

AURORA



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The Royal Astronomical Society of Canada - Windsor Centre

March 2010

The Sun is Finally Waking Up by Bert Huneault

While writing this on January 20, 2010 I have just posted yesterday's and today's entries into my daily log of solar activity. And I thought that now would be a good time to examine the history of recently ended solar cycle 23 and take a peek at now emerging cycle 24.

What prompted me to take this action?... The fact that M-class X-ray flares occurred on both days and a flare that strong had not happened in almost two years. The Sun is finally coming out of its long-lasting lethargy!

Sunspot numbers and 10.7-centimetre solar flux values are two additional indications that Old Sol is coming out of its slumber.

Sunspot number 0 was first recorded in April 2005; and again two months later. But those were isolated occurrences. The Sun didn't begin to exhibit a spotless face in earnest until mid-2007 when sunspot numbers were zero on several consecutive days during each of the summer months. And as autumn arrived, the Sun really flirted with "minimum" when 21 days were spotless in September and 28 days in October. Since January 2008, the sunspot number was zero on a lot of days in most months, August 2008 being notable for all 31 days being spotless, as was the case on 30 days in August 2009. But since the autumn of '09, sunspot numbers have been creeping upwards, reaching the 40s in December and again this month, with the spots mostly showing up at the higher solar latitudes. Solar cycle 24 has definitely started.

Solar flux units ranging from mid 60s to low 70s were the norm during the two-year period from January 2008 to December 2009 - minimum phase in solar cycle 23. But in mid-December 2009, solar flux suddenly reached values in the low to mid 80s. And the upward trend has continued, 10.7-cm radiation reaching 93 on January 12 this year. Solar cycle 24 is obviously here to stay!

Those statistics pale by comparison to the solar activity that was taking place some six years ago, albeit subsequent to the 2001 solar maximum. For example, the intense X-class flare of October 28, 2003 was the most powerful in years and caused a coronal mass ejection (CME) with a velocity of 2,125 km/s! The next day sunspot number reached 330, solar flux 279, solar wind detectors aboard the Advanced Composition Explorer (ACE) spacecraft were saturated by the ongoing radiation storm, and aurora borealis was observed in Windsor and as far south as Texas, Arizona and Florida!

As if that wasn't enough, in addition to three M-class flares on November 4, 2003, an extremely strong X-class flare at 19:50 UT that day hurled a CME into space and turned out to be the biggest explosion ever recorded in our solar system. Compared to the excitement of "solar max", things are rather dull nowadays as we just begin climbing the curve of cycle 24.

February Update: The year's first *geomagnetic storm* occurred on January 20th. Several *M-class X-ray flares* occurred in February, four of them on the 8th! And *solar flux* reached values in the 90s on seven consecutive days in February. There was also a resurgence in *auroral activity* in northern latitudes (Alaska, Nunavut and Scandinavia).

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Calendar of Events

Our next meeting...

Tuesday April 20, 2010

7:30 p.m.

at

Maidstone K of C Hall

10720 County Road 34 (Old Highway #3)

Main Speaker...

TBD

Topic...

"TBD"

Activities...

Vernal Equinox: Saturday March 20th at 1:32 p.m. EDT the Sun crosses the Celestial Equator and Spring officially begins in the Northern hemisphere.

