Orbit

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December 7, 2000 Volume 33, Issue 10

GREEK IN THE ROUND

by: Ev Rilett

Are you anxiously waiting for the second half of Perseus' story?

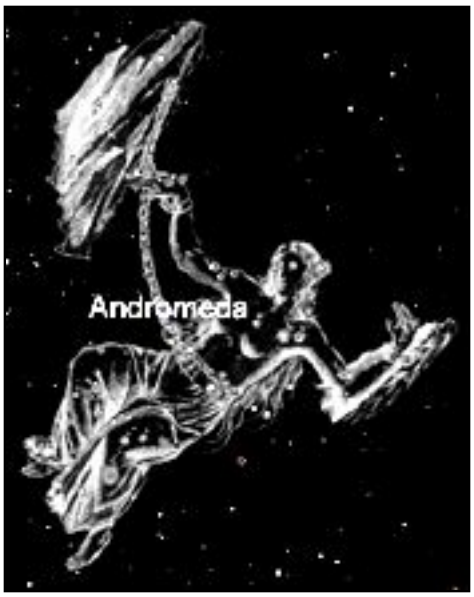
Good!

Last month we saw Perseus slay the Gorgon Medusa. This month he encounters the beautiful maiden Andromeda. Let's begin with her story.

According to the Greeks, Andromeda was the lovely daughter of Cassiopeia and Cepheus. Proud of her daughter's beauty and her own, Cassiopeia one day foolishly boasted that both were the fairest that ever lived. This soon reached the unbelieving ears of Hera, the jealous wife of Zeus, and the Nereids, who were nymph-maiden favourites of Poseidon. they demanded that Poseidon immediately avenge Cassiopeia's majesty.

Poseidon therefore sent a sea monster, Cetus, to attack Cepheus' kingdom. The monster is now usually depicted as a whale, but in the original story Cetus was a cross between a fire-breathing dragon and one of those fearsome, ship-devouring "sea serpents" bred in the darker corners of sailors' imaginations.

With his kingdom in terror, Cepheus consulted an oracle for advice. The appalling reply: To save the realm, Andromeda must be delivered up to Cetus. Heavy-hearted and bitter over his wife's vanity, Cepheus was forced by his people to comply. The place chosen for the sacrifice was a rugged part of the coast. Andromeda was chained hand and foot to a large rock to await her grisly doom.



Soon the monster swam by and noticed her. Hissing with delight, he clambered out of the water and slithered across the boulders toward the screaming girl.

Suddenly Cetus felt a sharp, slicing pain. He turned and saw a man behind him armed with a great bronze sword. Again and again the man struck but as pain lanced through the creature and his

continued on page 4

Editorial:

