

# STARDUST

Newsletter of the  
Royal Astronomical Society of Canada  
Edmonton Centre



September 2014

Volume 61 Issue 1



C/2012 K1 (PANSTARRS)  
Canary Islands 1 High Mag  
Jun 22nd, 2014 21:44:44 UTC  
Taken by Franklin Loehde



Comet C/2012 K1 (PANSTARRS), taken 2014-06-22. Image by Franklin Loehde and [SLOOH](http://SLOOH).  
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**Mailing address** RASC Edmonton Centre  
788, 10301 104 St.  
Edmonton, AB, T5J 1B9  
Canada

**Observing Deck** 780-452-9100 x2249

**On the web** <http://edmontonrasc.com>  
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**Stardust submissions:** Submit articles by email to the editor (see above). **Submission deadline** is the 2nd Sunday before the monthly meeting. Meeting dates are on the following page. Any standard document format is fine (MSOffice, OpenOffice, LibreOffice, AbiWord,) but **plain text is preferred**. Do not try to layout and format your article; your labour will only be discarded. Graphics may be submitted as separate files, and clearly identified; indicate references to them within the text. Do not consider your article successfully submitted until you receive a confirmation email from the editor.

## Upcoming Events, Meetings, and Deadlines

**Regular Meetings** are held monthly (see below) from September to June at 7:30pm in [Telus World of Science, 11211 – 142 St.](#)

**Admission is free, and everyone is welcome** to attend, member or not. Follow the signs from the main entrance.

**Observers meetings** are held monthly (see below) at [Boston Pizza, 10543 – 124 St.](#) Contact the observing\_group @ edmontonrasc.com for details.

**Council meetings** are held monthly (see below) from September to May at 7:15 in the 5<sup>th</sup> floor observatory of the [CCIS\\* Building](#) on the U of A campus. Any RASC Edmonton member may attend.

\* Centennial Centre for Interdisciplinary Science

### MEETINGS 2014

2014	Regular	Council	Observers	New Moon	Full Moon	Blackfoot
September	8	22	15	24	8	26-27
October	20	27	15	23	8	24-25
November	10	24	17	22	6	21-22
December	8	-	15	21	6	19-20

**Edmonton Area Astronomy Discussions:**

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### SLOOH Survey for RASC members by Franklin Loehde

For those members that have used our Centre account or their own personal account to take pictures from the telescopes on the Canary Islands and/or Chile when it was operating, I would like to hear from you so as to assess the potential and existing uses for our broader memberships and others affiliated with us.

You can reach me, Franklin Loehde, at [franklinloehde @ yahoo dot com](mailto:franklinloehde@yahoo.com)

At the GA in Victoria, I attended the paper sessions. All of the talks were fascinating, but one given by Robert Dick really attracted my attention. He discussed the red lights that are so commonly used to do astronomy, and the idea that red light may not be the best to use. In order to read charts or do drawings you have to make the red light too bright, which actually hurts dark adaptation. You can also forget about seeing red colours on charts when using red light.

Robert looked at the way the eye is constructed and how it responds to various wavelengths of light. I admit I don't fully understand everything he said so I hope that Robert or the reader doesn't mind if I paraphrase quite a bit. Apparently the rods in the eye do not provide as good a resolution as the cones. We use our sensitive rods for a lot of our dark vision so the less we can affect them the better. Robert suggested using amber light with a spectral emission that only slightly affects the rods and let the cones do most of the seeing. That way the rods are preserved while giving low light sensitivity and the cones give good resolution. Robert claimed that he could use sufficient light shining on the ground (1 to 3 lux), turn off the light, and then turn around and within seconds see the Milky Way. That works if the colour of light is amber.

Robert also found a supplier whose product is a Light Emitting Diode (LED) that generates light at the proper wavelength. Fortunately I was able to purchase several of the LEDs from Robert and thus this project was born.

Let me be the first to admit that I'm so old that all my electronic projects were done the old way. That is electrical tracks or traces on a board with holes drilled to where you could solder. The LED provided by Robert was (GASP) surface mounted. Surface mount has the advantage that electronic boards can be very small but soldering a surface mount item I found to

be very tricky. You also need to supply pads instead of having traces and holes drilled. To be honest, I haven't the time or desire to make my own boards. The idea of the fine drilling and the disposal of chemical compounds does not appeal to me.

