or moon head-on, with even a greater release of energy.

With a greater technological processing of the positioning of these orbiting asteroids and comets, is it a good thing to be aware of these potential disastrous threats and at the same time do so little, if anything, in avoiding them? Do we

live in precarious times now? No I don't consider so. The human being on this particular planet is our current greatest threat.

Stuart Murray

May Meeting



May's meeting was a combination of the Society's Annual General Meeting as well as a presentation by Dr Bruce Griffiths and Robin Holdsworth of the Hamilton Astronomical Society. The AGM went along the usual lines. Thanks were given for the services of two committee members, Graham Mills and Janine Neustroski, who are stepping down. The remaining members were reinstated and will be joined by Ted Harper. The President's report in it's entirety appears latter in this newsletter.

The presentation by Dr Griffiths was an overview of large telescopes in general and a discussion of the Hamilton Astronomical Society's 24 inch telescope in particular (pictured). Also covered was the dome and observatory that houses this telescope. This was a timely presentation as we consider designs for the construction of our own observatory. Also presented were Bruce's opinions on the testing of telescopes including the Hartman test.

The Hamilton society's telescope is a 24 inch classical cassegrain with optics by Graham Loftus of Auckland (probably the most experienced telescope maker in the country) and the rest of the scope and dome were made by the Hamilton Society members themselves.

All present appreciated the speakers making the trip over the Kaimais.

Public Meeting presentation June 2007

John Drummond , an excellent astro-photographer and comet-chaser from Gisborne, recently put together a presentation about Comet McNaught, the brightest comet we've had in 40 years, and this was the subject of the nights' meeting.

Ursula Macfarlane hosted the presentation, with pointers on the various images which included plenty of comparisons between McNaught and various other spectacular visitors to our stellar neighbourhood. The most magnificent part of McNaught was the tail, and if we look at the physics of this we find that a comet tail is made up of dust particles and gasses. The magnetic influences of the Sun at work on dust particles of McNaught's tail caused the many striations across it's length – with an effect of "ripples" along a substantial part of it. Considering the size of the tail – the cloud of coma was about 100,000km across and about 100 million km long

– you can imagine the show we were all treated to. The spread and the striations didn't become really pronounced until around January – lucky for us here in the south !

A few other past comets have shown similar behaviour; Comet Hyukatake (1996) and Comet West (1975).

Other comets such as LINEAR(2003) and Hale-Bopp(1995) have shown more solid looking tails more like a gas jet than a 'ripply fountain'. This is due to the nature of the physical make-up of the particles coming off the nucleus - most likely to be more gasses than dust for the sun to burn off.

McNaught was discovered by Rob McNaught in August 2007, from Siding Spring, Australia, and interested spectators worldwide watched it's approach, wondering whether it was going to fizzle out or develop into a spectacular show.

John set up the second part of the presentation with images he'd collected from fellow amateurs around the country and we settled back to enjoy this to some lovely music. Some of the images were superb, with a few showing real artistic skill - it's almost enough to get you racing out to buy new gadgets to update your current rig – and if you do? John might say "welcome to the dark side" !

John is the director of the RASNZ comet and meteor section, and his website can be viewed at www.possumobservatory.co.nz

For the RASNZ comet and meteor site, go to www.cometeor.co.nz

Ursula, June 2007.

President's Report

As previously mentioned May's society meeting also doubled as the AGM, during which the Annual Presidents Report was delivered by George Stewart. His report is reproduced here:

I have much pleasure in presenting this report, which covers a busy year and some quite significant achievements

But first I must thank my hard working committee. Without them and their enthusiasm and contribution, there would be no astronomical society in Tauranga

A number of highlights are worth mentioning. In June of last year we chartered a bus to travel to Rotorua, to hear visiting NASA scientist and spacecraft designer, Dr Jack Bacon. In August we were delighted to bring to Tauranga one of New Zealand's foremost research astronomers, Dr Grant Christie, to tell us about Quasars...and his work discovering new planets in the far reaches of outer space, involving "Gravitational Lensing"

And during the year some very well researched and informative programmes were presented by members of our committee, as well as Ted Harper and our former newsletter editor, Ursula McFarlane.

