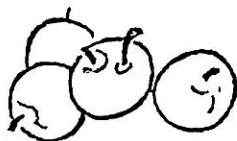
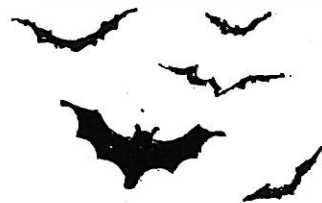


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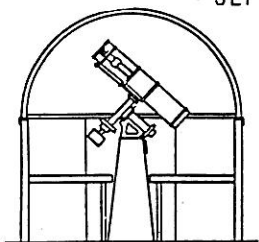


## SPECTRUM



e/g

BUFFALO ASTRONOMICAL ASSOCIATION, INC.  
SEPTEMBER/OCTOBER 1993



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The telephone at **Beaver Meadow** is for emergency use only at no cost. However, for domestic calls, there is a **box** placed near the phone for which we ask that you pay **50¢** for the first three minutes and **10¢** per minute thereafter. Please abide by this ruling. **Thank you!**

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IN CASE OF EMERGENCY

If for any reason there might be cause for cancellation of the meeting of the B.A.A., tune your **radios** to **WBEN 930** or **WGR 550**. Also, if Buffalo State College has been closed because of inclement weather, so will the meetings of the B.A.A. be cancelled.

## &gt;&gt; MEETING NOTICES &lt;&lt;

**SEP 10th:** Dr. Ernst Both on 50 years of Mars Research.

**OCT 8th:** Dr. James LoPresto on the Sun's Variable Luminosity.

Meetings: 2nd Fridays @ 7:30pm Jan-June and Sep-Dec.

Location: Auditorium of the New Science Building at Buffalo State College on Elmwood Ave.

We hope to see you all there at these meetings.  
As usual refreshments will follow!

In September, Dr. Both from the Museum of Science will talk on Mars research which includes much of his own work. Given at the NFAAA meeting, this is an excellent talk.

Our October speaker, Dr. LoPresto is a professor at Edinboro University. He designed and directs the new Solar Observational Lab at Edinboro; does high resolution spectral studies of solar velocity fields at Kitt Peak; and is widely published.

Come one, come all and welcome our speakers!



## PRESIDENT'S NOTE

## SHORTER, MORE RESPONSIVE MEETINGS!!

## CRITICS APPLAUD!

## CARL SAGAN SAYS "NEXT BEST THING TO A CLEAR SUNSET"

Your board, this summer, rehashed the general meetings agenda for content and suitability and came up with a segmented format we feel is an improvement. Last year, items were added to the agenda in an attempt to give more short topics and opportunities for participation. They, however, did add to the length of the meeting. This year, the meeting will be broken up into 3 segments: business; short talks and observations; and main speaker program. The entire revised agenda follows. Times will be adhered to; thus if you are primarily interested in the main speaker or in the short presentations as well then you can be assured the times that they will start are accurate.

## COFFEE

Yes, coffee, tea and cocoa will be available in the meeting room prior to 7:30! This makes it easier to relax after the work week.

## BUSINESS SEGMENT

Absolutely starts at 7:30 PM

Board meeting report  
Secretary's report  
Treasurer's report  
Newsletter editor's report  
Open business



## SHORT PRESENTATIONS AND OBSERVATIONS

Starting time about 7:45 PM

### Opening comments

### Announcements and handouts

The membership, instrument section, study group and other committee group chairs will be surveyed before the meeting for any announcements they might have and only those with comments will be presented.

### Introduce and welcome new members and visitors

**Back to basics: New program!** Bruce Newman will present a very short, to the point, wonderfully visual (overheads, slides) presentation of astronomical definitions and concepts. No matter what your experience level is, beginner to guru, you'll learn something new or something clarified and all presented in Bruce's easy to understand style.

### Observatory director's report

**Observing hints: New program!** Bill Smith will present a short program on how to see and enjoy the sky better along the style of Bruce's "Back to basics".

### Observation reports

The 1 to 3 minute very short presentations designed for member participation will be lumped into one group so they take less time to request. They are: "Points to ponder", the short, odd item of astronomy, the "Book preview", our short show and tell of a book brought in for all to see and "New Equipment" the praise / critique review of gear you may have recently bought.

### Open comments / announcements from the membership

A short "3 minute, see you in 5" break will follow before the main program.

## MAIN SPEAKER PROGRAM

The main speaker format will be single speaker 45 minute long talk for 2 meetings alternated by a meeting or two where the program consists of perhaps 3 short talks on a variety or related topics. These short talks will be pretty much of a non-technical nature and be primarily member presented.

Starting time 8:15 PM

The main speaker will be limited to a maximum of 45 minutes with an approximately 15 minute question and answer period following.

### Recap announcements & comments

The meeting adjourns at approximately 9:15, 15-30 minutes earlier than last year, for refreshments and social hour. This gives us more time to talk to the speaker, see old friends and new.

## REFRESHMENTS / SOCIAL HOUR

We're moving this to the main meeting room. This avoids splitting into several groups as often happens when a separate room is used.

## GENERAL NOTES

Other items usually in the agenda will be handled differently.

