

The Spectrum

The News Letter of the Buffalo Astronomical Association

Volume 14 Issue 1

January / February 2012



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Observatory Report

The AP1200 mount has come back from Astro Physics and looks like they have solved the problem with the movement in RA when moving in Dec. The NP101is focuser moves nice and smooth, and the ST-9 has been serviced and is in the mail (heard that before) at the time I wrote this article. Just itching for clear skies so we can start having fun. A preliminary test using a ST-8, a focal reducer, CCDSoft and the ST-4 auto guider port, the mount seems to auto guide ok for 10 minute subs. Anthony and I took 12 ten minute subs while experimenting with the guiding parameters. We may have some issues with mirror flop with the C-14, maybe that we only need to let the mirror "settle"? after manually focusing it. We had CAREFULLY focused it and then moved the scope, and there was a definite focus shift. At first glance it looks like when you use the mirror to focus, we need to "shake"- think move scope with controller till mirror is facing over head, and then going near your target and refocusing using the electric focuser. Have not had the opportunity to use the NP101is for imaging yet, can't wait! I will be setting up the robofocuser that came with it so it will be belt driven, not direct drive so the imagers can use the electric focus and the visual users can just pop the belt off and use it manually. I will continue to hold Monday nights at BMO, but now they will be weather dependant. If Snowing, or cloudy I plan to stay home. So check Egroups to see what is going on or call me at 773-5015/ cell 445-4991.

Here is the image we got just testing out different guiding parameters.

Continued on page 2

COLLEGE OF FELLOWS MEETING

The annual College of Fellows meeting will be held at 7:30 PM , Thursday, February 24, 2012 at my home at 132 Burroughs Drive, Snyder. Please let me know if you can or can't come. My telephone number is 839-1842; my e-mail address is rarupp@verizon.net.

Rowland A. Rupp

Nice job Rick Pason on processing the 12 ten minute subs that Anthony and Dan took on Dec 2 using Alan's ST-8 camera, internal autoguider, the clubs focal reducer on the C-14 scope. Thank you Astrophysics! the turnaround time was just a week from the time it was sent to the time we got it back! Sounds much better than it did before we sent it back. Picture is shown on page 7.

ATTENTION : Observatory Public Night Schedule Change: I have been asked by several members if we can free up more weekends to help train people on the new equipment as they are having a hard time getting there on my Monday night sessions. I have informed Beaver Meadow that we plan on only having one official public night – the First Saturday of the Month from April through October. If we get a lot of public showing up on the 3rd Saturday (we have the schedule in a lot of places that may not get updated and people are used to the 1st and 3rd for the last 20 years – old habits are hard to break), we may need to have to set up a public night during the week for a second one. The trade off will be we will need to put on a good "show" on our public nights. If we can get some good beginner talks on basic observing for public nights, that will help some of our newer members as well as the public. I intend to utilize the 3rd Saturday for member night at the Observatory so more members can have the opportunity to learn the night sky as well as our new equipment. Monday nights will continue to happen on clear nights and will be geared to imaging/repairs/calibrating. If you have any suggestions for talks, or want to give some, help out, learn more about astronomy, please contact me.

Schedule of BAA Events for 2012 (corrections in bold print)

Note: These are subject to change so check the current Spectrum to make sure of the times and dates of the events have not changed, or others added.

Monday nights- Imaging classes will be only if clear, check with Dan Marcus

January 13 – our lucky day! BAA meeting at Williamsville North High School Planetarium starting at 7:30pm

February 10 – BAA meeting – back at Buff State 7:30pm

February 25 – If Clear – 5pm. How about checking out the snow at the Observatory? New moon night! If we can't get the roof open, we can get great views of the winter sky with the 20"

March 9 - BAA meeting at Buff State at 7:30, see page 10 for speaker details

March 17 and 18 - from 9am to 4pm Maple Festival at Beaver Meadow: We will be doing solar viewing at the Observatory.

