



# Winnicentrics

The Journal of the Winnipeg Centre of the Royal Astronomical Society of Canada

## Astronomy News from Around the World

by Roger Todd

A few weeks ago, a friend of mine in New Zealand alerted me to the imminent declaration of the Lake Tekapo area on the South Island as a UNESCO-recognised "starlight reserve." Lake Tekapo claims to have one of the most spectacular night skies in the world. Canterbury University operates an astronomical observatory on top of Mt. St. John, overlooking Lake Tekapo. The discoveries achieved by this observatory are attributed to the clear skies and low levels of local light pollution. Since the building of the observatory, the local area has been subject to light restrictions. There has been an understanding between the residents of Lake Tekapo and the observatory that any exterior lights were to be shielded to prevent light shining vertically. Local developers complied thorough the installation of specialized street lighting on new sub-divisions. Recently, a 1.8 metre telescope has been installed at Mt. St. John, by the universities of Canterbury, Auckland and Victoria, New Zealand, in partnership with Nagoya University in Japan. This may be an example as how to do something locally with respect to "dark sky" areas of Manitoba.

<http://www.tekapotourism.co.nz/feature.htm>

There have been some excellent articles being shared on the rasc-wpg list. I thought I might list some of what I view as highlights.

One of my favourites was the essay by Dennis Overbye in the New York Times. The article dealt with the speculations by a couple of scientists, Holger Bech Nielsen of the Niels Bohr Institute in Copenhagen, and Masao Ninomiya of the Yukawa Institute for Theoretical Physics in Kyoto, Japan. Dr. Nielsen is one of the founders of "string theory," and is now taking an interest in "time travel." The essay quotes Einstein as saying that:

"For those of us who believe in physics...this separation between past, present and future is only an illusion."

*continued on page 10*

# MEETINGS

Robert B. Schultz Theatre. St. John's College,  
University of Manitoba Fort Garry Campus

## Friday January 8

- 7:00-7:30 Beginner's session: Topic TBA  
7:30-7:40 Welcome and Announcements: Peter Toth  
7:40 – 7:50 Constellation of the Month – Canis Major  
the Big Dog: Gail Wise  
7:50-8:00 Explore the Universe with Stan Runge  
8:00-8:10 What's up: Jay Anderson  
8:10-8:30 What's New: Jennifer West  
8:30-9:00 Refreshment Break  
9:00-9:10 Guest Speaker: TBA

## Friday February 12

- 7:00-7:30 Beginner's session: Topic TBA  
7:30-7:40 Welcome and Announcements: Peter Toth  
7:40 – 7:50 Constellation of the Month – Cancer the  
Crab: Gail Wise  
7:50-8:00 Explore the Universe with Lindsay Price  
8:00-8:10 What's up: Jay Anderson  
8:10-8:30 What's New: Jennifer West  
8:30-9:00 Refreshment Break  
9:00-9:50 Guest Speaker: TBA

