

CANOPUS

The Astronomical Society of Southern Africa

Johannesburg Centre

Monthly Newsletter for November 2000

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**The Sir Herbert Baker Library, 18a Gill Street, Observatory, Johannesburg
P.O.Box 93145, Yeoville, 2143**

Editorial

Venus is brilliant in the evening sky as this editorial is being pondered upon. At the time of the last new moon at the beginning of October, it was a beautiful sight as seen from the small Western Cape hamlet of Stilbaai where your editor and his better half were unwinding after another year's stressful existence up here on the Witwatersrand. A couple of attempts to photograph the Moon, Venus and Mercury were singularly unsuccessful due no doubt to the fact that today's point and shoot cameras do not adapt easily to astronomical imaging.

The skies down in that region of the country are quite phenomenal due to the lack of indiscriminate lighting and air pollution (when not overcast that is). It is very easy to see why an area like Sutherland was chosen as the site of the national Astronomical Observatory. Until one gets closer to Cape Town, the skies are really dark and the seeing is great.

Bill Wheaton is snowed under until at least April 2001 with major work to do with the 2MASS project and will not be able to provide his excellent articles until then. *Good luck with the PSFs Bill.*

Brian Fraser has supplied us with the sky happenings for November and December as well as the applicable Planetary data for the same period and **Trevor Gould** is looking for some volunteers to help with observations of the next transit of Venus in 2004.

Danie's variable of the month article covers some strange antics of Delta Velorum and has a request for some observing to be done by the society members - read his article with special attention to the footnote thereafter.

Dave Gordon has submitted a really good article on polar alignment. As you're all aware, we in the Southern Hemisphere, although having more beautiful skies than our friends in the North, do not have their advantage of a bright Polar Star - so read this carefully and you will learn how to align your telescope to the South Celestial Pole with relative ease.

Please make a note of the date of our special event - Saturday 11th October, 19:00 for 19:30.

The Editor

chris@penberthy.co.za

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Notice of Meeting

The **November** meeting of the Johannesburg Centre of the Astronomical Society will be held at the Old Observatory, 18a Gill Street, Observatory, on Saturday the 11th of November 2000.

Time:- 19:00 for 19:30

Dress:- Smart Casual

Please note the different day of the week and starting time.

Future Meetings

November 11 th	Special Event	Various
December 9 th	Under the Full Moon	Annual Star Party

Are there any subjects that you would like to hear at one of the monthly meetings? Contact your local friendly committee member and ask her/him to discuss it in committee.

Dark Sky Viewing

On the Saturday nearest New Moon at Tom Budge's Farm in the Magaliesberg. Remember that this is by arrangement only as most observers will be following specific viewing programmes and if you don't have your own 'scope, you should contact one of the observers (e.g. at the monthly meeting) to arrange some viewing time with them.

25th November

Year End Star Party 2000
"Under the Full Moon"
 9th December

Annual Subscription Fees

There are no changes to the Johannesburg Centre's subscription fee structure for the 2000/1 year. The joining fee remains R50-00 and the Annual fee R100-00. The Family membership subscription fee also remains unchanged at R125-00. The Family membership is restricted to couples and their co-resident dependants and although all Family members receive full rights as members of the Centre, only one copy of the monthly magazine, Canopus, will be posted to the family address. The annual subscription form is included with this issue of the Canopus and we would like to urge you as members to pay your subs as early as possible to enable your committee to plan the Centre's projects for the year ahead.

Please post your subscription fee, or deposit/transfer it directly into the Society's bank account at NEDBANK. The Account information is as follows:-

Bank:		NEDBANK
Branch	Name:	Park Plaza
	Code:	19 21 42 44
Account	Type:	Current Account
	Number:	1921 013761
	Name:	<u>ASSA Johannesburg Centre</u>

Please remember to write your name on the deposit slip or to include your name as a reference on a direct transfer. Then fax the details to the Chairman to let him know that you have paid via direct deposit or transfer so that you will be kept on the Canopus mailing list.

Jo'burg Centre Outings for 2000

Your Committee is making arrangements for several outings during the year. Amongst these are some old favourites as well as a couple of new ones which should prove interesting.

Swinburne was visited, and an article has been promised for the next issue of Canopus.

Boyden has been cancelled due to lack of availability of the 60" but we'll plan a visit again next year.

The possibility of a visit to Sutherland is also being discussed - though this would involve a rather long trip.

We will also be looking at the possibility of arranging visits to other ASSA Centres (e.g. the Pretoria Centre) during the year - and also try to see if we can organise some joint ventures.

