

CANOPUS

The Astronomical Society of Southern Africa

Johannesburg Centre

Monthly Newsletter for May 1999

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The Sir Herbert Baker Library, 18a Gill Street, Observatory, Johannesburg

Editorial

Some of you may have noticed a little bit of a bite in the air during the evenings over the last couple of weeks - could it be that Autumn has at last decided to put in an appearance before Winter does? **Venus** shines gloriously in the West while **Mars** is putting on quite a show in the East. Though not as quite bright as the evening star, it is unmistakable with its deep ruddy hue.

Instead of a variable this month, Danie has sent us an article on the ASSA Symposium held recently down in Cape Town while Bill Wheaton has submitted a piece on Mars - appropriate when one considers its current overhead position and brightness. Brian has supplied us with the Sky happenings for May and June and Eben van Zyl has been prompted to write a short article after reading Chris Stewart's fun article on Relativity in the April issue.

We have picked up an article from Associated Press in Boston on the origin of the term "a Blue Moon" whereby the Sky & Telescope magazine admits to an error in one of its articles on the subject. Apparently a Blue Moon is not the second Full Moon in a month, but the fourth Full Moon in a season. This error has been with us since 1946. Read the article and see what you think

Please read the notices of the forthcoming meetings - and especially note the date and venue of the ASSA parent body's Annual General Meeting. Try to attend if you can.

Thanks to Chris Stewart for forwarding some light relief in the form of the Alien cartoons.

We have been a little short of articles this month - all of you budding Pulitzer Prize winners out there please take note. Anything you submit will be considered seriously for publication

The Editors

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Notice of Meeting

The **May** meeting of the Johannesburg Centre of the Astronomical Society will be held at the Sir Herbert Baker Library on Wednesday 12th April 1999 at 8:00 p.m.

Topic:
"Leaving Planet Earth....."
 by
Tom Budge.

Future Meetings

Jun 9 th	Special Show at Planetarium	T.B.A.
Jul 14 th at 19:00	Bring & Braai at Observatory	A.G.M.
Aug 11 th	Test the Team	An Erudite Panel

Dark Sky Viewing

On the Saturday nearest New Moon at Tom Budge's Farm in the Magaliesberg.

15 th May	11 th September	<i>Year End Star Party</i>
12 th June	9 th October	11 th December
10 th July	6 th November	
7 th August		

ASSA Annual General Meeting.

The Annual General Meeting of our parent body, the ASSA, will be held at the Pretoria Centre on the 28th July 1999 at 20:00. All members are welcome to attend the meeting which will be held at that centre's normal meeting place, the CBC in Silverton.

Telescope Driver's Licence

The May course is now booked out and by the time this issue of Canopus reaches you, the April course will have been completed and we will have some new "licenced drivers". Good luck to those on the course(s) and for those of you who did not get onto these two latest courses, Constant will organise more of them in the future.

Swinburne 1999

Our annual trip to Swinburne will be held on the long weekend of 7th to 9th August 1999. If you are interested in this trip, please contact Ed Finlay for further details. We will arrive on the afternoon of the 7th and leave after breakfast on the 9th.

Boyden 1999

Our annual trek to Boyden will be held from the 9th to 11th July 1999. If you are interested in this trip, please contact Constant Volschenk for further details. This trip is the one where we “rough it” in one of the buildings at the Boyden observatory outside Bloemfontein and get to use the 60" telescope for some spectacular viewing.

More trips in the planning stage

Other trips are in the process of being set up, including an overnight jaunt to Suikerbosrand later in the year (when night-time temperatures start easing up a little), and a Sunday afternoon outing to Haartebeeshoek. This latter jaunt to cost about R10-00 per head. More information will follow nearer the time.

If any of you have ideas for trips that you feel would be beneficial to Jo’burg centre members, please contact one of the committee members and pass your idea(s) on to us. We will discuss these both in committee and at the Monthly meeting to gauge support for the proposed trip(s).

Wits Planetarium

The planetarium website is now available. Follow the link from our own home page for all the information you need regarding planetarium shows and times and a little history....

.....and like ourselves, the planetarium links page will include links to all of the ASSA centres that have their own web sites.



Letters to the Editors

A question please.