## Welcome to our newest member!

Margaret Childs, Winnipeg

## The Winnipeg Centre Executive Council

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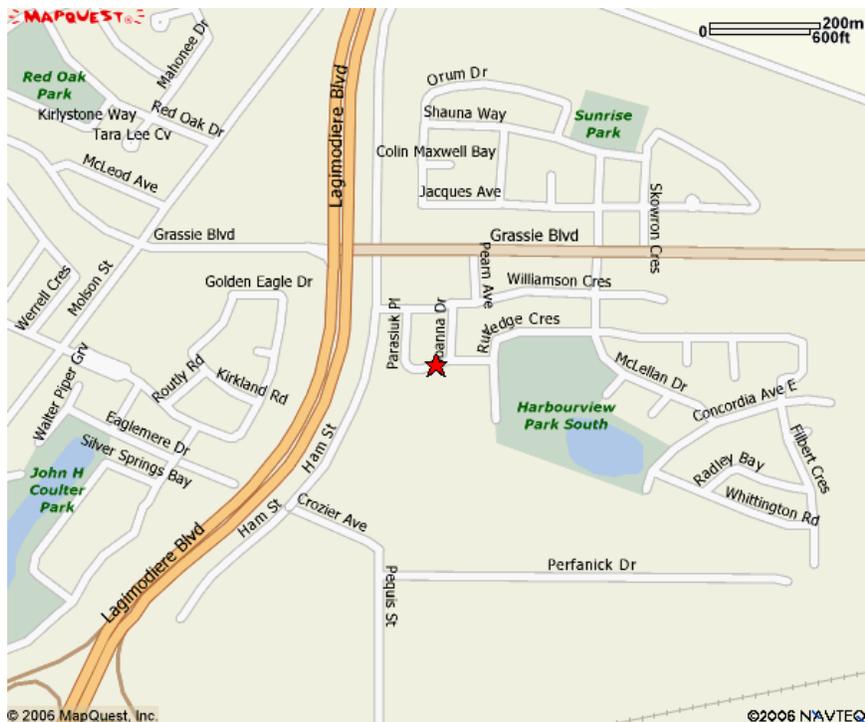
*Winnicentrics* is published six times each year by the Winnipeg Centre, RASC. *Winnicentrics* is produced by and for the members of the Winnipeg Centre, and any opinions expressed are those of the author. If you have comments, questions or concerns about *Winnicentrics*, you can contact any of the councilors or write to RASC, Winnipeg Centre, Box 2694 Winnipeg MB R3C 4B3

Winnipeg RASC members are invited to a winter Potluck at 55 Parasiuk Place, Winnipeg (Terra Jentsch's place) on Saturday, January 30, 2010 at 7 pm. It is a bungalow with a tyndalstone front and forest green roof & trim. The large driveway can hold 12 vehicles and there is more parking on the street in front. See map for directions or phone 669-8003 for more details. Please bring a food dish, your favourite beverage and your spouse/special friend. Also bring a towel and bathing suit if you want to take a dip in our hot tub. Besides good food and good fellowship, there is a foozeball game and a pool table. Supper will start around 8 pm. Hope you can all come!

*Lucille Eustache & Terra Jentsch*

*Home phone # 669-8003*

[lucille.eustache@ic.gc.ca](mailto:lucille.eustache@ic.gc.ca)



# Astro Book Drive

In association with Astronomers Without Borders, the Sri Lanka Astronomical Association is conducting a global Astro Book Drive. There are many small astronomy clubs in developing countries that popularize astronomy among students and the public. Even though the enthusiasm of these groups is overwhelming, they are always very limited in the scope of their activities due to a lack of resources when conducting programs and gaining astronomy knowledge.

To help overcome this barrier, Astro Book Drive hopes to get excess books and reading material from the developed world to those who are in the greatest need. The task of improving the astronomy and science education in developing countries is an important gateway to improving global peace and security, so we invite everyone to join the effort and make a difference. You can get more info at <http://astrodrive.lakdiva.net/>

I have undertaken to promote this project in Canada and for a first activity am asking RASC Winnipeg Centre members to support an astronomy club in Jamaica. Errol Rickman is the President of Astronomical Association of Jamaica (AAJ) and also the National Coordinator for AWB – Jamaica. Even though their association is 60 years old, lack of resources has been a problem for them. To build on the momentum provided by IYA2009, they have set up a program to establish astronomy clubs in schools. School children are the best ones to reach when you want to educate young people and inspire them to a possible future career in science. They require materials to share with these school astronomy clubs.

So, I am making an appeal to all RASC Winnipeg members to bring the following to the JANUARY meeting:

1. Back issues of astronomy magazines (Astronomy / Sky And Tel) of RECENT VINTAGE (1950s vintage would be interesting but not all that educational).
2. Relatively recent astronomy general text books at the high school level or even introductory university texts.
3. Planispheres red flashlights, etc. - anything that seems a good thing to provide them for their programs.

HERE'S THE IMPORTANT PART SO READ CLOSELY - it costs approximately \$75 to ship 10kg surface mail to Jamaica. To cover this cost, anyone who donates a book or magazines to the Astro Book Drive NEEDS TO ALSO DONATE enough to cover the shipping costs as well. So if you can donate 1 kg of magazines, please donate \$7.50 to cover postage for same. I would be happy to accept donations that don't accompany books as well - if there are any excess donations I'll convert them to an international money order and send them along as a donation to the club with the books to help fund astronomy programs.

