NEWSLETTER OF THE BUFFALO ASTRONOMICAL ASSOCIATION INC.

The Spectrum

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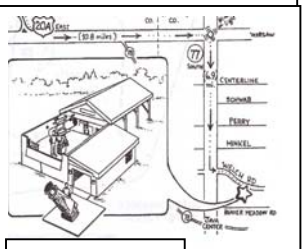

BAA Observatory

Whence The Telescope?

Rowland A. Rupp

Sometimes when I look over past *SPECTRUMs* to find material for the BAA Annals I come across an article that raises an issue that I think is worth commenting on. In the February 1970 *SPECTRUM,* I found a brief note taken from the *Optical Spectra* for July/August 1969 that pointed out there are claims that Roger Bacon might have presaged the invention of the telescope as early as the thirteenth century, and that Leonardo da Vinci may have such a claim early in the sixteenth century, one hundred years before its actual invention. An entry in one of da Vinci's notebooks is translated as "Make glasses in order to see the moon large." In another notebook, da Vinci elaborates on the subject, seemingly concluding that the instrument would reduce the field of view while enlarging the image. Though da Vinci may have speculated about such a device, the author of the article is doubtful that he ever built one.

That raises a question that has long bothered me, and to which no one has ever given an answer -not even a poor answer - just no answer at all. From what I have read, eyeglasses first came into use in the 1290s. Yet Hans Lippershey, a Dutch spectacle-maker, is generally credited with inventing the telescope in 1608. What was going on in the three centuries that intervened? Did no one during that extended interval hold a long focal lens in one hand and inspect the image produced by a short focal length lens in the other hand to discover that distant objects appear larger?

I think that if you gave a variety of positive and negative lenses to a bunch of ten year old kids it wouldn't take long for them to make this discovery by trial and error. Unless the folks living in the Renaissance had a vastly different approach to experimentation (surely there was some difference), I find it hard to believe that three centuries of reasonably intelligent spectacle-makers failed to do what I think kids would do, or if they did, failed to appreciate the implications of their discovery.

I welcome any suggestions that explain what appears to me to be an unfathomable mystery. Perhaps it boils down to a comment attributed to Mark Twain to the effect -"when it's time to steam, you steam". Maybe the fourteenth, fifteenth and sixteenth centuries just weren't the time to steam as far as the telescope is concerned.

BAA Observatory Services For Special Groups

The BAA opens the BAA observatory at Beaver Meadows (BMO) to special groups for a fee ($2 per person with a $35 minimum), on other than public nights, provided adequate notice is given. I have been appointed coordinator of this activity, meaning it's my job to find volunteers to manage the program for a particular night. It seems to me that two are needed, one of whom should be adept in the use of the telescope and the computers, and another who can give a talk appropriate for the visitors.

I have been asked to compile a list of volunteers for these tasks whom I can call upon. These events occur rarely, so if enough people volunteer it is unlikely anyone will be asked to assist very often unless they want to be. Please let me know if you wish to participate in this service.

Rowland A. Rupp 839-1842

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Articles: various authors

BAA Web Site

www.upstateastro.org/stars/index.html

Location /Time Of Meetings

BAA meetings are held on the ***2nd Friday of the month*** from ***September to June*** in the ***New Science Building on Buffalo State College Campus***. Meetings start at ***7:30 PM.*** See above web site for a map of the location. Non-members are encouraged to attend.

Spectrum Deadline

Articles for the next Spectrum will be due by: ***February 16, 2005***

Managers Of BAA Computer Sites

BAA Web Site	E-Spectrum Web Site*	YAHOO E-Mail Group*
Timothy Finucane	Timothy Finucane	Dennis Hohman Mike O'Connor

* members only

President's Message -- Take a Chance!

