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Winnicentrics

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Keep your eye on…

Jupiter and Saturn, high overhead, move closer and closer through early January.

Mars, in the morning, as it brightens rapidly in February

Venus, which is highest in the sky on Jan 17 but reaches its greatest brilliancy on Feb 22.

The largest full Moon of the year on Feb 8.

Deadline for the next issue is February 18, 2001

The Joy of Planetary Observing - A Beginner's Guide to Jupiter

By Mike Karakas

And what a joy it is. Imagine being able to do some serious observing from your own light polluted backyard instead of having to travel a couple of hours to a dark sky site. Well, believe it or not, this kind of observing does exist if planetary objects are your quarry.

Let's face it folks, for us urban dwellers, planetary observing is one of the few telescopic pursuits that can be enjoyed just as much from the city as in the country. Now that we're into January, all we have to do is brave the cold - but heck we Canadians are used to that right?

The two giant planets, Jupiter and Saturn, are in high in the night sky, each having reached opposition late last November. Venus is also shining brightly at magnitude -4.4 in the southwest at dusk, so there's no lack of targets to choose from.

Because I don't want to take all the available space in Winnicentrics, this article will be devoted to making general observations of Jupiter.

Observing Jupiter is always a treat and for good reason. Due to its ever changing cloud belts coupled with its fast rotation, observers will never see the same features twice. This fact alone makes Jupiter my favorite planet of study, but there's much more on the Jovian surface to explore.

The evidence of Jupiter's fast rotation is the first feature for us to observe. All amateur telescopes will show the planet's pronounced equatorial bulge. Jupiter makes one revolution in less than 10 hours. The resulting centrifugal force from such a rapid rotation makes its polar diameter about 9000 km/s. less than its equatorial diameter. This rotation is so fast that a feature in the center of Jupiter will be at the edge of the planet in about 2 ½ hours! Interestingly, Jupiter's rotation varies slightly from one region to another. These regions are identified as "Sections", with Section 1 being the Equatorial region and Section 2 being the rest of the planet. Section 1 rotates 5 minutes faster than the Section 2 in a time of 9 hrs 50 mins.

Next on our list to observe are the many belts and zones of Jupiter. Scopes 80mm and larger reveal the darkening of the polar regions and about three dark belts, with the two largest being the North and South Equatorial Belts (NEB and SEB respectively). The characteristics of these two belts will keep you studying the details for hours. Many different festoons, wisps, knots and ovals can be observed if the seeing conditions are favorable. To help bring out these subtle details, coloured filters are often used. These filters simply screw into the threaded barrel of an eyepiece. Yellow, green, blue and orange are popular choices to bring out the contrast in these features. As an added benefit, I have found that using a light yellow filter eliminates that annoying blue haze that achromatic refractors exhibit when looking at bright objects. Not bad, using a $30.00 filter can trick your eyes in believing your looking through an apo refractor - that's money well spent!
With an approx. size of 9000 miles x 16000 miles, the Great Red Spot (GRS) makes for another highlight and is probably the most famous Jovian feature. The

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WHO, WHERE, WHEN?

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January

January
12

Our first meeting of the millennium has something for everyone. Scott Young will give a presentation on observing lunar occultations, eclipses of a different kind.

Dr. Richard Bochonko will speak on "The Telescopes of Mauna Kea"

Jay Anderson will keep us briefed on "What's New" in astronomy and space science.

Gail Wise will present her regular "Constellation of the Month" — Monoceros the Unicorn.

Robin Woods will bring us some archaeoastronomy of the Pyramids.

We may also have a guest speaker, still to be confirmed.

The meeting starts at 7:00 PM with a 30 minute "Beginner's Session"

February

February
9

Guest speaker Gerald Stelmack will lead us through the world of astronomy with a video camera. This exciting field has produced some amazing images of the moon and planets, and even earth satellites and the space shuttle! Gerald's work with a 5" Newtonian and Sony Digital -8 HandyCam has worked well for imaging the moon and planets, all without a clock drive!

Gail returns with a story about a dog! (don't tell her cats…). This time its Canis Major, "the big dog".