Haartebeeshoek - Wolf Lange is attempting to organise a visit later in the year, as well as a visit to the Suikerbosrand Nature Reserve.

Tswaing Crater - still trying to set up a day visit under the guidance of Prof. Reimold

New Members

Mr. M Gendel

Mr. & Mrs. Lindsay

Mr. E Mofokeng

Mr. Carel van der Merwe

Welcome to the Jo'burg Centre and clear skies to all of you.

Telescope Making Classes

Would you like to make your own telescope?...or finish off a partially finished one? Well your opportunity has arrived (once again). Join the Telescope Making Class being held under the guidance of Brian, Evan and Chris. Contact Brian on 803-8291 if you are interested.

International Amateur Collaboration – Call for Volunteers Venus Transit June 2004

Andreas Inderbitzin, Ing.HTL, Head of the Society of Astro- Amateurs, Zuerich, Switzerland, is looking for Southern African volunteers to participate in a project observing the transit of Venus on June 08, 2004.

He says: "Our group of amateur astronomers consists of about 25 members (from 20 to 70 years of age) in Zuerich. We plan to take advantage of the forthcoming Venus Transit in 2004 to determine the astronomy unit according to Halley (1656-1742). We are therefore looking for interested collaborators on the Southern hemisphere.

Main points of interest from our point of view for this project are to:

- (i) learn about the historical background;
- (ii) understand the mechanics behind this transit;

- (iii) determine with the means of an amateur astronomer the transit times of the 2nd and 3rd contact. For this we plan to have multiple observatory point in the northern and Southern Hemisphere to minimize the risk of having clouds obstructing the view;
- (iv) exchange the acquired data (online?)
- (v) inform the public.

The official start of the project will be on the 26 of October 2000 in Zuerich."

Interested observers are requested to contact **Trevor Gould** at:

Mobile 083-212-8945

Home 011-886-5602

e-mail: trevorgo@tnet.co.za

The Elusive SCP

A comprehensive guide to finding the precise South Celestial Pole “drill hole”

By Dave Gordon

We in the Southern Hemisphere have traditionally felt a little disadvantaged at not having our own “Polaris” with which to align our telescopes. Owners of computerised “goto” telescopes are not ordinarily faced with the daunting task of aligning to the SCP. For the rest of us, an approximate SCP alignment is sufficient for ordinary observational purposes. However, it is critical to align perfectly to the SCP prior to attempting any long-exposure astrophotography. An added bonus of a perfect alignment is the opportunity to use the setting circles to locate objects, with outstanding accuracy.

The star drift method is much too cumbersome and time consuming. Most guides refer the observer to the very shy magnitude 5.5 *sigma Octantis*. With practice, a dark sky observer can become quite adept at hunting down its position, however city dwellers are faced with many wasted and precious minutes of observing time waving binoculars in the general direction of *Octans*, trying desperately to locate a faint beacon buried amongst many other faint beacons, wishing that *sigma Octantis* had a big neon sign that screamed “POINT HERE”.

Forget about *sigma Octantis* as a stand alone item and concentrate on the shapes close to the SCP. This is the key to a fast and accurate alignment.

There are 5 distinct stages to a perfect SCP alignment:

1. Naked eye confirmation
2. Binocular familiarisation
3. Scope positioning and leveling
4. Finder scope adjustments
5. Micro-adjustments in a low-magnification eyepiece

Naked Eye Confirmation

The objective is to find the approximate SCP so that the telescope can initially be positioned in a rough SCP alignment. Familiarise yourself with the constellations immediately surrounding the SCP. The best pointers we have to the approximate SCP are:

- Crux and alpha & beta Centauri
- Triangulum Australe
- Apus
- Chamaeleon
- The SMC and LMC

These can be used for approximate alignment at different times of the year. For example, on the 15 October, Crux and the pointers are of no use, so we apply the alignment of Triangulum Australe with Apus to extrapolate onto the approximate SCP position. Refer to **Chart A** below:

