

TAURANGA ASTRONOMICAL SOCIETY NEWSLETTER

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Edited by Jim Barrowclough

Welcome to the second edition of the Tauranga Astronomical Society's newsletter which to the majority will be delivered by e-mail which will make a very useful publication if you print it out, preferably in colour and keep each one, as the astronomy articles could make a series of interesting facts for future reference.

Some of the content has been supplied by Gunter Van Dijk, where from I don't know as I'm just starting this and Gunter's contribution has not yet come to hand - shall we say it'll come from somewhere in the depths of his computer.

Now is the time to mention the generosity of the newsletter's sponsors, Harris and Tate, whose advertisement appears at the end and who will be printing out and mailing copies to those not on e-mail. They have our thanks as it is felt that a newsletter does much to hold the interest of members and to a few who aren't but have a keen interest in astronomy. I have been told by many who also appreciate the times when the clouds part and allow us to look through the telescope at the splendid planets of Saturn and Jupiter, the moon and a number of interesting objects which show up quite well on our 8 inch telescope. David Gordon and Ursula got an even better view of the triple transit of Jupiter's moons across the planet's face through David's 12 inch Dobsonian recently. Interest in astronomy in Tauranga is growing with a total of 47 people now on our list to notify about telescope viewing, newsletter or other matters of value, although not all are members of the Society but may become members at some time but we're happy to have them join in and share the delights of all there is to see up there in the sky. For a society that has only been going a couple of years we seem to be growing at a steady pace. We're also expanding and taking the telescope out to show other groups the wonders of the night sky and giving talks which of course is one of the aims of our Society.

The Society wishes to record our grateful thanks to Gunter Van Dijk who donated his small astronomical dome to us to use on our first observatory which we are hoping to build at Fergusson Park.



THE MEETING ON MAY 26th. WILL BE THE ANNUAL GENERAL MEETING

with the usual public meeting afterwards with talks, videos and telescope viewing as we always do, so please do come along - we value your opinions on all matters. Financial members will receive a separate mailing with particulars pertaining to the A.G.M. This will be in e-mail format for those with PCs and hard copy for non e-mail members. Owing to work pressure on the poor editor this separate notice to members may not appear until about the end of the month or thereabouts which still gives plenty of time for the required notice before the A.G.M.

Although progress appears to be slow there has been a lot of work done by the Trustees (committee) over the past year with going through and making proposed amendments to the Trust Deed, which will be discussed at the AGM; quotes, estimates, drawings and plans for the proposed smaller observatory at Fergusson Park, meetings with the City Council officers on numerous matters such as negotiating sites for a future large observatory, the current smaller one, and a possible planetarium in the City museum to be built in a few years time as preparations have to be considered well before if we want to be included in all these projects.

We want our Tauranga Astronomical Society to be well known in the community and hope to have more publicity on our activities and aims which all help our efforts to obtain finance to achieve our ultimate goals. We have recently acquired some 12 inch spiral tubing similar to sonatube which would

be ideal for making telescopes and also some plastic tubing of about 8-9 inch diameter. Building your own telescope would be a fascinating hobby so if anyone has a serious urge in that direction, please get in touch with our Society.

Don't forget our usual monthly public meeting at Fergusson Park at 7.30pm. on Wednesday, April 28th. 04

