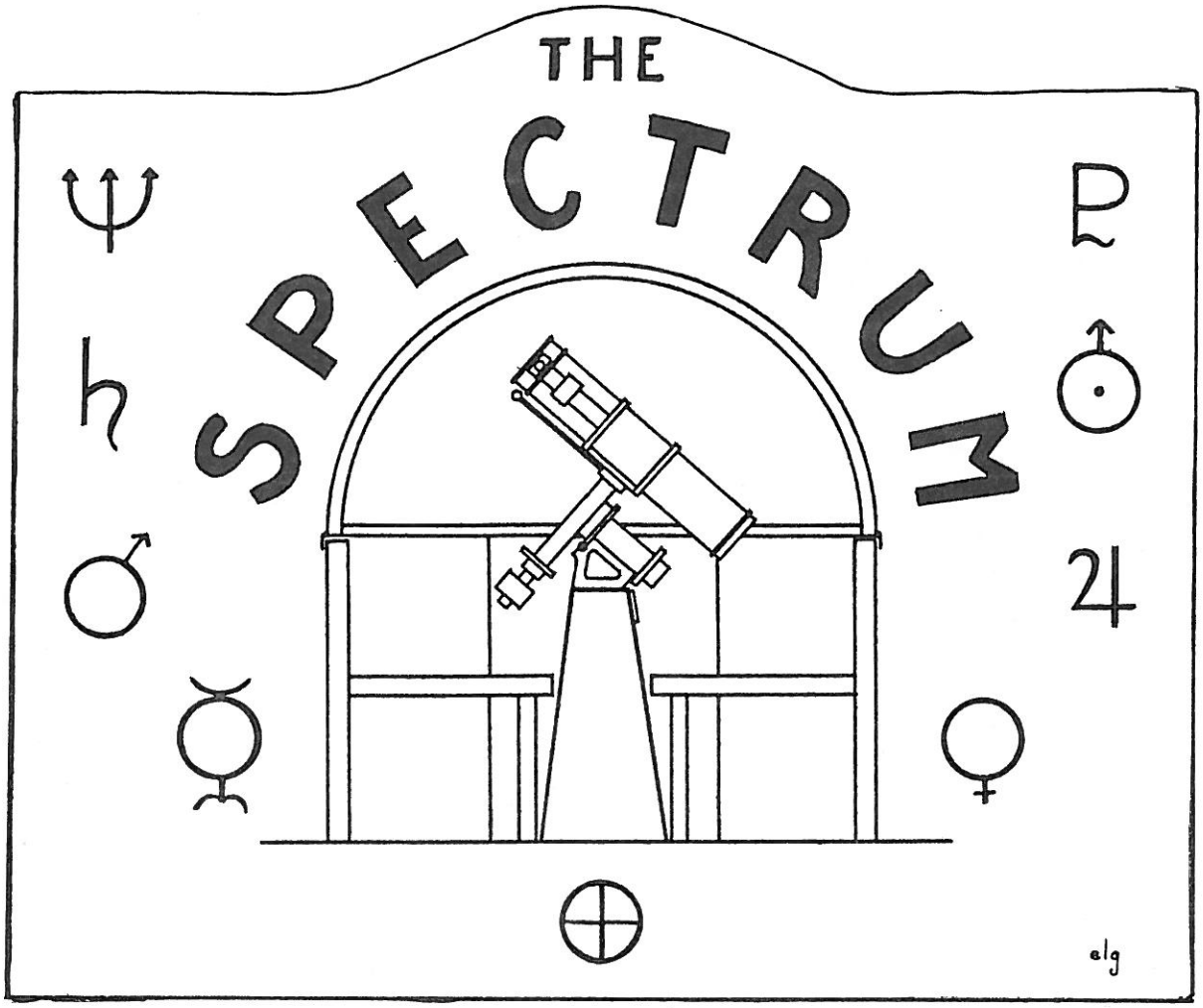

MARCH - APRIL
1984

Buffalo Astronomical Association, Inc.

* RECUURENT NOVAE *

In the last few decades astronomy has advanced spectacularly over a broad range of study. First-of-a-kind objects are discovered, objects like pulsars, quasars, radio galaxies, etc., and soon catalogs are filled with additional samples of each new species. As soon as astronomers define a particular class of objects the vastness of space offers numerous duplicates of the prototype.

But this generally is not true for one type of object--the supernova. At least it's not true for supernovae occurring in our galaxy, where we can get a good look at them. Astronomers must be content to observe these stellar explosions in other galaxies whose great distances drastically diminish the supernova's brilliance.

The last supernova seen in our galaxy occurred in 1604 and is associated with Johannes Kepler, the most prominent astronomer of that time to observe it. This predates the telescope by a couple of years and the spectroscope by a couple of centuries; hence astronomers often lament that no nearby supernova has ever been observed with modern equipment.

Depending on whose opinion one reads, supernovae occur three or four times per century, or per millennium, in t the Milky Way. Those who suggest the higher frequency of occurrence account for our not seeing them more frequently by blaming galactic dust that blocks out starlight from distant regions of our galaxy. The fact that no local supernova has been seen in nearly four hundred years is even easier to explain for those who predict a span of several hundred years between occurrences. Either way, the prospect of seeing a supernova in our galaxy during one's lifetime is so small that we might just as well give up hope.