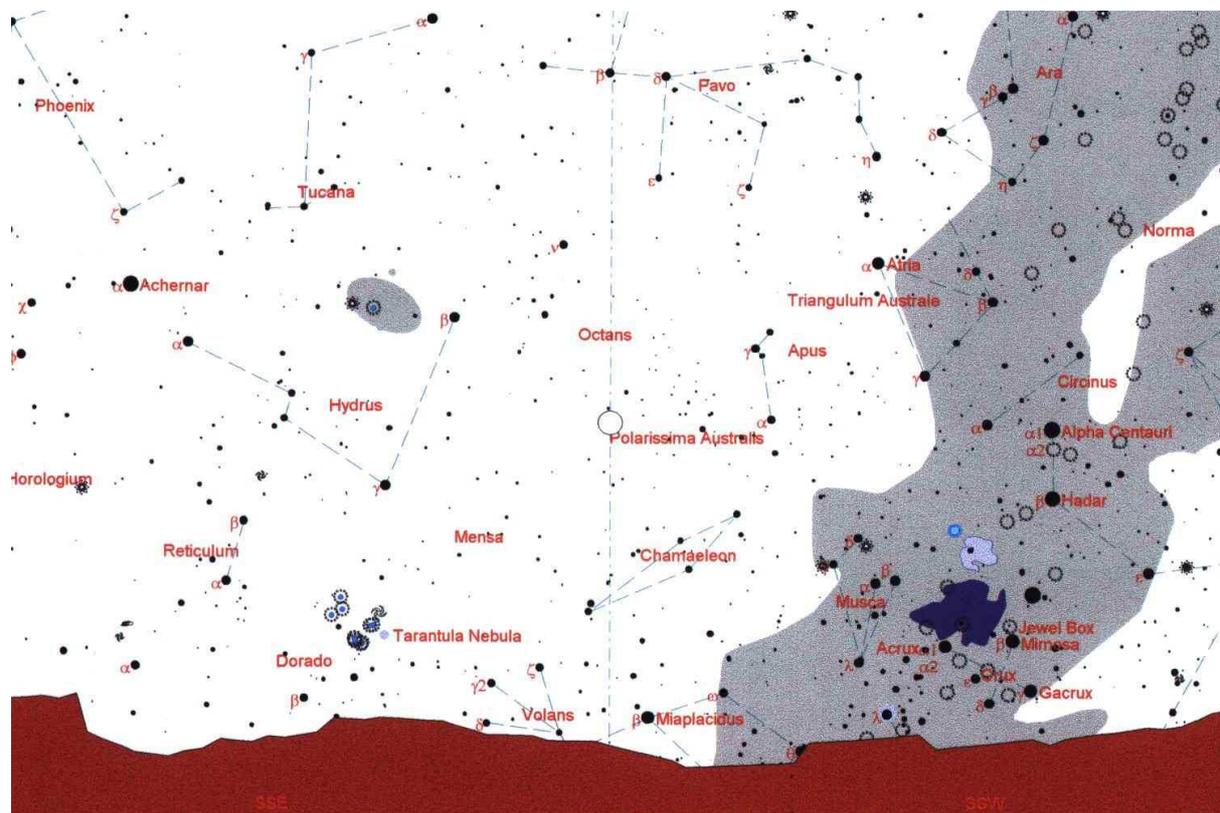


Chart A, 80° FOV, 15 October 19h30 SAST, 26° south, north is up west is right

This is an 80 degree field of view, similar to a naked eye view looking southwards. Find *Triangulum Australe* and specifically *alpha Trianguli Australis*, or Atria. Now find the right-angled triangle forming the head of *Apus*, specifically: *beta*, *gamma* and *delta Apodis*. The line drawn from Atria to the right angled triangle must be extended its own length again, and the result will be the approximate SCP.

Binocular Familiarisation

Now it is important to get an optically aided view of the SCP region that you have just visually identified. I use 10x50 binoculars but any will do. You are looking for two shapes; We shall name them the *Chinese Hat* and *Little Corona*.

Start with a familiar shape in the binocular view and then slowly work your way towards the approximate SCP. Make sure you can find these two shapes in binoculars first. It is much more difficult to start with the finder scope if these are not yet familiar shapes.

Refer to **Chart B** below.

You will see both the *Chinese Hat* and *Little Corona* in the same field of view, only *Little Corona* is much fainter but distinctive in shape. *Sigma Octantis* is the brighter star at the top of the *Chinese Hat*. It is our guide star used to draw a line to *Little Corona*, and the point we are chasing. Alternate with a naked-eye and binocular view to memorise your altitude (angle from the horizon). Remember, the position of the *Chinese Hat* around the SCP depends on the current time. You will become familiar with it in any orientation.