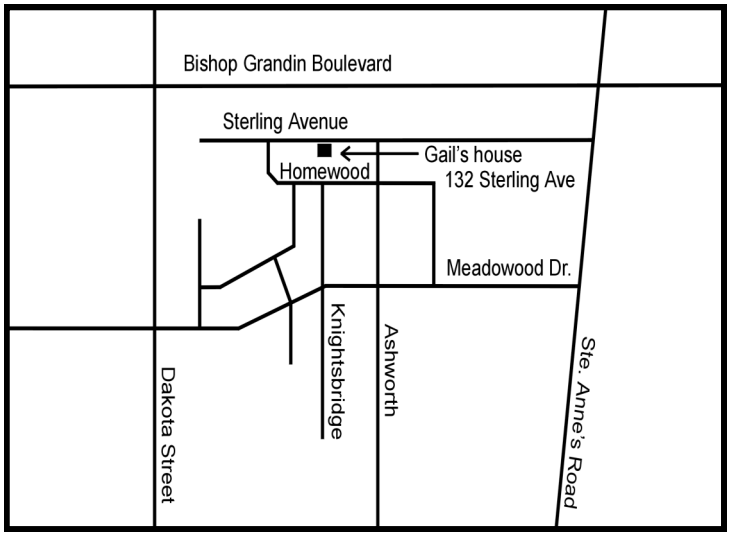
Jay will return with another "What's New?" to cover developments between the two meetings.

The Beginner's Session starts at 7:00 PM, a half-hour before the regular meeting.

How to get to a meeting…

The meetings of the Centre are normally held in Room 118 of St. John's College at the University of Manitoba every second Friday of the month.. Meetings start with the Beginner's Session at 7:00 PM and move on to the regular session at 7:30.

We normally take a short break between 8:30 and 9:00 PM and finish the meetings at 10 to 10:30. After the meeting, members typically convene at Boston Pizza on Pembina Highway to continue astronomical



January 13, 7:00 PM

Don't forget the "Christmas Party"…

Bring along your spouse or significant other, beverage of your choice and some food for sharing as we celebrate at our annual Holiday potluck. Gail wants to break her record of 35 people in her house at once, so mark it down on your calendar! A little catnip for the cats will go down well too.

The date is January 13. Don't be surprised—we typically have the "Christmas" get-together in the first month of the year. Gail lives at 132 Sterling Avenue, just south of Bishop Grandin Blvd (check out the map). Best approach from the north is by way of St. Anne's Road. The celebration is a potluck, so be prepared to bring along something for consumption. Start time is 7:00 PM.

Christmas Morning Treat—A Partial Solar Eclipse

Huguette and I were in Montréal, Canada, for Christmas, visiting my mother and friends. As luck would have it, the northeast was one of the best locations to view the partial eclipse of the sun (weather permitting). Here in Montréal, 61% of the sun's diameter would be covered by the moon at maximum eclipse at about 12h45 EST.

Because I would be quite busy on this trip, I did not bring any photographic equipment (I even forgot to bring any viewing filters). So, I would just try to view the eclipse.

Christmas Morning

At about 12h15, Huguette and I are having a Christmas lunch with my mother in the comfort of the main dining room of mother's nursing home. Only a few of the more than 100 diners are aware of the eclipse already approaching its maximum. I can't stand it! I put on a sweater, excuse myself, and slip away to get a glimpse of the eclipse. I exit the building and . . . YOW! Going from 80 °F to –18 °F is a shocker, especially dressed with only a sweater and summer pants. And, you don't want to know the wind chill factor! So, this will be a short glimpse, indeed. There is a moderate cloud in front of the sun—allowing me a short, naked-eye look. Yes indeedy-do, the moon has taken a big bite out of the sun. Now I wish to project the image of the sun but what do I use? Ah yes, my belt. I remove my belt and observe 5 perfect crescent suns projected on my dropping pants. Oops! I don't want a repeat of the near mooning I did during the Turkey eclipse. Besides, I'm freezing to death! I quickly go back inside to rejoin my lunch party. I would do this twice more over the next 30 minutes. Meanwhile, I must tell you what was going on at Huguette's cousin's house, our home base in Montréal. . . .