Earlier last year the Society made an extensive submission to the Tauranga City Council, in support of moves to upgrade this building, with the objective of having our own permanent observatory installed at Fergusson Park. We were, I am happy to say, successful in convincing council to accelerate its 10 year programme by some 12 months, so that money to extend this building would take priority over planned walkways, lights and plantings... The first round of funding is due to be released in July.

But as just one of several users of this building, which is owned by the Otumoetai Sport and Recreation Trust, we are caught up in the inevitable round of meetings and consultation with soccer, cricket, Guides and Scouts and appear to be the only group who are keen to get things moving... The City Council has promised to pay for new public toilets and an enlarged deck area. However I should stress that a massive fund raising campaign lies ahead, to finance both the additions, as well as equipping our observatory with a telescope and guidance system.

In December a number of members visited the Whakatane Observatory, where we enjoyed not only an excellent barbecue with our Whakatane colleagues, but a presentation by Dr Alan Gilmore from Mt John Observatory, who spoke about his trip to the World Convention in Prague. We also took a close interest in their observatory, which is equipped with some impressive telescopes and a large roll-away-roof.

On a more sombre note, on April 16 of this year we were saddened to lose one of New Zealand's pioneer astronomers, Dr Frank Bateson. Dr Bateson founded the variable star section of the Royal NZ Astronomical Society. He was also responsible for investigating and setting up the Mount John Observatory, which is located above Tekapo. Frank Bateson was our patron, and came to a meeting here about two years ago, to tell us a little of his life, including his adventures in both the navy and as a member of the Cook Islands government. We have been fortunate in securing several cartons of the publication Sky and Telescope for our future library. We also have 60 copies of his own publication, "Paradise Beckons" which his family has donated to help raise funds for our new observatory.

In closing I must thank our outgoing newsletter editor, Ursula Macfarlane for a sterling effort over many years, and welcome on board Andrew Walker, who has already impressed us with his first issue.

The next 12 months is going to be a challenging time for the Tauranga Astronomical Society and some hard work lies ahead....

My personal priority is to get us into our own rooms, hopefully within the next two years. An observatory which will then

become an asset, not only to the city of Tauranga, but to members of the public and students, who have an interest in astronomy and who want to know more about what lies and flies up there in outer space.

George W Stewart

23 May 2007

From the President

Apart from that spectacular display by Comet McNaught, the next best news this year has to be that plans are now underway to extend our meeting place, which is to include our very own astronomical observatory.

Meetings of all user groups, including astronomy, soccer, cricket, scouts, guides and cubs are being held every fortnight to make sure we get the very best of facilities. Driving the changes are Richard Kluit from Otumoetai Soccer, engineer Gavin Frost and Residential Design's Matt Biddle. Our observatory will be approximately 16.6 sq. meters by 15 sq. metres, with a 4 section fold-away roof, which should accommodate a fair sized crowd and allow excellent viewing of the night sky.

Two of our committee members, Ted Harper and Andrew Walker are investigating what's available in the way of a really good telescope, complete with state-of-the art electronic controls..

So how much is this all going to cost? Quite honestly I cannot tell you, as its too early and pricing of materials has not really started. The building's construction costs are to be funded by making applications to various agencies, such as Pub Charity, Scottwood Trust, Perry Foundation, Bay Trust and TECT. Labour is to be donated (hopefully) by the many parents of the hundreds of the children who play soccer and cricket. Everyone may also be asked to pay for one concrete block! Our society will also be making applications for funding for the telescope and its "add-ons".

As you all know, our patron Dr Frank Bateson died earlier this year, leaving a vast library of astronomical literature, personal journals, photographs and books. Many of these items have since been dispersed throughout New Zealand to various astronomical societies. However we have been gifted 320 copies of Frank's amazing story, 'PARADISE BECKONS' which he published in 1989. His family told us that these were to be sold to help raise the money to pay for our new observatory, and set a price of just \$25.00 each.

