THE Prairie Astronomer

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GLOBULAR CLUSTERS?

10-85

One of my favorite sights in the sky is still a globular cluster, and of those perhaps M13 or the double cluster in Persius sticks out. But as much as I enjoy moving my telescope in search of the globulars, when someone asks 'what is a globular cluster, anyway?' , I always seem to fall quite short in my answer. Well, for those of you who fall into the same quandary as I, this month and next we will concern ourselves with a short review of globular clusters.

Most of you know globulars to be small fuzzy patches of light as seen by the naked eye or in small binoculars. The ancients saw them in the same way, but of course thought of them as only faint stars. Messier was the first stargazer to actually notice globulars in a serious sense, but here again his only interest was to note them as being some fuzzy patch other than a comet. It wasn't until William Herschel came along a several decades later and studied M13 (the Great Cluster in Hercules), that someone noticed these patches were actually made up of thousands of stars. Herschel counted the stars of M13 that he could see in his telescope and came up with 30,000 stars. Since then we have discovered that the number of stars in M13 and many other globulars is something more like 100,000 to 1,000,000!

I suppose you could ask now, WHAT'S THE BIG DEAL? Globular clusters are nice to look at, but who really cares? Well, it so happens that from about the early 1800's to the 1930's, globular clusters were used in developing the scale and distances we use in determining the size of our galaxy, The Milky Way. You can look back into recorded history and easily see the major questions that our sky gazing forefathers contemplated. How big is the universe, Are we at the center, How far away are the stars, etc., etc., etc.. Books have been (and are being written) about topics such as these, and I'm not even going to try to touch on the evolution of our thinking about such matters. But needless to say, the question of how the universe, and especially our local group of stars were put together was a major puzzlement.

John Herschel (1792-1871), son of the famous William Herschel and quite a good astronomer in his own right, noticed that the globular clusters that could be seen were not distributed evenly across the sky. He noticed that almost all of them were in one hemisphere of the sky, and that an entire 1/3 of them were in the single constellation of Sagittaruis... only 2% of the total sky! Well, John was not too be fooled by this and concluded that this was no accident, but rather had some great significance!

This significance eluded astronomers for more than a century, mainly because the exact position of globular clusters could not be determined using the old parallax method. They were just too far away. It wasn't until the 20th century, 1912 to be exact, that a lady named Swan Leavitt began locating and studying a group of variable stars called Cepheid Variables, and began the chain that ended with the discovery of how to measure great distances. Studying the variables from her Harvard supported observatory in Arequipa, Peru, Swan applied the already known luminosity-period relationship of Cepheids to relative distances and produced a scale plot of the galaxy. (The whole rationale and history behind these relationships would make a great newsletter article, hint, hint). (CONT. PG 2)

It was Harlow Shapley (1885-1972) that came along and finally applied the Cepheid scale of distance to the globular clusters. By using Cepheid variables that were actually a part of the clusters, he determined that the globular clusters marked out a large sphere with it's center toward the constellation of Sagittaruis. The whole ball of clusters seemed to take up just a small part of the sky. Why? Shapley supposed that the clusters were centered about the center of our galaxy, just as the planets of our solar system are grouped about our massive sun (see fig. 1). If this was so, then our view of the universe put us out toward the edge of the galaxy, rather than at the center as was previously supposed. And, by finding the distance to globular clusters, we were finding the distance to the center of the galaxy!

But there were still lots of problems. We still didn't know the actually distance to the globulars since the scale using Cepheids was only that, a scale. We needed to know exactly how far away these clusters really were.

Well, between the years of 1842 and 1930 lots of great people got into the act. Christian Johan Doppler(1803-1853), William Herschel, Armand Fizeau(1819-1896), Ejnar Hertzsprung(1873-1967), Robert Trumpler(1886-1956), were just a few of greats that helped us finally to determine the actual distance to the Cepheids, and therefore to the globular clusters. By the early 1930's we finally had a size representation of the galaxy (see fig. 2).

