

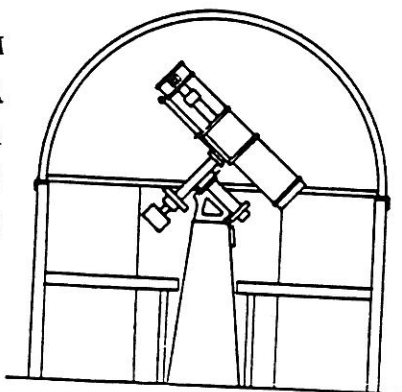
The

Spectrum



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1992

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MEETING NOTICES

MARCH: The MARCH meeting will be held in the Auditorium of the New Science Building at Buffalo State College on the 13th, beginning at 7:00 PM EST. Our meeting will host Dr. Fred Price who has served as President as well as a member of the Board of Directors of the BAA. He was a member of the British Astronomical Association. He is a professor of Biology at Buffalo State College and has written books, both on the subject of Biology and astronomical subjects. One such book was, "The Moon Observer's Handbook." Let us welcome Dr. Price, who will enlighten us with, "Astronomy on Cigarette Cards." Refreshments will follow.

APRIL: The APRIL meeting will again meet in the New Science Auditorium at Buffalo State College starting at 7:00 PM EDT on the 10th. Our guest speaker will be Paul Mazierski who is employed as a Hydrogeologist at Woodward & Clyde Consultants. He has a B.S. & M.S. in Geology from the University of Buffalo. His topic for the evening is, "Volcanism in the Solar System." Let us give a warm welcome to Mr. Mazierski. Following the meeting will be our usual refreshments!

NFCAAA

The Spring meeting of the N.F.C.A.A.A. will be held in Hamilton, Ontario, Canada on Saturday, May 2, 1992. The meeting will take place at the Dragon City Restaurant at the corner of Fennell & Gage Streets. Save this date as Bob Speck is hoping for a good turnout. You will be especially welcome if you offer to present a short paper. Bob Speck's number is (416) 388 0782.

"SPECTRUM" DEADLINE

The deadline for the JULY-AUGUST (SUMMER) issue of the "Spectrum" is JUNE 12, 1992. Be sure all articles are in by this date as the "Spectrum" has to be out NO LATER than the following week!

REMEMBER - STAR PARTIES!!!

MAY-JUNE DEADLINE is APRIL 10th
FAA ANNALS

5 YEARS AGO - Our March 1987 meeting was held in the old Humboldt Room at the Museum of Science. Jim Stegner spoke on "A Year in the Life of F26", highlighting his experiences while directing work on the Orbiting Geophysical Observatory. John Croucher spoke in April on materials that reduce the weight and cost of a portable telescope. While a student at Erie Community College he had written a winning paper on this subject.

Rowland Rupp reported on a conference on creation he attended at the University of Rochester. Prominent astronomy authors Sir Fred Hoyle and Dr. Robert Jastrow spoke on the Steady State and the Big Bang respectively. Darwin Christy wrote a report on a book written by his friend Shigeru Morikubo on meteors. What Darwin didn't mention was that significant coverage was given to his own work on micrometeorites. Unfortunately for us, the book is written in Japanese. Dave Czuba wrote two essays on the anthropic principle, a topic that had been featured in the previous issue of the SPECTRUM. Regrettably, the SPECTRUM included an obituary for member Paul Noye.

10 YEARS AGO - Who spoke in March 1982? The SPECTRUM doesn't tell. For the April meeting, Larry Carlino talked on "New Dimensions in Visual Astronomy".

An anonymous article on how the Earth-Moon system would appear to a naked-eye astronomer located on Venus, an article on Pluto by Carl Milazzo and another on Saturn by James Makowski rounded out a "planetary" SPECTRUM. Edith Geiger contributed a profile of member Bob Dietrich. Carl Milazzo, Steve Desmond, Rowland Rupp, Doris Koestler and Shaun Hardy all contributed observation reports. Where are the observation reports for 1992? What will the author of the Annals of 2002 have to write about? Think of him, and write a report!!

Observatory Director John Riggs reported that Bob Mayer had completed a modification that improved the clutch on the Beaver Meadow telescope. Also, the BAA's bylaws were updated. I believe this is the version currently in effect.

15 YEARS AGO - "Astrophotography" was George Keene's topic at the March 1977 meeting. In April Jack Mack spoke on "The Search for the Missing Mass". We're still searching!

Larry Carlino wrote a comprehensive article on techniques for observing Jupiter. Anyone, especially a newcomer, could benefit from reading this article. Fred Price, another of our planetary observers, reported on his recent observations of Jupiter.

The eight-inch Robert Kartyas Memorial Telescope had been renovated by Bob Mayer and Tom Dessert and installed at Beaver Meadow Observatory where it remains in use today. The BAA was planning an astrophotography exhibit for the ECC South Towns Community Fair in April.

25 YEARS AGO - Ray Manners, a Bell Aerosystems engineer, spoke in March 1967 on the Apollo program. Ron Clippenger presented an anecdotal talk on "The Search for the Planet Vulcan". Dr. Seville Chapman, also an engineer, but at Cornell Labs, gave a talk on "The Ellipse" at the April meeting.

The Museum's Solar Observatory was dedicated March 1, 1967. Several BAA members were recognized for having made contributions to its preparation. They were: Walt Semereau, Ed Lindberg, Dick Zygmunt, Dr. Shirley Jones, and Alan Gee.

