Aurora

Volume 31, Number 1

The Royal Astronomical Society of Canada - Windsor Centre

September 2005

Night of the Trifid

The Lagoon (M8) and Trifid (M20) Nebulae along with the open cluster M21 (just above and to the left of the Trifid) were photographed on Saturday July 30 at about 11:55 p.m. EDT at the Hallam Observatory in Comber, Ontario by Steve Mastellotto. Steve used his Canon 20D and 400mm f/5.6L lens piggybacked on top of the Henry Lee telescope (14" Celestron SCT and Paramount ME mount). This is a single exposure of 5 minutes @ f/5.6 and ISO 800. Steve manually subtracted a dark frame in Photoshop CS2 and applied a slight amount of noise reduction via Noise Ninja software.

In This Issue

Calendar of Events

Our next meeting…

Tuesday, Sept 20, 2005 8:00 p.m.
at
K of C Maidstone Recreation Centre
10720 County Road 34 (Old Hiway 3)
just west of beautiful downtown
Maidstone (and the railway crossing)

Main Speaker…

Steve Pellarin

Topic...

The Cassini Mission

Coming Events

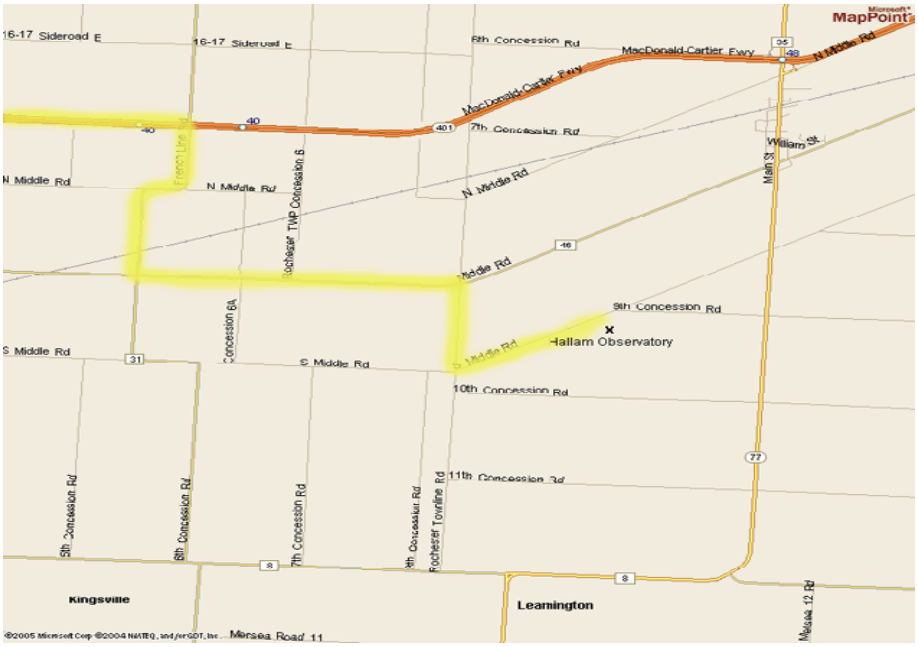
September 16	Moon at Perigee (~223K miles)
September 22	Autumnal Equinox
October 29	Mars nearest Earth (69.4M km)

Observatory Open Houses:

September 10, 2005	8:00 p.m.
October 8, 2005	7:00 p.m.
November 5, 2005	7:00 p.m.
December 10, 2005	7:00 p.m.

Council Meeting

Tuesday Oct. 11th; 7:30PM at Tim Bennett's



Hallam Observatory Site

New directions for April - November 2005 during 401 construction!!!

The map at left shows the Comber area and it includes the major highways (401, 77, 8, 31 and 46) that are in the area of the observatory.

During the 401construction, the best route from Windsor is "highlighted" on the map which is to take 401 East to Highway 31 South to Middle Road East to Rochester Townline Road South to South Middle Road. While on South Middle Road you will pass a couple of houses and just before Concession 9 intersects it you will find the observatory site on the South side of the road.

