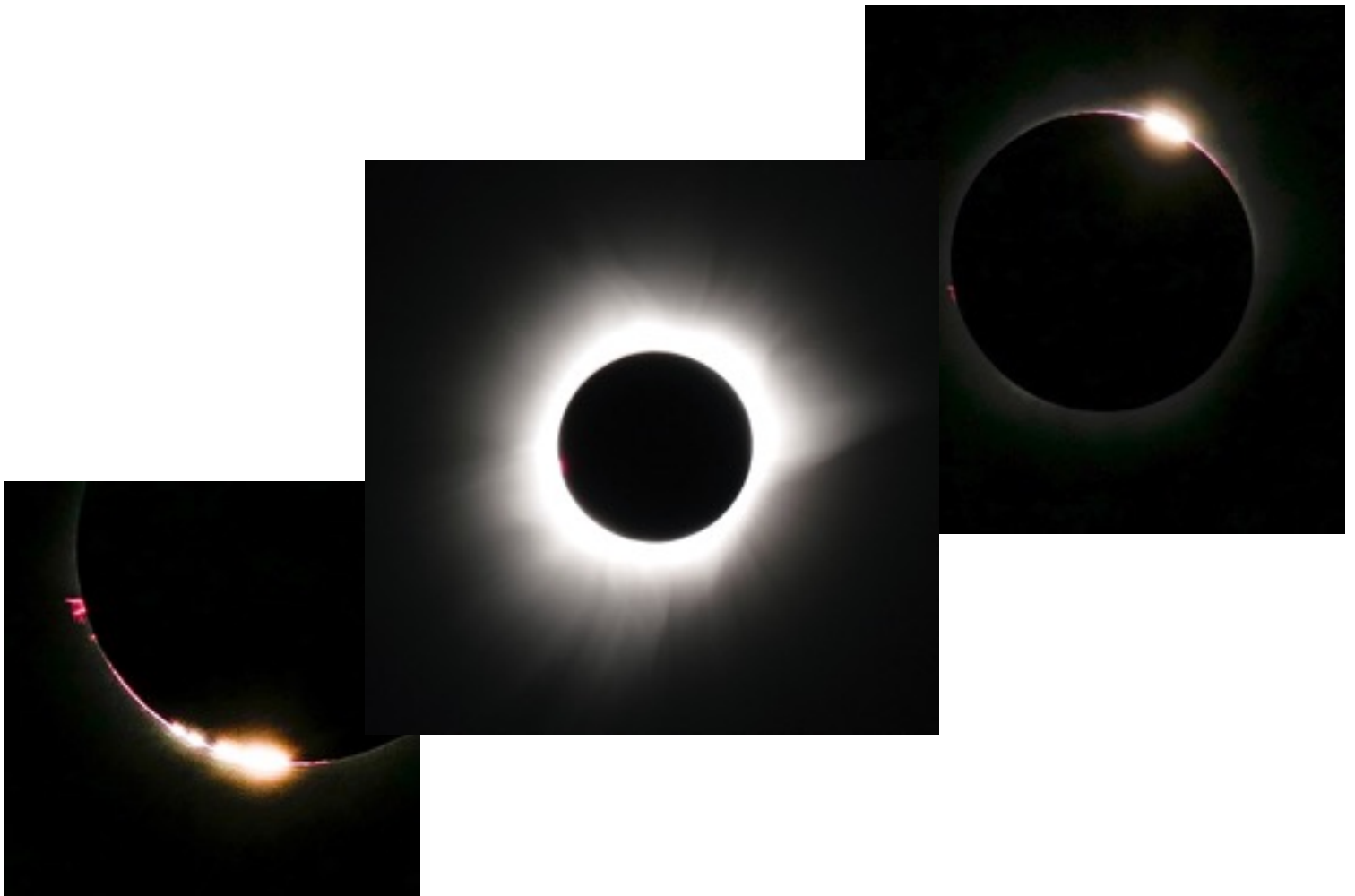


# SKYNEWS



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## Highlights of a Total Eclipse

**March 9th 2016**

By Michael Webb

Michael's Eclipse Cruise included a  
Jungle Adventure!