Scope Positioning and Levelling

Switch off all motorised drives for the duration of the alignment. Position the scope as accurately as possible with respect to the altitude and position that you memorised visually and with binoculars earlier. Level the scope with a GOOD spirit level. This is important. If you gain a perfect SCP alignment but your scope is not level, tracking will not be accurate. When the scope is level, perform the following steps:

- The telescope should be equatorially mounted. Set the wedge to your latitude. If your scope has a flat backing plate, such as a Schmidt-Cassegrain, there is a double check to confirm this. Rotate the optical tube so that it is pointing straight down. Place the spirit level on the back and it should read level. Now, check the reading on the declination circles - it should confirm your latitude. If it does not read your latitude, set the scope to your latitude on the *declination circles* and then adjust the wedge until the spirit level on the back of the optical tube is reading level. For this purpose, it is important that your declination circles are accurately calibrated with respect to the telescope mount.
 - Rotate your scope so that the tube is pointing due south. Your setting circles should now read a declination of -90 degrees.
 - The RA setting is of no importance for this exercise, however ensure that the OTA (optical tube assembly) arms of the scope are level.
-

Finder Scope Adjustments

Your wedge should allow you to make fine adjustments in azimuth. Loosen the screws that attach the wedge to the tripod mount so that you can make certain fine azimuth adjustments. You will also be making fine declination adjustments, but this is easily achieved with the declination adjuster knob.

Look through the finder scope. Once again, you are looking for the *Chinese Hat* and *Little Corona*. They should be in the same field of view (as in an 8x50 or similar finder scope). Refer again to **Chart B**. Bear in mind that their orientation will be reversed in comparison with the binocular view.

Chart C is a more detailed view for a dark observing site.

You can now see the goal point – the drill hole of the SCP. Draw an imaginary line up from *sigma Octantis*, also marked as *Polaris Australis* on **Chart C**, towards the star marked BQ in *Little Corona*. BQ forms a perfect right-angled triangle with two other stars of similar brightness in close proximity. On Chart C and D, they are marked CQ and DQ. The three stars in the triangle are magnitude 6.6, 7.8 and 9.7 respectively. Align the cross hairs of your finder scope on that region of *Little Corona*.

