The Spectrum

The News Letter of the Buffalo Astronomical Association

Volume 12 Issue 6 November / December 2010

HELP WANTED

The BAA is in need of an enthusiastic individual to head up the position of Spectrum Editor. The pay is non-existent but the job is fun and rewarding if you are the creative type.

You read this right, the BAA is looking for a new Spectrum Editor. I have decided to pass the torch onto the next willing individual that would like to take over as Editor. In my 2 years of being the Editor I have had fun with the Spectrum and enjoyed it very much but it is time to move on.

The job is easy and takes a few hours every 2 months. The hardest part is getting articles from club members. It seems it is feast or famine but if you are creative you can mange through the lean times like I did. As the Editor you are open to use whatever format you like. I choose to use an open source editor (Scribus) and designed a template that allows me to insert preformatted pages for the newsletter.

I will work with whomever the board appoints to the position on how I handled it and they can do it the same way or change it however they desire. If you are interested in the position please email any of the board members. They will discuss it at the next board meeting and decide on a person to take over.

It has been a pleasure to be your editor and a wish you all clear and dark skies!

Mike...

In this Issue...

Message from the President

Alan

Fall is surely the shortest season in Buffalo. Some years it seems the time between the last day of wearing shorts and the first day of wearing down can be measured in hours. Though I'm not sure that I'm excited to be looking down the pipe at Thanksgiving, I am excited and deeply grateful to be able to report the early success of our Campaign for Beaver Meadow Observatory. Though there is much fundraising left to do, our club members have responded to the appeal with enthusiasm and generosity. On this day in late October, member donations, pledges, outside fundraising, contributions and the BAA Board pledge from the club treasury have reached a grand total of $16,878… 68% of our $25,000 goal. This is awesome!

There is still work ahead of us and we still need lots of help. If the timing has not been right for you to make a cash donation, please consider a pledge. Maybe you know a friend, family member or co-worker who would be willing to support our mission. We will continue the membership phase of our drive through the end of this year and then shift our focus to friends, employers and institutional partners for their assistance.

Thanks to you, we will have some wonderful new equipment to use at BMO. But the most wonderful part of the BAA remains its members.

Thanks for all you do and all that you contribute all of the time.

Upcoming Meetings

Friday, November 12th at Buffalo State College – BAA Homecoming… featuring four member presentations on a variety of topics.

Friday, December 10th at Buffalo State College – the Annual BAA Holiday Party

Friday, January 14th at Williamsville North – Mark Percy will lead us on a special celestial tour from the Williamsville North Planetarium.

Friday, February 11th at Buffalo State College – speaker: Alan Friedman, presenting: Windows to the Universe/ A personal journal of two recent pilgrimages to astronomical "holy" lands - Astro-Physics and Mount Wilson Observatory.

Please visit the BAA Website for the latest updates on meetings and programs.

Harvard University International Interdisciplinary Conference: BAA Member Presents Talk on Hubble Telescope

Dr. August Cenkner Jr.

From May 31 to June 3, 2010, an international interdisciplinary conference was held at Harvard University in Cambridge, Mass.

The main objective of the conference is best described in their own words: "There is an increasing realization that each academic discipline cannot thrive on its own without capitalizing on the rapidly developing research and findings across disciplines." This is exactly what I did with my Hubble Telescope research.

In my slide show talk, I detailed how I

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THE STAR OF BETHLEHEM

Rowland A. Rupp

What would Christmas card manufacturers do without the Star of Bethlehem? Could they find a symbol to replace it? Almost certainly not, at least not a symbol that has the same inspirational significance. What the Star was has troubled theologians, astronomers, astrologers and laymen for centuries. So I thought I would look up just a couple of the countless dissertations on the subject to see if there was some accord about the matter.

The Star could be either a natural or a supernatural event. If it's the latter, I'm in deep trouble because the supernatural is awkward to explore. If it was a natural astronomical occurrence, one had better know when it happened so one can search backwards in time to see what cosmic event or events occurred then.

One turns to the Gospel of Matthew (the only Gospel to mention the Star, by the way) to set the date. Matthew notes that the Magi (the Wise Men) told King Herod about the Star after being led to Jerusalem by it. Two conclusions may be drawn: Herod was alive, and was unaware of the astronomical event. So when did Herod live and, more importantly, when did he die?

