

SKYNEWS



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Messier 45

The Pleiades

By Daniel Posey

This Image Appears
In the March-April edition of
SkyNews Magazine

NEXT MEETING

Wednesday Apr 13th 2016
At 7:30 PM
Room 167
Elliot Building
University of Victoria
3800 Finnerty Road

www.victoria.rasc.ca

On the Cover

Dusty Messier 45: The Pleiades

by *Dan Posey*

This long exposure emphasizes the interstellar dust surrounding the stars of the Pleiades open cluster. Sixty two 5 minute subframes, taken with a Canon 6D at ISO 800 through a Televue 127is were integrated to obtain a total exposure of five hours and ten minutes. The image was captured over two nights (November 3rd and 9th 2015) from the Victoria Centre Observatory. Each dataset was calibrated with darks, flats, and bias frames, and stacked/processed in Pixinsight.

Presidents Report

by *Sherry Buttnor*

Rain rain, go away.....good grief, will it ever stop? Sure would be nice to see some interstellar photons again, wouldn't it? Fortunately, the Victoria Centre has within it's membership many volunteers who are very good at indoor activities. Take Lauri Roche and Sid Sidhu, for example. These two dedicated RASCals have gone into our local schools 48 times in the last few months, and educated some 1800 students. These involve classroom talks, and night sky viewing. Pretty amazing! And they have more planned. And what about Bruce Lane, our capable Treasurer? He organized and facilitated a very successful Hobby Show at Westshore Town Centre Mall in February, where we had 843 visitors stop by our display. Thanks, everyone, and well done! Next major event is International Astronomy Day, on May 14th. Nelson Walker is taking the lead on the daytime segment at the Royal British Columbia Museum, then we continue on to the Dominion Astrophysical Observatory for the evening portion. Hope you can volunteer a few hours at one of these. The evening portion also kicks off our immensely popular Summer Saturdays at the DAO. More below. Meanwhile, though, we have our normally scheduled observing events for our members, all weather dependant:

-RASCals at Cattle Point on March 4th. Bruce Lane's popular observing get-together at Victoria's own Urban Dark-Sky park.

-UVic observing on March 11th. Another popular RASCals event. Observing on the 32" telescope is amazing!

-Messier Marathon on March 12th at the Victoria Centre Observatory. A long but fun observing run: try to see all 110 Messier objects in one night. Many have tried, few have succeeded! Contact Michel Michaud if you'd like to participate: VP@victoria.rasc.ca

And don't forget our weekly Astronomy Cafe, every Monday in Fairfield. John, Reg, and Chris are your hosts for a fun, informal evening, often with great guest speakers. Astro Cafe is a great way for newcomers to RASC or astronomy to meet us! victoria.rasc.ca/events/astro-cafe/

Our monthly meeting is on **Wednesday March 9th, 7:30pm, in room B150** in the Bob Wright building. This is a change from our regular room A104. B150 is in the same building, but on the far side of the main lobby. March's guest speaker is Dr. James DiFrancesco, who whose presentation is:

"The Secret Sits: What's in Our Galactic Centre?" James will discuss recent observations of the very centre of the Milky Way galaxy. At ~8 kpc from the Sun, the Central Parsec is filled with thousands of stars, but also most interestingly a supermassive black hole named Sagittarius A.

James is a Victoria Centre member, and a professional astronomer at the DAO. His talks are very popular, so don't miss it!

As mentioned above, The evening portion of IAD also kicks off our Summer Saturdays at the DAO. Plans are well underway to hold 13

Saturday evening public openings this year, but without as many breaks as last year, which was a little confusing to the public. I will provide more details as they are worked out between RASC, NRC/DAO, and Friends of the DAO.

Lots of great stuff coming up at RASC-Victoria! I hope you will join in as a volunteer, or a participant. See you out there!

Clear skies,
Sherry

February Meeting Speaker

James DiFrancesco: "The Secret Sits: What's in Our Galactic Centre?"