Most of us have a vague understanding of what "redshift" means in terms of measuring distance. The higher the number, the faster the object is, and the further away it is.

My question is this. - By what unit of scale is the Redshift measured?

Melvyn

Thanks for the question Melvyn - we'll throw it open to be answered by some of our more erudite members in (hopefully) the next issue of Canopus.

An eMail from Natal

Dear Jo'Burg member,

Have you visited the Natal Centre web site yet? You may get there by selecting <http://www.astronomical.lia.net>. Perhaps you would like us to put a link to your site (http://www.aqua.co.za/assa_jhb/assa001q.htm) on our links page.

Please reply and let us know.

Regards,

Kaine

Kaine.Varley@iName.com

We will be contacting the Natal Centre to ask them to place a link on their links page, and will reciprocate by adding a link to their page.

Eclipse 2001

I'm sure that this is old news to you chaps, but US groups are already advertising trips to Zim for the eclipse of June/July 2001. I know Jim Knight was planing to "do" this one. We should start telling people about it now so as to possibly generate a minute spark of interest.

Do we have any contact with a decent travel agent?

We have been contacted by Dave Pringle-Wood of the Harare Centre and we quote a portion of his eMail in connection with your above query .

"We are well ahead on planning for OUR ECLIPSE in June 2001, and would like to let members of ASSA know this.

We have started discussions with Zimsun Hotels and many tour operators".

This has been brought up in committee and a tour to observe the Zim eclipse is on the cards. Anyone with an interest in joining this expedition should get in touch with one of the committee members so that they can see just how much interest there is.

The Editors.

JPL and NASA News

Bill Wheaton, IPAC - 1999 May

The New Mars Program.

Developments in the exploration of Mars have been so rapid during the past few months that it seems I could almost devote this entire column to Mars alone, every month, and still hardly keep up. At this moment Mars Global Surveyor (MGS) is in operation, finally in its proper mapping orbit (despite a problem with an antenna hinge, still being worked); the Mars Climate Orbiter (MCO) and the Mars Polar Lander (MPL, carrying also two Deep Space 2 micro-penetrator probes) are in transit and scheduled to arrive later this year. I have previously described these missions, most recently in the January 1999 and September 1998 issues. Exciting as they are, the most remarkable recent development is the suite of missions in preparation and planning, which includes landers and orbiters at virtually every two-year opportunity, and a simply bewildering array of rovers, sample-return missions, and even an aircraft.

Mars mission opportunities are timed about every two years, much like oppositions. To go to Mars efficiently, one must wait until a few months before opposition, and then depart from Earth by increasing one's orbital speed around the Sun. The transfer orbit is approximately tangent to the orbits of both Earth and Mars, with the Earth-Mars opposition somewhere between launch and arrival. Thus the current MCO and MPL missions departed in December 1998 and January 1999, and will arrive in September and December 1999, respectively, with opposition in April 1999 just past. Note that returns from Mars to Earth run on a rather similar schedule, centered on the oppositions: departing before, and arriving after. The mean interval between oppositions is 2.135 years, or 2 years and a little over 7 weeks, with substantial variations around the mean, mainly due to the large eccentricity of Mars's orbit. Based on such

arithmetic, oppositions and hence opportunities occur on odd years, e.g. '01,'03, '05, '07, until late in the next decade.

Objectives of the program include characterization of the chemistry and composition of the surface and atmosphere, a search for evidence of present or past water, and of course the search for fossil life. It had originally been planned to launch an ambitious rover for the 2001 opportunity, which would gather and cache rocks for later return to Earth in 2005. Unfortunately cost and schedule problems with the rover and its elaborate instruments proved too much and forced a painful revision, completed last November. The original 2001 rover has been placed with a much simpler version, similar to that on Pathfinder in 1997, and the more complex sample-collecting rover delayed until 2003. The new plan, as summarized in the table, is greatly broadened and strengthened by major involvement of European partners, especially France and Italy. It is based on a sample return scheme in which US landers and rover combinations ('03, '05, '07, '09) collect and launch Martian samples (about 1 kg each) to low orbit using a solid-fuel Mars Ascent Vehicle (MAV). The samples are then collected in Mars orbit by orbiters, launched on an Ariane 5's, in 2005 (committed) and 2009 (planned), for final return by parachute to Utah.

