

# the Spectrum

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

Editor: Ernst E. Both

MARCH - APRIL 1977

**MARCH MEETING:** Our March meeting (Friday, March 11, 8:00 p.m., New Science, Buffalo State College) will feature George T. Keene in a lecture on "ASTROPHOTOGRAPHY." Associated with Eastman Kodak of Rochester, Mr. Keene is a widely recognized authority in this field and has numerous publications to his credit. We extend a warm welcome to George T. Keene.

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**APRIL MEETING:** Dr. Jack Mack of Buffalo State College will be our featured speaker for the meeting on April 8 (same time and place as above). His topic will be "The Search for the Missing Mass." This is an important topic in cosmology and we are looking forward to an excellent presentation by Dr. Mack.

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**ROBERT KARTYAS MEMORIAL REFLECTOR:** A special showing of the Robert Kartyas Memorial reflector will be made at the March meeting. Bob Mayer has recently renovated the instrument by adding a rotating tube. Tom Dessert has repainted the reflector in the original colors and has said that he will install it at the Beaver Meadow Observatory as soon as the weather improves. The 8-inch, f/8 reflector will be available to our members for general observations. Astrophotographers who are interested in trying various spectroscopic films should contact Tom either at home (652-5530) or at the meeting. The film is free for the asking and Tom will bring orders received prior to a monthly meeting to the respective meeting.

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**FOR SALE: TWO FINE TELESCOPES:** 1) Cave 10-inch, f/6 deluxe Newtonian reflector with rotating tube, clock drive, setting circles and manual declination slow motion. Optics have exquisite definition, \$ 600. ... AND ... 4 1/8-inch, f/15 refractor - home built from commercial parts. Excellent Jaegers objective, 12X40 finder, star diagonal, Edmund equatorial mount on five-foot hardwood tripod, \$ 285 or offer. Contact Larry Carlino, 453 Niagara Falls Blvd., Eggertsville, phone 832-0491.

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**ASTROPHOTOGRAPHY EXHIBIT AT ERIE COMMUNITY COLLEGE SOUTH CAMPUS, April 22-24, 1977:** As part of ECC South Towns Community Fair the B.A.A. is planning a special exhibit of photographs and telescopes by its members. This is an excellent opportunity to show our community what our association is all about. We hope to have many photographs and need the help of volunteers to be present to answer questions, etc. Preferably photographs should be 8 X 10 or larger, glossy, mounted or unmounted. Include on a card the necessary information (date, time, telescope + camera used, etc.) and bring to the meeting or mail before April 15 to E. Both, care of the Buffalo Museum of Science. If you can volunteer for any or all of the above dates, please call Tom Dessert (652-5530) or contact one of the officers at the March or April meetings. **WE NEED HELP!**

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\* OBSERVING JUPITER \* By Lawrence M. Carlino

Now that the paucity of bright planets that dimmed our summer and fall skies has ended with the brilliant prominence of Venus and Jupiter in late winter, the cold,

no longer numbing, should cancel any excuses for staying indoors, excuses which were easy to concoct in mid-winter. Yet a mild case of the shivers or frostbitten toes becomes a reasonable penalty to pay in light of these planets' spectacular telescopic appearances - particularly that of Jupiter. The giant planet hangs high in the southwestern sky in the constellation Taurus during March, and offers a veritable treasure house of observing pleasure for even the moderately equipped telescopic observer. We often tend to look at fabulously detailed photographs of the planets taken through observatory-size instruments and despair - not realizing the marvelous advantages the unique acuity of the human eye gives us. In fact, the skillful observer with a three-inch refractor may detect more Jovian detail visually than a twelve-inch will reveal photographically. Jupiter's high northerly declination this year will aid matters a bit by providing steadier than average seeing conditions.