For these reasons I decided to out-source the layout of my board. I used a program call [ExpressPCB](#). This program allows me to make schematics as well as board layouts that can be ordered online. I found this program fairly easy to use and the service was fast and efficient. Be warned, however: it is fairly expensive.

The LED requires 3 volts to operate and to adjust the brightness I used a process called pulse width modulation (PWM). PWM means that the power is supplied for a small period of time. The period can be adjusted. For example I used a frequency of 5000 cycles per second. A 50% PWM means that power is only supplied for 2500 of those cycles. A 0% PWM means no power is supplied while 100% PWM has the power on all of the time. Many embedded microcontrollers offer a PWM module and I used a Pic 18F2553 for my project. I used this device for no other reason than I had it lying around my work bench.

To be fair, Robert supplied me with a drawing using a 555 timer to control the LED. This is a very simple circuit and is cheaper but I had no 555 timers lying around. In any event I enjoyed writing code for this project so I went a different route. I have a copy of Robert's 555 timer circuit if anyone is interested.

For construction I ordered a larger electronic board from ExpressPCB which had the pads for the LED on a separate section (**Figure 1**). This allowed me to cut off the pads from the rest of the circuit board. I then cut a small hole in my project box and hot glued the LED into the small hole. Using a Dremel I also cut holes to allow for all the switches and mounted them.

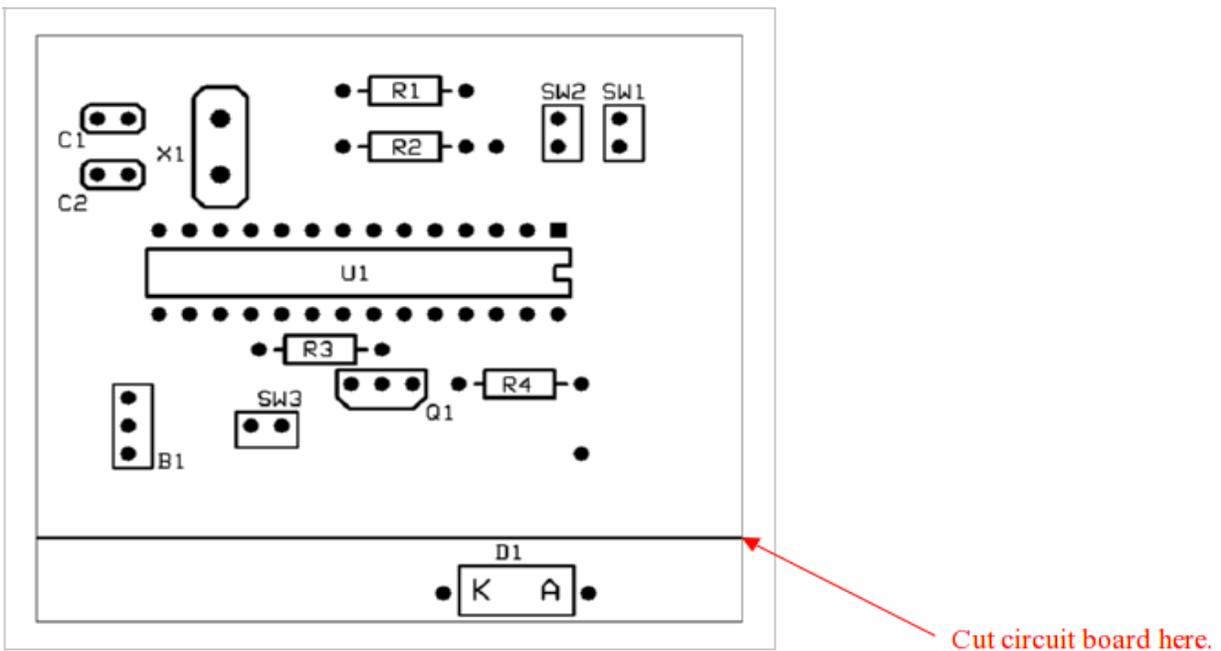


Figure 1

Due to the size of my box and the voltage requirements, I was forced to use 4 N size batteries. I did this to provide a 3volt source for the amber LED and a 6 volt source for the microprocessor. The battery holders were hot glued inside the project box. It was then just a matter of soldering the proper

components into place, inserting the batteries and turning it on. When I heard no popping noises nor smelled any smoke and saw that the amber LED was turned on I knew I had my project working. **Figure 2** shows the schematic for my project and **Figure 3** shows some construction details.

