

THE SPECTRUM



BUFFALO ASTRONOMICAL ASSOCIATION, INC.

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ASTRONOMER FROM THE PAST

JOHANN ELERT BODE WAS BORN JANUARY 19, 1747 IN HAMBURG, GERMANY AND DIED NOVEMBER 23, 1826. A GERMAN ASTRONOMER, HIS FIRST WORK ON A SOLAR ECLIPSE APPEARED LATER IN 'ANLEITUNG ZUR KENNNTNIS DES GESTIRNE HIMMELS' (1768). IN 1772 THE BERLIN ACADEMY CHOSE HIM THEIR ASTRONOMER AND IN 1786 HE BECAME DIRECTOR OF THE BERLIN OBSERVATORY. HIS BEST WORKS ARE 'BERLINER ASTRONOMISCHES JAHRBUCH' OF 54 VOLUMES (WHICH BEGAN IN 1774) AND 'URANOGRAPHIA' PUBLISHED IN 1802 COMPOSING OF 20 SHEETS. THIS CATALOGUE INCLUDED 172,400 STARS --- 12,000 MORE THAN ANY PREVIOUS CHART.

BODE'S EMPIRICAL LAW RELATING TO THE DISTANCE OF THE PLANETS FROM THE SUN IS VERY WELL KNOWN.

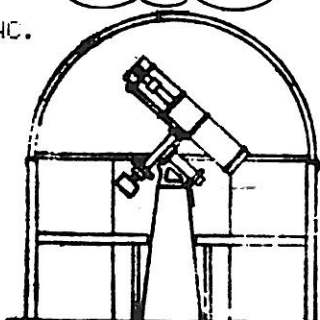
DARWIN CHRISTY

A SUMMARY OF ACTIVITIES AT BEAVER MEADOW OBSERVATORY

FROM OCTOBER 1981 TO PRESENT

I. Public Nights and Observatory Use

-In an attempt to make the Observatory more accessible to our own membership on weekends, the number of Public Nights was reduced from every Saturday night year round, to just the first and third Saturday nights of each month from April through October. During July and August, every Saturday night was set aside for Public Night to take advantage of the high public turn-out during these months.



* MARCH - APRIL *
*** 1 9 8 5 ***

-A closer cooperation and communication between the Observatory and the Beaver Meadow Audubon Center was initiated.

-A monthly schedule of Public Night events was written for each observing season by John Riggs and was published in the 'GUSTO' section of the Buffalo News.

-Approximately 2750 members of the general public attended Observatory Public Nights over the past 3½ years.

-\$ 347.46 was collected in the donation box from 40 Public Nights during this same period. This outside source of income provided the funds to purchase many pieces of needed equipment and material for repair and maintenance.

-Fourteen additional groups (Boy Scouts, schools, etc.) were given special nighttime observing programs at the Observatory by John Riggs.

-Of particular help with the regular Public Nights during the 1983 and 1984 seasons, Michael Idem's contribution was very significant.

-Nineteen of our own members were checked out on the proper use of the telescope and Observatory.

-Twenty-five members are currently eligible to use the Observatory. Approximately 1/5 of these people visit the Observatory more than four times a year. One third of the eligible members make no use of the Observatory whatsoever.

II. Equipment and Facilities

During the past 3½ years the following changes and/or repairs have been made at Beaver Meadow Observatory:

-The major repair and replacement of the moto drive and friction clutch on the 12½-inch telescope's polar axis

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-The major repair and replacement of the motor drive and friction clutch on the 12½-inch telescope's poar axis by Bob Mayer.

-The repair and replacement of the Observatory roof rail supports which had become rotted and posed serious danger, headed by Earl Pfarner and John Riggs.

-A cork lining was added to the inside of the telescope tube to improve thermal characteristics during observing sessions.

-The electric frequency controller device for the motor drive was replaced by Rowland Rupp.

-A set of eyepiece heaters was built by Rowland Rupp to prevent dewing on humid nights.

-Instruction sheets on the proper use of the frequency controller were written by Rowland Rupp and John Riggs.

-A movable safety barrier was added to the top of the stairs of the west entrance to prevent another and possibly serious accident during Public Nights.

-The timer switch regulating the Observatory ventilator fan was repaired by John Riggs.

-The 12 $\frac{1}{2}$ -inch telescope's main mirror was re-aligned and diagonal were re-aluminized.

-The polar axis of the telescope was re-aligned by John Riggs.

-A no smoking rule was established at the Observatory in the interests of courtesy, safety and to conform to the overall policy and wishes of the management of the Beaver Meadow Audubon Center.

-An 8mm Brandon eyepiece was purchased for the telescope.

-A 3 x Brandon Barlow lens was contributed to the Observatory by John Liptak.

-The eyepiece box was repaired by John Riggs.

-The door combination was changed to prevent the further theft of materials from the Observatory by non-members.

-A red light desk lamp was purchased.

-A field edition of the new Sky Atlas 2000 was purchased.

-A formal donation box for use during Public Night was built by John Riggs.

-An 8-inch f:9.5 reflector without mounting was donated to the Observatory by Darwin Christy.

-The 6-inch diameter V-belt pulley, which operates the opening and closing of the Observatory roof, developed a serious crack and was replaced by John Riggs.

Several instruction sheets on general Observatory operating procedures were written by John Riggs.

Several instruction sheets on general Observatory operating procedures were written by John Riggs.

-A new astrophotography exhibit for the warming room was assembled and displayed.

-Numerous minor repairs to the building and the equipment were also made. These involved door repairs, screen windows, lock maintenance, light switches, light bulbs, eyepiece cleaning, camera adapters, and so on.