But we needn't despair entirely. Astronomers tell us that another class of stellar outburst, the ordinary nova occurs about 10,000 times more often than the spectacularly more brilliant supernova. Famous examples of such novae that have occurred in recent years include Nova Herculi 1934, Nova Puppis 1942 and Nova Cygni 1975, reaching magnitudes one, zero and two respectively. Nova Herculi increased 15 magnitudes (one million times) from its pre-nova state to its peak. The other two novae increased their magnitudes by 18 and 19 respectively. A 19-magnitude change corresponds to a 40-million-to-one change in luminousity! This increase in brilliance is so great that Nove Puppis and Nova Cygni were nearly the supernova class. Further study, however, places both in the "classical" nova category along with Nove Herculi,

even though they were far brighter and faded much more rapidly then the latter.

The term "clasical nova" appears to apply to the brightest examples of a whole category of stars that undergo abrupt increases in luminosity. They should not be confused with supernovae or variable stars because in both cases the mechanism causing the change in brightness is very different. This kind of object includes classical novae, recurrent novae, dwarf novae and flare stars with the distinction between them none too clearly defined.

Most astronomers agree that all novae, except supernovae, are recurrent with periods ranging from thousands of years for classical novae to days and even hours for flar stars. The change in brilliance is more or less proportional to the period between nova activity. Dwarf novae and flare stars have short periods and chnage brightness by only 2 to 5 magnitudes. A typical recurrent nova may brighten by 8 or 10 magnitudes every 80 or 100 years. Classical novae like Nova Herculi probably erupt every 10,000 years and increase in brightness ny 15 magnitudes. This long period between outbursts is speculative, but is deduced from the observed rate of novae and the number of stars that are candidates for nova activity. Because there are dozens of novae in the Milky Way Galaxy each year they must be recurrent; otherwise all stars, including our own, would nova at one time or another.

Stars that nova are believed always to be part of highly evolved, close binary star systems. The star that flares is the more evolved member, generally a white dwarf. The other star is entering the giant stage; in other words, it is approaching the final stages of its stellar life which, for the dwarf, has already passed. As the giant's gaseous envelope swells, the outer layer of hydrogen becomes loosely attached. The nearby dwarf attracts this gas, drawing it from the giant to form an accretion disk of inburned hydrogen. In time, this gas condenses on the hot surface of teh dwarf and , eventually, ignites to produce the nova. Generally speaking, if the dwarf accumulates hydrogen for a long time before the eruption, mpre fuel will be available and the greater will be the flare, explaining neatly the relationship between period and brilliance.

Most of these systems exhibit a perculiar property. The degenerate white dwarf is usually less massive than the giant star which is just leaving the main sequence. How can this be if stars in a binary system are born at the same time and if more massive stars evolve faster than less massive stars? It should be the other way around--the white dwarf should be the more massive component.

The answer lies in the extreme closeness of the binary system; sometimes the compnents actually touch one another. Originally the star that became the dwarf was the more massive partner, It evolved rapidly and expanded into the giant stage spilling its material onto the less massive main sequence star. By the time the first star became a white dwarf its companion had acquired so much material that it became the more massive component. This new mass accelerated the companion's evolution until it became a giant, the stage reached when recurrent novae can occur. The giant now returns its borrowed mass to the degenerate donod causing eruptions in the latter.

Each outburst results in the ejection of a tiny quantity of gas (relatively speaking) into space forming an expanding gaseous envelope around the system. It looks a little like a planetary nebula, but the gas is much less massive and is formed by entirely different means. My measuring the rate of expansion of this gas over the years, and also finding the Doppler shift of its spectral lines, we can determine the distance to the system and learn much about its absolute luminosity and mass--hte essential properties in out understanding of any stellar object.

So it turns out we can somewhat assuage our disappointment over the absence of supernovae by turning to recurrent novae as a source of study and speculation. It is to be learned about these complex binary systems that should help us while away the time until the long-awaited supernova occurs.

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** More on Double Star Colors **

Ken Brown, our March speaker, received a copy of the January-February 'SPECTRUM' and sent this note on double star colors. ed.

I enjoyed your article on double star colors. While looking at them at times I have not tried to describe the colors as you have done. This sounds like a good club project to have as many members as possible look and describe the colors for a list of doubles.

In any event I pulled out a few books in an effort to try to find more information for you. Not too much luck but Descriptive Astronomy by G. F. Chambers, 1867 had a few goodies:

Name	Magnitudes	Color-'A'	Color-'B'
η Cassiopeiae	4.0 - 7.5	Yellow	Purple
α Piscium	5.0 - 6.0	Pale Green	Blue
γ Andromedae	3.5 - 5.5	Orange	Sea Green
ζ Cancri	5.5 - 8.0	Orange	Blue
ϵ Bootis	3.0 - 7.0	Pale Orange	Sea Green
γ Coronae	5.0 - 6.0	White	Light Purple
α Herculis	3.5 - 5.5	Orange	Emerald Green
β Cygni	3.0 - 7.0	Yellow	Sapphire Blue
σ Cassiopeiae	6.0 - 8.0	Greenish	Bright Blue

These were cited as good examples of colored pairs.

