



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

# the Spectrum

Editor: Ernst E. Both

M A Y - J U N E 1 9 7 3

MAY MEETING: Friday, May 11, 1973, 8:00 p.m. (EDT), Club Room, Buffalo Museum of Science. Our May meeting will feature Mr. Ed Banaszak in a lecture entitled: "YESTERDAY, TODAY, AND TOMORROW." Mr. Banaszak is Assistant Chief Illustrator of Technical Communications for Bell Aerosystems and a former member of our association. This promises to be a very interesting lecture and it is our pleasure to welcome MR. BANASZAK! Refreshments will be served after the meeting in the museum's Lounge.

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JUNE MEETING: Our annual business meeting will take place on Friday, June 8, at 8:00 p.m. (EDT) as above. It will feature the annual report by our president, Mr. Darwin Christy, and a presentation by the Instrument Section under the direction of Ed Lindberg. We will also elect three Board Members (see below) and should have some preliminary announcements concerning the Summer Star Parties. Refreshments afterward.

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ELECTION OF BOARD MEMBERS: Three Members-at-Large are to be elected at the June meeting. The following members were nominated as candidates for election to the Board for the period 1973-1975: BILL CHAMBERS, EDITH GEIGER, CARL KALWEIT, FRED PRICE, and GRETCHEN SCHORK. Bill Chambers and Fred Price are running for re-election. Irv Goetz has declined to run for re-election - we take this opportunity to thank him for his faithful service as a board member in the past.

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## \* A NOTE FROM YOUR PRESIDENT \*

This will be the final Spectrum of the season. I wish to express my thanks to all the members for the backing I received throughout this half of my term. Although I may have received 100% backing from you, I could not have pleased all of the members. But then . . . neither does the President of the United States of America. . . and this proves to be a working democratic society.

I wish to express my gratitude for the wonderful exhibits we had. To those who supplied materials and displays of equipment, drawings, paintings, and photos - - thank you. For the time so many of you gave to sit with the equipment at Eastern Hills Mall and to tell the public about our exhibit and the knowledge you uttered to the public - - please accept my thanks. The success of these exhibits could NOT have been achieved had not all the afore mentioned been done by you, the members of the Buffalo Astronomical Association. For those persons from the Buffalo Audubon Society I wish to extend on behalf of the B.A.A. a very hearty thanks for your display and time that some of your members put in for us.

To ALL the committees both past and present I wish to thank for your services and accomplishments. Without your support, as well as the support (cont'd. page 5)

\* DEEP SKY OBSERVING FOR MAY AND JUNE 1973 \* By John Riggs

For many amateurs the coming of May and June marks the beginning of more frequent observing sessions at the eyepiece. Warm weather does wonders to bring out an observing instinct which seasonally must be compromised with the biological instinct for maintaining a constant body temperature. Combine this with a cloudless sky, and no telescope should remain idle. Unfortunately, however, the area which passes across the meridian during these evening hours is not as well endowed with bright objects as are the regions to the east and west. As a result, amateurs are sometimes torn when trying to decide which section of the sky to explore, and frequently choose to observe the rising Milky Way over the more favorably placed constellations on the meridian.

Located directly beneath the arc of the Big Dipper's handle lies a small, relatively faint constellation, Canes Venatici. Though this grouping is not of particular interest to the naked eye observer, telescopically it contains objects which should not be overlooked. Besides being located on the meridian this time of the year, Canes Venatici is also of sufficient declination to be placed directly overhead for mid-latitude, northern hemisphere observers. In short, this is a good place for the deep sky enthusiast to find himself roaming.

Two and one half degree to the southwest of the beautiful double star alpha Canum Venaticorum lies an often neglected galaxy, NGC 5005. It is located midway between and slightly west of the two stars 14 and 17 Canum Venaticorum. Find these stars on your maps and then check on their position in the sky with a pair of binoculars before attempting to locate them with the telescope. With a 10-inch reflector, NGC 5005 appears as a relatively small, moderately faint, elongated fuzzy ellipse which is well defined around the edges. The nucleus rises to a small bright oval patch and adds much to the interest of this object. If you use a wide angle low powered eyepiece and look a little less than a degree to the south west of this galaxy, you should be able to see another hazy ellipse. This galaxy is NGC 5033 and is very similar in appearance to its neighbor NGC 5005 except that it is a bit fainter.