John I. Riggs.

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NEW MEMBERS

Let us welcome the following new members:

Scott White

Paul Krupinski

Ben Ungerlirider

Michael A. LaBerta

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"SPECTRUM" deadline for the MAY-JUNE issue is April 24th!!

PROFILE

Evan J. and Adrienne M. Morris

Jerry and Adrienne are one of our very fine couples in the B.A.A. Their many interests and community activities make for them a rich and rewarding life.

Jerry, as Evan is known to most everyone, was born in Buffalo and lived on Longmeadow Rd. in Eggertsville, and attended the Windermere Elementary School. His parents wanted their five children to play the piano. Jerry did very well and played piano for the chorus in elementary school. His father taught him to play guitar which he needed to perform for a special occasion. He studied piano from 4th to 8th grade, and accompanied the choruses at Amherst Junior and Senior High.

In 8th grade he and another lad worked on a special project involving talking over a light beam, which won them an award in the school Science Fair. In 9th grade Jerry, in another project, attached a photodetector to half a pair of binoculars and pointed it at a star and measured the star's brightness. This won for him an award in the junior division at the Science Congress held at the museum.

In Amherst High School, Jerry was president of the Quiz Bowl Club, which was a training club for It's Academy a well-known TV program. It was composed of eight teams which challenged each other at their meetings. Jerry made an electronic score board for the club's use. He was also a member of the Computer Club and used the computer to determine the position of the planets.

In high school he continued to be an accompanist for the operettas, and for the Varsity Singers of which he was president for one year. He also sang 2nd tenor in the group on occasions. Somewhere along the line he also learned to play the accordion for his own enjoyment. On graduating, Jerry received a Regents Scholarship and a scholarship from Bell Aerospace.

He went off to Cornell for three years where he majored in mechanical engineering. He took two introductory courses in astronomy, the first being on the solar system, the second on everything else. He attended a series of seminars where Carl Sagan and James Houck, our October speaker, and other astronomers from the department appeared.

Jerry sang in the Cornell Glee Club under the direction of Thomas Sokol, and was an assistant accompanist. The group traveled in concert to Florida and the Midwest. He enjoyed his student days at Cornell, and living on campus, and later residing at the Sigma Phi Epsilon fraternity house.

As his course in mechanical engineering was mainly theoretical, and was not as he had anticipated, he left Cornell and enrolled at the University of Buffalo, and received a B.A. with a double major; math and economics. He went on to get his Masters in business administration, with a major in management science; applying math, computers, and statistics to business.

For three or four summers, while attending U.B., he worked five nights a week at a 7-11 Food Store, and also had a job working with children at Windermere Elementary School. He was responsible for the building, was grounds keeper, and acted as a guard. He is now employed at the Lotepro Corporation in Amherst Commerce Park where he does computer work for the company. He also finds time to accompany and sing in the well-known Amherst Male Glee Club under the direction of Walter Reitz.

Jerry's father worked as an electrical engineer at Bell Aerospace. It is easy to understand why Jerry would become interested in space. It was in October of '65 that he was really attracted to astronomy, as comet Ikeya-Seki came into view. He also found an encyclopedia with descriptions of the planets that so intrigued him that he retyped all of the material and made a little booklet for

himself. His father had a 35mm fixed lens camera, and soon Jerry was taking pictures of the moon.

In 1974, the family took a trip to England, France, Germany and Switzerland. Jerry had taken a new book along, The View from Space; Photographic Exploration of the Planets. It is reported that he kept his eyes glued to the book throughout the trip, looking at the sights only if someone pointed out something he should see. His interest in space, space telescopes, and planets grew deeper.

Adrienne Kaczmarek was born in Buffalo and went to School 62, and then to St. Luke's R.C. School where she was at the top of her class. In grade school the astronomy book she received from her parents was to spark her curiosity about the subject, one in which she would continue to find great enjoyment. She went on to the Depew Middle School where she continued to be the top student in her class. While at Depew High School, she was a member of the Ski Club, and Spanish and French Clubs. She didn't take the Latin course, but she was very fortunate to be able to go with the Latin Club to Spain. Her major in high school was science-math, and when she graduated she was awarded a Regents Scholarship.

Adrienne became a student at the University of Buffalo, majoring in physical therapy. She continued to be excited about astronomy, and joined the Astronomy Club. After graduation she attended the club's meetings, and helped with public nights on Fridays at the university's observatory. It was at the club's meetings that she met Jerry, and their romance flowered. They were married on May 28, 1983 in St. James Church in Depew. On their honeymoon they visited the Maria Mitchell Observatory on Nantucket Island, and also spent some time at Mees Observatory in the Bristol Hills near Rochester.

After Adrienne's graduation from U.B., she became a physical therapist at the Veteran's Administration Medical Center where she will have been employed six years in August. She works on a rotating schedule in the rehabilitation center, the outpatient department and the cardiac unit, and also gives home care to some of the patients. Her work involves exercise programs, walking patients, and using various machines to relieve pain.

Adrienne is very busy as a Girl Scout leader for a group of slightly retarded girls from 13 to 21 years of age. They meet once a week in the hall at the Lancaster Presbyterian Church. Carl Milazzo, Shaun Hardy, and Adrienne have put on astronomical and other science programs, much to the girls' enjoyment.

Adrienne bought a 6" telescope which she has used in observing programs at Windermere Elementary School. Her special interest in astronomy is in deep-sky observing. She has helped out at Beaver Meadow by doing Public Nights occasionally, and has helped at the museum with public viewing of a lunar eclipse. Jerry and Adrienne have also presented astronomy programs for the Gowanda Psychiatric Center. They were counselors for a week at the Christian Camp in Dunkirk. On one of the evenings they treated the campers to a starry night of observing.