Smyth's Cycle of Celestial Objects was published (?) in 1840.

Struve double star catalogs published:

1822 - 795 stars observed at Dorpat
1827 - double stars seen at Dorpat
1837 - 3112 stars observed at Dorpat
1845 - 514 Double and multiple discovered at Pulkova with great refractor
1852 - 2874 stars observed at Dorpat, reduced to 1830

Other interesting bits in Chambers book:

List of double stars - no colors given
List of triple and multiple stars
List of variable stars
Catalog of 293 red stars
List of all the priciple Catalogues of Stars and other celestial objects which have ever appeared!!! (128 B.C. - 1866 A.D.)

Plus much more in 816 pages!

If I run across any other information on colors of doubles I will let you know.

Ken Brown
Astronomy Section
of the Rochester Academy of Science.

* * * * *

'SPECTRUM' deadline is April 25th

??? QUIZ ???

The answer to the 'word extraction' quiz in the last issue of the 'SPECTRUM' is:

Word #1 - SATURN Word #2 - KEPLER Word #3 - JULIAN Word #4 - SYSTEM Word #5 - PLANET Word #6 - OCULAR Word #7 - BOOTES Word #8 - COMETS

How did you make out??? If you like these - please let the editor know and more will be made up.

'SPECTRUM' deadline is April 25th

Spy and Tell

Dave Bertuca is back in school working on his Masters in library science at the University of Buffalo Amherst Campus studying computers and record keeping systems. Along with his studies he has a job working in the art library, where he is also filing slides on art. He graduated in photography from R.I.T. in Rochester, and was a free lance photographer before he decided to work on his Masters.

Former member, Gene Witkowski, is in Thailand, building a house for some friends. He plans to be back in Buffalo before the year is over. He reports that it is very strange to see Orion coming up straight instead of sideways as we see it here.

Robert Hughes works at Radio Shack Repair in North Tonawanda as an electronic technician. The company services the area from Cleveland through to Syracuse, so Bob is an especially busy man.

Gil Brink is on a sabbatical leave from the University of Buffalo, and will be sojourning to several laser labs. He will visit M.I.T., Princeton, the Bell Lab in New Jersey, and Los Alamos in New Mexico.

Jerry and Adrienne Morris are involved in many things. Jerry works at the Lotepro Corporation on the Ridge Lea Campus in Amherst Commerce Park. The company makes oxygen equipment, and Jerry does computer work for the company. Jerry sings tenor in the well-known Amherst Male Glee Club under the direction of Walter Reitz. Both Jerry and Adrienne teach religion to seventh graders on Sunday mornings at St. Amelia in Tonawanda, and sing in a folk group at the mass on Saturday evenings. Adrienne is also a Girl Scout leader in Lancaster for a group of mentally retarded girls ages 13 to 21.

Tristan and Debbie Dilapo have purchased 10 acres on Cole Rd., 1/10 mile south of Wohlheiter Rd. in North Boston, with an elevation of 1675', on which they will build a geodesic dome type house. The area is one of the most beautiful in the county and the view of the skies is superb.

Edith L. Geiger

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- ASTRONOMICAL HAPPENINGS -

SOLAR:- The Sun passes from Pisces into Aries in March and from Aries into Taurus in April. On the 20th, we will experience the Autumnal Equinox when the Sun will be due east in the morning and due west in the evening. Just think---warmer weather is just around the corner!

LUNAR:-New Moon - March 2nd & April 1st & 30th
First Quarter Moon - March 10th & April 8th
Full Moon - March 17th (Sap moon)
April 15th (Pink moon)
Last Quarter Moon - March 24th & April 22nd

Lunar Conjunctions:- Mercury - April 2nd
Venus - March 30th
Mars - March 21st & April 17th
Jupiter - March 24th & April 21st
Saturn - March 20th & April 16th
Uranus - March 22nd & April 18th
Neptune - March 23rd & April 20th

Planetary Conjunctions:- Mercury & Venus - April 29th

March 13, 1855 Percival Lowell was born

METEOR SHOWERS:-March 11 - Zeta Bootes
March 16 - Corona Australids
March 26 - Virginids *****
April 9 - Alpha Virginids
April 17 - Rho Leonids
April 21 - Lyrids *****
April 25 Mu Virginids
April 28 - Alpha Bootes

* * * * *

+ Limits of Visual Perception +

Upon occasion I like to push my visual skills to their limits. After doing this repeatedly some interesting patterns result.

1) As most of us probably already know the human eyes sensitivity to faint light markedly improves as one views a given object off the central visual axis. This visual center or fovea centralis is composed chiefly of the so called cone shaped retinal cells which are chiefly responsible for color perception and acute or sharp vision. While the fovea retina is necessary for viewing colors and details, indeed if absent it would be practically impossible to read a single page of writing, it is nevertheless relatively insensitive to dim light. The surrounding retina, however, is primarily populated with rod shaped cells which are much more sensitive to feeble illuminations. Thus we are faced with two choices, visual acuity or visual sensitivity. For viewing really faint objects, though, it should be obvious that off axis or averted vision is the way to go. For most people this amounts to the ability to see stars or other more diffuse objects as much as 1.5 magnitudes fainter via averted vision than is possible when staring directly at the target object. Putting it another way, by not directly staring at a faint object but instead concentrating ones gaze a little to the left or right the apparent aperature of a given telescope can be seemingly as much as doubled! This is of course something of a maximum case. For my own eyes I have determined a 1.2 magnitude differencial.