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 accept emails at the address below, floppy disks, CD's, or written submissions.
Editor: Ken Garber Email: kgarber@cogeco.ca
Ass't: Dan Anzovino Email: danzovino@sympatico.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, the RASC Journal, a subscription to SkyNews magazine and access to the Centre's library and telescopes.

Annual Membership Fees are Regular - $55.00, Youth - $34.25 and Life - $1100.00. **** NOTE New Rates ****

Contact Ken Garber at (519) 966-3478 or visit our website at: Http://www.mnsi.net/~rasc for more information.

A Philosophy of Amateur Astronomy by C. Joady Ulrich

Escape to the Outer Limits

Upside down along the Milky Way
The starry stallion Pegasus carries me away.
We'll go and visit Hubble, window to the stars.
There we'll see a close up of Jupiter or Mars.

Fly with the Eagle, soar with the Swan,
Play a tune on Lyra, then it's off and gone.
Beyond our Milky Way, leave our galaxy behind.
Visit neighbour Andromeda, see what we can find.

Will we find answers? Or have we gone too far?
Are we treading in hallowed space to see the birth of the Star?
The splendor of the cosmos has lured me this night,
To let imagination saddle up and then take flight.

Martha Pinch, Wheatley, Ontario, 1997

Astronomy compels the soul to look upwards and leads us from this world to another.

Plato 427(7) - 347(7) B.C.E.

Introduction

"The love of wisdom, and the search for it. A philosophical system; also, a treatise on such a system." This part of Funk and Wagnall's dictionary definition of philosophy should be suitable for what I want to call a practical "philosophy of amateur astronomy." As amateur astronomers we love to look for wisdom in what is beyond the Earth. I believe that there is a system or way of doing so.

I've had the good opportunity to gain much observation and practical experience in the study of what is in the night sky. There are those fascinating "why" questions, even of just wanting to know "Why does the Moon look so close in a telescope?" For me, the ability to answer probing questions in and the enjoyment of amateur astronomy was very much enhanced from my involvement with the Nova Astronomy Club in Windsor from 1972 to 1977. Many of my "first light" experiences, including in 1974 when viewing through my bright yellow (tube only) 8-inch f/7 Newtonian reflector, occurred when I was with this very energetic group. What a great time it was to experience astronomy with a truly fine bunch of people who were genuine observers and explorers of the grand night sky.

Philosophers such as Aristotle, Plato, John Locke, John Stuart Mill, and more recently, the 20th century thinker, Karl Popper, wrote about life from what they saw, learned, and also from being influenced by the times they lived in. Such has been the same for me in the development of the perspective on amateur astronomy that I have put together. The motivation behind our desire to observe the heavens consists of, I believe, a group of defined states of perception, which I will call "**senses**."

The Five Senses

The sense of wonder. "In 1931 I built a 10-inch f/8.6 Newtonian reflector. ... The first object I looked at was M13, and the view just about knocked me off my observing ladder. Previously I had observed the cluster with a 1-inch refractor, and I wasn't prepared for what the 10-inch could offer. Even now, some 62 years later, I vividly remember the view." This description of wonder midst observing the night sky from Walter Scott Houston is a good one since it rings quite true even for those of us more "seasoned" observers. I recall seeing about the worst view of M13 in a 6-inch scope and at another time my best one in the Porter Turret Telescope at Stellafane, near Springfield, Vermont, in the first half of the 1980's. In the latter instrument, I saw trails of stars outlined in this million starred sparkling diamond dust object that resembled some of the better photographs taken of it. That sense of awe that we call wonder is what gets us into amateur astronomy and helps keep us there.

The sense of joy

"By the time I was half way home it was completely dark. Every star name that I knew had now been fitted to its owner and for another mile or so I tossed a few Greek letters here or there about the sky. The Milky Way arched high above my head..." Leslie Peltier's wintry observation of the heavens as given in his classic book Starlight Nights (1965) directly reminds me, that like him, I've been encouraged by an underlying feeling of delight while viewing the starry sky. In the Book of Mormon, which has profoundly influenced my life for good, is this marvellous observation on another important "why," that is also relevant here, being "...men are, that they might have joy," 2 Nephi 2:25. At star parties I've seen this emotion readily expressed, such as when an individual sees the Veil Nebula in a 12-inch scope at Stellafane. Also when magnified in an immediate group experience of what in sociology is described as "we-feeling," that is having "something significant in common" apart from others, where instantly, there is a chorus of delight expressed by observers over a particularly bright meteor, from Metta Spencer, Foundations of Modem Sociology (1985). Joy is an excellent motivator in amateur astronomy! Oh, how we can relate to joy from observing the stars!

