Urania

Astronomy Society of Southern Africa.

March 1991

Whats up Doc

This month lets look at a couple of clusters. Firstly NGC2168 (M35) and NGC2158 in Gemini. M35 is an easy object showing 120 stars from Mag 9 down. The cluster should be easy in even small telescopes but larger apertures show more of the stars which appear to be arranged in arcs and loops. NGC2158, however, is a challange. It is located half a degree south-west of M35 and clock in at 12th magnitude.

M41 in Canis Major is an easy bright object. Neville Young has a soft spot for this cluster since it was one of the first that he saw. It is bright and is located 4 degrees south of Sirius. The cluster also shows chains and arcs of stars and I have always wondered if this effect which occurs in so many clusters is part of the cluster dynamics or if it is an observational artifact.

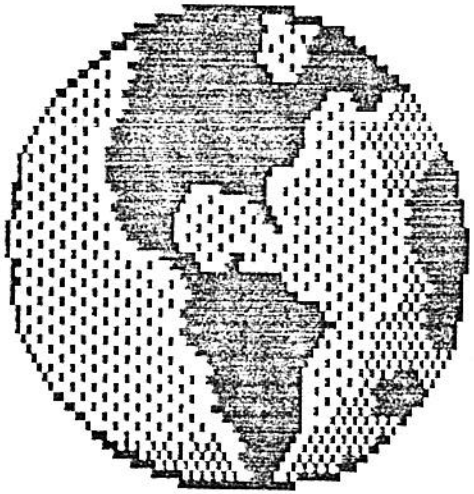
NGC2437 (M46) and NGC2422 (M47) are located close together some 10 degrees east of Sirius. M47 is the brighter of the two and is really a spectacular object. M46, however, has an appeal of its own since a faint planetary nebula (Mag 11) is located within its boundaries. The nebula lies between us and the cluster and is not associated with it. A four inch should show the nebula as a faintly glowing disk in the cluster. It is an easy object in an 8 inch.

TELESCOPE BUILDING

Although this series of articles is really intended to give some help in building a telescope mounting, it is necessary first to build the telescope itself and to consider certain requirements concering the tube. Firstly the telescope tube especially for a newtonian or a refractor needs to be rigid enough not to allow movement between objective and eyepiece. The optical axis must run down the centre of the tube. Any deviation which occurs between the axis of the tube and the optical axis will make setting circles useless and will probably affect climation so badly that the telescope will not perform at its best.

When working with a tube there are always two problems to overcome. The first is how to draw a straight line exactly down the length of the tube. This line would for instance be required when mounting the tube to the declination axis. This is an easy problem to sole. Find a piece of agnle iron with sides of about one quarter of the tube diameter. If the angle iron is then pressed against the tube in the following fashion <o, it will align itself with the tube length and its edge can be used to mark the line.

The same angle iron also helps you to cut the end of the tube square. If one end of the angle iron is itself cut square, it can be placed against the tube and the two places where the square corners rest against the tube can be marked. These marks are then used as reference points and the angle iron is aligned with them in such a manner that more reference points can be drawn. By the time you have gone all around the tube you will have enough reference marks to make it easy to cut the tube squarely. If once you have gone around the tube your start and end marks do not align, then the angle iron is not cut squarely.



THE RUNAWAY STARS

Surrounding the Orion Nebula are three very peculiar stars. 53 Arietis, Mu Columbae and AE Aurigae are three stars which are "running away" from the orion area at a velocity which is difficult to explain. AE Aurigae has run into a patch of gas and dust and is now lighting up what is known as the Flaming star Nebula. The star will however leave this gas behind in due course and the nebula will fade. Only one theory seems to fit the speed at which the stars are moving. Normal movements of stars relative to one another are relatively slow and high speeds only really occur in close binary orbits. SInce orion is a region where new massive stars are forming, buring out and exploding, it is possible that these stars were all close binaries in the orion nebular complex but that their companions exploded and they were released from the close orbit at high velocity. Recently I read about a fourth star which seems to have suffered a similar fate and which is known as Gliese something or other (sorry, I cannot find the reference to this star). Is this how clusters gradually disperse until they are no longer recognisable as a family of stars and can it be that the sun was once ejected from a cluster in a similar manner. The sun is moving at a "normal" velocity relative to other stars and it therefore seems more likely that a more gentle mechanism removed it from its cluster family. We cannot be sure though.

LETTER TO THE EDITOR

I received a letter from Lana Slabbert in which she expresses some very positive views about ASSA (and also Urania!). She states that she used to wonder-

"Where are all the other interested Astronomers?. My question was answered when I heard about the Astronomical Society of Southern Africa. I was very exited to become a member and I'm glad I did. I look forward to every months meeting and I find it very educating, interesting and I feel pleased to be among people who share the same hobby."

Thanks Lana for such a postive letter.

Lets here from more of you out there.

EDITORIAL

As I sit here typing the editorial there are only a few days to go before the GREAT DARK SKY WEEKEND. Looking out the window I can only hope that it does not become the Great Wet Sky Weekend. At any rate I have been working very hard to complete my new German equatorial mounting in time. Testing it last night was disasterous and everything which could go wrong did. Nevertheless, I hope that I exhausted the mountings bad luck last night and that it will be ready and working in time. Now what is the purpose of such a weekend. There really is no single purpose. We are going in order to do some deep and dark sky observing. We are also going in order to have some fun, to learn some astronomy, to socialise with our friends, etc, etc. The point is that we are going to do that which we wish to do. You do not have to bring along a giant 24 inch reflector in order to be welcome. There are only three requirements which qualify you to take part in any of the Society's events. Firstly, be interested in astronomy, secondly become a member and lastly, come and take part in the events which are arranged. From monthly meetings to practical sessions to GDSW (See if you can figure this out) you are all welcome to take part. I sometimes get the impression that many members regard the practical sessions as only attendance by the "inner circ There is no inner circle and so t opinion must be wrong. Lets more members attending functions.