The late first century AD Jewish historian Flavius Josephus says that on the night of a lunar eclipse Herod executed two rabbis and died shortly afterwards, just before Passover. Not a very nice Passover gift for the two rabbis, but maybe they had the last laugh when Herod died painfully thereafter. A forty percent total lunar eclipse occurred March 13, 4 BC, a month before Passover. This seems like a good candidate to mark the approximate time of Herod's death.

Elsewhere in Matthew one finds that when the Magi prudently decided not to return to Herod to report exactly where to find the Christ Child, Herod ordered the death of all boys in Bethlehem who were two years old or under. The fact that the Magi sought a child, and that Herod was concerned about two year old boys, argues for the birth to have occurred a couple of years prior to 4 BC.

After eliminating astronomical events like novae and comets that seem inconsistent with the idea of a star that escaped notice to most people, two phenomena at that time may fill the bill. The one generally accepted as the Christmas Star is a triple conjunction of Jupiter and Saturn in 7 BC. The other was a close grouping of Mars, Jupiter and Saturn in 6 BC. A triple conjunction is a fairly unusual event in which the nearer planet, in this case Jupiter, passes the more distant object, Saturn, in its eastward motion against the stars. Then the nearer planet goes into retrograde motion, passes the distant object while heading west, and finally passes once more when the normal eastward motion is resumed. Both the conjunction and the grouping occurred in

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Conference Continued...

transferred experimental and theoretical high speed gas flow research, from the Aerospace industry to the astronomical area, to develop insight to help interpret gas dynamic data acquired from the Hubble Space Telescope. This lead to an identification of dark energy and a realization that dark energy is responsible for the occurrence of other currently unexplained astronomical phenomenal – not just the acceleration of galaxies.

The details of the talk are given in: Cenkner A. A. Jr., Hubble Space Telescope Identifies Dark Energy, 8/3/2009, ISBN: 978-1-4490-1134-5 (Sc), Barnes & Nobel, Amazon.com.

Bethlehem Continued...

Pisces, which "was associated with the nation of Israel," thereby adding relevance of both events.

It has been suggested that this triple conjunction, which occurred in May, September and December of 7 BC, fits the Biblical account nicely. The first would have occurred in the east, and subsequent ones would have occurred further west. So the Magi could set out at the first, arrive in Jerusalem at the second and pay homage at the third. I find a sticky point in this argument. Bethlehem is only five miles south of Jerusalem. Why did it take the Magi three months to traverse five miles, and why didn't the nervous Herod become impatient with the delay? Also, neither of these events could be mistaken for a single star. The conjunctions had about a one degree separation, and the grouping of 6 BC was never closer than eight degrees.

Having settled on the date, even if some of the circumstances seem to be a bit iffy, we appear to have finished our quest for the Christmas Star. Not just yet! It turns out that an argument can be made for Herod's having died in 1 BC. Some scholars contend that a typographical error in dates was made while copying one of Josephus's manuscripts in 1544. Prior to this time, according to the article's author, all of Josephus's manuscripts "suggest the inference that Herod passed in 1 BC." Copies subsequent to 1544 are believed to perpetuate the error.

Going back to the records of lunar eclipses that might sustain the story of Herod, the rabbis, the eclipse and Passover, one finds that a total lunar eclipse occurred on January 10, 1 BC, about three months before Passover. Supporters of this later date observe that the forty percent total eclipse of 4 BC may have been too insignificant for anyone to notice, and that evidence concerning Herod's death implies more time was needed between the eclipse and Passover than is available for the earlier event. Those who argue in favor of the earlier date note that the three successors to Herod's extensive realm, his sons, all date the start of their reigns at around 4 or 5 BC.

There are two notable astronomical occurrences prior to 1 BC that might help identify the Star of Bethlehem. The "Star" turns out to be the planet Jupiter – the King of Planets. In September 3 BC, just before the Jewish New Year, Jupiter and Regulus had a very close conjunction, so close that they might not have been distinguishable from one another. Regulus is derived from "regal;" it is the kingly star. Moreover, the symbol of the Jewish tribe of Judah is the lion, and this conjunction took place in Leo. It was prophesied that the Messiah would be identified with Judah. So here we have the King of Planets meeting the kingly star in the sign of Judah at the time of the Jewish New Year. What more could one ask for?