1. The "Planetary and special sky/social events calendar" and "mail", usually catalogs and offerings, will be at the membership desk instead of announced. Exceptional events, however, will still be announced.
2. The "What's up this month", the personalized list of interesting objects for the current month is replaced by the new "Observing hints" short program. Anyone that would like to do such a program, one time or periodic, is invited to do so for either the general meeting or the "Spectrum"

This agenda is an attempt to make our meetings more enjoyable, meaningful and fun. It is evolutionary and we will play with it to see what works best!

*So, come on down and see for yourself!*

- Bill Smith



## MEMBERSHIP CORNER

We open this column with a hope that everyone had a chance to enjoy the summer that was. This summer certainly presented more observing opportunities than last summer did. We hope that many of you had the chance to attend a star party or stop by Beaver Meadow to check progress on the observatory addition. The end of summer closes out the BAA's membership year, our first year as Membership Co-Chairpersons. Looking back we think it's been a good year for the BAA and for us. The club successfully completed fundraising for and purchase of a new 20" Obsession telescope and work on the new observatory addition is nearing completion. Personally we measure the success of this past year by the lack of irate phone calls and nasty letters, leading us to believe that we have done an adequate job of keeping track of who's who and who paid what.

2

From endings we turn to beginnings. Fall marks the start of our regular meetings on the second Friday of each month. It also marks that time of year when membership dues should be paid. [We pause now . . . while the groans fade away.] I am happy to report that some members have already renewed for the 1993-1994 membership year. It is our goal this year to complete the membership renewal process a little sooner than in previous years so that we may get out the Membership Directory in a more timely fashion. The cooperation of the members in this endeavor will be greatly appreciated.

With this issue we will begin publishing the names of our newest members. And they are:

Bud&Ella Abate 1575 Love Rd. Grand Island, NY 773-2398	Mark Adamchick 5559 Johns Ter. Hamburg, NY 649-1201	Nils Gunnersen 210 Tampa Dr. Buffalo, NY 825-0321
Mark Kimball 5948 Old Orchard Dr. Hamburg, NY 649-5133	Emily Lyons 182 Robert Dr. Tonawanda, NY 692-3047	Chris Matyas 68 Tiernon Park Kenmore, NY 832-9244
Mark Reville 5191 Glendale Ave. Hamburg, NY 627-4213	Howard Stirling 107 Oakland Pl. Buffalo, NY	

Please join us in welcoming them to the BAA.

Joe and Bev Orzechowski



## OBSERVATION REPORT: more globulars!

The Mar-Apr and May-June 93 Spectrums included an article on globular clusters and gave summary visual impressions on all but 14 of the 86 Messier and NGC globulars visible north of -40 south declination. This past Spring and Summer I have viewed 10 of these leaving the last 4 for another article. These 10 are mainly quite southerly. Refer to the May-June 93 Spectrum for sky positions, sizes and magnitudes.

The following impressions are from views with my 10" Dobsonian and viewing powers from 28 to 210x. All are identified by their NGC number.

- 1851: This was seen reasonably easy in a fair sky so this must be a great globular! A very southern globular.
- 2298: Small and not resolved.
- 5053: Located about a degree from M53, it shows as grainy but unconcentrated. It is smaller and 2 mags fainter than M53 and opposite in "look". Compare them and see.
- 5466: About 5° east of M3 and this pair is another great comparison between nearby (in the sky) globulars. Very loose looking and only somewhat resolved in the 10".
- 5634: A small, unresolved globular with no good guide stars to it.
- 5986: A grainy, good size glob and bright. Fair guide stars to help you find it.
- 6139: An easy to find, small but bright glob. Concentrated core but not resolved into stars.
- 6380: Another easy to locate glob from a star map but not much there; somewhat tough to see on a pretty good night.
- 6441: Super easy to find, it is small with a bright core; shows no resolved stars.
- 6723: East to find, a nice glob! Resolves nicely, shows a large core but no nucleus.

There is some good variety in this group and the best of this batch to view are 1851, 5986, 6441 and 6723. Go ahead, give them a try. Drop a note to the Spectrum on your impressions.



- Bill Smith

## ASTRONOMICAL HAPPENINGS

SEPTEMBER 1993

- 1 - Beta Lacertid Meteor Shower
  - Aurigid Meteor Shower
  - 3 - MOON at apogee (406,124 km)
  - 4 - Ceres stationary
  - 6 - Conjunction - Mars & Jupiter
  - 9 - Last Quarter MOON
  - 10 - Conjunction - Juno & Sun
- Buffalo Astronomical Association Meeting

- 11 - Epsilon Perseid Meteor Shower
- 12 - The SUN leaves Leo and enters Virgo
- 13 - Conjunction - Venus & Moon
- 15 - NEW MOON
- 16 - MOON at perigee (357,407 km)  
Conjunction - Mars & Spica
- 17 - Conjunction - Mercury & Moon  
Conjunction - Jupiter & Moon
- 18 - Conjunction - Mars & moon
- 20 - Southern Piscid Meteor Shower
- 21 - Kappa Aquarid Meteor Shower
- 22 - First Quarter MOON  
Alpha Aurigid Meteor Shower (see below)  
Autumnal Equinox. On this day the SUN, on its travel southward, crosses the Equatorial plain. On a smooth table, one might try standing an egg on its end between 6:30 and 8:30 PM Est. I have seen this accomplished, ed.
- 24 - Conjunction - Neptune & Moon  
Conjunction - Uranus & Moon  
Conjunction - Mercury & Jupiter
- 26 - Conjunction - Mercury & Spica
- 27 - Conjunction - SaTURN & Moon  
Uranus stationary
- 29 - Neptune stationary  
Sextantid Meteor Shower
- 30 - MOON at apogee (406,425 km)  
FULL (Harvest) MOON