In 1967 the BAA had an Instrument Section, an Advanced Study Section and a Lunar Section. The Lunar Section must have been very active. I found a BAA publication, edited by Ernst Both, reporting on one of their meetings. It contained reports, references, current literature and an article on William Radcliff Birt written by Ernst. Ernst also included two of his excellent lunar sketches.

Rowland A. Rupp

A letter sent to Walter Scott Houston from Khalid P. Marwat, has been given our permission to reprint as needed. Walter Scott Houston, (TWINKY as he is known by his friends) writes a column for Sky & Telescope entitled, "Deep-Sky Wonders." He also is very active at the Stellafane Amateur Telescope Maker's convention held in Springfield, Vermont every summer. There he gives an evening talk on, "Stellafane Shadowgrams." Following is that letter as written by Khalid.

from: Sqn. Ldr. Khalid P. Marwat
Officer's Mess
P.A.F. Base Sargodha 40180
Pakistan

Mar. 18, 1991

Walter S. Houston

Ref. S&T Jan 91 p.110. Yes I will tell you my first constellation on following conditions.

1- You will reply my letter.

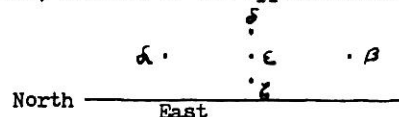
2- Send me stars of Zodiacal Catalogue (Mags. > 9) I need them for my occultation recording. The charts are not available in Pakistan.

First Constellation: Big Dipper. It is known as 'The Old woman's Cot' in my village, Dalo Khel, Tehsil Laki Marwat, District Banmu in the North West Frontier Province bordering Afghanistan. In summers after hot days people lie back to sleep outside in the open and the 'arrangement' of stars beckons you.

α, β, γ and δ UMajoris make the pillars of the cot of the old woman who has her goat, her only property, tied with rope to Megrez (ϵ). Alcor & Mizar (considered one) is the dog guarding the goat from the wolf (Alkaid). The day the wolf is successful in getting to the goat will be the doomsday. It fascinated me then when I was 10 but couldn't understand why would not see it during other seasons.

General: I came across a 1st level book on astronomy in 1967 when I went out on a duty in a desert where I had relatively free time & dark surroundings at night. I was hooked. I'd spend the whole night matching those rudimentary charts with the sky and seeing things 'rotate' around the Polaris. I neve (after studying this work, which was hard to read, believe it to be 'even') became a member of the Miami Valley Astronomical Society, bought a Meade 2080 1x5 and met Ronald Whitehead who taught me further on astronomy. He, now, is the president of MVAS. Now I get my S&Ts also. I'm obliged to Ronald. He's been a great help. I've since then, opened the field to many others. I show different objects to friends, relatives and children. I intend opening a hobby club in a college here. But things are difficult here. I get everything from U.S. or Japan and they are expensive. So if you can send some surplus books or charts or catalogue (if you can) I'll be obliged. In return I can record events in the Eastern Hemisphere, provide folklore on astronomy or other help.

Incidentally my second constellation was Swan, 3rd was Cygnus and 4th was, probably, Sagittarius. This is because I learnt about them, through the books, in summers. In my Village Orion is the second constellation referred to quite often and it is called Scales, because of its appearance in the East when it rises.



Pl. Write Back
Clear Skies

Khalid Marwat

VERNON H. SIEGEL

This amazing gentleman was born in Little Rock, Arkansas. In high school, Vernon became interested in electronics, which he turned into a lifework, with great success. He was a fine student and a member of several honor societies. Many of his after school hours were spent in repairing radios.

He graduated from Little Rock High School and attended a junior college for one and a half years before going into the Navy for two years during WWII, teaching radar repair at the air station in Corpus Christi. He went on to Oklahoma Agricultural and Mechanical College at Stillwater (now Oklahoma State University), where he received his B.S. in Electronic Engineering. He also earned his Masters in Electronic Engineering at Northwestern University.

Vernon worked at Bell Aeronautics for nine years, and after being employed for four years, they sent him to M.I.T. to do advanced study on inertial guidance systems, after which he became project engineer for radar guided missiles for Bell. Vernon made a helicopter flight simulator using a point light source projection that trained helicopter pilots. He was also part of an engineering project for aircraft automatic landing systems.

A group of six left Bell to start the Sierra Research Corporation, with Vern being one of the original fellows. They made a variety of avionic control systems and air traffic control systems. He later left to go to Kistler Instrument Corporation that manufactured instruments to measure acceleration, force and pressure.

Three individuals from Kistler formed the Radatron Corporation which produced the first police radar detectors for cars. This, by the way, was one of Vernon's inventions. They also purchased and operated Hotel Worth on Main Street. He was, at the same time, vice president of Kistler and president of Radatron Corporation. They sold Kistler Instrument to the Sunstrand Corporation, and he then founded a company called S.R. Instruments Corporation that manufactured weighing scales for the medical industry and instruments for pleasure boats. Vernon has been president and the majority owner of S.R. Instruments Corporation since it's founding in 1973.

With his natural ability as an inventor, he holds twenty patents on various types of instrumentation including: radar detectors; a proximity detector for power lines to keep cranes from hitting the lines, and an impedance converter for piezoelectric transducers.

He has been interested in astronomy since his youth, and especially in optics, and in the telescope as a precision instrument. He also enjoys eclipses, scope building, deep sky, comets, radio astronomy, and satellites. Vern went to Prince Edward Island in 1973 to view a solar eclipse, and in 1974, traveled with BAA member, Walt Semerau, to see a solar eclipse from Africa.

In 1972, Vern constructed a homemade weather satellite receiving system to display weather pictures. He hopes that someday we can download high resolution pictures of sky objects taken by satellites that one will be able to view in the comfort of one's living room. Incidentally, this accomplished fellow knows where Hubble is at all times.