Both Jerry and Adrienne are very involved in church work. They taught religion to a class of 7th graders at St. Amelia for one year. They find time to sing in a folk group at Mass on Saturday evenings. They also are involved in a group for engaged couples in which all aspects of engagement and marriage are discussed with projects using notebook writings and discussions based on couples' thoughts expressed therein.

Jerry reads space magazines and articles on math, science fiction, and Analog, a science fiction magazine. Both he and Adrienne read Science News, Scientific American and Sky & Telescope.

One of the astronomical highlights of 1984 for the couple was the trip with Carl Milazzo to Atlanta to witness the May 30th annular eclipse of the sun. They are now making plans to see Halley's Comet from either Chile

or Hawaii. They are very excited about a special project in which they are partners with Al Kolodziejczak, Tristan and Debbie Dilapo, and Carl Milazzo. They are building a 26" Dobsonian telescope. Having purchased a mirror blank from Tom Dey in Rochester, and having sent it away to be ground and polished, they are hoping that the telescope will be finished by this summer.

These very talented young people are dedicated to hor church, and service to others. They are both immeasurably enriched through their involvement in the sciences and music, and the joy it brings to them and those with whom they come in contact. They have a refreshing vitality in all their undertakings, and a oneness of endeavor as they work together sharing their common interests.

Edith L. Geiger

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BUFFALO SOCIETY OF NATURAL SCIENCE SPRING CLASSES, HIKES, TOURS & EVENTS

Attention all nature lovers!!! This spring, starting 1 March, the Buffalo Museum of Science will offer a wide variety of programs. Continuing Education evening classes for adults range from classes designed to develop a new hobby to those of a more scientific or technical nature. Special outdoor programs include bog walks, bird walks, some wilderness camping and study tours. Information and brochures are only a phone call away. Call the Education Department at 896-5200 to put yourself in touch with the natural sciences.

You may wish to add or select items of interest from the list of upcoming classes and outdoor activities, which are as follows:

- ☐ BMS 100 The Study of Bone 3/20 - 5/15
- ☐ BMS 101 Southwest Indian Country 3/18 - 4/15
- ☐ BMS 102 Egyptian Religions: An Introduction 3/20 - 5/22
- ☐ BMS 103 Environmental Archaeology and Early Civilization 3/21 - 5/23
- ☐ BMS 104 Native American Beadwork 3/20 - 5/22
- ☐ BMS 105 How to Draw and Paint Nature's Wonders 3/20 - 5/22
- ☐ BMS 106 Woodcarving 3/21 - 5/23
- ☐ BMS 107 Basic Astronomy 3/20 - 5/22
- ☐ BMS 108 Backpacking 3/19 - 4/23
- ☐ BMS 109 Reptiles and Amphibians 3/18 - 4/22
- ☐ BMS 110 Aquatic Insects 3/19 - 4/23
- ☐ BMS 111 Wildflower Identification 4/1 - 4/29
- ☐ BMS 112 Introduction to Herbs 4/16 - 5/14
- ☐ BMS 113 Geology of New York State 4/19 - 5/7
- ☐ BMS 114 Paleogeology 3/20 - 5/1
- ☐ BMS 115 The Dinosaurs 3/21 - 5/9
- ☐ BMS 116 Advanced Computer Graphics and Electronic Spreadsheets
- ☐ BMS 117 Holography 3/21 - 5/9 3/19 - 4/2
- ☐ BMS 118 Special Topics in Mineralogy 3/19 - 5/7
- ☐ BMS 119 Topics in Nature Photography 3/18 - 5/6

N.F.C.A.A.A. MEETING

The Spring meeting of the NFCAAA will be held at Buffalo State College on Saturday, May 11th.

This meeting will be more of a work session than a festival. We are planning to return to something of the format of the earlier meetings held at the Museum of Science.

At the business meeting we will update our list of speakers, hear reports from member clubs and field whatever comments are made. We hope to have several short talks. These will be shortened versions of longer talks that the particular member is willing to present to area member clubs. This feature has been of great help to program chairmen in the past.

Announcements will be sent out to area clubs as soon as firm arrangements can be made.

Ed Lindberg

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Charles Messier (1730-1817) used a 3.5 inch f:10 refractor and his list of 108 deep sky objects was complete in 1786.

- CM -

Starting with this issue I will attempt on a regular basis to continue the tradition of past BAA Presidents in preparing a report for publication in each "SPECTRUM" issue. This report will be entitled, "The President's Corner."

I feel this will be a good way to provide general information about our organization to you the members as a supplement to information supplied at our regular monthly meetings. For example, it will give me the opportunity to keep you informed of the activities of your BAA Board of Directors. (That esteemed, or infamous, as the case may be, body of "leaders" you elect every two years who for the most part actually do run the club.)

I will also have the occasion in this feature to provide assorted bits of "relevant" news and other information concerning various events and activities of the association.

I may also from time to time make brief mention of one or more particular, as the case may be, individuals in personal recognition for their noteworthy contribution to insuring the vitality of the BAA, and in helping make the BAA an organization one can be proud to be associated with.

I will also on occasion bring up for everyone's consideration and thought certain important issues, maybe even some controversial in nature, in an attempt to elicit constructive criticism, draw out suggestions, encourage useful debate, and in general promote more individual involvement and participation by members in club affairs.

Therefore, in addition to being informative, this report is meant to instigate a two way communication process whereby any and all members are encouraged to get involved and to feel free to contact me personally at meetings, by phone, or by writing anytime they feel they have an idea, suggestion, complaint, or a criticism to contribute for the betterment of our fine organization.