I had discussed the eclipse with Dr. Olivier (one the best brain surgeons in the world) and his wife, Nicole. They are true eclipse novices, never having seen even a partial solar eclipse. I had warned them not to look at the sun directly but to use a pair of binoculars to project the image. With the sun shining on their back yard, they could simply view

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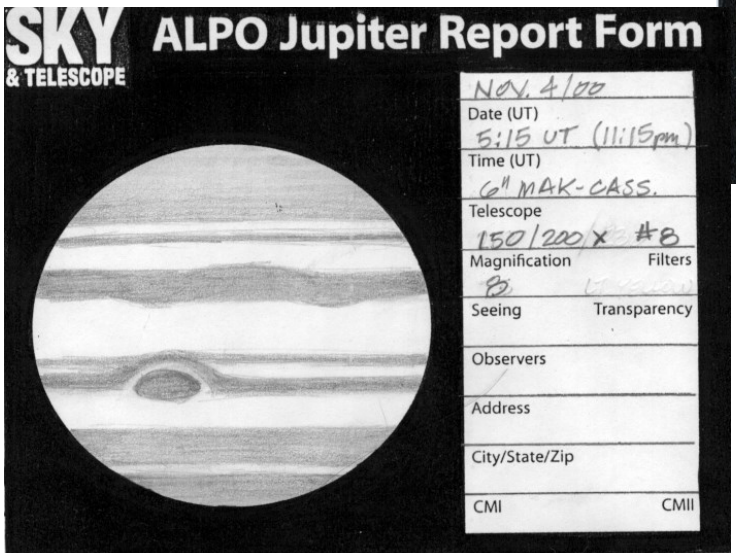
GRS is located in the SEB and its colour and brightness seems to be inversely related to the brightness of the SEB. In other words, the lighter the GRS, the darker the SEB and reversely so. Through my scopes, the GRS appears to be a pinkish, flesh like colour, fairly well defined against the darker SEB.

Last on the list are the Galilean satellites. Only these four moons are visible in amateur telescopes, which can also be seen with binoculars. Ganymede and Callisto are actually the first and third largest moons in our solar system, with Saturn's moon Titan coming in second. Through an amateur telescope under moderate to high power, the size difference of these moons can be noticed from each other. On rarer occasions, a moon's shadow can transit across Jupiter's surface. This shadow will appear as a ink black spot that will be in contrast to the brightly coloured zones on the planet. To plan ahead for the next shadow transit, the RASC Observer's Handbook has a listing which identifies each transit occurrence throughout the year.

Okay, now that you've had a chance to observe Jupiter, I want to encourage you to sketch it. Now don't panic - sketching the planets requires no artistic talent.

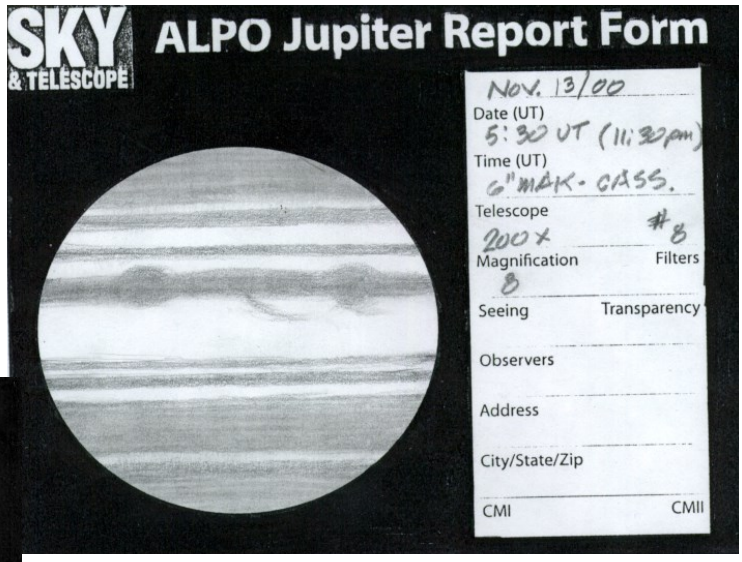


I have come to realize that sketching greatly improves one's own observing skills, and in time your eyes will become more adapt in making out subtle details. In addition, your sketches will graphically illustrate your own progress in the development of these observational skills. The Association of Lunar and Planetary Observers (ALPO) has pre-made templates that match the size and shape of Jupiter which can be printed from their website. With these templates in hand, a pencil and a red flashlight mounted on a clipboard is all you need to start.