March 23? or 24? - If clear, there will be a Messier Marathon at the Observatory. We will start around 5pm and stay all night. There will be a bring a snack to pass bar- chocolate covered coffee beans are good! My favorite is chocolate covered Almonds (bring lots). More nutritious snacks are welcome, bring a sleeping bag as we should get in a couple hour nap in the middle of the night.

March 24 - Beaver Meadow has asked us to help with a Boy Scout Merit Badge program. It will be from 1pm -5pm help will be needed.



Schedule of BAA Events for 2012 continued

April 7 - Our first public night of 2012. We will need a short beginning astronomy talk- any takers? Beaver Meadow will also be holding a Full Moon nature walk that night, so if clear it may be mobbed, if cloudy we will still have visitors.

April 14 – Annual Dinner Meeting at Banchetti's - details to be announced

April 21 - Club night at the Observatory: This is a new moon night. Anyone want to organize a bring a dish to pass party?? Good time to come out and see what is up and enjoy the place. Bring a scope and toys to pass.

April 28 - Astronomy Day - time will be Noon to 5 with a Public night to follow?? Better figure on a bring a dish to pass picnic as well – we do like to eat :) Will need someone to coordinate this event as it conflicts with NEAF. I will be at NEAF, hopefully not spending any money :,,,(

May 3 – Public Night, BAS will also be holding a full Moon Walk

May 11 – BAA meeting at Buff State 7:30pm

June 2 – Public Night

June 6 – Venus Transit in the afternoon – Museum of Science viewing, the rest of us will be on a road trip for clear skies. See Daniel Marcus 773-5015 if you are interested. I intend to be in the center of the current high pressure cell that has the clearest skies we can drive to in 16 hours.

June 8 – BAA meeting – club elections for Pres/VP/Treasurer/Secretary.

June 14/15/16/17 Cherry Springs Star Party in Pa.

June 16- New Moon at the Observatory!! Get out and play, unless you are already at the CSSP.

July 7 – Public night at BMO

August 4 – Public night at BMO

August 12 – Sunday night – hosting a public meteor watching evening at BMO. There is nothing like watching meteors with a bunch of enthusiastic people. If clear will be great for Kids of all ages.

August 17/18/19 Star Fest, Mount Forest, Ontario, Canada

August 18 – New Moon at the Obs, Club Star Party any one!! Please contact me if you would like to organize one

September 1 – Public Night at BMO

September 14 – BAA meeting at Buff State 7:30pm

September 14/15/16 Black Forest Star Party

October 5/6 BMO is closed to members till after 10:30pm due to the annual fall festival. The BAS has requested that we do not come to the Obs until after they close down their festivities for the night as they have a LARGE paying crowd that shows up annually for this event

October 12 – BAA meeting at Buff State 7:30pm

November 9 - BAA meeting at Buff State 7:30pm

December 14 BAA Annual Holiday Party

Keep looking up!

Daniel Marcus



Dark Matter Sheds Light On Milky Way And Other Spiral Galaxies' Structures..

By Randy Boswell

The Milky Way galaxy, a barred spiral, has a peculiar anomaly in its structure. The outer parts of the galaxy exhibit a warping, much like an old LP record that has become bent along its edges. Astronomers have determined this deviation by radio telescopes. It is known that the Milky Way's interstellar space consists in large part of hydrogen gas out of which stars are born by gravitational condensation. [Neutral] hydrogen atoms naturally produce radiation at a wavelength of 21.106 centimet[ers] [1]. A radio telescope tuned to this frequency can therefore detect the presence of interstellar hydrogen gas. Also, by tuning to slightly higher or lower frequency, radio astronomers know whether it is approaching or receding from us and at what speed due to the Doppler shift, as in the visible spectrum. In this way, astronomers have been able to map its' distribution.

Regarding this, it's known that at distances of more than 50,000 lights years from the galactic center the galactic disk composed mostly of interstellar hydrogen. Mapped by radio telescopes, the gas does not lie in the plane of the galaxy; the further out you go, the more it deviates [2]. By a distance of about 75,000 light years, the disk has bent about 7,500 years out of the plane [2]. Although astronomers were aware of this since 1957, they could offer no plausible explanation. It was not until they became aware of the existence and nature of dark matter was any explanation forthcoming.