Now if you'll notice how globular clusters fit into the above discussion, you will see that by determining how far away globulars were, we discovered how far it was to the center of the galaxy. Pretty neat! We today know that globular clusters form a large sphere around the center of the Milky Way, with the sphere having a diameter of about 100,000 light years. We also have catalogued 131 globulars, but assume there to be about 100 or so more that we can't view from Earth. So, we know quite a bit. But I haven't really said much about globulars other than who first saw them, where they are, and how they were used. Just WHY are they there in the first place? I'll leave that until next month...

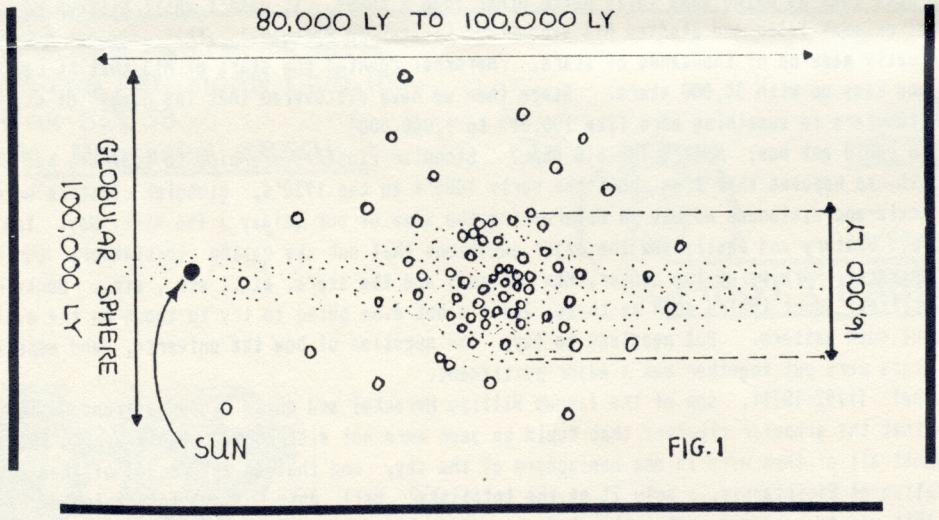
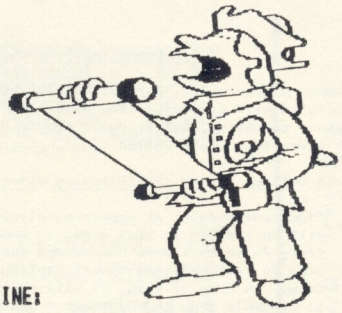


FIG. 1

The Prairie Astronomer is published monthly by the Prairie Astronomy Club and is free to all club members. Membership expiration date is always listed in the right corner of the newsletter mailing label. Address all membership renewals to: PRAIRIE ASTRONOMY CLUB, INC., P.O. BOX 80553, LINCOLN, NE 68501.

For further club membership information or suggestions contact one of the following: John Lortz (Pres.) 572-1451(Omaha), Ron Veys (V.Pres) 464-1449, Bev Hetzel (Sec.) 435-7881, Lee Thomas (Tres.) 483-5639, or Andy Corkill (Prgm. Chair.) 488-1096. All articles for the newsletter should be sent to newsletter editor, JOHN LORTZ ~~3319 MAPLEWOOD BLVD. #41, OMAHA, NE 68134~~, no later than 10 days before each club meeting date.

TREASURER'S REPORT



ABOUT TELESCOPE MAKING MAGAZINE:

Astromedia says that the last issue of Telescope Making to be published was #25. The editor of that august publication, which apparently comes out only when said editor gets around to editing, informs us that the next issue should be mailed to subscribers "any day now."

We have every reason to believe that all members who have indicated that they subscribed are actually on the mailing list, although they apparently are not all coded as club subscribers. We will want to keep in touch with this problem, so when somebody receives issue #26, let's make sure everybody who is supposed to gets it as well.