Ken Biggie

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SPY & TELL

Claudia Bielinski and hubby, Bob, had a fun weekend in Las Vegas in the middle of January.

Dave Junkin writes that, "Don Dessert and Bob Dessert were skiing at Swain over Christmas vacation. They noticed that the sign is still posted on the 4man lift called the Quad Lift. Dave Maul ran this lift every ski season. The sign reads "Heavy's Lift." (Dave Maul, deceased, was a former B.A.A. member).

Doris Koestler, our glamorous Vice President, has joined the Holiday Lady Figure Salon to which she goes four times a week.

Darwin Christy gave a talk on general astronomy at his Masonic Lodge meeting in Tonawanda on February 7th. It was enthusiastically received with members asking many questions.

Steve Krickovich is a member of the Varsity Hockey Team at Lancaster High School. He is planning a trip to Florida during Easter vacation, and is looking forward to visiting Disney World.

Scott Taperman, a student at U.B. majoring in accounting and taking a few courses in astronomy, is also busy working several times a week at Great Skate Hockey Supplies. When he finds time, he likes to play the game, Dungeons and Dragons.

Walt Whyman suffered a stroke on January 15th, and is in Batavia Memorial Hospital, Batavia, N.Y. 14020. I'm sure he will appreciate cards from our members.

Edith L. Geiger

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Three of the 108 Messier objects pass over the zenith of our latitude of +43 degrees. They are M-106, a galaxy in Ursa Major, M-51, a galaxy in Canes Venatici, and M-39 an open cluster in Cygnus.

.CM-

The Instrument Section has been in limbo during the present winter, due partly to the unfavorable weather. Another reason is the fall off in interest in making optical mirrors.

There are still some relatively unexplored areas in Telescope Making, however, even if everyone seems to be buying commercially made mirrors. One subject that should be of considerable interest is the testing and use of optical flats. We still haven't tried using flats for testing objective lenses. If you have any suggestions---TRY US!!!

Ed Lindberg.

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John I. Riggs

John has been a fine, dedicated, extremely capable Director of our Beaver Meadow Observatory, and his resignation is a great loss to the B.A.A. and the many people he served. During the three years that he was Director, a large following gathered on Saturday nights as he generated enthusiasm for the wonders of the heavens. He gave freely of his time, and brought a new, rich experience to numerous people. With his vast knowledge of the sky, his presentations afforded a unique opportunity for those who took advantage of his Saturday night offerings.

John is sincere, dependable, with a rare fidelity to duty, and an excellent rapport with the public. We appreciate all the effort he exerted in the fund raising that made the observatory at Beaver Meadow possible, and all the many hours he has spent in his commitment to that observatory. A heartfelt thank you.

We regret to report that Bob Burdick, a former very active and highly respected member, passed away during the early part of December 1984.

The passing of Lorne Moore came as a shock to his many friends in the B.A.A. The Blizzard of '85 claimed his life as a result of shoveling snow and helping people with stalled cars. We extend our deepest sympathy to his family in their loss.

ASTRONOMICAL HAPPENINGS

SOLAR: The sun leaves Pisces in March and enters Aries. In April, after passing through Aries, enters Taurus. On March 20th the sun crosses the celestial equator- Spring begins

LUNAR: The moon's phases are Full on March 6th (the WORM) April 5th (the PINK) and May 4th (the FLOWER); Last Quarter on March 13th & April 11th; New on March 21st & April 20th First Quarter on March 29th & April 27th. An eclipse will occur on May 4th but will not be seen from our area.

LUNAR Conjunctions: In March - Uranus on the 13th, Neptune on the 14th, Mercury & Venus on the 22nd & Mars on the 24th. In April - Saturn on the 8th, Uranus on the 9th, Neptune on the 10th, Jupiter on the 13th, Venus & Mercury on the 17th & Mars on the 22nd.

PLANETARY Conjunctions: Mercury & Venus on the 22nd of March.

METEOR Showers: For March:-

Zeta Bootes on the 11th
Corona Australids on the 16th
Virginids on the 26th (*****)

For April:-

Alpha Virginids on the 9th
Rho Leonids on the 17th
Lyrids on the 21st (*****)
Mu Virginids on the 25th
Alpha Bootes on the 28th.

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12 Messier objects are circumpolar from our latitude of +43 degrees.

THE PRESIDENT'S CORNER

The 'Museum of Science' is going through some rough financial times these days and I would like to encourage all our members to support the Museum by making an occasional visit, or by getting involved in some of its various programs. One can also join the Buffalo Society of the Natural Sciences (BSNS) - an excellent way to support the 'old fossil' and benefit yourself at the same time. Get application forms at the Museum or see me.

Also, our friend and colleague, Ernst Both, Museum Director, would like the assistance of 4 or 5 of our members, sometimes in March or April between first quarter and full moon, in putting on a lunar observation program, probably 3 consecutive nights. Anyone with a mobile telescope and knowledge of the moon should contact Ernst at the Museum or make yourself known to me as soon as possible.

Our May Dinner Meeting at the Wilcox Mansion is all set, And I urge every single member to make arrangements to attend - and to bring one or more family members or friends. If we can push attendance over 100 persons our treasury will benefit by over 100 dollars. So get cracken on buying your tickets - details elsewhere in this publication, or see John Raymonda, Al Kolodziejczak or Triston Dilapo.

John Riggs has resigned his position as Observatory Director effective January 29, 1985. I wish to thank him for the fine job he has done, especially in conducting the Public Nights at the Observatory. The Board of Directors has discussed the matter of replacement and since this position is very time demanding we have pretty well decided to go with two persons, one being an assistant. Carl Milazzo and Mike Idem are strong possibilities if they will accept the duties. I will keep you posted on what the Board decides.

