

# TAURANGA ASTRONOMICAL SOCIETY (INC)



**PATRON: Dr. Frank Bateson OBE FRAS FRASNZ**

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## February Newsletter

Hi to all. Well this is the first newsletter of the Tauranga Astronomical Society which comes to you by the generosity of the legal firm of Tate - Harris who offered to send this out to not only the members of our Society but all others who might be interested in astronomy and telescope viewing. We welcome anyone with an interest and are also happy to accommodate a commercial from the sponsors.

At our public nights on the fourth Wednesday night of each month the business of the Society and of the committee is usually explained so I wont just reiterate what has already been announced but we feel that a number of you may not be familiar with the History, Aims and Objectives of our organisation and so they are displayed right here.

### THE FORMATION, CURRENT ACTIVITIES AND FUTURE

**BACKGROUND:** It has become obvious in recent years that among all cities of comparable size, and many even smaller, Tauranga alone in N.Z., did not possess an astronomical observatory and a pro-active Astronomical Society.

To rectify this deficiency a steering committee was formed by the late Mr. Dennis Twiss and the inaugural meeting of the Tauranga Astronomical Society Inc. was held at Bureta Park Hotel, Tauranga on 19th. May 2002. The inaugural committee was elected and the Aims and Objectives of the Society, listed as Appendix 1, were confirmed.

**CURRENT POSITION:** We have 32 financial members and a number of individuals and families who are attending our monthly meetings, which include talks, videos and planet/star viewing using our 8 inch telescope, purchased with loans from our committee members, plus privately owned telescopes belonging to members.

We are fortunate to have among our members some with considerable experience in amateur astronomy including David Gordon - a keen amateur astronomer since school days and owner of a 10 inch and a 12 inch telescope. Teaches astronomy for the University of the Third Age in Tauranga. Main astronomical interests are mathematics appertaining to astronomy, and astrophotography.

Ursula MacFarlane - member of Wellington Astronomical Society 1996 - 2000, Newsletter editor 1998 - 2000, teaches extra curriculae classes primary school children.

Jim Talbot - keen amateur astronomer since school days. Owns an 8 inch Meade reflector telescope. Main astronomical interest is web cam astrophotography. His website is <http://frontpage.wave.co.nz/~jtalbot/> - he also writes the website for the Tauranga Astronomical Society - [www.tauranga-astro.150m.com/](http://www.tauranga-astro.150m.com/)

Gunter Van Dyk - foundation member and treasurer of Wellington Planetarium Society Inc. On retirement in 1981 became Planetarium Director and operated the Planetarium 7 days a week. The Planetarium became part of the Carter Observatory which in 1992 was renamed the New Zealand Astronomy Centre. Owns a 2 metre dome observatory and an 8 inch telescope.

All four are committee members of the Tauranga Astronomical Society. The Society has a close and growing affiliation with the Tauranga University of the Third Age (U3A) astronomy group. U3A is developing a mutual assistance programme with the University of Waikato and it is hoped that will lead to a positive benefit for the Astronomical Society.

### STRATEGIC PLAN:

**Stage 1.** The Society intends to establish a viewing platform and storage facilities in an urban location convenient for schools and the general public. To this end the Society is working closely with the Tauranga District Council to identify a mutually acceptable site where, subject to funding, a start may be made to introducing astronomy to the citizens of Tauranga. It is hoped that the 8 inch telescope will be supplemented with a 10 inch model for use on the site, together with members telescopes.

**Stage 2.** The site outlined for Stage 1 will be a satisfactory and convenient level to astronomy for newcomers to the science including our younger folk. To progress to more serious study as opposed to hobby participation it is envisaged that an observatory will be built, perhaps in a different location, containing a 16 inch telescope plus storage and lecture room. Several sites are being evaluated at this stage.

**Stage 3.** This will be a state of the art planetarium, built within the city. Our President paid a visit to the Brisbane Planetarium to obtain background planning data for this longer term objective. Tauranga will be only one of four cities in New Zealand to have such a facility. It is anticipated that, once stage 1 is completed, a major sponsor will be sought to bring Stages 2 and 3 to fruition.