Obviously, since most of our subscribers have received only one issue on their 4-issue subscriptions, renewals are not necessary at this time (!) Astromedia sent sufficient numbers of issue #25 for all subscribers to get one. I'll have them at the meeting. Leftovers may be perused by other interested non-subscribers.

ABOUT ASTRONOMY MAGAZINE:

All members who indicated at the last meeting that they wanted Astronomy subscriptions have been signed up. Payments have been received from all but the following members:

Rick Johnson
John Lortz
Scott McMaster

As you may know, a substantial portion of our operating capital has been shifted to an interest-bearing account, so we ask that, when purchases are made, payments be made quickly to minimize a drain on the checking account.

The following members are listed as having current Astronomy subscriptions, but we were unable to reach them because we have no telephone number on file:

Roger Grant
Marc Cherry

If these individual wish to renew, **they must let me know at, or by the next meeting,** at which payment must be received.

ABOUT SKY & TELESCOPE:

Apparently, Sky & Tel failed to correctly enter a check mailed way back last January, which affected four members, none of whom received any issues of the magazine after that. Sky Publishing has rectified the matter by sending each of those members the last 6 months of back issues, and giving them a full years' subscription starting with the next issue. (If you are one of the members in question, and have not yet received the back issues, let me know.)

This situation could have been rectified much faster had we known sooner. Please keep an eye on your magazine address labels. If you renew in advance of termination date and you don't see a change in expiration date on the label, or your subscription stops, **let me know immediately.** To guard against lapses renew your membership when you get your first notice from Sky & Tel. Don't wait. It takes 6-8 weeks to process everything. Don't squawk if you renew at the September meeting on a membership that ends in September--you probably won't get either the October or November issues of Sky & Tel.

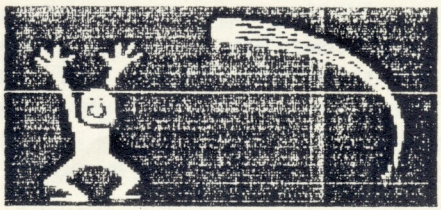
ABOUT DEEP SKY MAGAZINE:

Having (apparently) resolved all of the above problems, we can now embark upon New Business, to wit: it is time to re-up for Deep Sky magazine.

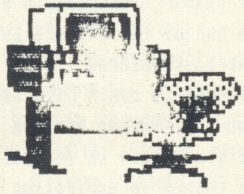
The price has gone up: it's now $7.00 for 4 issues.

The following members presently subscribe. (Asterisks indicate that you signified intention to renew at the last meeting.) We need a minimum of five subscribers. Please come prepared to ante up the funds.

Andy Corkill
Norma Coufal
Russ Genzmer*
David Knisely
John B. Lortz
Ronald B. Veys*
Richard Johnson (New)*
Lee Thomas (New)*



FROM THE EDITOR



Please note that your Prairie Astronomer Newsletter Editor has changed his address. The new address to send all articles and comments to is...

JOHN LORTZ
9255 CADY AVE. #14
OMAHA, NE 68134
(402)390-9821

Comments concerning the newsletter made at the last meeting were relayed to the editor, and he will do his utmost to make the needed corrections. He would like to comment that any article(s) a club member would like to submit to the newsletter would be GREATLY APPRECIATED! Just think, an article submitted for the Prairie Astronomer is read by the THOUSANDS of Prairie Astronomy club newsletter subscribers...why, you'd be FAMOUS!!! Remember, deadlines for articles is 10 days before the next meeting (but if one was submitted a little late, I'm sure the editor wouldn't mind!).

A Communications Nightmare

A number of years ago, Dan Bellus illustrated the human problems associated with communications in a speech. His story dealt with a military situation, but it could easily be applied to any organization with several people involved.

A colonel issued the following order to his executive officer:

"Tomorrow evening at approximately 2000 hours Halley's Comet will be visible in this area, an event which occurs only once every 75 years. Have the troops fall out in the battalion area in fatigues, and I will explain this rare phenomenon to them. In case of rain, we will not be able to see anything, so assemble them in the theater and I will show them films of it."