He is also an amateur radio operator with an extra class Amateur Radio License. He is an accredited volunteer examiner that licenses other amateurs and teaches courses for ham radio. Exams are held under the auspices of the American Radio Relay League.

Vernon and his wife (nee Lattie Kenworthy) have four fine children: John, Don, Susan, and Carol. They are all college graduates with very good positions. Four grandchildren have been added to this wonderful family.

Vern is a Rotarian and was a past president of his club and was the past district secretary last year. There are sixty-three Rotary clubs in this district. He enjoys his garden in Clarence and has found ways of keeping the creatures out of it with a fence and a little zap from an electric wire. A solar powered noise generator also keeps puzzled birds out of his cherry trees. For further relaxation he reads a little fiction when time permits; enjoys listening to opera; collects art of the local scene, and has a sailboat on Lake Ontario. He is also a photographer, and takes all the pictures for the brochures for his corporation.

Vernon Siegel is a brilliant gentleman with a very sharp mind, endowed with great creativity, and a remarkable ability in business relations and development. He is a quiet, warm, and friendly human being with a most pleasing personality. He is a valued member of the BAA.

Edith L. Geiger

FORGOTTEN AGAIN

Reprinted from the "ORBIT", the newsletter of the RASC Hamilton Centre. Vo. 23 No. 11. by Alister Ling.

Have you seen the special issue of 'Scientific American' (Energy for Planet Earth?) It is a fascinating account of how the engineers and clear thinkers are hoping to save gobs of energy for our troubled blue-green orb. There was talk and more talk about conservation, because saving 1 KW is much cheaper than producing it.

But was there one word about the disgusting waste of street, highway and advertising lighting? NO! Not one sentence about low pressure sodium, better reflector designs and time limits on commercial lighting. We'd practically need Dr Spock to calculate how much energy is being radiated directly to space or making it there after one reflection.

And we thought light pollution was a visible problem.

I was also surprised to see that little, if at all any, words were written about education of the masses. I think it was left to something like "people have to realise." One wonders in these days of rampant New Age acceptance and continuing belief in astrology how the masses are going to turn around. Need more money in R&D in industry. Sure, how about putting some into schools? Can the world learn to slow down and become more efficient if they don't even know that the Earth orbits the Sun and the Moon's phases are not caused by the Earth's shadow?

No one talked about telecommunication as a way of reducing energy requirements. Do all those millions of people who drive for half an eternity to get downtown really need to? Couldn't a vast amount be done from home via modem, fax or the almost passe view-phone? Obviously some degree of trust or control would be necessary for the system to be fairly honest and we think of it: taking a morning swim in Lake Simcoe before sitting down in front of a terminal for a couple of hours, then taking your coffee break on a quick sail around the bay. Imagine the jump in productivity!

What all politicians and managers need to learn is the dynamics of chaotic systems. We no longer live in a world that is linear and independent, it all feeds back. You can't expect to continue pushing hard and not expect to get yanked. Chaos deals with the notion that small perturbations can drastically affect the whole (The "butterfly effect"). Soon enough, we will be in a position "sensitive to initial conditions" where a small push can create a cascade from our cusp point. The problem is to where: A well-balanced global society or an ecological nightmare? Isn't it interesting that great hope and deep despair can be so close to one another?

I am glad that we as astronomers are involved in a field that deals in education and sharing the wonders of the natural world with others less fortunate. We're a step ahead, but there is still a lot we can do.

ASTRONOMICAL HAPPENINGS

- March 1 - conjunction MARS & MOON
conjunction SATURN & MOON
- March 2 - conjunction VENUS & MOON
- March 4 - NEW MOON
- March 6 - conjunction MERCURY & MOON
conjunction MARS & SATURN
- March 9 - MERCURY greatest elongation 18° East
- March 11 - FIRST QUARTER MOON
Zeta Bootid meteors
- March 12 - Sun leaves Aquarius and enters Pisces
- March 16 - MERCURY stationary
MOON at perigee (362,410 km)
Corona Australid meteors
- March 17 - conjunction JUPITER & MOON
- March 18 - FULL (SAP) MOON
- March 20 - Vernal Equinox - Time to try standing an EGG on its end between the hours of 2:45 AM EST and 4:45 AM EST. Equinox occurs at about 3:48 AM EST. (IT WORKS!)
Camelpardalid meteors
- March 24 - LAST QUARTER MOON
- March 26 - MERCURY at inferior conjunction
conjunction URANUS & MOON
Sun will graze Cetus
Virgind meteors *****

March 27 - conjunction NEPTUNE & MOON (an occultation will be visible from Central Africa and Southwest Asia)
 March 28 - MOON at apogee (404,904 km)
 March 29 - conjunction SATURN & MOON
 March 30 - conjunction MARS & MOON

April 1 - conjunction VENUS & MOON
 April 2 - conjunction MERCURY & MOON
 April 3 - NEW MOON
 April 4 - Kappa Serpentid meteors
 April 5 - conjunction MERCURY & VENUS
 April 7 - MERCURY stationary
 Delta Draconid meteors (See below)
 April 9 - large Sunspots naked-eye visibility 1947
 Alpha Virginid meteors
 April 13 - conjunction SATURN & MOON
 MOON at perigee (367,731 km)
 April 16 - FULL (PINK) MOON
 Sun leaves Pisces and enters Aries
 April 17 - Rho Leonid meteors
 April 20 - NEPTUNE stationary
 April 21 - URANUS stationary
 Lyrid meteors *****
 April 23 - conjunction URANUS & MOON
 conjunction NEPTUNE & MOON (and occultation will be visible from the Northeast Pacific and North America except the extreme north and east parts of the continent
 MERCURY greatest elongation 27° West
 April 24 - LAST QUARTER MOON
 April 25 - conjunction SATURN & MOON
 MOON at apogee (404,202 km)
 Mu Virginid meteors (See below)
 April 28 - Alpha Bootid meteors (See below)
 April 29 - conjunction MARS & MOON
 April 30 - conjunction MERCURY & MOON