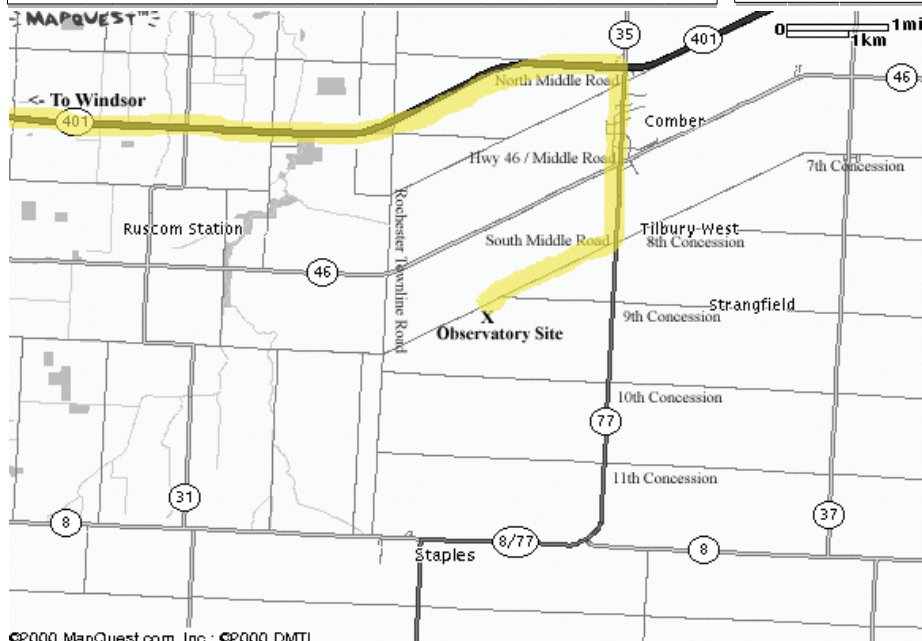
Open House Night at Hallam: Saturday March 20th starting at 8:30 p.m..

Saturn: Is at opposition on Sunday March 21st.

Public Observing Night: Saturday April 17th at Malden Park. See Steve Pellarin for details.

Earth Day: Sunday April 25th from 10:00 a.m. - 3:00 p.m. at Mic Mac Park.

Council Meeting: Tuesday June 8, 2010 starting at 7:30 p.m. at Steve Mastellotto's house.



Hallam Observatory Site

Directions: The map above shows the Comber area and it includes the major highways (401, 77, 8 and 46) that are in the area of the observatory.

The most direct route from Windsor is "highlighted" on the map which is to take Highway 401 East to Highway 77 South to South Middle Road. Turn right onto South Middle Road and go about 1 kilometer and just after the point where Concession 9 joins it (it is hard to see this intersection) you will find the observatory site on the South side (left) of the road.

If you hit the Rochester Townline Road (you come to a stop sign) you have gone too far.

Submissions

Aurora is published monthly except for July and December. The August, October, January, March and May issues are full newsletters (usually 6 pages) with a number of member submitted articles. The September, November, February, April and June issues are short flyers (2 pages) with one short article.

Submitted articles can be of any length from a paragraph to multiple pages. I can scan pictures and/or diagrams (both prints and film) to support your article and the originals will be returned to you.

Submission deadline is the 1st of the month.

Editor: Steve Mastellotto Email: mmastellotto@cogeco.ca

Membership

The Windsor Centre of The Royal Astronomical Society of Canada meets on the 3rd Tuesday of every month (except July and August) at the K of C Maidstone Recreation Centre. In addition to regular meetings the centre hosts a number of observing nights, a picnic and a December social. Members receive a copy of the Observer's Handbook, a subscription to SkyNews magazine and access to the Centre's library and telescopes. And optionally the RASC Journal in print form—online version free.

Annual Membership Fees: Please see the RASC website at www.rasc.ca for current rates.

Contact Greg Mockler at (519) 326-7255 or visit our website at: <http://www.rascwindsor.com> for more information.

February 2010 Meeting Minutes by Arthur Rae

Minutes from the meeting of February 16, 2010 held at the Maidstone Recreation Centre and chaired by President Paul Pratt.

Paul welcomed members and guests.

Minutes from the January meeting were adopted as read by motion to accept by Susan Sawyer-Beaulieu, seconded by Rick Marion. Carried.

Paul then introduced a change in format for the meeting agenda. The night's agenda would include, first, a presentation by Juliana Grigorescu, monthly sky report by Steve Pellarin then the Break. Following the Break will be a second presentation by Steve Mastellotto.

First Presentation – “The Planets – A Software Program”

Juliana Grigorescu demonstrated a new planetary prediction program that produces daily visibility data for all the planets, both inner and outer solar system planets. The graphical display shows the available visibility and other viewing information of any planet, one at a time, on a graphical display. Juliana stepped through the planet displays from Mercury through to Pluto showing various measurements available such as apparent size in arc seconds, magnitude variations and time of year and day or night viewing availability. With the Mercury data she demonstrated why apparent magnitude changes due to apparent size and why this planet is only visible at very few times of the year. While doing the same for Venus Juliana demonstrated the dramatic disc change in size through the year and why a partial disc of Venus might be brighter than a full disc. From an audience question of what an arc second is, Juliana led us through a bit of history of how that term was developed and the rule of thumb that, “an arc minute is the size of a dime held at 60M, an arc second that of a dime held at 2KM”.

