

## Southern African Fireball Observations 2006

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### Catalogue of Recent Sightings

This article continues the sequential numbering of reported fireball sightings from southern Africa and covers fireballs observed from January to December 2006. By definition, a fireball is any meteor event with brightness equal to or greater than visual magnitude -3. The following events were reported to the author and details are reproduced as given by the observer. All times were converted to UT and all coordinates are for epoch J2000.0.

#### Event 184 – 2006 January 4 – Pine-lands, Cape

Observed by Cliff Turk at 19h48.  $m_v = -8$ . Duration 2-3 seconds, colour white and leaving a narrow yellow trail persisting for 1 second. No sounds or fragmentation noted. Bright head surrounded by a coma, appearing like a comet. Path from 22h00, -40 to 18h00, -70.

#### Event 185 – 2006 January 22 – Brits, Gauteng

Observed by Wayne Mitchell at about 17h30.  $m_v =$  not estimated. Wayne reported 'I had just stopped at the T-junction at the Elandsrand turn off left towards Rosslyn, straight ahead was Silkaatsnek. The sun had just set and the sky was still bright. Suddenly a brilliant blue white meteor appeared in the upper part of the windscreen, travelling directly away from me. The duration

was about 5 seconds, the meteor had a blue train of 6-8 degrees and disintegrated into three orange fragments which continued to descend for about another 5 seconds before disappearing at an altitude of about 10 degrees.

#### Event 186 – 2006 February 18 – Piket Bo-berg, Cape

Observed by Tony Mullin at 19h28.  $m_v = -3$ , more than twice as bright as Sirius. Duration 4 seconds. Colour bright orange to yellow. Traversed from Crux vertically below Corvus, about  $\frac{1}{4}$  width of Corvus). Only last part of trajectory was witnessed.

#### Event 187 – 2006 February 20 – Sutherland, Cape

Observed by David Anderson and Neil Parley, visiting Ph.D. students from the UK, shortly after 21h00.  $m_v =$  about -11 (about twice as bright as the 60% moon which rose shortly afterwards). Direction of path very approximately from 07h, -49 (Puppis) towards lower right (west), initial trajectory not seen. David commented 'Neil and I thought at first that someone was shining a torch in our faces from close range. I believe the reason Neil did not look and see the trail was that I was in fact holding a torch at the time and perhaps he assumed this to be the source of the light. Half the sky appeared orange. I looked towards the source of the light and despite my slow

reactions, I saw the meteor continue for a few degrees travelling towards the horizon in a westerly direction. Although it was not at this point as bright as the initial flash, it was still a markedly bright white trail’.

**Event 188 – 2006 March 17 – Polokwane, Northern Province**

Observed by Magda Streicher at 20h35.  $m_v = -4$ . Path approximately 04h40, -04 to 05h20, +10. Colour green, speed slow, terminated with a green flash.

**Event 189 – 2006 April 16 – Bryanston, Gauteng**

Observed by Rob Scott at 00h05, reported by Trevor Gould. Much brighter than Venus, seen while driving on William Nicol highway. No further details provided.

**Event 190 – 2006 July 8 – Ugie, Eastern Cape**

Observed by Angelique Tegg at 17h40. Brightness exceeded the near-full moon, which was up at the time. Duration 3-5 seconds, colour golden yellow. Path very approximately from Sagittarius towards Carina, starting at altitude  $15^\circ$  when first seen and fragmenting in an explosion about  $10^\circ$  above the horizon.

**Event 191 – 2006 July 11 – Makhado, Northern Province**

Observed by Sarah Coroniaios at 15h55. She reported ‘Seen around 60 to 70 degrees above the eastern horizon, moving east to west, disappeared about 30

degrees above the western horizon. Duration approximately 2 seconds. Large with train, about 1 degree long.  $m_v = -3$  or  $-4$ , about three times brighter than Jupiter’. The event was also reported via Claire Flanagan by four independent members of the public in the Johannesburg/Midrand area.

**Event 192 – 2006 July 29 – Cederberg, Cape**

Observed by Dudley Field at 18h05.  $m_v = -4$ . Speed slow, duration 3 seconds, colour white, no train. Moved from Sagittarius through Ophiuchus towards Arcturus. The description is possibly consistent with that of an alpha Capricornid.

**Events 193 and 194 – 2006 October 13 – Cederberg, Cape**

Observed by Dudley Field. Event 193: at 19h34, starting just above Altair, going downwards to just above horizon, duration 3 seconds,  $m_v =$  about  $-2$ , brightened significantly as it descended with a distinct flair at the end. Colour White. Event 194: at 20h11, started near Capricorn and went towards Achernar, duration 2 seconds, started at about  $m_v = -2$ , brightening, with a flair approximately halfway and another significant flair at the end.