Peter Proulx

How did I get to this place? Just around five short years ago I attended my first BAA meeting. I sheepishly entered the room not knowing what to expect and now I am President of this great club! Truth be told, this is a job that no one goes looking for and volunteers are hard to find. Now for those who don't know me, I'm not an expert in astronomy. I love this hobby and it is my passion, but I have much to learn. If I have any expertise, it is tinkering with my own equipment. So when I'm running the next meeting, no embarrassing questions about super massive black holes, quantum efficiency of a CCD chip or Dawes limit for a 4" refractor (which is by the way R' = 4. 56/D). With that being said I am looking forward to the next two years and will try to follow the great example set by our previous Presidents (since Joe 0. is still on the board I'm sure he'll keep me in line!). All joking aside, I think that we have a great team in our Board of Directors; a mix of old and new faces. .

What makes the BAA a great club is its members, that means YOU! I made some friends at that very first meeting I attended: Alan Friedman, Anthony Davoli, Jeff Gardner and Tom Bakowski, just to name a few. All are excellent Astronomers with different interests in our hobby, all are passionate about astronomy and all are willing to share their knowledge and experience. My first public night I got introduced to Bob Hughes and Dan Marcus. By the end of the night, I learned more than I had on my own observing over the previous six months. I attended my first Star Party at Stellafane and to my surprise BAA member Carl Millazo was a speaker in the main tent. We have members that have had scientific observation recognized by NASA and the professional community. Bill Aquino has even been quoted by famous author Timothy Ferris in his book "Seeing in the Dark". We have long standing members like Tom Bemus, Rowland Rupp and Dr. Jack Mack that are walking Encyclopedia Astronomica! The point here is that our club is the sum of all its parts, the BAA has a lot to offer for anyone willing to take a chance and make a few friends. Participation in the club is the quickest way to learn about all aspects of Astronomy.

As your President I don't have any agenda, other than working with the Board and making our meetings interesting and fun. I will continue to promote all the community out reach that brings our passion for Astronomy to the public and I'm looking forward to making some new friends.

So if you are a new member to the club don't be shy, there are no stupid questions. If you are a standing member, look around at that next meeting and introduce yourself to a new face (you may meet your new best friend!). And everyone, next time there is a call for volunteers or a club outing, take a chance and participate. I guarantee you will learn something about Astronomy and have a great time -- who knows, in two years you may be the next President of the BAA. In closing I would like to quote a phrase that aptly applies to our hobby: "Welcome to the Greatest Show on Earth!"

BAA Annals

Rowland Rupp

5 YEARS AGO -Mark Reville was our *SPECTRUM* editor at the beginning of year 2000 (the beginning of a new millennium if you think there was a year *zero,* or are impatient), and he gave the publication a somewhat different format. Marilou Bebak was scheduled to speak on the Space Station at our January meeting, while a panel on solar activity, composed of Larry Carlino, Bob Hughes, Carl Milazzo and Jack Mack, was planned for February. Dan Marcus announced plans to have a lunar eclipse watch at BMO that was to span midnight on January 20-21. Brrr! ! !

Mark Swiderski and Neil Dennis, co-directors at BMO, both had notes in *THE SPECTRUM.* An interesting comment made by Mark was that the Board had agreed that there would be a fee of $2 per person for groups coming to BMO on non-public nights, with a minimum fee of $35. I wonder if we still adhere to that. Neil addressed the temporary inconveniences caused by construction of the addition to the Fred T. Hall building which was then underway. He noted that part of the plan called for " large classrooms and public restrooms that will be available for our public nights or special activities". Are they?

Bill Halbert sent a letter from Germany, where he is an operatic singer, in which he commented on his recent astronomical observations, and on suggestions for observing in general. Carl Milazzo had some advice for beginning observers, and perhaps contributed an anonymous commentary on reasons for attending outdoor astronomy conventions. Dan Marcus wrote about the transit of Mercury he and other BAA members observed near St.Louis, and Rowland Rupp reported seeing sun dogs right here.