What, then, can be gained by visually observing Jupiter and its retinue of Galilean satellites? Certainly, the mere thrill of observing such an awe-inspiring sight in its changing configurations provides edification and quiet enjoyment. But, going one step beyond a cursory examination of the planet, a fairly experienced observer, through systematic observation, can make a valid and useful contribution to the overall body of scientific knowledge - and perhaps even make a minor discovery or two. The Jupiter section of the Association of Lunar and Planetary Observers (A.L.P.O.) regularly receives and publishes sketches, transit times of prominent details, and observational data submitted by experienced amateurs.

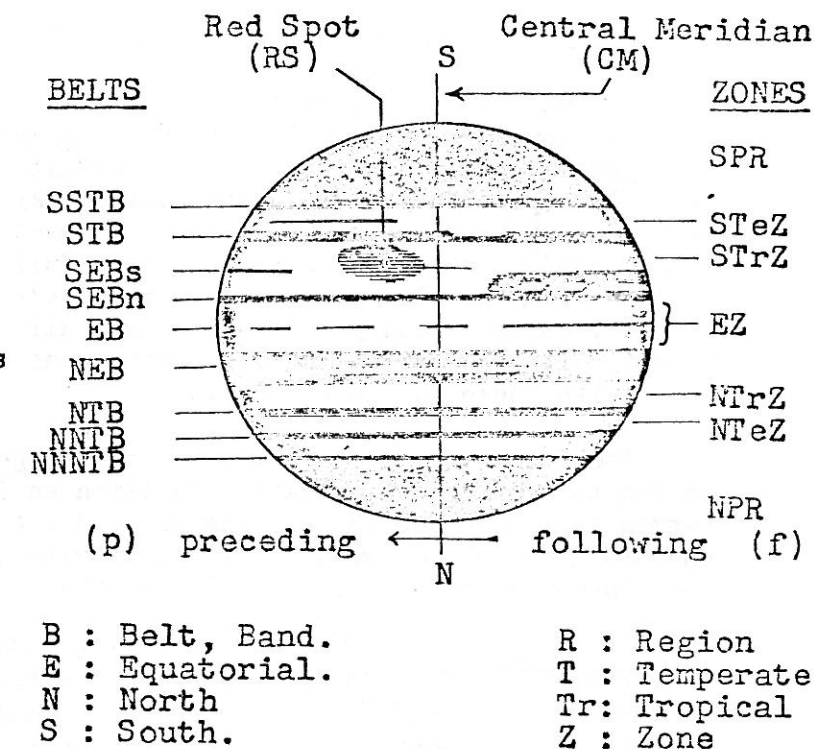
This apparition Jupiter features some fascinating cloud belt detail and the near-disappearance of the famed Great Red Spot. The "spot", for the first time in several years, has lost its intense pink-red hue and is now a ghostly pinkish-white - the northern half being almost completely invisible. Periodic inspection is highly important in determining when the Red Spot (RS) returns to a more normal appearance - if it does! Detail on almost all other portions of Jupiter's disc abounds this season. The North Equatorial Belt (see diagram), which has a definite reddish cast, shows many knots, festoons, and dark projections into the Equatorial Zone. Several short-lived white ovals are found near the EZ, and a number of semi-permanent ones in the South Temperate Zone. The patient observer with a six-inch reflector can see all of this and more, and a larger 'scope makes accurate reproduction of all the Jovian detail on paper a challenge.

How can an observer get the most from his equipment in a Jupiter observing program? Familiarization with the nomenclature and location of the belts and zones (see diagram) is a good start. A perusal of current drawings and photographs will aid in preparation for what recent belt and zone configuration to expect. Those who aspire to sketch planetary detail might also profit from attempting a "dry run" indoors on a simulated "Jupiter" target, a good source being a recent issue of Sky and Telescope or Astronomy. But when one steps into the crisp winter air, the real fun begins. A low power view of Jupiter (say, 75 X through a 2.4-inch refractor) will immediately show the planet's oblate form - the poles being noticeably flattened. If the telescope's optics are good, several of the more prominent belts and zones will be seen. For the next 15 or 20 minutes, observe carefully the latitude of the belts and prepare a mental picture of the major details visible, particularly belt latitudes. During this short period of observation a perceptible shift in the markings will have occurred. In reality, the change in position of a marking near the central meridian will be noticed in less than 45 seconds by an experienced observer! The cause is Jupiter's rapid rotation period: for the EZ and the inner portion of the equatorial belts, this period is approximately 9 hours 50 minutes (known as system I) and is some five minutes longer for the rest of the planet (system II). But there are many local variations, and the interface of the two circulating currents can give rise to some spectacular and rapidly changing detail in the form of festoons, wisps, semi-belts, ovals, and projections.