A very sad event last month (January 23rd) when we lost one of our members, Mr. Lorne Moore. Our condolences to his wife and children. He was a fine person and we will miss his presence at our meetings.

Also, more bad news. Our long time member and dear friend, Walt Whyman, suffered a stroke and at this writing, January 31th, is still in a coma in the hospital. We should all wish his speedy recovery and address our hopes and prayers for him and his family.

The Board of Directors, at our last meeting, initiated some preliminary discussion about the possibility of increasing the size of our Observatory Telescope from 12.5" to 16" or maybe 17.5" sometime in the near future. We would keep the same mount, etc., just change the objective and the tube basically. Let me or any other board members know what you think of this idea.

We have available in our possession two small reflecting telescopes, one a 2½" or 3" and the other an 8", which need to be refurbished and could be used as loners to any member and/or for display purposes at one of our Mall or Museum displays. Anyone, especially our younger members, who do not own instruments, and would be willing to adopt one of these beauties, work on putting it in operational condition, with our assistance - is welcome to have a go at it. Here is an excellent opportunity for some on the job training and hands on experience for your own benefit and the clubs. (Contact me or our vice president, Doris Koestler)

And finally a reminder that we will be conducting another Eastern Hills Mall display and astronomy show the weekend of April 5th, 6th & 7th. We will need many members to assist with meeting the public, giving demonstrations, showing slides, or whatever else you are capable of doing. Or--- just come out and hang around if you like and do some shopping or girl watching like I do. Its fun! If your interested contact Al. K., Doris Koestler or myself.

Ken Biggie, President

The faintest deep sky objects seen by the ancients was 5th magnitude M-41, the open cluster in Canis Major.

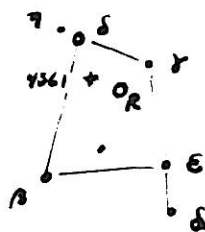
MARCH CONSTELLATION

COMA BERENICES, 'Berenice's Hair' is an inconspicuous constellation but has many objects of interest. Its glistening beauty ascribed by the ancients was given its place among the stars by Conon of Egypt, assuring the King they would remain there forever. It is bordered by Bootes on the east Virgo on the south; on the west by Leo & Ursa Major; and Canes Venatici on the north.

Objects of interest are: Galaxies designated NGC's 4008, 4032, 4064, 4073, 4136, 4150, 4152, 4158, 4162, 4189, 4192 (M-98), 4203, 4212, 4237, 4245, 4251, 4254 (M-99), 4264, 4274, 4278, 4283, 4293, 4302, 4314, 4321 (M-100), 4340, 4350, 4377, 4379, 4382 (M-85), 4383, 4394, 4414, 4419, 4448, 4450, 4455, 4459, 4473, 4474, 4477, 4494, 4498, 4501 (M-88), 4540, 4548 (M-91), 4559, 4561, 4565, 4571, 4595, 4635, 4651, 4670, 4689, 4710, 4712, 4725, 4747, 4793, 4862 (M-64), 4872, 4874, 4889, 4961, 5012, 5016, 5116, & 5172. Globular Clusters are NGC's 5024 (M-57), 5053 & 4147. Variable stars are UU-21 & R. Double Stars include 2, 12, 17, 37, 42 (Alpha), 24 & 11.

APRIL CONSTELLATION

CORVUS 'The CROW' is a smaller constellation encircled by Virgo on the east; Hydra on the south; Crater on the west; and Virgo on the north. Objects of interest are galaxies,



variable stars, double stars and a planetary nebula, NGC 4361. The galaxies are NGC's 4024, 4027, 4033, 4038, 4050, 4094, 4462, 4756, 4763, 4782, 4783 & 4802. Double stars are Delta & Gamma. Variable stars are SV & R. 'R' is a famous long period variable discovered by Karlinski in 1867. It reaches maximum magnitude of 6, then declines to 14th magnitude, taking 317 days. It is something for the avid variable star observer to locate and record.

SOUTHERN CONSTELLATION

CENTAURUS, 'The Ramping Centaur!' is one of those constellations which is out of our vision in the south. We can, perhaps see the extreme portions of its northern border. Anyone who takes a trip down under might perhaps take this note with you to study this unique asterism. It is bordered on the north by Hydra; on the east by Lupus & Circinus; on the west by Vela, Carina & Puppis; and on the south by Crux and Musca. Surprisingly, it does contain a wealth of deep-sky wonders.

Galaxies consist of NGC's 3557, 3706, 3783, 4219, 4373, 4507, 4603, 4645, 4679, 4767, 4835, 4936, 4945, 4947, 4976, 5011, 5064, 5090, 5102, 5121, 5128, 5156, 5161, 5188, 5193, 5257, 5266, 5357, 5365, 5398, 5419, 5483, 5494 and I,3253, I,3370, I,3896, I,4296, & I,4329.

Globular Clusters are NGC 5139-w & NGC 5286.

Planetary Nebulae are NGC's 3699, 3882, 3918, 4367, 5307 and I,2872, I,2944, & I,2948.

Double Stars include Alpha, Beta, d, Epsilon, Eta, Gamma h-4, Iota, J, Kappa-3, N, Q, X & y.