On April 7th, the Delta Draconids will appear from the radiant of Right Ascension 18h 44m, +68° Declination. The duration of these meteors is about 20 days peeking on the 7th, with about 5 to 15 hourly. They should show up as fourth magnitude brilliant yellow streaks. Although not much is known about them, it would prove interesting to observe them and provide as much observational data as possible. Even for a spot in the "SPECTRUM."

Another meteor shower, the Mu Virginids which occur on April 25th are visible from Right Ascension 14h 44m, -05° Declination. Their appearance provides us with from 3 to 12 hourly and of fifth magnitude white meteors. Again much observational data is needed.

Finally a third meteor shower of little significance on April 28th is the Alpha Bootids. Their radiant is from 14h 32m Right Ascension, +19° Declination. These pinkish, fifth magnitude meteors provide us with no more than about 3 to 10 streaks per hour. Because of their colour, they should not be too hard to be recognized among any sporadic meteors seen. The three meteor showers previously established could add greatly to the empty spaces in "The SPECTRUM" as 'observations.'

Darwin Christy

INSTRUMENT NOTES

It seems that now amateurs are thinking big telescopes. Gone are the days when serious observing was done with 6 and 8 or even 12½-inch telescopes. Now we look for a 20-inch or larger aperture.

While I have no problem with striving for a more sensitive telescope, I hasten to point out that with a large mirror comes the problem of mirror maintenance. If the mirror is not cared for it may soon have to be realuminized. This is a very troublesome operation as the mirror must be removed and sent away to a shop that offers service. If much care is taken with handling the mirror the operation of realuminizing may be put off for a very long time.

Precautionary means vary with the size of the mirror. Our

Beaver Meadow mirror is mounted in a solid tube. The rear end of the tube should be capped. Then after an observing session a hair drier should be used to blow away any accumulated moisture. Then if the front end is capped, the mirror should be well protected.

With a lattice mounting such as is popular with bigger apertures it is not possible to seal the tube. The 60-inch reflector at Harvard, Mass. is fitted with a close fitting cover out into four quarters which fit tightly over the mirror. Some similar arrangement might work with a smaller mirror such as we might acquire. If the mirror is blown off with a hair drier a tight fitting cover would offer good protection. Some thought should be given to this problem when planning the mounting.

Ed Lindberg

BEAVER MEADOW OBSERVATORY *457-3104*

The Mirror is back! Thanks to Dave Fliss, Bruce Newman, Lynn & Wade Sigurdson, the scope is now back in working order!

STAR PARTIES: Bill Smith and Carol Lorenc invite you to their annual Messier Marathon. The dates they will attempt this event is on Friday March 6, with cloud days on March 7, 27, 28! Call them at 1-664-0841. Since they live in Jamestown, the weather can be dramatically different from that in Buffalo! So it is best to call for a weather report, as well as directions. For those who have never participated in a Messier Marathon, it is an all night search for all 107 Messier objects. We start right at sunset trying to catch all the setting objects before they set. Once we bag those, we start a leisurely scan of all the brighter ones. Once it gets really dark we work on the fainter ones. Around Midnight we take a couple hour break waiting for the morning objects to rise. Around 3am we start in earnest on the morning objects. The next flurry of activity occurs just at astronomical twilight as we try to catch the last of the objects before Sun rises! With any luck this year we maybe able to bag all 107 objects as well as all 9 planets! Oh yes bring your binoculars, and any telescope you might own. This is a great place to sharpen your observing skills, and the more telescopes we have the easier it is to bag all 107 objects. (we need all sizes from 50mm to 20"!) Speaking of STAR PARTIES sign up for your summer star party and beat the crowd!

EVENTS: Buffalo Museum Of Science Telescope/Computer prog Clinic on Sunday March 15 from 12-5pm. We need telescopes, computers, people to man the Museum's solar scopes, and people for CROWD CONTROL! The Dinosaur's Alive Event will be in progress, and I expect a real crowd. Please let me know if you think you might be giving me a hand, and I will leave your name with the guards so they will know that you are BAA volunteers and let you in free. So you don't know enough about telescopes, and hate computers? Then please give us a hand with the crowd.

Buffalo State Astronomy Day Saturday April 11. HEEELLPPPP!!!! This event has won a national award! And as usual we would like to put on a really good show. We need scopes for display, photographs, drawings, computers, and people to talk to the public. If you would like to help contact either Bob Hughes (893-4010) or Dan Marcus (773-5015). So remember we have fun even when it is cloudy!!!

Daniel R Marcus

LOW POWER EYEPIECES:

by Bill Smith

Nov 2, 1991

If I had only one eyepiece it would be a low power eyepiece. There are several reasons why:

- Wide angle of view allows you to find things. You can see star patterns that are on star maps, thus you can follow a trail to many objects.

You can use your finder which has a larger field than any scope to approximately locate an object. A low power field will often contain your object. Higher power eyepieces can easily be exchanged.

If you can't find it - you surely won't see it!