The sketches show the level of detail that you can expect to see through a typical amateur telescope. I made these last October observing with my 150 mm Maksutov and using pre-printed templates from a past issue of Sky and Telescope.

The purpose of this article is to encourage all observers, regardless of their skill or what type of telescopes they have to turn them to the planets and enjoy observing them.

During the last few years, I have had the opportunity to look at planets with several different scopes, and I have had some satisfying observing sessions with very modest instruments. For example, during an evening with good seeing conditions, I saw the Great Red Spot and witnessed a moon's shadow transit across Jupiter with just



a 60 mm achromatic refractor. These features were not very bright or pronounced, but it just goes to show that there's something for everyone no matter what instrument they possess.

Fortunately, our club has a total of 5 loaner scopes which are available to all members free of charge, so there's no excuse not to take advantage of the favorable planetary viewing conditions. So keep warm and enjoy!

Didja see it? The Christmas Day eclipse?

It was visible for a short while over the city, about 11-11:30 AM, dimly at first and then more clearly as the clouds thinned. No filters were needed, and the unexpected appearance of the crescent Sun made the apparition even more intriguing than usual. One could imagine the impact that such a view might have to Babylonians or Sumerians in days gone by. Or maybe it wouldn't—they had a pretty spiffy astronomical ability in those days.

Astronomy on the Run

Stan Runge

Every one has heard Jay, myself and others expound the virtues of traveling to a Total Solar Eclipse. Booking flights to far destinations just to spend a scant few minutes beneath the moon's shadow.

You have also heard about Kevin, Ray and Jay on one of their jaunts down south in the spring. Driving thirty to forty hours for clear dark skies to view some of the more southerly treasures.

But how far would you travel to go see a meteor shower?

At the November meeting, Scott gave an excellent talk about the possibilities of a storm for this year's Leonids. Two peaks were identified, one for early Friday morning, the other early Saturday morning. Unfortunately, the waxing crescent moon would interfere. Regardless, some people were planning to try to view them. Question is, where would it be best to see them?

One problem with the Leonid shower is that it falls within the cloudiest month of the year for Winnipeg. For the last three years, we have been plagued with trying to make a decision of where to go to find clear skies. Very fortunately, we have Jay and the Winnipeg Centre RASClist. A few days before the event, he did some detailed analysis of the forecast weather conditions and posted it to the email list.

Having a fellow astronomer, who works for Environment Canada, in our club, is a huge benefit. Jay knows exactly what we are looking for - absolutely clear skies. No thin cirrus allowed if at all possible. We need to know where it will be clear when we start, and when we finish.

Having access to receiving email is also a benefit, as you get details on a fairly up to date basis. (If you have an email account, and you want to join the Winnipeg RASC list, let me know.)

On the Wednesday, a few days before the predicted peaks, the weather forecast was posted in detail. Both nights were possible, but there might be travel involved. Maybe to Brandon or Dauphin, or maybe even further west. More accurate details to follow with the arrival of updated satellite images.

So how far would you travel to set up a lawn chair in below zero temperatures to stare at the sky, hoping that the meteor shower predictions were correct? A hundred kilometers? Two hundred? Five hundred?

Well as fate would have it, the prospects diminished. An update for Friday morning indicated that the prospects were poor, and we would have to drive a significant distance to chase holes in the clouds. That fact, combined with "having a job", basically ruled that morning out for me. Maybe Saturday morning, with the higher shower prospect would be a better plan.

But Saturday morning's opportunity didn't prove encouraging either. A large band of low level clouds was filling in the gaps between the high level clouds. There didn't seem to be any significant holes. The opportunity to see this event under clear skies seemed to have escaped us again.

I called Jay late Friday afternoon and then again after work. He indicated that it did not look good. Jay was heading out for the evening and promised to get back to me before midnight. But if we had to travel a couple of hours to find a hole, with the peak at 2:00 am, we would need to know ASAP.

At 11:00 p.m. I let my cat back into the house. A quick glance at the sky showed nothing but cloud. I was resigned that this would not be a successful year. I decided to relax on the couch, and catch up on the latest drama on the US election.

At 11:45 came a call. It was Jay, and he was excited. Preparing for bed he had taken that "last chance look" out of the window. The moon, the planets, they were visible. I was told a hole had opened up and he was coming by shortly to pick me up. Site of choice - Glenlea. Wow, a spot nearby. Now I was excited.

