BUFFALO ASTRONOMICAL ASSOCIATION INC.
BUFFALO MUSEUM OF SCIENCE
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the Spectrum

Editor: Ernst E. Both

JANUARY - FEBRUARY 1973

* * TO ALL OUR MEMBERS, FRIENDS, READERS, A VERY HAPPY NEW YEAR AND CLEAR SKIES 1973 * *

JANUARY MEETING: January 12, 1973, 8:00 p.m. EST, Club Room, Buffalo Museum of Science. For our first meeting of the new year we are happy to present our own Larry Hazel in a lecture entitled "Variable Stars." Larry is one of the more active members of the AAVSO who has recently branched out into solar observations. An observer of great tenacity, Larry should give us valuable insights into the do's and don't's of variable star observing. After the meeting there will be a preview of the BAA Astrophotography exhibit, followed by the usual coffee hour. It is with pleasure that we welcome our own LARRY HAZEL!

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FEBRUARY MEETING: On February 9, 1973 (same time, same place) we welcome our Vice President Tom Dessert who will discuss "Telescopes and Accessories." If you want to know what telescope to buy and what to do with your telescope, this is the meeting for you. Tom is rapidly becoming one of our most avid observers and astrophotographers, and his experiences should prove very helpful and interesting. Welcome, TOM DESSERT!!

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NEWSTEAD STARPARTIES: Again we have scheduled several star parties, in the hope of eventually (??) hitting on a clear (??) night. The following dates have been selected: January 5/6; January 13 (only); January 26/27; February 2/3; February 10 (only); February 23/24. Observations begin at dusk, at Newstead Observatory. If in doubt, call John Riggs at 875-7965.

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PRESIDENT'S MESSAGE: Four meetings have passed and there are six to come. If attendance at future meetings will continue as it has at past ones, I will be overjoyed. I have been very encouraged by it and think it reflects the fact that we have had very fine programs. There are others coming which I feel will be equally good. I have stated at the meetings that I would call on members to present five or ten minute reports in addition to the main speaker. Some of our members may not have enough material for a full program - so these short reports provide everyone with an opportunity to share his/her experiences with the entire membership present and not just a few during the social hour. I would like to hear from you whether or not you like this idea.

From what I have heard, our planned exhibits should turn out to be excellent ones. The astrophoto exhibit at the museum (there will be a preview at the January meeting) will be part of bigger ones to come. Gretchen Schork indicates that our exhibit planned for the Eastern Hills Mall has met with wonderful response from our members. I hope these ventures will make you feel proud to be a member of the BAA. They should give us the kind of publicity we need. Let me thank all members who are helping with the exhibits.

While I am very encouraged with the attendance and the cooperation with the exhibits, I am somewhat discouraged with our financial situation. As you know, our only means of support at present comes from membership dues. Contributions to the piggy bank and refreshment bank merely cover expenditures incurred for our coffee hour. Sad to say - we do have many members who have not yet paid their dues (see announcement elsewhere in this issue); I hope they do so without delay. Beyond that I would be happy to hear from anyone who has an idea (or two, or three) for a fund-raising scheme.

With the proposed move of our observatory to the Audubon Society's Beaver Meadow

Environmental Education Center, we are accepting new and additional responsibilities - we are committed to fully support the Audubon Society in its fund-raising campaign to insure their goal and the success of our own plans. At the January meeting I intend to report to you fully on the meeting we have had with the Audubon Society. Until then, have a very happy New Year and may your skies be still and clear. Darwin Christy. * *

