Urania

Astronomical Association of Southern Africa
Pretoria Centre

January 1991

WHATS UP DOC

From my home in Villieria I can on the most exceptional nights just make out faint glow of the Small and Large Megallanic clouds using averted vision. I will never forget one particular visit to the Kruger Park for the reason that from that location, despite unshielded lights around me and without any dark adaption both the clouds were so brightly luminous that it was impossible to miss them. Unfortunately I was in the park to attend a seminar and I was not able to drag my telescope along. The contrast between the views of the clouds as described above gives some indication of the advantage of a dark sky site over our normal viewing areas. Many of you with small telescopes will have been dissapointed at their performance on deep sky objects. When you have the opportunity to visit a truly dark sky location drag that telescope along and it will surprise you.

Our subject this month is these enigmatic clouds. From the small telescope point of view there is one attractive object in or near each cloud. Near the LMC is a fuzzy star which in the days of old was specified by Flamsteed as the 47th star of Tucana. This object turned out to be a globular cluster and today 47 Tuc is regarded as the second finest globular in the sky. One other globular which should be within the reach of a small telescope is also indicated on the chart. 47 Tuc, however, is the one to steal the show. In my eight inch it remains one of my favourite objects, a family of bright pinpricks which is hard to beat. It is not in fact part of the SMC but is one of our galaxy's globular clusters which is merely located in the same direction as the SMC. The SMC itself is an irregular galaxy which seems to be in orbit around the our galaxy at a distance of about 200 000 light years. If you can see the SMC consider that the light left those stars 200 000 years ago.

Inside the LMC is the Tarantula Nebula. This is the greatest single nebular complex we can observe anywhere in the sky. From a dark site it is a naked eye object despite the fact that it is some 180 000 light years away. If it were as close as the Orion Nebula it would extend over some 30 degrees of sky and would be bright enough to cast shadows on earth. Through any telescope the Tarantula is impressive. Try to also make out some of the fainter nebulous patches surrounding the Tarantula. With my eight inch there are a number of other objects in the clouds which can be seen. Try it and let me know what you see. If there is anybody

with a detailed map of the LMC I would very much appreciate a copy of it. The maps I have do not show enough detail for me to identify every object that I can make out in the cloud.

ASTROPHOTOGRAPHY SERIES

This will be the final part of the astrophotography series as such although future articles will touch on the subject. We will be looking briefly at problems associated with developing of films as well as the enhancement of images.

As far as films go colour slide film is the first choice of astro-photographers. Normal colour print film has two major disadvantages which detract from its usefulness in this field. Firstly, after developing the negative it has to be printed and the machines which do almost all of the printing these days just cannot cope with what to them is an incorrectly exposed negative. You can of course request that printing be done by hand but even that does not guarantee good results and adds significantly to the cost. Cost of course is the other major problem with colour print film. Although the film itself is slightly cheaper than colour slide film, the developing costs are much greater. My answer to the problem lies in using colour slide film and developing it myself. Did I hear someone whisper "Yes but you have a darkroom". Well, no I don't and I don't need one. Light tight developing tanks are available at most large photographic stores for about R50,00. The chemicals you require for the E6 process (which applies to almost all colour slide film) are available in packs but here a word of warning. By far the best chemical pack in my opinion is the Agfachrome 5 bath set (the film goes through 5 chemical baths) but it is very expensive and in fact works out more than just having the store develop the film. I tried various other (not very satisfactory) chemical packs and finally discovered the Chrome Six three bath pack. This not only gives excellent results, but is also one of the most economical sets. The Chrome Six pack costs about R76,00 and can develop 16 films. This works out at less than R5,00 per film which is much less than a photographic shop would ask. The problem with chemicals is that once a batch is prepared, it does not last for very long. You must therefore ensure that you have enough films available for development to use the chemicals to their full capacity before they expire from old age. You mix batches of chemicals that can do four films and once mixed these last about two weeks. The original concentrates which you use to mix the batches last much longer (up to six months). This results in my astrophotography taking place in great bursts of exposures over a two week period with long empty pauses in between. The development process is quite simple. Firstly put the film inside the development tank. This is done in the dark and is quite tricky until you get the hang of it. I use a closet which is very dark if all the lights in the vicinity are turned off. Next warm your chemicals to the right temperature, usually 38 degrees C. I use a large tupper bath which I fill with water at 42 degrees C. The temperature is monitored with an ordinary thermometer and is maintained by periodically adding warm water.

beskyrfdes ooreenstem nie. Skrywer kan die beeld nie uitwerk nie. Is daar 'n leser wat kan help?

