

# NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC  
VOLUME 2020 ISSUE 5 SEPTEMBER/OCTOBER 2020



## At Last, a Naked-Eye Comet

by J. Karl Miller

After a fairly lengthy time of “comet starvation” we finally had an appearance of a comet which,

while not super-bright, was visible to the naked eye. Comet Hale-Bopp in 1997 was the last one to be so visible. Using binoculars brought out a pretty impressive view of this “new” comet (NEOWISE C/2020 F3), even in the light-polluted sky in

our part of the city. Without the COVID-19 pandemic in progress, the RASC would have held many public astronomy meetings; now this can only be approximated vir-

tually (i.e. Zoom and similar applications).

NEOWISE C/2020 F3 was dis-



covered on March 27, 2020 by NASA’s “Wide-field Infrared Survey Explorer” space telescope, which has been in orbit for about 11 years. You can see the source of the com-

et’s name. This is a very productive telescope, which has discovered thousands of astronomical objects.

Look up details in Wikipedia under its name.

At the time of discovery, NEOWISE was a faint blob of magnitude 18, at twice the Earth’s distance away from the Sun. From position measurements made of NEOWISE C/2020 F3’s orbital positions as

it moved towards the Sun, a 4,400 year long orbit was calculated. By now, NEOWISE has been moving away from the Sun for some time,

continued on page 5

**NOTE: Our Sept–Nov lectures will be held on Fridays at 7pm**

**SEPTEMBER 11**

RASC National 1<sup>st</sup> VP Charles Ennis presents Ancestors’ Skies. RASC Executive Dir. Phil Groff will also speak. See Meetup for details and Zoom link.

**SFU**

**OCTOBER 9**

Dr. Arif Babul from UVic will speak about his attempts to solve the origins of the universe via computer simulations. See Meetup for Zoom link.

**SFU**

**NOVEMBER 13**

Dr. Tessa Fisher, a gender-neutral astrobiologist from U of Arizona, on using spectral analysis to study the atmospheres of exoplanets. Zoom link on Meetup.

**SFU**



### The Pelican Nebula by Ken Jackson

The Pelican Nebula is an emission nebula near the bright star Deneb in Cygnus. Energetic light from young blue stars ionizes the surrounding hydrogen gas causing it to emit red-coloured light. Shot from Coquitlam, BC on Aug 4th, 2020 with an ZWO ASI 553 camera using a Skywatcher Esprit 80 scope - 87 subs @ 30 seconds that were processed with Astro Pixel Processor and Topaz Denoise.

# President's Message

by Gordon Farrell

While 2020 continues to be the sort of year that, if it were a person, keeps asking us to hold its beer, it did finally offer us astronomers something interesting to look at: a naked-eye comet! While not as bright or easy to spot as 1997's Hale-Bopp, C/2020 F3 (NEOWISE) was a welcome sight. In

normal times, RASC Vancouver would have been organizing viewing events throughout the Lower Mainland in mid-July, with throngs of people waiting to take a peek at this inner-solar-system interloper. But, this being 2020, it was not to be.

Which isn't to say we have

no way of sharing Comet NEOWISE with our membership or the general public. In this issue you'll find many pictures of the comet taken by many people, myself included. My partner and I made time to find the comet every night the weather allowed it, hunting

continued on page 4

## About RASC

The RASC Vancouver Centre meets at 7:30 PM on the second Thursday of every month at SFU's Burnaby campus (see map on page 4). Guests are always welcome. In addition, the Centre has an observing site where star parties are regularly scheduled.

Membership is currently \$89.00 per year (\$52.00 for persons under 21 years of age; family memberships also available) and can be obtained online, at a meeting, or by writing

to the Treasurer at the address below. Annual membership includes the invaluable Observer's Handbook, six issues of the RASC Journal, and, of course, access to all of the club events and projects.

For more information regarding the Centre and its activities, please contact our P.R. Director.

NOVA, the newsletter of the Vancouver Centre, RASC, is published on odd-numbered months. Opinions expressed herein are not nec-

essarily those of the Vancouver Centre.

Material on any aspect of astronomy should be e-mailed to the editor or mailed to the address below.

Remember, you are always welcome to attend meetings of Council, held on the first Thursday of every month at 7:30pm in the Trotter Studio in the Chemistry wing of the Shrum Science Centre at SFU. Please contact a council member for directions.