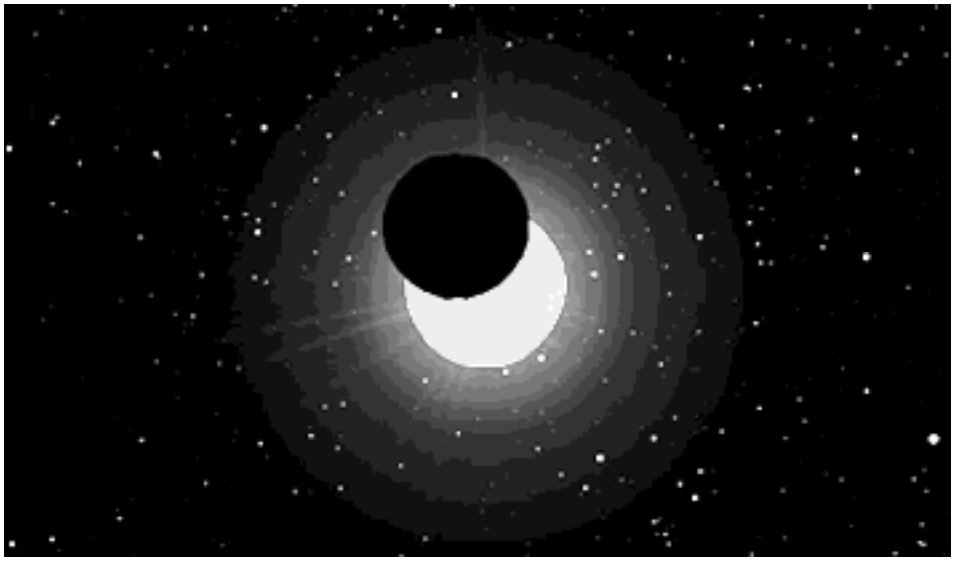
by: Scott Barrie

We live near a Christmas tree farm and, judging by the number of trees going by tied to the tops of SUVs, it would seem that a lot of people are starting to gear up for Christmas. I'm sure that most members who celebrate Christmas have a list of astronomical items they'd like to find under the tree on Christmas morning, but whether you celebrate Christmas or not, if it's clear, we're all getting a special gift on December 25th in the form of a partial solar eclipse.

From our latitude, at the maximum, less than half of the sun will be covered, but it's still an event not to be missed. I know I'll be putting on the solar filter and heading outside with my scope to have a look.

Another event worth getting bundled up for takes place on December 29th. The crescent moon will be situated just over 2 degrees from Venus and, completing what will be a beautiful triangle, barely a degree away from both Venus and the moon, will be the magnitude 2.84 star Deneb Algiedi in Capricornus. Don't miss it.

Finally, since this is the last Orbit for the year 2000, I want to wish you all a healthy and happy holiday season, and all the very best for 2001!



Partial Solar Eclipse December 25, 2000

Board of Directors Contact info.

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President's report, December 2000:

by: Harry Pulley

At press time, the two November club observing activities run so far have not been blessed with good weather. The beginner's observing night around the first quarter Moon was completely clouded out, and the Algol minima event had only a few hours of clear sky. A few people showed up for the beginner's night. A new member was shown around the observatory, how to open the buildings and use the telescopes and so on. Others showed up and we discussed optics, books and other topics. Thus the night was useful after all.

I hadn't planned on making the beginner's nights "rain or stars" events, but maybe we should. Bob Botts brought some videos to watch but the cables to hook up the TV and VCR were missing. Assuming that we have all the equipment ready next time,

we could bring slides and videos for cloudy nights. We should plan to run next year's beginner's nights whether the weather is clear or not. I may not be able to make it on the January 6th event but hopefully some experienced members can help out.

The second observing night of November, on the evening of the 12th, was for the purpose of observing a minimum of the eclipsing variable star, Algol. Algol is also known as beta Persei and "The Demon Star" for its naked-eye observable dimming act. Using the comparison stars alpha Persei (mag.1.9),gamma Andromedae (mag. 2.2) and delta Persei (mag. 3.1), listed on page 239 of the 1999 RASC Observer's Handbook, I observed Algol to be between the brightness of alpha Persei and gamma Andromedae, or about magnitude 2.1, at 1:25UT (8:25PM EST). This means it had not yet started dimming, or my estimation was off.

By 2:17UT, however, Algol was obviously dimmer than gamma Andromedae, and by 2:38 it was just a bit brighter than delta Persei, putting it at about magnitude 3.0 (unfortunately, I didn't compare it to Zeta Persei at mag. 2.9). Shortly thereafter, clouds made comparisons impossible.

While waiting for the next timing opportunity, the Full Moon, Jupiter and Saturn presented themselves nearby for easy observations. On Jupiter, the Great Red Spot (GRS) was present, past the centre and heading off the observable side of the planet. Unlike recent years where the GRS has been very faint, there is a both a spot hollow and an actual spot to observe this year.

Without filters, I saw no real colour on the planet this time, which is strange as I usually find it quite colourful when observed during a full Moon where my eyes cannot dark adapt properly. Using a #58 dark green filter brought out the features more clearly. It showed a nice southern temperate zone that was unusually bright. There was a nice projection from he southern edge of the northern equatorial belt (NEB) with a light partial festoon. I also saw a couple of barges on the north edge of the NEB, and lots of nice detail in the bifurcated southern equatorial belt.