Executive officer to company commander:

"By order of the Colonel, tomorrow at 2000 hours, Halley's Comet will appear above the battalion area. If it rains, fall the troops out in fatigues, then march to the theater where this rare phenomenon will take place, something which occurs only once every 75 years."

Company commander to lieutenant:

"By order of the Colonel be in fatigues at 2000 hours tomorrow evening, the phenomenal Halley's Comet will appear in the theater. In case of rain, in the battalion area, the Colonel will give another order, something which occurs once every 75 years.

This month's program is entitled, 'AN ASTRONOMY VACATION WITH RICK' and will feature member Rick Lapp who this summer visited 4 major observatories and numerous other sites. The PAC business meeting will for the most part be taken up with nominations for next years club officers. We hope to have a good number of nominations this year, and hope that YOU are interested in one of the offices. Remember, if you feel you would like to run for office, you can nominate yourself without feeling any guilt. Positions included for nomination are...

1. PRESIDENT
2. VICE-PRESIDENT
3. SECRETARY
4. TREASURER
5. PROGRAM CHAIRMAN

(the positions of observing chairman, recording secretary and newsletter editor are delegated by the president).

Deciding on club officers is an important part of any organization, so we hope you will make it to the meeting and give the club your input!!!

COMMITTEES

Two important committees were formed at the last PAC meeting...THE PAC OBSERVATORY COMMITTEE, and THE CLUB TELESCOPE CLEAN-UP COMMITTEE.

The Observatory Committee has already had a meeting and has included in this month's newsletter a page on which YOU THE MEMBER can put your comments. Please fill out this sheet. The committee plans on holding its meetings on a monthly basis, the Tuesday after the regular club meeting. ANYONE IS WELCOME TO ATTEND THESE MEETINGS! Those on the committee are:

Bryan Schaaf	477-3323
Ron Veys	464-1449
John Lortz	390-9821
Bev Hetzel	435-7881
Dave Knisely	223-3968
Rick Johnson	423-6726
Russ Genzmer	429-3484
Doc Manthey	489-3237
Steve Bornemeier	435-0007
John Glover	464-0163
Steve Kell	476-7816
Lee Thomas	483-5639
Andy Corkill	488-1096

The Club Scope Clean-up Committee consists of:

Brian Schaaf	477-3323
Bev Hetzel	435-7881
Rick Johnson	423-6726
Rick Lapp	474-5912
John Glover	464-0163
Andy Corkill	488-1096
Steve Kell	476-7816

Any questions or comments for these committees can be directed to the committee members listed above. Bryan Schaaf is chairman of each committee.

DONATION TO THE P.A.C.

A donation was recently made to the PAC. Dwayne Hutchenson has donated an assortment of astronomy related magazines including Sky & Tel, Astronomy, Star & Sky, etc. which he wishes to auction or sell in memory of Jess Williams. One suggestion for the use of the money raised through sale of these magazines is to use the money for the new club telescope and then dedicate the telescope in Jess' name. We will be auctioning the magazines in the near future at a club meeting.

NEXT MONTH'S NEWSLETTER

In next month's Prairie Astronomer you'll find the second part of this month's cover story on globular clusters. Continuing our search for Halley's Comet you will find the December star chart showing Halleys position in the sky, plus a listing of yet another computer program for finding the comet. And of course you'll find our regular features... the Observing Chairman's Report, Defining Astonomy,and the PAC Calender. It should be a good newsletter, so STAY TUNED!

DEFINING ASTRONOMY

SEYFERT GALAXY

A type of galaxy first investigated by Carl Seyfert in 1942. Seyfert galaxies are peculiar in having very bright compact nuclei within which gas appears to be moving at high speed as if some violent event had occurred or was taking place there. They are also quite strong infra-red and radio sources. About 1 % of all galaxies appear to be Seyferts, and it is not at all clear whether this implies that 1 % of galaxies are Seyferts for all of their lives, or that all galaxies become Seyferts for 1 % of their lifetimes as a part of an evolutionary process. Possibly the truth lies between these extremes.

