*The Newsletter of the Buffalo Astronomical Association*

# The Spectrum

**Volume 10 Issue 1** **Sick of Winter Already Edition** **January/February 2008**

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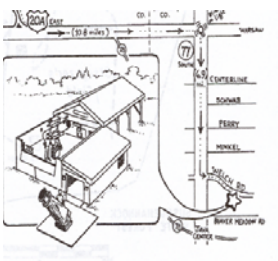

***From the Editor's Desk…***

Greetings on New Year's Day! (I'm writing this on January 1st). Here is the "Sick of Winter Already" edition of The Spectrum, also known as Volume 10, Issue 1. Please note that the next BAA meeting will be at Williamsville North High School, which is at 1595 Hopkins Road in East Amherst. We will meet in the school's planetarium. See the announcement on page 2 for details. Also, Carl Milazzo and Fred Gordon are giving a planetarium show at our February business meeting, which is on February 8th at Buffalo State College. Two exciting planetarium shows in two months. So if the clouds don't let up, at least we can see some fake stars! Hey we can always pretend, right?

On behalf of the entire editorial staff, we wish everyone a happy and prosperous 2008!

**President's Column**

**ATTENTION change in meeting locations:** the Jan 11, 2008 meeting will start at **7:00pm, and will be held at the Williamsville North High School Planetarium.** Our meeting will follow the Planetarium show. Also please mark on your calendar that the March meeting is being replaced by the **BAA Dinner Meeting** which will be held on **Saturday March 8 at Classics V • 2425 Niagara Falls Blvd • Amherst.** While on the subject of meetings, we have found that the College is ticketing cars parked in the lot before 7PM. Make sure you do not arrive before then. I still intend to start meetings ON TIME (7:30pm).

I had a great time at the BAA Holiday Party everyone helped to make it fun. I would like to thank my wife Melissa and Janice Gardner for all the help organizing it, and to thank all the people who contributed food, helped with the setup and the clean up. It was great fun to get together, just talk and enjoy each others company. Rowland dazzled us with his talk on the Christmas Star, and Mike Anzalone, although he has never had the pleasure of seeing one of Edith's Christmas shows managed to show off our peculiar habits and afflictions that seem to manifest themselves whenever a camera is around at a BAA event. Of course Edith did not have the assistance of PhotoShop to help her out.

Now that we are done with the holiday season, it is time to start plotting what we want to do as soon as it gets clear! Since we all received some sort of astro toy for presents, the weather is sure to be lousy till spring. If not, Comet 8P/Tuttle may just reach naked eye visibility after New Year's, so check January's Sky and Telescope for more information.

*(continued on page 3)*

## BAA Officials

**BAA Officers**
President – Dan Marcus
(716) 773-5015
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Treasurer – Chris Mullen
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**At Large Directors**
Janice Gardner
Jack Mack
Richard Fusani

**Observatory Directors**
BMO – Pat Lannon
(716) 827-8836
Remick – Paul Tabor
(716) 434-7148

**Membership**
Alan Friedman
(716) 881-4310

**Robotic Telescope Project**
(open)

**Star Parties**
Dan Marcus???
(716) 773-5015

**College of Fellows**
Rowland Rupp
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**BAA Website**
www.buffaloastronomy.com

**BAA Voice Mail Box**
(716) 629-3098

**Location/Time of Meetings:**

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

**Spectrum Deadline**
Articles for the next Spectrum are due by: October 26th

**BAA Webmaster**
Mike O'Connor

**BAA Yahoo E Group Coordinators**
Dennis Hohman
Mike O'Connor

## *Important Announcement!*

**JANUARY MEETING**
NEW PLACE: Williamsville Space Lab / Planetarium
NEW TIME: 7:00 pm

The January meeting will be held at the Williamsville Space Lab / Planetarium located at Williamsville North High School, 1595 Hopkins Rd, East Amherst. The meeting will feature a special planetarium show presented by the planetarium's director and BAA member Mark Percy. The theme of the show is "a live tour of the digital universe" which makes use of the planetarium system's realtime mode of operation. The show will begin promptly at 7:00pm.

