

NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC
VOLUME 2020 ISSUE 3 MAY JUNE 2020



A Close, Unheralded Neighbour

by J. Karl Miller

Not very far in the night sky from the Andromeda Galaxy (our sister galaxy) you can find M33. It is about 2.9 million light years distant

from our galaxy, but not often a target at public astronomy nights (i.e. SFU's Starry Nights). Under the best observing conditions—no light pollution and a really dark sky—this galaxy, the third largest in our local group, is visible to keen, dark-adapted eyes without optical help. A pair of binoculars is

a great help because M33 is a diffuse object—the amount of light it produces is distributed over an area about four times the apparent area of

the Moon in the sky (see pages 317 and 333 in the Royal Astronomical Society's *Observer's Handbook* for the year 2020). You can understand

access to a Slooh.com telescope.

Some on-line star applications call it the Pinwheel Galaxy. That is not generally accepted, because the

name is normally given to M101, a galaxy in the constellation of the “Big Dipper,” about 21 million light years away.

M33 seems to be a satellite galaxy of the Andromeda Galaxy (M31). It may perhaps be on a rebound into that galaxy. The velocities, proximity, and indications of gravitational in-

teractions make that a possibility. A very detailed entry regarding M33 and M31 and the interactions be-

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that the sky conditions required for its visibility are unlikely to be met in a light-polluted city night sky. Below is a photo I took via remote

MAY 14

SFU

Our own Bill Burnyeat presents a virtual lecture this month: The Early Greek Astronomers: Were they Smart or Dumb? Sign up via Meetup. **SFU**

NO MEETING IN JUNE

See our schedule of Virtual Assembly lectures on our website

JULY 9

SFU

Speaker TBA. See Meetup for details when they become available.

SFU

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tween them can be found in Wikipedia by searching for the “Triangulum Galaxy.”

scenarios include being torn apart and absorbed by the greater companion, fuelling the latter with hydrogen to form new stars; eventually exhausting

all of its gas, and thus the ability to form new stars; or participating in the collision between the Milky Way and M31, likely ending up orbiting the merger product and fusing with it much later.

Two other possibilities

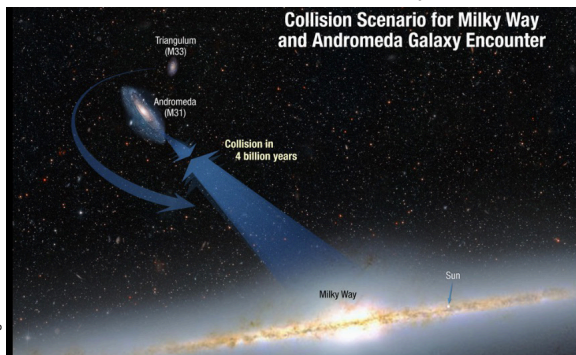
are a collision with the Milky Way before the Andromeda Galaxy arrives or an ejection out of the Local Group. Astrometric data from Gaia appears to rule out the possibility that M33 and M31 are in orbit. If correct, M33 is on its first infall proper into the Andromeda Galaxy (M31).

At right is an ex-

cerpt from a (highly recommended) Stellarium Mobile planetarium map of the sky showing the relative positions of the Triangulum and Andromeda galaxies.

The above excerpt shows that several different scientific opinions are stated about M33. It's obviously an object about which a number of uncertainties exit. And yet, it is less likely to be shown as an object of interest at public astronomy nights (placed best in the sky in the autumn of the year). The reason is likely because public astronomy nights are usually set in or near a city, with light pollution making M33 hard to see. Usually, the planets, the Moon, and even the Andromeda Galaxy are the showpieces. ★

Image credit: NASA



Triangulum on the collision paths of Milky Way and the Andromeda Galaxy

Here's an excerpt from Wikipedia regarding the relationships between these two galaxies:

M33 appears to be linked to M31 by several streams of neutral hydrogen and stars, which suggests that a past interaction between these two galaxies took place from 2 to 8 billion years ago, and a more violent encounter will occur 2.5 billion years in the future.