#### OCTOBER 1993

- 2 - Quadrantid Meteor Shower
- 3 - Andromedes Meteor Shower
- 6 - Conjunction - Mercury & Mars
- 8 - Last Quarter: MOON  
Buffalo Astronomical Association Meeting
- 9 - Draconid Meteor Shower
- 12 - Northern Piscid Meteor Shower
- 13 - Conjunction - Venus & Moon  
Mercury at greatest elongation (25° east)  
Pallas stationary  
Vesta stationary
- 14 - MOON at perigee (357,243 km)
- 15 - NEW MOON  
"SPECTRUM" DEADLINE for the NOVEMBER-DECEMBER Issue!!
- 16 - Conjunction - Mars & Moon
- 17 - Conjunction - Mercury & Moon  
Epsilon Arietid Meteor Shower
- 18 - Conjunction - Jupiter & SUN
- 19 - Epsilon Geminid Meteor Shower (see below)
- 21 - Conjunction - Neptune & Moon  
Conjunction - Uranus & Moon  
Orionid Meteor Shower
- 22 - Ceres at opposition
- 24 - Conjunction - Saturn & Moon  
Leo Minorid Meteor Shower  
The SUN leaves Virgo and enters Libra
- 25 - Mercury stationary
- 27 - MOON at apogee (406,102 km)
- 28 - Conjunction - Mercury & Mars  
Saturn stationary
- 30 - FULL (Hunters) MOON

#### METEOR SHOWERS

On September 22nd the Alpha Aurigid meteors can be found out of radiant 04h 56m R.A. & +42° declination. They produce slow, short, white meteors of 4th magnitude. This irregular shower only lasts for one day (24 hours), also a very few are detected, 5 or 6 hourly. These meteors would prove to be a challenge for anyone who likes the sport of observing meteoros.

On October 19th the Epsilon Geminid meteor shower will appear from radiant 06h 56m R.A. & +27° declination. Not much is known about this shower. Perhaps 3 to 7 can be counted hourly

over a period of 13 days. It is said they produce a greenish-blue hew of 4th magnitude. As are the Aurigids in need of observational data, so are these insignificant meteors.

TRY THEM!



#### SPY and TELL

The annual Canal Fest was held along the Barge Canal. Orrin Christy and his friend, Mike Lance, entered the Sika Challenge, where the competing boat is built on the spot on the canal bank and raced in the final days of the Fest. Lumber for each boat is supplied; 3 sheets of 4x8 marine plywood, 2x2 and 1x1 pine wood. When the boat is finished it is sealed with Sikaflex compound. Heckling the boat builders is part of the event. There were 16 teams. Different heats were set up for the race and Orrin designed the course. Orrin and Lance built their boat in 50 minutes on Wednesday and raced on Saturday, July 24th. They set a record heat in 01:43 sec. In the final heat the boat began to take in lots of water. They had to push/pull against the water, but succeeded in winning the trophy with their Grunge Bucket V. Congratulations!

Bill Smith continues to win recognition for his photography. He won an honorable mention at the Allentown Art Festival with a cow print; a line-up of cows in winter. This was Bill's third honorable mention in twelve years. At an exhibit in Elmira on June 26-27, he won First Place for his entire display. He participated in art shows in Kalamazoo, Michigan, and at the Corn Hill Art Show and the Lilac Festival Art Show in Rochester. Bill has sold around 300 prints so far this year. He has six other shows sprinkled here and there through November. Bill's wife, Carol, entered their horse, Ally, in a dressage competition in a big Arabian Horse Show in Batavia where he won two 5th places and one 6th place against 23 other horses in the show. In other news, Bill and Carol have three new kittens (donation from the neighbors) to help out the old barn cat. Their names are: Mouse, Squeek, and MC (for Maximum Cat). Now their cat population is eight.

Ken Biggie's gallbladder operation was a big success. He went into surgery on June 23rd and was back home on June 25th. Ken and Diane visited Washington, Fredericksburg, and Annapolis over the July 4th weekend.

The Sigurdsons have a new little member in their family. Hannah Frances was born April 27th, weighing 6 lbs. 9 oz. Ryan was 3 years old on August 7th, and is on the go, exploring his world. Lynn is back, working for U.B. at Buffalo General. Her job and the children keep her very busy.