Our regular meeting will begin at the conclusion of the show and will be held in one of the lecture halls of the high school. Members of the public visiting the planetarium will be invited to join us. The speakers for the evening will be Michael O'Connor and Alan Friedman who will share with us a small sample of their portfolios of imaging masterpieces. The meeting will be followed by an outdoor observing session if the weather permits. So please bring a telescope so that we can share views of the night sky with those who attend.

This special evening presents us with a wonderful opportunity to contact new members, spread the word about the BAA and our activities, and to enjoy what should be an exciting planetarium program. Please join us.

## In Memoriam

GERTRUDE COOK

Gertrude Cook, a former BAA member and supporter, died December 8, three months shy of her 100th birthday. She was the mother of Bruce Cook, *Spectrum* editor in the late 1960s. Bruce had contracted a serious illness and was confined to a wheelchair. Gertrude brought him to BAA meetings and always declined help in getting Bruce into her car and horsing his wheelchair into the trunk, neither one an easy task.

After Bruce's early death, Gertrude donated his 3 ½ inch Questar telescope to the club in 1997. The Questar was a very elegant and expensive scope dating from forty or fifty years ago that was well suited for a handicapped observer. I also think, but don't know for sure, that she occasionally made financial donations to the club as well.

## President's Column

*(continued from page 1)*

With any luck we will have as much fun with it as we did for comet Holmes.

Next on my wish list is getting a better computer set up for the Observatory Robo scope. We are currently using a Celeron 400 MHz with 256meg of ram, and a CD burner (no USB2 or FireWire ports with Windows 98. If anyone got a new one for Christmas/ Hanukkah/---- and is looking for a home for the old one let me know. We could use an extra monitor at BMO so if you got one of those nice LCD ones and need a home for your old one, let me know (we only need 1). It would be especially useful if we could get a couple of legal XP operating systems (original XP box for proof of ownership) on donated computers so we can upgrade the other 2 to XP.

I am still on the prowl for a cogged belt and gears for putting the encoders on the 12". If you are throwing out a printer/scanner/VCR/electric typewriter, I'll take it and see if it has any parts we can use. I need two 1" to 2" cogged pulleys for the encoder shafts, and two 3" to 4" cogged pulleys to install on the mount axis. Still looking for free before I go looking to pay.

My thanks to Peter Proulx's donation of a replacement power supply. We should have the Internet back at the Observatory as soon as I get out there to install it.

Anyone have an extra *powered* USB hub? It would be nice to install one on the 12" and run the cord under the floor so visitors can't trip over them. Nothing like having your equipment ruined by a misplaced foot. That way we can run a laptop on the table. We could upgrade the computer we use for the 12" if we had enough people using it, or if we get enough Christmas castoffs we can replace the existing one to one with Firewire and USB2 ports. Keep in mind we currently only have a couple of users, and most of us use our own laptops with our own favorite programs for our cameras. If we can get enough interest it will make funding easier.

The Robo Scope/Imaging group will meet at BMO on Saturday January 12 at 6pm. We will image if clear (Comet 8P Tuttle?), clean the Observatory, practice processing if cloudy. The new filters are working great, and I have started setting up the camera to autoguide. The Robo Scope probably could use the PEC adjusted, and TPoint initialized to get the scope pointing more accurately. If the weather is really bad call me first to make sure I am heading out there. With the price of gas the way it is, no point in traveling that far unless we have work that can only be done there. We can always meet some place else to practice processing, or even go to Remick if it is clear there. I will announce my intentions at the January meeting (which will be at Williamsville North High School Planetarium at 7pm). We will also be meeting Saturday, February 9, and Friday, March 7, at Beaver Meadow Observatory at 7pm. If the weather is really lousy we will cancel, or move the date and location, so stay tuned to the E-groups for any updates on time and location. If you are not on the e-group, call me at 773-5015 to get any updates.

In keeping with my usual gotta have fun doing astronomy you might think about attending a Star Party! The commercial ones can be very informative, and as more than one of our members has found out, there is plenty of valuable free advice on spending your money for Astro Toys.

I am looking for volunteers to organize an Astronomy Day. Need to settle on a time and a place, activities, and publicity.

Start marking your calendar for Star Parties.