There was more. This was the first stage in a triple conjunction between the two celestial kings that ended in 2 BC. Again, the first conjunction would be in the east while those following were to the west. With Jupiter now in the western sky just after sunset, another spectacular event occurred. Venus may have occulted Jupiter. The separation between their centers has been calculated to be only 30 arc seconds, making it impossible for an observer to resolve them. Significantly, Jupiter was still in Leo, the sign of Judah. And finally, this union of the Mother Planet and the King of Planets happened nine months after the first conjunction with Regulus. Nine months: conception to birth. Now we must have it all! Or do we?

Michael R. Molnar, formerly associated with

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Bethlehem Continued...

Rutgers University, and Ph.D. recipient in astronomy from the University of Wisconsin, wrote a book, published in 1999, entitled The Star of Bethlehem: The Legacy of the Magi. Dr. Molnar's hobby, collecting ancient Roman and Greek coins, resulted in the purchase of a bronze coin he believes may have been minted in the first few years of the Christian era. The coin shows Aries the Ram looking over his shoulder at a star. Molnar then consulted Ptolemy's Tetrabiblos, the last word on Greek era astrological matters, and determined that Aries was the sign of the Jews, specifically of Judea (Judah), and so concluded that it was here that ancient astrologers would search the skies for evidence of the birth of the Messiah. (We now have three signs associated with the Jews: Pisces, Leo and Aries. There still have nine more to go, but I haven't read all the literature yet.)

The author did not claim that the star depicted on the coin was the Star of Bethlehem; it merely alerted him to the significance of the sign of Aries as the place to seek the announcement of the coming of the Messiah. Accepting the earlier date for the death of Herod, he searched the four or five years preceding 4 BC for noteworthy astronomical events that took place in Aries. After consulting several astrological sources of the time, Molnar concluded that an occultation of Jupiter, the planet of kings, by the moon would enhance the power of Jupiter in regal horoscopes. If the occultation happened in Aries, it would have signaled astrologers that a royal birth had occurred in Judea.

Of course he was successful, or there would be no book In his words, "On March 20, 6 BC, just before sunset in Judea, the moon occulted Jupiter while in Aries." He added that the occultation ended a half hour later almost on the western horizon. Just how the Magi, living well to the east of Judea, managed to see this event is unclear to me.

A month later, on April 17, the moon again occulted Jupiter, still in Aries, "a little after local noon, when Jupiter was too close to the Sun to be seen." (How often does one see Jupiter at noon, occultation or no occultation? If the author explained this, I didn't find it.)

Instead, Molnar went on to reason away some of the questionable aspects of the account in Matthew. How could the Star be "in the east and went before" and "stood over the young child." For the "in the east," Molnar concluded that what was really meant was that Jupiter was a morning star, rising just before the sun. Astrologically speaking, that caused its powers to be enhanced as the planet emerged from the heat of the sun.

As for "went before," that meant Jupiter moved westward from a morning star to become an evening star, while the Magi were traveling west. Also, Jupiter went into retrograde motion, and literally went west. Finally, Jupiter arrived at a second stationary point on December 19 before resuming its regular motion to the east. So, in a sense, it "stood over." In the process of its excursions, Jupiter again wound up in Aries for this "stood over" which, after more astrological reasoning, the author concluded, further enhanced its power.

Another author, Mark Kidger, stirs the controversy further with a couple of speculations in his book, The Star of Bethlehem. For one, he contends that in the Apocryphal Gospel of James (one of the Gospels that the Church excluded from the Bible in the canon of 167 AD that decided what was "divine" and what was not), reference was made to the Star being so

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Bethlehem Continued...

bright that it dimmed into obscurity all the other stars. Kidger suggests that this was, indeed, the real Star of Bethlehem.

He maintains that the date of Herod's death was the earlier one, the one in 4 BC, apparently because the eclipse of March of that year occurred within the month prior to Passover. Thus, there were no other full moons between the eclipse and Passover, a condition that seems important to the writer. With that in mind, Kidger establishes a sequence of the events that leads the Magi to the conclusion that a royal birth has occurred in Judea.

