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# mnassa

monthly notes of the astronomical society of southern africa  
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October 2010



- Annual General Meeting 2010 • John Dobson turns 95 •
- Jan Hers (1915 – 2010) • ScopeX 2010 & the Big Scopes •

## monthly notes of the astronomical society of southern africa

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### Cover picture: Daytime occultation of Venus, 11 September 2010

As if to commemorate the dramatic events of 11 September 2002, Venus was occulted by the Moon at about the same time of day, as seen from South Africa. Suki and Gavin Lock from Cape Town followed both the disappearance as well as the reappearance, 1,5 hours later. The latter was captured here, using a Canon 350D on a 10 inch Dobsonian. Picture credit: Gavin Lock.



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Monthly Notes of the Astronomical Society of Southern Africa  
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## editorial

### A time to say goodbye

After been thrown into the deep end in March 2006 to take over as Editor from Auke Slotegraaf when he suddenly resigned, I had to learn to swim quite quickly. Not only had I suddenly to write, edit and often originate articles, but I had to (very quickly) learn a desktop publishing software package which was completely foreign to me. Regarding the latter, I am ever thankful to Shireen Davis who gave me a crash course in Adobe InDesign and helped me set up master pages and templates to get going.

The other person on whom I could lean quite heavily for checking each and every article for language and factual errors was Dr Ian Glass, Assistant Editor. Since English is my second language, Ian's help in this respect was indispensable! I wonder if he realises how much I appreciated the unselfish support which he gave me in this respect. Thank you very much Ian.

In order to maintain high standards of peer-reviewed articles in *MNASSA*, I

am ever grateful to those of you who were always prepared to act as referees. It was wonderful to know that there are people willing to help review articles, or even just to give me guidance on the suitability of publishing certain material, particularly when my knowledge of a particular subject was a bit fuzzy.

To all you folks who contributed by sending me articles, particularly the "regulars", I am most grateful. An editor cannot edit if there is no material to work with. One can only dig up so many news releases and rewrite them to be interesting when filling up an issue. For any journal to stay relevant, one relies heavily on regular submissions of good quality basic articles. Thank you all contributors.

Finally I would like to thank those who sent me feedback. An editor is "blind" without feedback from readers. Without it, you have no idea which articles work and which are less popular. Feedback also tells us which authors get read, information which can be

used to encourage them to submit more material. Your complimentary remarks and encouragement kept me going for longer than I really wanted. As you must have noticed in the last year or so, I found it more and more difficult to get issues out on time due to other commitments. I therefore decided reluctantly not to go for re-election when nominations became due this term.

This issue will thus be my last with Case Rijdsdijk now taking over as Editor. I am confident that Case's solid science background and impressive track record of popularising astronomy at all levels will take *MNASSA* to new heights. Please welcome him and give him the support I experienced from passionate *MNASSA* readers over the past almost five years.

*Willie Koorts*

## Annual General Meeting 2010

### ASSA Council Report 2009 – 2010

Michael Poll, President

#### **Membership for 2009 – 2010**

Members: 246, including 31 new members who joined in the year ending 30 June 2010.

#### **Council Persona**

Council started the year without a Secretary, Membership Secretary or Business Manager.

No progress has been made towards appointing a Secretary. There have been no offers to do the job and no-one has been nominated for the position for 2010 – 2011. Thanks are due to Pat Booth and Ian Glass for preparing Agendas and for taking Minutes at various times.

Maureen Rogers offered to do the work of Membership Secretary and was co-opted on to Council at its meeting of 8 Septem-

ber 2009. Council is grateful to Maureen for taking on this task. Thanks are due to Lerika Cross and Margaret Kumalo for their interim input. There are no nominations for this post for 2010 – 2011.

Concerning the position of Business Manager, taking into account the importance of the post, especially with respect to processing orders from commercial customers for *Sky Guide*, a consensus emerged amongst Council members that, in order to attract a suitable person, the Business Manager position should be remunerated. Isobel Bassett agreed to take on the task, but she said that she would start the work first to see what it entailed before discussing a remuneration amount. Isobel has done a good job under difficult circumstances and Council expresses its gratitude to her. Isobel continued to work until December 2009 and then indi-

cated that she wished not to continue. In the absence of a replacement, she has carried on with the work free of charge and continues to do so until a replacement can be found. There are no nominations for this post for 2010 – 2100

Considering that there are no nominations for any of these three posts for 2010 – 2011, Council must examine its options at its first meeting following the AGM. The provision in the constitution for this type of situation is in Section 10: “Council shall have the power to fill any vacancy that may occur in any offices of the Society or in its own body until the next election of officers and members”.

### Remuneration principles

The decision to remunerate the Business Manager led to a debate amongst Council members about the principle of remuneration for people doing ASSA work. It has been queried as to why some people should be paid and others were not. For example, the *Sky Guide* editor is paid but *MNASSA* Editor is not, Business Manager was paid but Membership Secretary was not. It would be fair to say that this debate is still open. It should be noted that certain members of Council are paid honoraria.

### *Sky Guide, Africa South*

Tony Jones relinquished the position of *Sky Guide* editor effective from the date of dispatch of the 2010 edition to the printers. Council has appointed Wayne Trow as editor for the 2011 edition. Council expresses its gratitude to Tony Jones for the work he has

put into the publication in the four editions that he has edited. Considering the problem of finding a Business Manager, who would normally be the person to process *Sky Guide* orders, Council, through its Editorial Board, has approached the publisher Struik with a view to contracting them to do the marketing, printing, warehousing and distribution of *Sky Guide*. A print run of 5 000 copies is envisaged, 250 copies will be passed on to ASSA for distribution to members.

### *MNASSA*

Willie Koorts is currently the editor of *MNASSA*. However, he has indicated that he wishes to step down as the editor. He notes that he has found it increasingly difficult to get *MNASSA* out on time due to other commitments. At present he is staying on until a replacement can be found. The incoming Council will need to consider this matter at its first meeting following the AGM. The June edition was delayed because of lack of material for publishing.

The Editorial Board has agreed that *MNASSA* will eventually be circulated by electronic means only. Subscribers to *MNASSA* will be notified by the end of August about the proposed change. Printed copies will still be sent to ASSA members until at least June 2011, but it is suggested that, at some stage, members may be offered a reduced subscription if they are willing to receive the electronic version. A memorandum about the proposed changes, with further details, including financial implications, will be published in a future edition of *MNASSA*.

**Website**

The ASSA website has been well managed by Christian Hettlage during the year. Christian was nominated for the position of webmaster for 2010 – 2011, but was reluctant to accept because he felt that he had not done as much as he could have. He said that if nobody else was volunteering, he would be willing to continue. The incoming Council will need to consider this matter also at its first meeting following the AGM.

**Sections of ASSA**

ASSA includes a number of Observing and other Sections, each under the guidance of a Director. Section Directors are required to submit, by 30 April each year, an annual report reflecting the activities of each section for the previous calendar year. It is disappointing to note that only six reports out of the 11 expected have been submitted. Of the six received, only two were submitted by the due date.

**Professor Phil Charles**

At the end of January 2010, Prof Phil Charles, Director of SAAO, was suspended by the National Research Foundation. At its meeting on 2 February 2010, Council resolved to express its support for Professor Charles, and its concern at the manner in which the matter of his suspension had been handled by the National Research Foundation. ASSA has made representations about this matter. On behalf of ASSA Maciej Soltynski prepared a press release dated 18 March, expressing ASSA's concern about the

summary nature of the suspension, called for the charges to be made public, and asked that a public enquiry be held to examine the background to the affair. Ian Glass summarised the situation thus far in *MNASSA* April 2010.

Prof Belinda Bozzoli (Chairperson of the NRF) was delegated lead a process of engagement with the SAAO and the broader astronomy community in order to listen to their concerns and priorities. On Friday, 9 April Soltynski, representing ASSA, met with Professor Bozzoli to give input on behalf of ASSA. On Friday, 2 July Soltynski met with NRF President Albert van Jaarsveld. It was learned that the Bozzoli report will not be made public and that the Minister considered the Charles' part of the matter closed.

**IAU Office**

The President sent a motivation on behalf of ASSA, supporting the proposal to establish the IAU Office for Astronomy Development (OAD) in South Africa. It has since been learned that South Africa was selected to host this office. The agreement was to be signed in Pretoria on 30 July 2010. Kevin Govender is the contact person. The President wrote to Kevin on 29 May offering, on behalf of ASSA and its Centres, to make its resources available to assist in making the venture a success.

The locating of the OAD in Africa, and in particular South Africa, would have a direct impact on one of the most underdeveloped regions of the world – yet it would be

situated in a country which boasts modern world class infrastructure and services necessary to fulfil the purpose of the OAD. The experience gained by the officers of the OAD, by being situated in this region, would be translated and expanded to developing regions across the world. South Africa has already positioned itself as an ideal venue out of which astronomy development activities can be coordinated. The support (so far) has been overwhelming, with words of encouragement and pledges of support coming from individuals in Tanzania, Kenya, Zambia, Gabon, Mauritius, Nigeria, UK, Malawi, US, Sudan, Uganda and Germany.

#### **NRF Astro-Geosciences Cluster Five Year Performance Review**

The Institutional Review of the National Research Foundation (NRF), including the performance of its National Research Facilities, is planned to take place in 2010. This review is scheduled in terms of the five-year reviews of the Science Councils in South Africa commissioned by the Department of Science and Technology. It is intended to be a retrospective view on the performance of the NRF during the period 1 April 2004 to 31 March 2009. ASSA has been invited to give input into this review which is done by an international panel of experts. The NRF Astro-Geosciences Cluster comprises the South African Astronomical Observatory (SAAO), Hermanus Magnetic Observatory (HMO), Hartbeesthoek Radio Astronomy Observatory (HartRAO). ASSA will be represented by Maciej Soltynski.

#### **ASSA Constitution**

Michael Poll has been working on a re-draft of the Constitution. It is hoped that the revised constitution can be finalised, approved and implemented in time for the 2011 AGM. Thanks are due to the members of Council for input, and also to Advocate AJ Nel who has given input from a legal point of view.

#### **Thanks**

ASSA members should note that some longstanding members of Council were not nominated for office for 2010 – 2011, including Cliff Turk, Pat Booth, and Peter Martinez. Kevin Govender did not wish to be re-nominated. Council and members would like to acknowledge, and thank these persons, and any others, for the time and effort that they have given in support of, and the running of, ASSA. Thanks go to all Council members who have offered help and support during the year.