**Event 195 – 2006 November 5 – Montague, Cape**

Observed at 21h44 by Cliff Turk and a number of staff and students from the Cape Peninsula University during a viewing evening at Protea Farm, Koo

Valley. The path was from 5h30, -15 to 3h20, -30.  $m_v = -4$ , duration 2 seconds, colour white with persistent train of 2-3 seconds, but no fragmentation.

### Event 196 – 2006 November 10 – Rhino Lion Park, Gauteng

Observed by Bill Hollenbach at 18h33.  $m_v = -8$  to  $-10$ . The colour emerald green and duration was 2.5 seconds. He reported 'I was looking from my house in a NNW direction. The initial flare was

like a fireworks explosion that caught our attention. About 1/4 second later it flared to its maximum brightness ( $\sim -10$ )'.

### Event 197 – 2006 November 11 – Waverley, Gauteng

Observed by Jannie Smit at 21h11.  $m_v = -5$  or perhaps  $-6$ . Short path through Lepus very approximately from 05h30, -20 to 06h, -22. Colour white tinged with red, no train or fragmentation, duration 4-5 seconds. ☆

## Eunice Primary School's new Astronomy Club

Mia Zeelie

Ye stars! Which are the poetry of heaven! (Lord Byron: 1788-1824). One cannot but agree with the well-known author when looking up at the sky during a dark evening, that it shows forth an indescribable poetry of its own. A forever changing poem consisting of the solar system bodies, stars, nebulae, star clusters, galaxies, clusters of galaxies, black holes and that which is

unknown, but yet to be discovered. What a great privilege we have to watch this poem revealing more and more of its intricate beauty to us and again sharing that wonderful knowledge with others.

Eunice Primary School in Bloemfontein was selected to take part in last year's astronomy quiz, organized by SAASTA and four Grade 7 learners went through to the final round held at HartRAO. This inspired the formation of an Astronomy Club at Eunice Primary. Participation in the first meeting was exceeded way beyond all expectations with about sixty learners attending. Interest remained high with subsequent monthly evening meetings held at the school, seeing between 50 and 80 kids, even when it was cloudy and cold outside.



A sea of enthusiastic faces at Eunice with Mia Zeelie in the centre, back. Photos: ASSA Bloemfontein

Activities are kept informative and fun-filled, either indoors or outdoors. These included multi-media presentations, quizzes, “make-your-own-planisphere”, telescope viewing on the playground, story telling and more. A “star hunt” was organized one evening where a list of celestial objects was given to the learners to “hunt” down. As part of National Science Week in May, a presentation on astronomy in Southern Africa and careers in science was given by Dr Matie Hoffman of the Boyden Science Centre, during a special evening where siblings and their parents were invited.

From the number of learners attending each meeting and the overwhelming enthusiasm displayed each time, it is clear that the



thirst for astronomy among children in South Africa is alive and well. We aim to make science, and particularly astronomy, a most enjoyable learning experience for the children. Who knows, some might go on to become scientists or take up amateur astronomy as a lifetime pursuit! ☆

*Mia Zeelie, the driving force behind the club, is a committee member of the Bloemfontein Centre and an avid amateur astronomer. She completed a home-built 8-inch Dobsonian reflector which was on display at ScopeX 2007 (see MNASSA 66, 5&6, 98).*

## news notes

### Dark matter ring imaged

There must be very few people who have not yet wondered what will happen when two planets or two stars collide. These days, discovering mergers between galaxies has almost become commonplace but who could have imagined the result of the collision between two massive galaxy clusters! An international team of astronomers using the NASA/ESA Hubble Space Telescope has discovered that a ghostly ring of dark matter can form when this happens (see cover picture). It is the first time that a dark matter distribution has been found that differs substantially from

the distribution of ordinary matter.

Astronomers have long suspected that invisible matter is the source of the additional gravity that holds together galaxy clusters, without which they would fly apart. Gravitational forces from visible material are not sufficient to hold them together. Although we cannot see dark matter, astronomers can infer its existence in galaxy clusters by observing how its gravity bends the light of background galaxies. The ring’s discovery is among the strongest pieces of evidence so far found that dark matter exists.

