

AURORA

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A Resurgence in Solar Activity by Bert Huneault

The peak in solar cycle 23 has come and gone; right?... Well, not exactly. It seems that Old Sol is up to its tricks again, solar activity having lately risen to a “secondary peak”.

In my article titled “Solar Cycle 23 On The Wane” (AURORA, September 2001), I wrote, “The peak in the current solar cycle came and went without too much fanfare... but the declining stage can still produce occasional surprises in the form of powerful flares and large sunspots; anything is possible in the months ahead.”

Little did I know then that the Sun had more than “occasional surprises” in store. As a matter of fact, sunspots, solar flares and coronal mass ejections became so **numerous** in the last three months that a second peak in activity is evident in the current cycle.

One way to track solar activity is to average the 10.7-cm solar flux on a quarterly basis. This tends to smooth out the daily flux variations which tend to mask the general trend. Average quarterly solar flux from the first quarter of 2000 through the last quarter of 2001 is as follows:

180.5, 182.9, 188.3, 173.3, 164.4, 166.7, 175.5, 219.1

Note the first peak (188.3) in the third quarter (July-Sept.) of 2000, and a second maximum (219.1) more than a year later, i.e. in the last quarter (Oct.-Dec.) of 2001; hence the “twin peaks” of Cycle 23.

I keep a daily log of solar activity (info gleaned from the Internet) and as I write this (January 18), the **average** solar flux so far this month has been 219.4. In addition to solar flux and sunspot numbers, I also keep track of intense solar flares, solar wind velocity and proton density; and the data occasionally reveal interesting anomalies. For example, solar proton density is typically between 2 and 4 protons per cubic centimetre, but on November 6, 2001, it shot up to a whopping 104.7 as a coronal mass ejection swept past the Earth. The solar wind, which typically has a velocity near 350 kilometres per second, increased in speed to 648.9 km/s on January 11, 2002; it had originated in a coronal hole. And solar flares (bursts of electromagnetic radiation) are still erupting quite frequently in the vicinity of sunspots. During the first 15 days of January this year, my log shows 10 intense X-ray flares of M or X class. On December 26, 2001, the sunspot number reached 290, the highest value since the preceding September. So, as you can see, our nearest star is not giving up yet, as it doesn't seem to realize it's supposed to be in the “declining” phase of Cycle 23! Who knows, the secondary peak might still be in progress.

Solar wind, coronal holes and coronal mass ejections; we often hear these phrases in connection with space weather and solar activity these days, so it might be in order to define them briefly. The **solar wind** is the outward flow of plasma (ionized particles such as electrons and protons) and magnetic fields from the Sun. A **coronal hole** is an extended region of exceptionally low density in the high-temperature solar corona. **Coronal mass ejections** are huge bubbles (billion-ton clouds) of magnetized gas which fly away from the Sun over the course of several hours, and buffet the planets.

In This Issue

A Resurgence in Solar Activity	Cover
Calendar of Events / Maps / Submitting Articles / Membership	Page 2
Arecibo Antenna Designated a Milestone	Page 3
Member Notes	Page 3
January Meeting Minutes	Pages 4 and 5
For Sale	Page 5
2001 Clear Nights Reports	Page 6

Calendar of Events

Our next meeting...

Tuesday, March 19, 2002
8:00 p.m.
at
St. Stephen's Church
Howard Road, 1.4 kms. south of
Hwy # 3

Main Speaker...

Phil McCausland

Topic...

"Meteorites"

Activities...

Saturn Occultation: On Wednesday February 20 at 7:12 p.m. EST Saturn will disappear behind the dark limb of the Moon. Saturn will reappear at 8:23 p.m. on the bright limb of the Moon.

Zodiacal Light: Look for the zodiacal light from a good dark sky for the first two weeks of March.

Mercury and Uranus: On the morning of Saturday March 9 Mercury and Uranus are only 1 1/2 deg. apart.

Jupiter Double Shadow Transit: Look for the shadows of Io and Ganymede on the disk of Jupiter on Thursday March 14 at 0:15 a.m. EST (night of March 13).

Vesta: Asteroid 4 Vesta passes 2 arc minutes south of Saturn on Tuesday March 19 at 11:00 a.m.

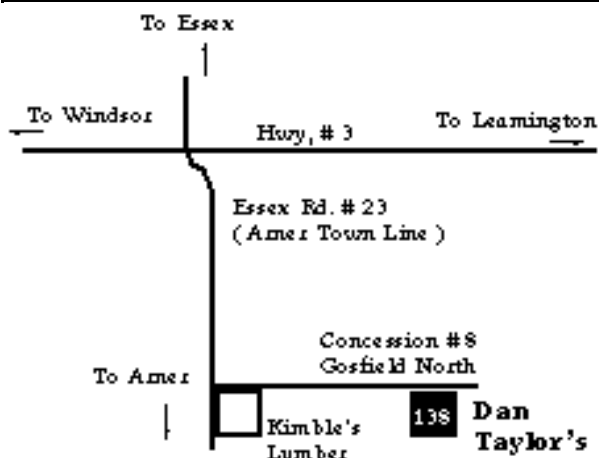
Spring Equinox: On Wednesday March 20 at 2:16 p.m. Spring officially begins in the northern hemisphere.