It was through the pioneering efforts of astronomer Vera Rubin and her colleague Kent Ford in the 1970s and early 1980s that led to the awareness and nature of dark matter. Rubin and Ford studied the rotation curves of more than 200 spiral galaxies, in

addition to the nearby Andromeda galaxy. They found that contrary to Newton's Laws of Gravity, objects at the outskirts of the studied galaxies were rotating at nearly the same velocity as those at the center. According to Newton's inverse-square law, the close-in objects should literally gallop around the center while the more distant objects would rotate at a more stately pace [3]. Rubin and Ford concluded from their "flat" rotation curves that something massive and dark was out there keeping the orbital velocities elevated [4]. Rubin coined the phrase "dark matter" to describe this entity and concluded that it comprised about 90% of the matter in spiral galaxies. Moreover, Rubin et al. concluded that the dark matter is in the form of a halo surrounding these galaxies, including non-spiral galaxies as well. [Concerning our own Milky Way galaxy, it is believed that] the halo begins at the edge of the disk around 65,000 light years from the galactic center and may extend out as far as 300,000 light years from the center of the galaxy [5]. The halo of dark matter, it turns out, offers an explanation for the Milk Way's warp.

This is based on the Leiden-Argentina-Bonn or LAB survey of galactic neutral hydrogen gas (HI) emissions. The LAB survey involved a compilation of a northern sky survey conducted by astronomers in the Netherlands (the Leiden/Dwinglo Survey) and a southern sky survey done by astronomers from the Instituto Argentino de RadioastronomAa. The data was then collected and corrected by researchers at the Institute for Radioastronomy of the University of Bonn, Germany. The data from the LAB survey was released in 2005 and analyzed. Leo Blitz, professor of astronomy at the University of California, Berkeley and his colleagues Evan Levine and Carl Heiles produced from this a new detailed map of the galactic HI emissions. Then, together

with Martin D. Weinberg, theorist and professor of astronomy at the University of Massachusetts, Amherst, they created a computer model that included the Milky Way's dark matter halo. The model showed the warping to be due to the interaction of the Magellanic Clouds with the Milky Way's disk and dark matter halo. [Specifically], the motion of the clouds through the dark matter creates a wake that enhances their gravitational influence on the disk [6]. When the dark matter is included, the Magellanic Clouds, in their orbit around the Milky Way, very closely reproduce the type of warp observed in the galaxy [6]. Regarding this, it was discovered that the clouds' wake creates a resonance or vibration in the gaseous disk. This takes the form of three modes: an up-and-down motion or flapping at the disk's edge; a saddle-shaped oscillation; and sinusoidal waves, much like the vibrations that are seen on a drum. The total effect of these three modes of vibration results in the shape of the warp. The image looks rather like a flapping in the breeze as the clouds complete an orbit of the Milky Way [7].

In addition to the Milky Way's warp, other spiral galaxies are known to exhibit warps as well. [In fact], roughly half of all spiral galaxies have similarly warped disks, which suggest that warps are a common and long-lived phenomenon [8]. Specifically, five of these warped spiral galaxies have been mapped based on HI emissions (M83, NGC 300, NGC 2481, NGC 5033, NGC 5055) for the purpose of studying the origin and evolution of galactic warps in addition to the Milky Way's warp. Accordingly, it has proposed by physicists Avishai Dekel and Izhak Shlosman [9] that nonspherical dark matter halos can induce sustained warps providing a number of conditions are met. One, the halo has to exert a dominant gravitational force at large radiuses providing that the inner

disks are self-gravitating, i.e., experiencing motion due to internal gravitational forces. Second, the halo is slightly flattened and becomes flatter at larger radiuses. Third, the halo's equatorial plane is tilted relative to the galaxy's inner disk.