James DiFrancesco will discuss recent observations of the very centre of the Milky Way galaxy. At ~8 kpc from the Sun, the Central Parsec is filled with thousands of stars, but also most interestingly a supermassive black hole named Sagittarius A. This curious object is our closest Galactic Nucleus, and will soon be observed at extraordinarily high resolution (~15 micro-arcseconds) using a world-wide network of high-frequency radio telescopes in a very coordinated effort to detect an accretion disk close to its event horizon.

Bio: James Di Francesco is an RASC member who works at the NRC Herzberg Programs in Astronomy and Astrophysics. He was born in Ontario and received his BSc in Astronomy and Physics at the University of Toronto in 1990, and his PhD in Astronomy at The University of Texas at Austin in 1997. After completing postdoctoral appointments at the Harvard-Smithsonian Center for Astrophysics in Cambridge, MA and the University of California, Berkeley, James joined NRC in 2002.

Scheduled Speakers 2016

Apr 13: Dr. Helen Kirk, *Watching the birth of stars with the James Clerk Maxwell Telescope and Herschel Space Observatory.*

May 11: Maan Hani, TDB

Jun 8: Zack Draper, *Exploring exoplanetary systems with the Gemini Planet Imager*



ASTRONOMY CAFE



Our weekly **Astronomy Cafe** is an excellent, informal, way to meet us. New comers are especially encouraged. Bring your coffee mug and join the chat! <http://victoria.rasc.ca/events/astro-cafe/>

Fairfield Community Centre

1330 Fairfield Rd. Victoria.

7:30pm - 10pm

Contact: Chris Purse for further details
vp2@victoria.rasc.ca



Email Lists

Observer / CU Volunteers / Members

Contact Chris Purse to subscribe
vp2@victoria.rasc.ca



New Observers Group

Hosted by Sid Sidhu - 1642 Davies Road, Highlands. Call 250.391-0540 for information and directions.



Cattle Point observing in Victoria's own Urban Dark Sky Park:

<http://victoria.rasc.ca/events/rascals-cattle-point/>

March 4th at 7:00 pm



Victoria Centre Observatory: Every Saturday Evening

Open to those on **the Active Observers list only**

Weather permitting. Use extreme caution while driving on Observatory Hill. We're now into the season of black ice and slippery conditions, so take care.

Membership Report - March 2016

Total membership is currently **222**. There are 13 members in the grace period which means their membership has expired in the past 2 months. Please contact Chris Purse (membership@victoria.rasc.ca) if you would like to check the status of your membership.

Friends of the Dominion Astrophysical Observatory An Update

by *Ben Dorman* FDAO Chair

1) FDAO's fundraiser at the Bateman Centre last November "Science and Culture in the Inner Harbour" was sold out and raised just over \$5000. The money from this and the Indiegogo Fundraiser [August-Oct], which raised an additional \$3400, is being put towards a pilot programme for schools which is being actively worked on, plus enabling administration for the society. (As an aside, our AGM at which we will present financial reports is to be held before the end of our first year of operation, which is the beginning of June). It is expected that the school programme to start in a very limited fashion either later in the spring or [more likely] in the fall.

2) FDAO's current membership list has 183 names including family members.