## 2020 Vancouver Centre Officers

**President** Gordon Farrell  
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**Vice-President** Alan Jones  
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**Secretary** Suzanna Nagy  
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speakers@rasc-vancouver.com  
**Past President** Leigh Cummings  
**At Large** Howard Trotter, Bill Burnyeat  
**Honourary President** J. Karl Miller

## Library

The centre has a large library of books, magazines and old NOVAs for your enjoyment. Please take advantage of this club service and visit often to check out the new purchases. Suggestions for future library acquisitions are appreciated.

## On the Internet

rasc-vancouver.com  
astronomy.meetup.com/131/  
www.facebook.com/RASC.Van  
www.instagram.com/rascvancouver/



@RASCvancouver

## Mailing Address

RASC Vancouver Centre  
PO Box 89608  
9000 University High Street  
Burnaby, B.C.  
V5A 4Y0

## Map to Meeting Site



### IMPORTANT NOTICE:

Our lectures have moved online until further notice due to COVID-19 and SFU having shut down most on-campus activities.

We will resume our physical lectures at SFU once it is deemed safe to do so.

continued from page 3

for it with binoculars from our small Vancouver roof deck, then with the naked eye as it became brighter. A trip one night to Jericho Beach with her friend was a good opportunity to take some more pictures and was the closest we came to public viewing as the occasional passerby asked to look at the screen on the back of my DSLR (from a safe distance, of course). I hope you had an opportunity to see the comet first-hand but if you didn't, hopefully the images in this issue and Karl's article will offer a glimpse of what graced our skies this summer.

And with COVID-19 showing no signs of abating any time soon, we will continue to hold our lectures on Zoom through at least the end of the year. This has brought with it many challenges, and we've contin-

ued to work with our friends at the Sunshine Coast Centre to find and schedule speakers for our monthly meetings. In the Before Times, speakers would visit each Centre in person, enjoying a quick ferry ride on Friday morning to get from Vancouver to Sechelt. But with lectures going virtual, there's no need to travel between the two Centres and giving the same lecture online two nights in a row doesn't make much sense.

So for the next few months, we'll be holding a joint event for both centres on the same night. This means we'll be moving the Vancouver lectures to match up with the Sunshine Coast ones on Friday nights at 7:00pm. We'll also be sharing hosting duties, with Sunshine Coast acting as host in September and November and Vancouver hosting in October. I know this is a change from

our traditional meeting night but I hope people will adapt to this temporary change. We hope to be back to our regular schedule as soon as possible.

There's also the Mars opposition coming in October, as detailed in Ken's article on p. 6. Mars has a special place in the public's imagination and usually draws huge crowds at opposition but we'll have to find other ways to bring Mars to the people since we can't safely bring the people to our telescopes. We may coordinate with SFU on a virtual event so keep an eye on [www.rasc-vancouver.com](http://www.rasc-vancouver.com) for details as the date draws closer.

I should also remind everyone that our AGM is coming up on Thursday, December 10, 2020 at 7:30pm. Members can expect an email with all of the details in early November.

Keep looking up and stay safe. ✨

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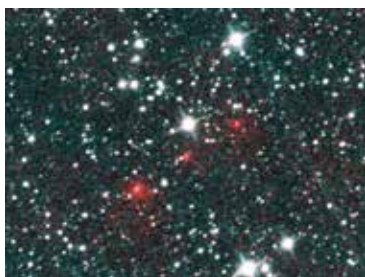
and is well past its closest approach to Earth on July 22. That means that its brightness is diminishing [in early August when this article was written]. The close approach to the Sun resulted in a change in the comet's orbital shape. The orbit is now longer and the comet has been recalculated to return in about 6,700 years, or so (I won't wait for it).

The picture on the front page was taken on July 19, around 10:30 PDT with a Canon 60Da camera from our lawn next to the house. It's a 10-second exposure ( $f/8$ , ISO 800). A slightly enhanced image, it is meant to show the comet bet-

ter from our severely light-polluted area. It was easy to see with the naked eye.

