



# the Spectrum

BUFFALO ASTRONOMICAL ASSOCIATION INC.  
BUFFALO MUSEUM OF SCIENCE  
HUMBOLDT PARKWAY  
BUFFALO NEW YORK 14211

Editor:  
Ernst E. Both

NOVEMBER - DECEMBER 1972

**NOVEMBER MEETING:** Our meeting on November 10, 1972 (8:00 p.m., Club Room, Buffalo Museum of Science) will feature Mr. Robert Little in an illustrated lecture entitled "General Astrophotography." Mr. Little is an expert astrophotographer who has worked in that capacity with Questar. He is currently teaching a course in this subject at the American Museum's Hayden Planetarium in New York. He is a Sales Representative for Celestron and a co-sponsor of Eclipse Cruise International. This promises to be a very exciting lecture and it is our pleasure to welcome Mr. ROBERT LITTLE!

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**DECEMBER MEETING:** December 8, 1972 is the date when we present our annual get-together of a more social nature (8:00 p.m., Club Room, Buffalo Museum of Science). As in years past it will again feature Mrs. Edith Geiger in a slide-show illustrating the lighter side of the B.A.A., and Ed and Olga Lindberg in their traditional globe-trotting adventures. A social hour will round out the meeting. COME ALL AND BE JOYFUL!!!!

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**STAR PARTIES AT NEWSTEAD OBSERVATORY** have been scheduled for the following dates: November 11; December 1 or 2 (if first date is cloudy, the second applies); December 9 (one date only); December 15 or 16. If in doubt call John Riggs, 875-7965.

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**PRESIDENTIAL MESSAGE:** by Darwin Christy

Two meetings have come and gone and again it is time for a message from your President. As the Summer Triangle disappears in the west to make room for the great hunter Orion, with all his surrounding beauties, I wish to express my appreciation for the wonderful attendance we have had at the first two meetings of the new season.

Time is dissipating toward our annual astrophotography exhibit here at the Museum. I do hope that there will be many photos in the exhibit. Two things can come from it if we have many entries. First, it will show to the public what we can accomplish as amateur astronomers and what we represent in our community. Second, it may mean enrichment of our treasury - those of you who do not process their own films or make their own prints may take advantage of an offer made by several of our members. For a slight fee the following members will do your processing: Orrin Christy, Tom Dessert, Larry Hazel, and John Riggs. Proceeds above and beyond the cost of materials will be turned into the treasury.

The possibility has been mentioned that our exhibit could also be displayed either at Main Place Mall or Eastern Hills Mall at some future date. If you are interested in such a venture, please contact Tom Dessert, John Riggs, or Warren Steinberg. Such a venture would need the support and approval of all, and the active cooperation of many. I personally feel that it would mean great publicity for our association and could draw new members to our ranks. An organization which is expanding is forging ahead!

Again let me thank you for the large turnouts at the past two meetings. Keep it up - - - STANDING ROOM ONLY?

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\*\*\*FOR SALE: Refractor with Jaegers 5inch, f/5 lens. Extras. Call Dan Smith 634-0570\*\*\*

\*\*\*FOR SALE: 8inch, f/7 parabolic mirror, + - 1/25 wave = 70.00; telescope spider with 1.550 inch minor axis = 8.00; elliptical diagonal, 1.550 inch minor axis, 1/10 wave = 7.00; rack and pinion with helical focuser, 3inch travel = 15.00; for all of these call or write Dennis Zywieczynski, 212 Strauss St., Buffalo 14211; phone 895-6819\*

WINNERS IN SEPTEMBER CROSS-WORD PUZZLE: Orrin Christy; Fred Gordon; John Riggs; Richard Zygmunt (sad to say, there were only 5 entries!!!) Solutions = Across: 1 Andromedids; 2 Birt; 3 Tele; 4 Hell; 5 AD; 6 Sun; 7 Toro; 8 Nonius; 9 Sunk; 10 Poisson; 11 AS; 12 AM; 13 OSO (OAO); 14 Dorado; - Down: 1 Nereid; 2 Robertson; 3 Murchison; 4 Io; 5 Sculptor; 6 Plinius; 7 Rod; 8 Suess; 9 Europa; 10 Honda; 11 Saros; 12 Nord; 13 Ara; 14 Norma.