2) All of the above holds true at any single magnification but the limit of visual detection can be still further improved by the judicious use of higher powered eyepieces. This is so, simply, for reasons of contrast.

Even on the highest mountains on earth some amount of natural airglow remains, in addition to this many sites also have present both chemical and light pollution. All this tends to drown out the light of faint stars. Therefore, if the magnification is, for instance, doubled,- stars or other compact objects which are imaged essentially as points still remain as points. The sky glow, however, is now dispersed over four times its previous area and is thus, relative to the star, diluted. Presumably every doubling of the magnification would result in, once again, a 1.5 magnitude greater penetration into space.

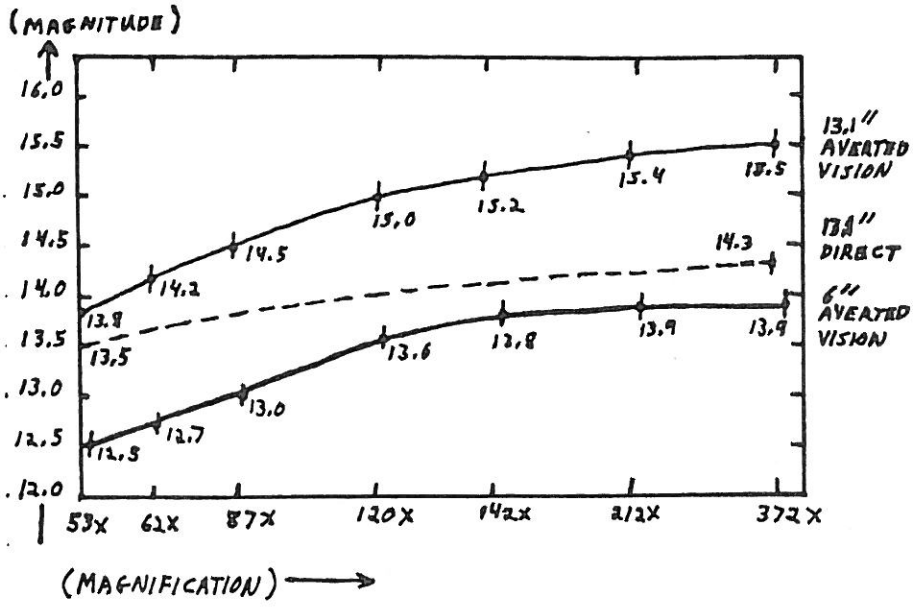
3) To a degree this is true but soon still another factor becomes very apparent. At some point the image begins to degrade, due to the ever present turbulance within the earth's atmosphere, faster than the sky background is darkened. My own experience is that on an average night seeing-conditions tend to break down a point image at about 15x - 25x magnification per inch of aperature. On nights of superior seeing conditions up to 32x magnification per inch of aperature can be employed.

4) Atmospheric turbulance really poes seem to consist of convective cells of, typically, 4 - 8 inches diameter. This can be nicely demonstrated by defocusing a bright star so as to form a large disked image. Since the telescope's aperature is known the apparent faction of the aperature covered by a given turbulance cell can be immediately ascertained.

Clearly smaller aperatures are relatively more efficient, on the average, in producing the required crisp images. All be it with ever decreasing returns, larger aperatures always prevail as per seeing fainter stars in the end results.

5) Almost needless to say, the glare of nearby lighting must always be avoided. To my eyes local outdoor lighting is at least as damaging to telescopic sensitivity as is light pollution.

All of this can, perhaps, best be shown graphically by using my 13.1" and 6" reflectors as example:



6) Lastly, practice does seem to improve your observing skills. What initially might have been considered very difficult or even invisible may eventually be found to be, instead, easy!

Michael Idem

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*** CONSTELLATIONS ***

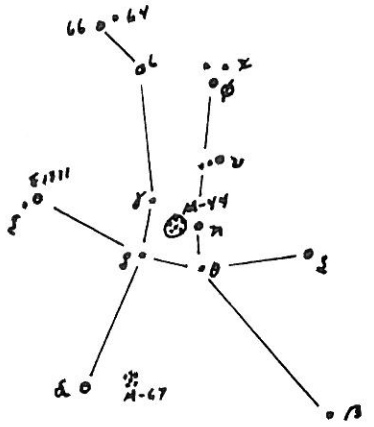
and there a Crab
Puts coldly out its gradual shadow claws.
-Mrs. Browning

CANCER (the Crab) is one of the zodiacal constellations and lies between Gemini on its east; Lynx on the north; Leo on the west; and Hydra on its south. ---or in right ascension from 07h 55m to 09h 22m and from +7.5° to +33° declination.