As the comet gets fainter, more and more telescope power will be needed to view it directly; photography, and the Hubble space telescope will be able to follow it for a longer time. By the third of August, the comet had faded to about magnitude 7, it was a faint hazy patch in my 10x50 binoculars, and I could not discern a tail. It was definitely no longer a naked-eye object. The Moon was almost full and, in addition, the sky was somewhat hazy. Added to the light pollution in our area, this made viewing the comet less than ideal.

Under similar conditions, **NEOWISE** was still visible in my 15x50 Canon stabilized binoculars in the evening (around 11pm PDT) of Aug. 9, between stars 70 Virginis and 71 Virginis. Directly looking at it showed a very faint, fuzzy, barely noticeable patch. Averted vision made it more readily perceived. The difficulty seeing it made for more fun to search for and trying to find it. **NEOWISE**'s apparent motion is now relatively small, due to the relationship of the Earth's and the comet's respective orbits. It's like we were passed by a train, and we can see it down the track, getting smaller and smaller, but not moving sideways much. ★



The discovery image for C/2020 F3. The comet appears as three fuzzy red dots in this composite of three infrared images taken by NEOWISE on March 27, 2020.

Image Courtesy of NASA/JPL-Caltech.

## Membership has its Privileges!

Are you tired of looking at the same objects again and again (planets, moon, etc.)? Is your telescope collecting dust because it's hard to locate deep sky objects? Would you like to bring your observing to a stellar level? Robert Conrad, our new observing director, revived the Vancouver RASC observing group and invites you to join by sending him an email at [observing@rasc-vancouver.com](mailto:observing@rasc-vancouver.com). Some of the benefits of belonging to this group include:

- Hands on training on how to operate the SFU Trottier observatory
- Weekly observing sessions at the observatory or at dark sky locations
- One-one-one coaching on how to locate thousands of objects in the night sky
- Attend small interactive seminars delivered by Robert on a range of topics including failsafe star-hopping, charting challenging objects and understanding the motions of the cosmos
- Learn to make your telescope dance by locating objects such as asteroids, nova, and supernovae
- Spectroscopy and imaging training from Howard Trottier and an opportunity to collaborate on observatory research projects
- Updates on observable sky events happening during the week like asteroid/comet/deep sky conjunctions
- Access to observing guides and lists that Robert created that took hundreds of hours to create and will help with planning observing sessions
- Knowledge and expertise from other observing group members
- Learn how to quickly and efficiently find and star-hop to deep sky objects using a range of binoculars and telescopes

# Upcoming Events

**October**

Manning Park Dark Sky Festival CAN-CELLED

**December**

10 – AGM

## The Five Ws for Mars at Opposition

The upcoming opposition of Mars promises to be an exciting event for planetary observers. Here is the Who, What, When, Where, and Why on the 2020 opposition.

**Who:** The planet Mars and you—to observe it!

Mars is the 4th planet from the Sun and is named after the Roman god of war. It is also called the red

planet because of its rusty, red surface. It is the second smallest planet, with a diam-



Hubble's Mars image showing the major surface features on of the planet. Image Credit: NASA, ESA, the Hubble Heritage Team (STScI/AURA), J. Bell (ASU), and M. Wolff (Space Science Institute)

Earth's and whose gravity is only 37.5% of Earth's. A big attraction of Mars as an ob-

planet rises when the Sun sets and it can be viewed throughout the entire night. An add-

by Ken Jackson

is that it is the only planet to reveal its surface features to us with backyard telescopes and oppositions are the best time for a chance to view those features.

**What:** Oppositions occur when the Earth passes directly between an outer planet and the Sun, placing the planet opposite the Sun in our sky—the



The dramatic change in the size of Mars around its 2020 opposition. Image Credit: ALPO (Association of Lunar and Planetary Observers)

ed bonus is that a planet at the weeks surrounding opposition is close to Earth and therefore appears bigger and brighter.