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\* DEEP SKY OBSERVING FOR NOVEMBER AND DECEMBER \* By John Riggs

November and December have never been the best months of the year to do much observing in this area. The lake-effect clouds only occasionally let the amateur observer peer through to see what's going on overhead. Prepared perseverance is the best stance to take under these conditions, for in the end the observer will succeed.

An ideal constellation to explore when the clouds break is Taurus. Two of the most striking and well-known asterisms in the sky are found within its borders; the Hyades and the Pleiades. Both of these naked eye clusters are well suited for low power, wide field instruments, such as binoculars and richest field telescopes. The observer's location does not change the appearance of these objects very much - both are beautiful whether seen from a suburban backyard, or an isolated country hill. The next evening you are out with your telescope, take time to slowly sweep through the Hyades and Pleiades as well as the region between these brilliant clusters. A thoughtful tour of the area at one's leisure is most enjoyable. Of added interest to telescopic observers is the faint nebulosity surrounding the Pleiades. Much has been said about how to see this nebulosity and what size telescope is required to show it. To say that a certain size and nothing less is needed to see it is ridiculous. The visibility of this object is almost entirely dependent upon sky quality. The poorest sky under which I have seen the nebula has been at Newstead with the 12 $\frac{1}{2}$ -inch reflector. Under these conditions, though the glow surrounding Merope was rather faint, it was nevertheless clearly visible. At my regular observing site, 45 miles southeast of the city, I have frequently seen it with my 3-inch, f/5 refractor at 18 X. With the 10-inch reflector at this site the nebulosity is almost easy, and practically fills the entire field of view at 62 X.

Another object in Taurus that has aroused a great deal of interest among professionals as well as amateurs is the "Crab Nebula," also known as M 1. This is the site of the famous supernova explosion observed by the Chinese in 1054 AD. Though M 1 is located just about one degree northwest of zeta Tauri, it can sometimes elude the observer who only uses this star to guide him. The surest way to find this nebula is to place zeta in the field of your finder-scope, then look to the north for three 7th magnitude stars that form a line stretching east-west. M 1 is situated slightly west of the middle star in the line. With my 10-inch it appears as a relatively bright, elliptically shaped glow of moderate brightness. Surrounding this bright region, I could see a faint, narrow, outer glow. Using averted vision to pick up the fainter details greatly helps to bring out the beauty of this fine object. Professionals are keenly interested in this object because it contains a pulsar. Though we as amateurs cannot study the various phenomena associated with this unusual object, we can see the nebula that resulted from this explosion and when observing it, contemplate upon the fantastic physical forces which produced it. Professional astronomers may be the scientists, but surely amateur astronomers are the humanists.

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\* QUASARS AND THE UNIVERSE - an exchange of letters \*

NOTE: Mr. Irving Goetz placed at our disposal an exchange of letters between himself and Dr. Paul W. Hodge concerning Quasars and the shape of the Universe. We believe with Irv that other members might be interested in this topic.

Dear Dr. Hodge: Having read your books "Galaxies and Cosmology" and "Concepts of the Universe" I am now absorbed in your recent "The Revolution in Astronomy" - all extremely interesting and instructive works. Early in this last book, on the topic of Quasars (page 36) you indicate that the "Big Bang" explosion took place 10 billion years ago. On the next page you state "-the most distant Quasars with velocities of 150,000 miles/sec must be 10 billion light years away." Now, if both of these statements are correct, we are seeing these objects where they were ten billion years ago; namely back at the site of the explosion. It seems to me that if the "Big Bang" theory is correct, and if the "Red Shift" is indeed a measure of distance, then all Quasars measuring a ten billion light year distance should appear to us in the same direction from us (toward the center of the Universe).