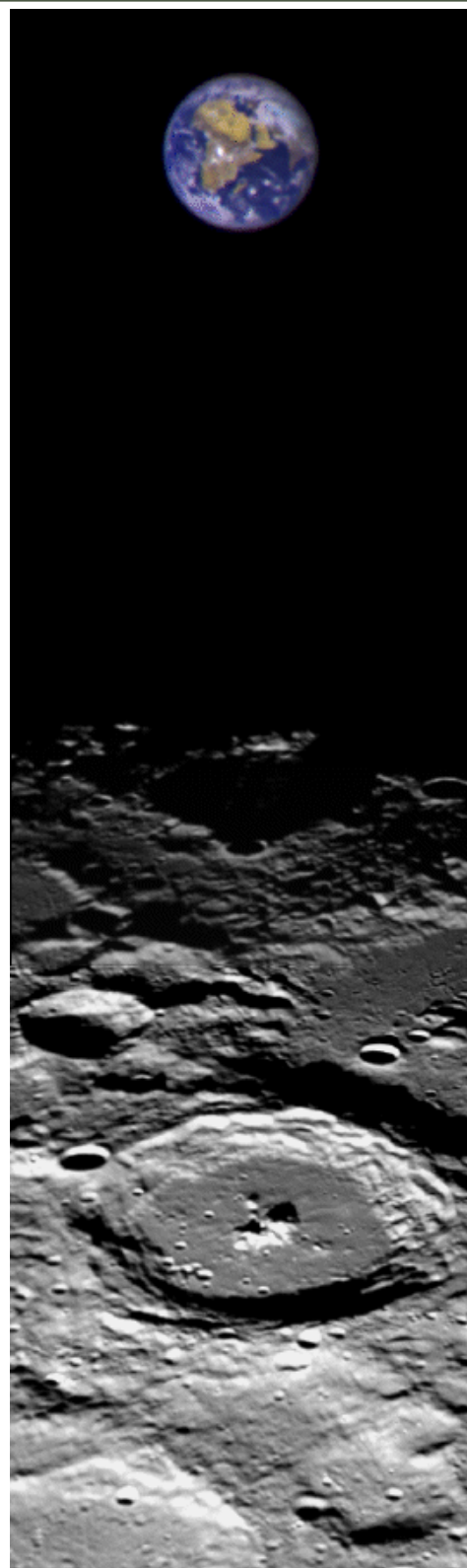
3) FDAO held an event for members of FDAO and RASC on 2016 Feb 13 at DAO, including [unfortunately] cloudy skies, but a great presentation from NRC astronomer JJ Kavelaars.

4) FDAO is shortly to conclude an agreement with NRC which is a 'License to Occupy' both the Centre of the Universe Building and the **Plaskett Dome** – naturally, for public science outreach purposes. The net effect of this for RASC is intended to be no extra paperwork and hopefully some of the administrative load for Saturday nights being taken on in future by FDAO. RASC will continue to determine Saturday night dates and programming as for the last few years.

Current state is that an agreement approved by NRC in Ottawa has been reviewed by FDAO and NRC/DAO and is awaiting final revisions. We expect to sign the agreement sometime in March.

5) FDAO has been working on other potential public tours with cruise line operators. For 2016 this programme will be limited to a few [possibly only one] selected dates.

6) FDAO is shortly going to start a program to attract volunteers for various roles on the Hill. This will ultimately assist with guides on public tours and possibly also on Saturday nights as required/requested.



Earth Rise with Plaskett Crater

Captured By Clementine Spacecraft in 1994.
Plaskett Crater is 109 km in diameter and is located near the lunar north pole on the far side.

Reflections on The Pleiades - M45

by Reg Dunkley

Dan Posey's 5 hour exposure which graces our cover this month looks beautiful. The Pleiades, however can be enjoyed with much simpler fare. It looks stunning with binoculars and is also a very conspicuous cluster using just the naked eye. In fact, this feature is referenced in the ancient folklore of numerous cultures across the globe. It often is incorporated into tales involving *seven sisters*, although most people can only discern six stars. For example Subaru is the Japanese name for the Pleiades, and the logo for the automobile, only contains 6 stars.



The Pleiades is located in the constellation Taurus. It is classified as an **open cluster** which is a group of stars that are loosely bound by gravity, share the same proper motion, similar chemical content and age. They behave like a *stellar motorcycle gang*. They are on the prowl in the same direction, with similar equipment and are prone to getting into gravitational disputes with each other and neighbours as they pass through the Galaxy. As a result stars are often ejected early and the cluster is soon disbanded.

The diameter of the Pleiades is almost 2 degrees; 4 times the diameter of the Moon. Because it is close to the ecliptic, Pleiades is occasionally occulted by the Moon. It is moving slowly towards Orion.