I can personally recommend the book as a fascinating read, which encompasses almost 90 years of his life, including amusing narratives of his time in the Cook Islands as an island trader. He also tells of the terrible conditions he had to contend with, while carrying out site testing at Black Birch in Marlborough and Mount John above Lake Tekapo. How he survived all those years of freezing cold while living in a tin shed no one really knows.

This book would make an excellent birthday or Christmas gift for family or friends. The books are available for sale at our public meetings nights, or you can place an order by phone (576-6170).

George Stewart

Building A German Equatorial Mount Part 2

By Andrew Walker

Armed with the expertise that comes from a B pass in school certificate metal work 20 years ago, I set out to begin the construction of a heavy duty German Equatorial mount that would allow accurate tracking of celestial objects (accurate enough for high power visual observation).

The first stage was to acquire the parts necessary. I started with a pair of precision bearings from "Trade Me". These were 80mm outside diameter and 40mm inside diameter; a second pair to match was purchased along with 4 "pillow blocks". Pillow blocks are castings that hold the bearings firmly; they are self-aligning and save the need for having housings machined by an engineer and hopefully keep the price of construction down. Two six-inch flanges were purchased to provide the joints between the RA shaft and Declination shaft as well as the joint between the Dec and the Optical Tube Assembly (OTA). These flanges were for 40mm pipe that I thought would be ideal for the 40mm solid

steel shafts that I intended to use for the mount. Unfortunately it turns out that pipe is measured by its internal diameter where as rod is measured by its outside diameter. As a result the threaded central holes in the flanges were found to be too large for the 40mm solid steel shafts that a local Te Puke firm, MAC Engineering, put together for me. Luckily the engineers had some 40mm black pipe that would fit over the shafts and could be threaded to suit the flanges. This was done for a small fee and I was well pleased with the result. The flanges were machined flat by a local machinist to ensure the joints were perfectly perpendicular.

Steel plate in both 5 and 10mm thickness was obtained. I began by drilling the necessary holes through the 10mm plates that would support the pillow blocks. These were 13mm diameter (wide enough for M12 bolts) and really pushed my \$80.00 Chinese drill press to the limit. As can be seen from the photo two slots were made to allow for a small amount of adjustment in azimuth on the plate that would support the RA Shaft. This combined with raising or lowering the front of the plate on its mounting bolts will allow for accurately pointing the RA shaft at the South Celestial Pole. Other holes were drilled to allow the declination plate to be fastened to the RA shaft flange.

As this mount is intended to be semi permanent I decided, with a little advise, to try using a wooden pier to support the equatorial head. I live in rural Te Puke and just happened to have a number of thick wooden posts laying about the place. I selected a post that was almost 10 inches in diameter. I delicately cut a 37-degree angle into the post (well as delicately as you can with a chainsaw), and then dug a deep hole. The hole is almost 1.5 metres deep and should be enough to hold the pier securely.



I made enquires with a local surveyor and was told that magnetic North differs from true North by 22.5 degrees in our area. I used a compass to line my pier (post) up with the North South line as accurately as I could then started to gradually fill in the hole around the pier. After every few shovel-fulls of dirt I compacted it using a piece of 4 x 2 and by the time I had filled in the hole the pier felt as though it were set in concrete, a hard kick would barely cause a tremor (which died out as quickly as it began). The pier stands 750mm above the ground.

The Equatorial head is fastened to the pier via a 5mm thick steel plate using three M12 wood screws 5 inches long. All metal plates were taken back to bright bare metal using a wire brush, then given a coat of etch primer and several top coats to ensure that they are as well protected from the elements as I could provide. Pillow blocks were then fastened to their plates and the equatorial head assembled.

All that is required now is to fit the OTA to the mount, add counter weights and to drive the telescope in RA.

To be continued....

Waharau Dark Sky Weekend, June 2007

Definitely a great weekend to remember - including the fact that at one point I was wearing 8 layers of clothing, plus had a drinking water bottle filled with hot water stuffed under my jacket. I think a lot of folks there last weekend did Michelin Man impersonations.

I was happily checking out the deep sky objects in Ophiuchus, and managed to find them all easily this time - the last attempt was from my back garden in Tauranga once - not a good position at the best of times. For those who are keen to try and find the objects, they were; M9, M10, M12, M14 and M107.