Naturally, it becomes necessary to fix the exact time of observation (to the minute) once a sketch is started. By penciling in obvious details near the central meridian first, minor details may be filled-in later, in their proper positional relationship. Though the pace can be a bit leisurely, it should never exceed about 20 minutes. In this way the selective moments of really good seeing can be used to their fullest advantage. A clock drive helps matters greatly but is not absolutely necessary. I have often used a "drift" technique with my 4-inch refractor and 10-inch reflector - and it works reasonably well.

If one does have a larger 'scope, one may choose to do a "strip sketch" of only selected Jovian belts that show detailed activity. In any event, all pertinent data (seeing, transparency, 'scope, magnification, filters employed, time, etc.) should be recorded during the observation along with notations of color, intensity, or anything unusual. This "raw" data should be put in final form soon after the telescopic session - human "coloring" of past events being far from objective and reliable should one wait too long. Recording Jovian detail accurately does not require a great deal of artistic talent - just a bit of patience and practice. But even for those who are hopelessly maladroit with a pencil, a series of transit timings of prominent or unusual markings across the Jovian central meridian can be highly valuable, since the rotation period and "drift" of specific features can be determined from these. One must time transits to the tenth of a minute and therefore needs a standard time synchronization "hack" and a stopwatch. Full details may be found in the A.L.P.O. Jupiter Handbook (available from Phillip W. Budine, ALPO Jupiter Recorder, Box 68 A, R.D. 3, Walton, N.Y. 13856). The charge is nominal and the handbook is an excellent starting point for those seeking to undertake a serious Jupiter observing program.

With this in mind, a few helpful hints are in order: 1. Be sure optics are clean and free of frost or the image can be severely degraded; 2. Use the lowest magnification that shows detail clearly (I regularly use 152 X on the 10-inch, and seldom exceed 220 X). Higher powers should be reserved only for excellent seeing and minute, intricate detail; 3. Get the "lay of the land" before attempting a sketch; 4. Try a green or green-yellow filter to accentuate contrasts; 5. Observe when the planet is fairly high in the sky, particularly when looking for belt coloration; 6. Look for the occasional passage of the shadow of one of the Galilean moons across the planet's disc (check your Observer's Handbook for dates and times); 7. If you have access to a 'scope 8 inches or larger and good seeing conditions, look at the different sizes and colors of the discs of Jupiter's moons. At least 250 powers are necessary. A 10-inch or 12-inch at 600 X may actually show some fleeting detail on Ganymede (J III) if conditions are perfect (I have seen faint markings twice in my observing career). Whether you observe for sheer pleasure or because of a scientific bent, the venture into the coming spring outdoors becomes well worth the effort when the giant planet looms tantalizingly within the field of your eyepiece.



Abbreviations of Jupiter's Belts and Zones.



\* SOME RECENT OBSERVATIONS OF JUPITER \* By F. W. Price

I first began systematic observation of Jupiter during November and December of the 1975 apparition and gave a short summary of these observations at the December 1976 general meeting of the BAA. During late 1976 the giant planet was again well placed for telescopic study high in the eastern sky in early evening. All my recent observations were made with 8-inch reflectors in conjunction with a 2.4 X Dakin Barlow lens and a 12 mm Brandon orthoscopic eyepiece. Ten full disc drawings have so far been made, eight of them from Buffalo with my "Criterion" f/7 reflector and the other two from London, England, during January 1977, with my "Fullerscope" reflector which has a Cave f/8 mirror. With the Barlow and the eyepiece used, nominal powers were therefore 269 X and 307 X with these two telescopes.