North of these two galaxies lies another object worthy of note, NGC 5055, better known as M 63. To find it in the telescope, first put the two stars 19 and 20 Canum Venaticorum in the field of a low powered eyepiece and then sweep north one degree. My 10-inch shows it as a large, relatively bright, elliptical hazy patch which rises to a broad nucleus. It is an excellent object in almost any instrument.

A three or four inch scope will usually only show the nucleus and the companion NGC 5195 as two bright spots involved in a pear-shaped nebulosity. For years amateurs have considered seeing the spiral arms of this galaxy to be one of the ultimate tests of an instrument and sky conditions. And for the small telescope, the arms are indeed a challenge. When seen with a 10-inch under good sky conditions however, the spiral arms are not quite as difficult and they should be fairly easy to spot.

Next time you are out observing try to imagine for a moment what it would be like if you did not know what those fuzzy patches called galaxies and nebulae really were. Put yourself in the same position in which the Herschels were 150 years ago and speculate about the nature of these objects based upon your own observations. What would you think if you found an object which appeared to be spiral? It is an interesting exercise and also helps you to better understand the observations of deep sky observers before the advent of modern astronomical photography.

\* THE ALIGNMENT AND CALIBRATION OF SMALL EQUATORIAL TELESCOPES \* By Art Young

In general, small equatorial telescopes are seldom employed in astronomical work which demands of them a high degree of measurement accuracy. Thus it is usually sufficient to attain a reasonable alignment of the polar axis with the true north celestial pole, and a reliable calibration of the setting circles. The former is necessary to enable good diurnal tracking, and with the methods to be outlined, can be made sufficient even for moderate photographic work. The latter is less critical, in that it allows the measurement of position angles and coordinates of unknown objects, as well as locating objects invisible to the unaided eye.

The procedure necessary to achieve a sufficient degree of accuracy for general work may be accomplished in a relatively short time, and with little tedious effort. They are outlined in this article in the order in which they must be accomplished so as to be logically consistent. For larger instruments requiring high accuracy, much more detailed and sophisticated techniques are necessary (see for example the book "Practical Astronomy" by J.J. Nassau, 1932).

1. Prior to any adjustments on the axes themselves, the entire mounting must be made level. For modest accuracy requirements this is most conveniently done with a bubble level, preferably the type which indicates variance in any direction. However, an ordinary carpenter's spirit level is sufficient if it is moved all around the mount base to insure positive leveling. Once completed, the telescope and mounting should be firmly secured to prevent loss of leveling during subsequent operations. Occasional rechecking of the level during the alignment is well worthwhile.

2. Proper and smooth diurnal tracking necessitates that the telescope be well balanced in its saddle, so as to relieve strain from the axis bearings. Preliminary coarse balance adjustments are first accomplished on the declination axis by placing it in a horizontal position unlocked. The right ascension axis is locked, and the telescope tube is slid back and forth in its saddle until a good balance is felt. (NOTE: eyepieces, tube extensions, and accessories which will normally be used with the telescope should be attached in operating position during these balancing operations). With the declination axis still horizontal, the right ascension lock is released, and the counterweight is adjusted to give optimum balance on this axis. If the slow motion (fine adjustment) control on the declination axis is spring-loaded, as it often is on small instruments, then no further refinements in declination balance can be readily obtained. If it is not spring loaded, then a more sensitive balance may be obtained by repeating the method to be outlined for the right ascension axis.

Small errors in balance of the right ascension axis may be detected and corrected by locking that axis and observing a star through the telescope while slow motion drive is moved. If, for example, the counterweight is out slightly too far (too heavy) the motion of the star seen through the telescope will be smooth when the counterweight is being lifted. The star will move slowly and uniformly across the field until the motion is reversed and the counterweight is going down. The motion will then become irregular and the star will move across the field in short jerks. This effect is possible because of a small amount of backlash which is present in all gearing systems. As the gear is turned, the weight "falls" during the instants when the small backlash frees the gear. This permits a very sensitive balance adjustment to be made by trial and error adjustments of the counterweight until the effect is no longer detectable. The use of higher magnifications increases further the sensitivity of this technique, but is seldom necessary. The balance should be checked at various hour angle settings to insure uniformity.

