

# "The Southern Cross"



## HERMANUS ASTRONOMY CENTRE NEWSLETTER

JANUARY 2011

Welcome to the fourth year of the Hermanus Astronomy Centre. We hope you continue to find the range of activities and resources provided for members, and others interested in astronomy, interesting, informative and enjoyable. We welcome two new members, Carol and Gert Claasen. In addition to this month's newsletter, there is a New Scientist article on the 'Quantum world'.

For those who have not yet renewed their membership, the details are as follows: The fee is R100 for the first family member and R50 for the second member. Fees are payable in cash, or by cheque made out to Hermanus Astronomy Centre and mailed to the HAC Treasurer Pierre de Villiers at PO Box 267, Hermanus 7200, or on-line to ABSA Hermanus. Branch Code: 632005 Account no.: 9230163786. Account name: Hermanus Astronomy Centre Reference: - Your name (MOST IMPORTANT).

The Centre is now the proud owner of FOUR telescopes. The latest addition is a portable 8" Skywatcher Dobsonian telescope purchased, almost new, from the Wortelgat Outreach Trust.

### WHAT'S UP?

Betelgeuse and Rigel are the most commonly mentioned stars in Orion (its upside-down shape is clearly visible overhead at this time of year). However, the two other stars which form the overall outline of the hunter are also interesting. The blue-white giant Bellatrix (Gamma Orionis), which forms the left shoulder in contrast to red Betelgeuse on the right shoulder, is the third

brightest star in Orion. Although apparently part of the stars in the constellation, the 'female warrior' (Latin) is actually much closer to Earth than the others (240 ly versus 640 ly (Betelgeuse) and 770 ly (Rigel)). Orion's right knee is marked by Saiph (Kappa Orionis), also a blue-white giant, and the sixth brightest star in the constellation. The name means 'sword of the giant' in Arabic. although it is not presently considered to be part of Orion's sword. It is similar in distance and size to Rigel, but, although much hotter, because much of its energy is emitted in the ultraviolet range, it appears to be dimmer.

### LAST MONTH'S ACTIVITIES

**Monthly centre meeting** Forty members and their partners attended the Christmas party held at Baleen's Guest House in Voelklip. They enjoyed a good meal and good company, and also participated enthusiastically in two quizzes.

### THIS MONTH'S ACTIVITIES

**Monthly centre meeting** Wolfgang Lange, one of the first presenters at the Centre, is the speaker at the meeting on Thursday 13 January. According to his e-mail, he will be presenting 'interesting info on KAT-7 and MerKat as well as SKA. Then there are the 4 new Las Cumbres telescopes that will come online at Sutherland early 2011!, a new network set of telescopes that are being installed.'

**Interest groups** The **cosmology interest group** will be meeting **three** times this month. The next four cosmology DVDs will be presented on Monday 10 and 24 January (2 at each session) at 7.30 pm at HMO. The topics are 5 - The sweep of cosmic history & 6 - Measuring distances, and 7 - Expansion and age & 8 - Distances, appearances and horizons.

On Monday 17 January, the fourth discussion on relativity will take place at Pierre Hugo's house at 7.30 pm.

For more information on any of the group's activities, please contact Pierre Hugo at [pierre@hermanus.co.za](mailto:pierre@hermanus.co.za)

Part 3 of the **Beginners astronomy group** series will be presented by John Saunders at the HMO on Monday 31 January at 7 pm. The topic is 'The Milky Way, and beyond'. Weather permitting, there will also be opportunities to star-gaze, using the Centre's telescopes.

For more information and/or to book a place, please contact John at [shearwater@hermanus.co.za](mailto:shearwater@hermanus.co.za)

**Educational outreach** The next scheduled session on the Monet telescope is on Sunday 16 January from 07.00 - 10.00. Learners at Hermanus High School who have been involved in the project are so enthusiastic about it that they are also planning to make a presentation to the whole school early in the New Year, with support from Deon Krige and Pierre de Villiers. Planning is also underway to involve learners from other Overstrand schools in the project.