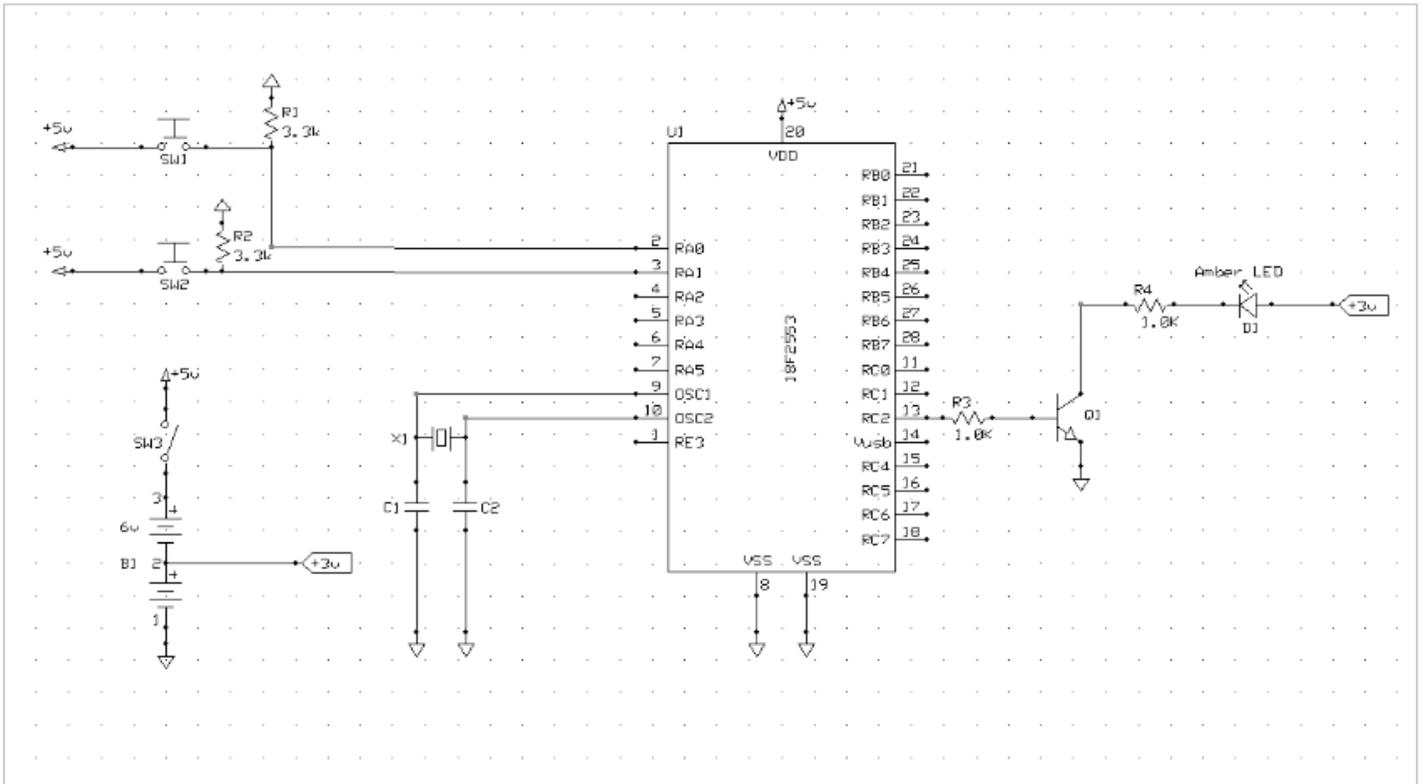


Figure 2

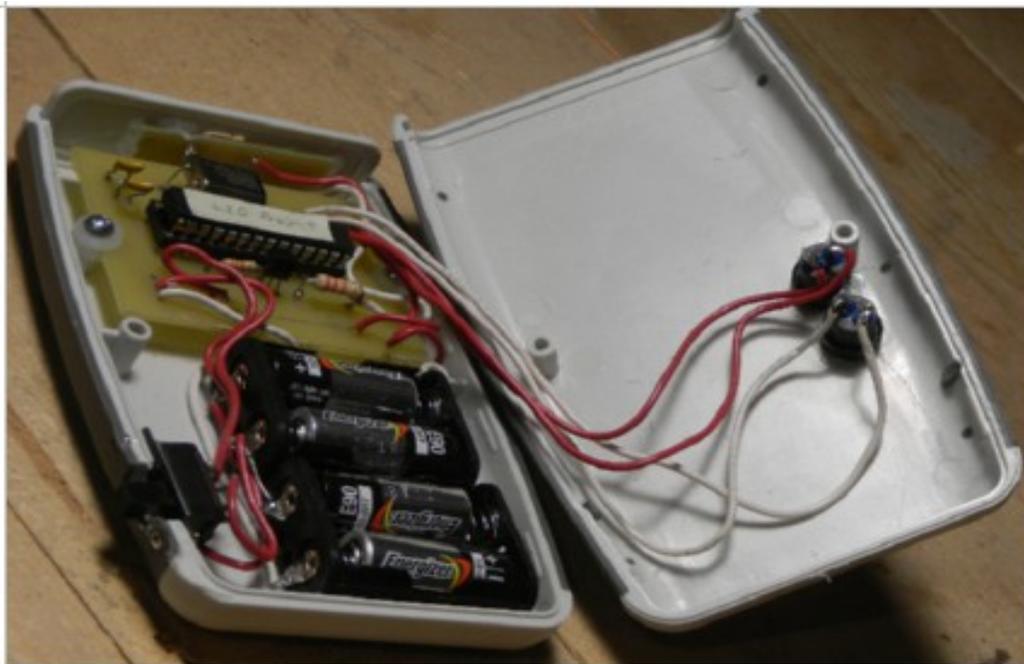


Figure 3

Whenever you use a microprocessor you need to tell the microprocessor what to do. You do this by writing code. For myself, writing the code is probably the part I like best. It's when you can be the most creative. I use a compiler written by [MikroElektronika](#) and a programmer made by the same company. To be honest the code was dead simple to write as MikroElektronika has a large library of sample codes. I just used the PWM sample and made minor tweaks to it.

The final part of this project will be testing and my testing will probably go on long after this article has been written. I've already noticed that there is very little change in brightness with the higher PWM values so I'll probably write the higher PWM values out of my code. I'll also have to play with how fast the

brightness changes so that I have it set to my liking. This is the advantage of using a microprocessor as I just remove the chip, rewrite my code, program the chip and re-install it all without changing any devices on the circuit board. **Figure 4** shows the completed flashlight.

Of course the final tests will be at a dark site. I am fully aware that some members don't like change the way that they observe and certainly don't like digital equipment. I will try to be sensitive to those observers and (where possible) set up a little bit away from other observers. In this way I hope to setup an amber led test area. If you want to visit me at the telescope don't worry I'll still have my red flashlight at least until I'm fully comfortable with the amber one.



*Figure 4*

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#### **Beaver Hills Dark Sky Preserve Annual Star Party** by Sharon Morsink

On Friday August 31, 2014, the 9th Annual [Beaver Hills Dark Sky Preserve Star Party](#) took place at Elk Island National Park. This year there was a fun mix of music, games, displays, talks, and of course lots of telescopic observations of the Sun, Moon, planets and stars. In addition we had an interesting mix of weather.