Read His Account on Page 4

## NEXT MEETING

Wednesday June 8th 2016  
At 7:30 PM  
Room A104  
Bob Wright Centre  
University of Victoria  
3800 Finnerty Road

[www.victoria.rasc.ca](http://www.victoria.rasc.ca)

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## On the Cover

### Highlights of a Total Eclipse

#### *A Series of Michael Webb's Photos*

March 9th 2016 found two Victoria Centre members near the equator basking in the shadows during a total eclipse of the Sun. Joe Carr was aboard a Holland America ship in Makassar Straits. Michael Webb was located further to the east on a smaller vessel in the Maluku Sea. Joe and Michael shared their experiences at the Astro Cafe later that month. Joe demonstrated a number of Solar Eclipse accessories and showed an excellent video of the eclipse. Michael captivated the audience with eclipse photos and jungle adventure stories. Don't miss his entertaining account on page 4 and stunning photos on page 5.

#### **Presidents Report** *by Sherry Buttnor*

Off we go! After months of planning, we're good to go on **Saturday May 14th for International Astronomy Day**, with public activities at the Royal BC Museum during the day, and our first of thirteen Saturday evening "star parties" at the Dominion Astrophysical Observatory that evening.

I want to offer my heartfelt thank you to all the amazing Victoria Centre members who have stepped up once again to volunteer their time at the upcoming events. The public loves what you do, and I deeply appreciate the contributions of each and every one of you. In particular, special thanks go to David Lee (guest speakers and scheduling), Chris Gainor (media relations), Nelson Walker (volunteers and scheduling), Matt Watson and Joe Carr (EventBrite), Matt Watson/Stocksy and Lauri Roche (posters), and Jim Hesser, who is always ready to help us navigate the complexities of working with the NRC/DAO side of things. And speaking of the NRC and DAO, none of this would be possible without the generous assistance of staff on the Hill: Kevin Farris, David Bohlender, Clyde Donnelly, Marilyn Bell, Dave Balam, and Dennis Crabtree. Many thanks also to Kim Gough

(RBCM), Saunders Subaru (posters), and all the Victoria Centre members who support us with their memberships. THANK YOU, everyone. Let's have a great summer sharing the universe!

Recently, the **Vancouver Island Science Fair** was held at UVic. In addition to our guest speaker, we have a special treat for members attending our May monthly meeting (Weds, May 11, UVic): two of the deserving award-winners will be in attendance:

**Ines Khouider** Grade 7 St. Margaret's School "Light Pollution: What's the Solution?" Ines's project was second overall in the Intermediate Division.

**Nathan Harlan** Grade 6 Home Learner

"Cosmic Ballistics: Trebuchets in Space!"

Nathan also received a prize from our very own Quarky Science. They will be set up at the front of our meeting room A104 at 7:00pm. Please come early and congratulate these amazing students!

**TRANSIT of MERCURY:** don't forget, Mercury will transit the Sun this coming Monday, May 9th. Unfortunately, the transit will be well underway at sunrise, but several Victoria Centre members will be setting up atop Mt. Tolmie in the pre-dawn hours to observe this transit. All are welcome to join them for this interesting astronomical event. In other Centre news, Sid Sidhu and Lauri Roche run our school outreach program; Sid reports they have visited local schools 50 times since September, with one more to go, and have shared astronomy with almost 1000 students. Well done! And just a reminder of our next **UVic Telescope Session on Friday, May 13**, weather permitting. These sessions are open to all Victoria Centre members, not just VCO Active Observers. The Spring sky is a cornucopia of galaxies; watch for our email notice, and join us! We welcome new members! If you're not a Victoria Centre member please join us! Just contact Chris ([VP2@victoria.rasc.ca](mailto:VP2@victoria.rasc.ca)) and he will show you how.

Thanks again, everyone, and clear skies!  
*Sherry*

## May Meeting Speaker

### Maan Hani UVic Astronomy: *"Hitchhiker's Guide to Other Galaxies"*

Since the earliest civilizations, we have been trying to understand the night sky. In the past century, following the Great Debate over the nature of "spiral nebulae" (known today as spiral galaxies), we witnessed the rise of extra galactic astronomy. Today, our understanding of galaxy formation and evolution is on the rise owing to revolutionary progress in observations and theory. In this talk, I will share our current understanding of galaxies and their exciting lives.

Bio: Maan H. Hani is an Astronomy PhD student working with Prof. Sara Ellison at the University of Victoria. After completing a Bachelor of Science with honours in Astrophysics at Saint Mary's university in 2013, Maan continued working under the supervision of Prof. Rob Thacker and completed a Masters in Science in Astronomy in 2015. Maan is particularly interested in understanding the big picture of how galaxies form, evolve, and interact with each other and their environment. His past research has focused on modelling star formation and BH activity in galaxy simulations. Both, star formation and black hole activity, are thought to be closely tied to galaxy evolution making proper models of such processes essential to our understanding of how galaxies evolve.