I will have my van at the January meeting to receive donations during the break and after the meeting - depending on the volume of contributions I might need some helpers to pack and ship as well. Please see me at the break and after the meeting to hand over donations. If you can't be at the meeting please get in touch and I'll arrange to pick up the items (or you can certainly drop them off to me.) Once the package(s) are received I'll share pictures and correspondence with the club to ensure the donations got to the right place.

With the holiday season, it's a good time to think of those less fortunate than us, and give freely to support astronomical outreach and education activities around the world. What a great way to finish off IYA! Thanks for your anticipated generosity!

***Gord Tulloch***

# SUN SPOTS

*by Guy Westcott*

The sun is always a tempting target. Especially when it's out all day and we have clear days and cloudy nights. For the first time in a year and a half, there are three spots on the sun at the same time. With the sun in the pits of the deepest solar minimum in a century, such an outbreak is remarkable. Readers with safely-filtered solar telescopes should take a look. For the smaller telescopes you can make yourself a solar filter with a piece of mylar film fitted into a suitable lens cap for your telescope. For reflector telescopes with an open tube you can do projection solar viewing. This means that you are not looking directly at the sun but at a projected image from the telescope onto a screen beside the telescope. Viewers might want to access the web site <http://spaceweather.com/> to see roughly how many and where the sunspots are at the time of viewing. Another really good site for solar data and images is <http://thesuninmotion.com/>

So what's happening.....Between Dec.18th and Dec. 22nd, the magnetic fields around sunspot 1036 erupted, producing a C7-class solar flare. NASA's STEREO-A spacecraft was almost directly above the sunspot at the time of the blast and recorded an extreme ultraviolet flare. A shadowy wave was seen racing away from the blast site. This was a "solar tsunami" a massive swell of hot, magnetized plasma about 100,000 km high packing as much energy as a million megatons of TNT. The tsunami petered out before it went more than halfway around the sun, but another manifestation of the blast is still going. The eruption hurled a faint coronal mass ejection (CME) into space and the billion-ton cloud should cross Earth's orbit on or about Dec. 25th. A glancing blow to Earth's magnetic field could spark polar auroras for Christmas. Thanks to [spaceweather.com](http://spaceweather.com) for this info. Next issue well look at the types of flares and CMEs.



# COLD SHOWERS

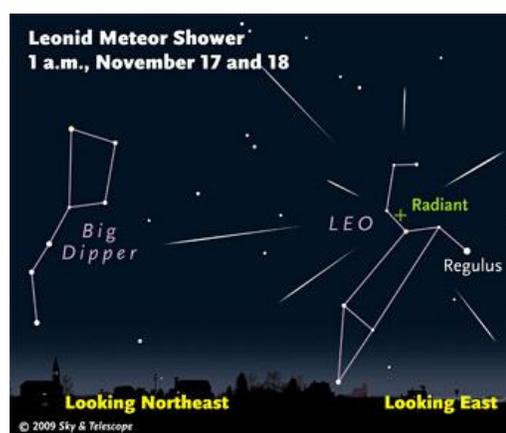
by Stan Runge

What could be easier than Meteor watching?

You just lie back in a reclining lawn chair in a dark location, where you have nothing in your field of view but clear sky, and watch. When done with others present, it provides a wonderful opportunity for good conversation and story telling. So why is it then that three of the best meteor showers (Leonids, Geminids and Quadrantids) all have to occur during the bitter cold of winter weather? This article is about my viewing of two of those showers, which by rare chance were both coincident with being very close to new moon and our having clear skies.