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CONCERNING MEMBERSHIP DUES: Membership dues are past due - if you have not paid yours yet, please see Bob Kartyas at the next meeting. Annual dues (September 1972 - August 1973) are as follows: Individual $ 5.00; Family $ 8.00; Student $ 3.00. The following members have paid their dues (as of November, 1972): David Blake, Mr. & Mrs. Ernst Both, Rudy Buecking, Charles Bull, Bill Chambers, Darwin Christy, Orrin Christy, Bruce Cook, Mrs. Gertrude Cook, William Deazley and family, Tom Dessert, John Dlugosz, Michael Dlugosz, Fred Flederbach, Mrs. Irene Flederbach, Donald French, Marybeth Gauthier, Bill Gehrke, Mr. & Mrs. Caroll Geiger, Mr. & Mrs. Irv Goetz, Eugene Hazel, Larry Hazel, Stephen Jaworski, Carl Kalweit, Bob Kartyas, Michael Krasner, Ed Lindberg, Donald McClure, Carl Milazzo, Donald Ortwein, Bill Parker, Fred Price, Margaret Rabe, Sylvia Regalla, John Riggs, Gerald Rote, Kermit Schlitzer, Gretchen Schork, Mr. & Mrs. Walter Semerau, Vernon Siegel, Warren Steinberg, Perry Spavento, Marjorie Sundell, Richard Taibi, Darl Washburn, Fred West, Daniel White, Walter Whyman, John Weiler, Richard Zygmunt, Dennis Zywiczynski. IF YOU ARE MORE THAN 5 MONTHS BEHIND, THIS IS THE LAST ISSUE YOU RECEIVE.

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* DEEP SKY OBSERVING FOR JANUARY AND FEBRUARY. By John Riggs *

The typical deep-sky observer's notebook frequently has a tendency to slacken off in the number of observations completed during the months of January and February. The reason for this decrease is not complex. The weather patterns which occur over most of the United States this time of year are not the most conducive to prolonged sessions at the eyepiece. The threat of frozen fingers, toes, and nose is almost as good a deterrent as a cloudy sky in keeping amateurs away from their telescopes. The sky, however, is indifferent to the thermometer reading, and many interesting and worthwhile objects may be found in the winter constellations if the observer will bundle up and look.

Gemini is an excellent area to explore as it culminates high on the meridian. Foremost on any observing trip through this constellation should be the beautiful open cluster M 35 near the foot of the twin, Castor. Under a dark country sky, this cluster can be spotted with the naked eye as a small hazy brightening in the Milky Way. To those who must observe under the less favorable conditions of a suburban backyard, M 35 may be found with a pair of binoculars by examining the arc of stars comprised of mu, eta and 1 Geminorum. The cluster lies about one and a half degrees northeast of 1 and should appear as a small stellar patch. With a 6-inch telescope working at about 45 X, M 35 is truly a wonderful sight that contains many bright stars arranged in curved arcs. Large telescopes and/or high magnifications tend to spread the stars out and make the cluster seem less spectacular. Of added interest to the area surrounding M 35 is an object that is often missed by amateur observers, the globular cluster NGC 2158. This object was once classified as an open cluster, but further study by professionals has shown it to be globular in character. NGC 2158 is located at the southwest edge of M 35 and is drastically over-shadowed by its splashy neighbor. A dark sky and at least a 4-inch telescope will probably be needed to show it. With my 10-inch, f/7 reflector it appears as a very faint, elliptically shaped glow containing several faint 13th magnitude stars resolved across the middle. It forms an unusual contrast with the big cluster in the same field of view.

For the observer who likes to see planetary nebulae, Gemini contains three of these

often challenging objects that can be seen with amateur equipment. One of these, NGC 2392, can be picked up with a telescope as small as a 3-inch. If you are confined to observe under a city sky, take heart, for this bright planetary can be seen through the murk without much difficulty. For setting circle users, its coordinates are: 7h 26.2m, + 21° 01'. For observers who do not use circles, NGC 2392 lies about two degrees southeast of delta and midway between and slightly east of the stars 61 and 63 Geminorum. Check the Skalnate Pleso Atlas for the exact location of these stars and the nebula. The 10-inch at 62 X shows it as a small, relatively bright disk that displays pronounced blinking when the 9th magnitude central star is looked at directly. Possible glimpses of structure within the nebula could be detected at higher magnification. If you have never seen this fine object, look for it next time weather and your stamina permit.

