Vol. 26 Issue 3

Summer 2025

HORIZON

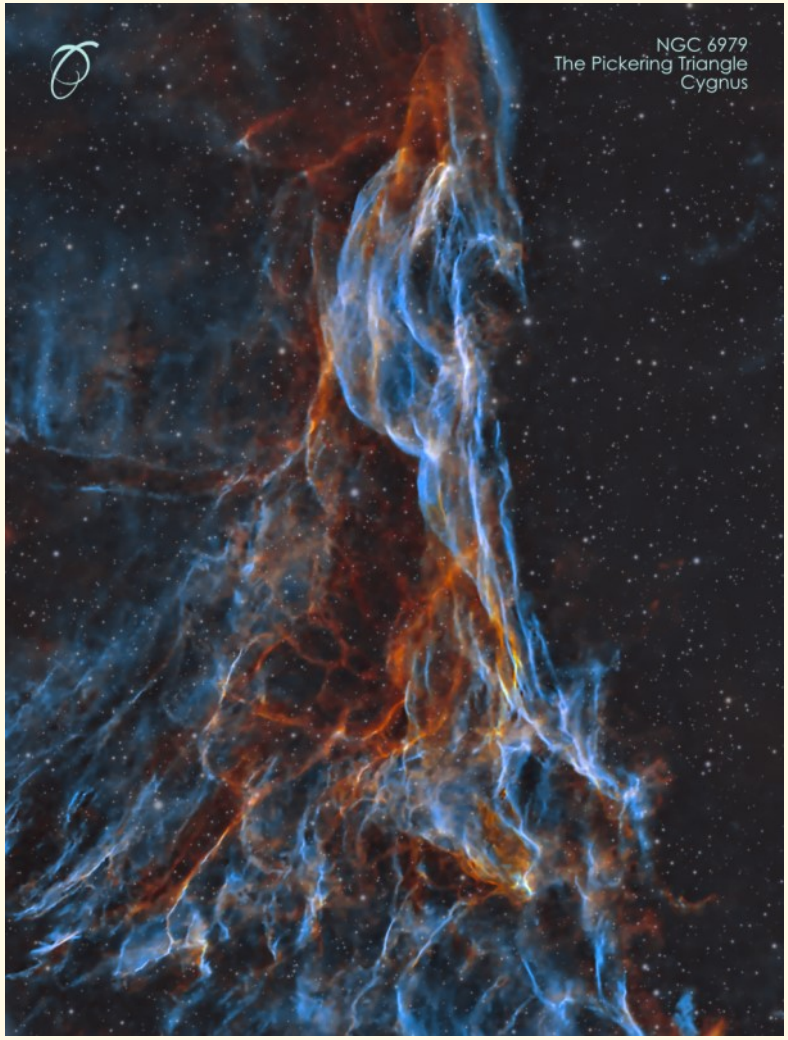
LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA
New Brunswick Centre du Nouveau-Brunswick
THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

Left

The Lagoon Nebula (M8) in Sagittarius by Stephan Hamel. Imaged with a 400 mm telescope, stacked in APP and processed in Photoshop.
20 hours exposure over three years

Right

Pickering's Triangle, part of the Veil Nebula, a supernova remnant in Cygnus, by François Thériault



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Centre News

Business Meetings
Third Saturday in some months
Annual Meeting October 18

Centre Presentation Meetings
Third-week evening of most months
September 15 (tentative)

Star Parties 2025
Kouchibouguac September 13-14

RASC NB membership remains stable at 76 members. Welcome to our new members since the last newsletter: Erin Mariah Harrell and Arash Ahmadi.

Please note a change of renewal times at the RASC National Office. Previously, those who did not renew by their renewal date were given a two-month grace period before their membership lapsed. **Beginning September 1 this year your membership will lapse the day after your renewal date.** You will receive up to four reminders from the National Office before your renewal date, and maybe one or two from me.

In the Winter 2025 issue of Horizon I mentioned receiving a request from BBC Sky at Night magazine to submit a brief article about RASC NB for their *Society in Focus* section of the April issue. I submitted it in January and subsequently subscribed to the magazine. It is an excellent source of astronomy news with a somewhat different perspective than the two American magazines. If all goes well I receive the magazine before the end of the cover month. However, I had to request them to re-send the February and April magazines as I had not received them after a few months. I received the May issue in mid-June and the June issue the following day. I suspect troubles at Canada Post has played a role in delivery problems but I do plan to renew.

Below is a scan from the April issue. The photo of an event at the Irving Nature Park is by Mike Powell, and the logo is by Ted Dunphy.

This autumn we celebrate our 25th anniversary as a RASC Centre. Any ideas on what to do?

Curt Nason

SOCIETY IN FOCUS

The **New Brunswick Centre of the Royal Astronomical Society of Canada** (RASC NB) began in 2000 with approximately 30 members. The current membership is around 65–75, with a high of 110 a decade ago. We have nine meetings annually, which used to be shared among the three largest population centres in our New Brunswick province of 850,000 people, until the pandemic necessitated online meetings. Although we have no infrastructure, we have a Coronado PST, Herschel wedge and other items for members' usage.