Astronomy Day: Saturday April 20. Stay tuned for details since we usually celebrate with the Earth Day group at Ojibway Park.

Council Meeting: Tuesday June 4 at 7:30 p.m. at Randy Groundwater's house.

Windsor Center Picnic: Mark you calendars for Saturday June 15. Details will follow in the coming months.

Maps



Observing Nights

Frank Shepley's.....Last Quarter Moon
Dan Taylor's.....New Moon

(please call before showing up)

Submissions

Aurora is published monthly except for August. The September, November, January, March, May and July issues are full newsletters (usually 6 pages) with a number of member submitted articles. The October, December, 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. I will accept Emails at the address below, floppy disks, or written submissions.

Editor: Steve Mastellotto

Email: smastell@wincom.net

Membership

The Windsor Centre of The Royal Astronomical Society of Canada meets on the 3rd Tuesday of every month (except July and August) at St. Stephan's church. 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, the RASC Journal, a subscription to SkyNews magazine and access to the Centre's library and telescopes.

Annual Membership Fees are Regular - \$44.00, Youth - \$27.50 and Life - \$880.00.

Contact Frank Shepley at (519) 839-5934 or visit our website at: www.mnsi.net/~rasc for more information.

Arecibo Antenna Designated a Milestone by Bert Huneault

Most amateur astronomers have heard of the Arecibo Radio Observatory in central Puerto Rico, operated by the National Astronomy and Ionosphere Center of Cornell University. Built in 1963, this 305-metre (1000-ft) bowl-shaped radio telescope is the largest in the world. The non-movable, massive dish consists of a fine wire mesh stretched with astonishing accuracy into a spherical surface over a natural valley in the Puerto Rican mountains.

A movable antenna, supported by a large arc-shaped track at the focus of the bowl, picks up radiation reflected from the bowl; it can record objects as far as about 20 degrees away from the zenith. The rotation of the Earth allows all objects within a 40-degree belt around the sky to come into view of the telescope at one time or another.

The 1,000-foot dish is used not only to receive extremely weak radio signals from the remote universe, but also to study the Earth's ionosphere. Furthermore, it is used as a very powerful radar telescope to explore the surfaces of planets. And astronomers used Arecibo to discover the first planets outside of the solar system and to investigate pulsars.

Signals picked up by the radio telescope are so weak that the total energy Arecibo has received since 1963 is less than that produced by striking a match! That's why scientists had to construct such a huge antenna. The sheer size of the dish has prompted scientists to quip: "The volume of the bowl could contain the world's annual consumption of beer", and "The surface, as is, would be a mecca for skateboard enthusiasts".

Arecibo has been in the news lately, when the History Center of the Institute of Electrical and Electronics Engineers (IEEE), and the American Society of Mechanical Engineers (ASME) designated the telescope as both an IEEE Electrical Engineering Milestone and an ASME Mechanical Engineering Landmark. For all the astronomy discoveries, it was engineering that gave Arecibo its honours. The project involved antenna design, signal processing and electronic instrumentation. After nearly four decades of operation, it was nice to see Arecibo receive the well-deserved accolades.

Member Notes

Wednesday evening Feb. 13th while setting up at Comber to try to see the Supernova near M74 a fireball was witnessed as follows: My car was parked at the south end of the machinery building. I was head down getting a grip on my usual bundle of books and maps on the back seat. Mysteriously, the area lit up brightly. I glanced up assuming another observer had arrived.

To the North, a red glowing object was descending Eastbound leaving a low orange reddish path much wider and redder than the usual meteor trail. The object was large enough to clearly display a rounded nose. It vanished entirely when only a few degrees above the horizon. In retrospect I regret not noting the exact time. It would have been about 7:45 p.m.

Comber is a good spot for these sort of events. It is dark and open enough to have a good view in most directions. The rest of the evening was less spectacular. I found M74 but could not absolutely confirm the pattern of dim locator stars near the super nova. Seeing conditions were good but M74 is visible best as full darkness sets in. By then it is moving into the glow and haze of Windsor/Metro Detroit.

More importantly, my Mark 1 prototype electric glove/mitt proved very promising. For the first time I observed nearly four hours at 20F without suffering intensely cold fingers.