The day's events started off at 2pm with very windy weather. The solar telescopes were set up in the telescope field, and inside a very large tent we set up displays. Kathryn and I helped out at the RASC booth and showed people how to use the RASC planispheres. Kathryn also got kids to colour their own exoplanet (**Photo 1**). I brought along a few hundred UV sensitive plastic beads that are coloured when exposed to UV light and are white otherwise. People made bracelets out of them, and these were so popular that I realized that I had better hold onto the last bag of 250 beads and ration them out so that they didn't disappear too quickly! **Photo 2** shows a nice macrame bracelet that one of our more talented visitors made using the beads. In this tent there was also an inflatable planetarium and booths from other Dark Sky partners, like the [Ukrainian Village](#). The tent was a great place to be when it started raining! Luckily the rain only lasted for about 15 minutes.

During the first few hours it was mainly cloudy (and sometimes rainy!) so the solar observers didn't see much light. But by 5pm it cleared up, and at this time we could view the Sun in earnest. The Sun was excellent: lots of spots with interesting penumbral features, a really large filament, plus some small prominences. **Photo 3** shows some of the RASC solar observers. Our guest speaker, [Stephen Ramsden](#), is a solar observing specialist, and he brought along two spectroscopes which I really enjoyed looking through. **Photo 4** shows Stephen Ramsden protecting his spectroscopes from me.

As the Sun started to dip behind the big island in Astotin Lake, astronomers started to set up their evening scopes. **Photo 5** shows a few of the RASC volunteers with their telescopes. Unfortunately the talks by Stephen Ramsden and Stefan Cartledge started at 8pm, and I had to make a difficult decision about whether to go to the talks or to stay outside and watch the Sun set. I ended up watching the Sun set over Astotin Lake (**Photo 6**). The view Eastwards towards the telescope field was also very pretty during sunset (**Photo 7**). Luckily my Mom joined me on this outing, and she attended Stephen's talk, which she enjoyed.

The evening featured a very nice triangle composed of the

Moon, Saturn and Mars. In **Photo 7** you can see the triplet: Saturn is to the right of the Moon, Mars is below, with the Moon reflected in the lake. The rest of the evening was a mix of clouds and clear bits. Looking through various telescopes I saw the Moon, Saturn, Alberio, M13, and M15. I know that some people

also saw the Ring nebula. Near the end of the evening a nice, if somewhat faint display of aurora started up. It was a wonderful end to an excellent day.

Thanks to Sherrilyn Jahrig for organizing this event!