## Scheduled Speakers 2016

**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](mailto:vp2@victoria.rasc.ca)



### Email Lists

#### Observer / CU Volunteers / Members

Contact Chris Purse to subscribe  
[vp2@victoria.rasc.ca](mailto: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/>

Next Session Postponed Until September Due to Late Twilight



### Victoria Centre Observatory: Every Saturday Evening Changing to Every Friday Evening after May 14th.

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

Weather permitting. Dress warmly, and see you out there.

### Membership Report - May 2016

Total membership is currently **225**. There are 16 members in the grace period which means their membership has expired in the past 2 months. Please contact Chris Purse ([membership@victoria.rasc.ca](mailto:membership@victoria.rasc.ca)) if you would like to check the status of your membership.

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## TOTAL SOLAR ECLIPSE....a perfect excuse for a trip.

*By Michael Webb*

The TSE of March 9 2016 traced a dark line from west of the island of Borneo, across Indonesia and off into the Pacific Ocean. It presented an opportunity to visit some "off the beaten track" places full of 40 degree heat, wild animals, different cultures, food and religions. What could a three minute interruption in the sunlight do but add to the excitement?

This would be our 6<sup>th</sup> TSE in the last eleven years. Given that all total eclipses will cease (as the moon moves away from Earth) in a billion years, one does not want to waste time.

After a 34 hour journey we arrived in Darwin Aus, recovered for a couple of days before attending a 2 day trip to Kakadu National Park..Aboriginal Rock paintings, various birds in the billabongs, and an unforgettable stay in the Kakadu Crocodile motel..with a can of bug spray in every room!! Great coffee in the lobby and no experience quite like walking through the gaping jaws of a crocodile shaped motel..left leg or right for your room. The air conditioning worked. We slept through the overnight downpour.

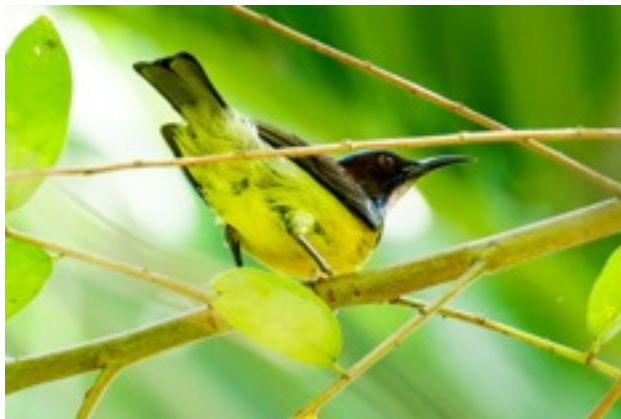
After a cool( 35 degree) morning hike, we boarded our bus driven expertly through several recently flooded roads and deposited three hours later at the docks to board the Ponant Cruise lines Soleal along with 200 eclipse chasers and a couple of dozen astronomers, wildlife biologists, cultural ambassadors and the like. Lovely ship.

Entering Indonesian waters over a few days, we had been lectured on cultures, spices, history of the areas and had our minds changed regarding some of the "good" western "civilization" brought to the area. We were offloaded numerous times from Zodiacs into places with excellent snorkeling, fine sand or hikes into the jungle to have troops of macaques literally running

around us. Once you saw their teeth, you became a little cautious. The day before eclipse day, was spent in Ternate where billboards proclaimed the oncoming event. Posters with generals and other officials made it seem that it was a gift from the government.

The eclipse was spectacular. The ship moved 90 miles from our planned point and traded a few seconds of totality for nearly perfect conditions. Though you sacrifice a little stability on a ship, the ability to react to weather is a real plus. In moving from our initially planned position, we crossed the equator three times in a 24 hour period. Thankfully, the King Neptune..kiss the fish, get covered in flour and fish soup "tradition" only happened once on crossing the equator.

Once anchored in Sandakan Malaysia, we took the Kinabatangan River overnight trip. While many of the animals we saw could be seen in rescue centres near Sandakan, this trip gave us the chance of experiencing them in the wild. Pygmy Elephants were spotted along the river. Proboscis Monkeys, various reptiles (usually above our heads) to beautiful birds and giant butterflies... we saw them all. After dinner we were invited to dance in native dress..everyone had a blast. The last morning a 6AM wakeup call had us looking for and finding a single Orangutan..the wild man of Borneo. A long high speed boat ride back to the ship was the precursor to a final evening and over night before docking and departure from Kota Kinabulu. Trip of a lifetime..you bet ..can't wait for the next.