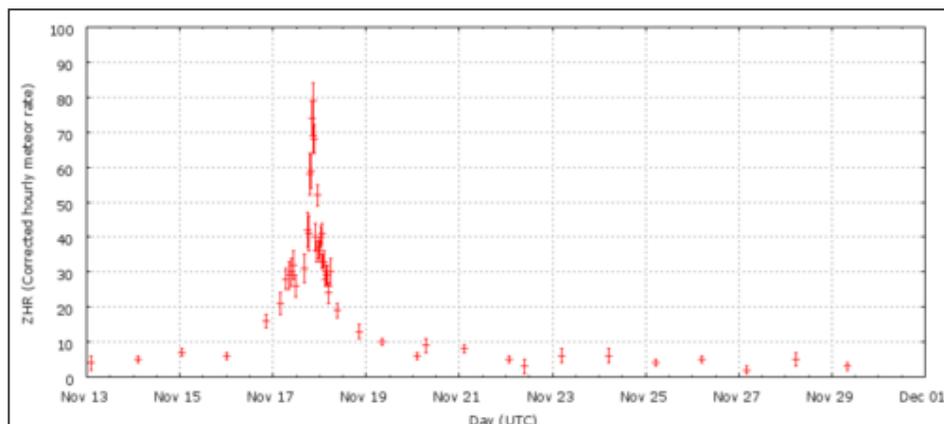
## Leonids

Now, ever since the fantastic success I had viewing the 2001 Leonid meteor storm, I have kept a close watch on the predictions for the activity of this highly variable shower. The shower normally produces a peak of 15 meteors (Observer's Handbook) travel at an amazing 71 km per seconds. The radiant is located within the head of the Leo constellation.



This year, the independent theoretical work to evaluate the debris from previous passages of the Leonids' parent comet, 55P/Tempel-Tuttle by David Asher, Esko Lyytinen & Marku Nissinen, Mikhail Maslov, and Jérémie Vaubaillon suggested that it might produce another enhanced return. Trails laid down by the comet in 1466 and 1533 are expected to be the chief contributors to whatever happens, with peaks on November 17. They predicted a number of peaks of exceeding 100+ZHRs, with the best for the Asian continent with predictions of over 500! But there were also two possible North American peaks with one of about 200 peaking at 01:26 a.m. CST, and another of 30 at 03:00 a.m. Both Jay and I had mentioned this

possibility at our presentations at the November meeting. In addition, this shower occurs simultaneously with another less-known meteor shower is going on — the Taurids. They are sparse and tend to be slow but very bright.



This Leonid shower tends to have a very narrow peak as shown in this chart of the shower from last year's observations.

So with two possible peaks occurring early on Tuesday morning, and clear skies predicted in a moon free sky, I happily proceeded to Glenlea Observatory on Monday night. Now, the Leonids are generally only visible after local midnight from any longitude, with the exception of some long Earth-grazing Leonids before midnight when the radiant is still very low. After all, the constellation doesn't

rise above the horizon till after 11:30 p.m. Plus, it is normally better to see more meteors after midnight as the Earth turns into stream - if you want an explanation of why, go ask Gerry.

I planned to get to Glenlea about 11:00 to set up. When I arrived, there were already about a dozen members present already enjoying the evening. Just before I left the car, I heard a loud “coyote howl”. It was the group’s way of letting everyone know they saw a good one. As I made my way to the pad I could see people lying on the grass around the pad in sleeping bags. Myself, I like to use a folding cot, with a sleeping bag beneath, and a second open one, which I squeeze into. We were in the middle of a November which was setting a record for being the warmest on record. So the temperatures were unseasonably warm, with no snow, but the wind was quite strong from the south. I knew I’d be there for a while so I used one of the observing pad tables, and laid it on its side as a wind block. Others were just downwind from me, sharing the lee side of the wind breaking wall. Plus I thought I’d try something new. I brought along an 80 watt car battery blanket, which I plugged into new the new power post beside the pad. It was located inside my sleeping bag beneath me to help keep me warm. It was something I’d want to use if I try to watch the Geminids (ZHR 120) in December. Another warming benefit was Peter had hot toddy, and cinnamon sticks.

The battery blanket worked well; in fact it was too warm for that night. At one point I lent it to Gail, who was cold inside her sleeping bag. After a while, she said that the unit had warmed her up comfortably.

As it approached Midnight, many slowly began to leave the site, as work awaited them the next day. I had scheduled the morning off as a vacation – something I am fortunate enough to do. I wondered if they would regret having to leave so early.