The first event is the triple conjunction of Jupiter and Saturn in 7 BC. Next is the grouping of the three planets in February 6 BC. The third event seems a bit hazy, but Kidger appears to favor the pair of occultations of Jupiter by the moon in March and April, 6 BC, noted earlier, that Molnar believed were significant. The fact that they were almost certainly unobservable to the Magi is passed off by Kidger with the comment that "they might easily have been able to calculate that an occultation was due." Finally, the clinching event was a nova that occurred in early 5 BC. The author found a record of this nova by consulting Chinese records; no observation of it was recorded in the western world, – at least none that survived.

The author took another step. After some fussing with other candidates, he concludes that DO Aquilae is the best prospect for having been the Star of Bethlehem! This normally eighteenth magnitude star is known to be a recurrent nova. In 1925 it blazed forth to all of ninth magnitude, hardly bright enough to dim into obscurity all the other stars, as James contended. A small telescope would have been needed to see it at all. That's all right, says Kidger, maybe when DO Aquilae convulsed in 5 BC it did so more brilliantly.

Enough is enough! I don't know how many other ideas are out there, but there is a limit to endurance. After reading about the speculation concerning this Biblical account, I've come to three conclusions, not necessarily mine alone. Two of the conclusions seem theologically questionable, and two seem scientifically unsatisfactory. Unfortunately, none is appealing in both regards.

The first, though inadequate in both respects, nonetheless may well be true. It is that whoever wrote the Gospel of Matthew made up the story of the Star as an embellishment to a good story – a sort of literary license. To the profoundly religious, those who believe that every word in the Bible is God's truth, this must be anathema. Scientifically, there is no point in investigating something that didn't happen.

The second has been mentioned, one way or the other, in the material I've seen, and may satisfy the religious. That is that God could have let only the Magi comprehend the significance of the message, or that God hid the event from those He did not intend to know about it. It seems to me that if God is supposed to have created the whole universe, He ought to be able to create one more star and move it around to wherever He pleases. Why God had only the Magi, who were Gentiles, understand His message is unclear, but who are we to question His motives. Again, this is hardly something that is amenable to scientific investigation.

Lastly, there is all the "scientific" material that made up the bulk of what I have written. Even here there is diversity of opinion. If one of these events is the real explanation, it occurs to me that God appears to have waited for some natural phenomenon to announce the birth of the Messiah who was to be the salvation of the

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Bethlehem Continued...

world. Who's running things anyway, God or nature? I doubt that those religiously inclined would be comfortable finding out that God had to wait for an eclipse or a conjunction before He saved the world.

New Auxiliary Astronomy Group Formed by BAA Member

Dr. August Cenkner Jr.

A new astronomy group has been formed at an Erie County Senior Center, that has 1100 members. Meetings are held twice a month at the center.

An astronomy display, -- that includes a moon globe, astronomical instruments, astronomy magazines, books maps and wall posters, -- was erected at the center.

A college level introduction to astronomy course is currently being presented to the members. In parallel, the search for habitable planets is being studied. Based on the attendance, in addition to the number of insightful questions being asked, there appears to be a considerable amount of interest in astronomy.

The members were introduced to the BAA, it's functions, and it's observatory.

I plan to, eventually, see if there is any interest in taking a group of members out to the BAA observatory.

Calculating the Circumference of the Earth

David F. Quagliana

As an amateur astronomer, I wanted to measure the circumference of the Earth. My 'tools' were limited to a bicycle – with a handle-bar mounted odometer - for measuring distance, a Global Positioning System (GPS) receiver – to measure latitude and longitude, an electronic calculator – to run my numbers, and a local street guide, to find a street near by that had a True north south direction. This would be a challenging project involving extensive measuring (pedaling), accurate measurements and record keeping in a bound notebook. One technique I used was to photograph my latitude, longitude and GPS Readings, with a digital camera. This enabled me to compute my calculations at my leisure. I think this experiment could be an excellent Earth – Science classroom project as it involves: mathematics, science, and technology.

The following are some important factors:

All circles have 360 degrees. Each degree can be divided into 60 segments called Minutes of Arc. Every Minute of Arc can be divided into 60 segments called Seconds of Arc. Do not confuse minutes and seconds of Arc with units of time! Multiplying 360 degrees by 60 minutes by 60 seconds equals 1,296,000. This means every circle has 1,296,000 seconds of arc.

One mile is exactly 5,280 feet. This is called a Statute Mile. All reference to North and South is in the True direction – rather than in the magnetic direction. My GPS receiver (it is actually a radio receiver) is a Garmin nuni Model 270. It will show your position on Earth in degrees, minutes and seconds under the Coordinates setting.