Dave Pantan

As the clock ticks 8:02 PM on Wednesday, February 20th, 2002, time will (for sixty seconds only) read in perfect symmetry.

It will read: 20:02 (time), 20/02 (date), 2002 (year).

It is an event which has only happened once before, and is something which will never be repeated. The last time it read in such a symmetrical pattern was 10:01AM, on January 10, 1001. And, because the clock only goes up to 23:59, it is something that will never happen again.

Ken Garber

When I drop in at the Center's new observatory, I am always amazed at the headway that has been made since my previous visit. Neither winter weather nor Christmas holidays has slowed the progress.

It is a reminder of all the dedicated people who are giving their time and resources to make a dream come true. All those who have come forward with their special talents and experience in the detail of the planning, the raising of funds, locating the site, the legal papers, surveying, purchasing, concrete work, power, carpentry, metal work and countless hours of just hard work. I am grateful to them for all of it and for the guts it took to start the project in the first place.

Every time that I drop in, Al DesRosiers seems to be there so I asked him why he was giving so much of his time, equipment and even his own materials.

"I do have the time," he said, "and I am excited about this undertaking. I have always hoped that our Centre would have its own observatory and I want to do everything that I can to make it possible. I believe that everyone wants to do something in their life that will make a difference, something that will be good for them and their community."

"I believe," he said, "that this is something worthwhile."

Rod Clark

January Meeting Minutes

General Meeting Minutes

January 15, 2002

President, Randy Groundwater: Randy requested and received a motion to accept the minutes from the November meeting. Moved by Joady Ulrich and Seconded by Susan Sawyer-Beaulieu the motion was carried.

Reports

Secretary, Joady Ulrich: Joady reported there was no correspondence since last meeting.

Treasurer, Frank Shepley and Assistant Treasurer, Ken Garber: Frank gave a report covering a number of items. Calendar sales totaled fourty five. Membership cards from September were available from him. He also reported the National organization would be handling membership renewals thus "decoupling" the task from local clubs.

Good news came also in Frank's announcement that Dave Ainsley has purchased a lifetime membership. Total membership has risen to 117. Prior to 1995 he noted the highest number had been 48 members.

A donation of \$100 was received from Brad Clark toward the Comber Dome project.

Frank later reported two members had each loaned \$2,000 interest free to the club in aid of purchasing materials to carry on and finish the warm-up building inside and out. Randy Groundwater and Al DesRosiers were the thoughtful creditors.

Following coffee break Frank conducted the 50-50 draw. It was won by ticket holder John Krevack. In turn John donated the prize back to the treasury.

Librarian, Tom Sharron: Tom had good news, announcing the lost loaned out telescope (valued at approximately \$1,100) had been located and recovered. More identification will be required of future borrowers.

National Council Representative, Tim Bennett: Tim asked members to spread the word about a job opportunity with the National. They are searching for a new editor for The Journal of the RASC. Tim will attend the National Council meeting of January 26, 2002.

Newsletter Editor, Steve Mastellotto: Steve has produced an updated membership list and a new phone committee listing. He also reminded us, members articles are always needed for the Aurora newsletter.

Light Pollution Committee Chairperson, Susan Sawyer-Beaulieu: Susan reported her contact with the Essex County Planning Board was very positive. They were interested and receptive to ideas about light pollution from highway and intersec-

tion lighting. Conversely she found City of Windsor authorities were simply defensive about current lighting standards. They believe current City street lighting meets those standards thus there is no reason to consider changes. Full or partial cutoff lighting was deemed unnecessary and inefficient.

She suggested we visit to see LaSalle's Normandy Road lighting as a good working example of full cutoff lighting's many benefits. Anti-light pollution lighting standards are coming but the wait will be long until a more aware public demands improvement. Randy added to the positive aspects mentioning he had recently read a good article on the subject in the Toronto Globe and Mail.

Public Relations Director, Robin Smallwood: In this capacity Robin reported there had been no recent activity.

Public Education Director, Randy Groundwater: Randy has a "Centre For Retirement Learning" course underway at the University of Windsor.

Director of Observing, Robin Smallwood: Robin presented several interesting events and areas of interest in the current night sky. A Saturn/Moon occultation will occur later this month. He encouraged us all not to be too concerned about poor visibility while searching for double stars. They can be seen on any reasonable night. Just in currently visible Orion there are 33 possible doubles to split. Two worthwhile observer's reference books have become available. They are Harrington's "A Deep Sky Introduction" and a very useful reference book as a companion to the "Sky Atlas 2000" map set.

Then Robin distributed maps of the Auriga/Taurus area of the current overhead night sky with a whole variety of interesting targets. Come out to Comber and observe at night or if that is too cold, cruise out in daylight to observe the dome project.