About 30 minutes later he had showed up with Judy at his side. She too was prepared for sleep, but wanted to see the shower. This reminded me of the 1986 Lunar Eclipse when we drove through heavy rain, all the way to Dauphin, to catch clear skies. I claim that she is a good luck charm to us finding clear skies.

Once at Glenlea, Jay was proven correct. A hole had opened. We could see the western edge approaching, but we had an opportunity to observe. Less that a minute after we setup our lawn chairs a bright visitor left a smoking trail through Orion. Wow! It was bright and beautiful. Seeing one of those on any night would excite any astronomer. Seeing that near a shower peak was even better. It was 12:44, almost an hour before the peak.

We began tracking the number of meteors in 10 minute segments, so we could confirm if there was a peak. Judy's exceptional eyes helped her detect numerous faint ones, despite the moon's menacing glow just to the east.

Unfortunately, we only managed two 10 minute periods before the clouds had closed our observing window. But the shower was proving it's worth and it was still about 45 minutes to the peak. Jay had a plan which was quickly accepted. We would pack up, drive south and then east - back to the leading edge of the hole that just passed over.

Away we went, first south to St. Agathe then east towards Steinbach. With speeds exceeding the posted limits, we raced to find a new spot. Humorously, we found a spot by the Kleefeld Municipality Treatment site. It took us only a few minutes to setup again. Tucked between a pair of sleeping bags, we regained contact with the Leonids.

We observed for three more 10 minute sessions. We struggled with thin clouds for the last five minutes of the third one, losing ability to see any faint ones. But it was apparent that this clear patch was breaking down. Another run would not prove beneficial. So with 50 minutes of observing time under

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our belts, we concluded our early morning's observations.

The final tally proved to be impressive. Eagle-eyed Judy had 47, I had 42. Jay who admits his vision isn't that great still had 18 - a very fair number for any shower. Considering the clouds, the moon, and the fact that we were only looking at a fraction of the sky, almost one per minute translates to a ZHR of well over 250 per hour - impressive. Also impressive was the fact that about 40 percent of them would have been considered as bright ones. Half of those left nice lasting trails, visible up to 4 seconds later. And on a few of them, there was a distinctive green tinge to the speedy traveller's trail.

Having pulled this one off at the last minute was even more satisfying. But most of all was my opportunity to once again chase clear skies with two of my favorite observing buddies.

We all felt disappointed that we could not contact everyone about this last minute opportunity. But November skies will do that to you.

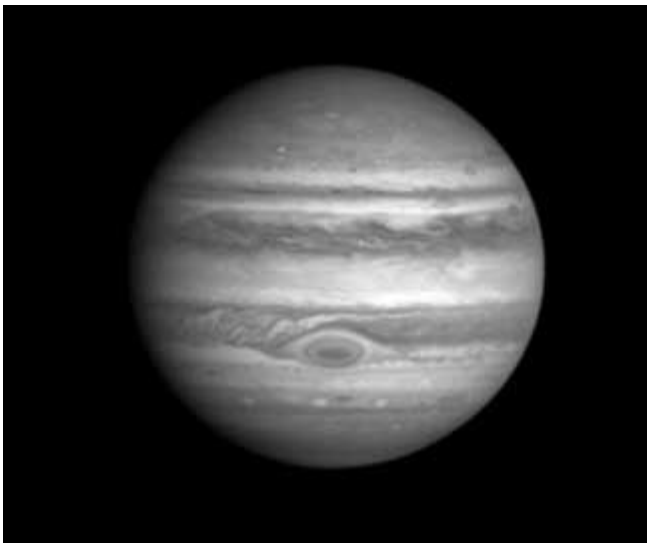
Thanks for the ride Jay. So you say next year's storm will be over China? Hummmm...

Goodbye Andora

December 30 was a day to say thanks and goodbye to Andora, off to Calgary to continue her education.

Andora has been *de facto* President of the Centre for two years, making the meetings work, arranging speakers, chairing meetings, and playing a major role in the successful organization of the GA. The thank-you took place at Boston Pizza, our traditional haunt for post-meeting carousing. It was a good party, lingering for over 3 hours, with all of the usual discussion of astronomy, careers, travel and dealing with winter (with a first-hand description of what a chinook can do). She'll be back on occasion, but now we'll have to do all of the work ourselves.