#### **Personal Note**

On a personal note, this year of being the president of ASSA has not been easy. I have turned over more than 1200 ASSA-related e-mails since taking office. In effect, I have been acting as Secretary as well as being President. Dealing with these e-mails has occupied nearly every morning of every day, and some evenings and weekends as well. I have to thank my wife for putting up with ASSA in our lives. I have to thank her for her support and tolerance of me spending so much time on ASSA business, and for allowing me to share ASSA problems with her. ☆

## Annual Report of the Comet, Asteroid and Meteor Section for 2009 TP Cooper, Director

Five meteor showers were observed by five individuals totalling 32 hours observation.

### Summary of Observed Meteor Showers

Observer (no. of showers observed)	Showers Observed and duration	Total Time hrs
Tim Cooper (3)	eta Aquarids (1.9), Orionids (10.8), Geminids (2.0)	14.7
Mary Fanner (1)	Geminids (4.0)	7.6
Wayne Mitchell (2)	Orionids (2.2), Geminids (3.0)	5.2
Kos Coronaios (2)	Northern Taurids (2.0)Pi Puppids (1.3)	3.3
Cliff Turk (1)	Geminids (1.2)	1.2
<b>Total</b>		<b>32.0</b>

### Notes on some Specific Showers Observed

**Pi Puppids** - the shower was found to be inactive by Kos Coronaios on the evenings of 22/23 April.

**Eta Aquarids** - Observed by Tim Cooper. Observations were possible on only one morning due to unseasonal cloud and rain.

**Orionids** - peak rates were observed by Tim Cooper on the night of 21/22 October, seeing 35 Orionids in the hour 0020-0120 UT under LM=6.4.

**Northern Taurids** - Kos Coronaios registered a single Taurid on the night of 11/12 November under LM=5.3

**Geminids** - observations from Gauteng were badly affected by clouds. On the night of 12/13 December Wayne Mitchell observed 19 Geminids and 7 sporadics from 22h00-01h00 UT with LM=5.0. Tim Cooper observed from 21h30 to 23h30 UT seeing 29 meteors of which 16 were Geminids. The night of traditional maximum was met with heavy showers of a different sort. In the Cape Mary Fanner managed to observe on the nights of 12/13 and 13/14 December logging 95 Geminids and 32 sporadics on the latter. The night of 14/15 December was misty.

### Summary of Observed Fireballs

2009 saw a total of 7 fireball reports. The full details have been submitted for publication in *MNASSA* as a separate article. There were two particularly bright fireballs during the year. On the evening of 24 August more than 40 individuals witnessed a fireball from four independent sites from Cape Town to Sutherland. Then on 21 November a very bright bolide, estimated magnitude -18, travelled from south to north, exploding in the Limpopo area. This latter event will be described fully in a separate *MNASSA* article.

### Summary of Observed Comets

Three comets were observed by Magda Streicher (STR03) and Nigel Wakefield (WAKxx) during 2009, as follows.

ICQ Observer Code	88P	144P	C/2008 Q3
WAKxx			•
STR03	•	•	

**Notes on Specific Comets Observed**

**144P Kushida** - observed by Magda Streicher in January at magnitude 10.5

**C/2008 Q3 Garradd** - observed by Nigel Wakefield in June at magnitude 8.

**88P Howell** - observed by Magda Streicher in September at magnitude 11.2

**Summary of Asteroid Observations**

Photometry was conducted by Tim Cooper and Paul Ludick on the following objects.

Both observers are still in the development phase, but Paul obtained some good photometric runs on several objects. Tim

Cooper met with the project leader Anna Marciniak during August to understand and further refine the program for the future.

- 193 Ambrosia
- 714 Ulula
- 895 Helio
- 1056 Azalea
- 1130 Skuld

All observers of comets, asteroids and meteors, are heartily thanked for their contributions. ☆

**Report of the Cosmology Section**

Frikkie de Bruyn, Director

The purposes of the Cosmology Section are twofold: (1) To promote an interest in the study of cosmology among members of ASSA and (2) To promote the scientific study of cosmology.

The number of members of the Section is currently 49.

An article was circulated to members, at least once a month, ranging from matters such as the entropy of the universe, gravitational entropy, the Standard Model of Cosmology, etc. Developments at the LHC at CERN are being closely watched in view of the importance of the study of

the extreme first moments of the universe. Scientific papers and articles of interest were regularly circulated to members. Research into neutrinos as Majorana particles and the possible influence on the movements of the Magellanic Clouds and the Milky Way Galaxy continues.

The Cosmology Section has been established as a special interest group in Google's Cosmology and Quantum Physics section. Circulation of articles etc. to the section is being dealt with by Google free of charge. It is believed that the Cosmology Section is the first ASSA section to have done this. ☆

## Education and Public Communication (EPC) Section Report Case Rijdsdijk, Director

### General

In terms of receiving information about the activities of various centres, things have improved, but regrettably, they are still incomplete! I know that many centres are active and it would be great if a short report of these for the year could be sent in to me by June next year, one that could be used by the local centre at their AGM as well.

### Centre Activities

#### Cape Centre

As usual they continue to help out with the SAAO Open Nights, but now have one night per month that they run the Open Night for the SAAO: a spin-off from IYA2009! There are regular Dark Night outings to Paardeberg which have been well supported. The centre's initiative to set-up the "Friends of the Observatory" is to be commended and it is to be hoped that they will achieve all they set out to do. A highlight was a visit to the SKA site at Carnarvon.

#### Hermanus Centre

Although the centre is new it has an extremely rich outreach programme visiting all 20 of the local schools, holding regular public meetings and giving extended presentations to ~10 eco-schools in the area.

#### Natal Midlands Centre

They too are active with several public talks having been given in the course of

the year on topics ranging from volcanoes to supernovae.

#### Johannesburg Centre

Their highlight of course is the ScopeX exhibition, which this year was bigger and better than ever, again drawing people from all walks of life, and many spending the day there enjoying many of the activities on offer. SAASTA is to be thanked for again giving substantial support to the event, especially in supplying transport for the many schoolchildren who attend. Thank you Lerika for a sterling job! In addition there are regular open nights at the Observatory: these are well attended by the public, as are the regular dark nights.

#### Pretoria Centre

Little news for here, but they have given huge support to the Johannesburg Centre during ScopeX.

#### Garden Route Centre

The highlight was undoubtedly the visit to Sutherland by a local group of about 23 people. The director led the group and from all reports it was a most successful excursion with two nights in Sutherland. The SAAO staff were most helpful and added to the ease of setting up the trip. Talks have been given to the public, including a short course on astronomy to the U3A group in Knysna and George – both well attended. The centre has also set up good relations

with the local chapter of the SA Institute of Electrical Engineers, and one meeting each year is now set aside as a joint meeting.

### Director

He has had a full year, the highlight of which was being able to attend the CAP 2010 conference organized by the IAU in Cape Town. It was great to see several ASSA members there as well (see report in *MNASSA* 60, 3&4, by Kerchil Kirkham). He attended ScopeX and the National Science Festival in Grahamstown. Numerous afternoon and evening talks were presented to a wide range of people from schools to volunteer park rangers. The director continues to write regular columns for the

media and also still has his radio slot.

It was great to hear the news that South Africa has won the bid to host the IAU Office for Astronomy Development at the SAAO. ASSA looks forward to supporting this initiative where ever it is able to.

### Acknowledgements

The director would like to thank SAAO for continued support with resources for outreach, and Tony Jones for again producing an outstanding *Sky Guide*. Also Auke Slotegraaf for his efforts at EPC here, there and everywhere and to Magda Streicher who does all those things that we all forget! ☆

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## Historical Section Report

### Chris de Coning, Director

During the calendar year 2009 the following events occurred concerning the History of Astronomy section:

#### Website

The Website has undergone a major change. While in 2007 the look and layout was totally changed, in 2009 more content was added. This process is ongoing in nature

#### Archive

The old minute books of the Cape Astronomical Association (1912 – 22), ASSA Council (1922 – 35; 1979 – 2001), and the Cape Centre (1928 – 45) were tracked down, photographed and, where applicable, placed in the ASSA Archive.

#### Publications

Individuals in their private capacities wrote articles with historical content. Please note my appreciation to the following people:

- R.W. Argyle for “Using the Innes telescope again” published in *MNASSA* 68, 1&2, February 2009.
- Greg Roberts for “Amateur Space Detectives” published in *MNASSA* 68, 3&4, April 2009.
- Michelle Knight for “Reawakening a Masterpiece” published in *MNASSA* 68, 5&6, June 2009.

#### Obituaries

*MNASSA* published an obituary on Anthony Fairall: *MNASSA* 68, 3&4, April 2009.

**Friends of the Cape Town Observatory**

The dome and floor-lift system of the McClean Telescope building is giving problems. To repair this telescope and help to maintain various other pieces of equipment requires an enormous amount of money. The “Friends of the Cape Town Observatory” was founded in order to find people with the necessary expertise, to raise funds and to promote awareness of historically important equipment.

**International Year of Astronomy (IYA)**

2009 was a momentous year because of the 400<sup>th</sup> anniversary of Galileo using the telescope to study the heavens. The Historical Section wishes to thank Kevin Govender and his team who headed the IYA events, and for all those who participated in outreach projects. During this year an event took place which is of historical significance in its own right. On 24 April 2009 the Astronomy Geographic Advantage Act (AGA Act) was signed into power by President Kgalema Motlanthe. ☆

**Variable Star Section Report**

Christopher Middleton

The following observations were submitted to the AAVSO database during the 2009 observation year.

David Blane	Henley-on-Klip	BLD	300 visual
Dale Botha	Capetown	BDAA	2 visual
Tim Cooper	Bredell	COM	95 visual
Brian Fraser	Henley-on-Klip	FBN	65 PEP
Percy Jacobs	Pretoria	JPM	46 visual
Berto Monard	Tiegerpoort	MLF	7018 CCD
Michael Poll	Gezina	PMO	52 visual
Jan Smit	Pretoria	SJX	239 visual
Peter Wedepohl	Somerset West	WPT	221 visual

It is regrettable that the numbers during the last year were substantially down upon previous years but the usual significant contributors (Gauteng area) were plagued with an exceptionally wet summer that ran well into winter.