**Brown Throated Sunbird by M. Webb**





### **Some of Michael Webb's Jungle Adventure Photos**

Top: Pygmy Elephants

Middle: Blue Eared King Fisher

Bottom: An Intimidating Macaque



### **National Rep Report for May 2016**

*by Lauri Roche*

Counting down to the RASC London Ontario General Assembly (and Astrocats)! It begins on May 19<sup>th</sup> and goes through the weekend with a golf game, astrophotography school, barbeques, star gazing, trips and tours, lots of meetings, presentations and lectures and, let's not forget the social scene at the end of each day. I am looking forward to meeting friends from across Canada. There is still time to sign up so come if you can. I will be reporting on the GA for our June meeting.

The RASC National website has lots of information on other up-coming events. All the star parties are listed so that you could plan to travel from one end of the country to the other between June and September visiting a lot of dark sky sites but don't forget to come back for our Metchoshin Star Party in August.

There is an excellent new resource on the Total Solar Eclipse in the summer of 2017 for \$34.99 at the [e-store](#). Have someone buy you one for your birthday or as an early Christmas present. Also check out the tours that the RASC are planning for the eclipse and to other Canadian and American astronomical sites.

If you have any questions or comments about the National RASC please don't hesitate to contact me at [nationalrep@victoria.rasc.ca](mailto:nationalrep@victoria.rasc.ca)

Lauri Roche

## RASC goes to the Vancouver Island Regional Science Fair

by *Lauri Roche*

The Regional Science Fair was held at UVIC on April 10th and 11th this year. Four of our Victoria Centre members, Dorothy Paul, David Lee, Diane Bell and Lauri Roche, were in attendance for judging and awarding prizes. We are happy to announce that we have two Honorable Mentions this year, one from the Elementary Category and one from Intermediate.

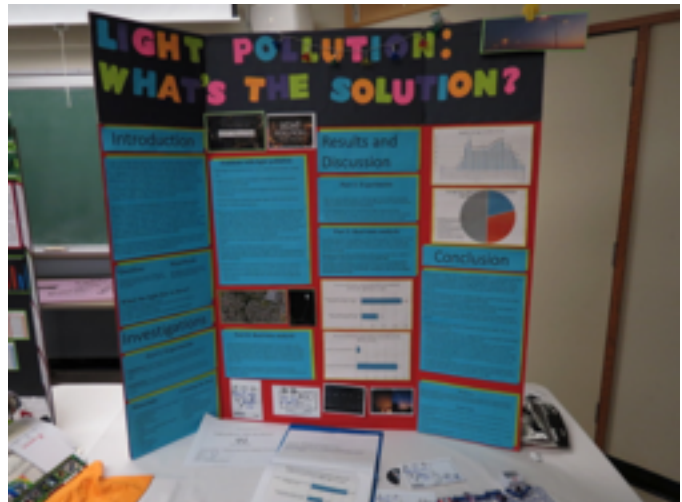
Our Elementary winner was **Nathan Harlan**, a grade six home learner, who did a project on **Cosmic Ballistics: Trebuchets in Space!** We had to watch where we were standing or we were attacked by flying objects as he showed how his trebuchet worked and what might happen on different planet surfaces. Nathan's work was also awarded a prize from our very own Bruce Lane from Quarky Science.

The Intermediate winner was **Ines Khouider**, in grade seven at St. Margaret's School. Her project, **Light Pollution: What's the Solution?**, gave her a forum to show how she would use "Needs-Only" lighting in neighbourhoods. Ines came in second place overall in her division and also won awards from the Association of Professional Engineers and Geoscientists of BC and from PARC systems.

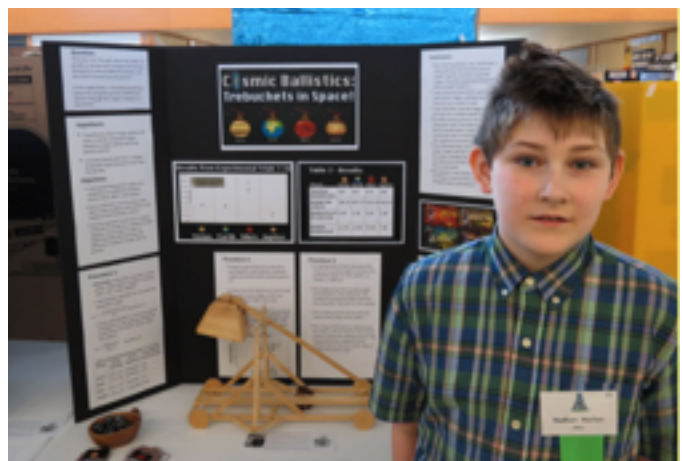
Congratulations from all of us at the RASC Victoria Centre to these students. We are fortunate to have both Nathan and Ines visiting our General Meeting on Wednesday, May 11<sup>th</sup> at UVIC. They will be setting up their projects at the front of A104 and we encourage all our members to visit their displays, talk with the students, ask questions and be amazed at what young people are doing in science these days.