This is certainly a very ambitious and exciting plan. It has the robustness advantage of being spread among a number of less-expensive missions, so no single failure would cause loss of the major objectives. The French contribution of at least one and possibly two Ariane 5 vehicles for the sample return is critical, as current US alternative launchers (only Titan IV is yet in operation) are too expensive considering the \$300 million per year NASA plans to spend on

the program.

Revised Mars Program

Year	Type	Name/Purpose	Status
1997	Lander	Pathfinder	Complete
1997	Orbiter	Mars Global Surveyor	Operating
1999	Orbiter	MCO	En route
1999	Lander	MPL	En route
2001	Orbiter	Surface spectroscopy	Committed
2001	Lander	Small rover	Committed
2003	Lander/ Rover	Surveyor '03 Sample acquisition for return	Committed
2003	Lander/ Aircraft	Kitty Hawk Mapping, composition	Budgeted
2003	Orbital Relay	Communications	Budgeted
2005	Lander/ Rover	Surveyor '05 Sample acquisition for return	Committed
2005	Orbiter France	Sample return from Mars orbit	Committed
2005	Landers (4) France	Netlander seismic network	Committed
2007	Lander/ Rover	Surveyor '07 Sample acquisition for return	Planned
2009	Lander/ Rover	Surveyor '09 Sample acquisition for return	Planned
2009	Orbiter France	Sample return from Mars orbit	Planned

In addition to the key missions shown above, a number of others, both NASA and non-US, are possible and at various stages of development. The Japanese *Nozomi* Mars orbiter is already launched, but will not arrive until early 2004 due to problems encountered in its on-board propulsion system. Putting all together, even if budget or technical problems result in some loss,

the next decade should be extremely productive in advancing our knowledge of Mars. Administrator Dan Goldin and many others have expressed the belief that successful completion of the plan will permit the realistic consideration of human exploration missions in the 2010-2020 time frame.

March 31, 1999

Definition of 'Blue Moon' Corrected

Filed at 3:46 p.m. EST

By The Associated Press

BOSTON (AP) -- Once in a blue moon, a widely accepted definition has to be rewritten.

Take the term "blue moon" itself.

For half a century, it's been known as the second full moon in a month, like the one that appeared Wednesday. But that's wrong, and the editors of Sky & Telescope say it's their fault: The magazine incorrectly defined the term 53 years ago.

"I hate to admit it," said Roger Sinnott, associate editor of Sky & Telescope.

Sinnott blamed the goof on an amateur astronomer.

James Hugh Pruett wrote a 1946 piece for the magazine after apparently misinterpreting a complex 1937 article in the Maine Farmer's Almanac that essentially, but not clearly, said a blue moon occurs when a season has four full moons, rather than the usual three. Pruett mistakenly thought that meant a blue moon is the second full moon within the same month.

Pruett's mistake went unnoticed for decades. A 1980 National Public Radio story about blue moons used the wrong definition. In 1986, the board game Trivial Pursuit repeated the error. When two full moons appeared in May 1988, "radio stations and newspapers everywhere carried an item on this bit of 'old folklore,' "

folklorist Philip Hiscock wrote in the magazine's March issue.

Sky & Telescope, based in Cambridge, discovered the error when it was working on an article about how January and March of this year featured what would have been two blue moons by Pruett's definition.

Although Sky & Telescope's editors think Pruett's mistake led to the popular modern misdefinition of "blue moon," it's unclear where the Maine Farmer's Almanac came up with the rule. The almanac is defunct.

Although the term "blue moon" has existed for centuries, Sinnott said his research of almanacs dating to the early 1800s found no precise definitions until 1937.

By either definition -- Pruett's or the almanac's - - blue moons occur about every two or three years, Sinnott said. The last blue moon as defined by the almanac was in June 1997. The next will be in February 2000.

Although purists may subscribe to the almanac's point of view, Sinnott thinks Pruett's error will prevail. Pruett died in 1955.

"This meaning is so entrenched now. Nothing we can do is going to put the genie back in the bottle," Sinnott said. "Our big mistake in 1946 has really caught on and there's no turning back."