Thus, it can be seen that dark matter not only sheds light on the rotation curves of spiral galaxies (and galaxy clusters as well), but also on the shape of our Milky Way galaxy and other spiral galaxies as well. End.

Notes

[1] Nigel Henbest and Michael Martin, *The new astronomy* (Great Britain: Cambridge University Press, 1996).

[2] Leo Blitz, "The Dark Side of the Milky Way", *Scientific American*, Vol. 305, No. 4, 38-45, (October 2011).

[3] John Boslough, *Masters of Time. Cosmology at the End of Innocence* (Reading, Massachusetts: Addison-Wesley Publishing Company, 1992).

[4] William H. Waller and Paul W. Hodge, *Galaxies And The Cosmic Frontier* (Cambridge, Massachusetts: Harvard University Press, 2003).

[5] Andrea Thompson, "Milky Way's Halo Loaded With Star Streams." 16 August 2008 <<http://www.space.com/15736-milky-halo-loaded-star-streams.html>> 24 October 2011.

[6] "Milky Way Galaxy is warped and vibrating like drum." 9 September 2006. <<http://www.universityofcalifornia.edu/news/article/7775>> 7 November 2011.

[7] Martin Weinberg and Leo Blitz, "A Magellanic Origin for the Warp of the

Galaxy." *Astrophysical Journal Letters*, Vol. 641, No. 1. 10 April 2006.<
<http://arxiv.org/abs/astro-ph/0601694>>
24 October 2011.

[8] R. L. Smart, R. Drimmmel, et al., "Unexpected Stellar Velocity distribution in the warped Galactic disk," *Nature*, Vol. 392, No. 6675, 471-473, (April 2, 1998).

[9] See: A. Dekel and I. Shlosman, "Galactic WARPS in Tilted Halos," *Internal Kinematics and Dynamics of Galaxies*, E. Athanassoula (Editor). Proceedings of the Symposium held 9-13 August 1982 in Besancon, France. SPIE Conference Proceedings, Vol. 100. Dordrecht D. Reidel Publishing Co., 187 (1983).<
<http://adsabs.harvard.edu/abs/1983IAUS..100..187D> > 8 December 2011.

EARLIEST SUNSET

By Rowland A. Rupp

At our last meeting I commented that today, December 9th, was the earliest sunset (give or take a day). I learned later that some people thought that was wrong because the Winter Solstice wasn't to occur until the early morning of December 22nd for our time zone. Lots of people think that the latest sunrise and the earliest sunset occur on that date, the shortest day of the year, but they don't. I told Alan Friedman I would give a brief explanation of the reason for this astronomical peculiarity at the February meeting, but afterwards thought it might be a good idea to address the issue sooner rather than later.

I recalled that some years ago while auditing a class in astronomy at ECC, I wrote a paper, "The Dilemma of the Analemma," no less, that helps explain this phenomenon of sunsets. As an aside, some of the traditional students taking this course for credit wrote on more exotic material:

black holes, the expanding universe, etc., but I decided to avoid trouble and pick a topic closer to home. After pointing out that the analemma has disappeared from most world globes, probably because no one knew or cared what it was, I continued on to explain it. Here it is in part:

The analemma is generally located in the eastern Pacific Ocean at about longitude 120 degrees west and centered on the equator. It has a tick mark for each day of the year that shows the position of the subsolar point at civil noon on this meridian. The extension north-south shows the declination of the sun that results from the roughly 23.5 degree tilt of the Earth's axis with respect to its orbit around the sun. During fall and winter in the Northern Hemisphere the sun's position is shown south of the equator, reaching the Tropic of Capricorn at the Winter Solstice. Six months later the sun is found on the Tropic of Cancer, marking the Summer Solstice for northern inhabitants.