**Diane Bell with Science Fair Winners  
Ines Khouider and Nathan Harlan**



**Ines Khouider's Light Pollution Project**



**Nathan Harlan With His Cosmic Ballistics Project**



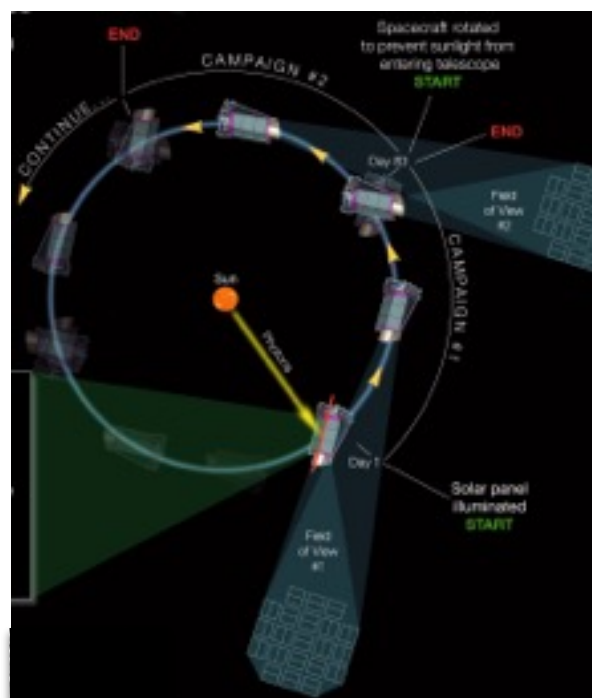
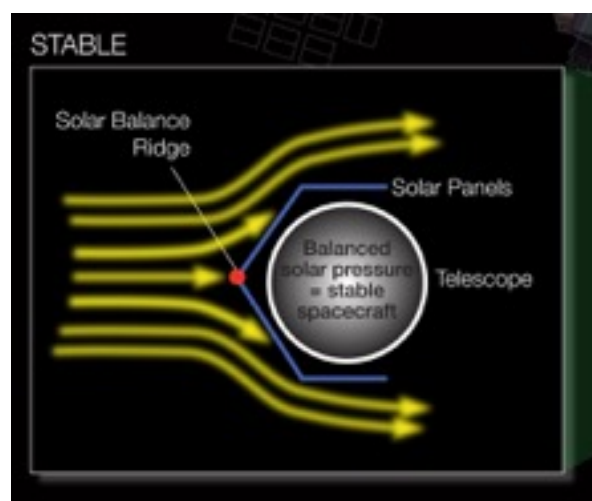
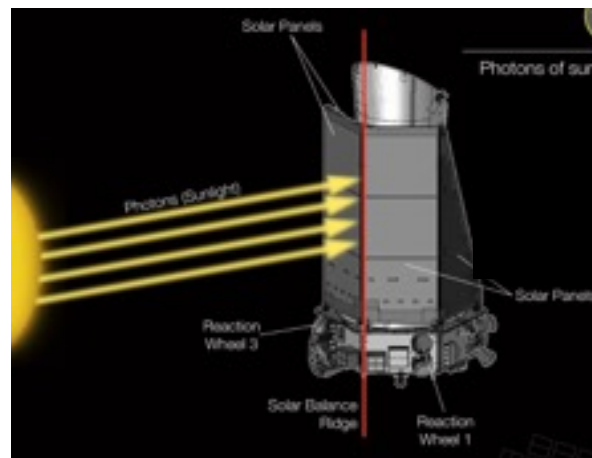
## K2 - Repurposing a Space Telescope

by Reg Dunkley using sources from [Kepler Science](#) and [Kepler Mission](#) websites

Not to be confused with the second tallest mountain on Earth, K2 refers to an innovative project to repurpose the wounded Kepler space telescope. You may remember that Kepler enjoyed a highly successful and prolific career estimating the abundance of Earth sized exoplanets that orbit nearby stars. Headlines were made when exoplanets were discovered that orbit within the habitable “Goldilocks Zone”.