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* CREATOR - GRIM REAPER * By Bill Parker

M 42 in Orion is perhaps the most beautiful object in the sky. The sight of this object always causes me to ponder on the subject of gravity. Gravity, the weakest of all the forces, has reached out tenuous arms and gathered in hydrogen from surrounding space. Slowly, over a period almost unthinkable, the hydrogen began collapsing. It came together unevenly, and blobs were formed. In the blobs gravity was also at work. It crushed the hydrogen more and more, until the atoms could stand it no longer. The nuclear furnace fueled with hydrogen gathered from space ignites. And so a star is born - but the role of gravity is not yet over. In fact, although it takes a back seat to nuclear, magnetic and electric forces, it still plays an important role.

The star that gravity has created will burn for eons. It will take hydrogen and convert it to helium. In so doing, it will remain in a balanced state for an eternity - but eventually the balance will terminate. If our star does not explode catastrophically and if its mass greatly exceeds that of our Sun, an event of startling nature will occur. The gravity that was Creator will now become Grim Reaper. Gravity may be the weakest force in the universe, but it will, none the less, crush the star into nothingness. I am not exaggerating! Once the star has been crushed to the gravitational radius, it will be compacted instantly into zero volume and infinite density. Not very likely you say? It can be shown mathematically that this is entirely possible. Not just mathematicians think it can be so - leading astrophysicists seriously discuss Gravitational Collapse.

Gravitational Collapse is controversial in its final stage. Many believe that rather than collapse to singularity, a star may be converted into radiant energy. This would be a relatively short-term process lasting only a few thousand years. This may be one explanation for Quasars. It would not only account fer their tremendous energies, but also for the enormous redshifts. When one considers the possibility of not just a single star but clusters of stars, or even whole galaxies being anihilated, a Quasar becomes a most interesting object. Pulsars too may be a gravitational phenomenon. A single star rotating quickly may temporarily halt collapse converting angular momentum into radiant energy. A pulsar following this model would be constantly loosing energy. Its period of pulsation would be constantly increasing. This appears to be the case in most pulsars yet observed.

Birth, death, and conversion. Gravity, the weakest of all known forces, seems indeed powerful. Think about it!

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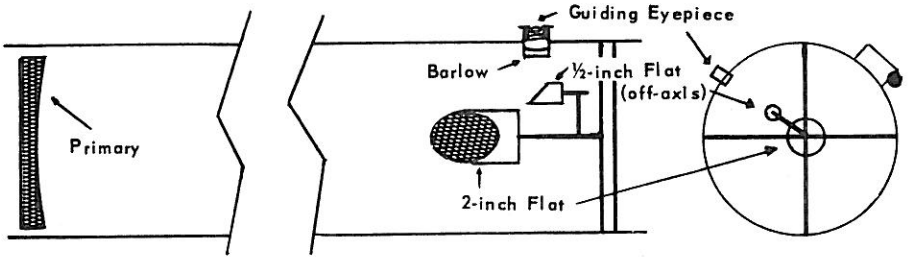
* OFF-AXIS PHOTOGRAPHIC GUIDING * By Tom Dessert.

After being introduced to deep sky observing several years ago, I resolved that one day I would capture some of these beautiful objects on film, for others to see. I acquired the proper type of telescope and camera only to find that I needed to modify my new

equipment before it would be suitable for astrophotography. If one is to take long exposure photographs with a conventional Newtonian reflector, an effective guiding system should be employed to compensate for any drive error. Through discussions with Orrin Christy and Bill Parker, both experienced isntrument makers, I developed a workable system..



