TAURANGA ASTRONOMICAL SOCIETY (INC)

Website; www.tauranga-astro.150m.com
Correspondence to Secretary; 14 Hazel Terrace, Tauranga

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The Moon, taken through Andrew Walker's 12-inch Telescope in his backyard observatory.

29 Brown Street, Tauranga,
P.O. Box 1147
Phone 07 578 0059, Fax 07 578 2692

A visit to the CERN Large Hadron Collider and other interesting highlights of my July 2009 tour of Europe

By Ursula Macfarlane

To treat myself for my 50th birthday I impulsively decided to go on a trip to Europe. With rising fuel prices and some airlines going under from the recession I thought I'd better not put it off any longer. The two places I really wanted to visit were the Large Hadron Collider at CERN in Geneva, and inside the arctic circle to experience the midnight sun.

A few weeks before leaving I emailed all the astronomy society contacts I could find on the net, with no result. However, my first day in Venice yielded surprising results. After a meal of real pizza close to where I was staying in Mestre, I went for a stroll around and came upon a crowd of people wandering in and out of the building opposite the place I was staying. I thought I'd go and be nosey, and unbelievably found the local astronomy society holding a public science night in celebration of the IYA 2009. What a find! I went in and had a look around and the guy in charge thankfully spoke English. You can imagine that there wasn't much in the way of "astronomy talk" in my conversational Italian book. They had a number of events planned for the year, and this particular night was a talk on electricity and magnetism. Lots of people were there, and I was also shown their planetarium. This was a proper dome and light machine housed in a room of approx. 4x4m. Very cosy. I stayed for awhile, in this very old building almost completely paneled in old oak and carvings, and watched the static electricity experiments going on. Later we went outside with a pair of homemade binoculars on a tripod, to watch the almost full moon rising. I can't say the seeing was great as we were in a well lit street.

My next close encounter with astronomy was in Geneva. I left Italy and it's delicious gelato ice cream, espresso coffee and fabulous tasty pizzas and took the train through the Alps. What wonderful dark skies there would have been there by night. I was surprised by the number of vineyards we passed through – I hadn't realized that the Swiss produced their own wine. Geneva itself was a lovely city; nice and clean; lots of chocolate to sample; and an old city to explore. My host was a fellow Couch Surfer and she logged onto the net to find me the best way to get to CERN the next morning. I started off on the tram, then took the bus to the main site at Meyhrin. (Oh ! All this lovely efficient public transport!!). Here I was met by Austin, an email acquaintance and a friend of a friend. He is also a senior physicist who has been with the CERN project for a number of years. We drove over to the French side of the site and met another friend. Austin took the two of us through an unassuming little building in the middle of the sedate and warm countryside and we descended 100m to the collider tunnel. And yes! there was a biometric iris scanner too. How thrilling!
We went into the CMS experimental area – this is the Compact Muon Solenoid – and boy was it an awesome sight. It was so exciting to be in this place – I had wanted to visit since hearing Brian Cox talking about the experiment on Radio NZ a couple of years ago, and now it was reality. So many brilliant minds from all over the world had collaborated in this project, and here I was. What struck me instantly was that there was such a lot of colour. Red metal coverings; green catwalks; blue wiring; copper panels. We saw the

helium cooling tanks for keeping the magnets super-cool, and had a close-up of the superb machining work that made up the inside tubes of the accelerator. The control room was filled with computers and yes there was a panel with the big red emergency button on it too. There is also an excellent museum at the site, and it tells the story of the initial plotting and digging of the site that started in 1954, up to present time. I was amused to find a gift shop so of course had to get the t-shirt……pity they weren't selling vials of anti-matter…..would I have been stopped at customs I wonder?