Astronomy outreach has been the focus of RASC NB since its inception and particularly since the International Year of Astronomy in 2009. Four weekend and several single-night star parties are held annually at provincial, national and local parks, featuring public talks, solar observing and evening observing. Between 2009 and 2011, RASC Dark-Sky Preserve status was awarded to three parks, and Urban Star Park status to another. Centre members have been active in giving presentations and staging observing events for many schools, youth and other groups. For the past five years, some members have presented the Sunday Night Astronomy Show via 'Astronomy by the Bay' on Facebook and YouTube, drawing viewers worldwide. Between 2012 and 2024, we recorded 2,135 outreach events, reaching 100,000 people and another 400,000 online.

Curt Nason, RASC NB president and outreach coordinator
▶ **www.rascnb.ca**

An RASC event in Irving Nature Park during 2017's solar eclipse

MIKE POWELL

Shooting Stars and Rainbows

by Yolanda Kippers

Every summer NB Public Libraries (NBPL) hold a Summer Reading Club for kids aged 0-12. Every year they have a different theme. This year's theme was "Space." NBPL appealed to RASC NB for members to give space-related talks at their various branches. As I already volunteer at the Kennebecasis Public Library, and having had given a talk there in 2024 about the total solar eclipse, I thought, "Why not?" In early June I met with the two summer students who would be managing the programs. They were planning different space-themed activities (story time, crafts, Lego building, etc.) as well as the talks for each of the eight weeks of the program. It was agreed that I would give four presentations.

To start off the program, the students planned a launch party, a sort of expo, to be held at the end of June. Would I be willing to set up a booth with a telescope or something? Of course! I would also have Star Finders and Moon Gazer Guides. Great!

Meanwhile, I had obtained some door prizes. About a year ago a previous SJAC member had donated a small, child-suitable telescope that her children had outgrown. Not having found a suitable home for it, I suggested that it could be used as a prize. This resulted in the donation of a small pair of binoculars and RASC-member Don Kelly's children's book, "Mary Lou's New Telescope." I also had the Star Finders, Moon Guides and astronomy-themed bookmarks. The summer students were delighted and made ballots for the children to fill out at each of the four scheduled talks.

It was only a few days before the launch date (June 24) when I learned that, if the weather was suitable, the launch would be held outside. While using the club's solar scope on that weekend, I thought, "Oh, I could use this at the launch." It wasn't until I was loading the car on Tuesday morning that I thought maybe I should have reached out for some help. Too late now! They set me up in a corner, away from the more rambunctious activities that had been planned for the kids. The day was already hot (28 C) and muggy while we were setting up, with just enough breeze to blow away the Moon Guides. We were in the parking lot, facing south, and I had the building at my back. It was stinking hot. The decorative balloons were bursting in the heat. In the end, all went well. There were about 100 children at my booth. I (barely) and the equipment (miraculously) survived.

Meanwhile, I began working on my presentations. Preparing talks for kids took longer than I thought. Two weeks after the launch, I gave my first talk, the theme being "Our Solar System." I used Curt's Cat-in-the-Hat presentation, changing and shortening it to make it my own. Neither the students nor I knew how many children would be attending. The prizes were displayed and the ballots were ready. The children (10) arrived: a very shy 9-yer-old boy and his less-shy 7-year-old brother, a very keen 8-year-old girl, 5-year-old Ivy (she could print her name but not her phone number), a brother-sister duo (8 and 6), and an assortment of toddlers. Things went well; the rhythm and the cadence of the Cat-in -the-Hat fortunately held the interest of the little ones.

The next theme, two weeks later, was "Astronauts." Five children this time: the two brothers, the 6 year-old (without her brother) and a new set of brothers (maybe 6-7 years old). All were eager and attentive. "So…who wants to be an astronaut?" Five heads shook in unison. No? I grew up with John Glenn and Alan Shepard, when everyone (at least the boys) wanted to be an astronaut. "Why?" "Too dangerous." We started with Laika, the dog, then Yuri Gagarin, the first woman, the first space walk (they enjoyed that tale), the first Moon landing, etc., until the ISS. None of them knew who Chris Hadfield was (!) and they still didn't want to be an astronaut. You gotta love kids!

The next week there were 19: the previous five and an assortment of others, but no more toddlers. I was grateful for that as I was concerned that a toddler would be the lucky prize winner. This week we talked about northern lights and shooting stars (the meteorite sample was passed nonchalantly around until one excited, "You mean this rock came from way out in space?"), comets and eclipses – many told their experiences of last year's total eclipse - and meteor showers. We talked about rainbows, including double rainbows – one clever girl "saw three once!" We ended with clouds. They had fun with the word "pareidolia", and their imaginations ran wild with the cloud images on the screen.

Final presentation - the history of astronomy. This was the most difficult to prepare, given the age group. This was also the day of the draw. The 6-year-old girl was the first to arrive. I learned that her name is Charlie. Her mother told me that Charlie loves everything space related and that they had taken her to the Lil Shop of Science on the weekend, thinking to buy her a telescope; but Charlie "didn't want to BUY a telescope, she wanted to WIN the telescope at the library." Then the two younger brothers came. It seemed that no one else was coming, so we started.

