



TAURANGA ASTRONOMICAL SOCIETY

PATRON : Dr Grant Christie MNZM FRASNZ MRSNZ

Website; www.tauranga-astro.x10hosting.com

Correspondence to Secretary; 14 Hazel Terrace, Tauranga

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Blast off! - Space shuttle Atlantis launches on mission STS-135 marking a historic end to the space shuttle program.

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Tauranga Astronomical Society: President's Report: From the Annual General Meeting May 24 2011

It gives me much pleasure in presenting this Annual Report for the Tauranga Astronomical Society. It has been a year of challenges, great excitement and satisfaction, culminating with the installation of our telescope, just 11 months ago.

I would like to pay a compliment to my committee, which has put in an enormous amount of time and effort into getting the observatory fitted out and operational. The city of Tauranga can be proud of being able to boast of having a modern, up to date observatory, a magnificent telescope and we should continue to make this educational facility available to the wider community. During the year we have tried to maintain a programme of high quality speakers, both live and recorded...covering a wide span of topics involving astronomy, space, and the universe.

To celebrate the opening of the observatory in June we were delighted to be able to bring our Patron, Dr Grant Christie, from Stardome Observatory to Tauranga : His address "For Love or Money" gave us a fresh insight into the outstanding work that many talented amateur astronomers in New Zealand are contributing to the discoveries of new planets and galaxies in our universe .

In July retired Master Mariner, Captain Tim Wood took us through the exacting science of how he was trained in Celestial Navigation. In September the curator of instruments for the Carter Observatory in Wellington, Gordon Hudson showed us how he goes about the meticulous work of restoring many ancient telescopes and allied instruments to "as new" condition.

This year, in March, Grant Christie returned, with a fascinating talk about "How the first stars were formed" and just last month, astro-photographer John Drummond traveled from Gisborne to show and tell us how he captures his amazing photographs of deep space objects. I am sure you will agree, it's been a great year and I am so grateful for the time and effort that our guests put into arranging their visits. I would also like to acknowledge the assistance of the Tauranga Community Grants Organisation, COGS, which funded the majority of our guests' travel and accommodation.

And of course during the year we have hosted visits from a number of organisations, including a grants donor - Pakeke and Mount Lions, as well as pupils from both Matua Primary school and Tauranga Intermediate. Next month is already looking extremely busy, with both Matua scouts and Whakamarama pre-schoolers booked to visit.

Looking to the future. I would hope that some funding can be arranged by the Otumoetai Sport and Recreation Club to engage an engineer, to improve the acoustics of this hall. The addition of acoustic tiles to the ceiling and walls, along with some heavy drapes over the windows, would go a long way to canceling out the delay and echoes, when we are trying to hear our guests speak!

This is my final year as president, and I am not accepting nomination for the committee. After 4 years in the chair I feel that I have achieved what I set out to do and I strongly believe that it's time for some new blood and possibly new directions to lead the Society forward.

George Stewart

Situation Vacant. There is a vacancy for an assistant secretary in the Tauranga Astronomical Society to help the Secretary and, if mutually suitable, to take over after May 2012. This is a key role in the Society and one for which the only qualifications are computer literacy and ,eventually, 4/5 hours per month of your time. You do not need to be a member of the Society but, of course it is hoped that you would eventually join us. Does this volunteer job sound like you or someone you know? To obtain further 'no obligation' information please ring Jim Barrowclough on 576 5389.

Tauranga Astronomical Society Gets an Award



An Astronomical Society member approached the secretary in June saying he would like to nominate the Tauranga Astronomical Society for a TrustPower community award, to which the secretary responded to the affirmative as any award would be very welcome indeed. That was followed by four pages from TrustPower that had to be filled in and sent back to Trustpower to have our nomination approved. Nevertheless the nomination was accepted and in due course we were advised that on July 18th our President, Vice President and Secretary were invited to attend the Awards' presentation. The President thought we might be up for a plaque/certificate, the Secretary, being an optimist, thought we might be getting some cash and the Vice, being a cautious fellow, withheld judgement. In the event we were all pleasantly

surprised to receive both a handsome framed certificate which is hanging in the observatory and a cheque for \$250, awarded as runner up in our category of Educational and Child/Youth development, presented in recognition of an outstanding contribution to the Tauranga community. It was gratifying that our work in the community was acknowledged in this way. It is also encouraging for all the people who have worked so hard over the years, and are still doing so, to bring us to our present position. With the help of all members may the Society continue to improve onwards and upwards [pun intended] in the future. Toby Tobias.

Local student goes to Spacecamp

By Toby Hendy

From the 22nd to 29th July I had the pleasure to attend the international space camp in Huntsville, Alabama. I was one of two students selected by the Royal Society of New Zealand to attend and joined over 100 students from countries all over the world. The week was a hands-on astronaut training, preparing us for the mental and physical demands of life in space.