10 YEARS AGO -In January 1995 we heard from Jayme Manning about hardware and software development used in CCD imaging. The following month Reon Wadsworth spoke on observations of a total solar eclipse he viewed in Peru, and Bob Hughes reported on the annular eclipse he observed at BMO in May. Darwin Christy was looking for someone to replace him as *SPECTRUM* editor, President Terry Farrell planned a membership survey, Bob Hughes was preparing for Astronomy Day at BMO, Treasurer Steve Kramer was taking reservations for the dinner meeting and Bill Smith had a Messier Marathon scheduled for March 4. In addition to his note on the seventeenth century French astronomer, Jean Picard, and the constellation Canes Venetici, Darwin Christy wrote an article on "Observing Meteorites Through a Microscope" , his long-time passion.

15 YEARS AGO -"The Total Penumbra Eclipse of the Moon - January 20, 1981" was the title of Darwin Christy's talk given in January 1990. For February, Jack Mack's topic was "The Big Bang". President Doris Koestler informed us that construction at the Museum of Science would mean we would hold our meetings for the remainder of the year at Buffalo State. Prior to that we held January to June meetings at our old haunt, the Museum.

Ed Lindberg, who led our Instrument Section for decades, submitted his autobiography for *THE SPECTRUM* -interesting material by an interesting member. Observatory Director Dan Marcus reported on our studies that eventually led to obtaining the 20-inch telescope for BMO. There was also a brief, unsigned article explaining how we came to relocate our observatory from Newstead to Beaver Meadow. The Pleiades and Hyades were the subjects of Darwin Christy's historical constellation commentaries.

25 YEARS AGO -We opened our first meeting of the 1980s with a tal k on "Deep Sky Wonders" by one of the BAA's accompl ished astrophotographers, Tom Dessert. In February, Dr. Lyle Borst, professor of astronomy at UB, spoke on "Biological Astronomy" . Lillian VonGerichten had just accepted the responsibility of welcoming new members, and Adrienne Kimble continued in charge of coffee and doughnuts, while her husband, Ken, led the Study Group.

AI Kolodziejczak was the BAA member profiled by Edith

Geiger. Fred Price wrote "On the Accuracy of Lunar Maps and Drawings". He suggested that observers with a fixed idea about how craters were formed (e.g. impacts vs. vulcanism) might influence how they sketched the formations they observed. Tom Dessert wrote about a trip he took during which he visited several astronomical magazine publishing facilities. Among them were: *Astronomy, Deep Sky Monthly* and the *Astrograph.* Ken Kimble reported on presentations made to Boy Scouts at Scouthaven. He, AI Kolodziejczak, Carl Milazzo and Rowland Rupp participated.

35 YEARS AGO -The BAA's Dr. Seville Chapman was scheduled to give a talk on "Celestial Mechanics" at our January 1970 meeting, but a "severe snowstorm" forced us to postpone his talk until February. There were ninety astrophotos made by ten member at our exhibit at the museum. Lillian VonGerichten was the BAA's refreshment hostess in 1970.

Walter Whyman sketched the predicted path of Comet Tago- Sako-Kosaka. It was expected to be about +2.7 magnitude at perihelion. Other *SPECTRUM* articles were by Ernst Both on the zodiacal light, and by Fred West on pulsars. Another, extracted from the *Optical Spectra,* suggested that the idea for a telescope predated 1608, the date generally credited for its invention by Hans Lippershey.

Spy & Tell

Edith Geiger

In December 2004, **Lynn Sigurdson** and her daughter, **Hannah** went to the figure skating competition in Skaneateles, N.Y. Hannah took Third Place in her difficult events, and Lynn took First Place in her events. Congratulations!

On Sunday, November 7, **Darwin Christy** had a great night. He was invited to be guest conductor of the National Championship American Legion Band of Tonawanda, Post #264. He won the praise of his audience, and as one gentleman put it, "He is a Jack of all trades!"