KV Library summer students Grace and Sarah with Yolanda in the middle

I had organized the history around the analogy of a seed growing into a seedling and then a sapling as knowledge was gained; that they would learn in school about the things that I was showing them; that reading (and libraries) and maths were very important. The three kids were very young but very attentive. About midway through the shy 9-year-old and his brother arrived and at the very tail end, three new older kids. I ended the analogy with leaf buds – these being them and the things they might contribute to the knowledge of astronomy in the future.

Now it was time for the draw. The first name drawn (for the book) was Ivy, the 5-year-old from the first week. I was happy with that. On a whim I suggested to Grace, the summer student, that if the next name drawn was present, that the child could choose the prize. It was the 7-year-old's younger brother's name that was drawn - his name was Atlas. Cool name. How apropos. He chose the binoculars, a bit of a surprise. Atlas made the final draw. He drew Charlie's name!

The Stars could not have been better aligned. And I couldn't have had more fun!

More Library News

Curt Nason

Having given presentations at various libraries over the past two decades, I was contacted by the head of children's programming at the Central Branch in Saint John seeking support for the Summer Reading Program. I sought volunteers through the Centre email list and received two positive responses: Yolanda for the KV Branch and Yvon Hachey for the Moncton region. Yvon has made two visits to the Rogersville Library, entertaining 55 people including 45 kids.

I volunteered for visits to all libraries in the southwestern district, from Sussex to McAdam, but I received replies from only the Main Branch and the East Saint John Library. I had 26 people at the Main Branch kickoff and nine at the East Branch. Surprisingly, I also received a request from the Oromocto Library though the Centre website and we set a date for July 3. There were 43 people at that event, including 28 kids and a former RASC member from Ontario who brought his two grandchildren.

I did another presentation that day at the Fredericton Airport as part of continuing training for the hero pilots of Forest Protection Limited. These are the people who provide aerial firefighting, and one of those pilots is RASC NB member Yves St. Germain.

On a trip to my hometown of McAdam in July I dropped into the library to offer a presentation for their reading club. We set a date and the coordinator made a poster for their social media. No reading club members showed up on that hot Saturday afternoon of the long weekend in August, but the two library staff said they wanted to learn so I started answering a question about tides. That is when three people arrived: my uncle, his daughter and her daughter. The poster did not really specify it was intended for kids. The Cat-in-the-Hat presentation was started up and I donned my matching Cat-in-the-Hat hat.

Here's to You, Nick

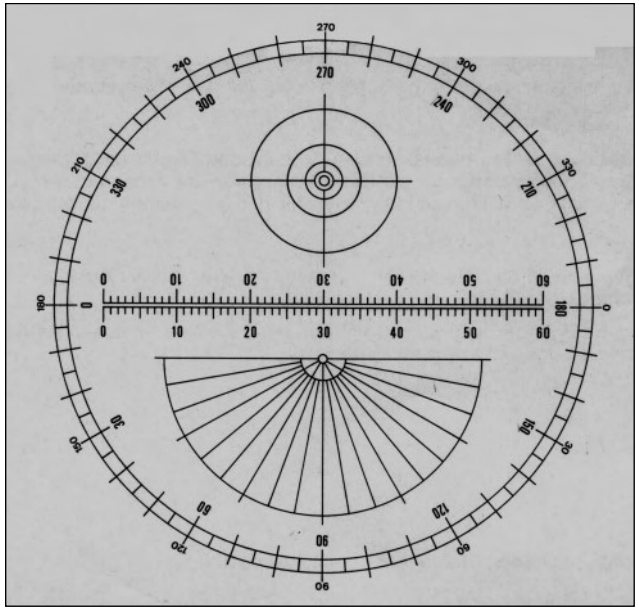
Len Larkin

I've been playing "Catch Me if You Can" with double stars for five years or so. My record of observing/measuring them has lots of successes and a healthy dose of failures. In last year's Horizon I even admitted failure to one particular double star in the article "Challenge of the Dolphin". This Aug 12 found me ignoring the Perseids as sky conditions were conducive for me to face my nemesis in the double star world.

Using the HEQ5 mount I dialed it up by its SAO # (my favourite method), centred it a bit in the finder and then moved to the main eyepiece. The main system is a 12.5 mm Celestron Micro measuring eyepiece, mated with a 3x Barlow and sitting in the 180 mm f/15 Mak-Cass. With all that effective focal length the magnification turns out to be 650x! My usual setup is at 450x as it can also measure separation but this double (at 0.46") is too close for that, so I chose the bigger image.

Holding my breath and peering into the high-power view, I wondered if it would be steady enough. Too much magnification? It was a bit fuzzy so I racked the focuser to make it more crisp and finally, gotcha! I was expecting an oval but instead it was a tiny wedge-shaped elongation. With the separation measurement out of the picture, I thought I could still catch the Position Angle by measuring through the centre line of the wedge – and that's what I proceeded to do.