Whilst efforts have been made to increase

the pool of variable star observers in SA, I have found a general lack of interest in active observation programs from ASSA members nationally.

This year has seen a change in my personal observation program away from extrinsic variables, to intrinsic. ☆

## Occultation Section Report

Brian Fraser, Director

Once again most of the favourable minor planet occultation predictions for South Africa were spoilt by unfavourable weather and no positive events were recorded. None of the local lunar occultation observers were active during the year.

We were geared up to participate in an

occultation of a star by Pluto on 21 April but this event too, was spoiled by cloudy weather. The team of USA observers at Boyden, Sutherland and Namibia obtained positive results.

We have again relied heavily on the minor planet occultation predictions provided by Steve Preston. ☆

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## ASSA Scholarships Report for the calendar year 2009

Maciej Soltynski (Convenor, ASSA Scholarships Committee)

The ASSA Scholarship was established in 2000 to encourage the study of Astronomy at any Southern African university at the 2nd and 3rd year level. The Scholarship is funded by ASSA with significant financial support from the ASSA Endowment Trust.

In 2009 there was disappointingly only one applicant for the ASSA Scholarship, who was unsuccessful. The holder in 2008, Daniel Oliver, continued his BSc studies in modules other than Astronomy at UNISA. The holder in 2006 and 2007, Wendy Williams worked towards her MSc in astronomy at UCT in 2009. Renée Holzek, holder of the ASSA Scholarship in 2005, continued with her DPhil studies in cosmology at Oxford University.

### South African Astronomical Observatory - Astronomical Society of Southern Africa Scholarships

The purpose of the SAAO–ASSA Scholarships is to encourage current or *intending* undergraduates (i.e. 1st, 2nd or 3rd year) studying for a BSc degree at any university in South Africa, who have a stated interest in astronomy, to prepare for furthering their interest. The Scholarships are financed by SAAO and are administered by ASSA. 2009 saw a third SAAO–ASSA Scholarship being made available, so that from now on in any year there may be a maximum of three Scholarships awarded. The value of each Scholarship in 2009 was R4 600, up from R4 000 in the previous year.

There were five applicants in 2009, of whom two were successful.

Rocco Coppejans was re-awarded the Scholarship for his final year of study for his BSc degree at the University of Pretoria. He successfully completed his degree with distinctions at the end of 2009, and has been accepted into the National Astrophysics and Space Science Programme (NASSP) at UCT where he will study for his BSc (Hons) in 2010.

Tshepo Molane was awarded the Scholarship in support of his first year BSc studies at UCT.

Mpati Ramatsoku, who held the Scholarship in 2007 and 2008, completed her BSc at UCT in 2009, and has been accepted into

the National Astrophysics and Space Science Programme (NASSP) at UCT where she will study for her BSc (Hons) in 2010.

### **Expression of appreciation**

Dr Abe Mahomed retired from the Committee early in 2009. His contributions to the deliberations of the Committee since its inception in 2000 are gratefully acknowledged. Dr Ian Glass, Kevin Govender and Andrew Gray are thanked for their valued inputs in the evaluation and selection of candidates during 2009. Thanks go to Cliff Turk for dealing with the financial administration of the Scholarships, and to the university lecturers who supplied assessments of candidates. ☆

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## **ASSA Awards 2009 – 2010**

At the AGM, ASSA announced the following awards:

### **Gill Medal – Lerika Cross**

The Gill Medal is awarded in recognition of services to astronomy. Prior recipients have all put in considerable effort over time to practise astronomy, in ways that have certainly reflected well upon the society and have made contributions to astronomy in South Africa, but in this day and age there are other ways of serving astronomy.

In successfully driving the ScopeX initiative for nine years, an event which has drawn in thousands of South Africans, Lerika Cross has contributed not only

towards the objectives of the society, but also to astronomy. It must be stressed that the purpose and effect of this event is to serve astronomy in Southern Africa, and not specifically the Society or any particular Centre of the society. Whereas many of the Society's activities are focused inwardly (public observing sessions and some "outreach" programs notwithstanding), ScopeX seeks to bring together a wide cross-section of the community for the purpose of informing, inspiring, educating, and engaging them in astronomy. It showcases the achievements of amateurs and professionals alike, and spurs on, for example, amateur telescope makers and astrophotographers. It is also an opportunity for people with an interest

in astronomy to “network”. These aims have consistently been achieved, despite extremely limited resources.

Producing ScopeX involves engaging a host of participants: amateur and professional astronomers, the academe, commerce & industry, Government in the form of DST and SAASTA, NGOs and more. This is done on a small budget, and credit is given considering the limited volunteer resources and facilities. As a participant in the preparations the proposer has had a very clear view of the effort, commitment and personal sacrifices required of Lerika Cross to make it all happen. Each event takes the equivalent of about six months’ full-time application. The work for ScopeX is done in addition to the secretarial and managerial tasks that she has so willingly performed for about a decade for the Johannesburg Centre, the telescope making class, and the ASSA Council, all of which is done to a very high ethical standard.

While giving time and applying effort for a good cause are commendable, results and outcomes are what truly count. Of all the society’s initiatives during its long history it is doubtful that any programme, or collection of events and activities, has attained the wide-reaching influence on public awareness that ScopeX has. Thousands of previously disadvantaged learners have been exposed astronomy and science, redressing a woeful gap in their education curriculum. We have cer-

tainly had enough feedback from them, and the public, to know it is well received. Two learners are known to have started science at tertiary level with the intention of doing astronomy.

In support of the Citation, it is noted that Richard Berry (former editor of *Astronomy* magazine, which has the world’s highest circulation of such a publication) visited ScopeX in 2007 as a guest speaker. Since he is regularly invited to and involved in similar events around the world (though primarily in the US), Berry’s feedback is therefore a good basis for comparison. Berry declared ScopeX to be “world class” and commented favourably about the general enthusiasm and the level of innovation. He later communicated that the Riverside Telescope Making Conference (held the following month and which is probably the largest of this type of event) had been very disappointing by comparison. It should be noted that similar big conventions in the US attract huge sponsorship and are put together by large teams.

Accordingly ASSA has no hesitation in accepting Lerika Cross as a recipient of the Gill Medal. Doing so is entirely consistent with the spirit of the Award, and, of all the awards conferred by the Society, this is surely the most appropriate means to recognise Lerika’s contribution to astronomy in South Africa.

#### **President’s Award – Auke Slotegraaf**

Auke has been involved in outreach

and communication of astronomy for some considerable time. By this involvement he has made an outstanding contribution to Astronomy Education and the promotion of astronomy in South Africa. He has achieved this through, amongst other things, his talks at Sutherland, and running workshops for previously disadvantaged schoolchildren. He was also largely responsible for creating the new look ASSA *Sky Guide*.

Michael Poll, President 2009 – 2010

### Section Awards

**Cosmology Section:** Bruce Dickson & Maciej Soltynski

**Comet, Asteroid and Meteor Section:**

Cliff Turk, Kos Coronaios, Mary Fanner, Paul Ludick, Wayne Mitchell, Magda Streicher & Nigel Wakefield

**Deep-sky Section:** Kos Coronaios, Richard Ford, Dale Liebenberg & Pete Scully

**Double Star Section:** Dave Blane ☆

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### *Sky Guide 2011*

The Society has made a printing and distribution agreement with Random House Struik for the 2011 *Sky Guide Africa South*. This is part of the plan to reduce the administrative complexity of the Society.

ASSA will no longer distribute indi-

vidual copies, which will have to be purchased from a bookshop at the retail price of R85.00. Members of ASSA will however receive copies as part of their subscription. ASSA may in addition, purchase copies at a discount of 35% for up to 50 copies and a discount of 40% for this number or more. ☆

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### news notes

#### Complete planetary system discovered

Planetary astronomy and, in particular, the search for extra-solar planets is currently one of the most interesting research areas in astronomy in recent years. [The extra-solar planet count stands at 452 as of 13 September 2010.]

One of the most interesting discoveries so far has just been announced by the European Southern Observatory (ESO). Using the HARPS (High Accuracy Radial veloc-

ity Planet Searcher) instrument attached to their 3.6m telescope at La Silla in Chile over six years, a group of astronomers have discovered a planetary system containing at least five planets, orbiting the star HD 10180, a G1 dwarf of visual magnitude 7.33 situated 127 light years from us. There is tantalising evidence that two other planets may be present, one of which would have the lowest mass ever found. This would make the system similar to

our Solar System in terms of the number of planets (seven as compared to the Solar System's eight). Furthermore, the team found evidence that the distances of the planets from their star follow a regular pattern, as they do in our Solar System.

Thanks to the 190 individual HARPS measurements, they could detect and disentangle the tiny back and forth motions of the star caused by the complex gravitational attractions from five or more planets. The five strongest signals correspond to planets with Neptune-like masses — between 13 and 25 Earth masses — which orbit the star with periods ranging from about 6 to 600 days. These planets are located between 0.06 and 1.4 times the Earth–Sun distance from their central star.

*“We also have good reasons to believe that two other planets are present,”* says the lead author, C. Lovis. One would be a Saturn-like planet (with a minimum mass of 65 Earth masses) orbiting in 2 200 days. The other would be the least massive exoplanet ever discovered, with a mass of about 1.4 times that of the Earth. It is very close to its host star, at just 2 percent of the Earth–Sun distance. One “year” on this planet would last only 1.18 Earth-days.

The newly discovered system of planets around HD 10180 is unique in several respects. First of all, with at least five Neptune-like planets lying within a distance equivalent to the orbit of Mars, this system is more populated than our Solar System in its inner region, and has many more

massive planets there. Furthermore, the system probably has no Jupiter-like gas giant. In addition, all the planets seem to have almost circular orbits.

So far, astronomers know of fifteen systems with at least three planets. The last record-holder was 55 Cancri, which contains five planets, two of them being giant planets.

Using the new discovery as well as data for other planetary systems, the astronomers found an equivalent of the Titius–Bode law that exists in our Solar System: the distances of the planets from their star seem to follow an approximately regular pattern.

[The semi-major axes of our planets according to this ‘law’ can be expressed as:  
 $a = 0.4 + 0.3 \times 2^m$   
 for  $m = -\infty, 0, 1, 2 \dots$   
 and  $a$  is in units of the earth-Sun distance  
 For the outer planets, each planet is predicted to be roughly twice as far away from the Sun as the previous object.]