The fate of M33 was sketchy in 2009 beyond seeming to be linked to its larger neighbour M31. Suggested



Stellarium Mobile app star map

RASC Virtual General Assembly 2020

“The Stars Belong To Everyone!”

– Helen Sawyer Hogg, Honorary RASC member, Companion of the Order of Canada

The Royal Astronomical Society of Canada (RASC) normally gathers annually to meet, exchange the latest astronomical accomplishments of its members, and celebrate

the achievements of its award winners. The General Assembly, or “GA,” is an excellent opportunity for members of the RASC and the public, from across the country, to gather and strengthen the bonds of community.

2020 has not be a normal year and the GA has been moved online because of the COVID-19 pan-

by RASC Vancouver GA Committee

demic. The Virtual GA is hosted by the RASC Vancouver Centre and will be live-streamed on the RASC YouTube channel on June 7th, 2020 from 11am to 2pm with several talks and speakers lined up in the schedule.

We hope to see you in YouTube at www.youtube.com/c/rascanada on June 7th! ★

President's Message

What a difference two months makes.

While we were planning to host the 2020 RASC General Assembly this coming June, along came COVID-19, which caused us to seriously reevaluate those plans. The bulk of the GA has been effectively cancelled, with just the official business happening in

Toronto and a few online lectures in place of what we had planned to do here in Vancouver. Our GA Chair, Hayley Miller, has the full details of the new, virtual gathering on page 2 of this issue (also see the full-page ad on the back cover).

These difficult/unprecedented/extraordinary/[insert similar

adjective here] times have forced us to change how we run our normal affairs as well. We've taken our monthly lectures online, using Zoom webinars in place of our in-person meetings at SFU. We've had to cancel or postpone our public outreach events for the foreseeable future, including this month's

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by Gordon Farrell

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 president@rasc-vancouver.com
Vice-President	Alan Jones vp@rasc-vancouver.com
Secretary	Suzanna Nagy secretary@rasc-vancouver.com
Treasurer	Phil Lobo treasurer@rasc-vancouver.com
National Rep.	Hayley Miller national@rasc-vancouver.com
Librarian	William Fearon library@rasc-vancouver.com
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Speakers	Scott McGillivray 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

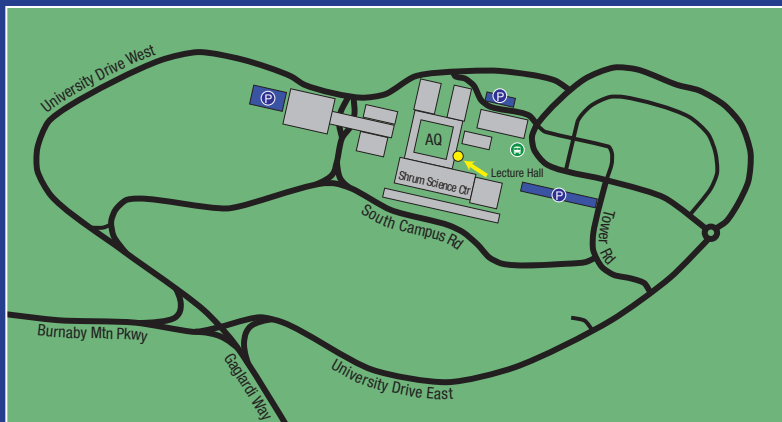
rasc-vancouver.com
astronomy.meetup.com/131/
www.facebook.com/RASC.Van
www.instagram.com/rascvancouver/

 @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 on-line 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.

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Astronomy Day talks and presentations at SFU's Science Rendez-vous event (also cancelled). With SFU's Burnaby campus effectively closed, all events at the Trotter Observatory have also been cancelled, including the regular Starry Nights observing sessions on Friday nights. The good news on the latter front is that Dr. Joanna Woo, who is taking over for the retiring Howard Trotter, is in the process of re-starting Starry Nights as a virtual event! Watch for updates on our Meetup page and the Starry Nights mailing list.