The "Tropic of Cancer" has that name, which marks the point at which the Sun arrives at noon overhead at the summer solstice. This point also alludes to the Sun's journey back south where it will reach its southern most point in Capricornus where the "Tropic of Capricorn" is so named. It therefore marks the northern most boundary of the Earth of the points where the Sun can be seen at the zenith. Perhaps the most noted object in Cancer is the 'Praesepe' or 'Bee Hive' cluster. It acted as a sort of barometer for the ancients as explained by Pliny, "If Praesepe is not visible in a clear sky, it foretells the coming of a violent storm." Another name appropriate was the 'Manger' from which Gamma (Asellus Borealis, the northern ass) and Delta (Asellus Australis, the southern ass) were seen feeding at the 'Manger' in the eyes of the Greeks. As the 'astrologers' were concerned that the Crab was cancerous, they decided that it should be changed to, of all things, the 'Moon Child.' so-be-it....

Objects of interest include galaxies, open clusters, variable stars and double stars. The galaxies are:- NGC's 2545, 2608, 2623, 2672, 2749, 2764 & 2775 and are found in the Sky-Altas 2000.0. Open clusters are the famous Bee Hive, M-44 @ 08h 40m R.A. +19.5° declination; M-67 @ 08h 51m R.A. +12° declination. Variable stars are:- V, UV, RZ, S, X, T, RS, RX, VZ, R, RT @ W. Double stars include Zeta, Phi^2, Iota^1, Delta, Rho^1, Alpha(Acubens, 'claws'), 11, 24, and 66.

Incidentally, Cancer, with Leo Minor, Lynx and Leo form a cross-over boundary, where the four corners meet.



ed's note:- because of the Earth's precession, the above article is no longer true. It was in the abcient times that the Tropic of Cancer and Tropic of Capricorn were established.....

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FOR THE "VIC 20"

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5 POKE36879,27
10 X=7680
20 POKEX+9,42
30 POKEX+22*2+14,126
40 POKEX+22*7+10,123
50 POKEX+22*8+12,123
60 POKEX+22*9+10,15
70 POKEX+22*11+9,42
80 POKEX+22*11+12,126
90 POKEX+22*11+16,123
100 POKEX+22*18+7,42
110 POKEX+22*18+9,15
120 POKEX+22*21+15,42
130 PRINT"CANCER"
135 PRINT"[redacted]M-44
140 PRINT"[redacted]M-67
150 FORT=1TO1000:NEXT
160 POKE36879,10
200 GOTO200
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ANTLIA (Antlia Pneumatica, the Air Pump) is one of the more modern constellations being only about 200 years old. It was one of the broken pieces of the constellation 'Argo Navis' which was considered to be too large and cumbersome for modern astronomical handling. Others which underwent the transition were 'Carina' (the Keel), 'Vela' (the Sails) and 'Puppis' (the Deck).

Its boundaries are between 09h 27m @ 11h 6m R.A. and in declination from -24° to -40°; between the constellations Hydra on the north; Pyxis on the east; Vela being south; and Centaurus on its west. It is not a very conspicuous constellation for it was formed from the lesser star studded heaven when broken up as before mentioned. The brightest star being Alpha, only 4th magnitude.

Notable objects are numerous though, and include galaxies, variable stars and double stars. Galaxies with NGC's are 2997, 3001, 3038, 3056, 3087, 3089, 3095, 3125, 3175, 3223, 3241, 3250, 3258, 3271, 3275, 3281, 3347, 3350 and 3449. Variable stars include S, RR, X, R, V and U. There are three doubles, Zeta, Theta and Delta. It is a southern constellation, although it can in part be seen from our latitude.

* * * * *

Marilou B. Bebak

Marilou has spent most of her life in Hamburg. She received her early education in the Frontier Central Schools. After graduation she enrolled in the New York State University College at Fredonia where her first major was French, the study of which she had started in elementary school and continued through high school and into college. After having spent a total of seven years on the language, she changed her major to English, with a minor in communications, and became involved in the campus radio and television station, WCVF. She was a disc jockey in the evenings for one year, with the programs being heard over a five mile radius. She spent four years as music librarian and working as news editor and in programming. Marilou received her B.A. in secondary education.

She has been interested in journalism for several years, and if Fredonia had offered a major in communications, she would have enrolled in the course. It is possible that at some future time she may go into radio or television where she would like to do work behind the scenes, editing, directing, and doing research.

Her first position was at St. Francis Elementary School in Athol Springs where she taught for four years. For the past six years she has taught science from fifth through eighth grade and English in seventh at the Annunciation School in Elma. Once a year she directs a play in which music is sometimes included. Marilou is also the coordinator of the Science Fair, and is very proud that during the six years she has been at Annunciation, the students have consistently won medals at the Science Congress held at the museum.

While going to college, Marilou spent summer vacations working on the playground for the Hamburg Recreation Department. After college she worked indoors and also conducted winter programs. She is now supervisor for the department.

She has always been interested in the space program. At St. Francis she was introduced to astronomy through the questions of, then student, John O'Dee, now a B.A.A. member, which she couldn't answer. This sent her scouring through books for material on the subject. When she transferred to Annunciation, she faced the same problem when Bob Dessert, son of former member, Tom Dessert, asked more questions in astronomy for which she had no answers. Bob suggested that she go out to the Beaver Meadow Observatory, which she did, taking John O'Dee along. She became acquainted with Tom, who taught her a great deal about astronomy during her many visits. She then learned about the Public Nights at the Kellogg Observatory and Ernst Both's lectures on astronomy. Ernst helped her to further understand the subject, and she finally found herself assisting on Public Nights in the observatory. She continues in that capacity and also helps with the solar shows during the summer months.