- **Minimization of scope and weather problems.**

Poor collimation, shaky mounts, turbulent atmosphere, temperature effects of a warm scope in cold air and wind effects are minimized.

- **Bright images**

Low power increases the brightness of objects as the light is not spread too thin. For example the Helix nebula, NGC 7293. Try it!

Problems and limitations:

- Details not seen on planets, the moon and deep sky objects.

- Many small deep sky objects won't be seen at all as they are too small or lack enough contrast with the bright night sky. (another subject to cover)

Mathematics of viewing:

- A good reference is a 4 page article in the May 91 issue of Sky and Telescope written by the mind behind Tele-Vue optics. Great illustrations and more detail than I can possibly cover here.

- Briefly, the "rule" that 3.5 power per inch of aperture is a minimum is horsefeathers! I routinely use a 55mm focal length eyepiece on my 10" f/5.6 yielding 2.6 power/inch. It gives a field of 2 degrees and makes cruising with a sky map reasonable easy as there is enough sky in the eyepiece to "see" where I'm going on the map.

- $\text{Magnification} = (\text{objective focal length (mm)}) / (\text{eyepiece focal length (mm)})$

- $\text{Angle of view} = (\text{eyepiece apparent angle of view (degrees)}) / \text{scope magnification (approximately - see the S\&T article)}$

- Angle of view (how much sky do you see) depends on the eyepiece construction. When you hold just the eyepiece and look at the wall you see a circle. This circle subtends an angle from your eye. To illustrate, cut a hole 1-2 inches in a piece of paper. Look through it with one eye and move the paper toward and away. The closer to your eye the wider view you can see. The "magnification" stays the same! Imagine measuring the angle from your eye across the diameter of the hole at various distances from your eye. When that angle is 45 degrees that is what most orthoscopic eyepieces give you. 82 degrees (the hole much closer to your eye) is what expensive Nagler type eyepieces give. What you really see in the sky is the apparent angle of view of the eyepiece divided by the magnification of the scope. Thus my 32mm Wide field eyepiece of 65 degree apparent view in my 10" f5.6 (1412mm focal length) yields a magnification of $1412/32 = 44$ and a angle of view in the sky of $65/44 = 1.47$ degrees.

- Exit pupil of a system is the diameter of the bundle of light at the focus of an eyepiece where your eye is placed. If that bundle is too large you cannot fit it in your eye. Your eye's pupil has a maximum diameter which shrinks with age. 7mm is an oft quoted value. Studies I've read and measurements of my dark-adapted eye with red light show it tends to be smaller. I say that 5.5mm is more like it. A system that yields an exit pupil greater than that is operating at reduced aperture. You will see the whole image. Every bit of the exit pupil contains the whole image. Sound confusing? Consider that the entire objective collects light from every object in the field. Thus an exit pupil too large to fit in your eye will merely allow less light in. The object you view will be as bright as it ever can be. As magnification is raised the exit pupil shrinks and when it completely fits in your eye then the object will dim with further increases of magnification.

WHY DO I HAVE TWO LOW POWER EYEPIECES?

I use a 55mm 50 degree apparent field of view and a 32mm 65 apparent field of view eyepieces a lot. They yield 26 and 44 power and 2 and 1.5 degrees of actual sky coverage. The moon subtends an angle of 0.5 degree so 4 moon diameters will fit in the 2 degree field of the 55mm eyepiece.

Another way of looking at magnification is that scopes, practically speaking, magnify angular dimensions. The moon is 2160 miles in diameter yet at the eyepiece it may look 0.5 inch. It subtends an angle of 0.5 degree but at 26x it looks like it subtends an angle of $0.5 \times 26 = 13$ degrees.

Back to eyepieces. Aren't 2 and 1.5 close together? Not really on an area basis. The 2 degree field has 70% more area than the 1.5 does. Considering I use the 55mm as a high power finder by matching star fields to charts it is very valuable. Cut two circles in a piece of paper of 2 and 1.5 degree to match the scale of your star charts and imagine following star patterns to get to an object you find hard to find and ask yourself which is easier.

Additionally I use nebula/light pollution filters a lot. I keep a Lumicon deep sky filter on the 32mm eyepiece all the time. This is because the 55mm eyepiece operates at a reduced aperture, I use it for finding purposes and the power is a bit low generally. The 32mm, while still quite wide field, allows all the light from the scope to enter the eye and has enough power to see most objects of interest such that I can center it for viewing at higher power. The deep sky filter is the least blocking of all the filters, doesn't really change the color of objects and the light pollution blocked by the filter helps viewing all objects some. Stronger filters usually give stars a green cast due to the wavelengths passed.

There is a lot more to viewing such as small faint objects are about best seen when the magnification used brings the object to 6 degree apparent size. For example a 3 arc minute galaxy needs $120 \times (3 \times 120 = 360 \text{ arc minutes} / 60 = 6 \text{ degrees apparent size})$. It has to do with the physiology of the eye. A good subject for a club talk.

In closing, I probably use 44x and 110x each about 40% of the time, and 26x and power >110 about 10% of the time each. Thus 90% of my viewing is at 110x or less. The scope just purrs, the atmosphere is rarely a problem and the viewing is just great.



from "The FOCAL POINT"

the newsletter of the Atlanta Astronomy Club

OBSERVING PLANETARY NEBULA

by Richard Jakiel

Planetary nebula are the ghostly embers of a star nearing the end of its life. What we see as a dim greenish glow are a series of "shells" expelled by a dying red giant star. This is only a very brief stage in a star's life, lasting only 10,000 years or so. The red giant rapidly evolves into a intensely hot white dwarf which irradiates the expanding planetary nebula. These dying stars are among the hottest known with temperatures from 25,000-100,000 K. In comparison, our Sun is a mere 5,800 K. The intense ultraviolet radiation produced an emission spectrum of only a few bright lines. One of these evolves ionized oxygen, or O-III, which produces the greenish glow often associated with these objects. The great observer William Herschel coined the term "planetary nebula", because of the green color and the small, rounded size which reminded him of the (then) newly discovered planet, Uranus.