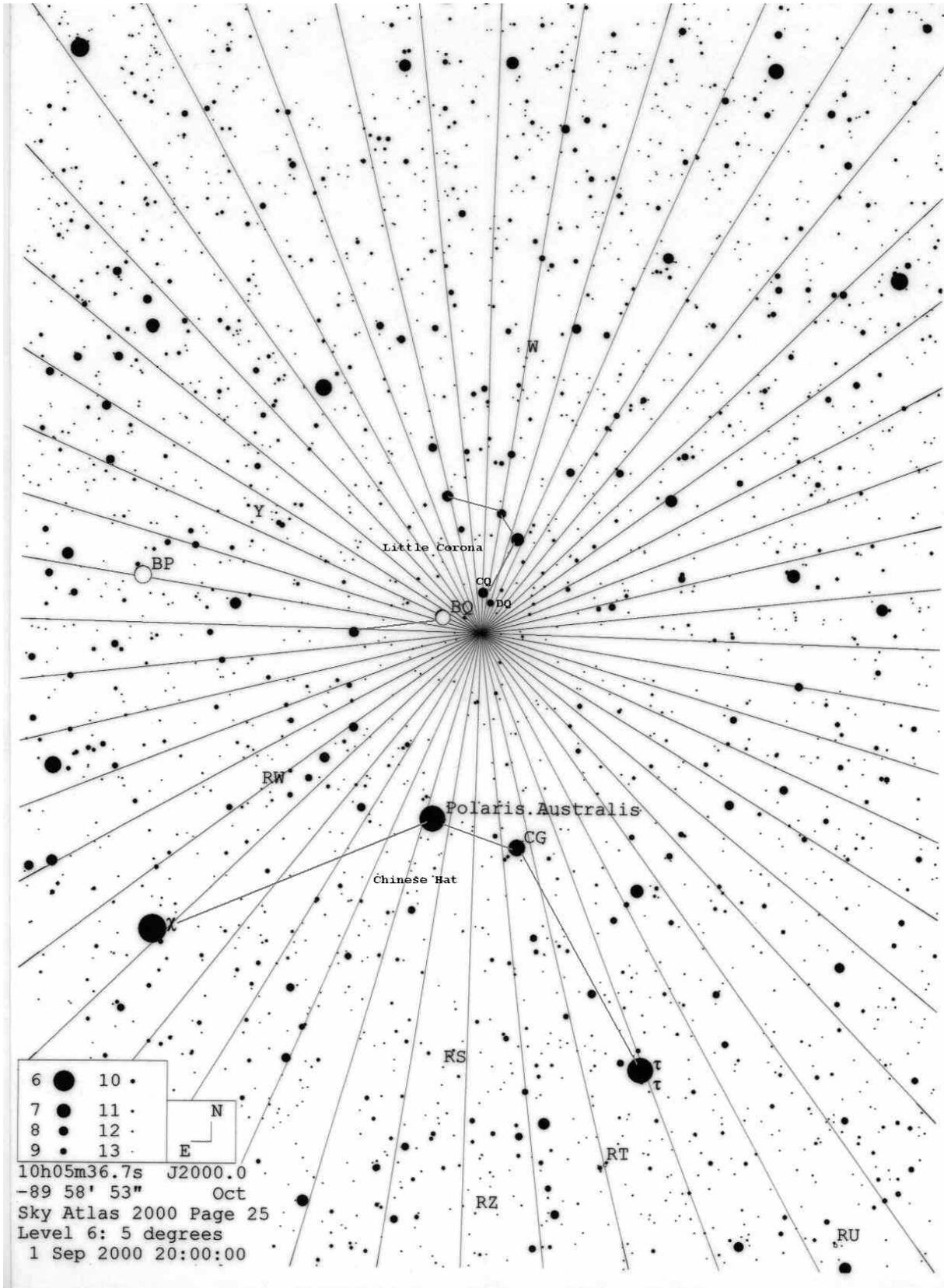


Chart B, Octans in the region of sigma Octantis, 5° FOV,

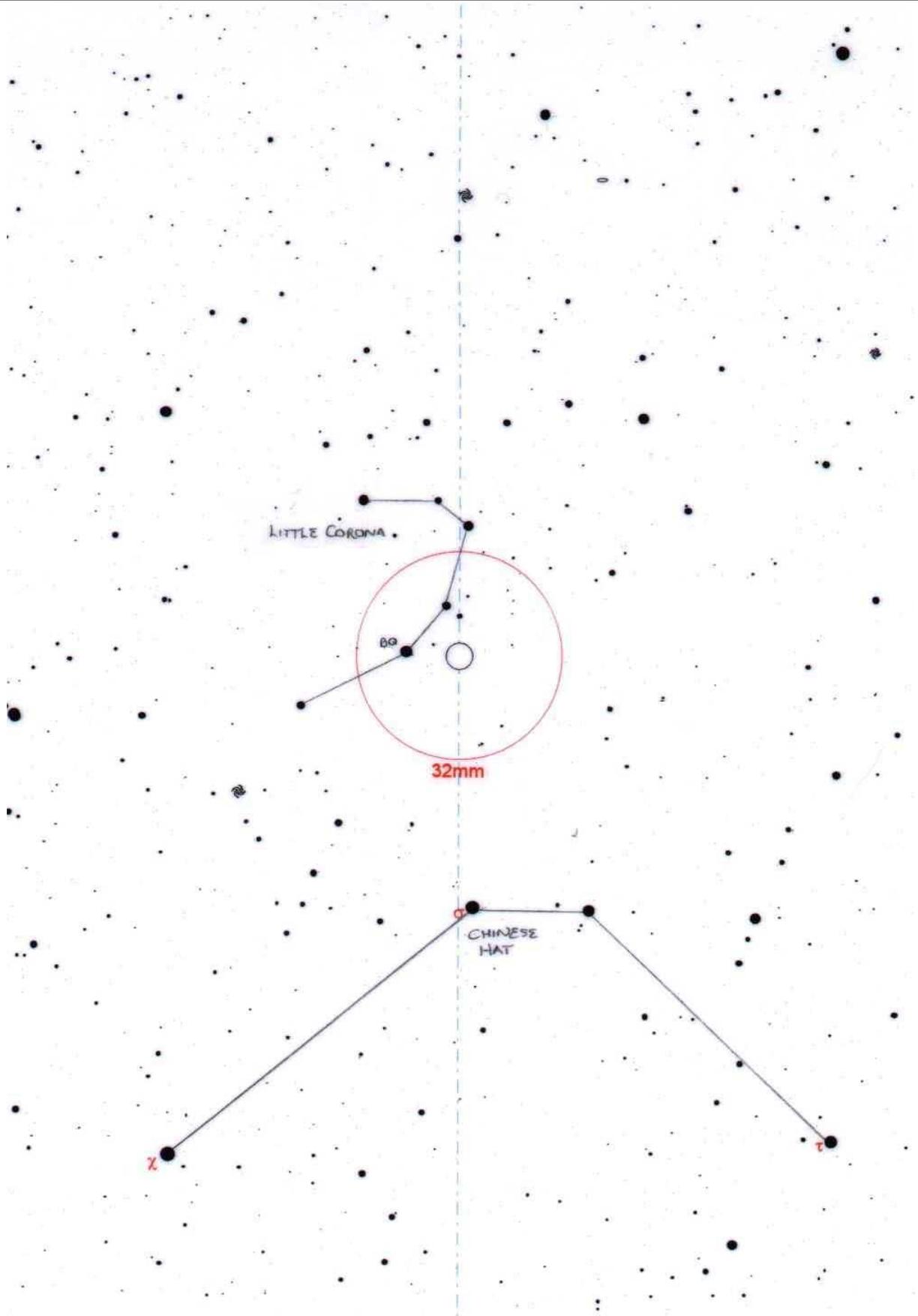


Chart C, Octans in the region of sigma Octantis, 5° FOV,

Micro-adjustments in a low-magnification eyepiece

It is the right-angled triangle of BQ, CQ and DQ that is the target field of view in your lowest magnification eyepiece. I use a 32mm wide angle (78x) for this purpose. I suggest no higher than 100x magnification (50 – 80x is ideal).

Refer to **Chart D**.