Perhaps I should mention how I measure (refer to the view in the eyepiece):



1. Rotate the eyepiece to line up the two stars (or star shape) precisely along double centre line.

2. Slew the scope to put primary (brightest star or "end") at exact centre of eyepiece.

3. Stop tracking; stars drift to the protractor circle and I estimate primary position to within 1˚.

4. Slew primary back to the centre. Repeat Steps 3 and 4 several times, record results – I'm done.

After the observing session I determine the mean (average), then apply a correction rule. In this case I just add 90˚ to get my real measured value. Here are my results:

Double star Beta Delphini (Rotanev)
(mag 4.1 & 5.0)
Date: August 12, 2025
180 mm f/15 Mak-Cass at 650x

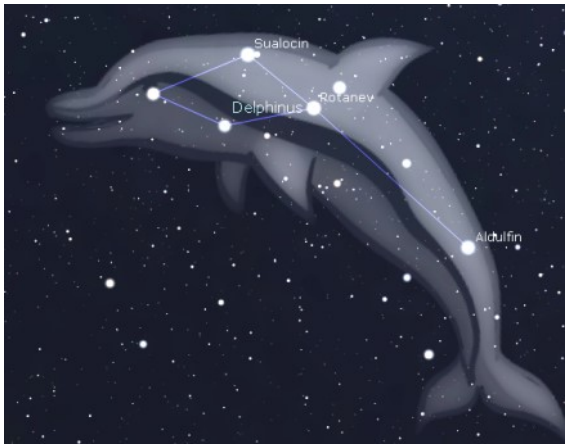
Measured Position Angle (degrees)

248.5
249.5
250.0
248.5
249.5
249.0

Mean	249.2
Deg (Mean + 90)	339.2˚
WDS database	335.7˚
Errror	+3.5˚

A shout-out to the folks who manage the WDS (Washington Double Star) database – a great resource.

An error of 3.5˚ is fine by me and fits under suggested limits. Game, Set, Match, Beta Del! And hats off to Nicolaus Cacciatore, alias Mr. Rotanev!



What's Up for Autumn

by Curt Nason

The highlights for the months of September to November will be the oppositions of Saturn and Neptune around the equinox, six opportunities for Jovian double shadow transits, and the challenge of a daytime lunar grazing occultation of Regulus low in the west.

The **Sun** reaches the equinox at 15:19 on September 22. It is still at or just past peak activity and aurorae are more common around the equinoxes.

New **Moon** dates are September 21, October 21 and November 20. The waning crescent Moon grazes past or possibly occults Regulus on October 16 around 16:00, less than an hour before setting.

Mercury has a close conjunction with Regulus on September 2, rising an hour before sunrise, and it is in superior conjunction on September 13. It runs low in the southwest but brighter than magnitude 0 throughout October, reaching greatest elongation October 29. Mercury is near Mars on November 12, eight days before inferior conjunction.

Venus slowly moves sunward on its way to superior conjunction in early January. It has a close threesome with Regulus and the slim waning crescent Moon on September 19.

Mars, like Venus but in the evening sky, is slowly moving toward solar conjunction in early January, and it is reduced to binocular observing. It has a colourful conjunction above Spica on September 14.

Jupiter begins rising before midnight in mid-October and reaches its first stationary point on November 11. If you don't mind keeping odd hours, you can catch double shadow transits on October 10 at 03:49 for 88 minutes, Oct 11 at 05:42 until it fades into twilight, Oct 13 at 00:11 (133 m), Oct 20 at 03:24 (54 m), November 5 at 02:12 (20 m), and Nov 20 at 21:33 (134 m). There will be several double moon transits around these times, see the RASC Observer's Handbook.

Saturn is at opposition on September 21, and its ring plane closes from about 2˚ to 0.4˚ over the three months. It resumes prograde motion in late November. There are opportunities to catch Titan shadow transits on September 4 at 02:25 (mid-transit at 04:09), Sept 20 at 02:09 (03:20 with Titan transiting nearby), and a north grazing transit around 02:32 on October 6.

Uranus rises within a binocular view below the Pleiades on September 1 and begins retrograde motion a week later. It should remain within a wide-field binocular view of the Pleiades over this period, and it reaches opposition on November 21.

Neptune is at opposition on September 23 and it remains within a 5˚ binocular view above and slightly west of Saturn. This is an opportune time to track it down with a telescope to observe its pale blue disc.

Comets C/2025 A6 Lemmon could be visible with binoculars in late September, low in the northeast, as it heads toward perihelion on November 8. Interstellar comet 3I/ATLAS reaches perihelion on October 29. It remains to be seen whether it gets bright enough for observing with a backyard telescope.

Meteor Showers November brings the South Taurids peaking on the 5th, the North Taurids on the 12th and the Leonids on the 17th. The Leonid rates should be increasing in about six or seven years,

Zodiacal light has two-week periods in the eastern morning sky starting around September 19 and October 19.

Emma's sunrise on August 20
Worth getting up for!