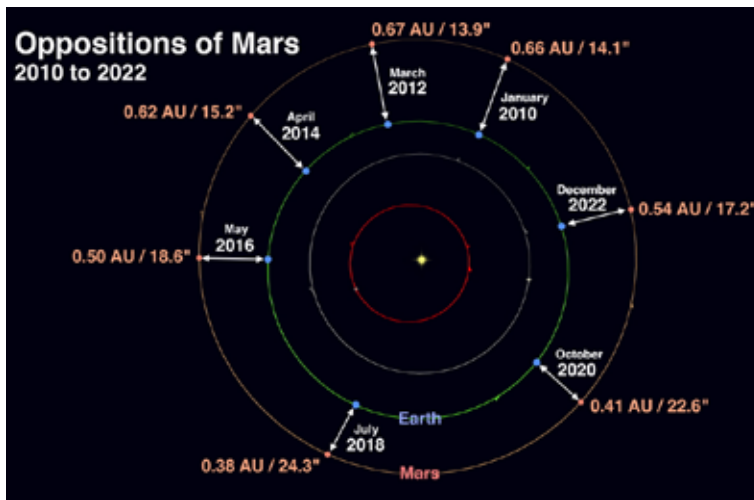
Mars displays the greatest changes in size because it is the first outer planet away from the Sun from us. It can go from being a fairly small and faint dot to the 2nd brightest planet in the sky (after Venus). Surface features like the polar ice caps, volcanoes, and darker regions of exposed volcanic rock become visible at opposition. A Martian sol lasts slightly longer than an Earth day so new surface features appear night after night and you get a chance to see much of Mars' surface in

the weeks surrounding opposition. Mars appears small,

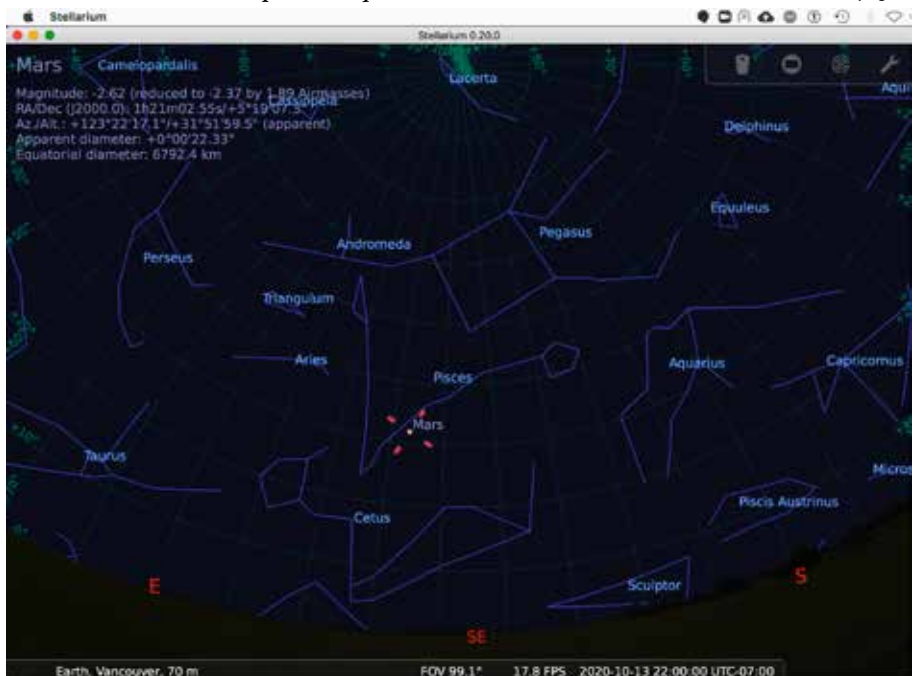
surface features. Bumping up the magnification and some patience can help in picking out the details.

**When:** Opposition occurs at 23:20 UT on October 13, 2020. That is 04:20 pm Pacific Daylight Time but you don't need to aim for the exact date or time—views of Mars will be good for several weeks even at its maximum size, so a telescope is required to see

continued on page 8



The minimum distance to Earth, in astronomical units (AU), and maximum disc size, in arc seconds ("), for some oppositions.  
Image Credit: SkyNews Magazine



Stellarium chart showing the Location of Mars at 10:00 pm on Oct 13, 2020 from Vancouver, BC

continued from page 7

Mars makes its closest approach to Earth on Oct 6, 2020, a little bit earlier than the opposition date due to the elliptical (non-circular) shape of its orbit.

Oppositions of Mars occur on average every 780 days or approximately every 26 months. The distance from Earth to Mars varies between oppositions as does its size. Mars will be about 0.41 AU from Earth at this year's 2020 opposition with a size of 22.1 arc-seconds. The 2020 opposition ranks high with respect to distance and size as Mars will not be as close nor as big during the next three oppositions in 2022, 2025, and 2027.