The sense of learning

"With each passing year, the parchment of the sky holds more information, more contentment, and more wisdom for us." This sagacious bit of perception from Walter Scott Houston is so true. In this particular gathering of wisdom, midst joy and wonder, is that exciting and poignant exercise we call self discovery. We do not have to be like Helen Sawyer-Hogg or lan Shelton to experience what discovery is. I like what Robert Garrison, an astronomer and past president of the RASC, said about discovery, when he spoke a few years ago in Windsor, being that one needs to be prepared to be able to discover something. So with preparation and that desire for viewing objects that are new to us, we too can feel that wonderful thrill of learning that comes from seeing, say, Mars in a 20-inch reflector for the first time. In Starlight Nights, which I

know is a book highly valued by Randy Groundwater, John Thompson (Ottawa Centre), Dan Taylor, and myself, Leslie Peltier wrote, "I feel quite sure that I first viewed the moon in my small scope with just as much incredible delight as Galileo did in his. ... No photograph has yet been made which has not been cold and flat and dead when compared with the scenes that meet one's eyes when the moon is viewed even through a small telescope." For me, being visually impaired, I've had to work harder than others to "learn" with my eyes. Helen Neal in Low Vision (1987) quoted one doctor as saying, "People with partial sight generally use it more efficiently than those with normal vision. They have to work at seeing." I have found this to be true, for example, while observing Saturn with its ever beautiful rings. This extra challenge emphasizes the fact that experiencing the heavens through direct observation, as with life, is among the best ways to learn, which for all of us makes us better people and advanced perceivers of what is real in the universe.

The sense of connection.

"Without an understanding of the nature of the universe, a man cannot know where he is; without an understanding of its purpose, he cannot know what he is, nor what the universe itself is." Marcus Aurelius, Roman emperor/philosopher 121-180 C.E., from his writings titled Meditations. "When we try to pick out anything by itself, we find it hitched to everything else in the universe." John Muir, My First Summer in the Sierra (1869). "It is clear from such a world (outside of our galaxy), as it is beginning to be clear from ours, how our matter, our form and much of our character is determined by the deep connection between life and the Cosmos." Carl Sagan from Cosmos (1980). I felt that the above three quotes were necessary in order to illustrate, in a strengthening way, the importance of our connection with the universe. This awareness is truly relevant since such helps make us better persons who can understand more clearly what is the cosmos and why we are therein. I would like to bring in one other interesting quote which I feel relates to this concept of "being hitched to everything else in the universe" that comes from the life of Ludwig van Beethoven. "Holtz the violinist, an intimate friend of Beethoven's, and a member of the famous Schuppanzigh Quartet tells how the composer conceived the idea of this movement (the second one of the Opus 59, No. 2 or Razurnovsky String Quartet) one night, in Baden, near Vienna, as he gazed up at the stars, contemplating the harmony of the spheres." This from Joseph de Marliave in Beethoven's String Quartets (1961). Seeing all that wide expanse and order of the starry sky directly can remind us as amateurs that truly we are attached to the rest of the universe. This could be a consoling thought for us.

The sense of the Divine.

"God is able to create particles of matter of several sizes and figures....and perhaps of different densities and forces, and thereby to vary the laws of Nature, and make worlds of several sorts in several parts of the Universe. At least, I see nothing of contradiction in all this." Sir Isaac Newton, Opticks (1704). "The new scholarship of science and theology suggests, too, that they have one thing in common: the motivation that animates both in the search for scientific truths and the search for spiritual meaning. 'I think that fundamentally the impetus for the two quests is the same,' says Carl Feit, a biologist and a practicing Jew. 'Religion and science are two ways of looking at the world, and each guides our search for understanding. Profoundly religious people are asking the same questions as profound scientists: Who are we? And what are we? What's the purpose? What's the end? Where do we come from? Where are we going? We have this need, this desire, this drive, to understand ourselves and the world that we live in.'"