Thanks Andora!



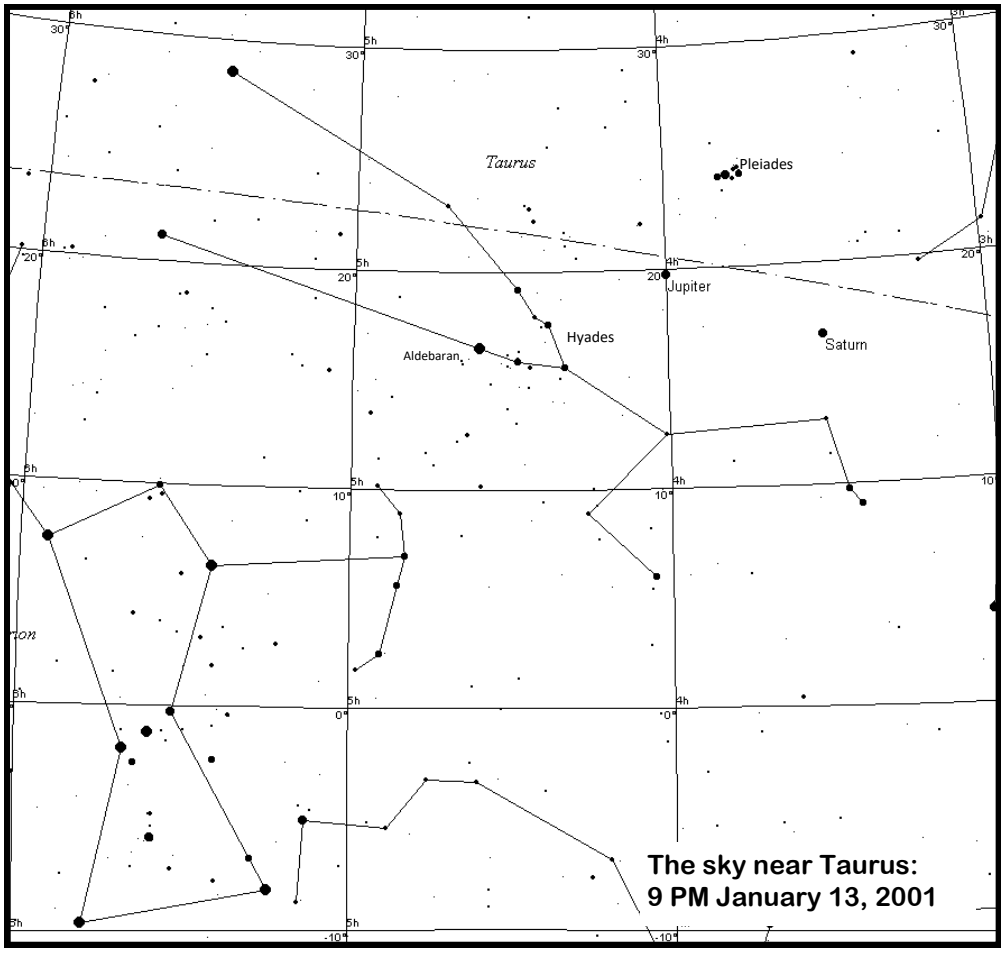
Cassini Passes Another Planetary Milestone

As the year closes, the Cassini spacecraft passed Jupiter, gaining a boost of 5.5 km/s to help it on its way to Saturn. This is Cassini's fourth planetary flyby. After launch in October 1997 it made two flypasts of Venus and one of Earth in order to gain extra energy to send it on its way to the ringed planet. The three gravity assists were equivalent of 75 tons of additional fuel.

The Jupiter boost wasn't a close pass—the required velocity change was a relatively minor one (the total velocity change from all of the planetary flybys was 21.44 km/s). The three planets were slowed by a corresponding amount according to the relative mass of the planets versus the satellite. Cassini will begin scientific observations of Saturn on January 1, 2004 and orbital insertion around Saturn will take place six months later.

The Cassini spacecraft is operating normally again after a small problem with excessive friction in one of the reaction wheels that controls its attitude and pointing. The problem fixed itself without intervention from Earth and may have been due to a small piece of debris that got caught in the bearing (and was subsequently ground up), or a loss of lubrication which was restored during testing of the problem.