# Aims and Objectives



- (1) To promote and foster the science, study and hobby of astronomy and related technology in the western Bay of Plenty.
- (2) To encourage and foster associations and groups interested in astronomy including other organisations, clubs and schools.
- (3) To cooperate with, advise and assist all persons interested in the science, study and hobby of astronomy.
- (4) To arrange viewing nights for members and for the public, at chosen sites using various telescopes owned by the Society members and others.
- (5) To set up and run a viewing platform and an observatory at suitable sites for membership and community use.
- (6) To encourage and foster the education of children in the science, study and hobby of astronomy and arrange lectures and demonstrations for schools.
- (7) To make available a number of telescopes for loan use by Society members.
- (8) To advertise and promote the observatory project among the local community.
- (9) To plan for a future planetarium.



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## Black Hole Mayhem



Two x-ray telescopes have caught a black hole in the act of ripping a star apart.

**February 18, 2004:** Thanks to two orbiting X-ray observatories, astronomers have the first strong evidence of a supermassive black hole ripping apart a star and consuming a portion of it. The event, captured by NASA's Chandra and ESA's XMM-Newton X-ray Observatories, had long been predicted by theory, but never confirmed ... until now. Astronomers believe a doomed star came too close to a giant black hole after being thrown off course by a close encounter with another star. As it neared the enormous gravity of the black hole, the star was stretched by tidal forces until it was torn apart. This discovery provides crucial information about how these black holes grow and affect surrounding stars and gas.



**Above:** An artist's visualization of a star that wandered too close to a supermassive black hole in galaxy RX J1242-11.

Observations with Chandra and XMM-Newton, combined with earlier images from the German Roentgen satellite, detected a powerful X-ray outburst from the center of a galaxy named "RX J1242-11." This outburst, one of the most extreme ever detected in a galaxy, was caused by gas from a star that was heated to millions of degrees Celsius before being swallowed by the black hole. The energy liberated in the process was equivalent to a supernova.

"Stars can survive being stretched a small amount, as they are in binary star systems, but this star was stretched beyond its breaking point," said Stefanie Komossa of the Max Planck Institute for Extraterrestrial Physics (MPE) in Germany, leader of the international team of researchers. "This unlucky star just wandered into the wrong neighborhood."

The black hole in the center of RX J1242-11 has a mass of about 100 million times Earth's Sun. By contrast, the destroyed star probably had a mass about equal to the Sun. Astronomers estimate that only 1 percent of the star's mass was ultimately consumed, or accreted, by the black hole. The rest was flung away from the black hole.

The force that disrupted the star in RX J1242-11 is an extreme example of the tidal force caused by differences in gravity acting on the front and back of an object. The tidal force from the Moon causes tides in Earth's oceans. A tidal force from Jupiter pulled Comet Shoemaker-Levy apart, before it plunged into the giant planet.



**Left:** Black holes aren't the only things that cause strong tides. Jupiter can do it, too. This illustration shows Comet Shoemaker/Levy crashing into Jupiter in 1994, after the comet was torn apart by the giant planet's tides. Although on a very different scale, the physical mechanism for the breakup of Shoemaker/Levy also caused the disruption of the star in RX J1242-11.

The odds of a stellar tidal disruption in a typical galaxy are low, about one in 10,000 annually. If it happened at the center of the Milky Way Galaxy, 25,000 light-years from Earth, the resulting X-ray outburst would be about 50,000 times brighter than the brightest X-ray source in our galaxy, but it would not pose a threat to Earth.

Other dramatic flares have been seen from galaxies, but this is the first one studied with the high-spatial resolution of Chandra and the high-spectral resolution of XMM-Newton. Both instruments made a critical advance. Chandra showed the RX J1242-11 event occurred in the center of a galaxy, where the black hole lurks. The XMM-Newton spectrum revealed the fingerprints expected for the surroundings of a black hole, ruling out other possible astronomical explanations.

Supermassive black holes in the centre of galaxies are familiar to astronomers. There are many of them, including one at the heart of our own Milky Way. Now astronomers have a way to find more: look for x-ray outbursts when stars are ripped apart by black-hole tides. Observations like these are needed, say researchers, to determine how quickly black holes can grow by swallowing neighboring stars.

Being the first of our newsletters there could be changes to the format in future issues but we hope this means of contact will keep everyone informed at what the Society is doing. As will be mentioned at the public meeting on Feb. 25th, we received a wonderful donation from Gunter Van Dijk of his observatory which we have transported to Bill Simms's property at Papamoa for storage until we can later use it - many thanks Gunter. If you can support our sponsor, please do. Bye for now and let's hope for better telescope viewing nights - Ed.



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