Melissa Marcus who finished her term as section chairman of District 8 Federated Garden Clubs of New York State, acting as liaison between seven clubs and the district, continues to be a representative of her Garden Club, and is actively involved being Environmental Protection Chairman in her district. She is taking an environmental course sponsored by the Federated Garden Clubs of New York State, with meetings held in different parts of the state. On June 7-8-9, she attended the class at Mohonk Mountain House in New Paltz, with nature lectures and hiking and found those three days to be stimulating and exciting. She is also taking a gardening study course sponsored by District 8, with meetings including workshops at the Buffalo and Erie County Botanical Gardens in South Park, lectures by informed members of local colleges and Cornell Cooperative Extension, and experts in the field. Both courses have four series twice a year, consisting of two days each. Melissa has taken two gardening study courses and is embarking on a third in the fall. After completing the environmental and gardening courses and passing the required exams, she will receive consultant status in both areas. Melissa also belongs to IKEBANA International, Buffalo Chapter 50, a Japanese Flower Arranging Club. As a cultural part of the recent World University Games in Buffalo, this group put on



an exhibit in the Delaware Park Casino. The president of the local club sent a letter to the mayor of Kanazawa, Buffalo's sister city in Japan, inviting their garden club to participate in the Buffalo Chapter exhibit. They arrived with 15 taiko drums and Japanese Odori folk dancers and put on spectacular entertainment, including the symbolic performance of the tea ceremony. Melissa's involvement in gardening, nature and the environment gives her great pleasure.

Sheridan Simon, who was a BAA member in the '60s, had a biography on Stephen Hawking published by Macmillan in February 1991, and has since published Wonders of the Solar System with Omni magazine. His software package, "The Physics Disk" is being used in school systems in several states. Sheridan is a professor of physics at Guilford College in Greensboro, North Carolina.

Another article concerning another former member of the BAA appeared in the September issue of Sky and Telescope. (pg. 91) Wayne Johnson, who was a member in the '70s, is President of the Orange County Astronomers in Southern California, and is known as Mr. Galaxy. He spends many hours in search of supernovae. In April of 1991 he found one in the Virgo cluster. Others also discovered the supernova, but the event was special for Wayne. We wish him success and we'll keep our eye out for any of his discoveries.

Edith L. Geiger



## B.A.A. GRAMS

Astronomy anagrams. Use clue to find astronomy term. Hidden term will be one or two words. Answers will be found in the next issue of the B.A.A. SPECTRUM.

### 1) SCRIBE SOME JETS

*You can get a certificate for finding all of them.*

### 2) DID HE SLEW

*It can keep your SCT dry.*

### 3) A PALLID GONER

*Your scope should be this to track correctly.*

### 4) LIARS DEEM IT

*Match RA and this and it will be on the meridian.*

### 5) AIR THY LEG

*Divide a parsec by 3.26.*

BN 9/93

Answers to May-June issue: 1) Obsession 2) Tom Nigrelli  
3) Beaver Meadow 4) twenty inches 5) open truss

## BEAVER MEADOW OBSERVATORY \*457-3104\*

Summers over ☹ ! But it was fantastic viewing

at the Observatory ☺! We have been having a grand time using the new 20". The new scope moves effortlessly, and handles with such ease that even the public has found it easy to use. By the time you read this the new addition to the Observatory will be 75% complete. We will have to finish painting, and fabrication the book cases, and desk areas. Our intention is to have an open house sometime in October for people who have donated time, money, or materials. My heart felt thanks to Tom Nigrelli, Tristan Dilapo, Rolland and Irene Rupp, Luann Szucs, Joe Drabek, Jack Empson, Dave Fliss, Dr. Jack and Jayne Mack, Bruce Newman, Joe and Beverly Orzechowski, Dave Sepulveda, Joel Stuckey, Bill and Carol Smith, Bob and Laurie Titran, Gene Witowski, Tom Bemus, Terry Radder, Bob and Brian Rzoska, Edith Geiger, Dave Bull, Larry Carlino, Ed Czaplak Bill Halbert. My thanks to all for helping out at all the club happenings.

## Observatory Want list:

- 1: A stepper motor for the 12" dec shaft, and reduce backlash.
- 2: Counterweights that are movable, so we can properly balance the scope!
- 3: CCD Camera- could use a grant proposal! Would be a great addition for public. Video, or computer.
- 4: Dob driver for 20"
- 5: Eyepiece box for 20" so we don't drop one, or the nebula filters!!!!
- 6: Some one to get the Solar Eclipse of 94 organized, as well as literature published for this event!!!

## Help Wanted:

September 18 & 19 from 10am to 5pm, and 1pm to 5pm for the usual public weekend. Need the usual computers, CCD cameras, and all the usual toys. This is Beaver Meadow's Trash and treasure sale, so come on out and join in on the fun!!!

A Tip of the Hat to Joel Stuckey, when he heard the observatory was not going to be open to the public for the Persied Meteor shower, he VOLUNTEERED his services for the event. Good thing too, because the shower was well advertised. Joel, and Bruce Newman, Bob Hughes, Bill Halbert, Terry Radder, and other members who donated their viewing time to help out. There were 80+ signatures in the log book, and I'm sure there were another 80 people who didn't sign in!!! The crowd was very appreciative of the event, they oohed and aahed for all the big ones. A good deal of these people had not heard of Beaver Meadow before. With this sort of favorable experience, we should see many of them back. The Shower produced only about 30 meteors per hour, but most produced nice smoke trails! If the weather had been comparable to some of the nights we had earlier in the summer, the count would have been in the hundreds!!!



Dan Marcus

SKY & TELESCOPE MAGAZINE

ASTRONOMY MAGAZINE

RASC OBSERVER'S HANDBOOK

Discounts are available on subscriptions to the two popular astronomical magazines, ASTRONOMY and SKY & TELESCOPE, and for copies of the RASC OBSERVER'S HANDBOOK. Currently 12 members subscribe to ASTRONOMY and 16 to S & T, and last year 12 members ordered the HANDBOOK.