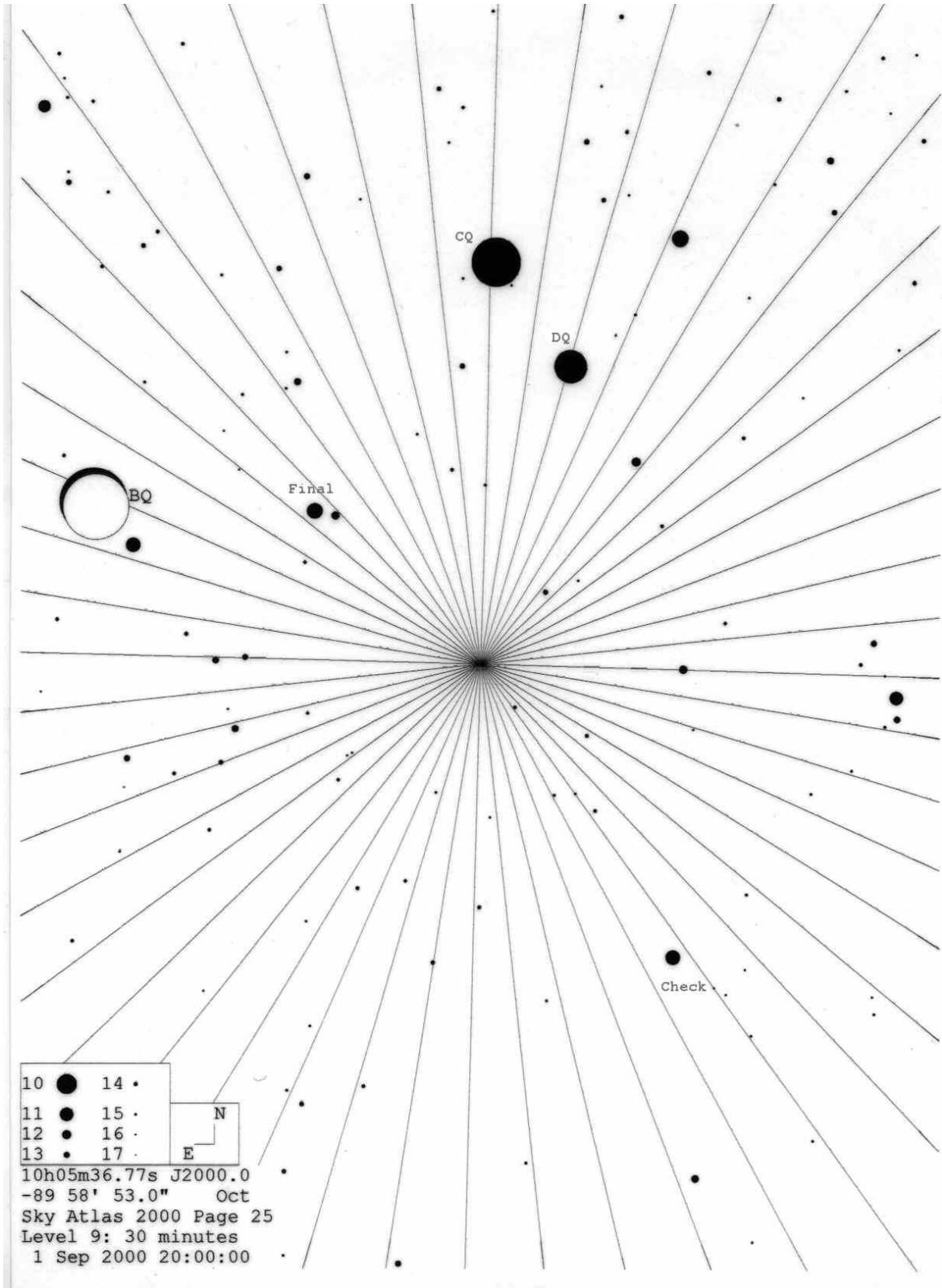


Chart D, 30 Minutes FOV,

Chart D has a field of view of 30 arc minutes. Make sure you have the right-angled triangle in the field of view. Now, on the hypotenuse, there are two close faint stars that I have collectively marked *Final*. They are faint at magnitude 11 but I can see them, even from a heavily light polluted Randburg. Now, form a perfect isosceles triangle with DQ as the apex. The star labeled *Final* and the SCP form the base of the triangle. As a confirmation and final check, there is another star I have marked *Check* (12th magnitude). The SCP lies precisely at 30% of the distance from *Final* to *Check*. Centre the SCP in your eyepiece.

Reconfirm that your scope is still level then tighten all wedge and tripod adjustment bolts. You have a perfect SCP alignment. All that remains is to calibrate your setting circles.

Directly after alignment, confirm that the declination circle reads -90°. Switch on the tracking motor and find a bright star of known co-ordinates in the eyepiece. Set the RA circle to the correct co-ordinate and confirm the declination on the declination circles.

Devote an observing evening to this exercise and practice it. The entire exercise from start to finish will eventually take you only 5 – 10 minutes.

As a test one evening, I placed the barred spiral galaxy M83 in the eyepiece and left the tracking motor running. When I returned 90 minutes later, M83 remained perfectly centred.

Acknowledgements

With special thanks and appreciation to Dino Fotinidis

Questions and Suggestions

E-mail your questions or ideas to Dave Gordon at skyowls@hotmail.com

30,000 NEW MARS IMAGES ARE NOW AVAILABLE ON THE WEB

Subject: 30,000 new Mars images are now on web
From: JPLNews@jpl.nasa.gov

The imaging team of NASA's Mars Global Surveyor spacecraft has doubled the number of Mars pictures available to the public with the release of a new archive of red planet pictures totalling slightly more than 30,000 images.

The archive contains all the pictures that were taken by Mars Global Surveyor from September 1999 through February 2000 and includes the images that were taken to search for the Mars Polar Lander spacecraft. No evidence of the lander was ever seen. The archive also covers the period of south polar cap retreat through southern spring and into early summer. This includes changes observed on the south polar cap's "Swiss cheese" surfaces, among others.

The full gallery of 30,000 images is available at

http://www.msss.com/moc_gallery/ , <http://mars.jpl.nasa.gov/mgs> .

A sample of images is available at

http://www.msss.com/mars_images/moc/oct_2000_sampler/

<http://mars.jpl.nasa.gov/mgs> .

Mars Global Surveyor was launched on November 7, 1996 and entered orbit around Mars on September 12, 1997. The spacecraft has been systematically mapping the red planet since March 1999.

Mars Global Surveyor is managed by the Jet Propulsion Laboratory for NASA's Office of Space Science, Washington, D.C. The camera system was built and is operated by Malin Space Science Systems, San Diego, Calif. JPL's industrial partner is Lockheed Martin Astronautics, Denver, Colo., which developed and operates the spacecraft. JPL is a division of the California Institute of Technology in Pasadena.

VARIABLE OF THE MONTH:

Mysterious "Disappearance" of Delta Velorum.

Recently, Paul Fieseler of NASA <fieseler@mail1.jpl.nasa.gov> wrote to David Dunham of IOTA reporting that Delta Velorum, one of the stars used to orient the Galileo Spacecraft, had unexpectedly vanished from the ken of the spacecraft's star scanner.

He writes as follows:

"Yes, we have clean data that shows the other stars in the field of view remaining steady during the time in question. There were no other spacecraft anomalies at the same time and Galileo took the star's apparent disappearance in stride. In the past when this has happened it is because we selected a known variable star - this looks like the same thing except Delta Velorum is not known to be variable - although an eclipsing binary is a possibility. A new and previously undiscovered operational mode of the star scanner is also a distinct possibility. The outage (where the star appeared to fall at least 0.2 in magnitude and thus "disappear") was from GMT 06:30 to 14:30 on June 19. At 14:30 the star re-appeared and took several more hours to regain full intensity. We were using this star for 20 days prior without incident. There is also an indication in our records that this same star may have disappeared in late 1989. We have not used it in between then and now so I have no more data.

Concerning your request to the occultation organizers and other folks in the Southern Hemisphere, I appreciate the effort and you may proceed. However, let me emphasize to all that my request for information springs from curiosity about the star itself. . .