Launched in 2009, the 0.95 m diameter Schmidt telescope had an unusually wide field of view ... roughly the size of your hand viewed at arms length. It was designed to continuously measure with great precision the brightness of over 100,000 stars near the constellation Cygnus during a 3.5 year period. The instrument could detect minute periodic variations in light intensity caused by transiting exoplanets. It was critical that the telescope kept pointing at the same area during this lengthy interval. This was achieved by positioning Kepler well away from the gravitational, magnetic and radiational influences of Earth. As a result it did not orbit the Earth at all but rather orbited the Sun in an Earth trailing orbit. In order to stabilize the orientation, Kepler had 4 reaction wheels which could slightly torque the spacecraft when required. A minimum of 3 reaction wheels were required to keep the telescope on target. By May 2013, however, two of these reaction wheels had failed and the Kepler Mission came to an end.

To date data collected by Kepler has confirmed over 1000 exoplanets from 440 stellar systems. Due to its great success and since the telescope itself was still functioning well there was strong interest to find alternate missions for this remarkable instrument. An ingenious proposal, dubbed K2 was accepted by NASA in May 2014. With two reaction wheels still functioning it was proposed that the pressure exerted by the Solar wind could act as a “third wheel”! In order to achieve this, the team exploited the the symmetrical nature of the solar panels. Kepler was reorientated so that the ridge line of the solar panels lay in the orbital plane. The pressure of the Solar wind was sufficient to stabilize the spacecraft.

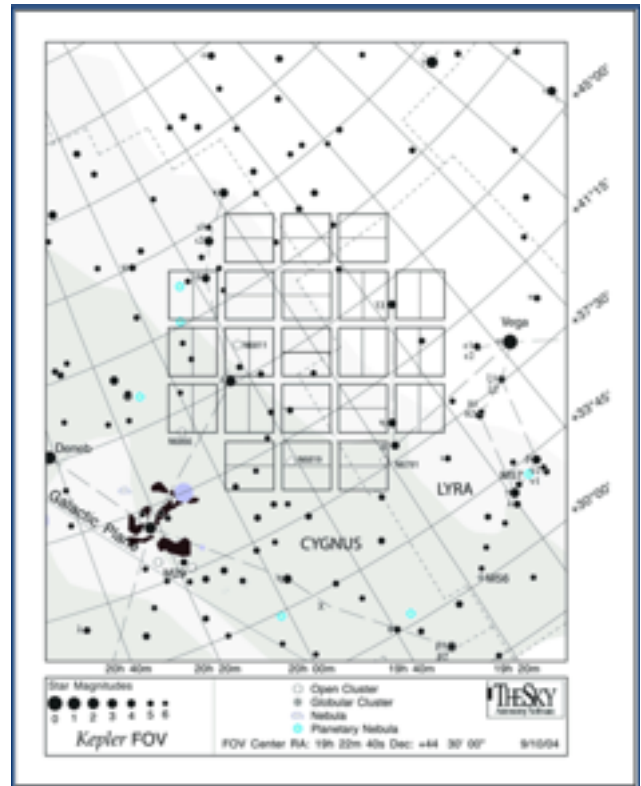


As Kepler orbited the Sun, thrusters were occasionally applied to maintain it's orientation. In order to avoid glare from the Sun the target would have to be changed every 83 days. This is a shorter observational interval than that enjoyed by the original Kepler mission but it is sufficient to detect shorter period exoplanets in a much wider area of the sky and monitor other events including supernovae. Each of these 83 day intervals is designated as a "campaign". The axis of the telescope is parallel to the solar panel ridge. As a result the zone of potential targets is confined to Kepler's orbital plane which is fairly close to the Earth's ecliptic plane.

The Pleiades lie close to the ecliptic plane and during Campaign 4 (Feb 7 2015 to Apr 23 2015) K2 collected data on that open cluster. You may recall that Michel Michaud's Pleiades project was described in the March 2016 edition of SkyNews. Maybe some of the K2 photometric data could complement Michel's project. All Kepler and K2 data is freely [available](#) and click [here](#) to find the location and schedules of the K2 campaigns.