**Other activities** An article by John Saunders, summarising his recent presentation on comets, was published in the November/December 2010 issue of Whale Talk.

### 2011 MONTHLY CENTRE MEETING SCHEDULE

These will take place at 7 pm at Hermanus Magnetic Observatory.

13 January	'KAT-7, MerKat, SKA, and other new telescopes at Sutherland' by Wolfgang Lange		
3 February	AGM		
10 March	Presenter: Dr Pieter Kotze, HMO. Topic to be confirmed		
7 April	Presenter: Wayne Trow. Topic to be confirmed		
5 May	'Nicholas de LaCaille's work in South Africa' by Dr Ian Glass		
Later dates:			
2 June	7 July	4 August	1 September
6 October	3 November	8 December	

### OBSERVATORY NEWS

New legislation means that a full Environmental Impact Assessment (EIA) is no longer a requirement. Instead, a report, based on work done for the EIA detailing the information which is now required has been submitted to the Department of Environmental Affairs and Development Planning at the Western Cape Provincial Administration, for their consideration.

Architectural work on the design of the observatory, including the recently proposed additional Daytime Astronomy features, continues. Plans for the observatory will be on display at the AGM in February.

### ASTRONOMY NEWS FROM STEVE KLEYN

**A Swarm of Ancient Stars**



This image is composed from exposures taken through the blue, green and near-infrared filters by the Wide Field Camera (WFI) on the MPG/ESO 2.2-metre telescope at the La Silla Observatory in Chile.

About 150 of the rich collections of old stars called globular clusters that orbit the Milky Way are known. This sharp new image of Messier 107, captured by the Wide Field Imager on the 2.2 metre telescope at Chile's ESO's La Silla Observatory, displays the structure of one such globular cluster in exquisite detail. Studying these stellar swarms has revealed much about the history of our galaxy, and how stars evolve.

Messier 107, also known as NGC 6171, is a compact and ancient family of stars that lies about 21 000 light-years away. It is a bustling metropolis, with thousands of stars concentrated into a space only about twenty times the distance between the Sun and its nearest stellar neighbour, Alpha Centauri. A significant number of these stars have already evolved into red giants, one of the last stages of a star's life, and have a yellowish colour in this image.

Globular clusters are among the oldest objects in the Universe. Since the stars within a globular cluster formed from the same cloud of interstellar matter at roughly the same time — typically over 10 billion years ago — they are all low-mass stars, as lightweights burn their hydrogen fuel supply much more slowly than stellar behemoths. Globular clusters formed during the earliest stages in the formation of their host galaxies and therefore studying these objects can give significant insights into how galaxies, and their component stars, evolve.

Messier 107 has undergone intensive observations, being one of the 160 stellar fields that was selected for the Pre-FLAMES Survey — a preliminary

survey conducted between 1999 and 2002 using the 2.2-metre telescope at ESO's La Silla Observatory, to find suitable stars for follow-up observations with the VLT's spectroscopic instrument FLAMES. Using FLAMES, it is possible to observe up to 130 targets at the same time, making it particularly well suited to the spectroscopic study of densely populated stellar fields, like globular clusters.

M107 is not visible to the naked eye, but, with an apparent magnitude of about 8, it is easy to observe on a dark night with binoculars or a small telescope. The cluster is about 13 arcminutes across (about 80 light-years at its distance), and it is found in the constellation Ophiuchus, south of the pincers of Scorpius. Roughly half of the Milky Way's known globular clusters are found in the constellations of Sagittarius, Scorpius and Ophiuchus, in the general direction of the centre of the Milky Way because they are all in elongated orbits around the central region and are most likely to be seen in this direction.