Many deep sky observers believe that planetary nebula are hard to observe and are not worth the effort to track down, but this isn't really the case. All that is really needed is good star atlas, some medium and high power eyepieces and a few observing tips. A good star atlas or finder chart is essential, as nebulae are, by large, small objects located in rich star fields. Medium to high power is also highly recommended in observing these objects. Many are disks less than 20 arc-seconds across, so at low magnification they often look like stars which are slightly distended, nebulous or just out of focus. However, many have a high surface brightness so you will find it easy to apply 20 or more magnifications per inch of t

telescope aperture (N.B. :8-inch aperture at 20x per inch = 160 magnifications).

One of the most exciting advances in the art of observing planetary nebulae is the development of the nebular filter. Since these nebulae emit light in only a few narrow spectral lines, it is possible to selectively block out unwanted light. This enhances details in the nebulosity as well as greatly darkening the background and reducing the adverse effects of light pollution. The best kinds of filters for viewing are the ultra-high contrast and the O-III, although broad band filters will also help. (The O-III filter will be reviewed in a later issue of "The FOCAL POINT"- ed.) The change in the view can be dramatic, especially when viewing large, low contrast objects like the Helix Nebula or the Owl Nebula (M-97). When the planetary nebula is very small, I often use the "blink" technique to help find elusive objects. The blink technique consists of nothing more than alternately moving a nebular filter in and out of the field of view. When you do this, the stars dim and brighten considerably while the nebula remains the same. As a helpful hint, this works best with a dark cloth or hood over your head to block out extraneous light sources.

One of the best ways to sharpen up your observing skills is the fine art of drawing at the eyepiece. Not only will your ability to see detail improve, but you will have a permanent record of your observations to look on those all too common cloudy nights. Planetary nebulae come in a wide range of shapes, sizes and brightness levels, so they make ideal objects to practice on. Many are small and detailed like the planets they resemble. Making high resolution drawings will help you see details that might have been missed with a more cursory view. The primary tools of the trade are a solid clipboard, paper, pencils and a red flashlight. When I want to make a drawing, I first survey the area, noting the position of the brighter stars, and the size and orientation of the target. I usually do this without a filter, and after plotting these details I switch to a filtered view to draw in the more subtle shadings in the nebula. Your first drawings may turn out rather crude and unattractive, but in a short period of time you'll notice marked improvement in both your drawings and observing skills.

The fall and early winter skies are full of bright and challenging planetary nebulae to observe. The upper reaches of the summer Milky Way are still visible along with the normal fall and early winter constellations. Small, bright nebulae include NGC 7009 (Saturn), 7662 in Andromeda, 1535 in Eridanus, and 7026 and 7027, both in Cygnus. Bigger, more diffuse nebulae include NGC 7293 (Helix), 246 in Cetus, 1360 in Fornax and M-76, the little Dumbbell in Perseus. Try your hand at observing and drawing these other nebulae visible during the clear, cool fall nights. I'll greatly welcome any observations you have of these and other deep sky objects. I'd like to include your observations in upcoming deep sky articles.

Editor's note: The author of the forgoing article, Richard Jakiel, is a former member of the Buffalo Astronomical Association. Hopefully, the article on "O-III Filters", to appear in the Focal Point at a future date, will be presented in this newsletter, "The SPECTRUM."

SPY and TELL

Ernst Both has coauthored an article with Timothy J. Baroni of the Department of Biological Sciences at the State University of New York, College at Cortland, on "Chalciporus Piperaeoides in North America." This article on mushrooms was published in *Mycologia*, 1991.

Wade and Lynn Sigurdson and son, Ryan, spent the Christmas holidays at Hot Springs, British Columbia. Lynn, a post doctoral fellow at the University of Buffalo, has a job at Buffalo General Hospital, transferring her work through the university. She previously worked at Roswell Park Cancer Institute.

Al Kolodziejczak received a shortwave radio for Christmas, giving him another hobby.

Word has it that former member, Shaun Hardy, is still working as librarian at the Carnegie Institution in Washington. He was formerly research librarian at the Buffalo Museum of Science, leaving in 1989 to accept the position in Washington.

Patty Rupp is doing her internship at a hospital in New Hampshire, and has very long, hard hours. She was about to catch a bit of sleep around 5 P.M. on January 9th. She heard a crash. Someone had run into her new car in the parking lot. Down went Patty in her pj's trying to prevent the reckless driver's getaway, and managed to get his license number. She reported it to the police and they picked up the fellow who, by the way, had several charges against him.

On January 15th, NBC came in to take care of the Bills-Denver Broncos' game. They contacted the company for which Dave Bull works and hired him to be the lighting director for the game. He had to do the tunnel, the locker rooms, the platform on which the commentators viewed the game, and had to come up with the means of mounting cameras in the tunnel. Dave was on the commentators' platform at the time when the place kicker for the Broncos missed the goal. An exciting moment for Dave.

Jack Empson and Dave Sepulveda work for Chase Securities and were also at the game in the crowd control capacity. Our three BAA members had an important part to play in the game.

New member, Don Knecht, reports seeing the Mir space station in early January.