Mactaquac COW 2025
The Dam Star Party Returns

by Ted Dunphy
Photos: Emma MacPhee & Ted (1)

The Mactaquac Star Party was a stellar success. Friday afternoon it rained, but the evening Sun brought clearing and the skies were good. Saturday was the best. Loads of action on the Sun to wow the public. Our Dagwood supper was Bumsteadalicious. Saturday night we had 12 telescopes on the field and the crowds were large. Good time had by all. It was nice to meet up with old friends and enjoy the sky together.

Approximately 225 people attended the evening presentations and observing, plus solar observing and a kids' program constructing a sundial.

A Banner Occasion

Andrew Lorens delivers the Saturday evening What's Up
Ted Dunphy photo

Above:
Jeff Leger adjusts his telescope...

Right:
while Ted adjusts his watch

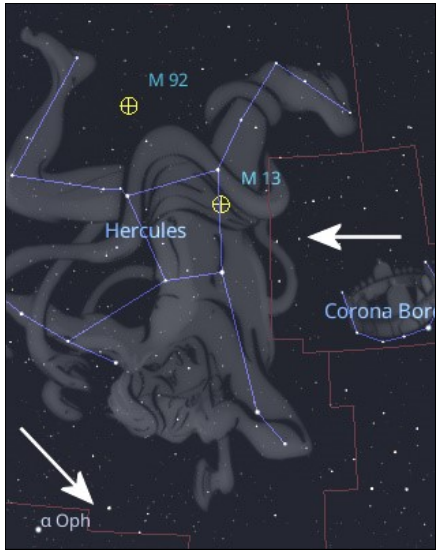
Above:
Ted's logo for 2025

Below:
He proudly sports a
Previous COW creation

Sketching Double Stars

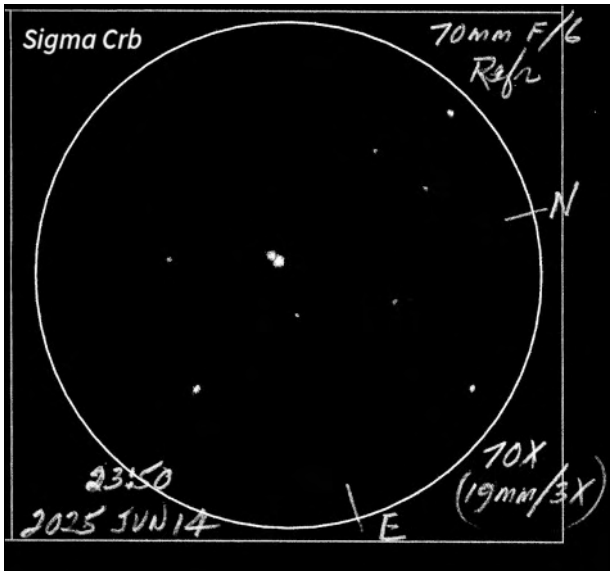
Len Larkin

Here's some sketching I've been doing lately. Both Sigma Coronae Borealis and Alpha Herculis (Rasalgethi), from the 19 Doubles list, were sketched in pencil and scanned into the computer. Sigma CrB is an experiment with inverting blacks/whites to give it a night sky look.

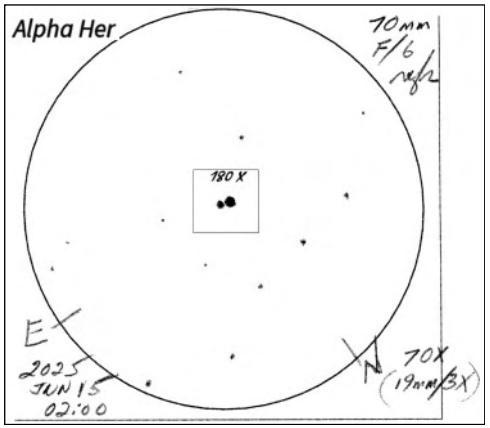


If you hunt down Sigma CrB you will find a 5th star there. The double is composed of mag 5.6 and 6.5 stars separated by 7.2" and, as the sketch suggests, I was able to split it at 70x in my 70 mm scope. Even so, it's worth trying a higher power to improve the view. I had noted colours in this double way back and you can try similar but I have to warn you, they are both G-type stars!

Alpha Her didn't seem to make it on the asterism train so now he is like a deposed ruler, hanging out with Ophiuchus folks. Regardless, this 3rd mag double is a treat in a 50 mm or larger aperture as long as you are willing to dust off a high-power eyepiece. For



example, I did split it in a 50 mm but at 130x - it's separated by only 4.5"! And with both the 50 mm and 70 mm 'scopes, 180x presented me with a view of the fainter secondary star sitting just outside the primary's diffraction ring - very nice. Note that I pasted in my 180x sketch over the single-looking star on the 70x wider field sketch. Oh, did I mention that the primary is a red supergiant? Don't miss this one.