To find out if this made any sense I made inquiries to several people, but only one person took the trouble to set me straight. That was the prolific Dr. Isaac Asimov who wrote: "Your theory would hold water if light traveled in straight lines, but due to the curvature of space it does not and Quasars will be seen in all directions from you." This explanation satisfied me for a time, but after reading your chapter 3, I started thinking about it again. I can see how the light from the Quasars, pulled this way and that by the gravitational fields it passes thru in curved space would no longer indicate the direction to the center of the Universe, but since the light from all of them started from about the same place, would their paths not all be similarly affected by the curvature? and shouldn't the Quasars still all appear to be in the same direction from us?

You will not have to have read this far to know that mine is not a scientifically trained mind. My ignorance of Astronomy is matched only by a great interest and curiosity. I sincerely hope you can find a few moments and a few words to enlighten me. Hopefully Yours, I.A. Goetz.

Dear Mr. Goetz: Thank you for your recent letter with its questions about astronomy and cosmology. First, regarding the quasars, the problem is one of our inability to be accurate about the exact distance of the most distant quasars. It turns out that the distance cannot be calculated reliably from the radial velocity for these very high velocities, because of the divergence from the straight proportionality of the Hubble Law when distances are measured that are close to the size of the universe. The actual distance for an object with such a high velocity depends critically on the assumed cosmological model, and so far our data are not sufficiently accurate to allow us to settle on one of any number of different possible cosmological models. Therefore although it would appear that what you say regarding the quasars is correct, namely, that they are nearly seen at the time of the beginning, this is not strictly true because of the great deal of uncertainty in the distance. Similarly, the date of the "Big Bang" is also uncertain, and values as large as 20 billion years are sometimes quoted and may be true. Therefore even if light travels in straight lines (and of course most of the presently likely models of the universe incorporate Einstein's general relativistic considerations of curved space) the apparent discrepancy is probably explainable completely in terms of the uncertainty of the measurements.

Dr. Asimov gave a good explanation of the property of light in a positively curved expanding universe, and in the case that this model is correct, what he states would explain the apparent uniformity of quasars in direction and in velocity. To understand this more completely, however, I think it would be necessary to read much more extensively in books that describe cosmology in popular terms. A good example is Einstein's book on relativity, written for lay people, and Armitage's book (cont'd. p4)



"The Universe and Dr. Einstein." Libraries have many others that are excellent and I believe that any of them would be of interest to you. Thanks for your letter and interest. Yours sincerely, P.W. Hodge. \* \* \*

NOTE: Our sincerest thanks to Irv Goetz for sharing this correspondence with us.

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\* SEPTEMBER MEETING OF THE INSTRUMENT SECTION \* By Darwin Christy and Warren Steinberg

On September 22, 1972, the first meeting of the new season was held by the Instrument Section in the Humboldt Room of the Buffalo Museum of Science. "Show and Tell" seems to be one of the section's main interests: Tom Dessert brought in his 10-inch, f/6 Dynascope to show us his off-axis guide system which, he reports, can get down to 12<sup>m</sup> compared to other guide systems. The on-axis main diagonal feeds the camera while guiding is achieved on the other side of the tube with an off-axis diagonal feeding an eyepiece. Darwin Christy had an 8-inch, f/5 spherical mirror in for testing. Those who looked at it in the Foucault test thought it to be very close to the quoted sphere.

John Dlugosz brought his recently purchased 16-inch (!), f/4.5 mirror for testing. The figure of the paraboloid was well-resolved, but Bob Burdick mentioned that when he had this mirror under test at his house, it took two days for the temperature of the mirror to stabilize - what a hunk of glass!

Bob Mayer described the unique telescope tripods he is offering for sale (as described in Modern Astronomy) and he later showed us slides of his visit to the 48-inch and 72-inch telescopes near Victoria, Vancouver Island, B.C. Because of these meetings it is possible that we may have interested another outsider to become a member of the B.A.A. - Frank Ricchiazzi has shown some interest having found that we exist! He is going to start making his own reflector and possibly build his own observatory.