I've been lucky enough to be able to work from home during all this and while spending days at the dining room table in a seemingly endless series of Zoom meetings can lead to a certain amount of cabin fever, astronomy is one hobby that lends itself to social distancing. Backyards and balconies, while not as ideal as remote locations, can serve as impromptu

observing locations. I've been out on my urban roof deck a few times myself, even snapping a few images of Venus's conjunction with the Pleiades last month. If you don't have a good observing spot at your home, you can venture out to a neighbourhood park and try some observing from there. If you're not comfortable being alone in a public place at night, don't hesitate to reach out to fellow RASC members and arrange to meet at a nearby site—at a safe distance, of course!

Hopefully we can all see each other in person later this year. In the meantime, a special thanks go out to all the front-line workers: the nurses, doctors and other medical staff keeping us safe and all the essential service workers keeping the cities running, the supply lines functional, and all of us fed. And as Dr. Bonnie Henry says, "Be kind, be calm, be safe." And, as always, keep looking up.

★

For Sale

For sale: Ernst Leitz, Canada (aka ELCAN) 90mm FL $f/1$ lens. May appeal to astrophotographers (best quality & astonishingly fast, which is what first attracted me). Photos below are of an identical lens (not mine). Interested parties please contact Seamus Dunne: sd11@shaw.ca



AAVSO Custom Chart Plotter – A Game Changer by Robert Conrad

Have you ever charted an asteroid or supernova in a deep star field that has a ton of stars of similar magnitude? Or can't quite make out that planetary nebula that looks just like a star? I'm going to share a solution that is a game-changer, called the AAVSO Variable Star Plotter. Originally used for identifying variable stars, a few years ago I had a eureka moment and decided to plot an asteroid as a backup to the detailed TriAtlas charts I also plotted it on. The main reason is that the star field where the asteroid was located was so dense I couldn't even find a place to mark the "x" and also knew that with so many stars in the field of view circle I had drawn, it would be a challenge to say with 100% certainty that I was looking at the asteroid and not just another star. After that night, I was hooked and started generating custom AAVSO charts for asteroids, comets, and those tough-to-differentiate planetary nebulae.

Then I also used it for novae and supernovae. Charting and viewing hundreds of these objects with a 100% success rate years later, I am convinced that custom charting with the AAVSO variable star plotter is the secret to astronomical observing success.

Where can you find this tool? Start out by accessing the following website: <https://www.aavso.org/>. Then access the **Observing** tab and select **Variable Star Charts** and then **Variable Star Plotter (VSP)**.

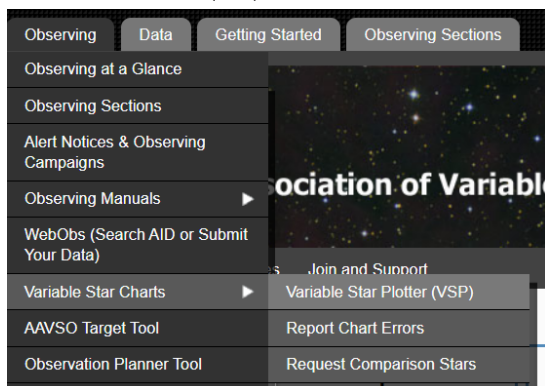
Let's chart using the most recent nova (Nova Sagittarii or AT 2020dgj) which is an 11.2 magnitude nova in the constellation Sagittarius.

Not all of the fields are required to be completed. So let me walk you through it.

Leave the first field blank.

PLOT A QUICK CHART	
WHAT IS THE NAME, DESIGNATION OR AUID OF THE OBJECT?	
<div>Required if no coordinates are provided below</div>	

Enter the right ascension and declination coordinates. The RA and DEC for the nova are RA = 17:56:14.04 and DEC = -29:42:58.20. It is important that you use the format using colons to separate the hours, continued on page 6



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. 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

June

7 – RASC Virtual General Assembly

August

15 – Perseid Meteor Shower Watch at Aldergrove Regional Park
15 - 23 – Merritt Star Quest
15 - 23 – Mt. Kobau Star Party

October

16 - 18 – Manning Park Dark Sky Festival

December

10 – AGM

continued from page 5
minutes and seconds.