Bob Hughes helped out at the Buffalo Museum of Science as they celebrated Space Travel. He gave several talks during the event, and answered numerous questions offered by the visitors.

Carl Milazzo has been busy attending numerous functions in western New York. On October 12, Carl attended a lecture at the University of Buffalo on cosmology, along with some 200 amateur astronomers. The lecture was given by Dr. Tyson, an author and Director of the Hayden Planetarium in New York City.

On October 13, several hundred amateur astronomers converged on UB to hear a talk about Mars Rovers by **Dr. Squyres**. Squyres is a planetary astronomer from Cornell University, and is in charge of the Mars Rover mission. When Carl went to the microphone to ask Squyres a question about the area on Mars known as white rock, Carl mentioned that he had been an active amateur astronomer for 35 years. This caused members of the audience to ask Carl if there were any astronomy clubs in the area.

Fort Niagara State Park put on a public viewing of the October 27 total lunar eclipse. **Carl Milazzo** volunteered to help. He brought his 6 inch home made Dobsonian and green laser pointer to point out constellations during the totality. Besides the public, the park police and border patrol stopped by to view the eclipse between the clouds. At this point we heard the yelps of some coyotes in the distance, and when the clouds blocked the moon, Carl showed the visitors Toronto's skyscrapers towering over Lake Ontario, through his 'scope.

On November 3, at Kleinhans Music Hall, the banquet award ceremonies of the Western New York Pioneers of Science commenced. **Tristan Dilapos family** was there as son, Jamey won second prize for his essay. He is a student at Orchard Park High School.

During the ceremony, several scientists who grew up in the Buffalo area gave brief talks. One such scientist, **Dr. Clifford Stoll**, offered that he had been an amateur since he was 10 years of age. In 1973 he received his bachelor's in astronomy from UB; in 1979 he received his PhD in astronomy from the University of Arizona. He worked at the Purple Mountain Observatory in the China, Jet Propulsion Laboratories, and as Kitt Peak robotic telescope designer. He helped design the Keck Observatory, Hubble Telescope, Chandler X-ray Scope, and has authored three books, one of which made the N.Y. Times Best Seller list. The PBS television show, NOVA did an hour documentary on Cliff Stoll. Carl Milazzo remembers helping out at the UB Observatory from 1970-73 with Cliff Stoll on public nights. At the banquet Carl Milazzo and Cliff Stoll spoke about their recent astronomical activities.

A **Note from Edith Geiger**, Spy & Tell Reporter. In an effort to keep members up to date with interesting events, milestones, and activities of our membership, I try to contact many of you by way of the answering machines you have to monitor your phone calls. You may not think you have any, "earthshaking" news to offer, however after a bit of chatting we have often found that our members lead exciting lives, full of newsworthy tidbits. Please don't be bashful. Call in any information which you would like to have the membership know.

Ernst Both throws a fit!

Rowland Rupp has qualified for janitorial service

From The BAA YAHOO E-Mail Group

Gus Cenkner

From: Wolfgang Buechler **Subject:** Re: [buffalo_astro_assoc] rainbows and sundogs

Here's a URL with which tries to dive into the science of rainbows. I had seen another web page a while back that attacked the central bright area explicitly but wasn't able to find it tonight.

Yeah, But How?

A brief foray into atmospheric optics – Part I

Cynta de Narvaez

I have been fascinated with the obvious of late. In the past I have seen things I could name, and because I could name them or had some vague understanding of their processes, I left my curiosity at the door. Well, not any more! After experiencing the meager monsoon display this summer, I began missing the atmospheric drama that normally accompanies August - especially rainbows. As I started looking into rainbows, other skyward optical phenomena that had been nagging, unanswered questions in the past became interesting once again. Why is the sky blue? Why is the Moon's sky always dark? How do stars twinkle? Why does the sun flatten out when it sets? Why is there a puddle of water seen with mirages? Is there really such a thing as "The Green Flash?" And what in tarnation is lightning?