Saturn offered some extremely steady views. I was able to employ 300x with a 5mm Celestron Ultima eyepiece at times for a highly detailed examination of the planet. Others there agreed that a #15 amber yellow filter greatly improved the view. The Cassini division was obvious, there was still some shadow of the planet against the rings, and the crepe ring showed up very nicely.

As well, there was interesting shading present in the rings, including a darkening in the middle of the 'A' ring, possibly the Encke/Keeler gap (not the much more difficult 'true' Encke gap). Without the filter, Saturn had a nice orange cast.

The Moon was very close to being full and yet it still had many craters visible. As well, the limb away from the cratered limb showed some mountains on the edge more obviously than I recall seeing them before. Lunar ray systems were showing very well around craters Tycho, Copernicus, Proclus, Menelaus, and so on. A dark red Wratten #25A filter helped bring down the brightness and improve the contrast.

Photo by: Scott Barrie

I was using the centre's 10" dobsonian for the above observations. Seeing the clouds nearby, I chose not to set up my own scope.

Bob Botts was there trying out his video equipment set-up, showing good detail on the Moon and with two barlow lenses stacked, his 4" refractor showed detail on Jupiter. Clouds rolled in before he got a good shot of Saturn.

I hope the above description of the observing night will entice you to come out next time. It shows how much fun you can have in just a few hours at the observatory. I hope to see you there at the next event.

Greek in the Round, continued

blood gushed fourth, Cetus felt his strength increasing. The man was none other than Perseus. Fired with a killing rage, he produced the Gorgon head he had just killed and whose face was so hideous that all who looked directly upon it were turned to stone with fear. Cetus was turned to stone.

Next, Perseus called down his flying horse Pegasus (who's devotion he'd won at Medusa's death) and, delighted by the girl's beauty, Perseus carried Andromeda home to marry her.

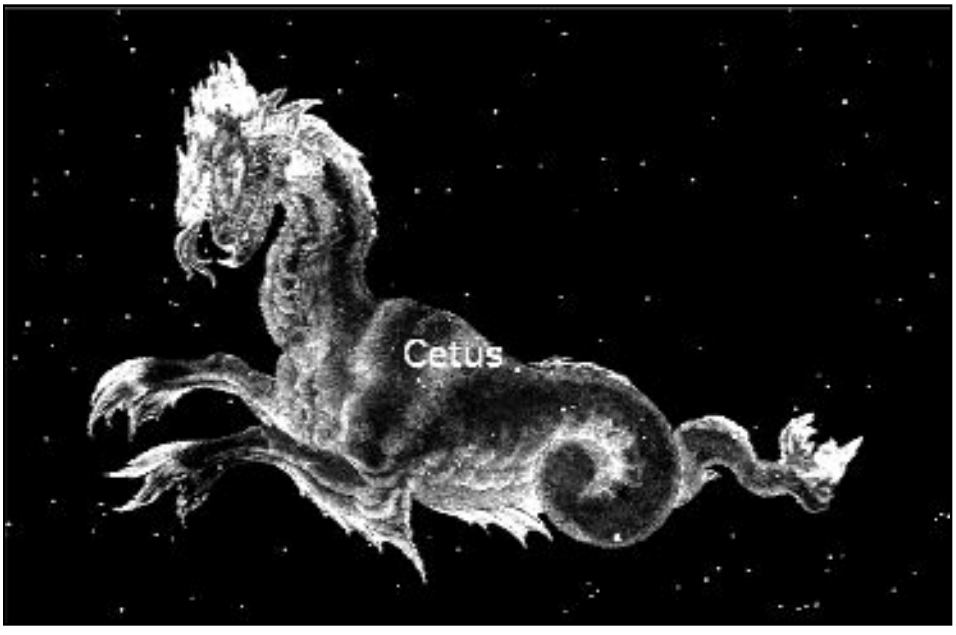
Unfortunately, the gods felt that Cassiopeia had gotten off lightly, so they tied her to her throne and condemned her to circle the Pole Star endlessly, alternating sitting right side up and dangling upside down.