Hoe om pols of pinkie kaarte te maak: Sit 'n transparant in die papier laai van 'n fotostaat masjien. Maak 'n fotostaat van die kaart op die transparant. Draai die transparant om, sodat die geskryf agterstevoor is. Maak 'n fotostaat van die agterstevoor-transparant op papier.

W P UYS

Ek benader die probleem van orientasie van die beeld op 'n ander wyse. Eerstens skakel ek die aandrywing van die teleskoop af en neem waar watter kant van die beeld die sterre inkom. Onthou dat sterre met die draai van die aarde van oos na wes beweeg. Die sterre kom dan op die ooste kant van die beeld in en verlaat die beeld aan die weste kant. Nou beweeg ek die teleskoop noord en let op aan watter kant van die beeld die sterre inkom. Dit sal die noorde kant wees. Op hierdie wyse kan ek, afgesien van die aantal spieel- of lensvlakke myself orienteer. Op die ster kaarte is dit ook eenvoudig om die rigtings te bepaal en dus kan ek die beeld in die oogstuk (met so 'n bietjie drie-dimesionele dinkwerk) met die sterkaart vereenselwig. Ek verbeel my ek het die artikel waarna mnr Uys verwys in een van my tydskrifte gesien. Ek sal dit opspoor en 'n afdruk aan mnr Uys voorsien.

J W SWART

DID YOU KNOW :-

1. that Leonardo da Vinci (1452-1519) was the first person to suggest that the faint illumination of the "night-side" (i.e. the non-sunlit portion) of the moon was due to sunlight being reflected from the earth to the moon:- i.e. the phenomonen known as "Earthshine".

2. that the moon does not have an official name.

3. the first observation of "Bailys Beads" at a total solar eclipse was probably made by Edmond Halley in 1715. English astronomer Francis Baily described them in detail in 1836 after the May 15 eclipse of that year. The "beads" are caused by sunlight shining down lunar valleys when they and the mountains are seen in profile at the lunar limb.

4. the first time a total solar eclipse was shown on television was on February 15, 1961. Commentators in France (Hugh Butler), Italy (C A Ronan) and Yugoslavia (Patrick Moore) covered the event live. (I watched this programme. I seem to remember Patrick Moore stamping about on a snow covered mountainside watched by sundry cows!)

5. the editor is very pleased at having recieved contributions to Urania.

MICHAEL POLL (Actully Michael cannot claim credit for the last fascinating "did you know" since I inserted that bit. ED)

LETTERS TO THE EDITOR

Dear Sir,

In response to the Editorial in Urania (Oct 1990) I thought that perhaps someone should start the ball rolling in writing letters to the editor- perhaps it is appropriate that the Chairman should do so! I would like to appeal to members to support your Editor, Johan, in his efforts to produce an interesting journal by sending him contributions. As hard worked committee members of organisations similar to ours all over the world are always having to say "Its your journal and it depends on your contributions".

Meanwhile, thank you Mr editor for your hard work.

Yours faithfully

Michael Poll

DIE "VERLORE" TRANSFORMASIE

Onlangs het ek by mnr Hers (Sedgefield) navraag gedoen oor die meriete van AAVSO en Bateson-kaarte vir die waarneming van veranderlike sterre. Mnr Hers het nie geweet nie hoe om 'n gewone sterkaart te wysig vir gebruik by 'n elmboog teleskoop soos 'n Meade 2080. Hierdie artikel word derhalwe vir inligting, kommentaar en 'n versoek vir 'n bepaalde Sky & Telescope geskryf.

Dit is bekend dat 'n landmeter-teodoliet (en ook 'n teleskoop 'n "omgekeerde" beeld by die oogstuk lewer. In die geval van 'n teodoliet is dit bekend dat bakens, bome en berge op hulle koppe staan. By die verkyker met 'n "regop-lens" (erection lens) is dinge gewoon. Dit is verder bekend dat 'n onewe aantal weerkaatsings by prisma- of spieel-vlakke ook 'n omgekeerde beeld lewer, maar 'n ewe aantal weerkaatsings gee 'n korrekte beeld.