Messier 107 was discovered by Pierre Méchain in April 1782 and was added to the list of seven Additional Messier Objects that were originally not included in the final version of Messier's catalogue, which had been published the previous year. In 1793, William Herschel independently rediscovered it, resolving this globular cluster into stars for the first time. It was not until 1947, however, that it finally took its place in Messier's catalogue as M107, making it the most recent star cluster to be added to this famous list.

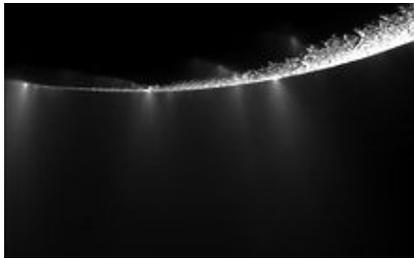
### **Light Dawns on Dark Gamma-ray Bursts**



Gamma-ray bursts (GRBs) are among the most energetic events in the universe, but some appear curiously faint in visible light. The biggest study to date of these so-called dark gamma-ray bursts, using the GROND instrument on the 2.2-metre MPG/ESO telescope at La Silla in Chile, has found that these gigantic explosions do not require exotic explanations. Their faintness is fully explained by a combination of causes, the most important of which is the presence of dust between the Earth and the explosion.

### DID YOU KNOW?

The fifth wonder of the solar system is the massive ice plumes found on Enceladus, one of Saturn's moons.



Enceladus is the 6<sup>th</sup> largest moon of Saturn and one of the smallest spherical satellites of Saturn, almost all of the others having irregular shapes. Named after a character in Greek mythology, it was discovered in 1789 by William Herschel.

Apart from identification of water ice on its surface, little was known about it until the Voyager space crafts passed it in the early 1980s. Voyager 2 identified the presence of large plumes, more information on which has been obtained by at least 4 flybys by Cassini, with more planned, if possible.

Its diameter of 500 km is about 1/10<sup>th</sup> of that of Titan and 1/7<sup>th</sup> that of the Moon, and it is small enough to fit into the length of the UK. It orbits 180,000 km from the outer edge of Saturn's atmosphere, within the ring system. Almost all the sunlight that strikes it is reflected, increasing its visibility.

Despite its small size, it has a range of terrains, ranging from old heavily cratered surfaces to young tectonically formed terrain. Much of its surface has impact craters. Its surface features also identify that it is tectonically active, with numerous rifts and ridges.

In 2005, Cassini identified a water-rich plume which included hydrocarbons as well as ice-crystals venting from the south polar region. This, and discovery of the presence of escaping internal heat and few, if any, impact craters in the south pole region shows that it is the youngest surface on the moon, and geologically active today. The presence of hydrocarbons raises the potential for life to exist below the surface. The outgassing appears to originate from a body of sub-surface liquid water.

The ice plumes have been found to vent at faster than 1,600 km/hr and rise hundreds of kilometres above the surface. It is believed that the gasses released from the ice volcanoes on Enceladus add material and help maintain the integrity of the E ring, the widest and outermost ring of Saturn.

As one of only 3 outer solar system moons (others are Io (Jupiter) and Triton (Neptune)) known to be geologically active, this small moon is the focus of much interest and research.

**Sources** New Scientist magazine, Wikipedia, plus other Internet and printed sources

For more information on the Hermanus Astronomy Centre, visit our website at [www.hermanusastronomy.co.za](http://www.hermanusastronomy.co.za)

### COMMITTEE MEMBERS

John Saunders (Chairman)	028 314 0543
Steve Kleyn (Technical Advisor)	028 312 2802
Pierre de Villiers (Treasurer)	028 313 0109
Irene Saunders (Secretary)	028 314 0543
Jenny Morris (Newsletter editor)	071 350 5560
Derek Duckitt (IT & website co-ordinator)	082 414 4024
Johan Retief (Monthly sky maps)	028 315 1132
Piet Daneel (Auditor)	028 314 0947
Peter Harvey (Co-opted member)	028 316 3486