To understand these and other light-oriented concepts, several basic physical laws and processes must be defined. First the definitions, then the descriptions and explanations.

Optical physics -- Basic properties of light within our atmosphere

Light and waves: Isaac Newton discovered that in a vacuum light waves travel with maximum velocity and in a straight line. Light is emitted (radiated) from the sun and travels in a straight line until it hits an obstruction like our atmosphere. It is the reflection, refraction and diffraction of these waves that cause us to see atmospheric optical displays like rainbows, green flashes and earthbound mirages.

Light waves have different lengths or "frequencies." There is still a question as to whether these "waves" are really only waves of "energy " or are actually "particles" as Einstein contends, for they seem to have the properties of both. For simplicity's sake, we will call them waves here. Within the visible range, light beams appear white, yet when they are dispersed we see a display of color.

Newton took abeam of light and shined it into a prism. The beam traveled in a straight line until it hit the glass of the prism, a new "medium." Once it hit this new medium, the light beam deflected with colors splayed at predictable angles. It then continued on in a new direction until it hit the other side of the prism. As the beam reacted to this different medium, glass to air, it dispersed the colors within the light beam even more into a "spectrum." This color, or electromagnetic spectrum, displays the full range of visible wavelengths of light in order, bordered by ultraviolet below and infra-red on top.

Reflection: We witness reflection in mirrors, on polished surfaces and on water. Images of objects are bounced back from a medium because none of the light waves were absorbed by that medium.

Refraction: This is the process of Newton's beam of light through the prism. The speed of the beam, or wave, depends upon the properties of the medium. The speed of the beam through air is faster than through glass (a denser medium) so the light "bends" because the "refractive indices" of these media are different. The shorter waves, violet and blue, are refracted more than the long red waves, and there is a separation of colors. Refraction is the unidirectional bending and slowing of the light energy after it has come in contact with an obstruction (like a new medium or level of pressure).

Diffraction: This is when a wave gets squeezed together, as though through a small lens (like a water drop) and, when exiting, is diffused or spread out. Rather than the wave remaining in its wavelike pattern, it gets broken up -- like the white light beam entering the prism.

Radiation: This is the spread of light from a center; the emission of waves from a central point. In this instance, the distance from the Sun to the Earth is such that the waves seem almost parallel as they hit the planet.

Inhomogeneity of atmosphere: Our atmosphere is made up of air and air is made up of particles. The density of air is variable. The density is affected by several factors: the barometric pressure; the amount of moisture in the air (more moisture, more density), the altitude; air has weight and so is affected by the gravitational pull of the Earth (every climber knows there is more air near the surface of the Earth than at higher altitudes), and lastly, air is affected by temperature and pressure (hot air expands, cold air compresses, hot air can absorb more water than cold air, etc.). To make matters more interesting, air particles are continually colliding against one another. Besides there being large levels and pockets of different pressures, densities and moistures, there is a constant movement of pinballing particles causing momentary "blobs" of air. So, unlike water, air is inhomogeneous; it fills its "space" inconsistently; thickly, sparsely and/or turbulently. This inhomogeneity affects the way light waves enter our system and, just like the prism, effects our optical perception of light waves and the objects they attempt to represent, i.e. "twinkling" stars..

Color and the way we see: Our eyes have been outfitted with rods and cones with which we discern shape and color. Cones specify bright light and so are color receptors while rods react to dim light and are shape or perspective detectors. The colors we see are the absorption or reflection of specific wavelengths of light as they strike an object. When the entire light wave is absorbed, we see black; the absence of color. When the light wave is reflected we see white, light diffusing and all colors overlapping. In many cases, different frequencies of light waves are reflected or absorbed as a result of the chemical makeup of an object. For example, most plants appear green because the pigment (chemical compounds in the skin of a plant) absorbs all the colors of the light spectrum but the green frequency. So if you try to grow a plant using green light, it will either change color, or if it grows at all, will do so feebly. The chemical makeup of the minerals within the Hermit Shale absorbs all the wavelengths of light but red. This red wavelength has been bounced back, reflected from the rock, and stimulates the cone receptors of our retinas. Not all the colors we perceive are made by this absorption or emission process. The color in the wings of blue birds has an entirely different cause not to be propounded here. The sky also has its own reasons for being blue, but this will be discussed later.