Another important result found by the astronomers while studying these systems is that there is a relationship between the mass of a planetary system and the mass and chemical content of its host star. All very massive planetary systems are found around massive and metal-rich stars, while the four lowest-mass systems are found around lower-mass and metal-poor stars. Such properties confirm current theoretical models. ☆

## HartRAO 26m Radio Telescope recommissioned after major repair

In a major engineering feat, the 200 ton, 50 year old, 26m diameter radio telescope at the Hartebeesthoek Radio Astronomy Observatory (HartRAO) has been recommissioned after replacing the main bearing in its polar shaft that failed in October 2008.

The 26m antenna was built in 1960 as part of NASA's Deep Space programme to send spacecraft to explore the Moon and planets. It participated in the historic Apollo manned Moon landings from 1969 to 1972. NASA closed the station in 1974, and handed it over to the Council for Scientific and Industrial research (CSIR), who had operated it for NASA. The large antenna was then converted for radio astronomy. Over the years ownership transferred to the Foundation for Research Development (FRD) and then the National Research Foundation (NRF).

The antenna and its systems were continuously developed over the years to expand its research capability. For many years it has been operating with radio telescopes on other continents to produce images with extremely high angular resolution, able to show details of the jets in distant quasars far across the Universe. This technique is called VLBI, short for Very Long Baseline Interferometry. From 1986 this technique was used to measure its position relative to telescopes on other continents with great accuracy. This intercontinental telescope network has been used to measure the movement of the continents – continental

drift, or plate tectonic motion – with ever greater precision. It also came to form the absolute reference point for the survey system in South Africa, its position being known as the *Hartebeesthoek94* datum.

However, on 3 October 2008 cracking sounds were heard from the antenna drive making it clear that the main bearing in the polar shaft was failing. Observing was immediately shut down to prevent catastrophic failure. Africa had lost its only operational radio telescope.



**The weight of the telescope was supported on a massive A-frame which could be jacked up by a 200 tonne hydraulic jack to move the polar shaft (which sagged when the bearing failed) back into position to remove the old and fit the new bearing.**

While closure of the facility was an option, the permanent loss of scientific capabilities implied by this path was such that repair, rebuilding in modified form or building a new telescope were considered. Opinions were sought from local and international science partners and quotations were obtained from engineering companies. After a meeting on 22 July 2009 to debate the issue, Albert van Jaarsveld, President of the NRF, decided that repairing the telescope



**Fragments of broken bearing fell out when the south polar shaft bearing got exposed.**

was the best option, based on the quotation from the US antenna engineering company GD Satcom, with local engineering partners Stratosat Datacom and subcontractor Tass Engineering. Science and Technology Minister Naledi Pandor then gave approval for the repair, and the Department of Science and Technology were able to source the necessary funding.

After reviews of the repair design concept the detailed design was prepared for an A-frame to support the 200 ton antenna while the bearing was removed and for the tooling needed for the removal and replacement of the bearing. The physical repair process started in March 2010, and was successfully completed in July 2010. This significant engineering feat has only been accomplished once before, on a sister NASA antenna in Spain.

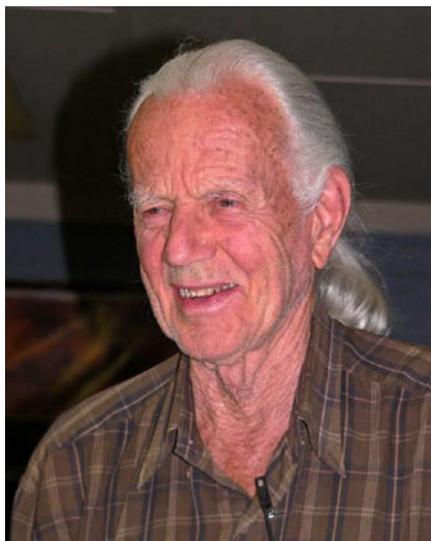
The repaired Hartebeesthoek telescope was first driven on the new bearing on 20 July

2010, and the first test observation was made on 22 July 2010, exactly one year from the decision to repair. In the recommissioning process the first spectroscopic and pulsar observations were made on 23 July. The return of the pulsar observing capability came just in time to capture a “glitch” – a sudden increase in spin rate – of one of the most scientifically interesting of these collapsed stars as it rearranged its internal structure. These observations were made in parallel with the first prototype telescope for the Karoo Array Telescope (MeerKAT) that had been built at HartRAO in 2007.

The first operational 24-hour VLBI observation session linked with telescopes on other continents was made on 11 August, and these have resumed their previous weekly schedule.

For photographs of the process, see [www.hartrao.ac.za/news/100906\\_26m\\_repair/index.html](http://www.hartrao.ac.za/news/100906_26m_repair/index.html) ☆

## John Dobson turns 95



**John Dobson in January 2010**

Source: <http://thilinaheenatigala.blogspot.com/2010/08/wish-john-dobson-happy-95.html>

Undoubtedly the most common telescope type at any star party or telescope makers' convention like ScopeX, is the Dobsonian. This is no surprise since its design is simple and cheap, yet very stable and, if well made, has very smooth movement and is extremely easy to use.

The man who turned telescope making on its head during the 1960s and '70s by using simple materials to produce low-cost, large-aperture reflectors, John Dobson, turned 95 on 14 September 2010.

Dobson was born in Beijing, China where his father taught zoology at Beijing University. In 1927 the Dobson family, includ-

ing his parents and three brothers, moved to the United States. They stopped briefly in San Francisco, intending to move on but because of a lack of funds they stayed. After school, in 1934, Dobson enrolled at the University of California at Berkeley and, after some interruptions, graduated in 1943 with a degree in chemistry and mathematics. He quickly found jobs in war-related fields at Caltech and at the Berkeley Radiation Laboratory.

On 8 May 1944, his life utterly changed course when he entered a Vedanta monastery, part of the Ramakrishna religious order. The strict daily schedule of worship, study, and meditation allowed him time to try to understand how the universe ticked. In order to see it for himself he built his first telescope, a small refractor. The turning point came when he followed this up with a reflector made from a 12-inch port-hole glass. Despite the rigors of monastic life, Dobson began making telescopes for others, using whatever materials he could find, even using the bottom of a gallon jug for the mirror. For abrasive, he'd collect sand and separate it by size.

On some clear evenings Dobson would sneak out of the monastery and roam the nearby streets with his 12-inch f/7 telescope perched atop a station wagon, to offer passers-by a glimpse of the heavens. If a youngster showed serious interest, he would, with the consent of the parents, offer to lend them the telescope free for

a month. Eventually he helped some of these people make their own telescopes – all while on AWOL from the monastery. By telescope number 17 the monastery, which had grown suspicious of his frequent absences, discovered his nocturnal activities. Dobson was warned to give up telescope making or face expulsion. He desperately wanted to stay but, as things panned out, was eventually asked to leave.

Dobson continued to live a spartan life in the outside world while “religiously” promoting the making of telescopes with the simplest materials and using the simplest procedures. Roof shingles were used to support the secondary and since he could not afford Sonotube, he used the cardboard cores of discarded garden-hose reels for tubes. If it took three such cores to fashion a tube, Dobson would call it a “three-barrel 12-incher”. In fact, these simple alt-azimuth wooden mounts that he popularized were so revolutionary that the first article he submitted to *Sky and Telescope* magazine was promptly refused by its founder/editor, Charlie Federer, with the comment: “While your shortcuts undoubtedly help to demonstrate large amateur telescopes, they can hardly lead to satisfactory instruments of the kind most amateurs want in these large sizes.” John still has this letter. Federer clearly missed Dobson’s point. He was not after perfection – he was after a simple way that practically anybody could build, own, or use a big scope.

To drive this point home, Dobson co-founded the *San Francisco Sidewalk Astrono-*

*mers* in 1968. Three years later he and his group rumbled into the Riverside Telescope Makers’ Conference with a jaw-dropping 24-inch f/6.5 reflector. In San Francisco this frail looking, often shirtless, man with a ponytail and his group were busy with a total “urban guerrilla astronomy” onslaught, stopping people on pavements to let them see the craters of the Moon, the moons of Jupiter, the rings of Saturn or the spots on the Sun. As John put it: “For just a moment, they have a personal connection with the universe around them, and sometimes life seems a little better after that.”

Celestial evangelist John Dobson, with the sky as his ministry, spreading the gospel, finally got his due when a long article titled “Have Telescopes, Will Travel!” was published in the April 1980 issue of *Sky and Telescope*. Once the design caught on, it was Dobson himself who did the underestimating. Each year at the Florida Winter Star Party, telescopes on mountings that bear his name stand like trees in a spot now called the *Valley of the Dobs*.

But what defines a Dobsonian telescope? Dobson, by the way, objects to this moniker. He says applying his own name to a class of telescope is anathema to him. He suspects it was Richard Berry who first coined the term “Dobsonian” in *Telescope Making* magazine.

When founding the San Francisco Sidewalk Astronomers, he made it clear that they would do no research or hold any formal meetings – their sole purpose was to

share the sky with the public. They often went to scientific conferences, not to attend any lectures, but with their telescopes set up outside. If asked why, he would explain: “Our only reason for being here is to show the sky to the people. Let other clubs do research with fancy telescopes. We want to share the sky with everyone.”

telescope, or build one, consider if you conform to the true Dobsonian spirit. Test yourself against Dobson’s view “I want a telescope in every driveway, on every sidewalk! We don’t make telescopes for us to use in our backyards and then go to bed. We make simple scopes for the people to use.”

So, next time you use your Dobsonian

**This is the heart of the Dobson Revolution.**

### IYA2009 Final Report released

A 1300-page final report for the International Year of Astronomy 2009 was released on 7 September 2010 at the European Week of Astronomy and Space Science in Lisbon, Portugal. The report shows that at least 815 million people in 148 countries participated in the world’s largest science event in decades. Funds equivalent to at least 18 million euros were devoted to IYA2009 activities. This investment was complemented by enormous in-kind contributions from the amateur and professional astronomers, educators and organisers who helped to run the events. Star parties, public talks, exhibits, school programmes, books, citizen-scientist programmes, science-arts events, IYA2009 documentaries and parades honouring astronomy and its achievements made IYA2009 the largest science event so far in this century.