Well, we certainly have had a few interesting definitions of the term "Blue Moon". We wonder if the above press release will be the final word in this saga.....

The Editors.

**The ASSA National Symposium,
Cape Town, 29 - 30 March 1999.**

This was a highly successful event, fully up to the standards of the 1992, 1994 and 1996 symposia. The papers were without exception well prepared and well presented. The speakers kept to their allotted times and ample time was allowed for discussion and questions.

In the opening address I mentioned how pleasing it was to see so many old friends but how much better it would have been if there had been a larger number of newer members. There were, however, a sprinkling of young people and I am sure that they benefited from the proceedings.

As can be seen below, amateurs were well catered for and in fact I was asked by the technical organiser to help to emphasise the amateur side of astronomy. The papers are marked "A" and "P" for the benefit of Canopus readers who do not know all the speakers.

<i>P</i> J W Menzies	The PLANET Project
<i>A</i> Brian Fraser	The Lameia Occultation
<i>P</i> Case Rijdsdijk	Alexandrian Astronomy
<i>A</i> Maciej Soltynski	The Discovery of Cataclysmic Variables
<i>P</i> AP Fairall	The Cosmic Egg
<i>P</i> RS Stobie	SALT - Current Status
<i>P</i> DAH Buckley	Science with SALT

<i>A</i> Chris de Villiers	Digital Encoding of Coordinates on a German Equatorial Telescope Mount
<i>P</i> DM Kilkenny	R Coronae Borealis Variables
<i>A</i> Jan Hers	Discussion on Amateur Variable Star Observing - Visual or CCD?
D O'Donoghue	Astroseismology with the Whole Earth Telescope
T Lloyd Evans	A red Variable
Ethleen Lastovica	Thomas Maclear - Astrologer Royal
<i>A</i> Danie Overbeek	Detection of a Stellar Gamma Ray Flare with Amateur Equipment
<i>P</i> D Smits	Multiwavelength Radio Observations of the Maser Flare in Mon R2
<i>A</i> Cliff Turk	Running a Public Observatory
<i>A</i> Tim Cooper	The ASSA Observations of Comet Hale-Bopp c/1995 O1
<i>A</i> Andrew Gray	History of the Durban Observatory

Poster papers:

- | | | |
|---|-----------------------------------------|--------------------------------------------------------------------------------------------|
| A | Hugh Lund
Observations | Amateur CCD

of a Contact Binary |
| A | Richard Wade | Preliminary Report of
Research into
Archaeoastronomical
Aspects of Great Zimbabwe |
| P | Tom Lloyd Evans | Visual Light Curve
of R Lep |
| A | TP Cooper | Observations of Lunar
Eclipses (1) and (2) |
| A | TP Cooper,
MD Overbeek
and J Smit | The 1993 Superoutburst of
the Cataclysmic Variable
OY Carinae |
| A | D Toldo and
MD Overbeek | Solar Flare Monitoring
at Edenvale, RSA |

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Fax: (011) 794 5338

A period was set aside for poster presenters to discuss their posters. Many questions from the floor demonstrated that posters are an effective means of communication at symposia.

I hope that the above will give the Johannesburg Centre a yard- stick to use, should the Centre decide to present national event in the next century.

Danie Overbeek

(Danie is, of course, currently Chairman of the ASSA Parent body)

The Editors.

What say, Jo'burg Centre, why not set up the last ASSA Symposium of the 20th Century up here in Johannesburg. We're sure you'd be able to hold a symposium that would be memorable.

The Editors



How can one see matter moving faster than light? (revisited.....)

I enjoyed Chris Stewart's sortie into the realms of Relativity in his article "How can you see matter moving faster than light?" in Canopus of April 1999. Actually my head started spinning and I got quite dizzy at his mentioning guzzies buzzing at 199 and 200 kilometres per hour. (What are guzzies?). And I must object at his spelling of koeksusters -- they have nothing to do with female siblings but every- thing to do with the sissling sound of cold doughy plaits being plunged into hot oil -- that's why they are called koeksisters from the sissling sound they make!