The reason for the excursion east-west is less obvious; it represents the Equation of Time. It is the position of the sun at noon with respect to our conventional method of reckoning time using constant rate clocks rather than the sun itself. One sees that sometimes the subsolar point is a bit east of the meridian, in which case the sun is lagging our clocks; at other times it is to the west and is leading. On the globe the east-west location of the sun is given in degrees of longitude, but if one applies the rule that the Earth turns one degree in four minutes one can easily convert lag and lead to time. This discrepancy in time can amount to more than sixteen minutes, although it's not quite symmetrical - the maximum lead being a couple of minutes greater than the maximum lag.

There are two principle reasons for this phenomenon. The first, and more

important, is the inclination of the Earth's axis. Each day the sun moves eastward an average of about one degree, When the Earth is near the solstices, all the sun's motion is eastward. When the Earth is near the equinoxes (that is, the sun is crossing the equator), some of the sun's motion is north or south, and only part of it is toward the east. Since it takes the Earth an average of about three minutes, fifty-six seconds to turn enough past its sidereal rotation to complete a solar day, one can see that it will turn too much at the equinoxes, but not enough at the solstices. Hence the sun gains on clocks at the equinoxes, but loses at the solstices. These effects are cumulative, resulting in the east-west excursion of the analemma.

The other contributions to the Equation of Time is the speed of the Earth in its orbit. When near the sun it travels faster, thereby requiring a longer period of rotation to catch up with the sun's position. The reverse is true when the Earth is far from the sun. We are nearest at the beginning of January and farthest in early July. So the effects are additive in January, near the northern Winter Solstice, but are subtractive in July. That the inclination of the axis is the major contributor can be seen from observing the analemma and noting that the sun lags in July as well as January, but not by as much.

So how does this apply to the discordant times of earliest sunset and latest sunrise? Near the Winter Solstice our clocks are gaining with respect to the sun. Therefore, while the days are growing shorter, our clocks are causing both sunset and sunrise to appear to occur later. Just before the solstice, as the time of sunset should be very slowly arriving earlier each day, the discrepancy caused by our clocks running fast relative to the sun causes the civil time of sunset to occur slightly later, resulting in the date of earliest sunset to

occur prior to the shortest day. For the same reason the date of latest sunrise is delayed about a week and a half to two weeks after the solstice.

Sky and Telescope magazine provides an annual "Skygazer's Almanac" for its subscribers that gives the times of earliest sunset and sunrise for observers at 40 degrees north latitude. We are at 43 degrees, but the difference in earliest sunset time is very slight, although it could make the date of earliest sunset change by a day or so - a day later for sunset, a day earlier for sunrise. The magazine gives the date of earliest sunset for 2011 as December 8 and the date of latest sunrise for 2012 as January 5. Note that earliest sunset is fourteen days before the solstice and latest sunrise is fourteen days after. The events are symmetrical about the solstice as one would expect, it's just that our civil clocks are running fast with respect to the sun and that creates the discrepancy. Earliest sunset for 2012 is given as December 7 at latitude 40 degrees.

M1 photo by Rick Pason taken at BAA observatory (details on page 2)



Written in the Stars: Chinese Art in the Sky – A Journey in to the Unknown

By Mark J. Percy

Planetarium folks come to the profession from many different walks of life. I started out as a Chemistry teacher that happened to like Astronomy. I've always worked in technical theater, so my transition to the planetarium of yesterday was somewhat natural. Smoke and mirrors was how we did it back then, right? Hopefully not too much smoke though!

I just wrapped up my tenth year as a Planetarium Director and I can't believe the strange and amazing places I've gone. I went from opaquing slides to digital animation is just a few short years. One of my latest odysseys has been a fun and rewarding experience that I'd like to share.

There are many fascinating things that you can teach in a planetarium. I stumbled across something on Planetarium.net that led to a really great experience for my students and me. Thinktank Planetarium in Birmingham, UK posted a video teaser about their new show, entitled Written in the Stars: Chinese Art in the Sky. It seemed like a really cool topic to teach about and something that I'd enjoy learning more about myself.