Make checks out to Buffalo Astronomical Assn. Mailing labels are not necessary for renewal.

This year I will try to get everyone on cycles which renew in JANUARY, by adding monthly increments to adjust the renewal amounts.

ASTRONOMY is \$16 a year or \$32 for two years, \$1.34 per month. It renews annually by group list, which I should have at the Sep.10 meeting. Renewal is for one or two years. If you wish to subscribe or renew, bring \$\$ to the Sep. 10 or Oct. 8 meeting or mail it to Steve Kramer\* by OCTOBER 12.

SKY & TELESCOPE is \$20 a year, \$1.67 per month. Currently, it renews individually during the year. For renewal, S&T sends you a notice, which you will give to Steve with the \$20 plus \$1.67 x [number of months (up to 11) to take you to the NEXT January]. To subscribe, see Steve any time.

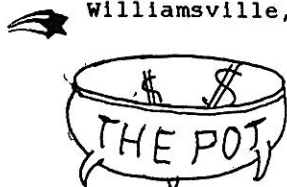
Remember, BAA members, who are subscribers to S&T, can order directly all other Sky publications and products at a 10% discount by using the form to be provided in future issues or by calling: 1-800-253-0245.

OBSERVER'S HANDBOOK of The Royal Astronomical Society of Canada for 1994 is US \$ 15.87 per copy this year. It is again available at a discount, US \$ 10.50, if we order more than 10 copies. They will be available by mid-November; I would like to send the order after mid-October.

\* Stephen Kramer  
80 Donna Lea Blvd.  
Williamsville, NY 14221

#### Treasurer's Corner

by  
Steve Kramer



Balance, Sep.1, '92 . . . . 3896.58

#### Debits

~ Spectrum print . . . .	552.00
" mail, &c. . . .	214.53
Supplies . . . .	81.70
Expenses . . . .	35.88
Bank chg . . . .	26.60
Telephone, BMO . . . .	255.44
Insurance . . . .	229.68
~ Refreshments . . . .	151.95
Annual Dinner . . . .	383.45
NFAAA . . . .	314.65
~ Mag. Subscrip. . . .	338.68
Group offers . . . .	118.80
~ Beaver Meadow . . . .	380.00
~ New Scope . . . .	5657.98
~ Observatory . . . .	5255.75
Total . . . .	13997.09

#### Credits

~ Dues . . . .	1155.00
Sales, raffle . . . .	1.75
Bank Interest . . . .	37.31
~ Kitty . . . .	47.70
Annual Dinner . . . .	495.00
NFAAA . . . .	420.00
~ Mag. Subscrip. . . .	332.00
Group Offers . . . .	118.80
Other Cr. * . . . .	16.00
~ Beaver Meadow . . . .	498.67
~ New Scope . . . .	5990.00
~ Observatory . . . .	3568.24
Total . . . .	12680.47

Balance, Aug.12, '93 . . . . 2579.96

Our fiscal year is 1 Sep. to 31 Aug. and will be essentially the same; it's been an active year at the Observatory. As a not-for-profit organization, we are required to file a Federal tax form if we have income of \$25,000 in a year. (We didn't quite make it.) Otherwise we file a "zero" form every third year.

#### "SPECTRUM" NEWSLETTER DEADLINE

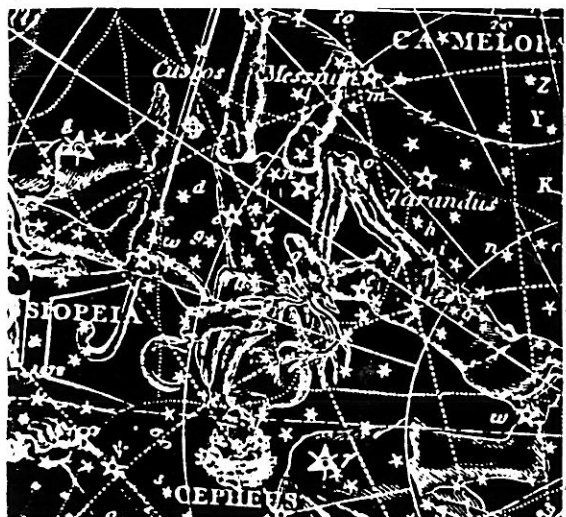
The DEADLINE for the NOVEMBER/DECEMBER issue of "The SPECTRUM" is NO LATER than OCTOBER 8th. I would appreciate all articles in by that time !

#### ANCINET CONSTELLATIONS

*CUSTOS MESSIUM*, the Harvest-keeper was located between Camelopard, Cassiopeia & Cepheus in La Lande's globe of 1775. It was formed from some inconspicuous stars in that area not far from the pole star, Polaris. This constellation, of course, no longer exists, having passed away from the recognition of astronomers, past and present.

Smyth gave it an alternative name, "Le Messien" and said of it as being in poorish punning compliment to his friend, the 'Comet Fernet', which King Louis XV had said of him. This all came about because for thirty some years he had been the gatherer and keeper of the harvest of comets. Smyth also has been credited for discovering 12 comets between the years 1794 and 1798. This title or name could have been induced by the fact that two neighboring royal personages were rulers of an agricultural people as well as the Ginaffe which was an animal of destruction to the grain fields. This also all because it was selected by the Phoenicians who are said to have imagined a large Wheat Field in that part of the skies.