**Where:** Mars will be in a good position for observers in the Northern Hemisphere during its 2020 opposition. Mars will rise in the east at sundown (06:30 pm PDT) and will climb higher into southeastern and southern skies closer to midnight. It reaches a maximum altitude at opposition of 46 degrees above the horizon at 1:00 am PDT on Oct 14th—there is likely

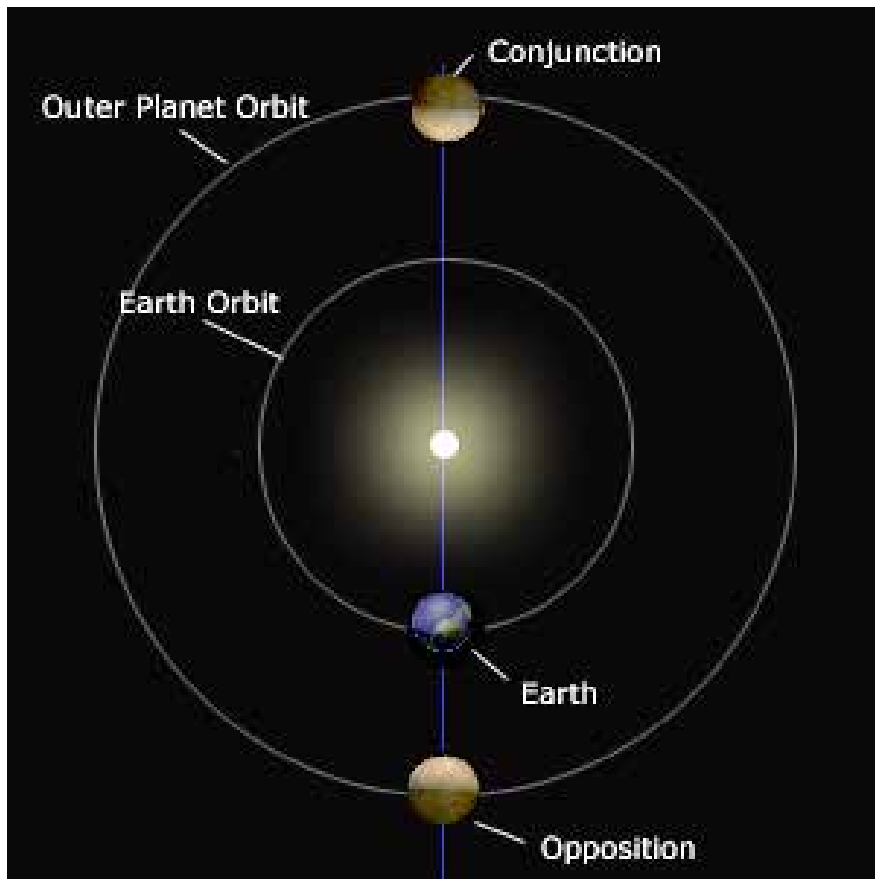
to be better seeing and less atmospheric distortion with Mars that high in the sky.

**Why:** Oppositions of Mars occur because the orbits of Mars and the Earth make them align in a straight line with the Sun where the Sun and Mars are on opposite sides of the Earth.

The Earth moves more quickly in its orbit than Mars so it passes and then catches back up to Mars every 780

days on average.

**That's it.** Go out and see Mars for yourself. Try to observe it over a few nights around the opposition to take in more of its surface. Keep an eye on our website <https://rasc-vancouver.com> for additional upcoming articles on Mars. With some luck with the weather and clear skies, Mars will reveal its surface details to us Earthbound observers. ★



Oppositions occur when an outer planet is lined up with the Sun and the Earth. Image Credit: Marsopedia



# 2020 Martha Ellen Pearse Award

by Suzanna Nagy

As we do every year, RASC Vancouver supported the BC Science Fair Foundation with a \$500 donation in the name of one of our 2008 legacy estate donors, Martha Ellen Pearse. However, due to COVID-19, and because all regional and national in-person science fairs were cancelled, the BC Science Fair Foundation transitioned into the BC Virtual Science Fair.

At the request of the BC Science Fair Foundation, RASC Vancouver agreed to allow our annual \$500 donation to be split into smaller \$50 amounts to allow for more award recipients. Our usual expectation that the award be given to a science project focused on astronomy or physics was broadened to allow for a greater variety of recipients.