Going through the outer planets starting with Mars, Juliana demonstrated why Mars is in a good position this month for viewing and why it won't be so good a month from now. Jupiter is so far away that it's apparent magnitude and size do not vary much, and the further planets Saturn through Pluto change those parameters even less.

The graphical display shows among many parameters, the relative polar axis of each planet. Uranus, for example, has an axis of 98° and is twice as far from the Sun as Saturn (20 vs. 10 AU). Neptune is half again as far away from our Sun (30 AU).

The program information can be found at Alcyone.de and Steve has offered to post it's address on our website.

Paul thanked Juliana for her presentation.

Director of Observing: Steve Pellarin walked us through the now transitioning winter to spring skies. Prominent is the constellation Leo, Saturn rising and Mars in it's best viewing position this year. High in the northern sky, Mars is in full glory

high in clear air where one can jack up the magnification of their telescope to see more of it.

With the winter side of the Milky Way still visible now is a good time “to take up a winter challenge to out your binoculars and a lawn chair” and explore the many star clusters embedded in it like the Messier objects M35, 50 and 46. The Auriga clusters M36, 37 and 38 warrant a look.

An unusual variable star near Epsilon Aurigae has an eclipse every 24 to 27 years. Right now scientists and amateurs are watching it as it is late in brightening back up this past year and many observers are still waiting to see it return.

Other observables of note are the Zodiacal Light is visible this next two weeks and the Moon will be going to full moon by the end of the month. The asteroid Vesta is in opposition this week and Mars is slowly dropping in brightness. Now is the time to see Mars. Orange or blue filters on eyepieces will enhance the telescopic view.

This month is the 70th anniversary of the discovery of Pluto. March will see summer constellations already rising in the early morning before dawn.

Paul thanked Steve for his comprehensive report.

Break Period: Randy Groundwater kindly filled in for an ill Tom Sobocan in preparing the coffee, tea, hot chocolate and desserts for the Break.

Centre Reports

President Paul Pratt: made a request for speakers for Centre meetings. He reminded Council of their next meeting on Tuesday February 23rd at the residence of Susan Sawyer-Beaulieu. The GA National Convention will be held this year in Fredericton, N.B.

Treasurer: Greg Mockler reported we now have 102 members and a bank balance of \$5,200.

Newsletter Editor: Steve Mastellotto reported this month's issue of the AURORA is now posted on the website.

Public Education: Randy Groundwater reported that he will be conducting a lecture with a group of young students at the Hallam Observatory tomorrow night (Feb. 17th).

Public Relations: Peter Bondy reported that Council is working to prepare a request of a Trillium Grant and a formal announcement is forthcoming.

Light Pollution Abatement: Dan Taylor has posted his latest report on the Centre website.

Observatory Director: Dave Panton could not make the meet-

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Hallam Happenings by Dave Panton