François Thériault back in Cygnus
Top: Omega 1 Cygni region
Below: North America & Pelican Nebulae

A Correct Explanation of How Observations of Jupiter's Moon Io Can Yield the Speed of Light

David M. Hunter

The speed of light, until recently (circa 360 years ago), was thought to be infinite, and plays a cornerstone role in the modern understanding of the universe. Descartes had argued that it was infinite, whilst Galileo thought it could be finite and tried to observe a putative finite value with his 1638 lantern experiment. He failed of course. However, the Danish astronomer Ole Roemer in 1676 observed changes in the apparent orbital period of Jupiter's moon Io which he attributed to changing distances between the Earth and Jupiter. He offered this as evidence that the speed of light was finite. Contrary to widespread information in scholarly books, texts, and online sources, he did not determine the speed of light, but only evidence of the finite speed of light. It is widely and erroneously stated that he calculated the speed of light by taking the cumulative changes of Io's expected orbital times (wherein it is incorrectly stated the he observed a change of 22 minutes from opposition to conjunction) as due to the time it takes light to cross the Earth's orbit, and then using his value of earth's orbital diameter he determined the speed of light to be 2.1×10^8 m/s. He did not do this and the aforementioned value is less than the true value. As will be seen later, when his analysis is correctly interpreted, his value of the speed of light, if so calculated, is greater than the true value. This latter comment is due to an interpretation of Roemer's original paper by James H Shea, Geology Dept, University of Wisconsin-Parkside, Kenosha, Wisconsin 53141 (Am. J. Phys. 66(7), July 1998).

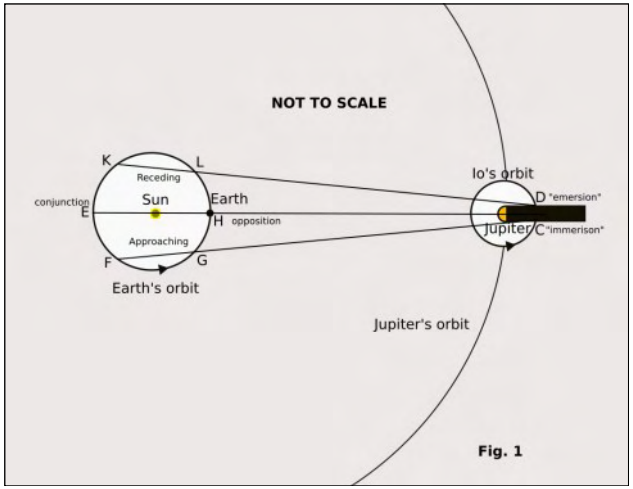


Figure 1: Adapted from Roemer's original paper

Figure 1 is an adaption of Roemer's original diagram. Referring to it Shea says:
"Now supposing that the Earth when at L, near the second quadrature of Jupiter, has seen the first satellite (Io) at the time of its emersion or coming out of the shadow at D; and supposing that about 42.5 hours afterwards, i.e., after a revolution of the satellite, the Earth being at K, the return path at D, it is evident that if the light takes time to cross the intervening space LK, the satellite will be seen at D later than it would have been seen if the Earth had remained at L, so that the revolution of the satellite, thus observed by means of its emersions, will be retarded by as much time as the light will have taken to pass from L to K. On the other hand, in the other quadrature FG, the Earth when approaching goes before the light, and the succession of the immersions will appear shortened by as much as those of the emersions had appeared lengthened."

It is clear that Roemer correctly understood that the changes in the apparent orbital times of Io were due to changing distances between the Earth and Jupiter. This is a Doppler effect and is not due to absolute changes in the distance between the Earth and Jupiter. The Doppler effect (the apparent change in the frequency of a physical action due to relative motion) was first analysed by Christian Doppler in 1842.

Shea has made a simplified computer model of the Sun, Earth, Jupiter, and Io dynamical system wherein he models all orbits as circular, ignores perturbations due to other Jovian moons etc., and his calculations are carried out through one Jovian synodic year (the time between two oppositions as seen on Earth). In such a synodic year (approximately 400 days) Io orbits Jupiter about 226 times with a mean period of about 42.5 hours. He shows that his simple model's predictions are very close to more sophisticated models.

I have independently generated a model following Shea's reasoning. Shown in Figure 2 is the geometry of the Sun/Earth/Jupiter system. From Figure 2 the distance D(θ) can be found and is given by Equation 1:

$$s(\theta) = \sqrt{(\mathrm{Esin}(\theta))^2 + (\mathrm{J} - \mathrm{Ecos}(\theta))^2} \quad ...(1)$$