I e-mailed Mario Di Maggio who is the planetarium manager at Thinktank. I couldn't afford to license the show, but after a bit of discussion we struck a deal. Thinktank is a Digistar 3 facility and we have Sky-Skan's Definiti system. As a school district planetarium, our funding is often minimal. However, one asset I do have is fantastic students. Our planetarium is attached to Williamsville North High School. Some of the high school students can work for me through our work-study program and others volunteer their time. With them, I knew we could do what Mario wanted in exchange for the show license. Our task was to convert the show to run through a Definiti system.

Of course, the first step in any good deal is the exchange of contracts. Once everybody had signed on the dotted line, our work began. Mario sent us some sample images and star charts. I understood the general nature of what we had to do, but I had no idea how involved it would be or how far we would take the project. Three students worked on the project with me over about a year's time and we produced a set of media and scripts with which I'm quite pleased.

The first student to work on the project was Sophie Wang. She had taken Astronomy as a student in her senior year and volunteered quite a bit of time writing scripts and testing the limits of what Digital Sky could do. She was interested in working over the summer and took on the project. Coincidentally, she had plans to travel to China to visit family and thought she might be able to do some research along the way. As it turned out, there was not much time for research between family fun occasions. We eventually learned that modern Chinese astronomy/astrology is very different from the historical constellations in the show.

Upon her return to Williamsville, NY, Sophie tackled the task of image processing. Thinktank supplied us with raw digital images that had been created by a local professional Chinese artist for the show. To look good on our dome, Sophie had to convert the format, resize, add alpha transparency and adjust the width of the drawn lines in each image. While this was tedious, her challenge had just begun. Positioning the images was a lot harder than we had imagined. Reflecting on the experience later, Sophie remarked that she had not only learned a number of digital media skills, but developed character strength with persistence and patience as the task just seemed to get more difficult every day.

Mario Di Maggio and his colleague Colin Hutcheson at Thinktank wanted the products to be spot on, not just close. Working with a set of constellations that were totally novel to us meant that we had to find new reference points. The charts had the same stars, but no names or boundaries with which we were familiar. Sophie tweaked the script variables as best she could for each image and then made a dome master frame for their review. Colin would match it up with theirs, and send the comparison back with notes. At first, we got pretty discouraged because close was rarely close enough.

I'm sure it didn't seem strange to Sophie, but I have to remark that I found it to be pretty amazing that we could have a back and forth collaboration across the ocean as easily as with someone down the hall. I've been around long enough to remember getting my first 300-baud modem. Since Birmingham, UK is 5 hours ahead, we'd make sure to plan our time carefully, but each day several e-mails went back and forth without much of a thought.

Digital Sky allows images to be positioned with almost limitless variation. How many degrees of freedom? Left/right, up/down, wide/narrow, rotate, scale, warp, and lens distortion are all among the parameters that can be adjusted for an image. Sophie developed a few different alignment methods and explored a number of mathematical thinking skills as she wrestled with each image. By the end of the summer, she had reformatted and created script "buttons" for each of the many images. She also made sky presets and some other fun details such as a button for the audience to "blow the clouds away" that was called for in the script. However, her time was up and she had to head off to college.

The following fall, two more students took over the project. Adam Blocher and

Aaron Borok were both work study students at our high school. They could come in one period per day to work on production projects. Sophie had established the workflow and laid out all the groundwork, so the boys' tasks were well defined. As it turns out, breaking the work up into short time periods was best for this project. Sophie's full work day was a lot more frustrating than a 45 minute period. I split up the list of images between Adam and Aaron and this provided a collegial yet competitive atmosphere between the boys. Each day, they would tweak an image and then we would send a dome master or two off for review. By overlaying each other's dome grabs, we could compare positioning with the required precision. Slowly but surely, the guys got one image after another approved.

Our agreement with Thinktank required us to position the images relative to the star field, but by this point I really wanted to create a full package. Knowing that Thinktank is Digistar and therefore they couldn't modify anything I sent them, I decided to keep working and create graphics to label all the constellations as well as a presentation-ready set of buttons for Digital Sky. We could make English labels fairly easily, but Chinese labels meant not only being able to read Chinese, but writing scripts to call characters from the Ming Lu font set. Instead, Adam made images out of the Chinese labels and then positioned them like pictures.