The ring, which measures 2.6 million light-years across, was found in the cluster ZwCl0024+1652, located 5 billion light-years away from Earth. The team found the ring unexpectedly while they were mapping the distribution of dark matter within the cluster. They created computer simulations showing what happens when

galaxy clusters collide. As the two clusters merge, the dark matter falls to the centre of the combined cluster and rebounds, back out. As the it moves outward, it begins to slow down under the pull of gravity and pile up, forming the ring seen. The team's paper appeared in the 1 June issue of the *Astrophysical Journal*. ☆

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### Pluto demoted even futher

Caltech astronomers, Michael E. Brown and Emily Schaller, using the Keck Observatory in Hawaii and the Hubble Space Telescope, have closely studied the dwarf planet Eris and its moon Dysnomia. After determining the radius of Dysnomia's orbit ( $37\,350 \pm 140$  kilometers) and its period (15.774 days), they could determine Eris' mass ( $1.66 \times 10^{22}$  kilograms). This confirmed

original estimates shortly after Eris' discovery that it outweighs Pluto - by 27%, in fact.

Eris is now ranked as both the largest known member of the Kuiper Belt and the most massive dwarf planet. Scrutiny of Eris also ruled out any possibility that it has any other moons larger than about 50 km. ☆

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### Possible crater found at Tunguska

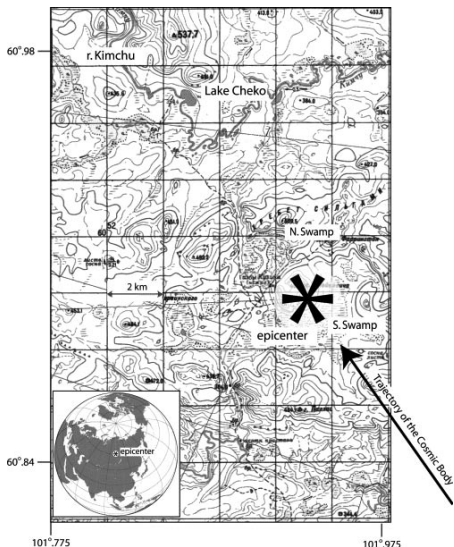
A team of Italian researchers just published a paper in the journal *Terra Nova* (<http://www.blackwell-synergy.com>), reporting on what may be the missing Tunguska impact crater. Tunguska is the best-known destructive impact to have occurred in the modern era, flattening over 2 000 square kilometres of remote forest in eastern Siberia on the morning of 30 June 1908. This was caused by a small asteroid or comet that entered the atmosphere and exploded with a force of 10-15 Mton of TNT, about 1 000 times more powerful than

the Hiroshima atomic bomb. Coinciding with the event, as far away as Europe and Central Asia bright luminescence in the night skies and anomalous optical phenomena in the atmosphere, such as massive glowing silvery clouds and brilliant colourful sunsets, were observed. The blast is thought to have occurred some 5-10 km above the ground and no trace of any impactor or signs of a crater has ever been found.

About 8 km north-northwest of the blast's suspected epicentre is a small

lake, Lake Cheko. The region is remote and it is unclear from old maps whether the lake existed before 1908. By means of acoustic imagery and direct sampling, the research team determined that the geology of the lake's bottom has a strange funnel-like shape that differs from those of neighbouring lakes. Cheko's shape is consistent with an impact origin.

They concluded that Lake Cheko may have formed due to a secondary impact onto alluvial swampy ground; the size and shape of the crater may have been affected by the nature of the ground and by impact-related melting and degassing of a permafrost layer. They hope a future drilling effort will settle the mystery. ☆



**Topographic map showing Lake Cheko, the inferred Tunguska Event epicenter and the probable trajectory for the cosmic body.**

## Two new international SALT partners

Two new partners, as far afield as New York and India, recently joined the Southern African Large Telescope Pty. Ltd. (SALT). They are the American Museum of Natural History (AMNH), New York, and the Inter-University Centre for Astronomy and Astrophysics (IUCAA) of Pune, India. In return for their financial investment and the contribution of their skills and knowledge, the new partners will have access to observing time on SALT.

Both institutes employ world-class astronomers, eager to exploit the unique capabilities of SALT. Apart from various fields of astrophysical research at the AMNH, they

also have extensive expertise in the field of adaptive optics and are world renowned in public outreach and popularisation of science. Astronomers at the IUCAA conduct a wide range of astronomical research and their involvement in SALT is expected to benefit the Indian Giant Metrewave Radio Telescope (GMRT).

Not only do the new partners increase the depth of scientific expertise of the SALT consortium but their contributions also secure the necessary funding for the development of the high-resolution spectrograph (HRS), to be built by Durham University in the UK. ☆