A more serious problem has been identified with the Huygens probe, which will detach from Cassini and enter the atmosphere of Saturn's largest moon Titan. The probe will radio its measurements and images back to Cassini for later re-transmission to Earth, but the receiver on the spacecraft has been built with too small a frequency band to follow the probe. As the probe descends and the spacecraft continues on its orbit, there will be a Doppler frequency shift between the two which will stretch the radio signal outside of the designed reception frequencies. The European Space Agency is conducting an investigation into the reasons for the



The sky near Taurus:
9 PM January 13, 2001

The Planets this Month

After too long without, the evening skies are once again blessed with a marvelous display of planets. At evening twilight, Venus is brilliant in the southwest, climbing higher and shining more brightly every day. Glowing Jupiter (magnitude –2.7) and a more subdued Saturn (magnitude 2.0) are rising in the east, accompanied by the Pleiades and the Hyades clusters and the noticeable asterism of the "V" of Taurus. Saturn and Aldebaran straddle Jupiter. Even in city skies the collection of stars and planets is a beautiful sight.

Mars is also on the rise, though only for early-risers for the next few months. This planet is promising a very close approach to the Earth and a wealth of detail as the summer approaches, but for the present we'll have to be content with a gradual increase in bright-

News from other Centres…

Montreal: The Centre's offer to host the 2002 General Assembly was accepted. The event will occur from May 18 to 20 at McGill University, the first time in 35 years that Montreal has hosted the GA.

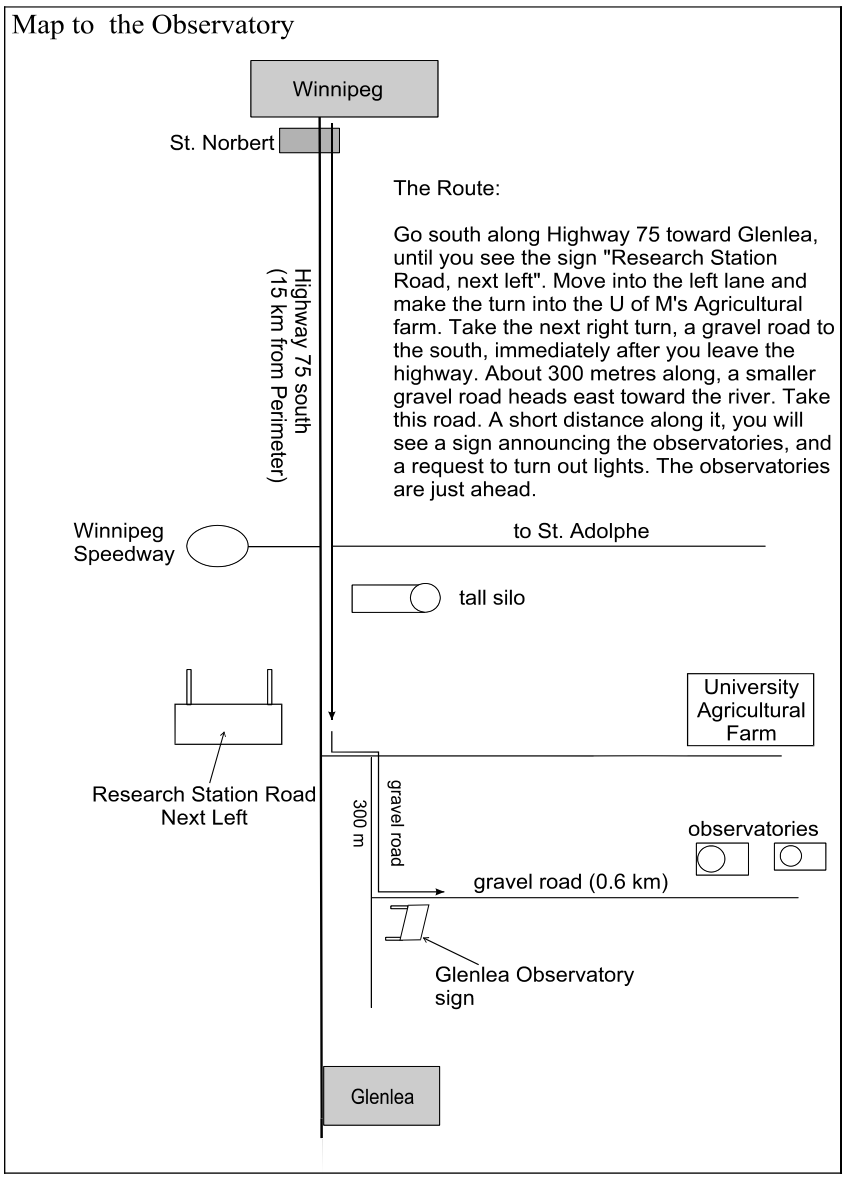
Calgary: The Centre has 13 telescopes to lend (for a small fee) ranging from 60 mm refractors up to an 8 inch Celestron. The club has an observatory at Wilson Coulee where they keep a 14" Schmidt Cassegrain (similar to the one we replaced with the 12" Meade).