Next stop was Dijon in France. I'd gone there to sample the wine and food of course – another fellow Couch Surfer cooked me a very tasty aubergine and raclette cheese tarte my first night there. I ended up finding a Salvador Dali exhibition which was a bonus, and the local science museum which housed the Planetarium and they also had IYA posters on view. I bought a ticket for the sky show and was in there with a French high school class. It was nostalgic seeing the familiar northern hemisphere constellations again, and oh yes ! there was ursa minor too! It was a great show, all in French of course, but vaguely understandable. The teacher there was happy to hear a bit about the southern sky and some of our fabulous objects too.Last stop was Norway. I flew into Oslo and did a bit of sight-seeing there. I found the Nobel Peace center and in the walkway opposite there was an exhibition of deep sky objects displayed on huge panels, and yes, you guessed, another hit for the IYA event. It struck me as amazing, how much I had stumbled on by sheer coincidence. From Oslo I traveled on two trains over two nights, to the north. The light was extraordinary. It got lighter and colder the further north we went.

I joined a boat trip for the last part of the journey, and ended up in Tromso. If anyone reading this really enjoys running marathons by the way, then look up “Midnight Sun Marathon” on the net.

Tromso's location is at 69 degrees 42 minutes, nicely inside the Arctic Circle. I'd aimed for doing this on June 21st but it was a cloudy night and so June 23rd/24th was when I managed to get what I wanted.
I took the cable car up the mountain on the island next to Tromso, and settled in with books, food, and cameras at 9.30pm. The left section of the image was taken at that time. I took a few images out of the final mosaic in order to show the sun a bit more clearly. I took an image every 15 minutes, however this was all a manual performance as I'd not

taken a tripod with me. The position north was marked on a large piece of shale which I positioned the camera on, and kept the sun in the centre of the viewfinder for each image. Passers-by looked on with interest, but they became few and far between as time went on. The last cable car went down the mountain at 1am. I was a bit leery of being all alone - WERE their polar bears here? Brown bears? Savage lemmings?
Just imagine how fantastic the night sky would be here in the middle of winter – on the aurora-less nights there would be very little light pollution at all.
At midnight the sun was due north, and I finished at 2.30 am because the building got in the way! Bad planning, that, I hadn't worked out how far round the sun would be at that time, and anyway I didn't want to stray too far from the beaten track. Out of 5 nights that I stayed in the area I only got one good clear night. It wasn't particularly cold - prob. around 8 deg. but the daytime temperature never got above 12 anyway.

I left the top at 3am and then couldn't find the path down...a bit desperate as I eventually went down the steep track under the cable car wires. This was a laugh a minute in the snow and the mud with no one to help if I lurched off an edge somewhere ! The important thing was not to drop the cameras . Good job it was daylight. Finally got back to the house at 4.30 am and got 3 hrs sleep then woke to rain and gloomy weather. It's quite an experience living all the time on daylight, you don't feel tired and have to make yourself go to sleep (sleep masks and Aquvit help). It took a while to get used to the dark here again. Maybe I'll live in Tromso for 3 months every year, and live on dried fish and reindeer steak. Yum.

Ursula Macfarlane July 2009.

M45 - Pleiades

A spectacular and most famous open cluster catalogued by Charles Messier as M45, this collection of stars is often mistaken as a constellation. It forms the bull's shoulder but also has a number of names and myths attached to it by various cultures.

Pleiades, in Taurus, is commonly known as the Seven Sisters and the Greek story tells that they were turned to doves and placed in the sky by Zeus to hide them from Orion. The sisters are named; Alcyone, Maia, Asterope, Taygeta, Celaeno, Electra, Merope.

The *Western Mono Indians* saw in the Pleiades 6 wives who ate onions and were thrown out of their huts by angry husbands. They wandered off to the sky and became the Pleiades. Later the husbands felt lonely and sorry and looked for their wives, but they were never found again.
(Website; http://seds.org/messier/more/m045_lore.html)