January 11 BAA club meeting at **Williamsville North High School Planetarium at 7:00pm** (NOT at Buffalo State College!)
January 12 RoboScope meeting at Beaver Meadow Observatory 6:pm
February 5 BAA Board of Directors Meeting 7:15pm
February 8 BAA club meeting at Buffalo State College 7:30pm also it is the Spectrum Deadline for March/April
February 9 RoboScope meeting at Beaver Meadow Observatory 7pm
March 1st – Messier Marathon at BMO Starts at sunset if clear
March 7th – *Tentatively Scheduled* - Robotic Scope discussion group with Wayne Johnson will most likely be held at Beaver Meadow Observatory at 7:00 pm exact date will depend on when he can get plane tickets.
March 8 BAA Dinner Meeting at Classics V (it is Saturday, NOT Friday night)
April 3 BAA Board Meeting at 7:15pm
April 5 RoboScope meeting at Beaver Meadow Observatory 7:30pm
April 11 BAA club meeting at Buffalo State College 7:30pm

April 19th ?? – Astronomy Day if happening/time/place TBA need ~ someone to organize it. The rest of us are always willing to help!
April 26-27th – NEAF a great place to check out equipment. Best way to go is to carpool with a bunch of friends. For more info check web site http://www.rocklandastronomy.com/neaf.htm. If you are going, and want to carpool please let me know as I would like to go.
May 3 RoboScope meeting at Beaver Meadow Observatory 7:30pm
May 9 BAA club meeting at Buffalo State College 7:30pm
May 31 RoboScope meeting at Beaver Meadow Observatory 7:30pm
June 5 BAA Board of Directors Meeting 7:15pm
June 13 BAA club meeting at Buffalo State College 7:30pm Elections for President/VP/Treasurer/Secretary
Do you want to have a star party?? Better put in for it early.
August 7-10 – StarFest Star Party, Mt Forest, Ontario, Canada
http://www.nyaa-starfest.com/index.php?page=sf.home
September 26-28 – Black Forest Star Party, at Cherry Springs
Humm- do you wish to schedule one for our club at Cherry Springs, BMO, Remick, your home?? Better get on the schedule as space is limited for new moon nights.

We are always on the prowl for Speakers. If you have a talk you would like to give or one that you would like to hear, please let me know. Are the lectures too technical? Or do you wish them to be on something practical, like how to observe, constellations, astronomical terms explained? Your input would be welcome.

See you at the next meeting.

Daniel Marcus

## The Universe Around Us

How old are the stars, the universe, the planets? Popular treatises often address that issue as, of course, do text books, and currently it stands at about 13.5 to 14 billion years. Since I've been reading about this subject, this time has varied from just over ten billion to twenty billion years. Before evidence that the expansion of the universe was accelerating became uncovered, and when the Hubble constant was believed to be about 55 kilometers per second per megaparsec, the twenty billion year time frame prevailed. If deceleration due to gravity was taken into account for a flat universe, the time since creation dropped to just over thirteen billion years, roughly the number accepted these days.

Later observations resulted in a higher Hubble constant that further reduced the age of the universe causing the age of the oldest stars, as determined from other factors, to be older than the universe – an awkward predicament to say the least. Acceleration came to the rescue because it extends the time since the universe began. The current age just barely accommodates the age of the senior citizens of the stellar population.

But if one goes back about seventy-five years, to 1929 to be specific, when the eminent Sir James Jeans wrote *The Universe Around Us*, one finds a very different age for the stars and the universe. The author makes a strong case for the stars having been created five to ten trillion years ago! That's almost a thousand times older then the prevailing age today. What's more, Jeans could prove it – well, more or less.

Jeans attacked the issue of the great age for the stars from a number of directions, but his main approach hinged on the "equipartition of energy". He compared the distribution of stars in space to the distribution of molecules of gas. In the latter, the agitation of the molecules equalized the distribution of kinetic energy, the energy of motion, very quickly as molecules collided with one another. It isn't hard to see that a collision between a high mass particle and a low mass particle will result in imparting a low velocity to the former and a high velocity to the latter. Since kinetic energy depends on both the mass of a particle and its velocity it doesn't take many encounters for the energies to equalize. Since the separation between molecules in a gas is minute and their velocities are relatively high, the time required to achieve equalization is a tiny fraction of a second.