Fading Supernova is Producing a Spectacular New Light Show

Seventeen years ago, astronomers spotted the brightest stellar explosion ever seen since the one observed by Johannes Kepler 400 years ago. Called SN 1987A, the titanic supernova explosion blazed with the power of 100,000,000 Suns for several months following its discovery in February 1987. Although the supernova itself is now a million times fainter than 17 years ago, a new light show in the space surrounding it is just beginning. There are many bright spots along a ring of gas, like pearls on a necklace. These cosmic "pearls" are being produced as a supersonic shock wave unleashed during the explosion slams into the ring at two million km per hour. The collision is heating the gas ring, causing its innermost regions to glow. Curiously, one of the bright spots on the ring (at 4 o'clock) is a star that happens to lie along the telescope's line of sight. Astronomers detected the first "hot spot" in 1996, but now they see dozens of them all around the ring. The temperature of the flares surges from a few thousand degrees to a million degrees Fahrenheit. Individual hot spots cannot be seen from ground-based telescopes. Only Hubble can resolve them. And, more hot spots are coming. In the next few years, the entire ring will be ablaze as it absorbs the full force of the crash. The glowing ring is expected to become bright enough to illuminate the star's surroundings, thus providing astronomers with new information on how the star ejected material before the explosion. An elongated and expanding object in the middle of the ring is debris from the supernova blast. The glowing debris is being heated by radioactive elements, principally titanium 44, that were created in the supernova explosion. The debris will continue to glow for many decades. The ring, about a light-year across, already existed when the star exploded. Astronomers believe the star shed the ring about 20,000 years before the supernova blast.

The violent death of a star 20 times more massive than the Sun, called a supernova, created this stellar drama. The star actually exploded about 160,000 years ago, but it has taken that long for its light to reach Earth. The supernova resides in the Large Magellanic Cloud, a nearby small galaxy that is a satellite to our Milky Way galaxy.

Solar Flares Cause Communications Problems

Mother Nature can sure cause a lot of static when she wants to. In fact, static was the only thing heard on a few air-carrier-based communication systems on Monday, as a solar storm was blamed for interfering with high-frequency communications. While the storm could last up to two weeks, a powerful flare-up that hit earth yesterday morning was labelled the "third most powerful solar X-ray flare on record, a remarkable X17.2 category explosion," according to The European Space Agency. Although the first flare-up did not cause widespread problems, the second event did disrupt some airline communications bands and cell phones and even caused some difficulties for the fire fighting in California. The FAA's William Shumann said the agency's ground-based and satellite systems have been unaffected to date. The storm, called a "coronal mass ejection," sent a mass of intensely radioactive solar gas toward Earth at 2,000,000 mph. And while many aircraft could be affected by the event, some are helping study it. Scientists have loaded specially designed Low Linear-Energy-Transfer Radiation Spectrometers (LoLRs) on a fleet of Boeing 747s operated by Evergreen International Airlines. As the jumbos fly across the United States and Africa and the Atlantic, Pacific and Arctic Oceans, they will help survey aviation-altitude radiation and relate those phenomena to what's happening in the "space weather" outside the atmosphere.



SPIRIT UPDATE: Spirit Stands Down for Flight Software

Upgrade—April 9th, 2004

The term ‘sol’ refers to one Martian day and they have been numbered since the rovers landed on Mars. Spirit began a four - sol stand—down on Sol 94, which ended at 8.37pm. On April 8th, 04. During this time, the Rover will receive a flight software upgrade that should make its remaining Martian days even safer and more productive. The upload will run through sol97 with a rover reboot on sol98, Monday, April 12th. Opportunity will be receiving the same update package in upcoming sols. Spirit is currently parked in front of the rock called “Route 66” , and will remain there for the duration of the flight software update, with the Mossbauer spectrometer integrating on the rock, and the alpha particle X-ray spectrometer pointed up to the sky. The flight software update package includes three key changes. First is an update to the autonomous navigation software that will allow Spirit to travel longer distances autonomously over over th extremely rocky Gusev Crater terrain. The current autonomous navigation software sometimes gets stuck when it detects a hazard that it can’ t navigate around. The new version will allow Spirit to turn in place to find the best possible path. The second part of the flight software update will allow Spirit to recover more easily from an anomaly like the one that occurred on sol 18. Although operational processes and software have already been updated to prevent something like this from ever happening again, engineers have included additional safety nets in the software that would allow the rover to autonomously react to a similar anomaly and recover to a more stable state. The third portion of the update is specific to Opportunity and is intended to mitigate against energy loss associated with the stuck heater on Opportunity’ s instrument deployment device. The fix allows rover planners to put the rover in a deep sleep mode, where the batteries are totally isolated from being able to power the stuck switch. Therefore, with no power reaching the stuck heater switch, the Opportunity rover battery will not be drained. Rover controllers not initiate the deep sleep capability on Spirit unless it becomes necessary.