When Perseus and Andromeda arrived back to the land where his mother awaited his return, he found his mother and step-father hiding from the King still seeking to force marriage believing Perseus was gone forever. Perseus traveled to the kingdom, greatly surprised the King and said "Here is your gift!" and he held up the Medusa's head for all to view. A second later the room was a gallery of statues of evil men frozen in horrible death.

And the evil grandfather of Perseus? Acrisius had long since fled his kingdom, but one day Perseus, while attending funeral games which is comprised of an athletic competition, hurled a javelin that went astray and killed a spectator. Acrisius. And so the death foretold to him came true, despite all of his efforts to evade it.

The rest of the life of Perseus and Andromeda was happy. They ruled their land wisely and had many children. One of their great grandsons was Hercules. But most important of all, the tale of their lives endures as the most star-honoured of all time.

"Wish Upon A Star"



Kendra Angles Teaches Telescope Making

by: Barb Schultz

Classes are being organized to take place over the course of approximately 1 year, resulting in the completion of a 7" telescope for each group or individual involved.

Kendra Angles will be teaching this 5 class course. It will take us through the step by step process of building a 7" telescope along the design of her own model. Kendra's model took 2nd place in a Montreal contest, because of her high quality optics. She spoke at the January RASC meeting in Hamilton, having been recommended because she was currently heading up a team grinding a 24" mirror. The big surprise was that she was a 9th grade home schooler!

The classes will be scheduled once a group of at least 8 interested people has been found. The cost will be approximately $480.00 (Kendra's telescope has compared with other telescopes valued in the $2,000. - $3,000. range. She tells us that the only irrecoverable error that can be made is dropping the mirror. Don't do that!) The location of the classes may vary, and will depend on those who become involved.

For the interested but timid group, there are two helpful reassurances:

1) Dad will be supportive in the background, and very present at the most critical points.

2) Kendra has a buy back offer for those who may fear getting started and regretting it. She is able to utilize partially completed work in a number of ways to recover her costs, and is quite willing to offer us this assurance. In addition, the full cost of the project is not necessary to have up front. Approximately half of the cost need not be incurred until near the end of the project.

For more information or a detailed electronic format class plan please call **B. Schultz (905)681-5370** or e-mail **wschultz@interlynx.net**

Hamilton Home to Canada's Largest Scope

by: Ann Tekatch

Did You Know?...

That in the late 1800's, the largest reflecting telescope in Canada was owned by a Hamiltonian?

William Bruce (1833-1927) was a registrar of patents, a justice of the peace and an amateur astronomer. Sometime around 1869, he built a home (called Elmwood) and an observatory near where the Bruce Park pavilion stands today on Hamilton Mountain. (Bruce Park is located between Queensdale and Brucedale Avenues at the foot of East 7th. Street.)