The spotlight show for the weekend must have been the double transit of Io and Ganymede. It highlighted the significance of having lots of different telescopes there - from the 6" dobs to the supergiant 16" binoscope. Through my scope I found the initial image quite comical - the shadows weren't apparent from the first instance of the crossing of course, but I thought the two moons looked not unlike cartoon eyeballs on Jupiter. Once the shadows were traversing the planet, I must confess that the best image for me was through Jason's 16" dob - the shadows were definitely more discernible (sorry Dave !)

But I was amazed and surprised that I managed to see the transit at all in my little 6" dob - a bit more patience and squinting required, but satisfying all the same.

A few of us tracked down the Omega Nebula(M17) on the border between Sagittarius and Serpens or "the Nose"

(was that the same one guys?). This is a cigar shape object with diffuse cloud around it. It needed a bit of star hopping to get to the right position. We also went for the Pavo cluster of galaxies. The trio were very well viewed in Andrew Walker's home built 10" dob. Great seeing. Just out of the field of view (can't remember which eyepiece he was using) was a fourth galaxy, side on. A most spectacular view. Checking out my star maps at home I find that there is more than one cluster of galaxies - 6872, 6876, 6877, and 6880 - so I have no idea which are the trio - another cluster is 6770 6771 and 6769 - now I'm quite disoriented !

Peppered across the sky during the evening were a number of inevitable meteors, a couple of which put on a good show of traveling slow and low to the horizon.

Saturday morning Andy Dodson set up his portable solar telescope (PST) that allowed us to view the sun in Hydrogen Alpha.

One prominence was obvious at first look, then gradually more were visible - I saw another two prominences, rather like fountains erupting around the edge. There was no sunspot activity that weekend.

This site gives a few details of the Pavo galaxies
<http://www.atlasoftheuniverse.com/superc.html>

Ursula Macfarlane, June 2007

Editors Note:

The next Wharau dark sky weekend is scheduled for the weekend 7th – 9th September and is organized by Dean Jonkers of the Auckland Astronomical Society. It costs \$25 for the full weekend or \$15 for one night. This fee covers accommodation and full use of the facilities. See the web site at www.astronomy.org.nz for further details including a very useful map. Might see you there!

Coming Up:

On the evening of August 28th we will be able to watch a total lunar eclipse weather permitting. This is when the moon passes into the shadow of the earth. We will see a darkening spread across the moon that to my eye's usually looks like a browny red colour. This will darken as the earth passes into the darkest part of the shadow known as the "Umbra" the dark but not as dark outer shadow is known as the "Penumbra".

Total lunar eclipses are not a common event as the orbit of the moon is inclined so that it usually passes above or below the shadow of the earth. If the moon passes through only the outer portion of the shadow the event is called a "partial lunar eclipse". In fact the next one wont be until 21/12/2010

So make the most of the opportunity and see this event for self!

The speaker for the August club night will be Roy Tallon, who will be speaking on astrobiology.

We are lucky enough to have two guest speakers from out of town coming.

Wednesday 26th September, John Drummond will be giving a talk entitled "Finding those faint photons"

John Drummond has been obsessed with the stars ever since his mother pointed the 'Pot' in Orion out to him when he was 12. He also began to develop an interest in photography about the same time and later combined the two to become an amateur astrophotographer. His other astronomical passions are comet and meteor observing. John is currently the director of two Royal Astronomical Society of New Zealand sections: the Comet and Meteor section, and the Astrophotography section. He is a Contributing Photographer for the *Australian Sky and Telescope* magazine and frequently has astrophotographs published in books and magazines. John is the president of his local astronomical society (the Gisborne Astronomical Society) and is fairly frequently asked to speak throughout New Zealand . He lives on a small farm with a dark sky 10 miles to the west of Gisborne and is imaging and observing on most clear nights. His website is www.possumobservatory.co.nz .

October's speaker will be Roger Feasey of the Auckland Astronomical society. Details of his presentation are not available at the moment but will be published in the usual papers closer to the time.

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.