**Photo 1: Kathryn showing off some of the exoplanets.**



**Photo 2: The prize-winning macrame UV bead bracelet.**







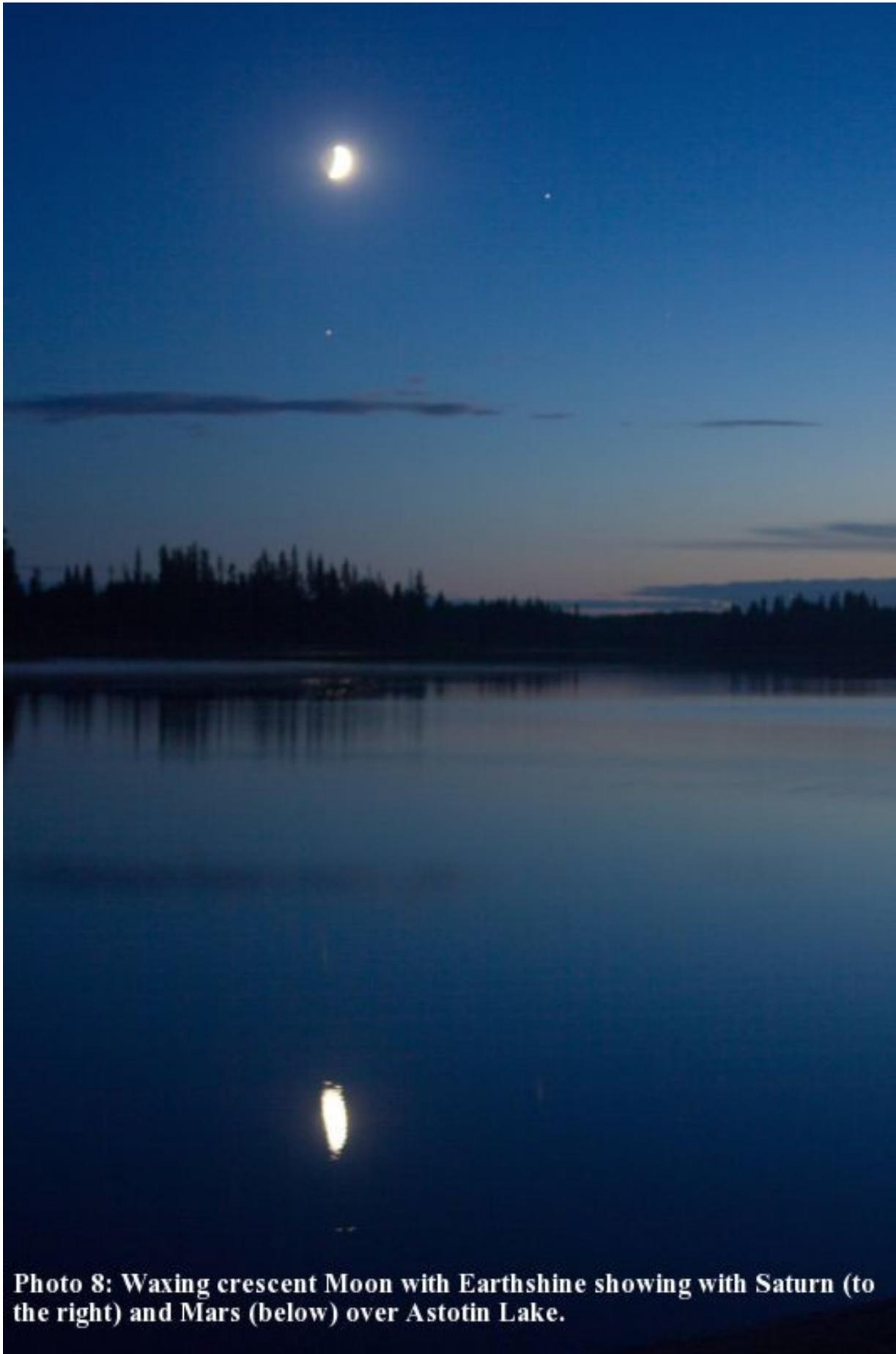
**Photo 5: Some of the RASC volunteers with telescopes. Clockwise from upper left: Chris with the Moon, John, Paul, Luca, and Sherry.**