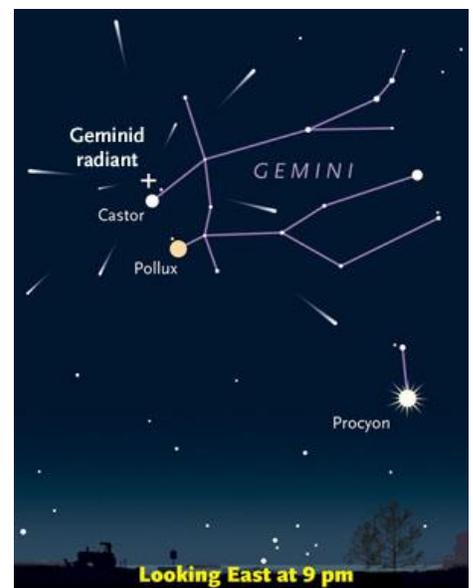
Well the answer was no. I was there for just under 4 hours, and I only saw 25 meteors total over that whole time span. I saw only 5 very bright Leonid meteors, and another 4 faint ones, no where near any sort of peak. Of the bright ones, three left “smoke” trails which I estimated at 5, 2.5 and 2 seconds in length. I also saw some bright Taurids as well, a shower where the meteors travel seemingly perpendicular to the Leonids, so easy to determine. Truly there was no indication of these predicted shower peaks, and reports off the Internet seemed to agree with our observations, so nothing special occurred.

The sky had some high cirrus clouds drifting over in occasional waves during the evening. Ultimately, these clouds would thicken and cover over the skies before 3:00 a.m. as the remaining five of us decided to pack it in and leave.

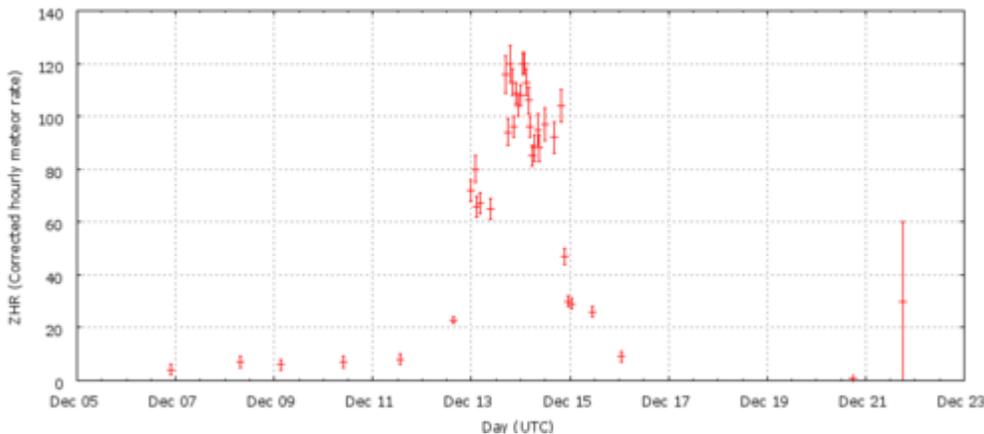
I now wondered how things might be for the Geminid meteor shower in a month’s time.

## Geminids

The Geminid meteor shower is considered one of the finest annual meteor showers because of it’s high predicted rate of 120 ZHR, and it being one of the most reliable. The meteors are slower (35 km per second), but usually bright and colourful as they radiate from a point at the north end near Castor. The constellation is also well placed high in the sky. Unfortunately, it is lesser known because it occurs during a colder time of the year, and the weather tends to be cloudier in December. Fortunately, these year the shower coincided with a near new moon and again clear skies.



Plus, the Geminid shower has a broader peak to the shower, meaning it has a higher probability of more meteors being seen, as shown in this chart of the 2008 reports.



Another interesting fact is that the parent object isn't a comet, but rather, it's thought to be an asteroid, about 5 km across named Phaethon. Scientists are not sure how an asteroid can produce meteors but believe that Phaethon is the core of an older comet, which has been baked completely dry. Something might have collided with it a long time ago, but the one thing known is that it has a trail of debris in its orbit.