Atmospheric Optics

Rainbows: Rainbows are the large scale representation of the refraction and reflection of light by raindrops. Descartes first figured this process

(continued on next page)

out in 1637 using glass spheres. As the beam of light first enters the raindrop (diameter: 200 micrometers), it refracts (is bent) and as the light diffuses, the colors separate and head toward the opposite wall of the drop. Here, part of the light escapes out the back, while the rest is reflected to the lower portion of the raindrop. Here it refracts even more as the dispersed light finally exits and becomes a point within a great sky spectrum of color.

Imagine entire walls of raindrops all reflecting different wavelengths of light at different points on the Earth's surface and one series hits you. A spectrum is represented when higher droplets reflect red, orange below that, yellow below them, and so on. Violet and blue, of course are refracted most and so they are reflected from the bottom portion of the rainbow. This single reflection event is called a "primary rainbow". These have the brightest images. For primary rainbows there is a consistent angle of 42 degrees from Sun to top of rainbow (red color) to observer. And because the angular diameter of a rainbow remains constant to the observer, we can never fit the entire thing into a 35mm camera; as we step back to fit the full rainbow into the frame, the color display moves with us.

Secondary rainbows occur when sunlight hits the rain at a higher angle and, because of the angle of incidence, the light beam reflects twice while inside the droplet.

Secondary rainbows are always above primary ones. Their color spectrum is reversed (violet and blue on top) because of the extra reflection. They have an angle of 51 degrees from Sun to rainbow to observer, and are fainter in appearance because more light has had a chance to exit due to the second reflection. Supernumerary bows are the faint arcs present within primary bows. These are simply interference bows; small concentrations of minor light energy .

There is an inconsistency of brightness around rainbows. Rainbows are a concentration of light through a raindrop, yet there is other visible light emerging within the primary bow and above the secondary bow. This comes from the extraneous light rays hitting all the droplets from every angle. There is a dark area between the rainbows where the brightness has been reflected from. This is called the " Alexandrian Dark Space."

White rainbows: Occasionally these rainbows can be seen from airplanes, but also from the ground in clouds and fog. The key is that the water droplets must be quite small, 10 micrometers (or 10 millionths of a meter in diameter). This allows for the diffraction of light. The light beam hits the small droplet, which acts like a lens and squeezes the light in such away that the bands of color within the beam spread out and overlap, reflecting all the light energy and the color is received as white. To witness one of these you must look 40 to 42 degrees from the top of the shadow of your head on the ground. This is known as your "antisolar" point and is the domain of all primary bows.

Red rainbows: These are placed high in the sky as the sun is setting. As the sun descends, its rays travel through more of our atmosphere and as we sequentially lose light waves (from violet to red) we witness a color display known as a "sunset." The intense reds of the sunset reflect off high clouds with a specific diameter of raindrop -10 micrometers. So when the sun is low on the horizon, an otherwise "white rainbow or cloud rainbow" appears red because of the selective properties of the atmosphere on the sun's beams.

Lunar rainbows: According to Robert Greenler, Professor of Physics at the University of Wisconsin-Milwaukee, there are lunar rainbows. However, to produce enough light to have a rainbow, the Moon must be full. The light from the Moon is a reflection of the sun's rays and does not itself have the necessary intensity. Needless to say, lunar rainbows are quite faint. Greenler says these bows have color but appear white because of this lack of intensity . The process is the same as with solar rainbows however; the same 42 degree angle, the same raindrops, only at night.