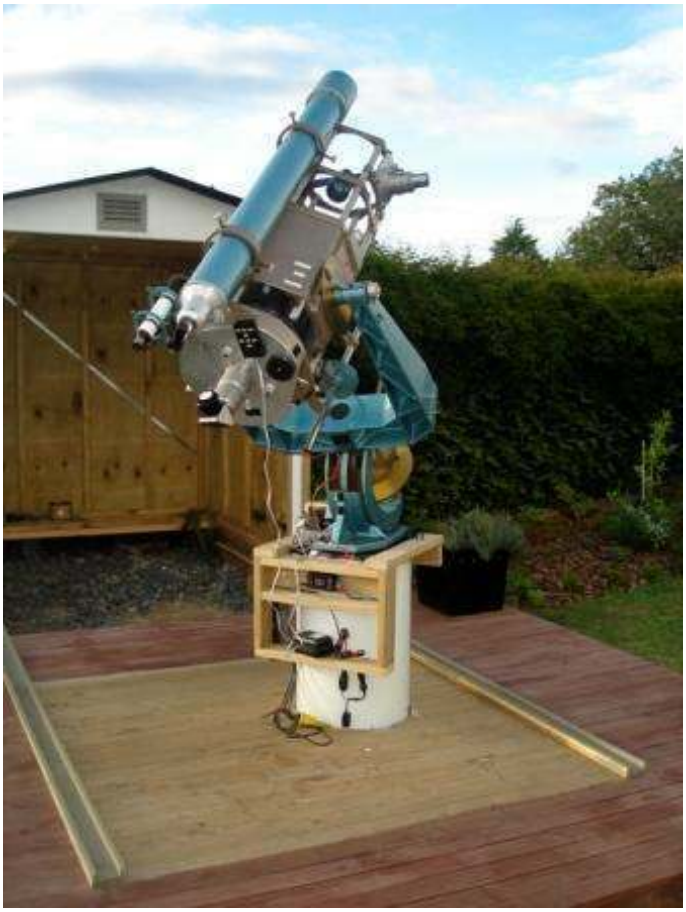
The Persian name is "Soraya", after which the former Iranian empress was named.
(Website; http://seds.org/messier/more/m045_lore.html)
The Maori name is Matariki, and in recent years this has become more of a celebration in this part of the world.

The stellar realm of indigenous Australians also often saw the Pleiades as a group of women sitting in the sky, much akin to the more modern European story of the seven sisters. Nonetheless, various groups have seen the Pleiades as a group of kangaroos, a clump of gum trees and the resting place of the dead.
(Website; http://sa.apana.org.au/~paulc/loreaussie.html)

The cluster contains more than 500 stars and is about 400 light years away. It doesn't get much higher than around 27 degrees in our part of the sky in the north island of New Zealand. There are both brown dwarfs and white dwarfs in the cluster and the star Merope (23 Tauri) has a blue nebulosity surrounding it.

A 12 inch AE (Luton) Cassegrain in Tauranga.

By: Andrew Walker



There's something about old scopes, not all old scopes but the classics. Can't really put a finger on it but there is something I find wonderful about them. That's not to say that all

old scopes are classics, same as cars I suppose, some are considered classics (XK series Jaguars) where as others are just old (such as the Austin Princess).

Back in October 2008 I made a work trip to Dunedin. While there I visited the Beverly Beg Observatory and meet with a number of the members of the Dunedin Astronomical Society. About 6 months before this I had seen an email posted on the NZ Astronomers Yahoo group asking if anyone was interested in purchasing the Dunedin Societies 12 inch Cassegrain. I had half forgotten about the ad but the sale of our lifestyle block in Te Puke around this time meant we had a few extra dollars in the bank and I was really keen to set up an equatorial scope on our new property in Tauranga. I remembered the ad and thought the Dunedin scope may fit the bill.

After tracking down the ad I sent a message to Ron of the Dunedin Society, asking if the scope was still available. I was slightly surprised to learn it was and that there had been very little interest in it. The scope had been disassembled and stored under the floorboards of the observatory some months earlier. It had been their prime instrument from 1972 until in 2008 when it was replaced by a state of the art 14 inch Celestron mounted on a Paramount ME computer controlled mount. This telescope was a 12-inch Cassegrain/Newtonian (f20/f5) that was made by an English company Astronomical Equipment (Luton) in 1972. It also came with a 4.5 inch refractor as a guide scope. I made arrangements to view the instrument while I was down in Dunedin with work.