Bill Halbert left Depew two years ago and moved to Calliocon, N.Y. He taught music, K through 6, in the school while there. This year he returned to the area and is living in Lancaster. He is a musician and his vocal performances are keeping him very busy. He sings with the Greater Buffalo Opera Company, and sang the role of the wealthy peasant, Micha, in University of Buffalo Opera Theater Workshop presentation of *The Bartered Bride* on January 31 and February 1. He is the understudy for the lead in *King Roger* to be staged by the Greater Buffalo Opera Company, and on May 1 and 2, he will be the lead in *Sir John in Love* with the U.B. Opera Theater, and will be giving a recital at Slee Concert Hall on the campus some time in the second semester. He also finds time to be a member of the choir at the First Presbyterian Church on the Circle. Bill is a bass-baritone studying privately with Gar Burgess, who is director of both the Greater Buffalo Opera Company and the University of Buffalo Opera Theater Workshop. He hopes to attend the Academy for Vocal Arts in Philadelphia next year. The academy is the finest school for opera in the country. We wish him the best in his operatic career.

Edith L. Geiger

The following article is from "Astronomy London" the newsletter of the RASC London Centre. The author, Peter Jedicke, is well known among the NFCAA as well as having been here to present a talk to our club.

GALILEO and the TURNING POINT in ASTRONOMY

For whatever reasons, scholars and aficionados of any serious field of endeavor seem fixated on the idea of a CRISIS--that at a particular point in a story or in history, the specific action of a particular individual or even a single event was the crucial turning point in the story or that branch of history. Have these people never heard of calculus? Great changes in direction can be wrought by infinitely many infinitesimal scientist or one event, whether fortunate or deliberate, a complete reversal of something so broad as the "modern scientific point of view."

In astronomy, Copernicus, Kepler, Descartes, Galileo, Newton, Herschel surely made marvellous contributions, but it was the cumulative effect of all of them--and John Philoponus, Nicholas of Cusa, Albertus Magnus, Nicholi Oresme, Regiomontanus, and such lesser scientists who deserve to be better known among astronomers--that brought modern science to its greatness. Galileo's own work on falling bodies followed that of others in the late 16th century; he did not come up with the heliocentric theory; his development of inertia harks back to Jean Buridan, even his titan's struggle

With the church followed that of Giordano Bruno, to say nothing of Anaxagoras, who was tried for atheism in Athens almost six centuries before Christ lived.

On the other hand, every great curve has its inflection point--even in calculus. In the history of science, one could argue that Newton was more clever than Galileo, Kepler was more fanatical, Archimedes and Leonardo da Vinci had more to offer the technology of their times, even St. Thomas Aquinas placed reason before scholasticism and risked more than Galileo. In spite of all this, it is Galileo who belongs at the cusp of this curve--the great turning point.

Galileo was at the centre of the scientific events of his time: in Italy, where the church exercised its greatest power most directly and where the interplay of fresh ideas constituted the Renaissance. His philosophic assumptions were truly revolutionary--although he was not the first to question Aristotle's physics, he was the first to do so successfully and without feeble arguments. He was both willing to question even his own most basic assumptions and perspicacious enough to offer alternations which proved superior. The plough he was riding may have been that he broke what was new and improved.

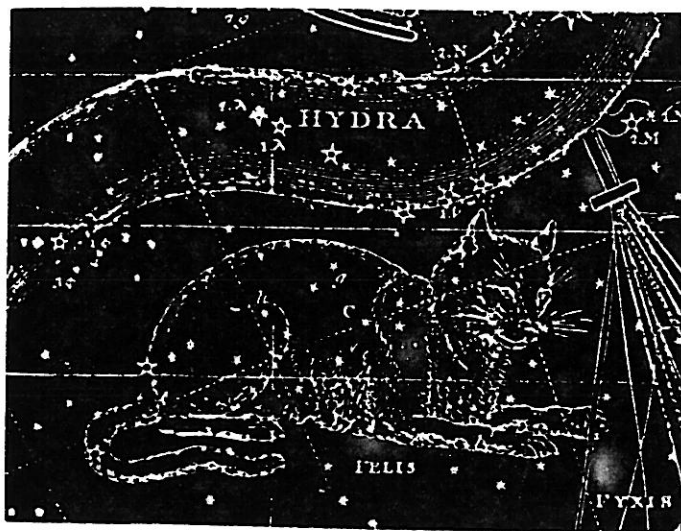
Beyond his central role and his revolutionary philosophy, two other aspects of Galileo's work make him stand out in the creation of the modern point of view. First, he had an incredible intuitive ability to observe things around him and see at once how they must be made to fit in to physics--for example, his observation of a swinging chandelier led him to understand the pendulum. How many others had seen chandeliers behave in precisely the same way, yet not truly seen what was happening?

Second, Galileo's writings, particularly his famous books "Two New Sciences" and "Dialogue Concerning the Two Chief World Systems", show a truly remarkable clarity of expression and even wit. Kepler, Copernicus, Descartes and even Newton all read like dead men--but Galileo is alive and sparkling still today in the pages of his books. He was the right scientist at the right place and in the right time; before Galileo, the science of astronomy can fairly be said to have been mired in antiquity and, after him, progress to modern astronomy was swift and sure.

ANCIENT CONSTELLATION

FELIS

Felis, The Cat, was first formed by La Lande in 1805. He placed it between Antlia and Hydra, using stars in that region of the skies. It was published in his 'Bibliographie Astronomique' and he said of it: 'I am very fond of cats. I will let this figure scratch the chart. The starry sky has worried me quite enough in my life, so I can have my joke with it.'