Her main interest in astronomy is the study of the planets, and the space program, especially the Voyager mission. She has a strong desire to understand the how and why of creation, and the relationship of the insignificant speck of dust on which we live, to the rest of the universe. Besides the museum telescope, she uses her 7x50 binoculars for observing, and hopes to get a larger pair to mount on a tripod. She has several wishes which she yearns to fulfill, including visits to Cape Canaveral, and Mount Wilson and Palomar Observatories. She nourishes a dream to ride in the space shuttle, and fantasizes about starting the first school in space, a sort of Little Schoolhouse on the Space Station. She regrets that children in school today don't know much about the space program, so she is doing all she can to educate them

Along with her other activities, Marilou is an ardent reader of mysteries, especially those of Arthur Conan Doyle and Agatha Christie. She enjoys crocheting, and finds time to sing in the choir at St. Peter and Paul in Hamburg. She is also involved in the Right to Life movement. Her home is on Lakeshore Road in Hamburg where she receives great pleasure walking along the beach and viewing many glorious sunsets.

Marilou is a radiantly happy person with vibrant energy and enthusiasm, enjoying the very full life she leads. We find delight in her engaging personality, and admire her ability to communicate freely with friends, students, and the public she encounters at the museum observatory. She has enriched our membership by her presence.

Edith L. Geiger

1983 OBSERVING CONDITIONS

Some time ago I used to keep records on the night skies in regards to the window which we have for observing the stars, planets and moon. I had dropped this practice for a period of time as the chances of finding more than about 10% of the nights to be clear was obviously nil. In 1982 I found that the number of nights to observe were becoming greater than the 10% afore-mentioned. With that in mind, I decided to record 1983 with the following results.

In January of 1983 there were 10 nights in which to observe the heavens, one of which a beautiflu Aurora occurred on the night of the 9th. This number of clear nights proved to be 32%. I did not record the window in degrees of clarity, only that one could use their eyes, binoculars or telescopes to see those precious objects we amateur and professional astronomers might hope to see. In February, which has but 28 days, I recorded 13 nights for observing. Perhaps there were three or four evenings which were not too appealing for observations but at least the stars were visible. I have found that even though the sky is hazy, the planets are about as easy to observe as they would be on a perfectly clear night.

In March, 13 nights were recorded as good to excellent. That makes more than 40% observable nights. I may not have been in my observatory that many evenings but I managed to use the telescope a few of those nights. March also is when the nights and days become equal in length, followed by shorter nights into the summer months and warmer weather.

April brought but 8 nights for observing, but then we are in that month of showers. It may not have been the best, but we did have a couple of exciting nights. The Lyrid meteor shower was very good around the 21st. In May found a large number of good evenings, 21 to be exact. My recollection tells me that there were 8 difficult nights, but 13 very good viewing nights. That is 67% clear nights as apposed to the 10% throughout the past years. Then the best month in the year, June, totaled 27 viewing nights. 16 were the more difficult variety, where-by 11 were of the excellent nature. That accounted for 90% unbelievable well deserved nights. The highlight of the night-watch w was a partial eclipse of the moon. That was a very good morning (I know!). Winding up with the first half of the year (six months) I recorded 92 observable nights out of 181 for an average of 51%.

July began the second half of the year with 21 observable nights of which 4 were exceptional. This sort of ma makes me believe that observations of the heavens is becoming better, even from within the city limits. Then came August with but 14 observable nights although 8 were of the best variey. Of course these nights are for the fair weather astronomers, being warmer and even going into the next month of September where 17 nights were recorded as being beautiful evenings to observe. Also-- in September the nights will surpass that time of longer nights and shorter days. Aurora were seen three nights, though not too brilliant, on the 24th, 25th and 26th.

October was far better than in the past years yielding 13 very good nights out of 14. Why, all of a sudden, is this happening? I do not have the answer but I am sure hoping it keeps the pace. Even November has become better with but 7 nights, making it 23% observable. Then in December we were entertained with 10 nights, one of which gave us a partial penumbral eclipse of the moon on the 19th. It was cold that night, being about 10 degrees fahrenheit, but I managed to keep warm by the excitement. In this second half of the year I recorded 86 out of 184 clear nights, or about 47% clear. The overall picture is 178 nights of the kind of windows we like to see, out of 365. That gives us near 49% which is a lot better than that 10% in the past few years in this area.

BETTER LUCK THIS YEAR OF 1984

Darwin Christy

++++++ MEETINGS ++++++

The MARCH & APRIL meetings will be held in the Buffalo Museum of Science, Humboldt Pkwy., Buffalo, N. Y. starting at 7:30 P.M. SHARP!

MARCH - The March 9th meeting will behheld at the Buffalo Museum of Science starting at 7:30 P.M. Ken Brown will speak on "A Cometary Commentary - Halley's Comet From When 'til Now". Ken is a member of the Astronomy Section of the Rochester Academy of Science and was an analytical chemist with Eastman Kodak until his retirement last year. He has been interested in astronomy for 40 years, has built two Newtonian telescopes and is a fellow of the Rochester Academy of Science. His well-known collection of astronomy books hovers near 500 volumes. Let's welcome an Old friend -- Ken Brown.