The following is a description of the general appearance of the gross features seen on Jupiter during the present apparition as I saw them (for an explanation of the terminology used see the diagram on p. 3). A more detailed account with descriptions of phenomena associated with the various belts and zones will be given later, either in the "Spectrum" or at a general BAA meeting.

S. Polar Region: Usually indistinct, sometimes was not certainly seen. No internal detail visible; S. S. Temperate Belt: The least prominent of the visible cloud belts. Appeared to be discontinuous in some longitudes, sometimes not seen at all; S. Temperate Belt: More prominent and broader than the S.S.T.B. Sometimes seen to merge in certain longitudes with the S.E.B.; S. Equatorial Belt: A single broad, pale band. Little or no detail seen within it. Straight edges. No separation into the usual two components; N. Equatorial Belt: The darkest and most prominent of the cloud belts (as it has been for many years). Irregular edges. "Warm" sepia color. About half the width of the S.E.B.; N. Temperate Belt: Sometimes seen as distinctly separate, other times partly or completely merged with the apparently extensive N.P.R.; N. N. Temperate Belt: Never seen. Perhaps merged with the N.P.R.?.; North Polar Region: Distinct and darker than the S.P.R. More extensive in latitude than the S.P.R. or perhaps it is merged with the N.N.T.B.?.; Great Red Spot: I never had a really good view of this object. Twice I saw a pale pink localised area in the latitude occupied by the spot but I could not see any distinct outlines, possibly because of the generally somewhat poor seeing during these observations; Zones: No special estimates of color or brightness were made. A warm brown-yellow color usually seen in the N.Tr.Z, seemingly associated with the N.E.B.

Summary: Although I am by no means an experienced observer of Jupiter, it seems to me that the planet's "surface" is relatively quiescent at present. My study of the literature and drawings made during previous apparitions show it to be very "active" at times with much intricate detail and "disturbances" in the cloud belts and the bright zones. The N.E.B. color phenomena and the consistent appearance of the S.E.B. as a single band are especially interesting. The N.E.B. color phenomena have been known for years but I had no previous knowledge of them when I first began observing Jupiter. They were among the first features to attract my attention both recently and during late 1976 and in 1975.

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\* THE RARELY MENTIONED PRECESSION OF THE SOUTH CELESTIAL POLE \* By Carl T. Milazzo

Almost always when precession is mentioned it deals with the precession of the North Celestial Pole and little is said about the South Celestial Pole. Even my Sky and Telescope star chart, which shows the northern precession, neglects to show southern precession. Some people say that one reason why exploration took place in the northern hemisphere was because explorers there had a pole star to use in navigation. But at times

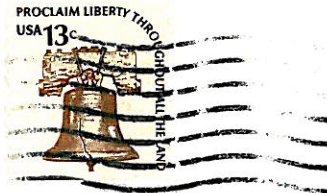
the North Celestial Pole was not marked by a convenient north star, while at times the South Celestial Pole did have a pole star or what could be called a "South Star." The precession cycle is 25,827 years, which means our celestial pole will again be marked by Polaris in the year 27,804 A.D. But by then most of the bright stars seen in our sky will have changed position, and to a lesser extent, apparent brightness. Here is a list of some of the pole stars of the past and future (a map showing southern precession will appear in the next issue of the "Spectrum"):