Extending this concept to the widely separated stars, Jeans concluded that five to ten trillion years were needed before the stars reached a state of equipartition of energy. Recognizing that even in that long time period actual

collisions were improbable; Jeans pointed out that the gravitational effect of close encounters would provide the mechanism for transferring energy. To prove this state had already been reached the author noted that the motion of stars shows that the more massive molecules move more slowly in a gas. Exactly what observations led to this conclusion were not given. It is somewhat surprising that this applies to the stars near us, where velocity measurements can be made readily, because nearly all of them must participate in the same general rotation of the galaxy, a fact probably unknown in Jeans' time.

Jeans cited other evidence that supported his view that the stellar universe was thousands of billions of years old. One was that he expected the equipartitioin of energy would also apply to the distribution of eccentricities of orbital motion of binary star systems. He asserted that the gravitational influence of passing stars should, over a long period of time, cause binary star systems to favor more eccentric orbits. To some extent this was shown to be true; where it was not, Jeans concluded that five to ten trillion years had not been long enough. Another sample of evidence was his contention that low mass stars were likely, over time, to be ejected relatively quickly from moving clusters by gravitational interaction with other stars. Jeans noted: "Observation *suggests* that this is what actually happens…" once again, his calculations applied to this phenomenon confirm the same age previously obtained. Jeans ran into troubles that he readily admitted and tried to circumvent. His problems really arose from observations that conflicted with his excessive age for the universe, but were not yet well understood. One of them was the recent observations by Edwin Hubble that confirmed the expansion of the universe, or the recession of the most distant nebulae" as Jeans put it. Tracing this expansion backwards in time led to the conclusion that in the past all these "nebulae" (galaxies) bring one to a time when they were all huddled together, so to speak, at an event we now call the Big Bang. The difficulty was that this time was only a couple of billion yeas ago, not the trillions of years that the author contended. Jeans discounted this disagreeable outcome by noting that all the evidence cited about for a much older stellar universe outweighed the new findings to the contrary.

Another problem was related to an additional argument used by Jeans to prove that the universe was trillions of yeas old. Like the former difficulty it was the result of misunderstanding processes that are seen in a different light today.

By 1929, it had become apparent that the only way the sun could sustain its outpouring of energy over vast periods of time was through some kind of transformation of mass into energy. Einstein's equation for this conversion showed that every second the sun must lose four million tons of mass, the same conclusion drawn today. However, the process by which this was accomplished was not yet known. Jeans thought that orbiting electrons within atoms somehow combined with protons in the nuclei and their mutual annihilation produced the energy. This will prove important later when Jeans attempted to reconcile a paradox.

Jeans worked the problem backwards to figure out how long the sun, and by inference most other stars, could radiate energy. He reasoned that in the past the sun must have been more massive than it is now since it has been expending mass continuously. Moreover, he was aware that the energy output of stars is strongly dependent on mass, by about the third power in fact. This means a star twice as massive as the sun will produce about eight times as much energy. As Jeans worked backwards he was confronted with a sun that was ever more massive, hence ever more luminous, hence converting mass to energy at an ever increasing rate. By luck, good or bad depending on how you look at it, Jeans found that about 7.6 trillion years in the past the sun's mass had to be roughly one hundred times what is now, and going back any further would exponentially escalate its mass beyond that of any star seen in the galaxy. Since this number neatly fit between the five to ten trillion years arrived at by variety of other considerations, Jeans was content to assert the sun and the other stars formed 7.6 trillion years ago, although he did admit "the exact figures…may be open to suspicion."
So where's the problem? It's this: Jeans believed that all the stars formed at the same time. He considered the possibility that stars formed continuously, but he rejected this idea based on the conclusion that there was a paucity of young stars, most were middle aged. The reason for this idea was that astronomers, Jeans included, thought stars start their lives as red giants, of which there are relatively few, then proceed down the main sequence from there. We now know that red giants are the end stage of a star's life. How, then, could one explain why some stars were much more massive than the sun if the buildup of mass going backwards in time was as enormous as jeans thought it to be? A star now twice as massive as the sun would have been 100 times as massive, limit for feasibility less than 2 trillion years ago, far less than the time since all the stars were born, as jeans thought. More massive stars would have been at this limit even more recently.