So this time with the constellation higher and a peak predicted to be about 11:00 p.m. CST, I arrived at Glenlea about 8:30 p.m. With the temperature near minus 25 and a strong breeze, this event was not well attended.

Jennifer and her friend, Jay and I were the only four who showed up at Glenlea. The other three came prepared to take pictures, and despite the extreme cold, had their cameras clicking away for hours.

I again setup with my cot, two sleeping bags and an observing pad table on its side to block the wind, and my car battery blanket tucked into my sleeping bag beneath me. It was a saviour until the incident. I lay in this position, with my sleeping bag pulled up to my chin, staring at the sky for about 3 hours solid. Occasionally I would pull my hand out of my glove, to warm up my exposed nose. Yes it was quite a challenge to be there.

But this shower was worth it. I kept an ongoing hourly count, so no "abouts" in the numbers I recorded.

From 8:45 till 9:45 - I saw 23, ~ same number as in 4 hours of the Leonids.

From 9:45 till 10:45 I caught another 29.

From 10:45 till 11:45 I caught another 48

Of these, the majority were actually Geminids, but 1 in 6 were from other showers. I saw quite a few radiating from a spot I believed to be just south of Orion, and wondered if there was another shower. I have since checked into this but cannot correlate it with any known shower.

There were short "lull" periods where there were no meteors and then flashes with 4 or 5 with in two minutes, so not steady but variable. Only one I would describe as a smoker - leaving an illuminating trail for a few seconds. Most were relatively bright but short in nature.

The absolute best meteor of the night was not a Geminid, but came out of the Orion area, and traveled east to west in the southern horizon, travelling about 60 degrees in 5 fully illuminating and fully enjoyable seconds.

Jay and Jennifer suggested they both saw about 30 less than I did – their camera fiddling and warm room activities being the difference. In the last hour, I did see 12 in a ten minute period when Jay went to change his boots.

So I was counting meteors out loud. When I was in the high 80's, it was already so cold, I appreciated each one. Finally, at the conclusion of the third hour, I hit 100 and thought this would be a good time to quit, and go home. The rest were also apparently waiting for this milestone, because as soon as I hit 100, they all started to pack everything up to head home. But I saw number 101 while walking to my car.

Overall a really good shower!

The incident I mentioned before, was the only interruption of my viewing for the night. At one point, I felt that the car battery blanket seemed particularly warm. So I decided to get up from my heated cocoon to see what was the matter. Apparently, things had gotten too warm from my laying on it, and the plastic of the blanket had melted onto my sleeping bag. The other side had warmed to the point where it left a permanent copy of the printed instructions onto the back of my cotton winter coat. When I went to pull the blanket and sleeping bag apart, there were sparks. I immediately unplugged it. So I did the last hour without my blanket, but did borrow Jay's heating pad for a bit. Back to the drawing board for the heating pad idea.

When I arrived home it was -28. Now that was a really cold shower!



*Photo by Jennifer West*

One of the finest, and probably the most reliable, of the major annual showers presently observable, whose peak this year is virtually coincident with new Moon. The Geminid radiant culminates around 2h local time, but well north of the equator it rises about sunset, and is at a usable elevation from the local evening hours onwards, while in the southern hemisphere, the radiant appears only around local midnight or so. Even from more southerly sites, this is a splendid shower of often bright, medium-speed meteors, a rewarding sight for all watchers, whatever method they employ. The peak has shown slight signs of variability in its rates and timing in recent years, with the more reliably-observed maxima during the past two decades all having occurred within 2h20m of the time given above. The main predicted timing favours places from all across the Americas eastwards to western Europe and western Africa. An earlier or later timing would

extend this best-visible zone some way eastwards or westwards respectively. Some mass-sorting within the stream means the fainter telescopic meteors should be most abundant almost 1° of solar longitude (about one day) ahead of the visual maximum, with telescopic results indicating such meteors radiate from an elongated region, perhaps with three sub-centres. Further results on this topic would be useful.