It was asked by a member: if and where did we have a place to grind mirrors and to learn to build telescopes, who knows where all the equipment went which was in the Craft Shop we used for the instrument section meetings? (Note: Ed Lindberg should know the answer to that one. As far as I know, there is no equipment left; eeb.) If they still exist, perhaps we could find a place to start having meetings to encourage younger members to build their own telescopes. This could be another branch of the instrument section so that more experienced members could instruct as well as guide the novice on. Attendance: Bob Mayer, Bill Smith, Tom Dessert, Bill Parker, Warren Steinberg, Dale Hankin, Orrin Christy, Ed Lindberg, Frank Fronczak, Bob Burdick, Darwin Christy, Rudy Neuhauser, Frank Ricchiazzi, Don Ortwein, John Dlugosz, and Mike Dlugosz.

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NEARBY SOCIETIES: Lockport Astronomical Association - meets on the third Tuesday of every month (September through June) at the Lockport High School (site of the Remick Observatory). \* \* \* Astronomy Section, Rochester Academy of Science, first Friday, October through June, meets at Strassenburg Planetarium. \* \* \*

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\* \* \* HARLOW SHAPLEY 1885 - 1972 \* \* \* By Kurt Erland

Harlow Shapley, one of the worlds most distinguished and most widely known astronomers died at the age of 86 (October 20, 1972) after a long illness. Shapley was born in Nashville, Missouri on November 2, 1885. After graduating from the University of Missouri, he received his PhD in Astronomy at Princeton in 1913. A year later he published his revolutionary theory of Cepheid pulsation. Until that time, astronomers had mainly tried to explain Cepheid variables as some type of eclipse phenomena. In his

publication Shapley showed that most of the observations could be explained in terms of a physical pulsation of the entire star. For the next seven years (1914-21) he was an astronomer at the Mt. Wilson Observatory, where he studied primarily globular clusters. His studies of these clusters led him to recognize that the solar system was far removed from the center of the Milky Way system, and that this center lay in the direction of Sagittarius. Most previous models of our galaxy were essentially refinements of William Herschel's star count technique which gave the erroneous impression of a relatively small system centered on the Sun. For example, Hugo von Seeliger's model (1901) had the Sun at the center of a flattened star system 23,000 ly in diameter and 6,000 ly thick. In contrast, Shapley envisioned a much larger and even more flattened system, measuring 300,000 X 30,000 ly, with the solar system located toward the outer fringes and far from the center. His later work reduced the diameter to 100,000 ly, with the Sun located between 25,000 and 30,000 ly from the center. This is close to the modern values (his earlier model, like others, had neglected the effects of interstellar material). For some time this model was met with considerable skepticism (this "clinging to the center of the universe" may be viewed as the last remnant of geocentrism/anthropocentrism). Although Shapley liked to think that he had removed man from the center of the universe (a deed analogous to Copernicus), he had merely formalized this removal which had begun some time ago, at least in the popular literature and in some isolated professional papers.

At first Shapley believed the spiral nebulae (i.e. what we now call galaxies) to be small, local systems of stars, but after Edwin Hubble showed that they were indeed systems comparable to our galaxy, Shapley, after assuming the directorship of the Harvard Observatory (1921-1952) launched a large-scale census of faint galaxies, chiefly at southern hemisphere stations (Peru, South Africa). His goal was to ultimately delineate the extent of the metagalaxy, that is "the total recognized assemblage of galaxies, i.e. essentially the measurable material universe." In the later years as an administrator, Shapley became increasingly concerned with problems not necessarily connected with astronomy: among others he helped organize UNESCO and was instrumental in bringing foreign scientists to the U.S. especially after the conclusion of World War II. He was the recipient of numerous honorary degrees and awards, among them the Gold Medal of the Royal Astronomical Society (1939) and the Pope Pius XI Prize (1941). Among the numerous positions he held we may cite the presidency, American Academy of Sciences (1939-44) and that of the American Astronomical Society (1943-46). His books include: STAR CLUSTERS; GALAXIES; THE INNER METAGALAXY; OF STARS AND MEN; THE VIEW FROM A DISTANT STAR; THROUGH RUGGED WAYS TO THE STARS; BEYOND THE OBSERVATORY.