Jeans circumvented this dilemma by concluding that some stars and to a state of "arrested development" in which, somehow, their orbital electrons, became free electrons, and so could not enter into combination with protons to generate energy in the process mentioned earlier. They might remain in this state for 98% of their lives and have only started producing copious energy recently. Jeans needed some examples of stars presently in arrested development to strengthen his case. He hit upon hypothetical, very massive white dwarfs as candidates, even though none had been seen, and proposed there might be some small O-class stars that also filled the bill. He admitted the notion of low O-class stars (O-class stars are the hottest stars of all) was not the general consensus among astronomers. Planetary nebulae were also suggested as possibilities since Jeans believed that their central stars were O or B-class, and that they may be in this "dormant state". He was uncomfortable with this latter idea because the high special velocity of planetaries mitigated against their having high mass central stars.

Jeans also speculated about the age of the universe itself and of the Earth. Having established that the formation of the stars occurred simultaneously trillions of years ago, he thought they were the result of the breakup of "a single huge nebula". He believed that before the stars were born the nebulae were concentrations of gas resembling a white dwarf, which explained why they "generate very little energy for their weights and shine so feebly". Perhaps this was an early allusion to the irksome missing mass problem. Likening the nebula to white dwarfs for which he already argued why energy production was low. He was able to conclude that the nebula may have been around for up to 200 trillion years before they broke apart into stars. He acknowledged his calculation was neither convincing nor exact. Finally, he offered the possibility that space, time and matter all came into existence together, and opinion not far removed from our present-day concept.

Jeans did much better estimating the age of the Earth. He took three approaches. One was to measure the rate at which sediment has accumulated in the seas. He concluded the time since the Earth formed, using this method, was just over 2 billion years. Although he admitted there were uncertainties in the method, he nonetheless expressed concern that England and the Isle of Wight might soon disappear from this ongoing process.

His second approach was to measure the decay rate of uranium, which yielded an age of 1.4 billion years since the time when the rock containing the element solidified. An isotope of uranium gave a result of 3.4 billion years, the two of them nicely straddling the 2.1 billion obtained from erosion.

Lastly, he commented briefly on an astronomical method that determined the age of the solar system from the shapes of the orbits of the planets and moons using just Mercury and the moon. The results range from one to ten billion years, a wide variation that makes the procedure unconvincing.

Regardless of which principle of calculation was employed, the age of the Earth came out to be a thousand times less than the age of the sun. Since the paradigm for planetary formation accepted in Jeans time was the close encounter hypothesis, it didn't matter when the event took place, any time was as good as any other. Jeans surmised that a star larger than the sun drew material from it during a close passage. A long cigar shaped filament extended into space and coalesced into the planets. Jupiter and Saturn formed from the fat center of the cigar, while the inner planets and Uranus and Neptune formed where the filament narrowed. At first, the orbits were highly elongated from the trauma of violent birth, but in time, as the planets collided with leftover debris, their orbits became more circular, as they are now. This reasoning led to a consistent third estimate of elapsed time since the planets formed.

Well, there you have it - past conclusions for the age of the stars, the universe and the solar system from a distinguished astronomer less than a century ago. His conclusions were compiled from lectures given at universities, and reflect the state of astronomical wisdom in the first third of the last century. So much has changed, so much has been added, and so much has been refined that one wonders how Jeans would react to the revision in thinking he would need to make if he returned today. My guess is that he would pick up a bunch of current text books and papers and come up to date in a jiffy.

Leslie Martin

## BAA Annals

5 YEARS AGO – I looked, without success, in the January/February 2003 *Spectrum* for the programs for the coming months. I did find that Observatory Director Bill Aquino reported work was going forward on the robotic telescope and the Internet link, and that Neil Dennis would no longer serve as co-director.

There were several articles. Gunther Lang (Wang?) wrote on the origin of the modern calendar. Tom Bakowski commented on his trip to Virginia to observe the Leonid meteor shower, and Larry Carlino wrote about the Vixen ED 130SS 5.1-inch refractor. He approved of it – sort of! Maybe Tom will tell me sometime why he went all the way to Virginia to observe the shower.