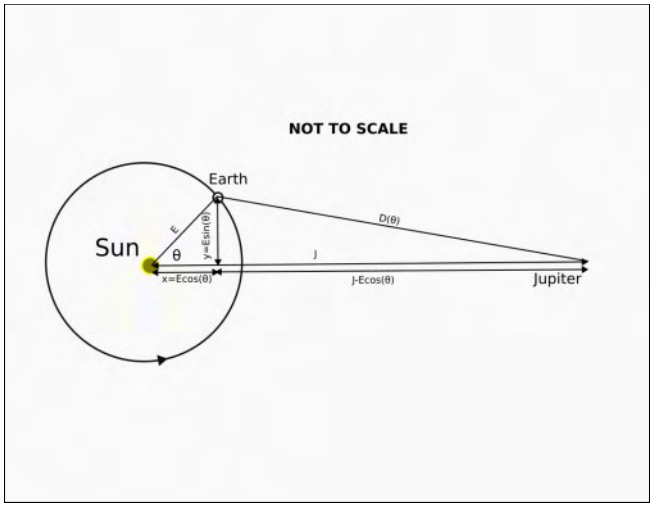
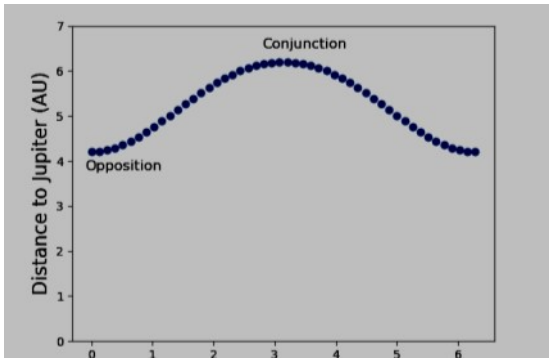


Figure 2: The geometry of the Sun/Earth/Jupiter as considered during one Jovian synodic year. Jupiter's orbital period is 11.68 years. From this perspective only Earth's position changes during the synodic period of ~400 days.

Jupiter's orbital period P_J = 11.68 years and its distance from the Sun J is 5.202 AU. Using the Copernican equation (Equation 2)for a superior planet we can find the synodic period S for Jupiter, finding that it is ~400 days.



Earth angle (radians)

Figure 3
Distance to Jupiter using Equation 1

$$1/S = 1/P_E - 1/P_J \ldots\text{(Eq. 2)}$$

The synodic orbital period of Io, SP_{Io} can be measured at Jupiter's opposition and it is 42.5 hours. The distance to Jupiter during a synodic period is shown in Figure 3.

We can find the change d(θ) of Earth (Fig. 2) during SP_{Io} using Equation 3.

$$d(\theta) = (SP_{Io}/S)\, 2\pi \ldots\text{(Eq. 3)}$$

Given SP_{Io} and S we can find that Io will orbit 226 times in one synodic period. Then, the value for θ_i from i=0 to i=226 at each orbit is given by Equation 4.

$$\theta_i = nd\theta \ldots\text{(Eq. 4)}$$

The change in distance from the Earth to Io at a given angle θ is given by differentiating Equation 1 where discrete values of θ are applied. The result is Equation 5.

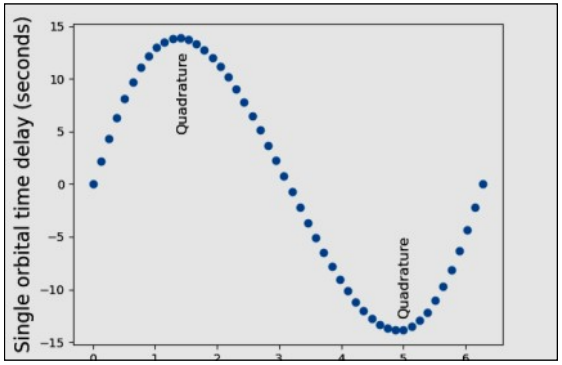
$$ds(\theta_i) = \frac{\mathrm{EJsin}(\theta_i)}{\sqrt{\mathrm{E}^2\sin^2(\theta_i) + (\mathrm{J} - \mathrm{Ecos}(\theta_i))^2}} d\theta \quad \ldots(5)$$

Then the incremental change in orbital time from i - 1 to i is given by Equation 6 where c is the speed of light with the results shown in Figure 4.

$$dt\,(\theta_i) = ds(\theta_i)/c \ldots\textit{(Eq. 6)}$$

During the Jovian synodic period the nominally expected immersion / emission of Io will show a *lag(n)* in time given by Equation 7.

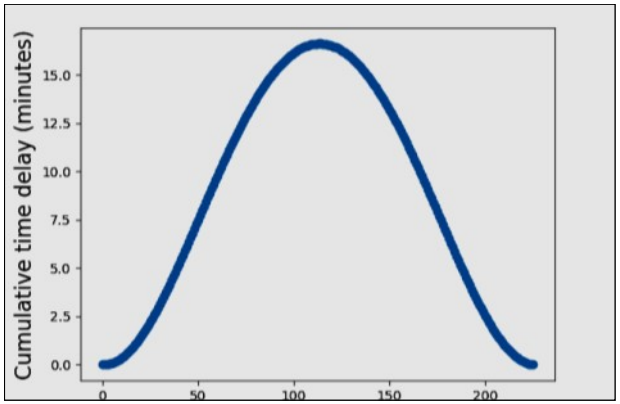
$$lag(n) = \sum_{i=0}^{i=n} dt(\theta_i) \quad \ldots \text{(Eq. 7)}$$



Earth angle (radians)

Figure 4:
Incremental change (lag or gain) from one orbit to the next.