RIGHT ASCENSION

17:56:14.04

Allowed Formats: HH:MM:SS, HH MM SS, DDD:XXXX

DECLINATION

-29:42:58.21

Allowed Formats: ±DD:MM:SS, ±DD MM SS, ±DD

In this field, don't select anything:

CHOOSE A PREDEFINED CHART SCALE

Select one...

A is larger, slower; G is smaller, faster

For chart orientation, select Visual (usually the default).

CHOOSE A CHART ORIENTATION

☒ Visual ☐ Reversed ☐ CCD

PLOT A FINDER CHART OR A TABLE OF FIELD PHOTOMETRY? *

☒ Chart ☐ Photometry

Note: The only time you would select “Reversed” is if your telescope setup results in a horizontal (or mirrored) flip which is often the case of refractors that have a standard star diagonal. If you choose this option, make sure that later when you print out the Triatlas C-set chart pages that you set up your printer to perform a horizontal (mirror) flip before printing so they match the custom AAVSO chart you generated (not all printers have this driver option so if not you can use the full version of Adobe Acrobat DC to

perform a horizontal flip. I have also done this for you already and placed them on my Google Drive. You can access here:

<https://drive.google.com/open?id=0B3OWwyrmlJowbjM0R0h4ZFRsMUE>

For the Plot a finder chart, select Chart.

For the FOV field, I usually select 60 arcminutes, which is 1 degree. My wide-angle eyepiece that I use to starhop is 1.5 degrees, so I could choose 90 arcminutes, however 1 degree is fine.

ADVANCED OPTIONS

FIELD OF VIEW

60.0

In Arcminutes. Must be between 0' and 1200'

The magnitude limit field is important. Be sure to select the appropriate magnitude for the environment where you will be viewing. For me, if I am viewing in an urban setting I will select 12, rural 13, and darkest location 14. These will vary depending on your scope limits and experience with these settings.

MAGNITUDE LIMIT

13.0

Stars fainter than this magnitude will not be displayed

For the resolution field, I leave it at 150—it just refers to the quality of the print (i.e. dpi).

RESOLUTION

150

Resolution in dpi to render the chart (default 150)

In the title field, I usually put the name of the object, the time I charted it for and the magnitude.

WHAT WILL THE TITLE FOR THIS CHART BE?

Nova Sagittarii 2020- Mag 11.2

Displayed at the top-center of the chart

In the comments section, I usually enter the magnitude limit I used to chart the object—in this case magnitude 13.

WHAT COMMENTS SHOULD BE DISPLAYED ON THIS CHART?

Charted to magnitude 13

Displayed beneath the chart star field

To ensure that the custom chart matches the orientation of other sky atlases and the Triatlas charts we will be using in further steps, ensure North Up is selected for North-South orientation and East Left is selected for East-West orientation. **Note:** If you selected “Reversed” earlier for Chart Orientation, then it will automatically select North Up and East Right (therefore leave like this if your telescope has this orientation).

WHAT NORTH-SOUTH ORIENTATION WOULD YOU LIKE? *

☒ North Up ☐ North Down

WHAT EAST-WEST ORIENTATION WOULD YOU LIKE? *

☒ East Left ☐ East Right

Leave all other settings as is, scroll
continued on page 7

continued from page 6
back up and click the button: Plot Chart

Plot Chart

Clear Form

Below (left) is the resulting chart and you can see why having this custom chart is critical to locating the nova with success!

Even more so, look what I would be dealing with if I simply charted it using the Triatlas Chart C415 (below right).