10 YEARS AGO – Jim Wornack, our January 1998 speaker, departed from our usual topics to tell us about his avocation – fireworks! Some disapproved of such an un-astronomical talk, but for many it was sparkling. The *Spectrum* claimed Rowland Rupp was to give a short presentation on "Can You Identify This Object?", but I can't remember it at all. Membership Chairman Joe Orzechowski summarized some of the advantages of belonging to the BAA. He grumbled about the slow rate of renewals.

Neil Dennis wrote on "Mars!! Are We Really Here?" He gave a summary of conditions on the Red Planet, and also some of the history of our observations over the centuries. Bill Aquino wrote about his observations of the fast variable star Algol, and also about activities at BMO. Bill Smith and Carol Lorenc scheduled a "Messier Marathon" at their "new home." Leslie Martin contributed "If You Were an Egyptian" – a summary of what the Egyptians knew about the heavens and time-keeping twenty-five hundred years ago.

15 YEARS AGO – In January 1993 we heard from Tom Bemus about the Marshall Martz Club's automated CCD 20-inch scope. A roundtable discussion was scheduled for February. Tom Nigrelli announced that "we will be obsessed," referring to the 20-inch Obsession telescope that the BAA was planning to purchase.

Darwin Christy wrote about the coming conjunction of Uranus and Neptune (January 26, 1993). He noted that the last time this was "seen" was in 1821. Of course, Darwin pointed out that it wasn't seen at all; Neptune hadn't been discovered yet. Rowland Rupp wrote a book review about a new theory of everything that sought to unhinge Copernicus, Galileo, Newton, and those who followed. Rowland didn't think well of it.

25 YEARS AGO – In January 1983 Shaun Hardy spoke on "The Classification and Origin of Meteorites." In February, Ed Lindberg and Al Kolodziejczak combined forces to report on their summer pilgrimage to Stellafane. Also, Beverly Botto showed her space art. She had been commissioned by the museum to paint for their forthcoming astronomy exhibit. Observatory Director John Riggs reported that the observatory now had new dew-resistors for eyepieces and a new sky atlas.

An anonymous article on red dwarfs appeared in the *Spectrum*, and Fred Price reported on an observation he made of the lunar crater Nasmyth that was at odds with sketches made of the same feature by other observers. There was also a reprint from the 1969 *Spectrum* of an article on probability by Orrin Christy. Dr. Elton Rock was the subject of this issue's member profile by Edith Geiger.

35 YEARS AGO – In January 1973 Larry Hazel spoke on "Variable Stars." Larry was a member of the AAVSO, an organization devoted to amateur variable star observations. "Telescopes and Accessories" was given by BAA Vice-President Tom Dessert in February. President Darwin Christy commented that attendance at our meetings was high. He also noted that our astrophoto exhibit at the museum was successful, and we looked forward to an exhibit at Eastern Hills Mall, organized by Gretchen Shork.

Bill Parker wrote about the role of gravity in the life cycle of stars, Tom Dessert commented on the use of "off-axis guiding," and Bill Chambers wrote about observations of infrared stars. John Riggs had another installment of his on-going series on "Deep-Sky Observing." We had an obituary for Paul C. Shuart.

Rowland A. Rupp

## COLLEGE OF FELLOWS MEETING

The annual meeting of the College of Fellows will be held at 7:30 p.m. on Thursday, January 31, at my home at 132 Burroughs Drive in Snyder. Please give me a call at 839-1842 to let me know if you can or can't come.

Rowland A. Rupp

The following poem was submitted by Alan Friedman. It's a little late for the holidays, but so what…

**From: Jane Houston Jones**

**The week before Solstice**

**Twas the week before Solstice, when all through the city,**
**Not a planet was shining, now isn't that a pity.**
**The telescope was stored in the garage with despair,**
**In hopes that the weather would soon turn to fair.**

**The astronomers were nestled all snug in their beds,**
**While visions of nebulae danced in their heads.**
**And Mojo with his laptop and I with my starmap,**
**Had just settled down for a cloudy night nap.**

**When out on the lawn there arose such a clatter,**
**I sprang from the bed to see what was the matter.**
**Away to the window I flew with a flash,**
**Tore open the shutters and threw up the sash.**