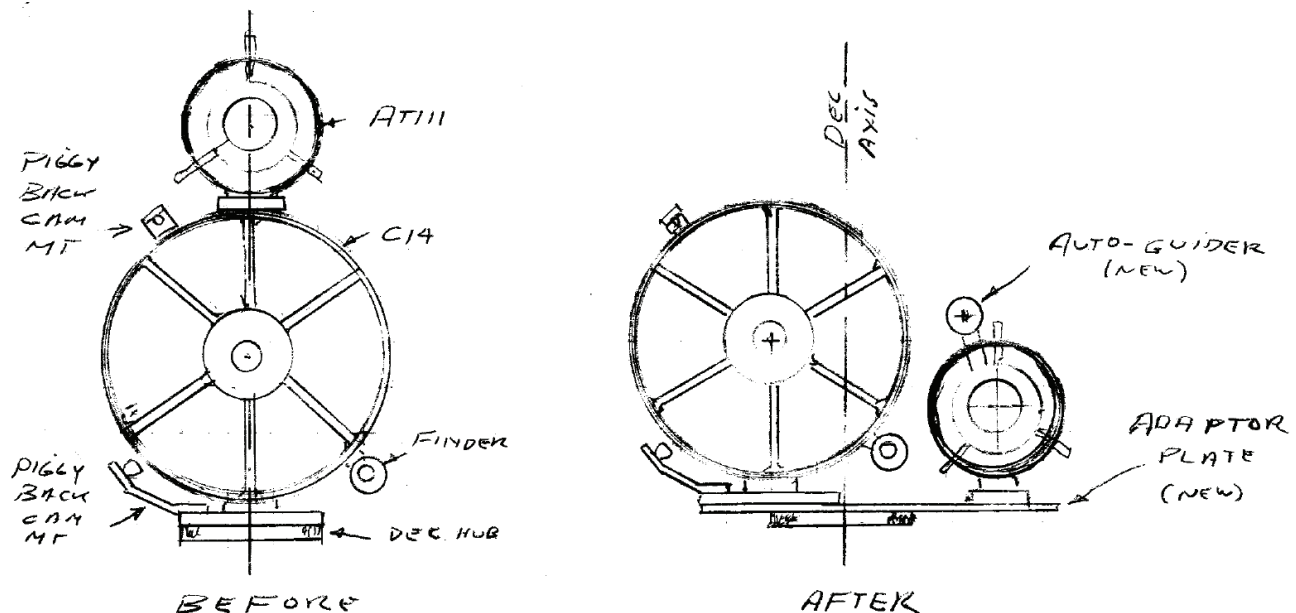
Other than nearly impossible skies, Winter has been kind at Hallam. The observatory was easily accessible during times when normally one would have to park on the side of the road and hike in through banks of snow. I don't believe there were more than six or seven nights were clear enough to do any serious observing or astrophotography. Thankfully we have had a few clear Moonless nights recently.

On the astrophotography front an auto-guider has been acquired, adapted to Steve Mastellotto's AstroTech AT-111 refractor, aligned, focused and its programming loaded into the warm room computer to control the telescope very accurately. Trial photographs (see bottom of page 5) can be enlarged to the point where dim stars are evident via a single bright pixel with only dim response on the surrounding 8 pixels. This has been a really ugly project for Steve as the programming required a lot of hard work to bring it to the point of actually working.

In due course it will be "hard wired" down through the telescope mount to eliminate the loose dangling cord used in trials. That takes us to the next step in telescope improvements at Hallam. Over the Winter there have been a number of options examined to remove the AstroTech refractor located high up (often completely inaccessible) on the C14 reflecting telescope down to a more practical position.

Two major benefits will be gained. In some positions we folk are not yet tall enough to see stars in the C14. By having the AT-111 down low it may be accessible while the C14 is not and vice versa. For observing and photography either or both can be used in virtually all positions. A third benefit is also possible. By moving the telescopes closer together and closer to their axis of rotation on a new adaptor plate their combined moment of inertia will be reduced. This is admittedly engineer speak but at the bottom line it means the telescopes will vibrate less wildly when disturbed.

The proposed plan is to tear the current setup down when it is used least (lots of Moonlight ruining observing). One weekend would be tear down, the week following would be needed for final design and machining of the adaptor plate. The next weekend would see reassembly in the new configuration. The diagram shows the before and after configurations.



We had a security scare at Hallam when a good neighbour driving past late in the afternoon noticed a teenager running from the observatory to a grey car parked at the gate. For those who do not know, in the early days we had two serious break-ins, one resulting in a lot of damage and in the second we very nearly lost our newly acquired \$25,000 C14 and its mount. The neighbour knew Dave Ainslie our former landlord (who also suffered break-ins to his machinery storage building) and called him to report the incident.

Dave called me next day with the story. Fearing the worst, Al DesRosiers and I drove out together that night to see if any harm had been done. There was no record in the log book so there was still some suspicion of undesirable activity. All was well both at ours and Moe Trepanier's building. Steve Mastellotto, on a hunch, sent out an e-mail to members asking if anyone had been to Hallam that day.