Of the 815 million people worldwide that was estimated to have been reached by IYA2009 events, the highest participation figures came from India, with

over 700 million people. This was mainly due to Indian astronomers proudly showcasing their work at the Republic Day parade in Delhi. With 30 000 people watching in person and an estimated 700 million watching on television, this was by far the biggest single event in the IYA2009 programme.

In Brazil, a budget equivalent to 2 million euros helped the organisers to reach 2.2 million people, with more than 16 600 events around the country. There were national Olympiads of astronomy and astronautic exhibitions and regional meetings on astronomy teaching. There was a big focus on education, with educational astronomy kits being produced, and 55 000 astronomy books and 20 000 Galileoscopes being distributed to state schools.

South Korea was one of the most active countries in IYA2009, with more than 500 activities reaching some 11 million people. A partial solar eclipse on 22

July was the highlight of the year, with viewing events held across the nation in 45 locations, reaching over 400 000 people from kindergarten children to the President of the Republic of Korea.

In the United Kingdom, the organisers had a budget of more than 1 million euros to reach over one million people: 300 000 at local star-parties, 300 000 at IYA2009 planetarium shows and the 400 000 people who attended the global exhibition project, *From Earth to the Universe*.

The global IYA2009 projects were more successful than anyone had dared to imagine. Two worldwide star parties were held in 2009: *100 Hours of Astronomy* in April, and *Galilean Nights* in October. In total more than three million people

were involved, with many members of the public seeing night-sky objects such as the planets and the Moon through a telescope for the very first time — a life-changing experience for many.

Other Cornerstone Projects highlighted were *From Earth to the Universe* and *Developing Astronomy Globally*, a spin-off of the latter being the Office for Astronomy Development (OAD) recently signed with the SAAO as its location. Several IYA2009-affiliated movies were also released during IYA2009.

The examples above are just a few of the many IYA2009 highlights that helped the citizens of the world to rediscover their place in the Universe and engage in a personal sense of wonder and discovery. ☆

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## IAU Office for Astronomy Development

The President of the South African National Research Foundation, Dr. Albert van Jaarsveld, and the General Secretary of the IAU, Dr. Ian Corbett, signed an agreement on 30 July with the International Astronomical Union (IAU) to foster and promote astronomy in the developing world. Under the agreement the South African Astronomical Observatory (SAAO) will house the new IAU Office for Astronomy Development (OAD). This is part of a ten-year plan initiated by the IAU to exploit astronomy in the service of education and capacity building in the developing world.

The agreement formalises a decision taken in May 2010 when the IAU selected South Africa as the host for the OAD. The South African winning bid was one of 20 competing proposals.

The OAD will be operated as a partnership between the IAU and South Africa. The South African side includes the SAAO, its parent organization the National Research Foundation (NRF) and the Department of Science and Technology, all of which have committed strong support to the IAU initiative.

The agreement is for an initial period of five years.

The OAD will mobilize professional and amateur astronomers, engineers and teachers around the world in the service of developing countries. The wide range of activities that it will coordinate include the education of young disadvantaged children, science education at all levels, the training of school

teachers and building up research capacity in university departments throughout the developing world.

This office is to be hosted at the SAAO in Cape Town, chosen because of its history of excellence in research, teaching, instrumentation, administration, technical matters, education and outreach, as well as its support to organisations in SA and other African countries. ☆



Dignitaries attending the signing event were Prof Phil Charles (SAAO Director), Dr Molapo Qhobela (DST Deputy Director General), Dr Albert van Jaarsveld (NRF President), Dr Ian Corbett (IAU General Secretary) and Prof George Miley (IAU Vice President for Development and Education)

### *Physics Comment* available online

A special Issue of *Physics Comment* (September 2010) about Astronomy in South Africa is available for download from <http://www.saip.org.za/PhysicsComment/>. It includes an interesting item about the successful reconstruction of the Spherical Aberration Corrector mounting components and various comprehensive tests which have kept the telescope out of action since the end of April 2009. ☆

## Jan Hers (1915 – 2010)

Compiled by Ian Glass

We regret to announce that Jan Hers, President of ASSA during 1967-8, passed away on 24 August 2010 in Sedgefield.

Jan was born on 4 March 1915 in Hilversum, Netherlands, where his father was a medical doctor. After an acrimonious divorce, in January 1928 his mother, grandmother and the three children of the family decided to move to Potchefstroom where they had relations and where Jan attended the Potchefstroom Gimnasium Hoërskool. In spite of having to learn Afrikaans and English, not only did he become top of his class but he was elected Dux of the school in 1932.

An interest in constructing radios led to a decision to study light-current electrical engineering at the University of the Witwatersrand. His family moved to Johannesburg in 1933 to facilitate this. He graduated in 1936.

His first job was with the South African Broadcasting Corporation. He worked in part as a recording engineer but was later given the task of developing equipment to measure the stability of the Corporation's transmitters. In checking the precision of the instrument he had developed he found that he was able to provide more accurate time than the Union Observatory, which then supplied standard time signals to South Africa.



**Jan Hers busy at the controls of the Union Observatory time-service when it was still located in the Herbert Baker building on the hilltop, before the main building was built lower down. Picture taken by Peter Smits**

In the course of this work, Jan built up a good relationship with the Observatory, who coveted his expertise. In 1947 he resigned from the SABC and joined them at a reduced salary. Van den Bos is said to have opposed his appointment as he was not an astronomer but Finsen's support carried the day. He developed a number of precision clocks in the course of his work, including one based on an 'Essen Ring' crystal that was stable to 2 parts in  $10^9$ . The radio time service station ZUO was put into operation in 1949. In 1966 a caesium clock was installed as the primary standard. Hers was appointed Acting Director of the Observatory (since

1961 known as the Republic Observatory) in 1965, following the retirement of its last astronomical director, WS Finsen.

During the late 1960s several efforts were under way, sponsored by the Royal Observatory at the Cape, the Republic Observatory and the European Southern Observatory, to find a new observatory site away from the lights of the big cities and having good atmospheric conditions generally. The final choice of Sutherland was bitterly resented by the Republic Observatory staff, particularly Hers and Finsen, who favoured a site near Graaff-Reinet and felt that the decision had been a political one.

On 1 January 1972 the Republic Observatory and the Royal Observatory were amalgamated to form the South African Astronomical Observatory under the Council for Scientific and Industrial Research (CSIR), with support for a limited period from the Science Research Council of the United Kingdom. Jan's role thereafter was basically to supervise the closure of the Republic Observatory site. Most of the staff resigned rather than be moved to Cape Town. Jan elected to move to the National Physical Research Laboratory at the CSIR in Pretoria.

In 1967-8 Jan had been President of ASSA. In retirement, he lived in Sedgfield and became very active as an amateur astronomer. He was an enthusiastic variable star observer and was the director of the Variable Star section of ASSA for many years following 1977. In 1997 he was awarded

honorary membership of ASSA. In 1998 he became the first chairman of the then newly formed Garden Route Centre.

He contributed 14 582 observations (14 578 visual and 4 PEP observations) to the AAVSO International Database during the period 24 January 1977 – 11 Apr 2004. The first observation he submitted was of L2 Pup, the last of CU Vel. In 1995 Jan was awarded an AAVSO Observer Award for contributing over 10 000 visual observations through 1994. This was announced at the AAVSO 84th Spring meeting in Stamford, Connecticut, on 14 May 1995. He was a member of the AAVSO from 1977 for 33 years.

He published several articles in *MNASSA* on timekeeping and grazing occultations. He also wrote three articles on the history of the Transvaal/Union/Republic Observatory.

He was a member of the SA Institute of Electrical Engineers (SAIEE) for 75 years.

Jan had three children, Peter, Enid (Mullin) and Joan (Musto). He is survived by them and his second wife, Rita. His first wife Phyllida, the mother of his children, passed away in 1985.

[Thanks are due to Chris de Coning, Brian Fraser, Peter Hers, Greg Roberts, Case Rijdsdijk and Cliff Turk for help with compiling this obituary. Some information has also been taken from the book *Living amongst the Stars* by Dirk J Vermeulen, Chris van Rensburg Publications, Johannesburg, 2006] ☆

## ScopeX 2010 — See it, the Big Scopes are here!

ScopeX was held on Saturday, 17 April at the Military History Museum, Johannesburg. It was three days before the volcano Eyjafjallajökull (pronounced “AY-yah-fyah-lah-YOH-kuul”) starting spewing ash, grounding hundreds of flights internationally. Luckily the out-of-town guests, Case Rijdsijk, Auke Slotegraaf and Willie Koorts only had to fly to the Cape. In anticipation of the World Cup, the Camera Obscura sported ribbons and a South African flag – the intended soccer ball unfortunately could not materialise.

What was new this year? A telescope auction was added to the programme – lasting all of about 5 minutes! Two live radio recordings by RSG’s popular *Sterre en Planete* program were made in front of an audience, one of them in a question and answer format with audience participa-

tion. ScopeX also saw its youngest ever presenters, Gr.12 learner Ernie Halberg and Monique Gerber (Gr.10). On the ATM-front, almost as if in celebration of John Dobson’s 95<sup>th</sup> birthday this year, the big Dobs have arrived. Johann Swanepoel’s 20-inch, Nigel Wakefield’s 16-inch and George Jagals’ 13-inchers certainly caught the eye! An extensive spectroscopic display and another by the amateur Rocketry Association added a nice flavour to the exhibits.

### Presentations

As always, the program was so jam-packed that several events have to run in parallel, so that all tastes and interests could be catered for. Seven 40-minute talks in the main auditorium ran concurrently with three more in another venue. In summary, these were:

Johan Smit (ASSA Pretoria) presented *The Dark Side of Light*, a polished presentation on light pollution. It was interesting to note the reaction of those attending to the security issue – it may well have changed some minds!

Ernie Halberg (Gr 12) reported his discovery of Asteroid 2010 DC2 and Monique Gerber (Gr 10) explained her asteroid project, “The Doomsday Rock”. What a wonderful breath of fresh air! Here were two great role models for our youngsters, generated lots of questions from other students.



**Hennie Maas (right) from RSG busy recording a radio program with guests Case Rijdsijk (left) and Willie Koorts.**

RSG's Hennie Maas did a live recording of the popular Afrikaans radio programme *Sterre en Planete* on which Willie Koorts is a regular guest. The interview with Willie went well and the audience found it interesting to see how such recordings work. It was followed by a Question and Answer session where the audience asked questions to a panel consisting of Willie Koorts and Case Rijdsdijk. This generated a lot of interest and really good questions. The two recorded programs were aired on 22 and 29 April 2010 respectively and are downloadable from the archives on RSG's website ([www.rsg.co.za](http://www.rsg.co.za)).