**Photo 6: Sun setting behind the island in Astotin Lake.**



**Photo 7: The view East towards the telescope field during sunset.**





**Photo 8: Waxing crescent Moon with Earthshine showing with Saturn (to the right) and Mars (below) over Astotin Lake.**

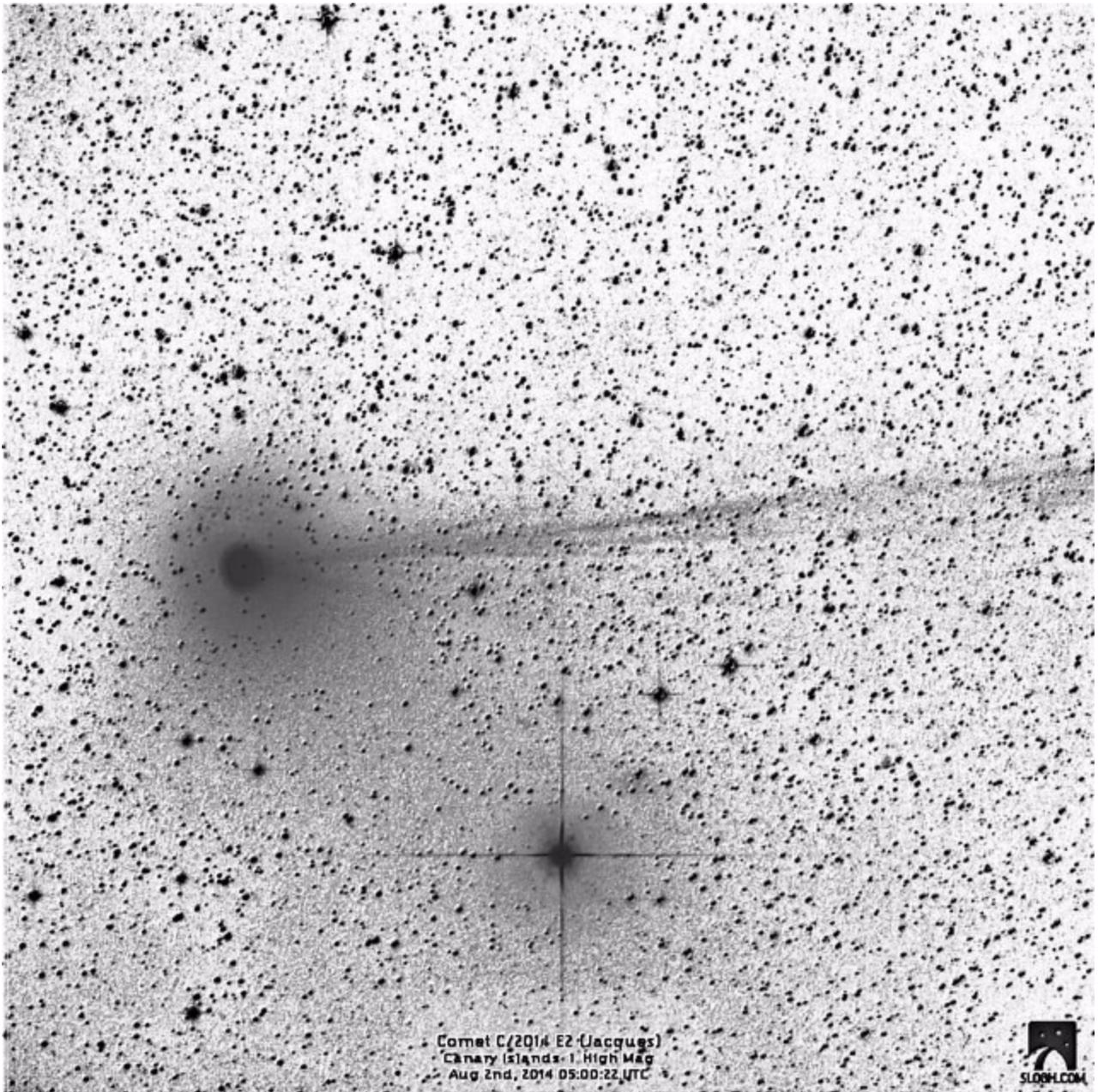


*Comet C/2014 E2 (Jacques), as you can see if you look carefully at the photo.*

The past three months has seen the periodic comet Jacques 2014 E2 lose its tails at least twice, so it has been a favourite target of ASTRO imagers like myself. Sometimes the images are overwhelmed by the comet's bright nucleus so that converting and inverting the original colour image (after processing with FilterStorm) to a black on white reveals much more of the inner structure of the ion and dust tails. The very broad and diffuse ion

tail is seen spread to the right and downward. The dust tail has numerous strands in it.

This photo was taken with the 50 cm Schmidt-Cassegrain telescope of SLOOH's observatory on the Canary Islands and consists of a single frame of 10 minutes exposure.



*Same thing, negative view.*

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**An Icelandic Visit** by *Franklin Loehde*