Of the more active annual showers, the Quadrantids, Lyrids,  $\eta$ - and Southern  $\delta$ -Aquariids, Orionids, Leonids and Geminids are best placed with regards the Moon, along with the occasionally stronger Ursids in December. Of greatest potential interest for what they may produce are the  $\eta$ -Aquariids and Orionids (which should be near their theoretical 12-year ZHR peaks in 2009, the Orionids having already produced unexpectedly strong activity in both 2006 and 2007, albeit apparently not from this cause), the moonlit Perseids, which may show an additional maximum again this year, and the Leonids, which could yield ZHRs in the 100+ category, maybe (if we are very fortunate) bordering on near-storm levels again!

| Shower            | Activity      | Max Date | ?      | ?    | ?    | $v_z$ | r   | ZHR |
|-------------------|---------------|----------|--------|------|------|-------|-----|-----|
| Quadrantids (QUA) | Jan 01-Jan 05 | Jan 03   | 283°16 | 230° | +49° | 41    | 2.1 | 120 |

## ***Astronomy News from Around the World***

*Continued from page 1*

The Large Hadron Collider built outside Geneva by CERN, the European Organization for Nuclear Research over the past 15 years at a cost of \$9-billion is designed to prove, or disprove, the existence and nature of the hypothesised Higgs boson, or "God Particle." According to the Standard Model, that rules almost all physics, this particle is responsible for providing mass to all other elementary particles. These physicists have suggested that the Higgs boson, which presumably would have existed during the first trillionth of a second of the Big Bang, might be "so abhorrent to nature that its creation would ripple backward through time and stop the collider before it could make one, like a time traveler who goes back in time to kill his grandfather."

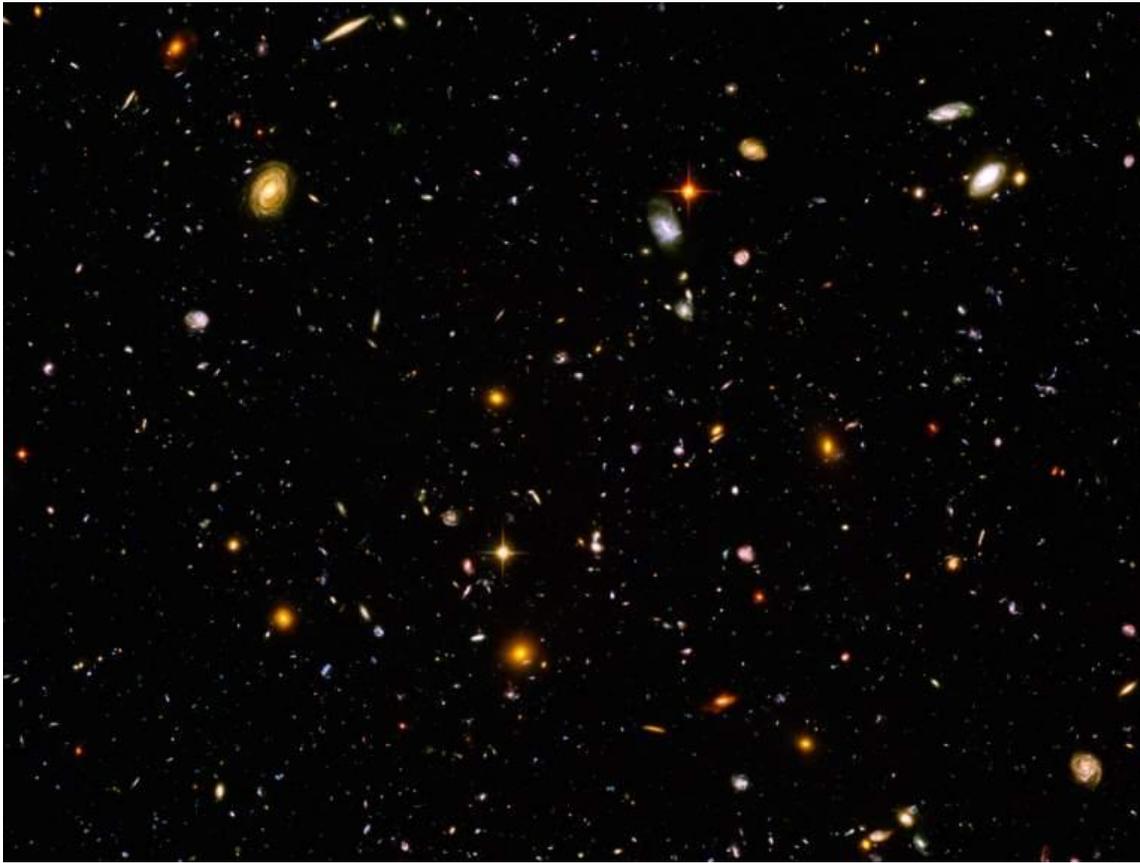
Dr. Nielsen has suggested that "all Higgs-producing machines shall have bad luck." The current Large Hadron Collider, when turned on, had to be shut down for more than a year, when a connection between two magnets vaporized. The U.S. Superconducting Supercollider, also designed to find the Higgs, was cancelled in 1993 after billions of dollars had been spent. It makes one wonder whether Nielsen might be on to something. Are we trying to violate some fundamental "universal laws"?