With all the images and labels done, I had to take over once again. I still had no way to really know what their finished show looked like since the nearest Digistar facility is almost 200 miles away. Colin had described their D3 scripts in detail, but it took me a while to understand the way the show was programmed as it was

a completely different scripting language. Now I had to learn another new language if I was going to really understand how the show was actually presented live. Colin patiently answered a number of questions as I translated each scene.

I wrote scripts for playing the music and demonstrating sky motions such as diurnal motion, precession, movement along the ecliptic and an eclipse. There was a graphic of the oldest star chart in existence that begged to become a wrap-around panorama, and an ancient story about the Summer Triangle that needed a special touch. One of my colleagues at school narrated a recording of the story. I mixed the voice and music so that I could make a script that circled each star and drew the triangle at just the right time. Finally, I thought long and hard about button layout. I've installed many show kits and worked through the strengths and weaknesses of each. I was determined to make sure this set was well organized and easy to use.

In the end, I am very proud of the hard work, perseverance and skill of my students. We created a really nice product that Thinktank can distribute in a plug and play format to any Digital Sky users. We are planning to premier the program here at the Williamsville Space Lab Planetarium in January in preparation for the Chinese New Year.

When I took over as Planetarium Director 10 years ago, my biggest concern was whether or not I'd know the names of all those constellations. Little did I know that I'd have the opportunity to guide three talented students to create a show that teaches about a whole different set of stars and constellations, and that those learners might be thousands of miles away from our little dome here outside Buffalo, NY! By the way, if you think those Greek pictures are hard to keep straight, just take a look at what the ancient Chinese saw in the sky.

Speaker for Our Upcoming March 9 Meeting

Robert Brewington has provided us with an abstract of his presentation and biography:

Adventures With a Remote Observatory

Over the last 10 years I have gotten heavily into astrophotography. Eventually I built a small observatory about 20 miles from my home, which I can operate from home via the Internet. My talk will look at the construction of the observatory, some of the equipment I use, and how I control things from home.

I have been teaching High School Chemistry and Physics for the last 15 years. Previously I developed software for many years (30?). My original education was in Theoretical Chemical Physics, with a BS from Cal Tech and a Masters from UC Berkeley.

I started Astronomy about 10 years ago, when I found an 8" telescope with GEM mount in a storeroom at school. I put it together, and spent 6 months trying to find M81/M82. I eventually moved to a GoTo scope (Celestron NexStar 11") and started getting into astrophotography.

Over the next few years I kept upgrading the various components of my system as I tried to do astrophotography. As a teacher, I had the opportunity to go on two summer "walkabouts", where I took my equipment to West Texas and Colorado and camped for 8-10 weeks at a time. This allowed me to leave everything set up the whole time, allowing more attention to imaging. However, it was clear that what I really wanted was an observatory of my own. I kept checking prices and options over a period of about 5 years, and eventually things came together to build my observatory.

BAA ANNALS

By Rowland A. Rupp

5 YEARS AGO - "Sky Watchers of Ancient Mexico" was presented in January 2007 at the Williamsville North planetarium by its director, Mark Percy. Cornell's Marko Krco spoke on "Hydrogen Dating Stellar Nurseries" at our meeting the following month. President Peter Proulx reflected on the well-known phenomenon that time passed more rapidly as we age. Is it the result of each year becoming a smaller part of the whole, we get busier, we become forgetful, or what we do just becomes more routine? Peter sidestepped the answer by suggesting Einstein might be culpable. Gus Cenker resigned as Spectrum editor, but he did write an article on "Future Asteroid Collisions with Earth." Steve Kramer wrote about recent findings on the ancient Antikythera computer.