ED.

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thinking, the more quickly we can establish self-sufficient habitats elsewhere in space, the more certain the survival of man becomes. We are all to likely to destroy this planet of ours and I will be glad to see some remnant of the human race safe and secure in a number of other places to safeguard against our extinction.

I will be pleased to receive your opinions in this regard.

J W Swart

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Relativity for real.

Relativity really messed it all up. Here I am sitting in a chair with basically only my fingers moving. For all practical purposes I am not moving at all, right? No shout the well informed. I am moving at thousands of kilometers per hour if the Earths orbital velocity and rotation rate are considered. I am really moving!

As if this is not bad enough, consider that you are surrounded in every direction by quasars moving at virtually the speed of light. Relative to them, we are moving at a large percentage of the speed of light. Consider also what happens as your velocity approaches the speed of light? Your mass increases until it becomes infinite, you become thinner in your direction of travel until ultimately you are no more than a wave front and lastly, time slows down.

Now consider whether your situation agrees with the predictions of the theory of relativity. I am certainly not an overweight, scrawny slowcoach. Come to think of it though I have seen some meetings and other work related events where time does indeed slow down by an exceptionally large factor. Ok, so relativity scores one out of three.

Nothing can go faster than the speed of light, right?. But the further an astronomical object is from us, the faster it recedes as a result of the expansion of the universe. One quasar is so placed that it is receding at .9c (.9 of the speed of light), its neighbour further out is receding at c itself. What about the next one further out. If it cannot move faster than the speed of light, it cannot be further out. If it is further out then it must be moving faster than c. Even the quasar moving at c presents problems, if it is moving at c, its light can never reach us. There is a word for such a boundary where light cannot pass, it is called an event horizon.

Event horizons occur around every black hole and are in fact the reason why they are black - no light can get out. Are we then living in a black hole?

One of the features of a Black hole is that things fall into it and disappear. Well, my salary does that with great regularity every month. Chalk up one more point for relativity.

One further feature of a Black Hole is that it can rotate. I can verify that after writing this article, my universe is spinning in a most dizzy fashion, and that must be the final proof of relativity. I am now a firm believer in Einstein's theories, but I'm afraid that I'll never understand them.

One more thing, if you think this contribution is all rubbish you are probably right but remember, its all relative.

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Michael Poll recently gave a most interesting talk about the possibilities of life arising in the universe. Shortly thereafter, Lana Slabbert came across the following lines of verse concerning the same issue and submitted them for inclusion in Urania. Thanks Lana, I think this is the best contribution ever made to Urania.

The Right Stuff
Michael Burnett

We need a star that's fairly bright;
(Not to dark nor yet too light)
Not too big or brilliant blue;
Not too red or feeble too.
We need one most that's by itself;
(Did fate leave our sun on the shelf?)
Doubles and triples just won't do;
They make their planets go askew;
One day's too cold, the next too hot,
Life's prospects there aren't worth a lot.
Our ideal, then, is 'medium yellow'
(And certainly a single fellow).

A planet next, and fairly small,
One too big won't do at all;
For ones too big have forces that
Will tend too make things rather flat.
Yet one too small's no good, I fear,
'Cos it can't hold no atmosphere;
So, like its star, its girth should fall
Between the extreme and the small.
Next it needs an orbit so's
It won't get burnt and won't get froze.
And if all this seems quite enough
Its make up needs the 'proper stuff'.

Our nice round world, with gentle spin,
Needs atmosphere that's fairly thin.
It needs above all this, for sure,
An ozone layer to shut the door
On tissue-rending Ultra-V
And then, below this too, some sea.
(It needs the sea, for life depends
On water, water without end.)
Clouds-then lightning-strikes the placid
Sleep of that amino acid.
Now, wait four thousand million years-
And lo! Old Patrick Moore appears!

And now the serious stuff

Contributions please. At the last committee meeting it was decided that Urania will not be published monthly. Urania will appear as regularly as contributions permit. If you enjoy receiving Urania, then the more contributions you submit, the more often it will appear. The fact that it is not going to appear monthly creates certain problems in that predictions of worthwhile events become difficult. Mauritz Geyser, for example can calculate and provide data regarding the observation of satellites for a month in advance but it pointless including this information after the event. The point I wish to make is that Urania can be better if we can publish it regularly. The way to ensure that is to provide contributions. I only need two or three per month to make Urania really worthwhile! So please get busy and jot down a letter, a comment, an article or whatever and send it me at 696 27th Avenue, Villieria, 0186 or give it to me at a monthly meeting. You can even send it by modem to telephone number 705557.

The purpose of space exploration

Many reasons can be advanced in support or in criticism of the efforts to explore space. Those against it usually base their arguments on the "waste of money which could have been better employed helping the starving millions". In my opinion this is a silly argument. If all the money spent on space exploration was handed over to the poor of the planet, it would hardly make a dent. There would still be starving millions. The benefits in technological development that have arisen from research regarding the space program, have helped better the lot of mankind to a much greater extent than could have been achieved by merely buying food for the poor. The space program represents money which is well invested.

These are not, however, the important factors, as far as I am concerned. There are two much stronger arguments in support of space exploration. Firstly, the more we know about planets and how they form and evolve, the more safely we can employ Earth's resources without making it uninhabitable. And secondly, and far more important to my