1973 Jan/Feb MODERN ASTRONOMY 13

I mounted a small ½-inch diagonal mirror on the secondary support vanes. By locating this diagonal approximately two inches further from the primary than the standard 2-inch flat, I achieved several desired objectives. The small flat will occult only a negligible amount of primary light while at the same time capturing nearly all of the primary mirror's off-axis light. In open tube designs, an off-axis flat would "see" all of the primary mirror's off-axis light. However, I have a closed tube and the available light is developed from an elliptical portion of the primary mirror. Since my primary mirror is 10 inches in diameter, I was able to place the off-axis secondary in such a position as to just capture the 10-inch major diameter of the ellipse. Also by careful alignment of this small diagonal I was able to "see" a maximum of 8 inches on the minor diameter of the ellipse without the main secondary stopping out any of the reflected off-axis light. At the same time this procedure will assure a minimum amount of coma and astigmatism. As the focal length of the off-axis images is identical to that of the prime focus images, the off-axis focal point is likely to be at or near the surface of the main tube. By using a negative lens ahead of the eyepiece I was able to extend the focal length from f/6 to f/8. This provides more than adequate magnification for guiding when used with a ½-inch eyepiece, and it places the eyepiece at a more convenient position on the tube. Since the Barlow lens was not strong enough to permit the use of a focuser, I mounted a slip ring collar on the side of the tube for holding the eyepiece. I further modified an old Japanese eyepiece (of focal length ½-inch) with an illuminated plexiglass double crossline reticle. When using this system I locate the location of the off-axis image in the main finder field. I then position the object I wish to photograph and rotate the main tube until I have located a star in the finder at the position of the off-axis system. I have used this method while photographing many deep sky objects and have found the results quite rewarding.

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* OBSERVATIONS OF INFRARED STARS * By Bill Chambers

I have been casually observing infrared stars for the past year or so. On the night of October 20-21, 1972, I took advantage of the unseasonably cool weather to search for several such objects using my image converter on the 12-inch Dall-Kirkham telescope of the Remick Memorial Observatory in Lockport. One of the objects seen was the variable star GP in Cassiopeia. This object is located between the two recently discovered galaxies Maffei I and Maffei II. In photographs (Sky and Telescope, March 1971, p. 144) this star is much brighter in the red and infrared than in blue light. It is identified as number + 60094 in the Infrared Sky Survey Catalogue which lists magnitudes of 6.22 at 0.84 micrometer, but 1.97 at 2.2 micrometers. This star was readily seen in the image converter. It was also readily seen visually with a regular eyepiece on the same telescope as a very red star.

After several other successful (and some unsuccessful) searches for late-type stars,

I turned the telescope to the constellation Taurus which was just then rising. I set the telescope at the coordinates 3h 51.5m, + 11° 18' to search for the remarkably cool star which was discovered there by a Caltech team in 1965. This object (ISSC + 10050) is so cool that its red magnitude is +16, while its magnitudes at 0.84 and at 2.2 micrometers are + 7 and 0 respectively. Visually it is a difficult object in the 200-inch Hale telescope! (See Sky and Telescope, October 1965, p. 195). After first setting the telescope I could see nothing. I reset the telescope several times - still nothing. The true field of the telescope is only ¼ degree, so even a small error in setting the circles will result in a miss. In desperation I turned to Norton's Star Atlas and discovered that 30 Tauri is almost due west of ISSC + 10050. The coordinates of 30 Tauri (from Lamkin's Naked Eye Stars) were found to be 3h 46m, + 11°0. Using the finder I located this star, and then offset about 1/3 degree of the low power field of the guide scope to the north, to correct the declination to that of the infrared object. Then I turned off the clock drive for five minutes to correct the tight ascension.

When I turned the drive back on and looked into the image converter - there it was, dimly perceptible above the background glow of the tube! I verified that it was a star and not a field emission point by several small movements of the telescope. Then, with the star accurately centered, I carefully removed the converter from the telescope and substituted a low power eyepiece. Only one star was visible at the very edge of the field of view. When I again carefully replaced the converter, I found that the infrared star was still centered. Thus I verified that the object seen with the converter was indeed "invisible" in the 12-inch telescope! Since the brightness in the image converter was about right for the listed infrared magnitude, and its location was right, I must have found ISSC + 10050. While the scientific value of this observation was nil, still it was quite a thrill to be able to see this remarkable star which very few (if any) other amateurs have ever seen!