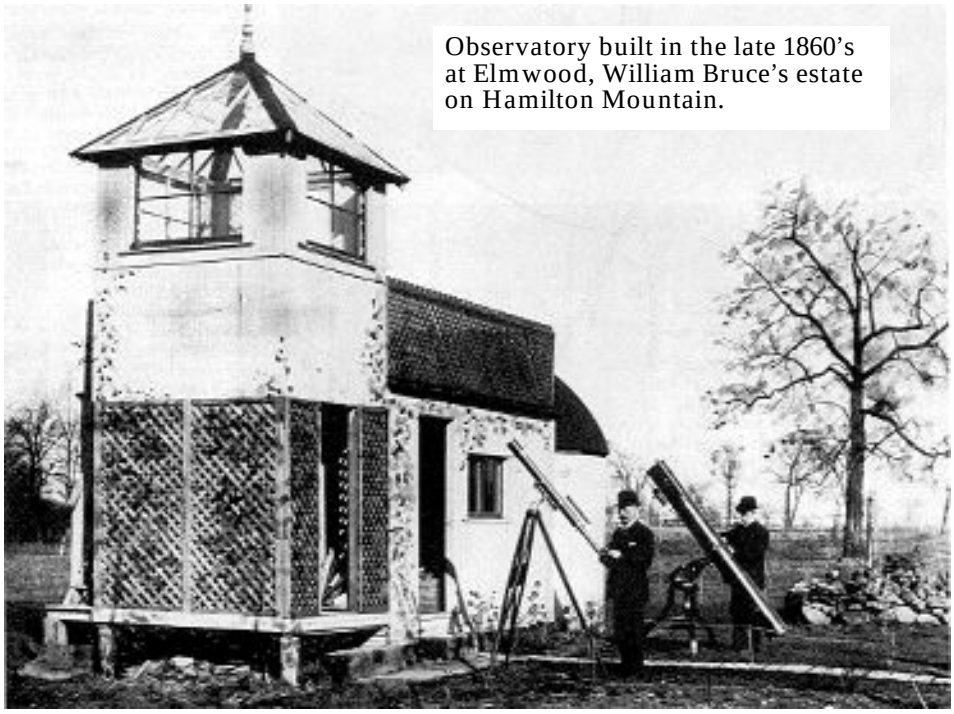
William Bruce also served as president of the RASC's Hamilton Centre from 1911 to 1915. According to Mountain Memories, my source for this article, Wm. Bruce opened his Elmwood Observatory to the general public on Thursday evenings. Could this be where the tradition of Thursday night meetings for the Hamilton Centre began????

The book, Mountain Memories, has two photos to accompany the section on Wm. Bruce: one is a portrait of Bruce; the other is of Elmwood Observatory and two dapper gentlemen setting up telescopes beside it. One of the scopes is a familiar brass refractor and the other is a long focal length 8" reflector. The accompanying text explains that Bruce "and a colleague are seen preparing for the solar eclipse in 1925". That "colleague" may have been Rev. Marsh and what we know as the Marsh refractor!

If you can find a copy of "**Mountain Memories: a pictorial history of the Hamilton Mountain**", check out page 127 for yourself.

Wiliam Bruce - former Hamilton Centre President

Note: Mountain Memories was published this year by The Hamilton Mountain Heritage Society. Copes are available for $25 (if memory serves) from the Bestsellers shop in Jackson Square (near the main entrance at King & James Streets).



Observatory built in the late 1860's at Elmwood, William Bruce's estate on Hamilton Mountain.

The Elegant Universe: Wraps in Superstrings

Part I

by: Mike Jefferson

It is said that a teacher's greatest compliment is to have his/her students surpass him/her. The second greatest joy, then, is to have a former student tell her father that although she is not interested in going to the Redman Lecture 2000 with him, perhaps Mr. Jefferson might be. Wow! This sure puts paid to the argument that students never think of their teachers outside of the classroom. Secondly, it sure does my ego wonders to think that I have made these kinds of impressions on the minds of children and young people.

My thanks has to go to Jasmine Baetz of Dundas and her dad, Dr. Brian Baetz of the Faculty of Engineering at McMaster University. One couldn't go to a cosmology lecture in better company. Many of the people there, he knew.