Paul"

So here is an opportunity for amateurs who do not use telescopes or binoculars to do their bit for science. Delta is at the right hand end of the crosspiece of the False Cross and can be compared with the other three stars of the False Cross. Proceeding clockwise from Delta, they are: Epsilon Carinae, mag 2.0, Iota Carinae, mag 2.3 and kappa velorum, mag 2.5 Have a good critical look at every opportunity. Don't be fooled by atmospheric extinction when the False Cross is near the horizon. Report any anomaly to Brian Fraser, Jan Hers, Paul or myself. Even if all seems normal you should make a note of the estimated magnitude, date and time of the observation and report these to Jan Hers <janhers@pixie.co.za> at the end of the month. Those observers who eschew visual observations can use monitoring devices ranging from the cheap and simple to the most expensive state of the art systems to do the monitoring for them. Contact me for ideas. If we all make an effort then sooner or later somebody should catch Delta Velorum doing its thing!

Danie Overbeek

Footnote to "Variable of the Month" Article.

After the above was written, it transpired that Sebastian Otero of Argentina has suspected since 1997 that the star is an eclipsing binary and has been monitoring it without arriving at a final solution. The current idea is that the period is 5.88 days. Yesterday morning, when an eclipse was predicted, Raol Salvo of Montevideo and I made some observations under difficult conditions without reaching finality. We need as many people as possible to monitor the star as often as possible.

Convenient comparison stars are Gamma Velorum Mag 1.82, Epsilon Carinae Mag 1.95 and Kappa Velorum, Mag 2.48

Danie Overbeek

2000 10 16

The Sky this Month

November 2000

dd hh	dd hh
3 04 Moon at apogee	15 13 Mercury greatest elong. W(18)
3 14 Neptune 1.6 N of Moon	18 16 LAST QUARTER
4 08 FIRST QUARTER	19 12 Saturn at opposition
4 16 Uranus 1.8 N of Moon	21 18 Mars 4.2 S of Moon
7 19 Mercury stationary	24 12 Mercury 3.0 S of Moon
11 22 FULL MOON	26 00 NEW MOON
12 11 Saturn 1.8 N of Moon	28 02 Jupiter at opposition
13 04 Jupiter 2.5 N of Moon	29 19 Venus 2.0 S of Moon
14 06 Mercury greatest brilliancy	30 22 Neptune 1.9 N of Moon
15 01 Moon at perigee	

December 2000

dd hh	dd hh
1 00 Moon at apogee	18 01 LAST QUARTER
2 01 Uranus 2.2 N of Moon	20 07 Mars 4.3 S of Moon
4 04 FIRST QUARTER	21 13 Solstice
4 13 Pluto in conj. with Sun	23 21 Venus 1.4 S of Uranus
9 16 Mercury 4.7 N of Antares	25 18 NEW MOON <i>Eclipse</i>
9 18 Saturn 1.9 N of Moon	25 18 Mercury 2.7 S of Moon
10 08 Jupiter 2.8 N of Moon	25 18 Mercury in superior conjn.
11 01 Mars 3.7 N of Spica	28 07 Neptune 2.0 N of Moon
11 10 FULL MOON	28 16 Moon at apogee
11 20 Venus 2.6 S of Neptune	29 10 Uranus 2.3 N of Moon
13 00 Moon at perigee	29 22 Venus 1.8 N of Moon
13 01 Mercury 10.9 S of Pluto	

LOCAL TIMES of RISE and SET for the MAJOR PLANETS, 2000

Site Location:- Long. +28.0 deg. Lat. -26.0 deg.

Local Time:- UT +2.0 hrs.

Date	Sun		Mercury		Venus		Mars		Jupiter		Saturn	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
Nov 06	05.17	18.26	04.38	17.24	07.33	21.24	03.11	15.13	20.16	06.55	19.26	06.21
Nov 16	05.12	18.33	04.15	17.04	07.45	21.39	02.49	15.01	19.31	06.11	18.43	05.38
Nov 26	05.09	18.41	04.17	17.25	08.00	21.50	02.28	14.49	18.45	05.27	18.00	04.56
Dec 06	05.09	18.48	04.28	17.58	08.16	21.57	02.06	14.37	18.00	04.42	17.17	04.14
Dec 16	05.12	18.55	04.47	18.32	08.32	22.00	01.45	14.24	17.14	03.58	16.34	03.31
Dec 26	05.17	19.00	05.14	19.05	08.46	21.58	01.24	14.11	16.30	03.14	15.52	02.50