APRIL - Our meeting for April 13th will be the final mee meeting of the year at the Museum of Science. Our speaker will be Tom Dey, former president of the Astronomy Section of the Rochester Academy of Science and as amateur astronomer for five years. He is a graduate of the University of Rochester and has obtained master's degrees in optics and mathematics. Tom is currently employed by Eastman Kodak.

His talk, entitled, "Equipment for Amateur Astronomers will highlight his activities as an amateur astronomer. His projects include four telescopes he has designed and constructed, a domed observatory he has built, a homemade nebula filter and a unique binocular finder scope. Tom is also experienced in wide field astrophotography using gas hypersensitized film. Tom will even be offering a door prize! Meeting time is 7:30 P.M.

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- OBSERVATIONS -

A Curious Observation

December 29-30, 1983 while observing the variable S Lyncis, I happened to notice a most unusual earth satellite situated in the same field. During this 6 minute observing run the satellite traversed only 1/4° of sky. Assuming a circular orbit, this corresponds to, approximately, a 6 day orbital period. Visually this object was dull red in color and varied between magnitude 12-13 over a period of three seconds. Orbital inclination was about 50°.

Michael Idem

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A +1 magnitude white meteor was seen on January 28th at 7:48 P.M. in the constellation of Canis Major. It traveled 10 degrees in a half second moving SSW 15 degrees below the star Sirius.

Periodic Comet Crommelin was located in Pisces with a 5 inch f4.2 refractor at 21 x on February 1st at 6:30 P.M. It was 9th magnitude with a 1 minute of arc coma, and it's orbital period is 27 years. The comet is also known as 1983n and is predicted to reach a maximum brightness of +6.3 on March 2nd as it passes through the constellation of Cetus.

A -1 magnitude man-made orbiting satellite was seen on both February 1st and 2nd at 6:20 P.M. moving from the constellation of Auriga through Gemini.

Carl Milazzo

- - - - -

10:00 A.M.EST - The last few months the Sun has been almost spot-free but not so today (28 January 1984). Present today, on the central solar meridian was an extensive sunspot chain. This disconnected chain spanned 150,000 miles along an E-W axis. The two largest spots consisted of singular penumbral masses within which lay a confused system of multiple umbral centers. The lead-spot was some 15,000 miles in diameter but the two following assemblies exceeded 30,000 miles in diameter.

Michael Idem

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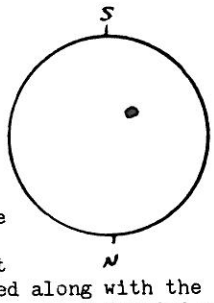

The Sun affords many spots during cycles, but not too many which are seen without the aid of a telescope or binoculars. In my study, where I observe meteoric dusts, I have been recording an 'anomaly. Thus- on the 13th of February at 9:00 A.M. I observed a spot on a white surface of a wall where the Sun's image was being cast from a pinhole in the window. At first I thought it to be a smudge, but that smudge creeped along with the Sun's image. It appeared to be rather large so I decided to take a look at it through a welder's glass. I did not make any measurements, but there was a naked eye visible sunspot.

Darwin Christy

* * * * *

*** DEEP-SKY SURVEY COMPLETED ***

From April 2-3, 1980 to February 8-9, 1984, I have succeeded in observing a total of 2507 Deep-Sky objects from my moderately light polluted suburban observing site. Therefore I can now clearly define the results.

At this site the yearly averaged naked eye magnitude limit is 5.0 with a corresponding telescopic limit of magnitude 14.8. The telescopic limit for the average night employed for Deep-Sky Observations, however, was magnitude 15.3 and for the naked eye 5.5 to 5.8, respectively. The objects observed ranged from a very bright magnitude 0.8, for the extensive Hyades Open Cluster, to a very feeble magnitude 14.7 to 14.9 for some of the faintest galaxies. The majority were observed with a 13.1" aperature and as such 600 were rated bright and easy, 300 moderately bright and easy, 400 moderately faint and difficult, 400 faint and difficult, 500 very faint and difficult, and about 300 extremely faint and difficult.

The alrger diffuse nebulae were most readily visable at 62 x plus a nebular filter. Even so for anything other than low surface brightness emission nebulae these filters are overrated, in my opinion. The smallest and faintest planetary nebulae and galaxies were best viewed at 142 x or 212 x, depending on the seeing conditions. Broken down the objects observed total: 397 Open Clustwrs, 92 Globular Clusters, 128 Planetary Nebulae, 139 bright or dark Diffuse Nebulae, 1737 Galaxies, and 14 Quasar or other peculiar type systems.

From all this I conclude that given a naked eye limit of magnitude 5.5 my own eye - telescope combination could view a total of 2600 ± 50 accessable Deep-Sky objects. I'm pretty sure of this for I have virtually exhausted this suburban site's capabilities. As best I can determine this sequence of observations required 673 hours to complete.

This, though, is no great feat for two centuries ago William Herschel did equally well without the aid of coated optics and an equatorial mounting.

Likely 6000+ Deep-Sky objects should be visable with similar equipment located at a dark country site such as Beaver Meadows.