While I was visiting the observatory I made small talk with the members and was told they used it only in its Newtonian configuration and that this made the instrument awkward as it meant the use of a ladder was necessary to reach the eyepiece (not the easiest of things for people to negotiate in the dark). Also the stepper motor arrangement that was on both the RA and Dec axis never really worked and the instrument would not track for long in RA. Never the less upon seeing the instrument I could see that this was one impressive scope. After a bit of discussion a deal was reached and 3 months later the scope arrived at my door in a very large plywood packing crate.

Upon inspection it was clear the telescope was showing its age. I could also tell it was as much a piece of engineering art work, as it was a scientific instrument, somehow the whole thing just shouted precision. I decided that I would not fully restore the instrument but instead give it a bit of a tidy up and get it in use as quick as I could. I could see from the moment I set eyes on it that it was not portable and would require a permanent fixture in the back yard. To this end I decided that a roll off shed would best

suit my needs and I was confident that my VERY limited building skills would be up to the task.

I started by sourcing a pier. This was the time when the new Tauranga harbour bridge was being built and my daily cycle to work took me past the bottom of Dive crescent where I spotted some off cuts of concrete storm water pipes. One piece in particular looked ideal. It was about a meter and a half long and 450mm in diameter. This pipe would be perfect as it has metal reinforcing through the concrete walls and once filled with more concrete and reinforcing would be more than strong enough to carry the 150kg's of telescope that I planned to mount on top of it!

I was happily surprised when I approached the foreman and asked if they had plans for the pipe off cut. When I told him what I planned to use it for he said it wasn't needed and that I could take it. Next I spray painted an area on the lawn where I planned to put the scope. I then put in some marker pegs to locate true South. This was done by finding Magnetic South with a compass and adding the 21-degree Magnetic variation. After digging a 1.5 meter deep hole, of 500mm diameter that fanned out at the bottom I started to mix concrete and filled the hole while laying some 10mm reinforcing steel throughout as I went. Upon reaching ground level I ensured that I had plenty of steel poking up through the concrete and gave it an hour to semi cure. I then placed and leveled my concrete storm water tube on top and filled it with concrete. Once I reached the top I set six anchor bolts into the wet cement. These would hold down the mounting plate onto which the telescope would be fastened.

I decided to give my pier a couple of weeks to harden before continuing. While this was happening I thought I had better get some advice on the rest of the scope. The worst effected part was the aluminum fork that supports the tube. I thought I should probably get it sand blasted then re painted. I put the fork in the back of our van and took it to a local sand blaster who told me that an aluminum casting like that could be left outside for 100 years with only the occasional coating of CRC and it would be fine. So I decided to sand, prime and spot coat the fork instead, as per the below images. Link up paint supplies were able to match the original Hammerite paint color perfectly, and provided me with an aerosol can of high quality paint.

I then proceeded to build a three meter square viewing deck around the pier. Once the scope was in place I would add rails and build the roll of shed. By now I was happy that the pier had cured so I started to assemble the scope. Each night I would cover the scope

with a tarpaulin. I was doing it this way so that I could make the shed to fit, thereby keeping it as small as possible.

Eventually the scope was nearing completion, so I stopped work on the instrument and built a small shed around it that could be moved on Nylon wheels along wooden rails. The shed was pretty basic and is the largest structure I have built myself. Can't say much about it really but as they say a picture is worth a thousand words.

My research into this telescopes history proved very interesting. It had been made by Astronomical Equipment Luton ltd in 1972, the company had been manufacturing telescopes under the direction of Cliff Shuttleworth since the late 1960's and was run on a day to day basis by two brothers. Robert Hysom was an engineer and built the mounts and tubes while Jim Hysom ran the optical shop. An ad asking for information on an English Astronomy website put me in touch with a man named Es Reid who had worked at AE Optics in the 1970's and 80's (they changed the companies name during the 70's). He told me the brown covering on the scope was not original and also gave me Jim Hysoms phone number. I phoned Jim and chatted for around half an hour. He sent me a copy of the booking book for 1972 that recorded all the telescope optics they manufactured that year. I was able to find the optics for my scope had been figured in June by no one else than James Muriden! A well known English astronomer, Author and telescope maker.