The Hyades cluster, also located in Taurus is the closest open cluster at a distance of 137 light years. The Pleiades cluster is located three times further away at a distance of ~ 444 light years. It consists of over 400 stars with a core radius of 8 light years. It is estimated to be

between 75 and 150 million years old and it is predicted to disperse after 250 million years.

The cluster is dominated by luminous blue stars which generate a beautiful reflection nebula. The stars act like flashlights in a smoky room and illuminate interstellar dust. The radial velocity of this dust is different from the radial velocity of the Pleiades. This dust therefore is not associated with the molecular birth cloud. The stars just happen to be moving through a dirty galactic neighbourhood at the moment as Dan's photo highlights.

Open clusters are important in the study of stellar evolution because cluster stars are formed by the collapse of the same molecular cloud at the same time. An inter comparison of Hertzsprung Russell diagrams (magnitude vs colour) can be used to determine distance. They serve as an important rung on the Cosmic Distance Ladder. So the study of open clusters like the Pleiades is important. It is more than just a pretty Messier object.



Are You Out of the Loop?

[Click Here](#) to Read Secretary Les Welsh's Comprehensive **Victoria Centre RASC Monthly Minutes and Council Minutes.**
Members Only Area
Password is required

The VCO Astro Planner

By Reg Dunkley

The Victoria Centre Observatory Astro Planner for March and April are located on page 7. The main purpose of these charts is to find at a glance **Moon Free Zones and optimize observing opportunities**. It amalgamates the times of Astronomical Twilight, Moon Rise/Set and Sun Rise/Set and is valid for the location of the VCO. The **time** is located on the left axis. Please note that although the time zone actually changes to PDT on Sunday March 13th, 2016 the **March chart remains on PST** to avoid a graphical train wreck. **The April Chart is on PDT.** The right axis relates the percentage of Moon that is illuminated for each day and it corresponds to the black sine wave curve on the chart.

Michel Michaud's Pleiades Project

by Reg Dunkley

Michel Michaud is a very active member of the Victoria Centre. He is the first Vice President, the Librarian and Co-Observing Chair. For members on the Active Observers Email List however, he is best known in his role as a Member in Charge at the Victoria Centre Observatory. It seems that whenever there is a promising observing opportunity Michel extends an invitation to join him at the VCO while he captures more images for his Pleiades Project.

But what exactly is his Pleiades Project? It involves *double stars*, an interest that Michel has pursued for nearly two decades. During the last five years he has focused his attention on double stars in the Pleiades open cluster.

Any pair of stars which are visually close are *double stars* but if they are gravitationally bound they are called *binary stars*. Meticulous measurements are required over time to determine if a double star is actually a binary. With a sufficient number of observations of a binary pair, the orbit and stellar masses can be calculated. These are very valuable quantities for astrophysicists. It is crucial that measurements of the separation and position angle of the pair are very accurate. Erroneous data is worse than no data at all. Magnitude and spectral classification or colour information is also of value.

Until recently, accurate double star measurements were tedious and involved a difficult to use device called a filar micrometer. The arrival of CCD's and DSLR cameras have simplified the process but strict procedures for calibration and data abstraction must be employed. In 2012 Michel authored a very useful "how to do it" [paper](#) on his double star measurements. He described the various steps used to ensure that the data was of the highest quality. These included the calibration of the image scale, the correction for proper motion, and the correction for atmospheric refraction. 245 measurements of 91 pairs in the Pleiades were published and added to the Washington Double Star Catalogue (WDS). Five of these pairs are labelled with Michel's unique identifier **MCD** because he was the first person to publish data for these candidates.