Comber Observatory Project Status: Al DesRosiers reported on work done since last meeting. Barry Gerard has completed all the rough wiring. Over 350 feet of underground cable has been trenched and laid to the warm room. It will be connected after the steel siding is installed.

The inside door from the warm room to the dome has been installed. The outside steel frame and door has been installed. Inside finishing is underway with insulation, and vapour barrier complete. Drywall sheets are on order.

Outside, the white soffit and end gable vinyl has been ordered. Exterior green metal paneling to complement Dave Ainsley's building will follow. Progress has been excellent via many hands helping, a mild winter and most recently, adequate funding to acquire material.

Comber Observatory Name: A popular question, asked by Joady Ulrich will have to be answered later per Randy. Construction is the priority of the moment.

(Continued on page 5)

January Meeting Minutes (continued)

Business

Meetings:

Randy Groundwater noted the annual picnic would likely be held at the dome site.

On Thursday January 29th the Observatory Committee is to meet at Randy Groundwater's home.

On Tuesday Feb 12th, a Council meeting will be held at Steve Mastellotto's home.

Speakers

Randy Groundwater: Newtonian Telescope Design

Randy brought a disassembled 6 inch aluminum tube Newtonian. He gave a history of the original design brilliantly conceived by Sir Isaac Newton. Then he explained the design features and function of this deceptively simple telescope. Local history of telescope building going back to 1970 was shown from Randy's collection of color slides.

Dan Taylor: Stellafane 2001

Nicely complementing Randy's presentation, Dan showed a series of slides taken during his camping trip to Stellafane with his son last summer. He started with a bit of history of Stellafane going back to the first event held in 1926. Dan showed Stellafane is the place to visit to see all manner of homebuilt telescopes. The vari-

ety was impressive and included a replica of an ancient 200 inch long refractor up to the latest 36 inch Dobsonian reflector. Excellent craftsmanship was evident in many telescopes while others were deliberately made from an absolute minimum of recycled materials.

Steve Pellarin: Peculiar Galaxies

Utilizing a stunning set of photographs Steve showed shots of a series of galaxies thought to support the ideas of one Halton Arp. He was an astronomer who did not accept Hubble's view of the reason for red shifts. He assembled a collection of galaxies which looked different than others as he tried to support his own views. They were not accepted. In turn this made it very difficult for him to obtain observatory time. The galaxies he chose became known as peculiar galaxies. Steve pointed out many of their differences. It seems Halton Arp was doomed to the backwaters of Astronomy.

Randy thanked our speakers for the evening for their excellent work and adjourned the meeting.

For Sale:

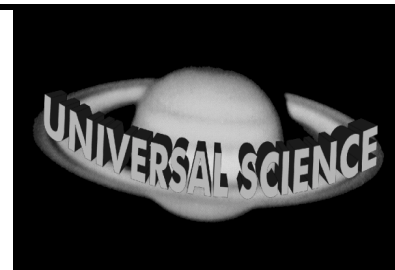
Televue Genesis refractor, 4" f/5 Fluorite with hard case, 2" diagonal with 1 1/4" adapter, full aperture Thousand Oaks solar filter (Type A+) and Super Polaris equatorial mount with motors on both axis, hand paddle and polar alignment scope. \$3,000 - Call Steve Mastellotto at (519) 735-9046 for details.

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Email: unisci@sympatico.ca

2001 Clear Nights Reports by Dan Taylor and Tim Bennett

In a retrospective of last years sky doings, we find some predictable trends in clear/cloudy numbers. Late fall and winter ensure a dearth of clear nights. However, we can 'thank our stars' (intentional pun) that summer and early fall yield many resplendent starry nights.

This leads to my definition of a clear/observable night. Although somewhat arbitrary it does serve the purpose of what many amateurs would find suitable to use as a clear night. To wit: at least one hour of 80 to 90 % cloud free skies between sunset and midnight.

In 2001 we find totals slightly elevated over the norm with 144 total clear night. It is notable that this fell well shy of the 1988 total of 169 observable nights.

As I write this, we are enduring some of the poorest skies ever over a protracted period. It could be said that from mid November 2001 to late January (so far) the clouds are, even on rare definable clear nights, always present.

Dan Taylor

My definition of clear nights differs from others because I do mostly deep sky observing. To be counted, as a clear night there must be at least 50% of the sky clear from clouds and the zenith must be clear 1 hour after sunset and midnight. With the increase in light pollution from Essex if it is hazy enough to limit deep sky viewing it is counted as a cloudy night.

Since most of deep sky viewing is done around new moon I also keep track of the clear nights for five night period (two nights prior, new moon and two nights after) at new moon. This year I've had the least amount of good observing nights since joining the Centre.

Clear Skies,
Tim Bennett