With long days and harsh early morning wake-ups, our week was jam packed with activities. Our engineering skills were tested with a rocket building challenge. The rocket needed to carry an egg high into the air, and ours was a success, being one of the only rockets to bring the egg back down to earth unscathed. We were also faced with constructing a pressure suit out of everyday materials, and building a heat shield to protect our egg from "the flames of reentry". Although it has to be known that our egg was fried by the end of it.



Another memorable activity was scuba diving in the Underwater Astronaut Trainer- a deep tank used to train astronauts for the weightless effects of space. In the water we were able to launch an underwater payload and play catch with a bowling ball! Experiencing some of the physical demands of an astronaut was a focus of the week. We felt four G's of force in the centrifuge, walked on the moon in the 1/6th gravity chair and were spun in the multi-axis trainer.

The week was also aimed at preparing us for simulated space shuttle missions orchestrated to be as realistic as possible. We attended lectures and workshops on shuttle design, space medicine, shuttle history, living in space and more. These helped us in our missions where there were team members in mission control, the International Space Station and on the Orbiter.

We had to communicate via headsets and rely on other team members (especially those in mission control) to aid our survival on the missions. We had four one-hour missions and one six-hour extended duration mission near the end of the week. Surviving these missions was not easy when many anomalies were thrown our way. From a hurricane in mission control cutting communication to an impending solar flare at the space station, there was no shortage of technical problems, malfunctioning life support systems or medical anomalies to keep us on our toes during the mission. I was chosen to preform an EVA (extra-vehicle activity) during the mission to repair a damaged satellite, which was a highlight as it meant I was decked out in astronaut gear and suspended over the satellite in a harness. Fortunately the pilot landed the orbiter safely and overall it was considered a successful mission.

Obviously this wouldn't have been achieved if the team didn't work well together. To grow as a team and develop leadership qualities we were taken to Area 51, where we were to complete many team building exercises and achieve feats such as reaching the top of a climbing wall without breaking the tether with your teammates, and climbing and jumping from a 40ft pole. Leadership and teamwork qualities are vital for the 'new breed of astronauts', where the focus is no longer on finding physically strong individuals, but people that can work well together to get tasks done.

The week was tinged with a sadness in the air as the last space shuttle Atlantis completed its final journey the day before camp commenced, marking the end of the Space shuttle era. Some American space enthusiasts I met had been left in bewilderment after the programme had been ended without a replacement. Although with focus expected to turn to work on mars and asteroids, the horizons are still promising for space travel. The end of the shuttle programme has not meant the end of exploration, and my time at space camp has deepened by passion and ambition to become a part of it.

Dr. Jeff Tallon was our esteemed guest speaker at our meeting on September 27th. 2011 which attracted a record audience of 112 people. He was extremely well received and we were honoured to listen to such a distinguished scientist.

At the crack of dawn – the very early Universe

Dr Jeff Tallon is Distinguished Scientist at Industrial Research Ltd and, until 2009, was concurrently Professor of Physics at Victoria University of Wellington. He is internationally known for his research, discoveries and commercialization of high-temperature superconductors. Dr Tallon's other research interests are in nanotechnology for biological applications. His research has received many awards, including the Rutherford Medal, a CNZM and the inaugural Prime Minister's Prize for Science. He is currently a Visiting Professor at Cambridge University.



The conditions of the very early universe set the entire cosmos on a course that would eventually result in cosmologists. It is a profound, indeed mind boggling, story that often requires us to abandon notions of commonsense. By the "early universe" we mean roughly its first second of existence. It can be studied in the lab, or with pencil and paper and some sometimes difficult

mathematics, or by looking out into space with an assortment of instruments. Symmetry breaking, the first appearance of mass, Higgs particles, string theory, dark matter, and black holes are all part of the backdrop to the rich canvas of the early universe. As it happens, the field of superconductivity (which is readily accessible in a moderately equipped lab) tells us a great deal about the early universe. One has only to make a leap of imagination (constrained by mathematics) and the full zoo of fundamental particles (quarks, photons, gluons, W and Z bosons,...) all fall out naturally from simple notions of symmetry. Interestingly, our mathematical minds insist on it. And this leads us to the fascinating question: does the universe about us constrain rational mind or does rational mind control the universe?

DARK SKIES

<http://www.skydome.org.nz>

If you are thinking of heading north for your summer holidays, drop in and experience an Astronomy Adventure at Deborahs' observatory!



When Deborah Hambly looks into the night sky above her Bayly's Beach observatory she becomes passionate about a subject that most New Zealanders take completely for granted. NZ has some of the darkest skies left in the industrialised world.