The inventor of this constellation is said to have been the enthusiastic astronomer who spent nights on the 'Pont Neuf' over the Seine. He did, perhaps, explain the wonders of the variable star, Algol, to whom all he could interest in the French Revolution, enabled him to "thank his lucky stars" that he did not become a victim of the fate so many of his friends faced.



*PHOENICOPTERUS*, the Flamingo is another not used any more constellation, although it does appear at times. Its inventor has never been revealed. Even the date which it is said to have been discovered remains a secret. A Treatise of Childmead has reference to it as, "The Phoenicopter" we may call the Bottour which is the Old English word for Bittern. In the absence of the titles in the foregoing description, perhaps, shows the Bittern, or Flamingo, was popular as an English figuring and title in the early part of the 17th century.

#### BAA ANNALS

5 YEARS AGO - In September Larry Hazel led off the 1988-1989 season with a talk on "Galaxies". Larry has long been associated with the BAA as a member and as a speaker. In October another BAA member, Phil Cizdziel, spoke on an infrared detector he worked on at Hughes Corp.

Two book reviews appeared in the SPECTRUM—one by Tom Santa Lucia on Stephen Hawking's new book "A Brief History of Time". The other was by Rowland Rupp on Sir James Jeans 1929 edition of "The Universe Around Us". His article focused on the many ideas prevalent then that became outmoded in the sixty years that followed. Observation

reports by Marylou Bebak, Rowland Rupp and Carl Milazzo appeared. Spy and Tell reported that Michael Idem was working on a 36-inch telescope and a 20-foot tall observatory; does anyone know how these projects came out?

**10 YEARS AGO** - Clifford Cunningham from Kitchener, Ontario spoke at the September 1983 meeting. An expert on the minor planets, he spoke on "Amateur Photoelectric Photometry of Asteroids". BAA member John Raymond's talk in October was "Spectroscopy and the Chemistry of Space".

This was an abbreviated SPECTRUM—only six pages. It did contain a profile of Jim Russell who, along with Alan Mohn, was co-director of Beaver Meadow Observatory during 1980-1981. Edith Geiger was the author. Observation reports were submitted by Carl Milazzo, Rowland Rupp and Shaun Hardy, and Darwin Christy reported on his summer pilgrimage to Stellafane.

**15 YEARS AGO** - Fred Price and Larry Carlino gave a joint presentation in September on the recent apparition of Jupiter. Miro Catipovik spoke on the 20-inch telescope he was constructing. He completed this long-term project and donated the telescope to UB.

Edith Geiger's profile was devoted to Bob Mayer, the BAA's late master-craftsman. An article by Carl Milazzo dealt with recent evidence of impact craters on solar system bodies other than the moon.

**25 YEARS AGO** - Marie Cain from Geneva, N.Y. spoke in September 1968. Her subject was William R. Brooks, who searched for comets at his observatory in Geneva during the late 19th century. October's speaker, Ralph Dakin of Rochester, described "Tools of the Astronomer".

The October SPECTRUM carried a follow-up article on William Brooks by Marie Cain. Spy and Tell noted that Ed and Olga Lindberg had visited the site of Tycho Brahe's observatory on the island of Hven in the Baltic Sea during their spring tour of Europe, and that newly elected President Fred Price visited England. The September SPECTRUM carried the obituary of Ed Stoklosa.

**35 YEARS AGO** - Featured at the September meeting was the film "Operation Moonwatch", which was made locally to show the BAA's contribution to the International Geophysical Year program. In October the BAA held an open house at the Museum of Science at which BAA President Herman Elson gave a short talk about the club. Other speakers were BAA members Seville Chapman on "Satellites and the I.G.Y.", Louis Reinagle on auroral and meteor observations, and Ed Lindberg on Operation Moonwatch.



Rowland A. Rupp

### JUPITER BEFORE SUNSET

Although my telescope is only a 3" refractor, I've never had a problem compiling lists of objects to view. Favorite targets of mine include the sun, moon, planets, long period variables, double stars, and the occasional Messier object. All of these are easy objects from my yard in Amherst. Recently, I got the feeling that "easy" had become a rut for me, so I decided to try something new.

During the past few months I've been observing Jupiter and its four Galilean satellites, enjoying the opportunity they provide for seeing changes happen while I'm watching. Several events for Jupiter's moons were to occur on the evening of June 26th including an eclipse of Europa and a transit of Ganymede's shadow. More challenging were the ending of transits for Io and Ganymede and an occultation of Europa which would occur almost one-half hour before sunset. Could I locate Jupiter in the daytime sky with a scope that had not been polar aligned? Could I spot the moons separating from the planet's disk in a sunlit sky with a 3" refractor? I decided to find out.

Using the diagram of the sun, moon, and planets which appears in the "Stars & Planets" column of Sky & Telescope I guessed that Jupiter was about 5° above (north of) the First Quarter moon. Those of you familiar with the chart I am referring to know that it is not exactly a precision finder chart. I centered the moon in the 1¼° field of my low power eyepiece, moved up about 8° using the declination circle on my mount and began sweeping east and west, lowering the declination with each sweep. After less than five minutes of searching I located Jupiter. It was 8:00 PM, a full 57 minutes before sunset. The north and south equatorial belts were clearly visible and later I was able to detect the darker shadings over the polar regions. I wasn't able to find Callisto which was well east of Jupiter.