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OBITUARY: It is with sadness that we record the death of an old member and friend - Paul C. Shuart, who died suddenly on November 16, 1972. We extend our deepest sympathy to his wife and our fellow-member, Jessie M. Shuart. We will always remember Paul as a kind, friendly, and happy gentleman, as a loyal member of our association, and as one who always and gladly took time out to interest some youngster in the wonders of our universe. * * + * *

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* SPY AND TELL * Bob Burdick is re-doing his mount, - it is completely torn down. He is now busily cutting a worm gear... * * * Bob Kartyas has made a 60 pound case for his 60 pound telescope. Reports have it that Bob is busily brushing up on weight-lifting exercises... * * * Bill Gehrke has built an observatory 10 ft in diameter. He says it looks like a dog house and has a flat roof suitable for UFO landings!... * * * The mention of UFO's brings to mind a true story which appeared in the April 1972 issue of "Blick ins ALL" - the newsletter of the Bavarian Public Observatory in Munich. It appears that during the occultation of the Pleiades on March 19, 1972, the observatory received a call from an excited observer who reported that at that very moment, swarms of UFO's were landing on the dark part of the Moon. When told that he was merely observing an occultation of the Pleiades, he became very adamant, refusing to believe said explanation. We don't know the exact words he said, but assume from what we know of some UFO buffs that he probably was brushing it aside as the typical Air Force whitewash! Oh well - at least he did see something!... *** Marybeth Gauthier announced that she has 57 friends around the world, 20 of whom are in Brazil (?) . . . *** We understand that Ernst Both is trying to trace his family tree. He has just purchased a book entitled "In Search of Dracula", which shows that he is on the right track... * * * On a clear night a few

weeks (or so) ago, Tom Dessert stayed up until 5 a.m. taking sky pictures, which gave him an "excuse" for not appearing at work the next day... * * * Quotable quote: "I haven't time to make money, I'm too busy" (Bob Burdick) ... * * * Our President is making the Niagara Mohawk News again - before as an amateur astronomer with his own observatory - this time he is shown delivering 60,000 volts to a "line" truck - 'Tis electrifying, Darwin! ... * * * By a singular error, this column in the last issue reported that Lillian Von Gerichten was "busy canning and gluing chairs." Obviously one doesn't do that sort of thing to chairs - it should be caning and gluing ... * * * Here is another cryptogram - these are solved by letter substitution. For example, a big boy might read r slt swk where r stands for a, s for b, etc. Try this one:

bislsmt alketymfma otrf tjpmedk ijtrd przldmf eissma lt eisslkdt biyxwmam iya mrftzi.

Or, using a different code, try this: Neadfu syetndna zeu wyaud tneujans wart cryxdu ed eqnbexsaye exs ugnxn. These will be deciphered at the next meeting. Good luck! * * * Our efficient member Charles Bull (most members don't get to see him before the meetings because he is busily setting up some of the trappings for the coffee hour) has moved to New Rochelle, N.Y., where he works at the Veterans Hospital. We hope you like it there, Charles! ... * * * 1973 will see a world-wide celebration of the 500th anniversary of the birth of NIKOLAUS COPERNICUS. During the months of February and March of this year, the museum's new Hall of Astronomy (the construction of which is essentially finished) will present a temporary exhibit illustrating the Copernican Revolution. On exhibit will be rare first editions of the works of Copernicus, Tycho, Kepler, and Galileo. A formal opening, sponsored jointly by the Buffalo Society of Natural Sciences and The Buffalo Astronomical Association, Inc., is planned for the beginning of February. Watch for further details in the local papers. * * * *

HAMBURG, NY JAN 8 AM 1973

The Buffalo Astronomical Association, Inc.
c/o Buffalo Museum of Science
Humboldt Park
Buffalo, N.Y. 14211

FIRST CLASS

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Mr. John Riggs
255 Grimsby Road
Kenmore, N. Y. 14223