Variable Stars are LZ, MU, R, RR, RT, RV, RX, S, T, U, UY V, A381, V412, V418, V419, V553, V659, V716, VZ, VX, W & XX

Telescope Size and Magnitude Limit

Carl Milazzo's note in the January-February 1985 "Spectrum" entitled "The Extreme Range of Apparent and Absolute Magnitude" made us curious to derive from first principles the relationship of the visual limit of a telescope to its diameter. Letting "M" represent the magnitude of the faint

est star visible; "B" represent the brightness of the faintest star visible; "A" represent the area of the telescope; & "D" represent the diameter of the telescope, we consider two cases:-

For case # 1, consider the naked eye. Here the magnitude limit is approximately 6 and the "telescope size" (the size of the dark adapted pupil) is approximately 1/3 inch. Hence $M_1=6$ and $D_1=1/3$ inch. B_1 and A_1 are to be calculated.

For case # 2, consider a telescope of arbitrary size. Hence M_2 , B_2 , A_2 , and D_2 are to be calculated.

From the definition of magnitude,

$$(1) \quad \frac{B_1}{B_2} = (2.512)^{M_2 - M_1}$$

where 2.512 is actually a convenient approximation for the fifth root of 100. Since the total amount of light reaching the retina is the same in both cases.

$$(2) \quad B_1 A_1 = B_2 A_2 \quad \text{or} \quad \frac{A_2}{A_1} = \frac{B_1}{B_2}$$

From the definition of the area of a circle,

$$(3) \quad \frac{D_2^2}{D_1^2} = \frac{A_2}{A_1}$$

Combining equations (1), (2) and (3), we get

$$(4) \quad \frac{D_2^2}{D_1^2} = (2.512)^{M_2 - M_1}$$

Finally, rearranging and taking the square root, we get

$$(5) \quad D_2 = D_1 (2.512)^{(M_2 - M_1)/2}$$

Equation (5) is plotted in the graph for $M_1 = 6$ and $D_1 = 1/3$ inch.

Jerry and Adrienne Morris

MEETING NOTICES

MARCH Meeting:- The March 8th meeting of the B.A.A. will be held at the Buffalo Museum of Science, Humboldt Parkway, starting promptly at 7:30 PM. The speaker will be Dan Marcus who has been a member of our club for two years, and has been an amateur astronomer for 16 years.

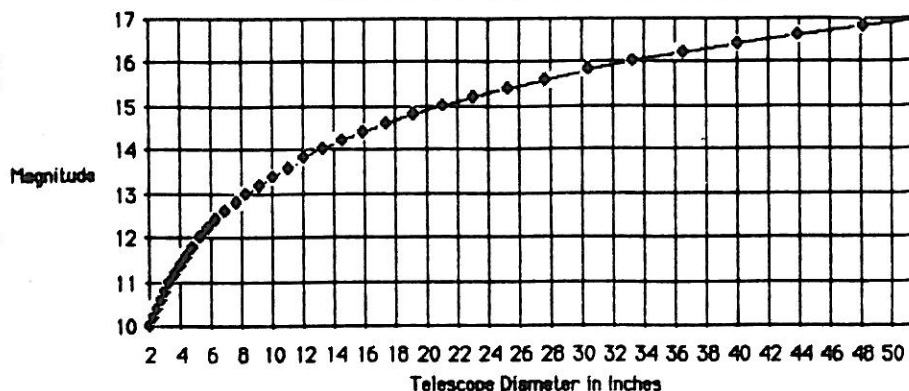
His talk is entitled "Astronphotography Geared Simply Towards Halley's Comet." He will go into detail with many different ways you can photograph Halley's Comet with simple common equipment. He will be showing slides of some of his spectacular and beautiful results from our club's telescope at Beaver Meadow, from his backyard on Grand Island, and from out west. Some of Dan's astrophotography has appeared in Astronomy magazine, and on the front page of the Buffalo News.

APRIL Meeting:- The April 12th meeting will begin at 7:30 PM at the Museum of Science and will host Richard Karlson, who has been an amateur astronomer for 37 years and is a member of the Rochester Club for 29 years. He is a color negative researcher at Kodak.

His talk is entitled "All About Eyepieces" which will deal with- what type is best with what kind of telescope and what type of celestial object. He will show what makes up their many designs, when they were invented, when they became popular and how he actually improved some of them. His talk will even include the many new types of eyepieces that have come on to the market in recent years.

* * * * *

LIMITING MAGNITUDES
(Based on 6th magnitude limit for a 1/3 inch pupil)



A piano has 88 keys as there are as many constellations, has as many white keys as there are constellations seen in the northern heavens, that of 52. The remaining 36 keys are black, the number of constellations in the southern skies

OBSERVATIONS

Comet Levy-Rudenko 1983t was seen on December 31 at 5: AM as an 8.4 magnitude object of medium surface brightness 3 degrees from Vega. No tail was detectable but it's 10 minute of arc coma had a star like nucleus. The comet was observed with binoculars, a 5-inch refractor and a 13-inch reflector. On February 18th it was seen in Ursa Major 1 1/2 degrees from M-82 & M-81 but the nucleus was no longer visible and the coma was magnitude 9.4

Carl Milazzo

1) December 30-31 As is one nova was not enough still another bright nova has appeared in the constellation of Vulpecula. Indeed it is visible to the naked eye looking to be of magnitude 5.8 tonight. This nova's 1950 coordinates are R.A. 20h 25m - Declination +27° 41'.

2) January 3-4 Variable star SU Ursae Majoris proved quite active tonight. When first observed at 8:55 PM it was estimated at magnitude 12.2 but when observed again at 12:05 AM it had brightened further to magnitude 11.9. This represents a change of 0.1 magnitude per hour.