3. The telescope tube must now be made parallel to the polar axis in preparation for using the telescope on Polaris to align the polar axis. This is entirely a declination adjustment which begins by aiming the telescope by eye as near to parallelism with the polar axis as possible. Both axes are now locked, and with a low power ocular, any convenient star is sighted in the telescope. A star with a high declination is desirable due to its small diurnal displacement. The telescope is then driven rapidly in right ascension. If the telescope optical system is truly aligned with the polar axis, the star will not appear to move when the right ascension drive is activated. If the star does move, a series of trial and error adjustments with the declination fine control will produce parallelism and the star will then remain undisplaced. Once again, the use of higher magnification enhances the sensitivity of this adjustment. Upon obtaining parallelism, the declination setting circle may be set to read  $90^\circ$ . Later, corrections may be necessary on this circle when actual declinations are measured for cross check.

4. The telescope polar axis must now be brought into north-south alignment prior to setting the latitude angle. If at all convenient, this is best done when Polaris is in transit (upper or lower). The declination axis is brought into a horizontal position by means of the bubble level so that it now measures altitude directly. The telescope is then aimed at Polaris by moving the entire mounting in azimuth, and then sighting Polaris by rotating the telescope in altitude on the horizontal declination axis. Higher powers are of some value in this operation, but their significance is not as great as in previous applications. When Polaris is centered in the field, the polar axis may be locked in azimuth since it is now aligned north-south.

5. Precise alignment of the polar axis with the north celestial pole is the next step. The inclination of the axis must be equal to the latitude of the location, but this is not a sufficiently sensitive measurement to be satisfactory. Instead, Polaris is again utilized. Although it is best to wait until Polaris is in transit, it is not necessary since tables are available (see "Practical Astronomy") which evaluate the difference in altitude between Polaris and the true pole for every minute of the day. From a table such as this, the difference in altitude between Polaris and the pole should be evaluated for the time at which the setting is to be made. The declination axis is still maintained in a horizontal position (see step 4), and if for example, Polaris is  $.75^\circ$  ( $45'$ ) above the pole, the telescope is raised this much from being parallel to the polar axis. This setting is made with the declination fine control by reading the declination setting circle which was previously calibrated so that it would read  $90^\circ$  when the telescope is parallel to the polar axis. Finally, Polaris is brought into the center of the field of view by rotating the polar axis about the horizontal declination axis. Switching to higher magnification is again of some value in the latter stages of this adjustment.

6. The hour angle setting circle remains to be calibrated. This is easily accomplished by aiming the telescope at a star whose hour angle has been computed. The star chosen should have a small declination (near the celestial equator) for greatest sensitivity. One may choose instead to wait until a certain star reaches upper transit and set the circle to  $24^h$ . Either method is acceptable. If a particular hour angle is used, it should not be more than 2 hours either way from the celestial meridian in order to avoid difficulties with atmospheric refraction, etc. For the computation of hour angle, all that is necessary is an accurate value of local standard time, since the Ephemeris contains tables stating the sidereal time at various Universal times for every day of the year. \* Ed. Note: Mr. Young wrote this article in 1963 when he was connected with the Niagara Falls Planetarium. Since then

he has earned a PhD in astronomy from Indiana University. Dr. Arthur Young is now on the faculty of San Diego State College. eeb. \*

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NOTES ON NEW ASTRONOMY PERIODICALS: In addition to the amateur's old friend, Sky and Telescope, astronomical journals and magazines catering to the amateur are springing up like mushrooms in a warm summer's rain . . . As should be well-known by now, one of the best of these "newcomers" is Dale Hankin's MODERN ASTRONOMY (6 issues/year, \$ 3.00/year; 18 Fairhaven Dr., Buffalo, N.Y. 14225). Dale has been a member of the B.A.A. for quite some time, and I think he well deserves our support in this venture. He has done a very fine job in bringing out this magazine, at times against very great odds. The latest issue (May-June 1973) features an interesting side-by-side comparison between astrophoto results on High Speed Ektachrome and GAF 500 - with GAF 500 winning hands down! By the way, astrophoto enthusiasts are urged to buy their GAF 500 from another local endeavor: ASTRO OPTICS, 1979 Buffalo Rd., Rt. 1, Darien Center, N.Y. 14040 - the price of a 20 exp. 35 mm roll with processing is only \$ 3.50! . . . A magazine somewhat more limited in scope is PRACTICAL ASTRONOMY (monthly, \$ 6.00/year; Astac Publishing Co., 7852 78th Avenue SW, Tacoma, Washington 98498) each issue about 20 pages. The attractive feature about this publication is the star-chart inset - for example, the February 1973 issue has a map of the Virgo Cluster of galaxies (from RA 12h00 to 12h20m, decl. 0° to +5° . . . . A fairly slick publication is MERCURY (The Journal of the Astronomical Society of the Pacific, bimonthly, \$ 6.50/year, including membership in the society; Astron. Soc. of the Pacific, North American Hall, California Academy of Sciences, San Francisco, Calif. 94118) - its contents are geared, somewhat, to astronomy of the area, but the articles are non-technical and very readable. . . . On the horizon is a monthly publication called ASTRONOMY (charter subscription \$ 12.00/year, later \$ 18.00/year; P.O. Box 431, Oconomowoc, Wisconsin 53066) - I have not seen any copy, but it is advertised as "a magazine that says in down-to-earth language, what astronomy is all about!" eeb.