Die verband tussen die werklikheid en 'n omgekeerde beeld kan aangetoon word deur die polse van jou hande bymekaar te hou (soos in die Sanlam advertensie) en die hande agteroor te buig sodat hulle in een vlak le. Die linker-hand stel dan die werklikheid en die regter hand die omgekeerde beeld voor. ("Omgekeerde beeld" = pols posisie.)

By 'n elmboog-oogstuk kry 'n mens 'n "geblaaide" beeld. Kyk na jou hande, met pinkies langs mekaar en met palms na bo. Indien die linker hand die werklikheid voorstel, is die regterhand die "blaai-beeld". ("Blaai-beeld = pinkie posisie) Die omgekeerde-beeld soos hierbo kan na die blaai-beeld gewysig word bloot deur die beeld in sy vlak met 180 grade te roteer. (Wysig die pols-posisie van die hande na die pinkie-posisie).

By die elmboog-oogstuk word die wysiging so gedoen: Stel die teleskoop op die zenit, stel die elmboog in enige gerieflike posisie en neem waar. Noem hierdie posisie van die oogstuk die "omgekeerde" of pols-posisie. Roteer die elmboog nou deur 180 grade en neem weer waar. Dit is dan die "blaai" of pinkie posisie.

Versoek.

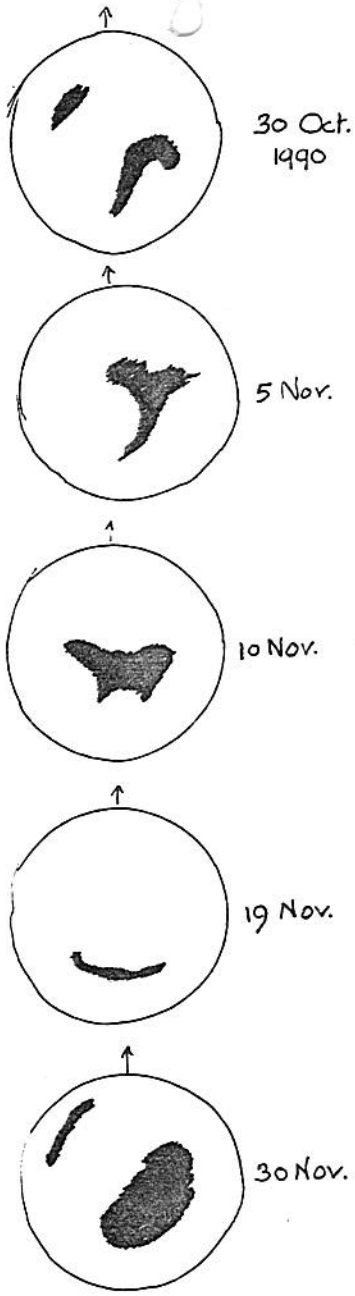
Alles wat hierbo beskryf is, is in 'n onlangse S&T beskryf. Volgens die gemelde S&T is 'n ander beeld ook moontlik, wat nie met enige van die

(Please buy your thermometer from a pharmacy. The same quality thermometer at a photographic store will cost you three times as much.) The developing tank and the chemicals are then placed in the warm water until heated to the correct temperature. Once the chemicals are warm the first lot (FIRST DEVELOPER) is poured into the developing tank through the light tight hole in the top. The film is agitated regularly for a period specified in the instructions and after the right time has passed it is poured back into its bottle. The film is then washed a number of times by pouring warm water into the tank, agitating the film and pouring it out. Similar procedures are then followed for the COLOUR DEVELOPER and the BLEACH FIX and may then be removed from the tank. There you have it, a milky white film which shows very little image. Be patient, the film must be hung up to dry before it can be evaluated. This is very briefly, what is involved in developing colour slide film. This article is intended only to give you an idea of what is involved instead of comprehensive instructions and I invite anybody who is interested in trying the process to contact me for further help and perhaps a demonstration or two. The main advantages of developing film yourself are that you save money, you can use special techniques to obtain a better image, you get to see the results of your efforts much more quickly and you can throw away the failures before some idiot asks you what they are meant to be. (This last one is quite important to me.)
Getting around to image enhancement, there are many techniques which can be applied. Perhaps the simplest is the technique which I use. A slide duplicator is a device which takes the place of a camera lens. A good one will cost about R250,00. A slide is placed in the duplicator and is re-photographed on a slower but higher contrast film. The resulting image is much better than the original in terms of colour saturation and image density although there is some slight loss of definition. This is how to go about it. Firstly select the slides you want to enhance. Load the camera with a colour slide film such as Fujichrome 200. Remove the camera lens and replace it with the slide duplicator and place the first slide in the duplicator. Since astronomical photos are largely black sky, you need a very bright daylight-balanced light source (since you are using daylight-balanced film a tungsten or similar light source will result in odd colours). The strongest and cheapest daylight-balanced light source on the market is the Sun. Point the camera about 30 degrees away from the sun and you should see enough of the image to compose the shot. The slide duplicator makes provision for moving and rotating the slide to obtain the optimum picture and some models also allow you to magnify the image. Since your camera's exposure meter will probably not be sensitive enough to suggest an exposure you have to estimate one. I usually take a series of exposures from about 1/60 of a second to about one second, each time doubling the exposure. With the exposure latitude of a good film I often then have two good copies. After re-photographing your choice of slides simply develop the film normally and you will be surprised by the results. This technique can also be used to rectify colour balance problems caused by