3) January 4-5 Nova Vulpecula #2 would seem to be of the so called "fast" variety for tonight it was estimated at magnitude 6.5, the night before it looked to be of magnitude 6.2. Still, though, it is an easy binocular object. Sweeping 12° west Nova Vulpecula #1 remains at magnitude 9.8 and still slowly fading.

4) January 15-16 Observations of Nova Vulpecula #2 continues, this night it looks to be of magnitude 7.7. Just four nights before it had been reported at magnitude 6.8, this being so it's rate of decline is accelerating.

5) January 29-30 Observed crater Pitatus to fine effect, this lunar cavity lies just southwest of the "Great Strai Wall". Tonight this crater's floor lies wholly in shadow but a low point upon its ramparts pierced the otherwise dark floor with a most striking, narrow, dagger of light!

6) February 2-3 Certainly the most exciting observation of this night was that of the recurrent nova RS Ophiuchi for it is once again in eruption. At 5:35 AM (est) it looks to be of magnitude 6.7, or just past maximum light.--telescopically it possesses a pale orange coloration. The last time this star had undergone an outburst, previous to this, was in October of 1967.

7) February 8-9 Journeyed some 40 miles to the Alabama Swamps Wildlife Refuge of Genesee County in order to observe a grazing occultation of the bright double star Gamma Virginis, although clouds much interfered some tantalizing views of this graze event were procured. As predicted by

John Riggs the graze was to occur just before 12:15 AM (est) and this indeed proved to be the case. When first viewed at 12:14 AM Gamma was already tangent to the dark southern lunar cusp, being situated at position angle 213° . John and myself were located along a line which placed us about half a mile apart and as conditions prevailed, I probably received the better view of the graze but to John goes the victory of precise calculation. The most notable event of this graze was an 0.2 second "blink" that occurred at 12:16 AM (est). Returning home by 2:00 AM Gamma Virginis was already well west of the moon.

Michael Idem

B.A.A. ANNALS

5 Years ago- The March 1980 meeting was addressed by Phil Cizdiel, the topic was Arizona Astronomical Observatories. That was back before Phil had graduated from U.B. and gone on to bigger and better things at the U of Hawaii. The April meeting was a joint meeting with the Lockport club. It featured David Atkins speaking on Arecibo. I remember it as a very interesting presentation.

While researching for this newsletters Annals I discovered that the clubmember that Edith Geiger chose to write about in the March/April Spectrum for 1980 was me, Ken Kimble. But I guess that would interest me more than you!

10 years ago- The March 1975 meeting was visited by Dr. Seville Chapman, then a member of the New York State Assembly. I don't know what he spoke about though. Our present president Ken Biggie had recently gone public by appearing on Bowling for Dollars, a TV program on channel 2. I guess he hasn't changed a lot. Still the same old outgoing Ken.

Our April meeting was addressed by Dr. Frank Bajer from the Science Museum. His topic was Lasers During that month the collectin for the Beaver Meadow observatory had raised \$ 2,625.

15 years ago- The BAA was visited in March of 1970 by a well known German astronomer Dr. Carl Heintz. He spoke on visual binary stars and evolutionary effects on same. Also in that month it was reported that all the color photographs were stolen during the BAA's first exhibit. a real kick in the teeth. I hope mentioning that doesn't bring back unhappy memories.

In April of 1970 many members of the BAA got together to do a presentation on the then recent total eclipse. among those members were Dale Hankin Larry Hazel, Walter Semerau and Walt Whyman. I'll bet it was an interesting affair.

Ken Kimble

PART ONE OF-- SOME THOUGHTS, REFLECTIONS, AND SS-433

I am writing this article mostly to placate that hard nosed editor of this publication, Mr. Darwin Christy. He has been badgering me for quite sometime now to do exactly what I am now doing but do not wish to do. In the past I have always tried to explain to him that because I really do not know any particular aspect of astronomy well enough to be able to write about, he should not expect an article. So I told him to stop bothering me and go away and collect some space dust or something, but no-- not Darwin, he just doesn't give up. He says, "How the heck could you ever become President of this here group and not know enough about the subject to write up some small article for the "SPECTRUM?" Well now, that is a good point he makes, so here goes.

Even though I myself don't know that much about astronomy, being a member of that B.A.A. is fun and allows me to be active in the organization, and at the same time learn from other members who's knowledge about the subject is indeed considerable. Like most of you in the B.A.A. I find astronomy a fascinating subject because of the many strange unusual and thought provoking phenomena one may encounter. Sure you encounter some strange and unusual persons as well and this in itself is interesting, but it is the multitude of fascinating events and occurrences which really grabs your interest and often gets your mind sailing off into the infinite where lurks the likes of quasars and black holes, red giants and white dwarfs, big bangs and little dippers, time warps and curved space, and assorted other wierd things. In short, I guess what I find exciting about the field of astronomy are not only the interesting things we may know about, but also learning through imagination and scientific investigation the things we don't yet know, and finally in dreaming of the things out there just waiting to be known.

Anyway, back to the task at hand. As I said before, not being much of an expert an anything in astronomy I have the luxury then of being able to select as a topic for this article just about anything over the sun I wish, for is ignorance not bliss? In fact, my ignorance of the subject is distributed pretty equally in all directions, or as the cosmologist might say, it is spatially homogenous and is also isotropic. But just remember that if you do not enjoy my article or learn much about my topic (since I don't know much about it) or otherwise feel cheated or short changed reading it, blame not me but our beloved editor for it is his fault and I will have tried my best.