10 YEARS AGO - The BAA's Fred Gordon gave a planetarium show of astronomical folklore at Buffalo State in January 2002. Next month we saw a program of several astronomy videos hosted by Jack Mack. Observatory Director Bill Aquino reported that a large public crowd materialized at BMO on November 17th to view the Leonid meteor shower. Bill was amazed since the observatory was closed for the season and there was no advertisement of the event. Carl Ericson wrote a follow-up article on Joe Orzechowski's talk on the "Scale of the Universe," given at our November meeting, by showing how the first reasonably accurate measurement of the astronomical unit (the distance of the Earth from the sun) was made. In 1672 the famous Giovanni Cassini and a colleague traveled to distant locations where they made simultaneous (one hopes) measurements of the parallax of Mars to find the distance of the AU to be 87 million miles. In another article Bill

Smith furnished an extensive "Naked-Eye Viewing Program."

15 YEARS AGO - "High Resolution Lunar Video" was presented by BAA member Gene Witkowski at our January 1997 meeting. In February, Greg Saxon from St. Catherines, Ontario, gave a talk on "Shoot the Sun" using CCD techniques. Bill Smith exhorted BAA members to use the club's CCD camera at BMO where Dan Marcus held classes in its use. Membership chairman Joe Orzechowski reported we had 91 paid up members to start the new year. Joe and Bev were stepping down as Spectrum editors, so we were again looking for a new editor. Here's a note: subscriptions to Sky and Telescope and to Astronomy magazines were \$27 and \$20, respectively. Neither has increased very much in fifteen years, especially S&T, probably a reflection of the inroads made by the Internet.

Alan Goodrich finished commenting on his views about the behavior of the universe. His article in the previous Spectrum invoked responses from Rowland Rupp, and from Joe Orzechowski. An obituary for Walter Semerau cited his extensive achievements in astronomy. Walter specialized in solar observation. A skilled machinist, he designed and built his own spectroheliometer with which he made observations that achieved recognition by professional astronomers. Many of his images were published in the leading astronomy magazines, and he wrote articles and commentaries for books devoted to his field.

25 YEARS AGO - BAA president Ken Kimble gave a talk about the sun at our January 1987 meeting. For February, Jack Mack, Rowland Rupp, Al Kolodziejczak and Ken Kimble were scheduled to hold a

roundtable discussion on cosmology. Leslie Martin wrote an article about the then very popular anthropic principle. Jack Empson was the subject of Edith Geiger's member profile. In Ed Lindberg's Instrument Report, he cited beginners taking on grinding a telescope mirror that was too large and thus becoming disenchanted with the project. The first part of a 1775 oration on the history of astronomy by David Rittenhouse must have been provided by Steve Kramer. Tristan DiLapo submitted an observation report (NGC 7023) as did Carl Milazzo and Michael Idem (both general). Darwin Christy's book report was Leslie Peltier's "Guide to the Stars" which Darwin concluded was especially suited for binocular astronomers. Octavia Black's obituary highlighted the many star parties she hosted for the BAA at her horse camp, Camp Sprucelands. She always saw to it that we were well fed.

35 YEARS AGO - The BAA's Bill Chambers spoke on "Image Intensifiers" at our January 1977 meeting. That's a term I haven't heard in a long time. Another club member; Dr. Fred West, spoke in February on "Open Clusters." Observatory Director Tom Dessert noted that the Bob Kartyas 8-inch reflector had been refurbished, but three additional telescopes of specific types were needed at BMO for our observational needs. He suggested that the mounts should be located outside the building. There was an anonymous article on Caroline Herschel, and an article on micrometeorites by Darwin Christy. We had a cartoon by Patty Rupp.

Rowland A. Rupp

Corrections for this January - February Issue:

Friday March 9 will be our regularly scheduled BAA meeting at Buff State at 7:30pm

Saturday April 14 will be our annual dinner meeting, to be held at Banchetti's Banquet Facility, details to be announced

These corrections are noted in the calendar of events on pages 2-3. An additional correction was made to the location of our January meeting, which was held at the Williamsville North High School planetarium.

Sorry for the confusion!

Cheri Harper
Spectrum Editor

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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. 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.