Perhaps the final verdict of history will assign Shapley a place of importance similar to that of Copernicus.

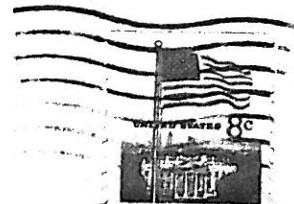
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CRYPTOGRAMS are fun and are solved by letter substitution. "THE WHITE DOG" might read "RNS INGRS MPI", R being used for T, N for H, S for E, etc. Try your hand at these to see what fact might be uncovered in the cryptic message which follows: "W ukpwx osulzvo lv hdp qdo caap zwvov qdxakmd qdo vdwah an qdo owxqd wpt w vauwx osulzvo lv hdp qdo caap swvqv w vdwah ap qdo owxqd." The answer will appear on the black board in the meeting room at the next regular meeting. (Submitted by Darwin Christy).

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\* SPY AND TELL \* Orrin Christy is back in the Reserves on Tuesday nights as an instructor. He is also an instructor in electronics on Thursday nights in the Niagara College of Arts and Science in Canada. He is also a volunteer fireman - no wonder you haven't found planet X yet, Orrin! \* \* \* Dick Zygmunt was observed on Channel 4 (10:30-11:00 pm) in September, on a Bicycle Safety Panel with policemen from Kenmore and Tonawanda. Dick is a former president of the Bike Club of the Town of Tonawanda. \*\*\* Kermit Schlitzer has taken up farm work. \* \* \* Rick Janas visited the Rocket Center 10 miles outside Huntsville, Alabama. Rick is still with VISTA,, he has about 22 weeks

of service left. On Labor Day Rick was seen playing blackjack at Las Vegas - he lost about \$ 5.00. \*\*\* Lillian Von Gerichten is busy canning and gluing chairs. On the astronomical side she hopes to observe the Zodiacal Light while cruising around the Bahama Islands in November. \* \* \* Tom Dessert's trip to Kentucky must have been a "Wow". The stars put on a spectacular show for him, and the Southern Cross, which by a revealing slip of the tongue he called the Southern Belle, sent him home with a severe case of eyestrain. A-hem!!! \*\*\* Gretchen Schork is rumored to be giving up reading astronomy books in favor of fairy-tales (?) - beware, Gretchen, or the "goblins will get cha if ya don't watch out!" \* \* \* Speaking of rumors, there is one afoot that Richard Ball has been in and out of the Air Force because he couldn't fold his socks right - now who would be spreading rumors like that??? \*\*\* Edith Geiger has been observed roaming the forests in search of toadstools - remember what happened to Kepler's mother when she did that? (In case you don't - she was thrown in jail as a suspected witch!) There is some circumstantial evidence that Edith doesn't want anyone to visit her observatory. One not so recent visitor, after braving a fierce array of fierce animals was turned away at the door by a "Wet Paint" sign! On the serious side: we report with considerable pride that Mrs. Geiger's outstanding work with Project Early Push at School 36 (Buffalo's exceptional enrichment program for pre-school children) has received national recognition recently. Her work was cited as one of twelve outstanding teachers from all parts of the country and considerable space is devoted to her teaching strategy in the publication "The Exemplary Teacher of the Disadvantaged." Our warmest congratulations, Edith! \* \* \* One of Europe's leading planetary observers, Dr. Werner Sandner, visited Buffalo on his return trip from touring the big observatories of the SW. Dr. Sandner was particularly impressed with the solar equipment of the Kellogg Observatory and Walter Semerau's Solar Observatory. A passerby at Cole's Restaurant saw him converse with Dr. Fred West in German! Dr. Sandner is the author of several books, including THE PLANET MERCURY, and THE SATELLITES OF THE SOLAR SYSTEM. He was staying with the Boths. \*\*\* WHERE ARE ALL THE PHOTOGRAPHS FOR THE ASTROPHOTOGRAPHY EXHIBIT? PLEASE SUBMIT THEM EARLY \*\*\*\*\*



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