Coincidence was the answer. A fairly new member had driven out with his teen age son to see if his new key fit the big padlock on the warm room door gate. It was cold and his son ran back to the car for warmth, just as our good neighbour drove past!

June Meeting Minutes (continued from page 3)

ing however Steve Mastellotto reported he has purchased from the estate of Jim Lucyk an auto-guider that will be tested on the Hallam C-14. If it functions properly the refractor will be repositioned for better access. Steve also reported the tentative startup of the Astrophoto Group later in March sometime after the next monthly Centre Meeting.

Public Relations: Tina Chichkan reported tonight's count of 103 paid up members now in the Windsor Centre. Steve Pel-larin, Director of Observing, will be a guest speaker at the London RASC Centre this coming weekend.

50/50 Draw: The wining ticket was drawn for Al DesRosiers who kindly donated it back to the Centre.

Second Presentation – Stellarium, A Walk Through The Latest Version

Steve Mastellotto put the latest iteration of a freeware planetarium program though it's paces letting us see the improvements that have come with this update. Stellarium is an impressive desktop planetarium that is published for all the major computer platforms including PC, Apple and Linux. It shows the sky for

any position on Earth for any date and time. Not only does it present the stars in the sky it also positions the Sun, Moon and planets for the time of day being viewed. Many deep sky objects are portrayed when parts of the sky are zoomed into.

Steve showed examples of types of views one can see including the effect of precession on the ecliptic and librations of the Moon. New features include field of view of sky objects based on the type of telescope to be used and the selection of eyepieces for that instrument. Star magnitude limits are based on the database that the user downloads from the Stellarium website. The current base program supports down to 8th magnitude objects. A progressive set of larger databases of stars will take it down past 14th magnitude. Also on the website is a user guide in PDF format and a user group assist page. The current version 0.10.3 is a big improvement over previous issues and you can't beat the price.

President Paul thanked Steve for taking the time to walk us through this new version of Stellarium.

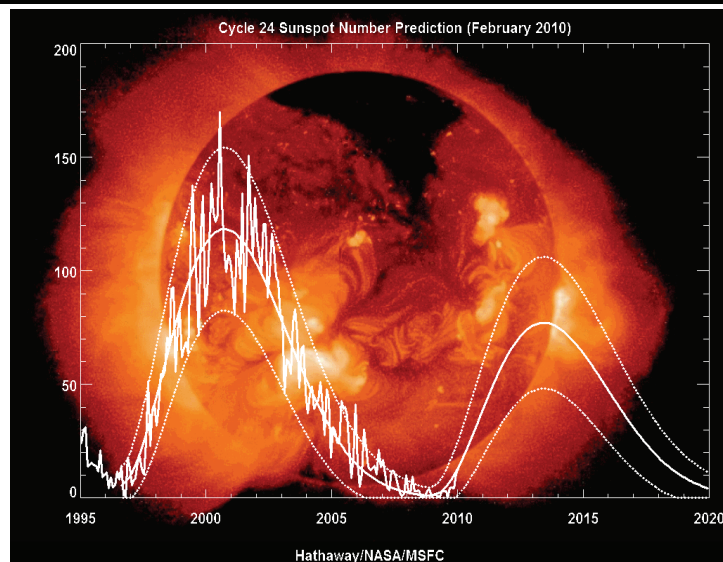
The meeting was adjourned at 10:07pm.

Solar Activity (continued from page 1)

A three-year first: February was the first month since January 2007 with sunspots *every single day*! But the best way to reveal trends in the solar cycle is to calculate the *monthly average* of sunspot and radio flux daily values. The results are:

	<u>Sept/09</u>	<u>Oct/09</u>	<u>Nov/09</u>	<u>Dec/09</u>	<u>Jan/10</u>	<u>Feb/10</u>
Avg sunspot #	6.7	7.0	7.7	15.8	21.3	31.0
Avg 10.7cm flux	70.4	72.4	73.5	76.8	81.1	84.8

Solar activity is obviously on an upward swing, and NASA's latest prediction has cycle 24 maxing out in 2013. In the meantime, Old Sol should become increasingly interesting to observe with solar-filtered binoculars and telescopes.