Now I chose for my topic something at least that I find very interesting, a peculiar object in our own galaxy known as SS-433. I'm sure many of you have some familiarity with it, and in fact a few of you probably are very knowledgeable about it thinking it nothing to get all excited about but I am also sure there are those, who, like myself, never heard of this unusual thing and this article is dedicated to you. And to be fair, let me preface this whole thing by saying that all of the information I provide here was taken from an article in "The Astronomy Quarterly", 1981, by George W. Collins III and a team from Ohio State University. There is nothing original on my part and in fact, since the information on SS-433 is almost 4 years old those of you who currently know a lot about it and are very up to date on it should probably not waste your time reading any further. I recommend you skip on to the next article or, as a challenge, you can use your extra time to sit down and

write a good updated follow-up article for a future "SPECTRUM" issue. (Al. K. - get the hint?)

Knowledge and understanding of what SS-433 really is dates back only about 6 years (1979) when this unusual object started receiving considerable public attention in the media (Walter Cronkite's C.B.S. Evening News, Paul Harvey and even the likes of Father Guido Sarducci on Saturday Night Live) and simultaneously set off what appeared to be a race by professional astronomers to be the first to explain this "star" which, as the broadcasters were saying, appeared to us to be both coming and going at the same time. Indeed, the optical spectra of this strange object showed both blue and red Doppler shifts of immense proportions shifting back and forth over a period of roughly 160 days and to top it all off, the magnitude of these shifts was larger than anything seen before in the Milky Way, close half the speed of light!

This object had appeared optically on the Harvard plates for a number of years, but it was 1965 before it was first noted as an emission object by Nassau & Stephenson. In 1975 the object was identified as a hydrogen alpha point source by Krumeraker, but his published coordinates were incorrect, and in 1977 Sanduleak and Stephenson entered it number 433 in their catalogue of hydrogen alpha emission line objects at the Warner Swasey Observatory - thus the name SS-433. For those of you who like numbers for symbol and for those who are into radio astronomy, this same ob-

ject had been known for the previous 20 years or so as W-50 (Number 50 on Westerhout's list). The object had also been thought to be an X-ray variable or a super nova remnant, and was believed to be at a distance of about 3.5 Kpc, but by most prior to 1978 it was considered no big deal.

Then in 1978 unusual changes (shifts) were noted in the optical spectra of SS-433. The emission line shifts seemed to wander across the spectrum. In April 1979 Margon and Tiebert independantly announced these shifts as variable Doppler shifts of enormous magnitudes and the excitement b began. The race was on to find out what forces could be at work to cause a volume of emitting gas from an object to change its apparent velocity by almost half the speed of light in the opposite direction in half a year. The gas also appeared to be cool and this added further mystery,

In the ensuing investigation the known fundamental forces which govern nature (gravity, the weak and strong nuclear forces and electromagnetism) were each considered as a potential cause. Nuclear forces seemed unlikely as being directly responsible considering such great velocity changes. Gravity, the usual souce of dynamic occurances, was also seen as an unsatisfactory agent since in applying Kepler's Laws and assuming some sort of periodic orbital motion of a binary system the observed results would indicate the need for a central governing mass of about one million solar masses in the case of SS-433. This would be approximately 1 % of the total mass of the Milky Way galaxy contained in a system not even located near the center of the galaxy. Besides, there was no apparent disturbance among nearby stars which would be expected, so gravity was also ruled out as the direct cause or at least as a plausible answer.

So it would seem that the only remaining fundamental natural force - electromagnetism - was most likely to be the force involved in such huge velocity changes. However, many questions still remained. For example, why was the apparent red shift (+ 50,000 Km/sec) larger than the blue shift (- 33,000 Km/sec)? And further, why did the object show a cool gas spectrum showing only neutral hydrogen and helium in the spectra when enormous amounts of energy must be involved? The differential red/blue shift could be explained by an understanding of the need in the case of SS-433 to apply what is known as the special relativistic Doppler effect formula in explaining the vary large speeds involved. The special relativistic Doppler shift formula considers only the speed of an object or observer while the more classic Doppler formula describes radial motions considering both the speed of the object and/or observer and

also the direction of motion. Applying this special relativistic Doppler effect to SS-433 produces a net red shift and explains the observed differential.

TO BE CONTINUED IN THE NEXT SPECTRUM

Nine constellations out of the 88 depict birds which are: Cygnus the Swan; Aquila the Eagle; Apus the Bird of Paradise; Columba the Dove; Corvus the Raven; Grus the Crane; Pavo the Peacock; Phoenix the Fire Bird; & Tucana the Tucan, a tropical bird with a large bill.

EDITORIAL

&

ACKNOWLEDGMENTS

I wish to thank all who have contributed to the newsletter, "The SPECTRUM", this issue as follows: Edith Geig John Riggs, Claudia Bielinski, Ed Lindberg, Carl Milazzo, Ken Biggle, Adrienne & Jerry Morris, Michael Idem, Ken Kimble and yours truly.

I have received many article for the up and coming issues of the "SPECTRUM", which will be seen in future issues as follows: The second and final part of SS-433 by Ken Biggle; "My Bed was Two Boulders" by John Muir submitted by Shaun Hardy; LaLande - Astronomer from the Past by your editor; "Two New Meteroite Falls" from the Japanese Meteor Newsletter submitted by Ernst Both; "Smyths" by Rowland Rupp; "Objects within 1.5° of Messier Objects" by Bill Smith; and perhaps a book report thrown in for good measure.

Please do not let this be a deterrent for sending articles for publication in the "SPECTRUM"!!!! They are essential in keeping the newsletter alive. Without those articles, you might perhaps be only receiving a postal card announcing the meetings, and I know that is not what you want ----- I will gladly receive any and all articles sent me.

Darwin Christy

'SPECTRUM' deadline for MAY:JUNE issue is APRIL 24th

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* THE SPECTRUM *

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