OPPORTUNITY UPDATE : Travelling Around the Trough - sol 73, Apr. 08 2004

Opportunity was on the move again on sol 73, which ended at 7.39 am. PST on April 7. The rover toured and examined the trough remotely. Opportunity woke up to “ Let the Good Times Roll” by B.B. King - a nod to Spirit’ s successful primary mission of 91 sols and a call for more good times during the coming sols.

Mysterious Sedna

Astronomers have discovered a mysterious planet-like body in the distant reaches of the solar system.

March 15, 2004: NASA-funded researchers have discovered the most distant object orbiting the sun. It’s a mysterious planet-like body three times farther from Earth than Pluto. "The sun appears so small from that distance that you could completely block it out with the head of a pin," said Dr. Mike Brown, California Institute of Technology (Caltech), Pasadena, Calif., associate professor of planetary astronomy and leader of the research team. The object, called Sedna for the Inuit goddess of the ocean, is 13 billion kilometres (8 billion miles) away, in the farthest reaches of the solar system. This is likely the first detection of the long-hypothesized "Oort cloud," a faraway repository of small icy bodies that supplies the comets that streak by Earth. Other notable features of Sedna include its size and reddish color. After Mars, it is the second reddest object in the solar system. It is estimated Sedna is approximately three- fourths the size of Pluto. The researchers used the 48-inch Samuel Oschin Telescope at Caltech’s Palomar Observatory near San Diego. Within days, telescopes in Chile, Spain, Arizona and Hawaii observed the object. NASA’s new Spitzer Space Telescope also looked for it.

Sedna is extremely far from the sun, in the coldest known region of our solar system, where temperatures never rise above minus 240 degrees Celsius (minus 400 degrees Fahrenheit). The planetoid is usually even colder, because it approaches the sun only briefly during its 10,500- year solar orbit. At its most distant, Sedna is 130 billion kilometres (84 billion miles) from the sun, which is 900 times Earth’s solar distance.

Saturn emerging from behind the moon during the occultation of November 3, 2001.

Well, don’ t know how many have seen this picture— it was from the Meade catalogue and it shows a portion of the moon with the shadow part above and to the left with the sunlit Saturn emerging from behind. Etienne Bonduelle of Cambrai, northern France, obtained this remarkable image with his Meade 8 inch LX90 Schmidt-Cassegrain using a web cam adapted to the telescope. Optically and mechanically this scope provides everything for high resolution and planetary work.



Planet Distances

All the planets orbit the Sun elliptically. The eccentricity of the elliptical orbit varies from almost circular for Venus and Neptune, to quite extreme for Pluto and Mercury. The Earth also orbits the Sun, which means that the distance from the Earth to the other planets depends on the position of the Earth and each planet on their respective orbits. The table below gives the Geocentric distance (measured from the Earth) and the Heliocentric distance (measured from the Sun) in AU, of the planets for the fifteenth of the month at 00:00 NZST. The Astronomical Unit (AU) is the mean distance from the Earth to the Sun; hence the geocentric distance to the Sun is always approximately one AU. To convert from AU to km, multiply by 149,597,871.

April 15 (0h)	Geocentric Distance	Heliocentric Distance
	AU	AU
Sun	1.00319	
Mercury	0.59366	0.41477
Venus	0.58645	0.71949
Mars	2.04014	1.60324
Jupiter	4.67214	5.42453
Saturn	9.28509	9.03773
Uranus	20.68337	20.04429
Neptune	30.40438	30.07231
Pluto	30.23399	30.78186