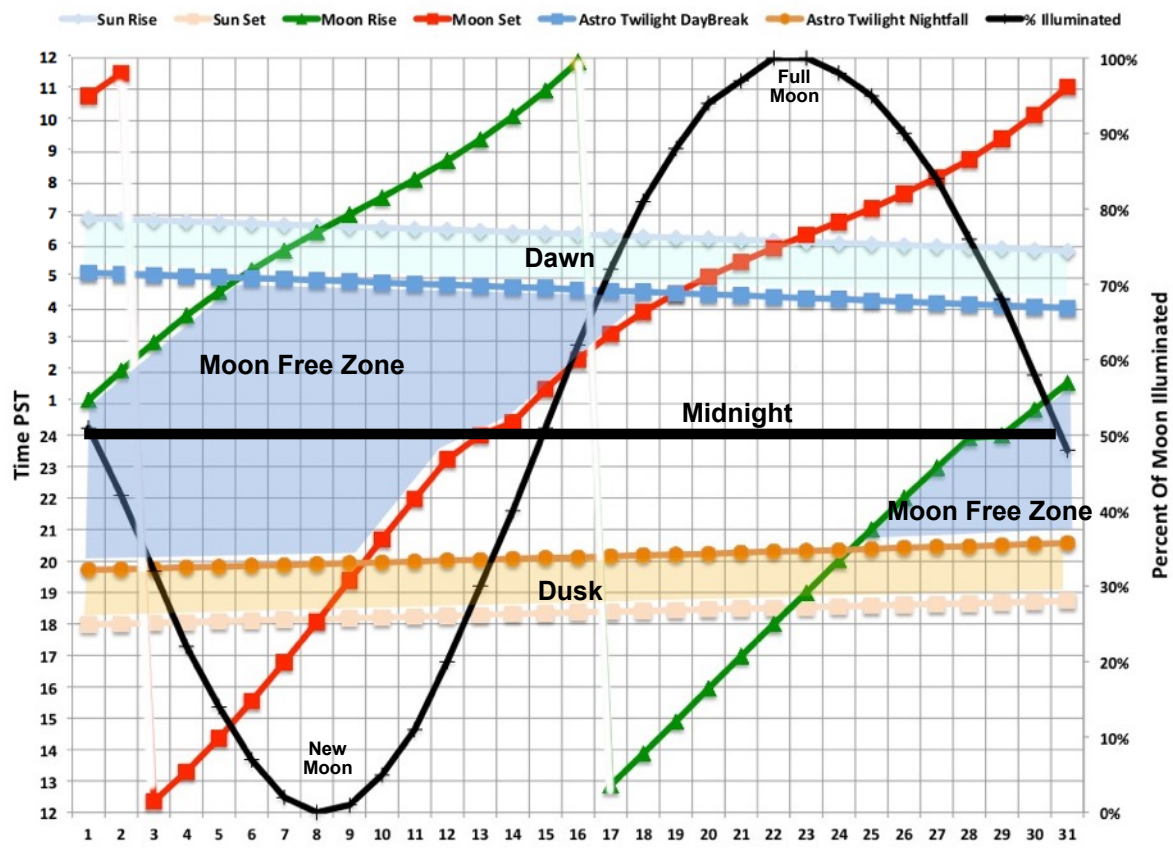


Since 2012 Michel has captured an additional 8936 images of Pleiades double stars from which he has abstracted 1200 measurements. Images are obtained using the VCO 14 inch Schmidt Cassegrain Telescope with his Canon 20a DSLR camera. Exposure times range from 2 seconds to 15 minutes and some of the stars he is measuring are as faint as magnitude 19! Michel emphasizes that the time and effort to capture the images is much less than that devoted to the data abstraction and quality control.