Kingston: The club is now polishing a 24 inch mirror for a future Dobsonian. Preliminary work was done on a polishing machine but now the hard and painstaking work is about to begin. With the recent article in Sky and Telescope about distorting spherical mirrors into paraboloids, perhaps they should consider a shorter pathway to a finished product. I wonder how much force is necessary to pull a 24" into shape?

Toronto: The club is auctioning off a set of personalized license plates with the name "STARGAZR". As of late summer, the leading bid had reached $420. The Centre is also accepting donations of Canadian Tire money to help purchase a riding mower for their observatory site.

Edmonton: Harris Christian tells of his adventures in reaching the top of Mount Kobau for the Kobau 2000 star party. His trip back and forth to the summit netted five flat tires in total. He had to purchase three new tires in the end and replace a bent rim. His car's cassette deck failed too.

Windsor: Randy Groundwater has completed his 18" Dob — a truss tube design using a mirror figured by Galaxy Optics in Colorado. Construction took seven months but the results seem to more than justify the effort.



Finding the Observatory

The Winnipeg Centre maintains a working observatory and warm room at the University of Manitoba's Research Farm. The observatory contains a 12" Meade telescope on a fork mounting. Members of the Centre may sign out the use of this telescope provided they have first taken an instruction course on its use.

The Meade provides outstanding views of the night sky. Its large aperture collects more than 2500 times as much light as the human eye. It is capable of magnifying more than 700 times under favourable conditions. The telescope also has a solar filter for those wishing to carry out day-time observing.

The warm room provides a convenient place for members to take refuge from winter temperatures and summer mosquitoes, or to wait out a passing cloud. The building also provides desk space and lighting for planning a night's observing session. A cement pad in front of the warm room and observatory provides a convenient space to place members' telescopes while conducting personal observing programs.

Etiquette requires that you approach the observing site with your headlights off. On newer cars, stop the engine at the Glenlea Observatory sign, engage the parking break by one notch, and then restart. Your headlights should remain off, but you can still use your parking lights to drive. Proceed slowly, and be careful about parked cars along the road, or people walking. If you cannot turn off your headlights, make a cardboard or garbage bag mask to dim the lights. You might wish to turn around at the end of the road so that you are facing the direction back toward the highway at the end of the evening.

Please—no smoking on the observing pad, or where it will bother other observers. If you bring food and drink along, please

the eclipse from there. But, at eclipse time, the sun was shining right into their kitchen! So, they decided to view it from the comfort of a warm kitchen. At first, they could not get the binoculars to work. Then, they remembered that I had told them to *reverse* the binoculars to project the image. When they first saw the double crescents, they went nuts! (These folks are normally quite stoic.) They continued to project the image of the eclipsed sun on everything in the kitchen—walls, floor, counter top, etc. By luck, there is a long dark hallway off the kitchen. The sun moved into perfect position so that they were able to project double crescents a large distance onto a dark wall. They claim that the crescents were about 0.5 m in size with sharp cusps! Fantastic. Now they had a great idea. Why not take pictures of all this? A frantic search for a camera is fruitless since they had left both of their cameras at their daughter's home at last night's party. Now this would have been a great shot for the astronomy magazines—a Christmas eclipse in a kitchen!

When we later joined the Oliviers that evening, they were still pumped up! If a partial can do this to them, imagine what would happen to them if they were to see a total eclipse of the sun. I think they are hooked. I expect them to join us in Australia for the December 2002 eclipse.

Jacques Guertin