A Canadian by birth, Deborah became interested in the stars as a young child, but it wasn't until she went to University and completing her Masters degree in Education that she was really able to become fully engaged in astronomy. When she started teaching Indian Children in Northern Canada, she bought her first "proper" (8") telescope and started a school-based astronomy club. Two years later she moved to the UK and as her interests developed she became involved at a national level in the Campaign for Dark Skies.

Her most significant astronomical event in the UK was the first transit of Venus in 125 years - the first time technology was available to record the event:

"A friend and I set up camp at "White Horse" in eager anticipation. Setting our alarms for 5:30am to have our three telescopes, camera, and video recorder set up and ready with time to spare, we watched the sunrise and the transit began with clouds in the area, but not obstructing our view. The rest of Oxfordshire missed the start of the transit due to local clouds but we were able to record the whole event. We promised each other that we would travel to New Zealand to see the next Venus Transit – in 2012. Little did I know that within the year I would immigrate here!"

She had become frustrated with star-gazing in England which was the 2nd worst country for light pollution in Europe, when a friend suggested moving to the southern hemisphere.

In 2004, she had planned to holiday here but after much research she realised there were no public facilities that would facilitate her star-gazing. The planetariums in the cities might offer a view of a planet through a telescope (interrupted by light pollution) but she certainly wouldn't be able to control the scope herself. So the holiday never happened and instead she



moved here sight-unseen to pursue her astronomical passion and her dream of opening a public observatory to showcase New Zealand's dark skies.

"I knew that NZ had a reputation for dark skies and given its Southern position, it also had the best of every type of deep sky object - star clusters, nebulae and galaxies".

Deborah arrived in 2005 to take up a teaching job in Dargaville, two and a half hours North of Auckland, and blessedly dark! Her first view of the New Zealand sky confirmed that the move was worth every kilometre - the view was beyond belief.

She also discovered that New Zealand had much more to offer to the field of astronomy than merely dark clear

skies. She set to building an Observatory with the largest hands-on telescope in New Zealand. It was not a task for the faint-hearted. She discovered a fibreglass dome in need of repair and a 15" equatorially-mounted and driven telescope (from the Whangarei club). The 4 metre diameter building was built and the reconditioned dome fitted into place by crane.

No sooner had she built her observatory than the local council announced plans to double the number of streetlights in the tiny beach community, and she was thrust once again into the battle for dark skies.

I knew from my Oxfordshire experience that streetlights themselves were the not necessarily the problem but that the intensity and distribution of light can have a powerful negative impact. I knew that it was possible to install entirely 'fully cut off' (FCO) lighting with no light misdirected into the night sky. The wattages of the lights could be lower also, reducing power cost, and lessening the impact on plant and animal life. All of these modifications could help to save our view of the stars."

After months of negotiations the council agreed to install slightly more expensive FCO lights. She also asked them to shield nearby lights – something any homeowner who finds the light spill from a streetlight an irritant can request. Once the lights were installed, there was, satisfyingly no measurable difference to the view of the skies from her observatory.

All kinds of people now come through Deborah's observatory to experience the benefits of the Southern dark skies coupled with her enormous experience. School children, tourists and visiting astronomers equally marvel at the quality of the star-gazing experience that is available here in New Zealand.

Since coming here Deborah has been able to embrace other aspects of our star-culture, in particular the special importance of Matariki (the Pleiades or "Seven Sisters") to Maori and the other Oceanic peoples of the South Pacific. When it is visible in the evening sky, Matariki is always a highlight and when it isn't, she finds another 'galactic cluster' and explains the similarities and differences. She makes a point of showing visitors how to locate the objects she shows on the tours at home, using binoculars, so that would-be astronomers go home with the skills necessary to take their interests further should they wish.

Now she's looking forward to fulfilling the promise that she and her English friend made years ago - to meet in New Zealand for the 2012 transit of Venus.



If you're keen to visit, Deborah has private self-contained accommodation on-site with spa facilities and for those families with kids - a trampoline, fort, trapeze and Wendy house.

Many thanks to Deborah Hambly for this article. Hope everyone enjoyed reading it!

THE PLANETS IN OCTOBER

Mercury and Venus become a close pair of planets visible in the early evening sky during the second half of the month.

Jupiter rises at sunset by the end of October so will be easily visible late evening as well as in the dawn sky in the month.

Mars remains a morning object to the northeast in the early dawn sky.

Saturn is at conjunction with the Sun on October 14th. (NZDT) so is not observable throughout the month.

Jupiter is at opposition on Oct. 29th. so will be readily observable in the late evening as well as the morning sky, although very low at sunrise by the month's end.