Considerable attention is being devoted to Seyfert galaxies at the present time as there does appear to be some evidence of a possible evolutionary progression between Seyferts, Radio Galaxies, Quasars, and normal galaxies. Even our own Milky Way galaxy has strong radio and infra-red sources located in its nucleus.

(from Dictionary Of Astronomy by Iain Nicolson)

OBSERVING CHAIRMAN'S REPORT

by David Knisley

This month's star party will be Friday November 8th at Earl Moser's house in Hickman. This month promises much with the presence of Halley's comet, now easily seen in a four inch telescope. On the night of November 15-16 the comet will pass about two degrees south of the Pleiades with its expected magnitude at 7.5 and the 4 day moon low in the west. This is a must see for all of you with rich field instruments.

A good starting place for those of you with six inch or larger instruments is the fairly bright galaxy NGC 1023, located 1/2 degree south and 3 degrees west of Pi Persei. It shows as a lens shaped fuzzy patch of light with a brighter center and a faint tuft of light on the east end. Also in Perseus is the open cluster M 34, located 2 1/2 degrees due north of 12 Persei. It is a moderate sized group of about 80 stars 8th magnitude and fainter and should show up well in a 4 inch or larger telescope.

For those of you who like challenges, try NGC 891, a very faint edge-on spiral galaxy about three degrees east of Gamma Andromeda. It can be just barely seen in a 6 inch aperture with a 10 inch showing its broad nuclear region and vague dark lane down the length of the galaxy. An interesting open cluster I ran into lately is NGC 752, a large group of about 70 stars located about three degrees west of the star 58 Andromeda. It should be a good target for three inch and larger instruments and is visible in binoculars.

The observer who is working on his Messier award probably has had trouble finding M 74, a faint face-on spiral galaxy in Pisces. it can be found by looking just over a degree north-east of eta Pisces. it can be found by looking just over a degree north-east of eta Piscium and appears as a small circular fuzzy patch with a slightly brighter center, but shows little detail in telescopes under 10 inches in aperture.

a fairly easy galaxy in the Messier list is M 77 in Cetus. this is one of the so-called "Seyfert galaxies" noted for their active almost quasar like nuclei and can be found by looking one degree south-east of delta Ceti. Most telescopes show it as a fairly bright fuzzy oval with a bright star-like nucleus. A ten inch may also show hints of spiral detail although they are vague at best.

CLUB SHIRTS??

No, we haven't forgotten the new club shirts. Our special contact at JC Pennys still has not received the shipment of shirts. (it seems navy blue is popular this year!)

The silk screen for the logo is all ready to print, and the minute the shirts arrive here in Omaha, they will be sent UPS to Lincoln for printing. Please have patience with us... we promise the product will be worth waiting for. In the meantime, anyone who has not ordered a shirt can still do so. A few extra shirts were put on order to fill any late requests.

EXPLORERS CLUB

The Explorers Club Of Lincoln (a group associated with the Boy Scouts) have asked the PAC to help them form an Astronomy Explorers group. One person from the PAC would be needed to run the group, and 4 or 5 other members to help in other capacities. The Explorers could be invited to our meeting on a monthly basis, and could be trained to help out at Hyde Observatory. If anyone is interested in working with the Explorers, please let a PAC officer know at the next meeting.

THE PRAIRIE ASTRONOMER
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Lincoln, Nebraska 68501

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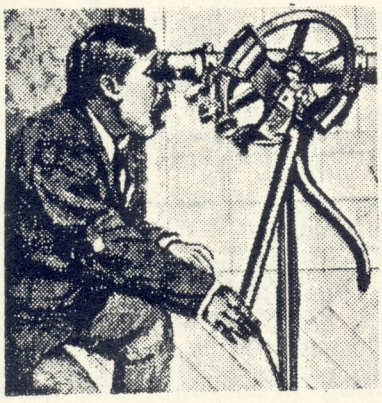

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