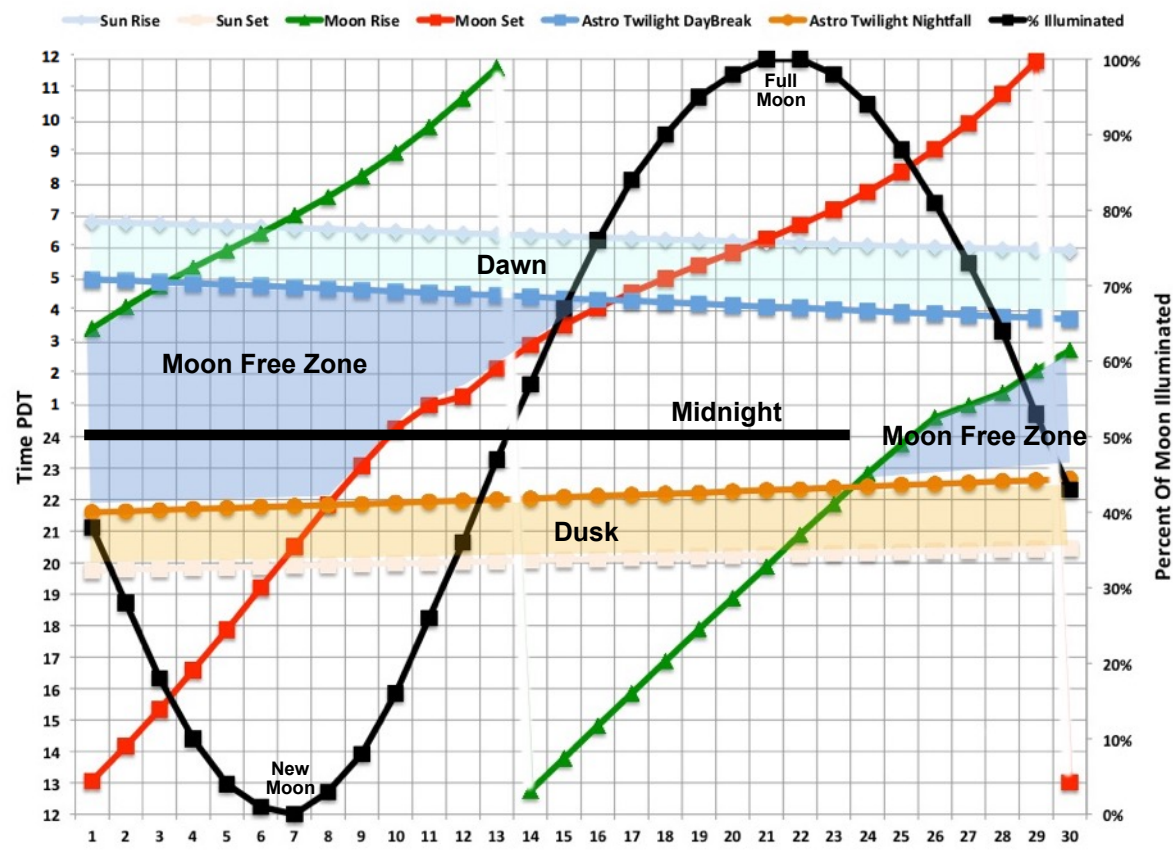
In addition to the methods described in his paper Michel is trying new techniques. For cases where the secondary star is too close to be resolved, Michel is comparing the star position with that of a distant stationary star. Any "wobble" of the candidate would detect motion about a mutual centre of gravity and indicate a binary pair. He is also experimenting with interferometry and spectrographic techniques.

Michel will soon submit many of his new measurements to the WDS catalogue to be shared with a community of over 200 double star enthusiasts. Some of these measurements may be of value even centuries from now and help determine or refine an orbit and weigh another star! Michel's dedication, patience and skill are an excellent example of how an amateur can make an important contribution to the science of Astronomy.

Victoria Centre Observatory Astro Planner - March 2016



Victoria Centre Observatory Astro Planner - April 2016



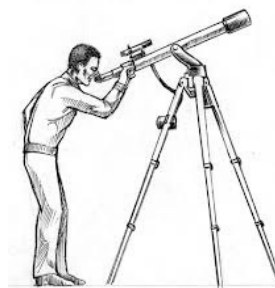
RASC Victoria Centre Council 2015 / 2016

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[Astronomy Now](#) Astronomy in the UK
[Amateur Astronomy](#) Magazine
[Astrophotography](#) Magazine



Borrowing Telescopes

The centre has telescopes for new and seasoned observers that members can use. Contact Sid Sidhu from the email list above.