But to get to his quasar which emits a jet of matter at a speed greater than the speed of light: The quasar recedes from Earth at the speed v and covers the distance $QA = v$ in 1 second. While the quasar travels over this distance, its emitted jet of matter travels from Q to B = c in 1 second, this being the speed of light. We see the jet as travelling the distance AB. How long is AB? Let's call the length AB, x . In 550 BC Pythagoras proved that the sum of the squares on the right angle sides of a right angled triangle is equal to the square on the hypotenuse.

$$\text{i.e. } AB^2 + QA^2 = QB^2$$

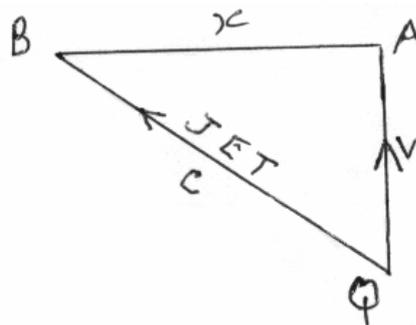
$$\therefore AB^2 = QB^2 - QA^2$$

$$\text{or } x^2 = c^2 - v^2$$

$$\therefore x^2 = c^2 \left(1 - \frac{v^2}{c^2} \right)$$

$$\text{Thus } x = \sqrt{c^2 - v^2} / c^2$$

$$\text{i.e. } x = c \sqrt{1 - v^2 / c^2}$$



This is always less than c because $1 - v^2 / c^2$ is less than 1 and the square root of $(1 - v^2 / c^2)$ is also less than 1.

Now $AB = x$ is the distance we see the jet travelling in 1 second but its actual distance is c in 1 second. Therefore the speed of the jet = $c \div c \left(\sqrt{1 - v^2 / c^2} \right)$. Since $c \left(\sqrt{1 - v^2 / c^2} \right)$ is always less than c , AB must be more than c , the speed of light.

Nobody schooled in Relativity would fall into this trap, but it does **seem** as if the speed of the jet is more than the speed of Light., whereas the speed of the jet is $c \left(\sqrt{1 - v^2 / c^2} \right)$

Remember Alf and Ben in their boats on the river flowing at a speed of v ?

Eben van Zyl

In the Sky this Month

May 1999

dd hh

1 07 Mercury 1.8 S of Jupiter
 1 18 Mars nearest to Earth
 2 03 Moon at apogee
 6 19 Neptune stationary
 7 17 Neptune 0.0 S of Moon - Occn.
 8 16 Uranus 0.8 S of Moon - Occn.
 8 18 LAST QUARTER
 13 05 Jupiter 3.6 N of Moon
 13 16 Mercury 0.7 N of Saturn
 14 10 Saturn 3.0 N of Moon
 14 12 Mercury 3.8 N of Moon
 15 12 NEW MOON
 15 14 Moon at perigee

dd hh

16 12 Aldebaran 0.8 S of Moon - Occn
 18 15 Venus 5.8 N of Moon
 22 03 Uranus stationary
 22 03 Regulus 0.7 S of Moon - Occn.
 22 05 FIRST QUARTER
 25 18 Mercury in superior - conjn.
 26 11 Mars 5.0 S of Moon
 28 02 Mercury greatest brilliancy
 28 18 Mercury 6.5 N of Aldebaran
 29 08 Moon at apogee
 30 07 **FULL MOON**
 30 21 Pluto at opposition
 30 22 Venus 4.2 S of Pollux

June 1999

dd hh

3 22 Neptune 0.7 S of Moon - Occn.
 4 22 Uranus 0.5 S of Moon - Occn.
 5 07 Mars stationary
 7 05 LAST QUARTER
 10 00 Jupiter 4.0 N of Moon
 11 02 Saturn 3.0 N of Moon
 11 09 Venus greatest elong. E(45)
 12 23 Aldebaran 1.0 S of Moon Occn
 13 00 Moon at perigee
 13 19 NEW MOON

dd hh

15 08 Mercury 4.6 N of Moon
 17 03 Venus 2.4 N of Moon
 18 11 Regulus 0.9 S of Moon - Occn.
 20 18 FIRST QUARTER
 21 20 **Solstice**
 21 23 Mercury 5.5 S of Pollux
 22 20 Mars 6.2 S of Moon
 25 18 Moon at apogee
 28 20 Mercury greatest elong. E(24)
 28 22 **FULL MOON**