At 8:30 PM I noticed a slight bump on the western edge of Jupiter north of the north equatorial belt (NEB). In a few minutes this bump became a point of light distinctly separate from the planet. It was Ganymede! As I followed Ganymede's separation from Jupiter's disk I kept a careful (and hopeful) watch for Io. In a few minutes I was rewarded with another point of light detaching itself from the western edge of the planet's disk just at the southern edge of the NEB. This was at 8:41 PM, still 16 minutes before sunset. I missed Europa's brief appearance (about one minute) between the end of its occultation and the beginning of its eclipse. I didn't spot Callisto until a few minutes after sunset which was probably because I couldn't use Jupiter as a positional reference for it. About three hours later I watched Ganymede's shadow encroach upon and slide across Jupiter's disk and afterward saw Europa gradually appear as it emerged from Jupiter's shadow.

The events I viewed were not spectacular nor unusual but it was the first time I had viewed a planet in the daytime sky with my telescope. Of course, having the moon nearby to serve as a starting point certainly helped tremendously and this is a technique I plan to utilize again in the future.



Joe Orzechowski

### BEGINNER ASTRONOMER

From the Von Braun Astronomical Society's newsletter, VIA STELLARIS, dated August 1993 by Jim Ballard

Many times at a public star party I am asked, "How did you find that planet?", or "How much does that telescope cost?" As a member of VBAS and amateur astronomer for many years I have noticed how we sometimes lose the beginner with our hype and lingo. That is not to say that many of the amateurs don't do a good job of explaining what they are sharing with the public at star parties. How many times has a new member joined only to be discouraged by lack of understanding of the basics? To bridge the gap, I have compiled a list of some recommendations for the beginning observer:

- 1) Learn about astronomy and observing by attending star parties and planetary shows.
- 2) Learn the constellations before you buy any equipment. A good beginner book is Stars in the Golden Book Series, available at most bookstores (small and a convenient size to carry in your pocket), or The Stars by H.A. Rey, available at one of the bookstores in Madison Square Mall, (In Huntsville, AL \*ed\*) Another good book is Nightwatch by Terence Dickinson.
- 3) Find a friend who shares your interest and go out together. It's much more interesting when you go with a friend and you usually see more. Plus, you are more motivated.
- 4) Be patient with learning constellations. It takes time and good weather. A good observing location can also help, but is not necessary.

-----continued on page EIGHT (8)-----



## A DISSERTATION ON EXIT PUPILS, OR THE JOY OF SEX-IT\*

Dr. Rick Letherer

My apologies to any sensitive readers. The title for this article is pure yellow journalism. It is a shameless attempt to grab your attention through deliberate misrepresentation and manipulation. The deceitful literary style used in this pathetic ploy is my attempt to get you started reading about the real subject of this article, exit pupils (which is far less interesting than sex), by appealing to the seamy side of reader morals. By the way, my questionable interpretation of journalistic license is working; I enticed you to read this far.

Just for the record, I find the conceptual study of optics boring. I would much rather write about, read about or actually do observational astronomy. I enjoy looking through my telescope but rather dislike doing mental dissections of its optical principals. Doing complex or routine optical calculations is a job best left for computers, anyway. I also enjoy the application of lenses for the improvement of human vision, my profession, which is rewarding beyond description. My motivation for this article is to set the record straight at least once regarding several misconceptions that I hear repeatedly in the field about the subject of exit pupils. The subject reared its ugly head again at the October RCA meeting. If you have the stomach for it, here we go.

First let me describe what an exit pupil is not. An exit pupil is not a part on an eyepiece. It is not a structure, or an opening attached to the eyepiece. It is *not* the diameter of the eyepiece lens opening that is positioned near your eye during observing. You cannot find a place anywhere *on* an eyepiece where you can measure the exit pupil. There is one, non-telescope exception to this rule; for a single lens forming an image of an extended, non-point object the exit pupil is the lens itself. This is the case for a magnifying glass (a single lens).

Now let me discuss what an exit pupil is. In telescope and microscope eyepiece

systems there are multiple lenses; so the exception mentioned above for single lens systems does not apply. In our telescopes the exit pupil is the *image* of the objective formed by the eyepiece. (The objective of a telescope is the light collecting front lens on a refractor, or the curved mirror of a reflector or Schmidt-Cassegrain). An image is not a structure, but a bundle of light that can be projected or observed directly. The distance from the eye-side of an eyepiece to the exit pupil determines the eye relief distance. Longer eye-relief distances are easier for observers using eyeglasses since the eye is positioned further from the eyepiece than in non-eyeglass wearers.

An exit pupil, also called the *Ramsden circle*, is where the light leaving the eyepiece has the greatest flux density or simply greatest brightness. This is where you want to place your eye (actually the entrance pupil of your eye) to collect the most light.