The winners of the 2020 Martha Ellen Pearse Virtual Science Fair were (more details on their projects can be found at [www.connectingideas.ca/projects/awards](http://www.connectingideas.ca/projects/awards)):

An Investigation of a Dark Matter-Dark Energy Interaction Model to Explain Discrepancies in Hubble Rate Measurements

By Angela Zhou  
Intermediate Category (Grades 9-10)  
Innovation | Physics

Development of an EOG Classification System for SCI Prosthetic Hand Movement

By Fawzan Hussain  
Senior Category (Grades 11-12)  
Study | Big Data / AI, Biology, Engineering and Computer Science

Preventing Climate Change by Modifying the Ocean's Albedo

By Jonah Ezekiel  
Senior Category (Grades 11-12)  
Experiment | Chemistry, Environment

May The Electromagnetic Force Be With You

By Nathan Hellner-Mestelman  
Junior Category (Grades 7-8)  
Experiment | Physics

Higher dimensional space and regular polytopes: the exploration of shapes

By Jose Miguel Valdes Rodriguez  
Elementary Category (Grades 4-6)  
Study | Mathematics

Detecting Cosmic Radiation Through a Cloud Chamber

By Jasmine Virk  
Intermediate Category (Grades 9-10)  
Innovation | Environment, Physics

Shuttering Out the Storm

By Lucie Li  
Junior Category (Grades 7-8)  
Innovation | Engineering and Computer Science

BandaGEL: A Phytochemical-Based Hydrogel Liquid Bandage

By Pari Goyal and Yolanda Tan  
Intermediate Category (Grades 9-10)  
Innovation | Biology

"Shaping" Our Homes

By David Li  
Intermediate Category (Grades 9-10)  
Experiment | Engineering and Com-

puter Science

A number of the award recipients were kind enough to mail Council for RASC Vancouver thank you cards/letters and I would like to share some of their written comments:

Nathan Hellner-Mestelman (Grade 7-8) thanked us for supporting him and appreciated our generosity.

Fawzan Hussain (Grade 11-12) appreciated our support. He told us about his dream to become a software engineer and hope to one day use an algorithm to help individuals with spinal cord injuries to control prosthetic hands with eye movements. He will be attending the University of Victoria in the Fall in their Software Engineering Program.

Lucie Li (Grade 7-8) is grateful for having been chosen for our award. She is now motivated to work even harder for next year's fair.

Jasmine Virk (Grade 9-10) thanked us for our generous contribution. We have inspired her to pursue further studies in physics. She says thank you for "bringing light to my life during these times of uncertainty."

It is always a joy to receive and read these thank you cards/letters from such aspiring youth. RASC Vancouver will continue to support the BC Science Fair Foundation in the name of Martha Ellen Pearse for many years to come. ✨

## Comet NEOWISE Gallery



**Jordash Kiffiak and Joanna Woo** - Taken July 12 near downtown Vancouver.



**Colin Jones** - Taken July 20 west of Spanish Banks.



**Ken Jackson** - Comet Neowise above the "Playground of the Gods" Ainu totem poles at Burnaby Mountain Park on July 13th just before midnight. Nikon D5100, 55mm, f5.6, 10 sec at ISO 1600.



**Gordon Farrell** - From Jericho Beach on the night of July 14. A stack of 10 exposures of 2.5s at ISO 1600 using a Canon 5D MkIV with an EF 24-70mm f/2.8L II USM lens at 70mm and f/2.8. Exposure increased by half a stop in Photoshop with the sky and land each stacked separately and composed together.



**Comet NEOWISE (July 14, 2020)** by Phil Lobo

Discovered on March 27, 2020 with the WISE (Wide-field Infrared Survey Explorer) space telescope. Neowise (C/2020 F3) is a long period comet and has an orbital period of 6700 years (outgoing) so this was a rare opportunity to see the comet. The image was taken with a Canon 1000D using a 200mm f5.6 lens on a fixed tripod to capture a series of 90 exposures of 10 seconds each. (Longer exposures would have caused 'star trails' on each frame due to the Earth's rotation and blurred the comet.) Stacked in Deep Sky Stacker using its comet processing feature.