From Sharon Begley in The Hand of God (1999). No doubt there is a need for the sense of the spiritual or as I'll describe it of the Divine, that is of God, in being involved with amateur astronomy and coming to understand the cosmos and our purpose in it. Newton and Feit, remind us of that need as well. From the last mentioned book is this further concurring quote. "I find it quite improbable that such order came out of chaos. There has to be some organizing principle. God to me is a mystery but is the explanation for the miracle of existence, why there is something instead of nothing." Alan Sandage, astronomer. The following quote from the Bible is inscribed on the front gables of an amateur astronomers' clubhouse on Breezy Hill, near Springfield, Vermont, "The heavens declare the glory of God," Psalms 19:1. I had a direct witness of this statement in the early 1970's on a "Nova" expedition to Wheatley Provincial Park. The Milky Way was glorious and blazing, prominently enough to be surprisingly so. I remember that Randy, Tom Smart (a founding member of the club) and I were observing this grand scene of order and beauty when Randy stated quite readily that he felt there must have been a God to have created all of what we saw. Tom and I quickly agreed. Consider this quote given in 1976 from Neal A. Maxwell, who was a well respected leader in The Church of Jesus Christ of Latter-day Saints. "The cosmos cries out convincingly that God lives, for those who have eyes to see and ears to hear." The knowledge of Divine influence and its ability to assure us can give needed comfort and purpose and direction within our lives in the universe.

Conclusion

I have attempted to give you a practical philosophy of amateur astronomy, which involves the five intertwined senses of wonder, joy, learning, connection, and the Divine. I hope that the contemplation and application of it may be of some benefit to you. In this regard consider the following reflective observation from Walter Scott Houston, which along with the other quotes from him was written in 1993. "The stars are always with us. Night after night the blaze of distant suns stretches from horizon to horizon. For many of us the fascination of a starry sky even began before grade school as the spectacle of the heavens astonished and excited our imagination. As we tally more and more memorable hours under the night sky, the sensation is cumulative. It makes no difference whether we observe with the naked eye, 4-inch telescope, or a 36-inch Dobsonian."

The Ionoshere Revisited (A comment by Bert Hunealt

In the 1860s, the Scottish physicist James Clerk Maxwell did revolutionary work in electromagnetism. He deduced that electromagnetic waves must exist, and that visible light is an electromagnetic phenomenon forming only a small part of the entire spectrum of electromagnetic radiation. He also proposed that electromagnetic waves were carried by the ***ether***, and that magnetic lines of force were disturbances of the ether. Back then it was thought that waves required some material medium for their transmission, so physicists assumed that there was an extremely diffuse substance, called ether, which was the unobserved medium. It turned out that such an assumption was unnecessary, but the ether concept was not readily abandoned. When I studied high-school physics in the 1940s, the idea of a universal ether still had its proponents, and we were taught that radio waves did propagate via that tenuous medium. But when I attended Marine Radio school afterwards, I learned that there is no such thing as the ether, and that radio waves can propagate through vacuum.

LONG-DISTANCE COMMUNICATION

On December 12, 1901, an Italian scientist named Guglielmo Marconi (sometimes called the "Father of Wireless") demonstrated transatlantic communication by receiving a radio signal in St. John's, Newfoundland, that had been transmitted from Cornwall, England. His experiment raised a serious scientific dilemma, because in the past it had been assumed that electromagnetic waves traveled in straight lines, just like light waves. If this were true, radio waves would be limited to line-of-sight distances; i.e. radio signals would not be received beyond the horizon, because the Earth's bulge or curvature would get in the way.

But Marconi's experiment proved that radio waves could indeed propagate hundreds or thousands of miles beyond the horizon. Obviously, then, something was causing the radio waves to apparently bend around the Earth's curvature and reach all the way across the ocean. But what was that "something"?