North Stars				South Stars			
DISTANCE FROM POLE	MAG. OF STAR	STAR	YEAR	DISTANCE FROM POLE	MAG. OF STAR	STAR	YEAR
				1°½	+1.8	GAMA VELA	11,400AD
				1°	+2.0	DELTA VELA	9,200AD
2°½	+2.4	ALPHA CEPHEUS	7,200AD	1°	+2.3	IOTA CARINA	8,000AD
2°	+3.2	GAMA CEPHEUS	4,000AD	1°	+3.0	UPSILON CARINA	6,900AD
27½'	+2.1	POLARIS	2,102AD	1°	+3.3	OMEGA CARINA	5,800AD
51'	+2.1	POLARIS	1,977AD	1°½	+4.1	GAMA CHAMAELEON	3,000AD
60'=1°	+2.1	POLARIS	1,940AD	1°½	+4.6	DELTA CHAMAELEON	2,600AD
2°½	+2.1	POLARIS	1,492AD	1°	+5.5	SIGMA OCTANS	1,977AD
5"	+2.1	POLARIS	1,000AD	2°	+2.8	BETA HYDRUS	100AD
11°	+2.1	POLARIS	100AD	2°	+2.9	S.M.C.	500BC
MINIMUM <1°	+3.6	ALPHA HERCULES	2,832BC	2°½	+2.8	ALPHA HYDRUS	2,800BC
5°	+0.0	VEGA	11,500BC	1°	+4.0	ETA COLUMBA	11,000BC
1°½	+2.9	DELTA CYGNUS	13,700BC	1°	+3.2	NU PUPPIS	12,300BC
				1°	VARIABLE +3.4-+6.2	L2 PUPPIS	13,500BC

**\*\* PARTIAL ECLIPSE OF THE MOON \*\*** A partial eclipse of the Moon will be visible from Western New York during the night of April 3-4, 1977. The Moon will begin to enter the Earth's umbra (darker inner portion of the shadow) at 10:30 p.m. (EST); about half hour before this, while passing through the penumbra (the lighter outer portion of the shadow), a slight darkening of the upper left hand portion of the Moon may be noticeable. Mid-eclipse occurs at 11:18 p.m. (EST), but only 1/5 of the full moon's diameter will be in shadow. The Moon will leave the umbra 6 minutes past midnight, April 4, 1977. For another half hour (roughly 12:30 a.m.) a darkening near the Moon's north pole may be noted. This is not a very favorable partial eclipse since the Moon will never get very close to the darkest portions of the Earth's umbra. But it should provide an interesting sight and hopes are that the weather will cooperate. Because of renovation, the Museum's observatory WILL NOT be open to the public. eeb.

\* SPY AND TELL \* By Edith Geiger ... During the week of February 14th Ed Lindberg gave mirror making demonstrations in the mall in Lockport at the exhibit presented by the Education Department of the Buffalo Museum of Science. Ed urges members who are interested in telescope making to come to the meetings of the B.A.A.'s instrument section (fourth Friday of every month at the museum). For information call 633-6725. Ed is also conducting a course in Telescope - Making at the museum; this course will start March 16 and goes through May 18, Wednesday evenings from 7:30-9:30 p.m. Fee is \$ 30. For registration call the Adult Education Department, Buffalo Museum of Science, 896-5200 ... In the October '76 issue of Collections (new name for the Museum's quarterly), Olga Lindberg has an article on Maria Mitchell, America's first woman astronomer ... Warren Steinberg is busy holding down two jobs. By day he works in a bike shop, and at night he is a sales representative for a building firm. ... If you are planning to travel this year, contact Darwin Christy, for you may be able to help him collect dust samples from afar for his study of micrometeorites ... Orrin Christy is teaching an adult education class at Tonawanda High School. Subject: Astronomy and Exploring the Unknown (extraterrestrial life) ... Bob Mayer is building a base for his telescope to be used at his summer home at Tobermory on Georgian Bay. He has built a firm foundation of stones out on a dock in the bay for some very steady viewing. What a great place for a star party! ... Bob Kirchgessner has been doing a great deal of reading about UFOs and has a large collection of books on the subject. ... Dr. Fred West holds a teaching position at Central Connecticut State College. He is in charge of a planetarium and a 16-inch Cassegrain - we wish him success! \*\*\*\*\*  
PLEASE REMEMBER THAT DUES ARE WAY PAST DUE. IF YOU HAVE NOT PAID YOURS, THIS WILL BE THE LAST ISSUE OF THE SPECTRUM YOU WILL RECEIVE. \*\*\*\*\*

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FIRST CLASS  
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