Willie Koorts (SAAO) also gave a talk on *Computers in Astronomy*. It covered a century of history, starting with the contribution that human "computers" made in the early 1900s with the calculations involved in the reduction of astronomical observations and ending with the complexities of operating the SALT telescope at Sutherland. Willie touched on many of the ways that technology is essential to modern astronomy.

Brett Edwards explained how to use *Photoshop for AstroPhotography*. Following his popular "Introduction to Planetary Photography" talk last year, Brett continued the topic by discussing and demonstrating how to use Adobe Photoshop to process astronomical images. He used a structured approach and each theoretical description was accompanied by a hands-on demonstration using his own images.

Dr Ian J. McKay of the School of Geosciences presented *Earth: from space ship to lifeboat on a restless sea*. The talk began with quotes from famous people who told just how fragile our planet is. It is at the mercy of many perils such as magnetic reversals, meteoric impacts, earthquakes, volcanoes, tsunamis and climate change.

Nigel Wakefield's talk titled *Cosmoclimatology*, was based on a paper by Henrik Svensmark of the Centre for Sun-Climate research of the Danish National Space Agency. He observed that there was a close correlation between the cosmic ray count, the amount of cloud and the observed temperature of the Earth over the



(above) Seeing the spectrum of a compact fluorescent was part of the spectroscopic display. (below) The team of Voortrekkers who presented the popular Camera Obscura.





**Rainer Jakob busy explaining the principles of operation of the numerous different types of sundials to a group of Voortrekker kids who also manned this exhibition.**



last 30 years. The higher the cosmic ray count, the higher the cloud cover and the lower the temperature.

Case Rijdsdijk gave an eloquent overall review of *Particles and Stars*. He explained how “one leads to the other” by the dual nature of light as both a particle and wave. The discussion covered fission and fusion, stellar evolution, the Big Bang and how it fits all the current observations. He closed

with an overview of the future of instrumentation in astronomy, including even the Large Hadron Collider and what it may discover.

Dr Michael Bietenholz, a senior research associate at York University in Toronto who is also a staff scientist at HartRAO, was the keynote speaker on *Extreme Explosions and Extreme Telescopes: VBLI Observations of Supernovae and Gamma Ray Bursts*. Michael struck a good balance, covering the mechanisms behind supernovae, the principles of radio telescopes, explanations of why we observe what we do and how to improve our understanding of the universe through improvements in instrumentation. Discussion of the MeerKAT and challenges of the ambitious Square Kilometre Array, provided topical relevance. Michael’s presentation prompted several interesting questions from the audience, some of which were on quite a high level.

### **ATM exhibition**

Judging by the 30-odd home-made telescopes that were entered, Amateur Telescope Making remains a popular hobby in South Africa. The awards were intended to highlight achievement, draw attention to particularly interesting or exceptional items and inspire people to even higher levels. Entries came from as far as Kwa-Zulu Natal and George. Thanks to generous sponsorship, six awards were made:



**The Big Scopes have arrived at ScopeX! Award winners Johann Swanepoel's 20-inch (left) and Nigel Wakefield's 16-inch stole the show. (All pictures in this article by Willie Koorts)**

George Jagals was determined to make the largest telescope that he could reasonably complete and use, given the need to trundle it through the house to observe. The size of the mirror was set to 13-inch by the aluminising tank to his disposal. To overcome the difficulty of locally sourcing such a big blank, he fused two pieces of 19 mm thick float glass into one, in a kiln. He built a grinding machine and carefully chose the focal length to allow the telescope to get through the door! Once the monster was together, he made an ingenious trolley to transport it to his observing site, as well as a rugged adjustable observing chair to allow comfortable viewing even at maximum eyepiece height.

Rainer Jakob expanded his stupendous collection of home-made sundials, attracting a lot of interest. Specially for this year's ScopeX, he crafted a large Heliochronometer – an equatorial sundial adjustable for latitude and longitude, that can indicate the time to within a minute.

Fred Oosthuizen also does not shy from a challenge. Seeing how well TCTs (tilted component telescopes) could perform, he chose to tackle a 3-mirror version: the Stevick-Paul design. The tube assembly of this large instrument separates into two pieces for transportation, with a keyed coupling to preserve collimation on reassembly. The alt-az mount is arranged for a comfortable seated eyepiece height, putting the focuser on the elevation axis to minimise the need for operator movement. A third virtual axis is provided by the step-motor driven equatorial platform.

Julian Shellard has an enviable knack for cleanly integrating unusual design features in such a subtle way that, to the uninformed, most of his innovations would go unnoticed. This he manages to do with a flair for industrial design that enables simple everyday materials to be transformed into elegant instruments with smooth movements that are a joy to use. This year's

submission, an 8-inch f/7 Dobsonian was a fine demonstration of his philosophy.

Johann Swanepoel from George takes a long-term view and follows a rigorous engineering approach, working meticulously towards his goal. He happily tackles challenges that would daunt a lesser man. This year, he presented the largest home-made scope ever to grace the field, a 20-inch f/4 in the Krige/Berry style – but with his own unique improvements. To achieve his aim, he first imported two mirror blanks and built a versatile reconfigurable grinding and polishing machine. He then developed a Foucault tester equipped with a camera and precision micrometer movements, conducting rigorous surface analysis via image analysis software he wrote himself. Finally, the behemoth truss-style optical tube assembly (sporting an 18-point computer-designed mirror cell, a rear-loading system for safe transport of the mirror, and a balancing system to cater for eyepiece changes) is driven by a motorised alt-az system that can be controlled in go-to mode from a PC.

Nigel Wakefield brought his 16-inch f/4.3 truss-tube Dobsonian up from KZN for the event. It is unusual in that he has incorporated novel mechanisms for conveniently adjusting the spider, primary mirror and finder scope. The theme of exploring the road less travelled extends to the “reverse Crayford” focuser, which features a planetary gear system for fine focus control. None of these would be obvious to a casual glance. The whole instrument breaks down into manageable parts that pack easily into his sedan for transport.

### Astrophotography

Although there were few exhibits this year, they were of a high standard. Astrophoto judges Case Rijdsdijk and Brett Edwards decided that the award winners were: George Liakos with “Omega Centauri”, Chris Stewart with “22 degree Solar Halo”, Percy Amoils with “Amateur versus Professional” and Gary Els with “Colour Moon”.



(left) Dave Hughes explaining telescope principles in the ATM-tent. (right) Fred Oosthuizen pointing at the Moon.



### Outreach and assistance

Thanks to SAAO, who sponsored the kits, Auke Slotegraaf, assisted by two Voortrekkers, Lorraine Laubscher and Marno Grobler, ran the MoonScope building workshop for about 300 invited students. Because of the size of the group, the learners were divided into smaller groups with student mentors from Wits.



(above) Auke entrusted his assistants, Lorraine and Marno, to present the Moon Scope building classes.

(below) Buying frenzy at the Experilab stand after each exciting show.



Talking about the Voortrekkers, one cannot imagine a ScopeX without the food tent of the Unika Voortrekker Kommando and the support from the kids for the activities and exhibits. This year the youngsters gave up two Saturdays ahead of ScopeX to come and learn the skills required.

Overall, the event showed its usual varied flavour with the different Centres, astronomy clubs and exhibitors setting up their stalls and the commercial vendors selling their products. We should not forget the entertaining science show of Experilab, often resulting in loud explosions, which also added to the huge success of ScopeX. The heart-felt thanks of all go to SAASTA/DST, the ScopeX non-commercial sponsor since 2004.

The day ended with the crescent Moon in a sultry cloudless sky looking down on the ever popular Star Party.

The date for next year's event has already been set – so mark your calendar for 7 May 2011. ☆



## *Pavo - A Fanciful Bird*

by Magda Streicher  
*magda@pixie.co.za*

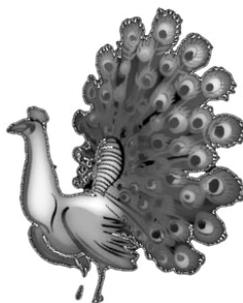


Image source: Stellarium.org

The constellation Pavo the Peacock can be seen flying south of the constellations Sagittarius and the Southern Crown. The bird itself, long a symbol of immortality, does not fail to show off its true colours in spreading its tail for all to see. The brighter stars in this constellation closely resemble the shape of a peacock and it isn't difficult to see why a constellation should have been named after one of the most colourful land birds we know. Astronomers of old must have regarded the dance and extravagant, showy display, of the Peacock as special, hence it's prominence in the southern night skies.

Dutch navigators Pieter Keyser and Frederick de Houtman introduced a dozen new constellations while mapping the southern sky at the close of the 16th century, which included Pavo. It survived as one of the 88 constellations declared by the International Astronomical Union in 1930 and their boundaries were officially laid out by Belgian astronomer Eugene Delporte.

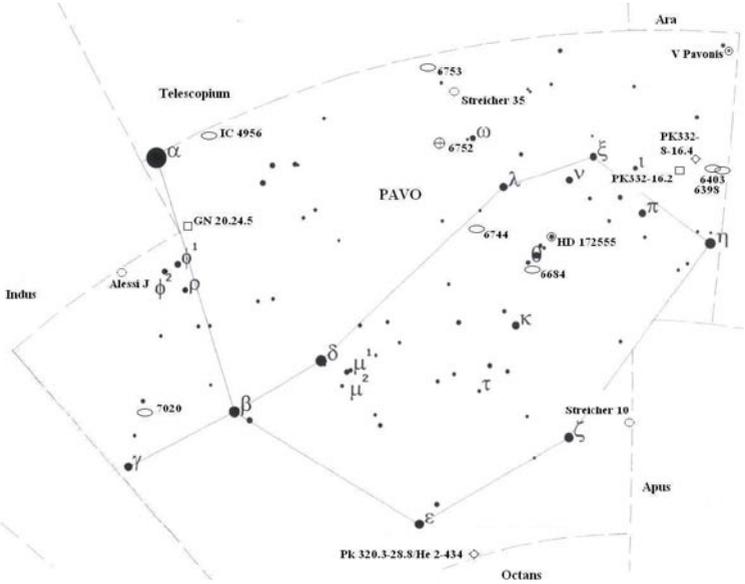
The constellation Pavo contains a multitude of bright stars, with alpha Pavonis, at magnitude 1.9, appearing as the bird's bright eye. Also known as the Peacock Star, it is the only star I know of that officially bears the name of the constellation

in which it is situated. It is a hot blue-white star, about 200 light years distant and its spectra shows that it has an unseen companion revolving around it every 12 days. The tips of the feathery tail are shown by magnitude 3.5 eta Pavonis and magnitude 4.3 xi Pavonis, towards the western part of the constellation.