This same ad also put me in touch with a man named Mark in Norfolk who used to live around the corner for the shop in Luton and had made his first mirror under the guidance of Horace Dall (co designer/creator of the Dall Kirkham telescope). Horace had also been heavily involved in AE. Mark and I correspond regularly and he has restored a number of these scopes from his 14 inch Cassegrain down to the 6 inch Newtonian.

The finishing touches were put on my scope last year with Shaun Belcher wiring up the SiTech telescope control system to 2 servo motors I had fitted to the scope. She now

tracks beautifully and can be slewed and panned with the touch of a button. It could also be totally controlled via planetarium software on a laptop however I do not use this as for my current interests it is not required. I am currently teaching myself how to take images of the moon and planets using the Meade LPI (Lunar Planetary Imager). This is a lot of fun however my results are rather poor at the moment (see below, taken 20.2.2010). The G-Star astronomical video camera purchased by the society should be excellent for this application.

I use the scope only in its Cassegrain configuration, although it can be used a Newtonian by changing the convex secondary for a Newtonian flat (that came with the scope). I find this set up works well from my urban light polluted location. As one would expect from an f20 Cassegrain with a minimal central obstruction it excels on the planets but is good on the brighter deep sky objects. By using a 55mm Plossl eyepiece I can get 110x Magnification and around half a degree true field of view. It has been a journey bringing this scope back out into the star light. One that I have enjoyed and learning a lot along the way.

A note from the editor:

We have had some wonderful DVD evenings over the last few months on various topics, we also had the opportunity to listen to John Drummond give us a detailed talk on astrophotography, Vewing has not been much good during the last meetings, with a lot of cloud cover obscuring the view of the sky.

Tauranga Observatory update

Picture showing our observatory as part of the whole attractive complex
- finance difficulties have delayed the opening of the observatory.

For Sale

Telescope Mirror set. I have for sale the primary and secondary mirrors for a 6inch f 4.7 RFT (Rich Field Telescope). The primary mirror was made by myself and could use re-coating though is still serviceable. They are currently in a telescope so any prospective buyers can view before purchase, I will include the whole scope minus the focuser. This would make a good first scope for someone who does not have a lot of storage space or boot room in the car. Use it as it is or build your own scope around the optics.

Orthoscopic eyepieces. I have for sale brand new, Japanese made Orthoscopic eyepieces for $80 a piece in 5,6,7,9,12.5 and 18mm focal lengths. These are excellent eyepieces of high quality that will last a lifetime if cared for. At this price they are cheaper than the wholesale rate from Japan! These are the same eyepieces offered by University Optics in the US.

For more information on any of the above phone Andrew Walker on 07 579-5656 or email andrew32walker@yahoo.com

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. Our editors welcome contributions from members provided they are on an Astronomy related subject and are original. Articles for the newsletter may be submitted electronically by email to: igreenman1@xtra.co.nz or sabelcher@value.net.nz

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 5795656. 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:

George Stewart:	President	576-6170	geo_dorothy@vodafone.co.nz
Stuart Murray	Vice President	576-1943	stual@clear.net.nz
Jim Barrowclough:	Secretary	576-5389	jimbar@clear.net.nz
Lew Lawson:	Treasurer	574-9800	lindy.lew@xtra.co.nz
Shaun Belcher	Editor	576-3773	sabelcher@value.net.nz
Noel Peterson	Co-Editor	576-1159	igreenman1@xtra.co.nz
Les Smith		576-4368	lesmith@xtra.co.nz
Ursula Macfarlane		576-7283	ursa.minor@clear.net.nz