The deep blue sky: Violet/blue waves, being the smallest, are more strongly refracted than red ones. Infrared waves are able to dodge atmospheric particles while ultraviolet light gets pummeled and scattered by them. When "scattered," this blue light is reflected in all directions and we see "blue sky". For this same reason, Leonardo da Vinci, the father of perspective, when asked how to put depth in a painting merely said, " Add a little blue." Seeing a long corridor of canyons corroborates this opinion.

It always puzzled me as a child why photographs on the Moon were always taken during the evening. The Moon has no atmosphere (no air particles to scatter light), so its sky always appears black.

Crepuscular and anticrepuscular rays: Occasionally, when the sun is rising or setting, it is possible to see the sun's rays looking like they have been blasted through a colander. These are the same kinds of events pictured on the covers of religious magazines. It looks as though the sun's rays are emanating from a central point directly within the cloud, not from a point 93 million miles away. If, as we already know, the sun's rays hit the Earth almost parallel to one another, then what is going on? We are being fooled by the optical illusion of da Vinci's point of perspective; at distance all things converge to a central point. In this instance, the central point of light is displaced due to the redirection of the solar beam. Crespuscular rays occur when parallel solar beams are funneled down and redirected through clouds, giving the impression that they are distinct beams emerging from alight source within the cloud and that God is on the verge of speaking.

Anticrepuscular rays are only slightly different. Occasionally, when crepuscular beams are visible, they can cover the entire sky .This does not mean that the beams continue to fan out as they do from the (seemingly) original light source. Anticrepuscular beams are the tail end of these beams, culminating at their own point of perspective. As the light beams pass overhead, they converge on the horizon at exactly 180 degrees from the colander clouds.

Distortion of the rising and setting sun: Most of the time, when the sun sets, we see a true image of that golden orb disappearing below the horizon. Yet every now and then, when the conditions are right, we can witness a flattening of the lower half of the sun. If we think of the Earth's atmosphere as a series of flat layers with increasing density due to gravitational pressure, the distortion of heavenly bodies near the horizon becomes possible. Rays of light carrying the image of the sun are bent at the points of entry to these layers due to changes in composition, pressure and meteorological conditions. The air particles within the various layers are being compressed by the weight of the air above as well as being affected by the gravitational pull of the Earth. This increases the density within the lower layers which causes light waves to bend toward the less dense air above. Simply speaking, when the sun is close to setting, refraction will effect the top part of the sun differently from the bottom half. The top half will radiate its image truly, while the bottom portion will send an apparent image. Since the bottom portion of the sun is being seen through thicker, more dense atmosphere, the bottom image is being bent intensely and gives the impression of being squashed or "flattened." The cool thing is that the bottom edge of the sun is actually below the horizon and the bending of light lets us think its still above. It is a little like an atmospheric pressure mirage.

Observatory News

Paul Tabor

There's not much going on at the observatory as we would expect. Our last public night -- sparsely attended -- was damp, dank, depressing, dismal, doleful, dour, dreary and drizzly.

Bill Aquino will be giving us an update on the robotic scope; I believe at our February meeting.

So, looking forward to next year, the following is the schedule for Public Nights. You may want to look it over and check your palm pilots for a date you may be able to give a presentation.