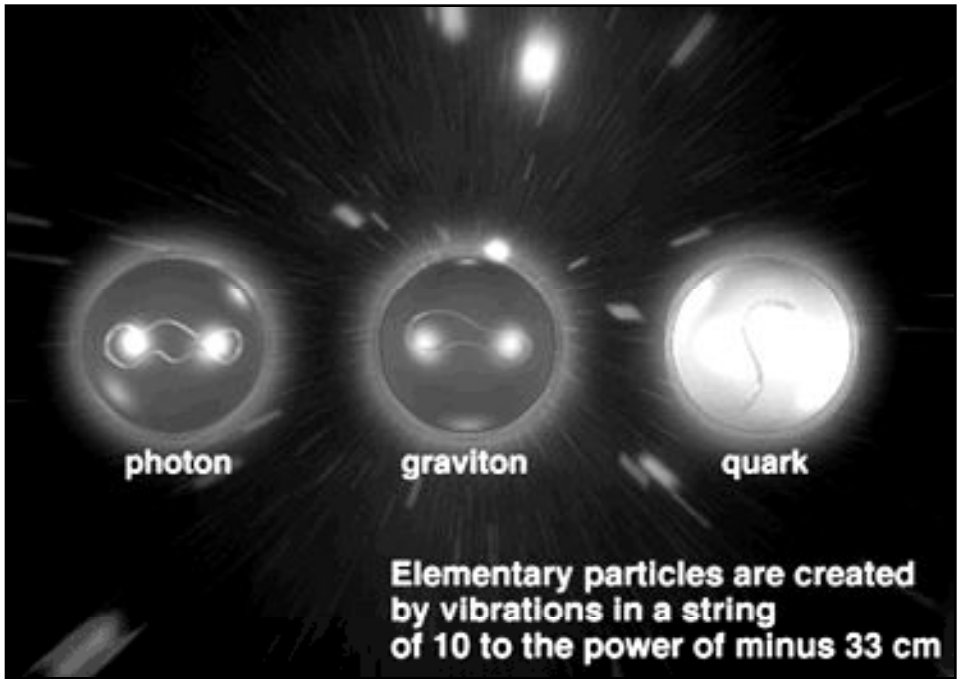
Dr. Brian Greene was the elegant presenter of THE QUEST FOR THE UNIFIED THEORY on Wednesday, Oct. 18 and SPACE AND TIME SINCE EINSTEIN on Thursday, Oct. 19. Both presentations were at 8:00 p.m. in Room 1A1 of the McMaster Health Science Centre. Several members of the HAA and the Hamilton Centre were in attendance either for one or both lectures. There may have been others that I did not see in a more-than-fully-packed house on both nights. Such is the drawing power of a mind like Professor Greene's. Cloistered at Columbia University, he set up the String Program there in 1996 and published the best-seller THE ELEGANT UNIVERSE: SUPERSTRINGS, HIDDEN DIMENSIONS AND THE QUEST FOR THE ULTIMATE THEORY in 1999.

Having shared the podium with Stephen Hawking and Edward Witten, he is one of the world's leading experts in string theory –– and here is the essence of what he said:

Over the last 100 years there has been a search for an elegant unified theory to unite all of the natural forces. It, perhaps, began with Einstein but it was always a stumbling block. What was needed was a simple and elegant solution. From the time of Newton there have been conflicts driving the world of physics. Newton's classical mechanics conflicted with the electromagnetic theory of James Clerk Maxwell. This led to the development of Einstein's Special Relativity which in turn conflicted with classical gravitational theory. This sparked the development of General Relativity (for macro applications) which later found itself at odds with Quantum Mechanics (for micro applications). Hence the development of **Superstring Theory** to unify the strife among all of these systems.

Newton maintained that gravity acted instantaneously on all bodies in the universe but Einstein said that light is the fastest thing there is. The solution was to invent the fabric of space and time. Its warps and curves would transmit gravity at the same speed as that of light.

In large scale, General Relativity sees only smooth, gentle curves. In the microworld on earth and in the universe, Quantum Mechanics sees only small, jittery curves, especially at the Planck length of 10-35 metres!



Therefore:

1) since the laws of physics are breaking down, deeper laws must exist and,

2) since we can't go back to TIME "0", we do not know what laws existed in the pre-natal universe (remember: Big Bang is an evolution only and NOT a cause) and we have to invoke a new way to explain the universe.

Enter STRING THEORY!