Michael Idem

* * * * *

The BAA ANNALS should be right here but our back issues of the Spectrum are lacking for this two month period for all of the years that I would normally be researching. If I had caught on to this a bit earlier I could have polled the membership for back issues or information.

Sorry.....KEN KIMBLE

INSTRUMENT NOTES

The Instrument Section of the B.A.A. has been meeting monthly for nearly 20 years. The early meetings were involved with completing the B.A.A. telescope at Newstead and later attacking various problems involving the observatory.

During these early years Museum Telescope Making classes were held nearly every year and after a class some of the students would bring their work over to the Instrument Group to get advice and suggestions.

The present group continues the tradition of helping the T/M's. Makers frequently bring in some device that they have built, either to show the group or to get ideas and suggestions.

The T/M clinic is still a big part of the meetings. At the February meeting Bill Mastroleo, who made a mirror at the museum class in the fall of 1979, and who is now a lawyer, brought in an 8 inch mirror that he had just polished. It had a beautiful spherical figure with a brilliant polish. He also had a 12 inch mirror in the rough grinding stage. It had a very evenly ground surface, needing only a little more depth.

It is always satisfying to see T/M's complete a telescope and again, after one has been made, tackling a more advanced project. If you have a semi-finished mirror or telescope or other gadget put away in your storage area, don't be ashamed to dust it off and bring it in. We will help give you the strength to finish it. Now is a fine time to work on equipment for next summer's enjoyment.

Ed Lindberg

* * * * *

+++++ OBSERVATORY NOTES +++++

The new season of Public Nights at Beaver Meadow Observatory begins this year on Saturday, April 7th and will run to October 20th. Once again, the first and third Saturday nights of a month will be reserved for Public Night. During July and August however, Public Night will be held EVERY clear Saturday night. Volunteers will be needed!! Please don't hesitate to help out. Your contribution is vital to the continued success of Public Night - and the Observatory. To make scheduling arrangements, please call 875-7965. This is the best way our club has to reach out and expose others to the world of astronomy. It is also one of the best ways for our own members to come and see the night sky the way it really deserves to be seen. If you are in doubt about times or dates check the Friday evening BUFFALO NEWS, "Gusto" section, under Beaver Meadow, for details and a gen general listing of objects that will be on view.

John Riggs

* * * * *

Editor's note

It has been a pleasure to have been editing this newsletter for the past five years. I have had good response when I have asked for articles, observations and what-ever. Had it not been for the response from so many of you this newsletter would not be what it is today. I, alone, cannot make it happen. SO----I am writing this as a sort of editorial and asking for more articles from the general membership as well as observations and trivia.

For those who contribute continually, my thanks go to you ever so robustly, and it is appreciated immensely. For those who contribute occasionally, it surely is appreciated also. I do need articles and what-ever for the up and coming newsletters. THANK YOU ALL FOR THE SUPPORT I HAVE GOTTEN!!!

Darwin Christy

* * * * *

The sparkling MILKY WAY.

After Sunset,
The COSMIC dark unfolds.....

STUDY GROUP

The Study Group attendance picked up a little last month but it is still not as good as it could be. Perhaps if we keep plugging the group, attending meetings will catch on!

At the March meeting of the group the topic will be stellar magnitudes. Members will study up on the subject for a discussion. Possible areas of interest might be the calculation of magnitudes, or the definitions of apparent and absolute magnitudes. Also the methods of measurement. (e.g.- visual, photographic and photo-electric)

The subject for the April meeting will be slightly different than the usual fare in that it will not be exactly astronomy per se. I am going to lead a discussion on atmospheric phenomenon such as rainbows, halos and the like. Even though it is not pure astronomy it is a subject that many people interested in astronomy are curious about. Come and learn about some of these beautiful occurences and broaden your interests in skywatching.

KEN KIMBLE

=== From the Past ===

DEEP-SKY OBJECTS IN MARCH

The March skies bring into a favorable position the galaxies in Ursa Major. Besides the more notable M-81 and M-82, I have selected some of the galaxies in the bowl of the dipper which might be of interest to observers with a six-inch telescope or larger. Starting at Beta Ursae Majoris and then moving about a degree and one half east the observer can easily find M-97 (the Owl Nebula) and M-108. With the 6-inch reflector at 32 x, M-97 appears as a large grayish disk, but the "eyespots" (of the Owl) are not visible. An 8-inch reflector will probably reveal these. Almost in the same field of view M-108 is an interesting object, appearing as a long, hazy streak with a mottled texture.

Abour one degree south of Gamma Ursae Majoris, NGC 3953 is fairly good and can be seen as a faint fuzzy glow (*) with a mottled appearance. North of Gamma can be found three more galaxies, NGC 3998, 3982 and 3899. The best is NGC3898, seen as a fuzzy patch with a brighter nucleus. The other two NGC 3998 and 3982 are merely faint fuzzy little balls of light.

(*) The wonder of young eyes! Personally, all of these objects look fuzzy to me. Seriously, though, beginners in the art of DEEP-SKY observing might want to search for the objects mentioned here and in the future issues.eeb.

Editor's note: The article is from the March 1969 issue of the "Spectrum", written by John Riggs. The foot-note was contributed by Ernst Both. Interesting enough, I would like to see these articles more as time goes on. What is the reaction from the general membership??????

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