The blood red star **V Pavonis**, situated in the far north-western corner of the constellation, could suggest one of Pavo's beautiful red feathers that dropped. It is a red, semi-irregular that varies between magnitudes 9.3 and 11.2 with a period of 225 days. Pavo also holds in its feathers a Cepheid variable, with kappa Pavonis sitting more or less in the middle of the constellation. The star varies in brightness from magnitude 3.9 to 4.7 with a period of 9.09 days. All Cepheid variable stars of a given type that vary at a specific rate have the same inherent brightness.

The Peacock's starry feathers are rich with galaxies and along the western border is a close pair of galaxies, **NGC 6398 and NGC 6403**, in an east-west position. They could well be twins, appearing as similar hazy ovals.

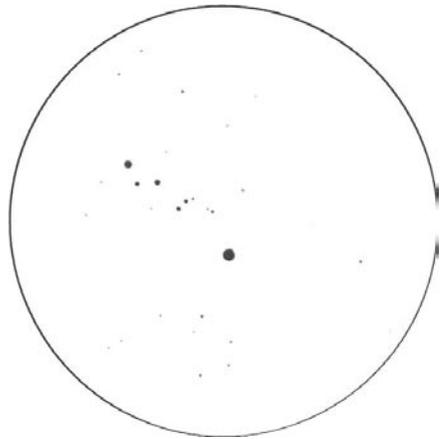
Planetary nebulae can be pretty faint and **PK 332.8-16.4** is no exception; It is situated only 1.6 degrees north-east of the galaxy pair mentioned above. A systematic close search of



the star-field only just reveals the planetary as a very faint out-of-focus spot. Only 30 arc minutes south of this nebula is another, equally faint and challenging diffuse nebula, **PK 332-16.2**. Filters will perhaps be your best tool to corner this nebula which is barely visible among the stars.

stars extend towards the north-east into the constellation Pavo. The stars in the centre area are somewhat fainter, but globally seen this uneven string exhibits well against the background star-field (see sketch).

Asterisms in various forms are among the most interesting groupings and searching for them in the star-field is most rewarding. I was fortunate enough to come across a star-string straddling the boundary between the constellations Pavo and Apus, 2 degrees west of zeta Pavonis. **STREICHER 10** (*Deep Sky Hunters Catalogue*) consists of eight stars strung together in a field crowded with galaxies. The beautiful white magnitude 6.7 star (HD 165861) marks the south-western end of the string and is situated in the constellation Apus. Seven fainter



**STREICHER 10**

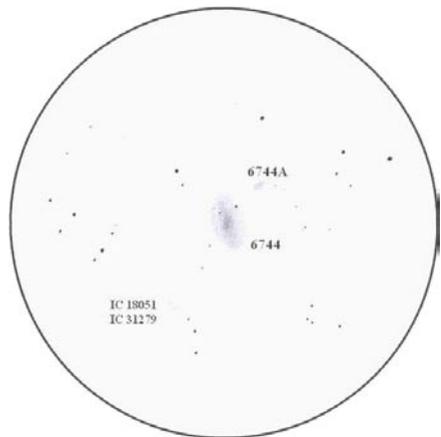
The galaxy **NGC 6684** is one of many in Pavo. It is situated only 6 arc-minutes south and very close to magnitude 5.7 theta Pavonis towards the middle area of the constellation. Although close to such a bright star it is easily seen as an oval haze, brightening to an almost stellar nucleus. Faint stars dot the way from theta Pavonis, extending in a half-moon around the galaxy's eastern side. It is advisable to place the intervening star outside the field of view to achieve a better view of the galaxy. A magnitude 9.5 star could be the reference point situated between theta Pavonis and the galaxy.

Barely 24 arc minutes north-west of theta Pavonis is a very special star in the constellation. The Spitzer Space Telescope detected the aftermath of a high-speed collision between two young rocky planets that occurred in the past few thousand years around the young star **HD 172555**. The star is believed to be 95 light years away.

Again use theta Pavonis as reference to another galaxy 2.6 degrees north-east. This area is galaxy territory par excellence – they appear like the many dots on the feathers of the bird's back. **NGC 6744** also known as Bennett 120 and is one of the largest of the barred spirals. This is an outstanding, easily seen oval-shaped galaxy in a north-north-east to south-south-west direction. The hazy outer edge appears misty, with a few faint stars on the galaxy's dusty surface. The nucleus is quite small and displays a soft envelope, slightly oval in shape. The galaxy stands

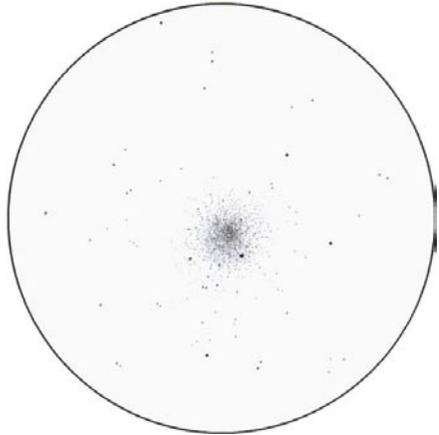
out well against the background star-field. Astronomers have detected several young massive star clusters in NGC 6744 that could be recently formed. NGC 6744A is a small spindle galaxy situated on the north-western rim of NGC 6744 (see sketch). Accompanying the system are a few others, possibly satellite systems, visible in the field of view. The star-field is quite pretty and displays a few lovely short strings of faint stars. Also found here is Delta Pavonis, an intriguing magnitude 3.5 naked-eye star. At a distance of 19.9 light years it is one of the closest single sun-like stars resembling, in a way, our Sun.

Also located here is a somewhat lone globular cluster, 1.6 degrees east of the magnitude 5 omega Pavonis. **NGC 6752** (Bennett 121), also known by its nickname, the "Starfish", is the showpiece of the constellation. James Dunlop discovered this globular on 28 July 1826 at Paramatta

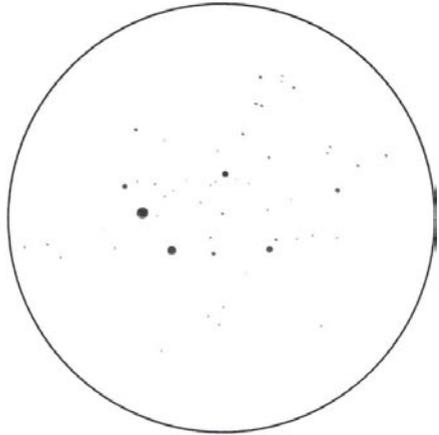


NGC 6744

Observatory near Sydney. The globular which is estimated to be 13 000 light-years distant, appears as a tight, well-resolved star-rich cluster with a small, bright condensed core. The cluster stars, running out in trails and loops, spreading out into the field of view. Higher power shows the core turned slightly oblong with very faint stars spouting out like a fountain (see sketch). A brighter outstanding circle of stars is situated on the south-eastern edge, accompanying a few doubles. An eye-catching whitish magnitude 6.7 star can be seen embedded in the southern outskirts of the globular cluster, while a few orange coloured stars can be spotted around the centre of the cluster. Our Deep-sky Section director, Auke Slotegraaf had this to say about NGC 6752: "The cluster is best observed slowly, letting your eye play with the shapes that the stars seem to trace out across the face of this cluster." He described the nucleus as banana-shaped. It is believed that M38 in the constellation Auriga has also been called by the nickname Starfish.



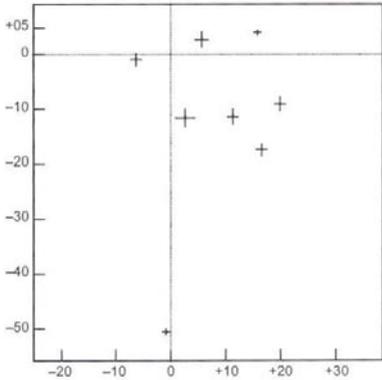
NGC 6752 (above) and STREICHER 35.



Regular investigation of star-forms have been rewarded with **STREICHER 35** (*Deep Sky Hunters Catalogue*), situated 2.2 degrees further north of globular cluster NGC 6752. Outstanding against the star-field is a half-moon shape consisting of five stars, with the brightest member the magnitude 6 star HD 176522 on the southern tip. The shape of the asterism reminds me in a way of a typical Japanese fan. The open side of the half-moon, facing north-east, appears to be filled

with a handful of faint splinter stars (see sketch). The vector-point diagram for the eight brightest stars in the asterism can be seen in the diagram provided by Slotegraaf (see illustration). The abscissa shows proper motion measured in milli-arcseconds per year, while the ordinate plots proper motion time cosine (declination). The diagram indicates the proper motion of the stars in different directions through space.

The galaxy **NGC 6753** is situated only 1.4 degrees further north-east of Streicher 35. The relatively bright small, round to oval, galaxy has an outstanding bright nucleus (see sketch). Companion galaxy member IC 4826 is 12 arc-minutes south.