On the night of February 19th I got a chance to test the new auto-guider at Hallam Observatory. The photos at right show the central 400 x 400 pixels of two images from my Canon 5D MkII. The image on the left is through the AT111 and the right is the C-14. Exposures were 10 minutes and auto-guided on an 8th magnitude star.

As you can see the auto-guiding was perfect.

Steve Mastellotto

Remembering Dr. David B. Toth by Randy Groundwater



Astronomy lost one of its greatest friends when David Toth passed away on February 26, 2010 at the age of fifty-five. Many of us here in the Windsor Centre today never had the opportunity to know Dave; but he was a member here during his teen years, and even served as its President in 1973.

One of five children born to Magdalen and the late Thomas Toth (a former Windsor city councillor), Dave by profession was a medical doctor, initially with a family practice in London, Ontario following his graduation in 1978 from U.W.O. Medical School. Then, in 1993, he moved to the United States to pursue a career as an emergency medicine/trauma physician, eventually settling in Ohio.

Dave was one of those rare individuals who it seemed could turn his hand to anything, and nothing was ever done by half-measure. He gave his best in everything he did. He was a passionate aviator who owned a Piper Twin Commanche, and was also a long-time HAM radio operator. To say he was in love with astronomy would be an understatement! A recollection of even some of his exploits and adventures from over the years as he literally travelled the world in pursuit of his love for the stars I'm sure would take a book; one which probably no single person could ever properly write, anyway.

Dave loved people. He loved being with kindred spirits. A spiritual man who cared deeply for his family and children, he gave freely of his time and immense talents and, at heart, was such a kind and gentle soul. He was a familiar figure at star parties in the U.S. and Canada. He especially liked to attend Starfest in Mount Forest each August, and the Winter Star Party each January, in Florida. He always seemed to know everyone and everything that was going on!

I recall a rather humorous moment from Starfest 2008. It was a muggy afternoon under those typically hazy, humid skies there when I'd bumped in to Dave while roaming through the field. We caught up on things machine-gun style (was there any other way with him?!). At length, I pointed out our campsite where some of the members were from Windsor, and he said he'd come around for a visit to meet the others there after dark.

It was the middle of the night when he showed up, and as was so typical of Dave, he already seemed to be in mid-sentence about something as his silhouetted figure approached the circle of lawnchairs where we were seated. After nearly an hour of lively chatter under the cool, quiet, starlit sky, Dave was on his way again. But before I left to follow him up to where his 'scope was set up, our Centre Director of Publicity, Tina Chichkan, clearly overwhelmed and perhaps even a bit irritated from the whole experience, exclaimed: "Who WAS that guy?!" I'm sure there was never a person who met Dave, who wasn't left without an indelible impression!

While living at his mother's house for a few weeks here in Windsor last fall as he took treatments in Detroit, I was finally able one cloudy evening to bring Dave and his wife, Ronda, out to see Hallam Observatory; as well as attend one of our membership meetings. Afterwards, as I drove him home the night of the meeting, he kept saying over and over how impressed he was with the strength and enthusiasm of our membership and the quality of the talks he'd heard that night. He'd had a tough road of therapy up to that point, but I could tell that being with us, being "home", so to speak, and hearing about the things that he loved so dearly, had been just the medicine he'd really needed.

I'll always remember Dave for his humour, his candour, and for the intensity with which he lived every moment of his life. May your star burn brightly, Dave. Our sympathies are extended to his wife, Ronda, his children and stepson, his mother, Magdalen, and all the family.

Club Discount on Magazine Subscriptions

Astronomy Magazine: If we have a minimum of five people taking a new or renewal subscription to Astronomy magazine, we can get substantially reduced rates (reduced by about \$9 per year). Rates (US\$) are:

1 year	\$40.25
2 years	\$72.00

We already have 3 people who have said they are interested. Once we have 5, we will submit the forms. If you are interested please let Greg Mockler know.

Sky & Telescope Magazine: We have also requested information from Sky & Telescope magazine. There is an option to renew through their website as a club member but no indication as to purchasing the initial subscription at a reduced rate - we're waiting for their response and will share when available.