Here, discrete particles present themselves, not as solid, inelastic bodies, but as tiny volumes containing little loops of vibrating energy. Perhaps the small decorative light bulbs with the dancing filaments would be good analogies. The type of vibration identifies the kind of particle.

Where does this leave us?

1) It resolves problems between Quantum Mechanics and General Relativity,

2) It makes both of these work in unison!

3) Probe size sets how sensitive you wish to measure.

4) Strings are too big to be affected by the insignificant, but annoying and violent micro-fluctuations in space-time.

5) It is also, therefore necessary to have a universe with more than 3-D.

In summary.

1) Current research is called M-Theory.

2) Before 1995 there were 5 'string theories'.

3) Actually, #2 is really 5 'windows' of M-Theory

4) "M" means MYSTERY, MOTHER, MATRIX, MEMBRANE --- MURKY?
- replace solid particles
- unite "gravity" & QM
- need more dimensions
- maybe "M" is the long-sought unified theory

See the next issue of ORBIT for the Part II.

"Wave Hello There!"

by: Klaas Dekens

My name is Klaas Dekens. I am a new member of the R.A.S.C. and would like to write a short article in order to find how much support and enthusiasm there would be for a relatively modest Radio Telescope at the Leslie V. Powys Observatory.

Rather than an extensive article full of debatable points of contention, I would like to suggest the arrangement of an informal discussion group of interested members to explore various issues. Let's talk about the budget, time needed to build the project, and nature of equipment that is needed to interpret the signals and data from the telescope - so all could understand. The pros and cons should be addressed with solid answers before proceeding with any action. Negatives such as financial constraints, reaching of agreements as to the type of equipment to be used, telescope location, neighbour complaints and the practicality of our location in terms of signal reception have to be weighed up against such positive factors such as possible 24 hours, seven days use including cloudy days, and maybe data transfer to an internet server, or accessing the telescope with a computer in a telescope user group.

In any case, these ideas are far away if they ever will be realized. But doesn't the notion of accessing "our" radio telescope on a cold rainy day or perhaps on a snap cold winter night, viewing images on a telescope with the CCD camera our club has, operating on an internet server as discussed before, appeal?

Hopefully this can work. I do not have all the answers but that's why an informal discussion would be a good place to start.

Thank you for your time.

Coming Events:

December 7, 2000 - General Meeting at the Steam Museum. The guest speaker will be Peter Ceravolo.

December 14, 2000 - Board Meeting at the observatory. Come on out and help shape the future of the centre.

January 4, 2001 - General Meeting at the Steam Museum. Program TBA.

January 11, 2000 - Board Meeting at the observatory. Come on out and help shape the future of the centre.

February 1, 2001 - General Meeting at the Steam Museum. Program TBA.

February 8, 2000 - Board Meeting at the observatory. Come on out and help shape the future of the centre.

Directions to observatory

From Hamilton or Guelph:

- Hwy 6 N of Hamilton,
- Take Concession 7 East eastbound, cross Centre Rd.
- Continue on 7E, past the rail tracks, proceed to near the end.
- Our gate is on the south side on the last lot (south west).

From Mississauga or Milton:

- Britannia Road past Hwy 25, Guelph Line, Cedar Springs to end
- South 1 block on Milborough Town Line to Concession 7 East.
- Right on 7th Concession, then first driveway on left.
- Our gate is on the south side on the last lot (south west)

From Burlington or Oakville:

- Dundas Street (HWY #5) to Cedar Springs Road
- Cedar Springs Road to Britannia Road
- Left (west on Britannia road to Milborough Town Line
- South 1 block on Milborough Town Line to Concession 7 East.
- Right on 7th Concession, then first driveway on left.
- Our gate is on the south side on the last lot (south west)

Hamilton Centre Observatory
43° 23, 26" N 79° 55, 22" W
Telephone 689-0266

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Orbit
Hamilton Centre RASC
Box 1223
Waterdown, Ontario
L0R 2HO