Shortly after Marconi's demonstration, a British telegrapher-cum-physicist by the name of Oliver Heaviside and an American electrical engineer named Arthur Kennelly independently and almost simultaneously proposed that a conducting layer existed in the upper atmosphere that would allow a transmitted electromagnetic signal to be reflected back toward the Earth; in other words, there was a sort of "giant mirror" up in the sky. Up to that time, there was no direct evidence that such a reflecting layer existed, and little was known about the physical or electrical properties of the Earth's upper atmosphere. But in the 1920s its existence was proved when high-frequency radio pulses were transmitted vertically upward by instruments called ionosondes, and the returning pulses from the reflecting layer were received. That 'electrical mirror', consisting of ionized gases, was named the "Kennelly-Heaviside layer", or the "ionosphere". It was later discovered that the ionosphere actually consists of four different strata which are classified as D, E, F1 and F2 layers, at heights ranging from about 80 to 500 kilometres above the Earth's surface.

PLASMA

That electrified region of the Earth's atmosphere is called ***ionosphere*** because it is richly populated with a plasma of ions and free electrons rather than containing only the usual mixture of neutral nitrogen and oxygen. In a neutral gas, each atom has the same number of negatively-charged electrons orbiting its nucleus as positively-charged protons in that nucleus. Such a gas shows little response to electric and magnetic fields, and is practically unable to conduct electricity.

But when photons of light such as ultraviolet radiation from the Sun dislodge electrons from their orbits, the resulting plasma consists of freely roaming negative charges (electrons) and positive charges (ions, which are atoms having lost one or more electrons). One characteristic of this ionized gas is that it is conductive and can be influenced by electromagnetic fields in such a way as to bend (refract) and/or reflect radio waves back to Earth, making long-distance communication possible.

Solar flares and coronal mass ejections produce increased ultraviolet, x-ray and gamma-ray photons which dramatically increase ionization, thus increasing the thickness of the ionosphere. This modifies its reflectivity and/or absorption characteristics, and can drastically affect radio wave propagation. The ionosphere is also home to auroras and the mega-ampere currents that heat the atmosphere at high latitudes during geomagnetic storms.

In an earlier article, "Radio Waves and the Ionosphere", I discussed the different layers of the ionosphere and their effects on the propagation of LF, MF, HF and VHF radio waves. That article appeared in the March 2003 issue of the AURORA newsletter.

Just in case you're tired of the hot and humid weather, here's a friendly reminder of what to expect.

Cold photo byTom Sobocan

Steve M. presents Steve P. with his 25 year certificate

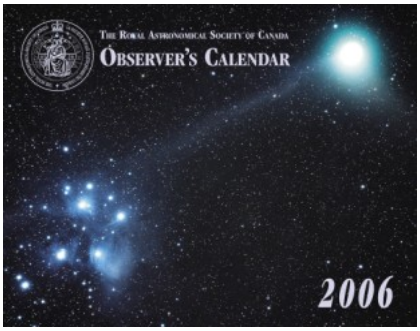
(Photo by Tom Sobocan)

The RASC 2006 Calendar ! !

Available at the September Meeting….

Member price at the meeting is only $12.00.

Get yours soon!



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1 T001 – 5 Color - Epson Stylus Photo 1200

Contact Prez Steve at mmastellotto@cogeco.ca
or Phone: 735-9046

Ask the Centre

Pondering about something in astronomy you'd like more info on. Ask away. If we don't have the answer, then it's unanswerable.

Here's the first question:

Can I view objects on the moon left by the astronauts??

The answer, for all you 'scope owners is no. And here's a site that has the reasons why:

http://curious.astro.cornell.edu/question.php?number=134

The Hallam Sky Clock

cleardarksky.com/c/HllmObONkey.html?1

The Hallam Observatory

As seen from the moon using a r-e-a-l-l-y good telescope.

Well okay… it's an aerial picture by Tom Sobocan

Time to Renew???

Don't forget that you can renew your membership at the treasurer's desk, by snailmail to the National, or online at the RASC 'store' at **http://www.store.rasc.ca/**

Centre Communications

Need Centre information and news between meetings?
A Newsgroup has been setup by Pierre Boulos on the Yahoo Groups Server called **RASCWINDSOR**.

To find out more about the ***rascwindsor*** group and to subscribe , please visit:
http://groups.yahoo.com/group/rascwindsor