When the page displays, click on it once to frame it for printing. Then right click and select Print. In the More settings window (click + to expand), ensure the scale is set to 175 so that it fills the 8.5x11 page:

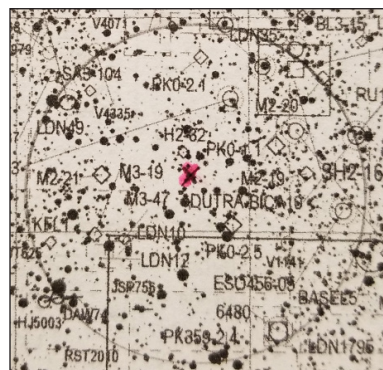
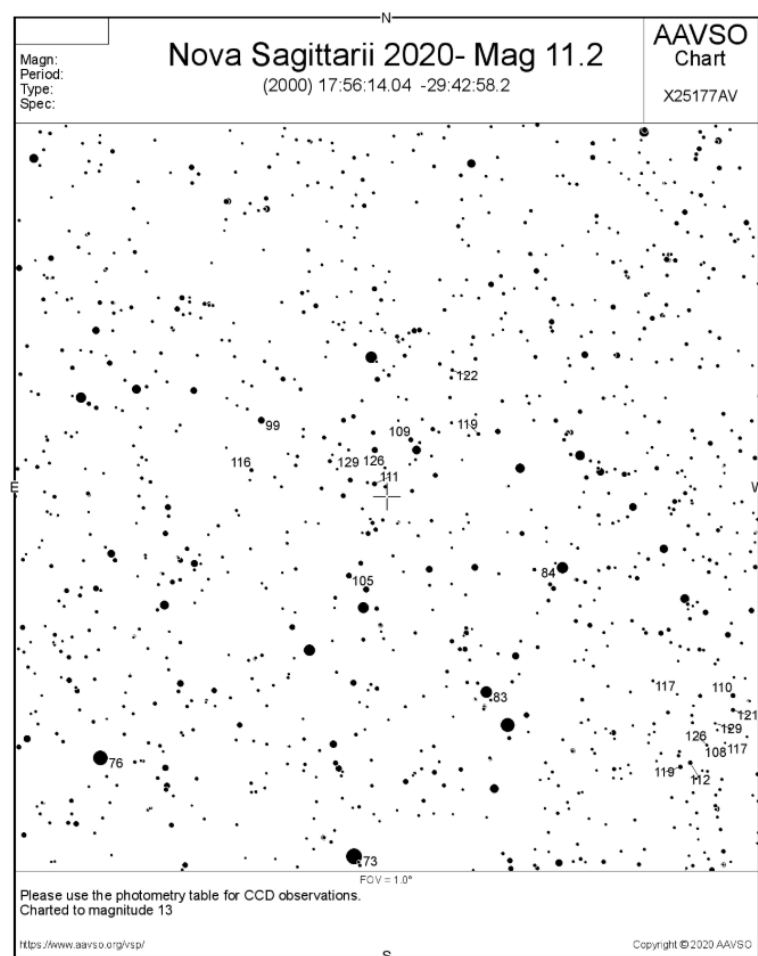
+ More settings

Scale 175

Print the chart and with a pencil/pen, circle a bright star near the object (the crosshair is the location of the object you charted).

Using the coordinates for the object (in this case the nova), place an “x” on Chart C415. Draw your field of view circle that matches your wide-angle eyepiece around the nova. Draw a circle around the star that you circled on the AAVSO chart earlier. This way when you are star-hopping and locate the star in your FOV circle that you circled, you can switch from the Triatlas chart to the AAVSO chart and narrow in on your target.

If you have any questions, please don't hesitate to reach out to me at observing@rasc-vancouver.com. I think you will find the AAVSO charts an invaluable tool to help you locate those challenging objects when surrounded by stars of similar magnitude. Good luck! ★



The generated AAVSO chart (left) compared to the Triatlas Chart C415 for the same area (above). On the AAVSO chart, the nova is indicated by the “+” at centre. On the Triatlas chart, the nova is at the hand-drawn “x” near the centre.



RASC Virtual General Assembly 2020

Youth outreach program featuring talks from Canadian Space Agency Astronaut Joshua Kutryk, Sara Seager, and Bob McDonald

Sunday, June 7, 2020 from 11:00AM-2:00PM PDT. Live
streamed on the RASC YouTube Channel
youtube.com/c/rascanada

Updates to be provided at: ga2020.rasc-vancouver.com



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