**The moon shone brightly, no clouds hid the glow,**
**The full moonlit lustre to objects below.**
**When what to my wondering eyes should appear,**
**But Pleiades, Orion, and Ursa Major, the bear.**

**With our trusty old telescope, the setup was quick,**
**I knew in a moment we had objects to pick.**
**More rapid than eagles, the targets they came,**
**We aimed and we pointed and called them by name.**

**"Now, Procyon, now Pollux, now Castor and Capella!**
**On Aldebaran, on Rigel, on Sirius, and Betelgeuse, the red fella :-)**
**To the top and around the winter circle of stars,**
**Now a quick look at Saturn, Jupiter, Venus and Mars.**

**As fireflies that before the dawns morning light,**
**Brilliantly flicker and soon are a memory bright,**
**A new wonder would paint the dark sky to pale blue,**
**The sunrise was nearing and morning twilight was too.**

**And then in a twinkling, I heard on the roof,**
**The prancing and pawing of each little hoof.**
**As I stepped from the telescope and was turning around,**
**Down the chimney the stranger came with a bound.**

**He looked like an astronomer, bundled from head to his foot,**
**Like a stargazer his clothes were tarnished with ashes and soot.**
**A bundle of toys he had flung on his back,**
**Looked just like our telescope accessory pack.**

**His eyes -- how they twinkled! his dimples how merry!**
**His cheeks were like roses, his nose like a cherry**
**He looked like we do after a cold winter starshow**
**Freezing but happy from the Milky Way glow**

**The stump of a flashlight held tight in his teeth**
**Its soft red glow encircled his head like a wreath**
**We asked him if he'd ever looked closely at Mars**
**"I'm working at night, I have no time for the stars".**

**He stepped up to the eyepiece, a right jolly old elf,**
**And I smiled as he gasped, in spite of myself.**
**A wink of his eye and a twist of his head,**
**Soon gave me to know I had nothing to dread.**

**He spoke not a word, but took in view after view,**
**Then he spoke with a sigh he had more work to do.**
**And laying his finger aside of his nose,**
**And giving a nod, up the chimney he rose.**

**He sprang to his sleigh, to his team gave a whistle,**
**And away they all flew like the down of a thistle.**
**But I heard him exclaim, ere he drove out of sight,**
**Happy stargazing to all and to all a dark night.**

## Buffalo Astronomical Association Members Astronomy Websites

Compiled by Tom Bakowski

Tom Bakowski -- www.tomseyeonthesky.com
-- Wide Angle images of the sky thru the seasons, from dark skies of PA, using a dslr camera and lens.

Thom Bemus -- www.upstateastro.org/stars/index.html
-- Astronomy resource site.

Anthony Davoli -- www.astro.premcom.com/ADM/index.htm -- www.admaccessories.com
-- Images of deep sky objects using a Takahashi FSQ-106 and a dslr camera.

Tristan Dilapo and Mike O'Connor -- www.orbitjetobservatory.com
-- Images of deep sky objects and transient events.
-- Tristan uses a fully robotic Meade 12" LX200 and CCD.
-- Mike uses a fully robotic Celestron 9.25", Takahashi TOA-130 and CCD.

Alan Friedman -- www.avertedimagination.com
-- Highest resolution images of the solar system using a Astro-Physics10"- 6,5,4" refractors.

Mike Israel -- http://poochpa.myjalbum.net/
-- Images of solar system and deep sky objects using a TeleVue NP101 and Meade 8" LX200GPS with a webcam or dslr camera.

Dr. Jack Mack -- http://facstaff.buffalostate.edu/mackje/
-- Astronomy resource page.

Mark Percy -- www.williamsvillek12.org/planetarium
-- Williamsville Planetarium schedule.

Peter Proulx -- www.gotastronomy.com -- www.ip4ap.com
-- Images of deep sky objects using a Meade 10" RCX and CCD camera.

If you're a BAA member, and not on the club's message board, then you're missing out on communication and current events. This message archive, started in 1999, has 134 members and had over 12,130 messages!
-- http://*groups*.yahoo.com/group/buffalo_astro_assoc/

**The Spectrum**
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