The value is accurate to one place after the decimal such as:

N 42 – 18 – 57.9, S 79 – 35 – 10.5

My calculator is a Texas Instrument TI-30 that will show ten digits. My bicycle odometer is a Schwinn model purchased at Wal-Mart. I Programmed my odometer according to the diameter of my bicycle tire. Then I measured 528 feet (one-tenth of a mile) along the sidewalk with a 100 foot tape Measure. Finally, I checked the odometer reading with my measured distance. At one point a neighbor asked me what I was doing, and without hesitation, I mentioned that I was trying to measure the circumference of the Earth. This caused him to immediately retreat into his house.

To begin, I located a near-by street in my street guide that is parallel with the True North – South lines along the edge of my map. The street or road should be at least one mile long. A road that is longer than one mile will increase the accuracy of your measurements. The road must be relatively flat as any hills or valleys along the road will increase your odometer reading and introduce an error. You are going to measure the distance traveled along this N – S road using the bicycle odometer.

I started at Main Street and Youngs Road in Williamsville NY. At that Point, (I was on the sidewalk on the East side of Youngs Road) I turned on my GPS receiver and set it to read Latitude and Longitude in degrees, minutes and seconds. I recorded my bicycle odometer reading at this starting point.

The GPS showed:

North 42 – 57 – 57.5 and West 78 – 43 - 28.6

I traveled south on Youngs road to Lawrence Bell Drive, a distance of 0.93 Miles on my odometer. South of Lawrence Bell Drive, Youngs Road is no longer level as it goes up and over the New York State Thruway. At Lawrence Bell – on the East side of Youngs Road.

I measured the latitude and longitude as:

North 42 – 57 – 10.7 and West 78 – 43 - 28.5

The West longitude numbers are almost identical – indicating that I Traveled in a True southerly direction. Subtracting the North latitude values 57.5 seconds minus 10.7 seconds equals 46.8 seconds of arc. Using the proportion rule or equation: 0.93 miles divided by 46.8 seconds of arc equals the circumference of the earth divided by 1,296,000 second of arc in a circle.

Or –

0.93 / 46.8 = X miles / 1,296,000

X miles = 0.93 X 1,296,000 / 46.8

X = 25,753 Miles

The published circumference of the Earth in the North – South direction over the poles is 24,860 miles. An error in my calculations of 893 miles (25,753 minus 24,860). This is equal to an error of 3.59% (893 divided by 24,860 = 0.03592 = 3.59%).

I welcome your comments. You can Email me at K2mtw@msn.com

BAA ANNALS

Rowland A. Rupp

5 YEARS AGO - Bill Aquino was our speaker in November 2005. His topic was succinct enough - "Stars." Only "Holiday Party" was mentioned for December, although I was to give a short talk on Olber's Paradox. Alan Friedman wrote "A Webcam Primer" in which he gave some insight into cameras to use, particularly the (Phillips ToUcam Pro), imaging techniques, and processing objectives. Peter Proulx had a brief article in which he commented on the "Big Guy" approach (God) and the "Big Bang" approach (evolution) to understanding the source of our universe. Rowland Rupp complained about Sir Arthur Conan Doyle's getting the phases of the moon wrong in one of his pre-Sherlock Holmes short stories. He admonished BAA members not to do the same.

10 YEARS AGO - For November 2000 we had a panel discussion on the appropriate apparel for winter observing. Edith Geiger gave her customary spoof in December, which was followed by the party hosted that year by Melissa Marcus. President Dan Marcus announced we were holding a telescope clinic at the Buffalo Museum of Science on November 19th. Help, as always, was needed. Alan Friedman reported observing "huge sunspots" on September 23rd, and showed photos of them in The Spectrum . Dennis Hohman and his team went after a Gamma Ray Burst and displayed an image that may or may not have captured the transient event. He left it to the reader to decide. Bill Aquino reported a "null" observation of another GRB that was reported in a GRB OBSERVATION REPORT. Bill noted that null reports are important contributions to astronomy because they set limits on the behavior of the objects under scrutiny. An obituary for Olga Lindberg said her age was 93.