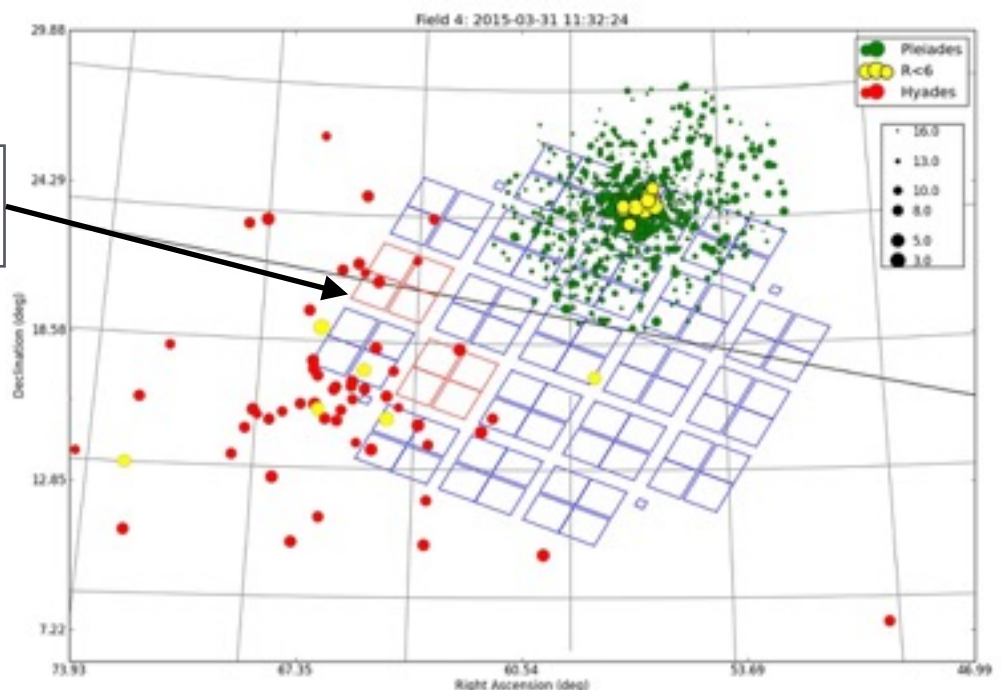
On April 7th 2016 K2 experienced a problem and the spacecraft went into Emergency Mode. NASA engineers [rallied](#) to the cause and the Kepler spacecraft was once again measuring starlight on April 23rd.

***What a talented team!***



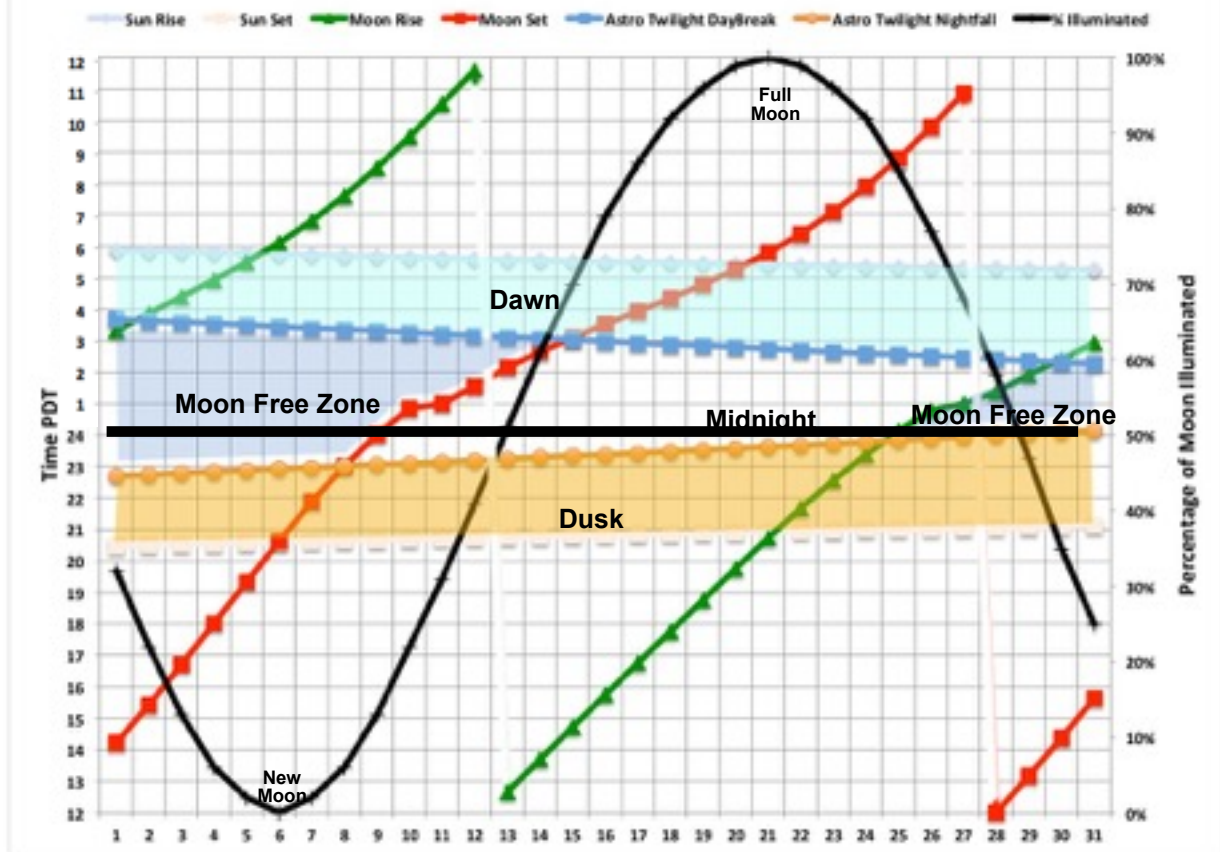
**Above** Original Kepler Mission FOV  
**Below** K2 Campaign 4 FOV Includes Pleiades