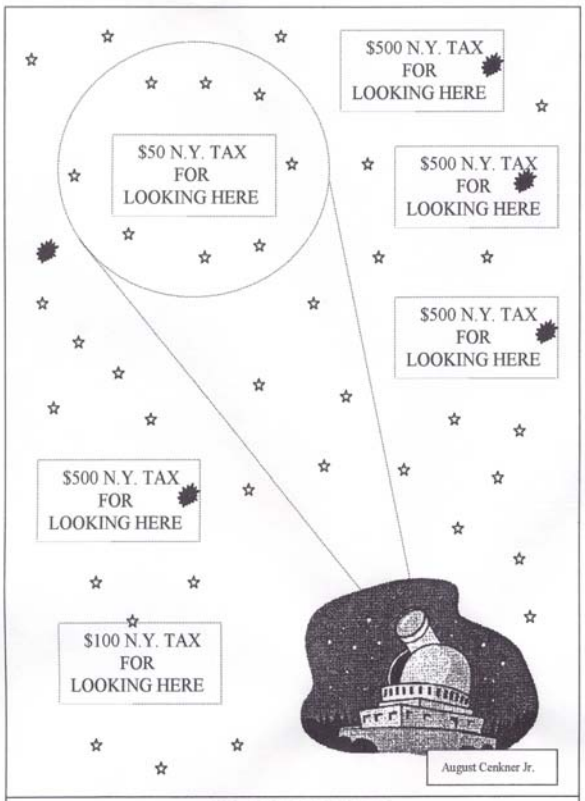
April 2, 2005	August 6, 2005
April 16, 2005	August 20, 2005
May 7, 2005	September 3, 2005
May 21, 2005	September 17, 2005
June 4, 2005	October l, 2005
June 18, 2005	October 15, 2005
July 2, 2005	
July 16, 2005	

As far as the Remick Observatory is concerned, we are still working with the Lockport High School. Hopefully we will have positive news by January l, 2005 or shortly thereafter.

Bill Aquino and I would like to express our heartfelt thanks to all the members who took the time to support Public Nights this past year. And also those who volunteered at times to come out to help with the maintenance of the observatory.

Looking forward to next year and clear nights.

Cartoons



Fellows Meeting

Rowland A.Rupp

The annual College of Fellows meeting will be held at my home at 132 Burroughs Drive on Thursday, February 3 at 7:30 PM. Please let me know if this date presents a problem. I'II try to contact each member beforehand to confirm the meeting.

Bob Kirchgessner

Former BAA member Bob Kirchgessner died early in November. He was particularly interested in Extraterrestrial Intelligence, having written on the subject for The Spectrum and given a presentation about it at a general meeting.

BAA Policy

MEETING CANCELLATION POLICY

If, for any reason (most likely snow or ice storms), there might be cause for cancellation of the meetings of the B.A.A., tune your radio to either WBEN (930) or (WGR) (550). Also if Buffalo State College has been closed due to inclement weather, the B.A.A. meeting will also be cancelled.

BEAVER MEADOW TELEPHONE

The telephone at Beaver Meadow, 716-457-3104, is for emergency use only, at no cost. Local calls may be placed for a small charge – see collection box by the phone. This phone cannot make long distance calls.

REPRODUCTION NOTICE

Upcoming BAA Meetings

Peter Proulx

January 14 -- Special Meeting At Williamsville North High School Planetarium -- Voyager Encounters And Star Show

BAA member **Mark Percy** has arranged a special show at the Planetarium. This show recaptures the dramatic encounters the Voyager Spacecraft made with Jupiter, Saturn, Uranus, and Neptune. The spectacular photography of the planets, and their moon systems, is displayed with our multi-screen projection system.

****Special note** -- we will start earlier than usual: 6:30- 7:15 P.M. Special BAA Show 7:30-8:00 P.M. Meeting

8:00 P.M. Public telescope clinic and public showings

(BAA members are requested to bring their scopes)

February 11 -- Care And Use Of The Telescope -- Tom Bakowski and Carl Milazzo

The talk will include the proper technique for alignment and collimation of a telescope, proper cooling of the telescope prior to observations, and seeing/transparency issues while observing with a telescope. A 12.5 inch Dobsonian telescope will be used to demonstrate the procedures.

March 11 -- SAVE THE NIGHT for Annual Dinner Meeting with guest speaker. (Details to be given in next Spectrum)

HAPPY HOLLIDAYS TO ALL

Buffalo Astronomical Association Newsletter
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