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/NOTE FROM THE PRESIDENT, cont'd. from page one)

of the membership we could not have accomplished the various projects we attacked during my first half term of office. I do hope in the next year of my term that we can do as much or even more, to show the public we can be involved in good public relations. This could attract new members who would be an asset to our association.

A goal should be set to have more star nights through the coming Fall and Winter months. They could be set up as are the Summer star parties. We could even hold some of these nights in various members' backyards. I may be a little ahead of myself but thinking ahead is far better than doing things on the spur of the moment. It is possible that we could be directing our attention to Beaver Meadows as a star party meeting place even though we may not have our facility yet. I beg your comments...

Darwin Christy

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\* SPY AND TELL \* When you have had so many members contributing to the success of the Eastern Hills Mall exhibit, it is very difficult to single out individuals. Yet there are some who did more than their share: Bill Deazley and family, Mr. & Mrs. Tom Dessert, Gretchen Schork, Vern Siegel, Warren Steinberg and many more. \*\*\* We express our deepest sympathy to Bill Gehrke on the death of his father. \*\*\* Bob Kartyas has purchased an 8-inch put-together telescope kit. When the telescope is ready for use, Bob plans to join our ever increasing number of astrophotographers. \*\*\*

The Parker and Hankin families are looking forward to the trip to Africa for the solar eclipse. \*\*\* The Geigers are planning to reconstruct the shutter on their observatory dome - they are also keeping their fingers crossed so the telescope won't fall out of its saddle (refractors don't have that problem!). \*\*\* Ron Poling is experimenting with solar energy in an effort to find a way to make its use more economical. \*\*\* Marybeth Gauthier attended the International Star Trek Convention in New York where she met several stars of this TV show - she also secured an autograph from well-known Isaac Asimov. \*\*\* Bill Parker is going in for the occult and has been to a couple of seances. \*\*\* Good news for Rudy Buecking, Warren Steinberg and Bob Kartyas - you won't mind leaving the raspberries at Newstead - - there are Blackberries at Beaver Meadows. \*\*\* Our congratulations to Mr. Dave Bigelow for being appointed Resident Naturalist at Beaver Meadows. \* \* \* Darwin Christy used to be a cook in the army. His specialty is soup, and specifically, oxtail soup. He makes three gallons at a time. Guess he thinks he's still feeding an army (perhaps you could use your talents at a summer star party?!). \* \* \* \* \* WANTED: WANTED: Used 6-inch or larger reflector, Carl Raymond, 8615 Rivershore Dr., Niagara Falls, N.Y. 14304, Phone 283-3598. \* \* \* \* \* PREDICTED OCCULTATION OF ASTEROID VESTA: asteroid Vesta (mag. 8.0) the fourth asteroid discovered (by Olbers, 29 March 1807), will be occulted by the 3-day-old Moon on May 6. Unfortunately for us it will be visible only from northern New England and the Canadian Maritime Provinces. The southern limit is along a line from Fort Ticonderoga, N.Y. (at Oh 3<sup>4</sup>m U.T.) to the northeastern tip of Cape Cod. Although invisible here (the occultation, that is), it might be rewarding to locate Vesta (position for Oh U.T. = RA 5h52m, decl. +23°29' in Taurus, near the Gemini border, distance from Earth = 3.174 astronomical units). \* \* \* \* \*

\*Late word indicates the Parker-Hankin trip to Africa is off - sorry to say.\*\*\*\*\*

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