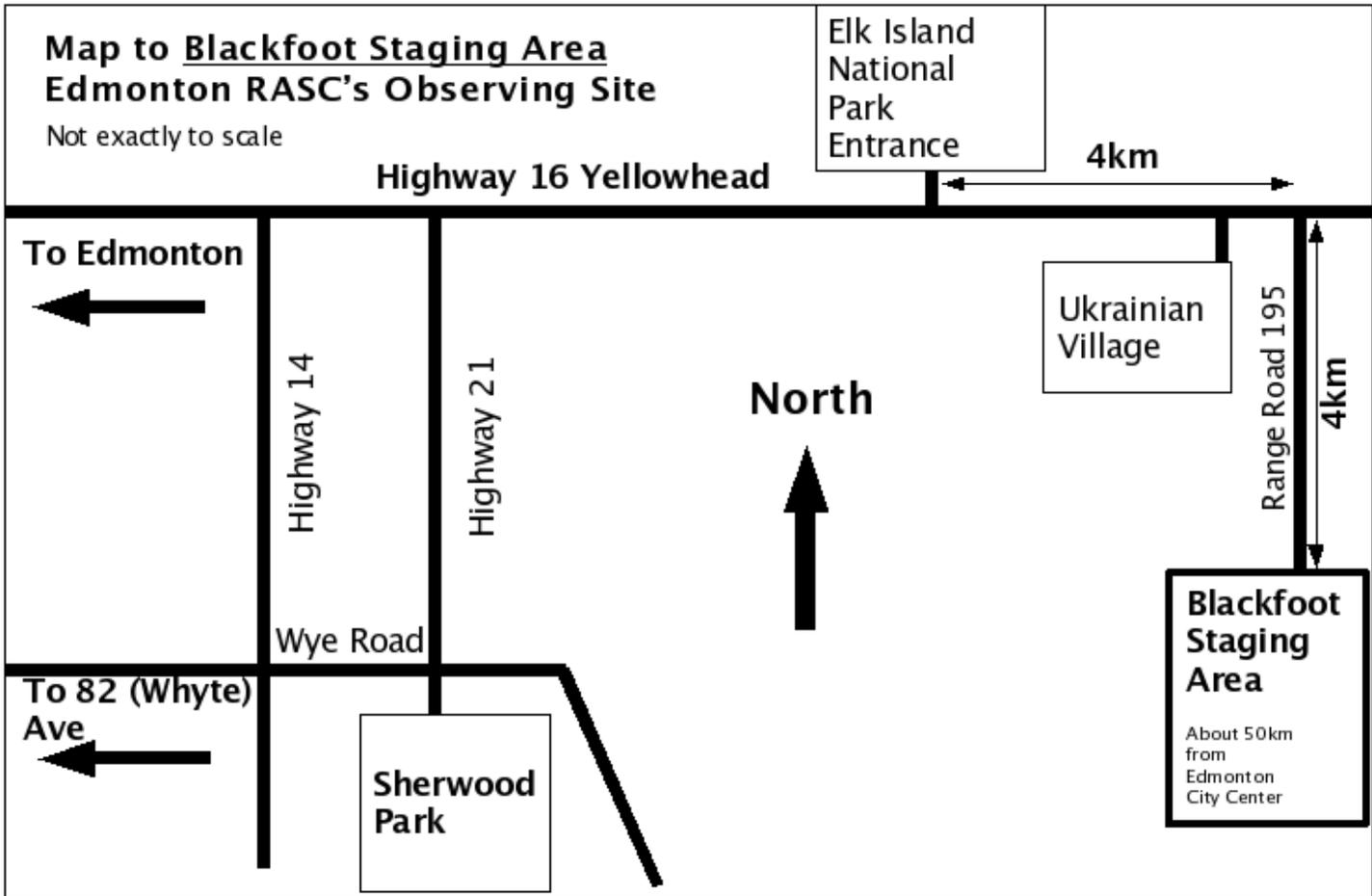
At the end of April I had an opportunity to visit an amateur astronomer and educator well known to a number of our members: Sverrir Guðmundsson and his wife Ósk Dagsdóttir. Sverrir teaches astronomy to young and older adults in Reykjavik, the capital city, at a junior college.

A few years ago his wife came to Edmonton for medical treatment. During this time Sverrir spent many a night at the Observing Deck at TWoSE with Bruce McCurdy enjoying the skies over Alberta. He and some like-minded colleagues often spend the noon hours in the central core showing the sun and the activity building up to the current cycle maximum.

Despite the less-than-cooperative weather of the country and the incredibly bright summer evenings suffered at 63° N latitude he and his group still manage to excite the locals to the beauty of the night skies and have published a very extensive and gorgeous magazine on astronomy in the Icelandic language. They can also be proud of the frequent spectacular auroral tectonics they

experience more frequently than Edmonton.





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