In "Die Gestirne," Bode's 2nd edition, the CAT appears as 'Katze,' showing twenty stars. Secchi included it in his plansphere of 1878 as the 'Gatt.' Since these times, the CAT has disappeared from all maps and charts as well as the disappearance of records pertaining to this constellation of old Proctor had assigned the title to the constellation Canis Minor though no follow-up continued to make this change.

Darwin Christy

BAA's NEW SCOPE

Your club needs you! If you haven't yet heard, The BAA is enthusiastically pursuing funding for our new proposed 20" telescope. With a funding goal of \$5000.00 we will get a large aperture Dobsonian mounted scope that is portable & available for star parties as well as private & public observing at Beaver Meadows. The sooner we raise the funds - the sooner we reap the benefits of large aperture. I am asking members to come forward with donations payable to the BAA. To date we have accumulated \$1685.00 towards that goal. Please send your checks, payable to the BAA, to Tom Nigrelli, 336 Utica St. Tonawanda, NY 14150...THANK YOU!!

TELESCOPES for SALE

Some members may be looking for telescopes. Here are a couple that are for sale!

Len Milks has an 8-inch Cave in very good condition. Included are a set of eyepieces and a very good finder. Len will take less than half the new cost. And you don't have to wait a whole year for delivery. If interested, call Len at 652-9639

Another fine scope is for sale by Tom Reid. It is a Celestron 8-inch Catadioptric. It has a finder and a set of good eyepieces. Some astronomical manuals come with this one. If interested, call Tom at 892-4407.

MEMBERSHIP CORNER

by Bruce Newman

Membership dues are to be made payable to the BAA and can be given to Bruce at any regular meeting or mailed to him at 67 Heather Hill Drive, West Seneca, NY 14224. Dues are listed as follows:

Family Membership - \$20.00
Individual or regular membership - \$15.00
Student or Senior membership - \$10.00

PLEASE HEED

Due to an oversight on myself, the format which is now in force is NO LONGER applicable. The present width has been 5.25" which has proved to be too wide. I am therefore asking those who prepare their articles to reduce them to 5" in width hereafter. Am sorry for the inconvenience

Editor

EDITORIAL

Perhaps this is NOT an editorial but it will serve the purpose as one. First, I wish to thank all those who have contributed to the SPECTRUM over the years I have been editor. Acknowledging those in this issue are: Edith Geiger, Rowland Rupp, Ed Lindberg, Walter Scott Houston, Dan Marcus, Bill Smith, Richard Jakiel from the Atlanta Astronomy Club, Peter Jedicke from the Royal Astronomical Society of Canada London Centre, Bruce Newman and last but NOT least, my wife, Ruth, for all the help she has given me in readying the "SPECTRUM" for publication.

The future of the "SPECTRUM" depends upon the response I receive in articles to continue this newsletter. I will appreciate any article, no matter how long or short it may be. I have personally been a contributor to many of the "SPECTRUM's" as you may all know, but I will admit that I am running out of ideas, so am looking for help from the members of this fine club. The response of other clubs from across the United States and Canada, who receive this newsletter, has been very favorable of its contents which has given me much encouragement. This newsletter is NOT JUST MINE, IT IS YOURS! And--I feel you, the members, should be contributors of articles as well as myself. THANK YOU VERY MUCH!!

Darwin Christy

* The "SPECTRUM" *

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** FIRST CLASS MAIL **

Horizons takes a big step Hiring firm brings new waterfront closer

THE SELECTION of a consultant to come up with a theme to turn Buffalo's neglected waterfront into a magnet for tourists and local residents is the most concrete proof yet that the Horizons Waterfront Commission will be more than just a paper agency.

The decision to give Cambridge Seven Associates of Massachusetts as much as \$100,000 to produce a concept for developing the Outer Harbor moves the commission firmly toward the action stage.

That is a significant step that should tell skeptics that converting the waterfront into something that both visitors and Western New Yorkers can marvel at and enjoy is really going to happen.

Cambridge will begin by looking at the ideas for an Outer Harbor aquarium, planetarium and park already put forth. But it will not be bound by those plans; it might well come up with different ideas. The only certainty is that what emerges will meet the criteria already established for the project: that it be appealing enough to be self-supporting, and that it reflect the local history and environment.

The Massachusetts firm seems well suited for the task. It has designed major aquarium projects in Baltimore and Boston and recently finished another in Osaka, Japan. It also has designed popular exhibits such as the Basketball Hall of Fame in Springfield, Mass.

The local task involves more than just picking a project. It entails designing the various elements within the project so that

they all relate to a single theme that will give the project an identity as well as attract visitors.

A subcontractor skilled in market analysis will work with Cambridge to advise officials as to how many local residents and tourists various attractions can be expected to draw and how large such attractions will need to be.

It is a well-planned effort to insure that while government capital funding will be needed to build whatever facilities are chosen, taxpayers will not have to pay for them. Making the project self-supporting will be no small selling point, no matter how much government coffers might improve if the economy rebounds.

Horizons has traveled a rough road to reach this point. From initial jurisdiction disputes with participating municipalities and mines laid by property owners fearing eminent domain takeovers, the commission has seen its plans constantly questioned and challenged.

That's to be expected for a newly formed agency with so much potential to improve the face of an entire community. Horizons has skillfully negotiated its way through such concerns to reach the point where it is ready to design a key project.

Funding will remain a concern, both for follow-up design work and for construction in two to three years. But hiring the consultant is a significant step that maintains momentum and keeps both state and local eyes focused on an effort that cannot be allowed to languish.

Mr Thomas D. Blanchard Jr.
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