15 YEARS AGO - "Light Pollution and What Can Be Done About It" was Tom Bemus's topic at our November 1995 meeting. For December, Edith Geiger's candid camera was the featured attraction. Terry Farrell was planning a short planetarium show to supplement Edith's talk. Bill Smith wrote about the many planetarium programs becoming available; some were "who-done-it" type mysteries from the past. Bill also had several suggestions for "Naked-Eye Mooning." Bob Titran submitted a report on several observations he made, including Comet Hale-Bopp, which he described as "a smudge barely visible through the 20-inch telescope." It looked better a couple of months later! An "In Memoriam" for Joe Provato was written by Fred Price.

25 YEARS AGO - Rochester's Tom Dey was our speaker for November. His topic was gas-hypersensitized astrophotography, a method to reduce the tendency for film (a product used formerly in photography) to reverse its capture of light. Edith Geiger held sway as always at the Christmas party with her provocative "Candid Camera". Doris Koestler presided over the wine and cheese aspect of the celebration. According to President Ken Biggie's report, John Yerger was looking for BAA members to support his effort to bring astronomy to kids in local schools. Observatory Director Carl Milazzo noted that public attendance at BMO was high, publicity was good, but maintenance was always on-going. Halley's Comet dominated The Spectrum. Jack Mack reviewed a book by Francis Reddy appropriately entitled Halley's Comet. Darwin Christy wrote a brief biography of Sir Edmund, and he also gave positional information for the comet in the coming

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Whatz-uuuuuup!

November 6 - New Moon

November 17, 18 - Leonids Meteor Shower. The Leonids is one of the better meteor showers to observe, producing an average of 40 meteors per hour at their peak. The shower itself has a cyclic peak year every 33 years where hundreds of meteors can be seen each hour. The last of these occurred in 2001. The shower usually peaks on November 17 & 18, but you may see some meteors from November 13 - 20. Look for the shower radiating from the constellation Leo after midnight.

November 21 - Full Moon

December 5 - New Moon

December 13, 14 - Geminids Meteor Shower. Considered by many to be the best meteor shower in the heavens, the Geminids are known for producing up to 60 multicolored meteors per hour at their peak. The peak of the shower this year should occur on the night of December 13 and morning of the 14th, although some meteors should be visible from December 6 - 19. Some estimates say there could be as many as 120 meteors an hour visible from dark-sky locations. The radiant point for this shower will be in the constellation Gemini. The Moon will set early in the evening setting the sky up for a spectacular show. Best viewing is usually to the east after midnight.

December 21 - Full Moon

December 21 - Total Lunar Eclipse. The eclipse will be visible throughout most of eastern Asia, Australia, the Pacific Ocean, the Americas, and Europe. The eclipse will be visible after midnight in North and South America. Since the Moon will be almost directly overhead from these locations, this should be an excellent chance to view a rare total lunar eclipse. (NASA Eclipse Information)

Annals Continued...

months. Perihelion was to be reached on February 9, 1986. Someone, not necessarily a BAA member, wrote an editorial asserting Halley's Comet had to be stopped to obviate the chaos its return might cause - exploitations by politicians, "vapors to our weaker sex," and an influx of comet memorabilia that soon would be added to the trash pile. On a more profound side, there were observation reports by Michael Idem and Rowland Rupp.

35 YEARS AGO - Rochester's Ken Brown extolled the virtues of being an "armchair astronomer" when he spoke to us in November 1975. Ken was a collector of historic books on astronomy and had an extensive home library. Our December Christmas party was very traditional for that time: Ed and Olga Lindberg talked about "Astronomical Clocks and Time Pieces", next Edith Geiger exposed (pun) our "Lunacy Unlimited", and we then retired for "cake, coffee and socializing." There was to be a total lunar eclipse on November 18th. Ernst Both contributed an article "The Largest Telescope on this Side of the Atlantic" in 1838. It was a 12-inch Herschelian reflector built by two students at Yale College.

December 21 - The Winter Solstice occurs in the northern hemisphere at 23:38 UT. The Sun is at its lowest point in the sky and it will be the shortest day of the year. This is also the first day of winter.

BAA Officers and General Information

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Location/Time of Meetings:
BAA meetings are held on the 2nd Friday of the month from September to June starting at 7:30 P.M. Due to construction, our normal meeting room in the Science Building at Buffalo State College will not be available during the fall semester. Beginning September 2009, our meetings will be held in Classroom Building C122 located just to the north of the Science Building. Follow directions (#35) on the Buffalo State College map.