Kepler photometer consists of an array of 42 CCD's with a field of view (FOV) as shown

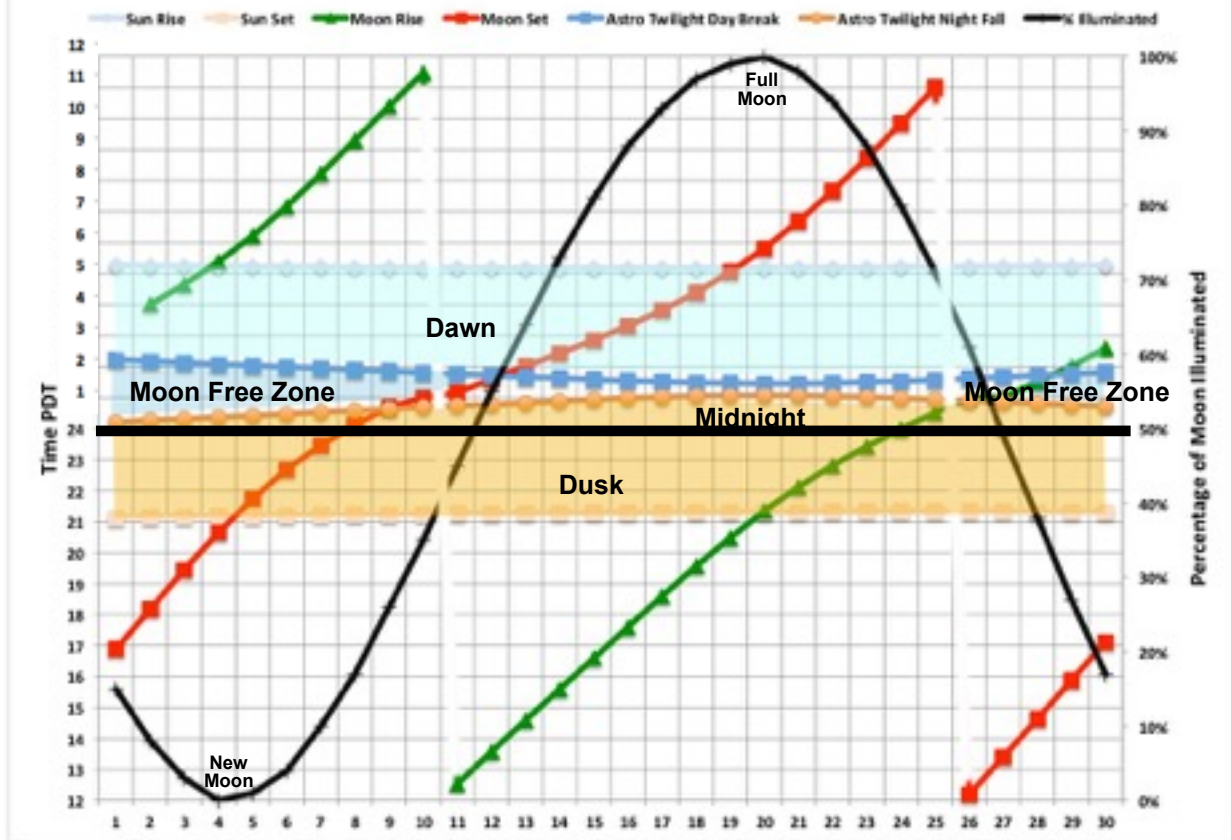




# Victoria Centre Astro Planner - May 2016



# Victoria Centre Observatory Astro Planner - June 2016



## RASC Victoria Centre Council 2015 / 2016

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NRC Liaison	James di Francesco	
UVic Liaison	Alex Schmid	
Member at Large	David Lee	

### Online Resources

#### Magazines

[SkyNews](#) Our National RASC Newsletter  
[Sky & Telescope](#) Magazine  
[Astronomy](#) Magazine  
[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.