[http://www.nytimes.com/2009/10/13/science/space/13lhc.html?\\_r=1&scp=1&sq=The%20Collider,%20the%20Particle%20and%20a%20Theory%20about%20Fate&st=cse](http://www.nytimes.com/2009/10/13/science/space/13lhc.html?_r=1&scp=1&sq=The%20Collider,%20the%20Particle%20and%20a%20Theory%20about%20Fate&st=cse)

Recently, however, the Large Hadron Collider has been performing well, according to reports. As with the Hubble Telescope, which initially seemed to be jinxed, perhaps persistence will always lead us to find a way around difficulties.

[http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20091214/collider\\_collisions\\_091214/20091214?hub=SciTech](http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20091214/collider_collisions_091214/20091214?hub=SciTech)

Another of my favourite features in the press has been the pictures from and discussions concerning the Hubble Telescope. Particularly interesting have been the pictures taken over an extended period of groups of galaxies. Back in 2003, the Hubble Ultra Deep Field was created using an exposure nearly 12 days long over a four-month period. This image looks back through time at thousands of galaxies that are between 1 and 13 billion light-years away from earth. Approximately 10,000 galaxies are captured in an area one-tenth the size of the full moon. It really gives one an impression of the immensity of our universe.



[http://www.boston.com/bigpicture/2009/12/the\\_decade\\_in\\_news\\_photographs.html](http://www.boston.com/bigpicture/2009/12/the_decade_in_news_photographs.html)

Another article on the Globe and Mail website talks about an image released on December 8<sup>th</sup>, 2009, taken in near-infrared light by the Wide Field Camera 3 aboard the NASA/ESA Hubble Space Telescope. The reddest and faintest objects are likely the oldest galaxies thus far identified. These likely formed only 600 to 900 million years after the Big Bang, which is very early, by cosmological standards.

The same article refers to two "Universes" – the *Entire Universe* and the *Visible Universe*. The "Visible Universe" (the part of the Universe we now see) used to be grapefruit-sized. The "Entire Universe" at the time of the Big Bang, as well as now, could be infinite. Therefore, there is no "centre" to the Entire Universe. The only meaning of "centre" for us, is the Earth, at the centre of our Visible Universe.

The "Big Bang" refers to when, 13.7 billion years ago, the Entire Universe increased by  $10^{30}$  times (a million trillion trillion), in less than a second. The Visible Universe is defined by how far light has travelled since the Big Bang. The Entire Universe is continuously expanding, but not at a constant rate. Expansion is accelerating. The article cites a number of experiments that verify that this is happening.

An accelerating expansion implies the existence of a gravitationally repulsive form of energy. This unknown form of energy is termed "dark energy". We have little idea what dark energy is, although some cosmologists currently estimate that it comprises 74 percent of the Universe's mass-energy.

<http://www.theglobeandmail.com/news/technology/where-does-the-universe-end/article1399573/>

**to be continued in the next issue!**

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*Mr. Bud . . . does Astronomy* by Murray Toews