Even though an exit pupil is not a structure, it can be calculated and even measured. The calculation to determine the diameter of an exit pupil follows:

$$\text{exit pupil diameter} = \frac{\text{objective diameter}}{\text{magnification}}$$

This relates the diameter of the exit pupil to the size of the objective lens, and the focal lengths of both objective and eyepiece. In other words, different objective mirrors and lenses produce different exit pupils from the same eyepiece. Moving the same eyepiece to a telescope with a different objective aperture and/or focal length will change the eyepiece's exit pupil diameter. Using some algebra, the F number (or focal ratio) is inversely proportional to exit pupil diameter. If the same eyepiece is moved to a telescope with a bigger F number, it will form a smaller exit pupil.

The measurement of an exit pupil is done by pointing a telescope at a diffuse light source like vacant daytime sky. Focus an image of the objective mirror or lens on a blank card held near the eyepiece. I used a piece of cash register receipt paper so that I could see when the image of the objective was in focus by

looking through the paper from behind it. I measuring the diameter of the image circle with a millimeter rule. Simply move the paper closer and further from the eyepiece to focus the image on the paper. Measure the size of this image to find the exit pupil diameter and measure the distance from the eyepiece lens to the image to find eye relief distance. Compare your measurements with calculated exit pupil diameters to see if they closely match; my test results were very close comparisons.

By the way, telescopes also have an entrance pupil. The entrance pupil is almost always the same as the diameter of the objective lens or mirror. Since this is a non-changeable parameter once built, it receives little attention.

One final discussion of field of view is necessary before we put this subject to rest. The angular degrees of sky that show inside your eyepiece during observation is the real, or actual field of view. The field of view in an eyepiece seems much larger though, and this is the apparent field of view. The apparent field equals the actual field multiplied by the magnification. If the moon (1/2 degree actual field) just fills the field of your eyepiece with magnification of 90X:

$$\text{apparent field} = (1/2 \text{ degree}) \times 90 = 45 \text{ degrees.}$$

Apparent field is a fixed parameter for each eyepiece usually listed by the manufacturer in the spec sheet or advertisement describing the optics.

I hope this has been helpful. If this subject has bored you mercilessly, makes little sense, or seems irrelevant to the excitement of visual astronomy, I agree! Please try my articles titled "Messier Menagerie" for more exciting reading. I prefer to leave the math calculations to computers and the opticians who program them. I plan to enjoy the fruits of their labors when I look through the high-tech eyepieces they design. I do all my testing by observing. What I see is what counts. Maybe I should have titled this article: Everything you never wanted to know about Sexit\*....but were afraid to ask!!?

\*Pupils



5) Read Sky & Telescope or Astronomy magazines, especially their monthly observing section.

6) You don't need a telescope or a pair of binoculars to observe. Until you learn your way around the sky and the constellations, a telescope will only be frustrating. You can spot constellations, find the planets and also catch a meteor shower just by watching the night sky.

7) After you learn the constellations, then find the right notch for you. Before you buy a telescope, see what everyone else is using at the star parties. You can find out more that way than by reading the manufacturers published specifications. Also there is a "shopper magazine" where amateurs sell used telescopes for far less than a new one.

8) There are different types of telescopes for different types of observing. Find out what you want to observe first. Is it the planets and the moon, or star clusters, nebulae and galaxies, or maybe asteroids, comets, and meteors? Some observers enjoy double stars, binary stars and variable stars. Also you could be one of the lucky ones who find a Nova or Super Nova.

Happy hunting!



#### Welcome! New Members

Each issue of the Spectrum will present  
a brief sketch of our new members.

Emily Lyons is a grad student in cognitive science at UB. As a young adult she was interested in astronomy, but could not find time for it when she entered college. She has now renewed her interest in the subject, with a special accent on cosmology. She owns binoculars which she uses for observing.

Mark Kimball is a student at ECC, South Campus, concentrating on science. He also tutors in the physics department at ECC. He plans to go to UB and major in physics. He works at Service Merchandise in Hamburg. He has been drawn to general astronomy for about two years, and owns an Edmund Scientific 6" reflector.

Christopher Matyas works at AMC Precision, Inc. in Buffalo. One of his hobbies is mountain biking which he does on Grand Island. He has been interested in general astronomy for two years. He mail ordered just the 8" Celestron tube, and purchased a cast aluminum mount with a clock drive at a flea market. He added a motor drive on both axes and digital setting circles. He machined mounts for the setting circles and motors, and wired in the motor to a hand held controller.

Mark Reville is married and has a year old daughter. He works with computers, and has been interested in general astronomy for five or six years. He has a 10" Dobsonian.

Rev. James Barlow and his wife have four daughters. He is the Northeastern Regional Director for Bible Club Ministries International, with its main office in Philadelphia. His office is in his home. He serves 44 people in 6 children's camps in New York State and all of New England. This means a great deal of traveling to perform his many duties. He is a Germanic tenor and has made an album heard over WDCX, in which he sings "Trusting is Believing," and "More to Come." His hobbies are golf and astronomy. He has always been interested in astronomy, but is devoting more time to it now with his friend, BAA member Leonard Werner. Rev. Barlow owns a 4.5" Meade Newtonian, and enjoys general astronomy and observing deep-sky objects with Leonard's 8" Meade.

Edith L. Geiger



#### THINGS TO COME

A report on the Summer Star Parties, an article from the Astronomical Society of the Atlantic on Astronomical Optics, an ancient constellation, Globus Aerostaticus and Meteor Showers for November & December



8

\* The "SPECTRUM" \*

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