eciprocity failure during the riginal exposure. Here the correct olour filters are placed in the slide uplicator together with the slide. ust obtaining a full set of the orrect colour filters is difficult nough and this would be only for ne more advanced strophotographer. (I still have not een able to get a complete set of hese so-called CC filters). Another echnique which I have used is to lace two rather poor original slides n register (properly aligned) in the lide duplicator. The copied image vas much better than either of the riginals. A slide duplicator allows rou great leeway to play with your mages and together with a eveloping kit, provides you with an dequate mini-darkroom that will urprise you at how effective it can e. You can in fact use it with ormal colour print and other pecialised films as well. Once again he description of the techniques nentioned are quite brief and again invite anybody interested in trying hem to give me a call.
Keep on snapping the sky and perhaps one of these days we can ave another slide viewing evening.

J W Swart

The following drawings of Mars were submitted by Dr Voogt. How do they compare with your views. I must say that I am quite impressed considering that his Shiefspiegler has an aperture of less than half of my eight inch Newtonian.



EDITORIAL

This month we consider telescope quality and astronomers guilt. Astronomy is one of those fields where high quality equipment is an absolute necessity. While an amateur philatelist, gemmologist or photographer can make do with a poor quality album, hammer or camera, an astronomer can do quite little with an inferior telsecope. Although a pair of binoculars can be used for astronomy, it eventually becomes rather like the mustard without the meal, your scope (parden the pun) is quite limited. In order to really study the sky in all its glories we require the largest and best quality telescope possible. Here we are at the mercy of economic realities, however. We pay and pay dearly for what eventually turns out to be only mediocre quality. If you were to buy a complete mass produced telesope you would find the optics not quite perfect, the mount shaky and the drive too inaccurate for applications such as photography or photometry. We have to accept that the mass production market cannot produce telescopes of the highest quality at low prices. Oddly enough, all the knowledge to construct a telescope is available and we even have a large amount of telescope making experience spread around amongst the members of ASSA. Not too long ago the construction of your own telescope was almost a pre-requisite to becoming an amateur astronomer and those people did it without the benefit of the store of knowledge and techniques now available. Are we not possibly forgetting an important part of the amateur astronomers heritige. Should we not make an effort to keep the art of telescope making alive. Apart from the money that can be saved, we can with a little effort produce better quality than those well known mass producers.

The second item on the agenda, astronomers guilt, may require some explanation. Perhaps the best way to clarify the subject is to cite my own case. On 11 November 1990 I suddenly realised that I could not recall when I had last done any observing or had even been inside my dome. Looking at my records revealed that for some three weeks I had been a lazy astronomer. (It is true though that we had had quite a few cloudy nights during that period.) At this point I started to suffer from astronomers guilt and decided there and then that I would have to do some observing that night. I started off with 47 Tuc and spent the next hour wandering around the SMC. Do you know what I discovered? Even though I have seen 47 Tuc before on many occasions, the awe and wonder which its myriad star images generated was as strong as the first time I saw it. The SMC gave me another surpise. While looking for one of the other globular clusters near it I discovered two small and faintly nebulous clusters in the SMC which to my recollection and according to my notes I have never seen before. I eventually concluded that astronomers guilt was not justified. There is no doubt that once in a while a good break does no harm and by contrast the sense of reverence which the next observing session generates gives your dedication to the hobby a new impetus.