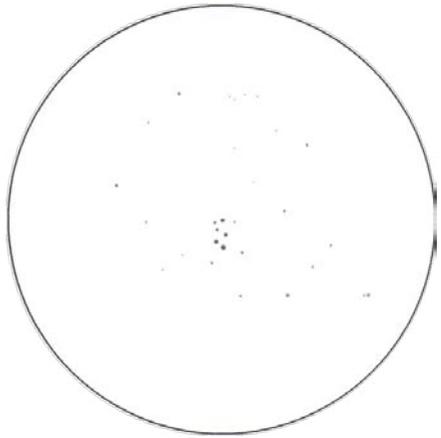
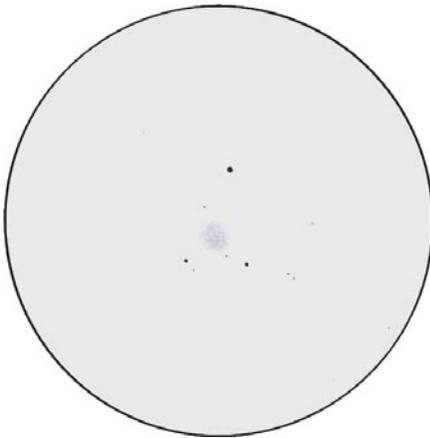


**Vector-Point diagram** vir the eight brightest stars in the Fan Asterism in Pavo. The abscissa shows proper motion in right ascension measured in milli-arcseconds per year and the ordinate the proper motion in declination. Diagram: Auke Slotegraaf

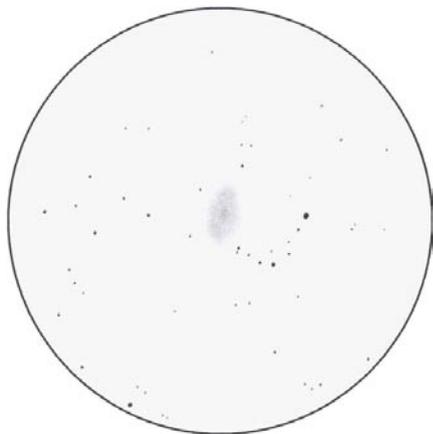
**IC 4965**, only 1.7 degrees west of alpha Povonis, in the far north-east, on the boundary between Pavo and Telescopium and close to the core of the Shapley super-cluster, an area also indicated as Abell 3667. The galaxy IC 4965 displays a very faint puff of haze, barely seen, with a slightly brighter nucleus.

Halfway between alpha and phi 1-2 Pavonis is another diffuse nebula, **GN 20.24.5**, about 4 arc-minutes in diameter, which could perhaps make it easier to detect. Once again, filters are the best tools to discern this kind of nebula.

Bruno Alessi is a keen amateur in search of exceptional star groupings. **ALESSIJ2053.8-5939** (*Deep Sky Hunters Catalogue*) is situated on the northern boundary between Pavo and Indus. This beautiful exceptional grouping



Sketches of NGC 6753 (left) and of the AlessiJ Asterism (right).



NGC 7020

lies in a north-south direction and resembles the shape of a mini-Cassiopeiae constellation. The brightest member is the magnitude 7.5 white-coloured star HD 198534 towards the south of this group of seven stars which are quite small in size but outstanding against the star-field. Between the three northern stars, very faint flickering points of light can be seen (see sketch).

Another special galaxy situated in the far eastern part of the constellation, 2 degrees north-west of magnitude 4.2 gamma Pavonis is **NGC 7020**, a known ring-type galaxy resembling a soft round cotton ball, with a bright small nucleus. Higher power turns the hazy round shape slightly into a north-south oblong. The galaxy is believed to be 150 million light years distant. The star-field to the west of the galaxy is interesting. A chain of faint stars connect a magnitude 8 star and the galaxy to each other, just like the old pocket watches with a gold chain attached (see sketch).

In the southern extreme of the constellation, in 1964 Karl Henize discovered the planetary nebula **PK 320.3-28.8**, also named He2-434. It is situated 2.4 degrees south-west of epsilon Pavonis and a few arc-minutes from the boundary with Octans. Averted vision is the best way of discerning the planetary's hazy appearance. Karl Gordon Henize was born on



**Henize's observatory on Naval Hill, Bloemfontein. Taken by Tim Cooper at the 2006 ASSA Symposium hosted in Bloemfontein.**

## deep-sky delights

17 October 1926 in Cincinnati, Ohio and died on 5 October 1993 from high-altitude sickness on the slopes of Mount Everest while attempting to climb the peak. Henize was an astronomer, space scientist and astronaut who had the third longest wait ever for a flight – 18 years. He flew on Space Shuttle Challenger in July/August 1985. During the 1950s he was an observer for the University of Michigan's Lamont-Hussey Observatory at Bloemfontein. A lifelong involvement saw him conducting an objective-prism survey of the southern sky for stars and nebulae showing hydrogen emission lines. Henize compiled a catalogue of over 2 000 Planetary Nebulae, now listed as *He* objects. In accord of his previously expressed wishes he was buried on Mount Everest. (Photo Credit: courtesy of NASA).

Colour your world with the excellent deep-sky objects that our own starry Peacock splashes out so liberally in a colourful array. ☆



**Karl Gordon Henize (NASA)**

Object	Type	RA (J2000.0)	Dec	Mag	Size
NGC 6398	Galaxy	17 <sup>h</sup> 43.4	-61°42'	13.4	2.0'x1.7'
NGC 6403	Galaxy	17 43.4	-61 41	13.5	1.1'x1.2'
V Pavonis	Red Semi *	17 43.3	-57 43	9.3-11.2	225 days
PK 332.8-16.4	Planetary Neb	17 47.3	-60 23	14	36"
PK 332-16.2	Diffuse Neb	17 54.4	-60 50	-	1'
Streicher 10	Asterism	18 15.3	-70 43	5.5	12'
NGC 6684	Galaxy	18 48.8	-65 10	11.3	4.0'x2.6'
HD 172555	Star	18 45.4	-64 52	4.7	*
Streicher 35	Asterism	19 03.7	-57 51	8	19'
NGC 6744	Galaxy	19 09.8	-63 51	9.1	20'x13.2'
NGC 6752	Globular	19 10.9	-59 59	5.4	20.4'
NGC 6753	Galaxy	19 11.4	-57 03	11.9	2.4'x2.1'
Pk 320.3-28.8	Planetary Neb	19 27.5	-74 39	13	10"
IC 4965	Galaxy	20 12.5	-56 50	14	1.1'x1.0'
GN 20.24.5	Reflection Neb	20 28.5	-59 15	-	4'
AlessiJ Asterism	Asterism	20 53.8	-59 40	9.1	7'x3'
NGC 7020	Galaxy	21 11.3	-64 02	12.6	3.5'x1.6'

## Directions to the Meteorite of 21 November (more or less).

Brian Fraser

Close to 10:55 pm on 21 November 2009 there was a very bright meteor visible over the Southern African skies. It was a Saturday night, people had been partying and alcohol may have been involved. It was seen by many people over a large area stretching from Kwa-Zulu Natal north coast to the Eastern Cape, Natal midlands, many locations in the Free State, Gauteng, Mpumalanga, Limpopo, Botswana and Zimbabwe. Hundreds of people saw a very bright object pass directly overhead for about 2-3 seconds. It was nearly always directly overhead. It was picked up on security cameras and must have been about magnitude -18 to -20 or even brighter. It was a magnificent sight for those who were lucky enough to witness the event.

But when you hear many of the eye-witness accounts you have to start worrying, because so many contradict themselves. Of course the question is: "Did it land somewhere, and if so, where?" This article is a comprehensive guide for anybody wanting to know exactly where it is (more or less).

It has been very difficult to compute the track from the sightings reported, but thankfully we do not need to know the track to find it. All we need to know are these details:

- How high was it when it entered SA airspace?
- How fast was it travelling?

- What was the angle of approach?
- How big and what shape is the object?
- Where was it seen to land (more or less)?

Unfortunately we don't have any of this information. So we are going to have to make some educated guesses. Meteors entering the earth's atmosphere have been measured at speeds as low as 16 km/sec and as fast as 72 km/sec. Because our object was seen for such short a time over any one site we are going to have to assume something near the upper limit – say 70 km/sec. As for the height – well we are just going to go along with other sightings and assume 90 km. A white light, like this object was, has a temperature of about 4 800K. And since it was seen over a path of more than 1 000 km we will assume a very shallow angle of entry. (Not that this is really important but it may assist to check the numbers.)

How big it was only concerns us in understanding the Most Vital Point (MVP – see below) but otherwise will only be useful when you go looking for it. The shape of the object also affects the assumptions around the MVP but we can only make an educated guess.

So where did it land? Luckily, there are a number of reports of an "explosion" near the end of the track, which happened somewhere over the Alldays area towards the Botswana border, maybe even just

inside Botswana. Houses were shaken, plaster fell off the wall and a door was blown shut by the blast. A loud “bang” was heard – some people heard a double “boom-boom”. These are the most valuable observations and point to the MVP.

There was actually no “explosion” as such. Meteorites do not explode. They are not made of dynamite and contain no gunpowder. Think about taking a rock from your back garden and heating it with a hundred blow torches for 10 or 20 seconds. You will not get it to “explode”. At best you may cause some crumbling on the surface, depending on the type of rock it is. But definitely no explosion.

So what was the shock wave? It was the meteorite going through the sound barrier as it slowed down. And this is our Most Vital Point for calculating where the meteor may have landed because we know EXACTLY the speed it was travelling at that point – the speed of sound – around 330 m/sec.

Now all we need to know are these points:

- How high did the MVP happen?
- What is the size and shape of the meteorites because with this information we can calculate how long it will take to fall from that height?

Again we don’t have this information. However, we are going to use some values from previous events and hope that we are in the same ballpark. Most importantly we would like to know the vertical terminal velocity our object would reach falling

from a great height. Once you drop an object from a great height it accelerates, due to gravity. But at some point it stops accelerating and reaches terminal velocity. Oh, and the height we are going to assume to be 40 km, based on other events. And also because it is a nice round number.

So what is the terminal velocity of an object falling from 40 km? This now depends on the size and shape of our object. If we had that information our job would be easy. One thing we do know, from the intensity of the shock wave, is that it is not a small trivial object as the intensity of a shock wave largely depends on how much air is being “pushed” out of the way by the object. Previous results show 200 m/s for a relatively smooth aerodynamic object and maybe 100 m/s for a rough odd-shaped object. (A man once dropped out of a high altitude balloon and exceeded the speed of sound (330 m/s) in free fall!) This means that it took between 200 and 400 seconds to fall to earth from the MVP. But it was still travelling horizontally at this time, starting off at 330 m/s and ending up at 0 m/sec when it went thunk into the earth. If we assume an average speed of 150 m/s for 200 seconds this means it landed about 30 km away. In 400 seconds it would have travelled 60 km before thunking down. Which puts the object, according to my map, at about 22 deg south and 29 deg east – nicely inside Zimbabwe in an area called the “Tuli Safari area”.

And that is exactly where it is (more or less). ☆

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