The results (minutes) are shown in Figure 5. The maximum lag occurs at conjunction, i.e., orbit number 113. Using that value one can determine that the speed of light is calculated to the correct value.



Synodic Io orbit number

Figure 5:
Apparent time lag for Io's orbital period.

Motivated by Shea's paper we make the following comments.

The expected time deviations (Figure 4) are near zero at oppositions and conjunction, because the distance between the Earth and Jupiter is not changing at those times. This obvious point is lost in some descriptions of Roemer's work. The difference becomes greatest at quadrature, i.e., near points L and G in Figure 1. (Quadrature is when the angle from the Sun to the Earth to Jupiter is a right angle.) That the times deviate most at quadrature is very important to notice.

The incremental changes shown in Figure 4 are not very large, just a few seconds. Because of this and because the timekeeping equipment Roemer used was not very precise, Roemer typically measured the total time difference for a large number of orbits (typically 40). Also, it should be noted that the occurrence of an immersion or emission could not be accurately demarcated.

Referring again to Fig. 5, note the total time difference in a synodic year of 226 orbits. The total increase or lag time for all orbits on the receding side is about 17 minutes and the gain time on the approaching side is also 17 minutes. The difference between the two is exactly 34 minutes. As explained in Shea's paper, the 22-minute figure as mentioned in Roemer's paper refers to the difference between the lag and gain times, not the increase or decrease of the true 17 minutes on the receding or approaching times. Thus, Roemer's observed lag times between opposition and conjunction are actually 11 minutes, not 22.

Therefore, if one interprets Roemer's paper this way, his speed of light determination (if carried out) is too high, not too low.

What is mistaken in so many interpretations of Roemer's paper is the idea that the static change in distance of the Earth from Jupiter from opposition to conjunction accounts for the lag observed and reported by Roemer. If the Earth could be made stationary at either opposition and conjunction, with the distance to Jupiter at conjunction increased by a span of 2 AU, the measured orbital periods of Io would be exactly the same for both opposition and conjunction, irrespective of the distance from the Earth to Jupiter (Io).

As it is, this should be obvious, and is illustrated in Figure 4. The static distance between the Earth and Jupiter has nothing to do with the changes in observed orbital periods, rather it is the dynamic changing distances, i.e., a Doppler effect, which causes the changes.

As Shea notes, the Doppler effect should be called the Roemer effect as it was discovered 166 years before Doppler.

Ole Roemer

1644 - 1710

ASTROVERSE

When I Heard the Learn'd Astronomer

Walt Whitman (1819 - 1892)

When I heard the learn'd astronomer,
When the proofs, the figures, were ranged in columns before me,
When I was shown the charts and diagrams, to add, divide, and measure them,
When I sitting heard the astronomer where he lectured with much applause in the lecture-room,
How soon unaccountable I became tired and sick,
Till rising and gliding out I wander'd off by myself,
In the mystical moist night-air, and from time to time,
Look'd up in perfect silence at the stars.

———————————————

This poem by Walt Whitman is one of the more famous astronomy-related verses. Was he bored by the science being presented by the speaker or just tired of sitting among a roomful of people?

I read recently that the "learn'd astronomer" was likely O.M. Mitchel (1810 - 1862). Although it was composed after Mitchel died (c. 1865), it could have been based on a memory.

I have two of Mitchel's books, none of Whitman's.

Editor

Outreach Reporting

Curt Nason

We appear to be maintaining our average rate of outreach events, although the school visits are down. There is a significant drop in the number of people, and especially youth, attending events when compared with the past few years. The reason for all three is that there was no Science Week in the schools this spring. It consisted of online presentations seen in multiple classrooms simultaneously, as well as recorded viewings. Also, schools are required to complete their curriculum before bringing in guest speakers.

The biggest event to date in 2025 was the live feed of the partial solar eclipse on March 29 by the Sunday Night Astronomy Show crew with 51,668 viewers on Facebook and YouTube.

Youth group visits picked up over the summer with nine library reading club programs and four science camps, but the Sunday Night Astronomy Show is on a two-month break. The star party at Mactaquac was revived this year after a covid hiatus with 225 attendees. The results from the star parties at Mount Carleton and Fundy have yet to be reported.

When you do perform outreach, please record the event in our monthly spreadsheet. Contact me if you need assistance. French and English Star Finders and Moon Guides are available for handouts.

RASC NB Outreach Events and Handouts

Year	# of Events	People At Events	Live Feed	Youth	Star Finders English	Star Finders French	Moon Guides English	Moon Guides French	Volunteer Hours
2016	219	9498			1984	115	2290	87	988
2017	248	9951	8441		2276	162	2262	131	1937
2018	187	7289	37,922	>1300	1788	170	1635	79	1355
2019	240	7036	46,675	2997	1320	216	1520	213	1950
2020	171	1859	161,688	954	817	22	636	125	1079
2021	131	731	60,240	565	108	0	46	0	1160
2022	173	12,952	63,122	10,192	586	60	472	106	1809
2023	168	23,419	9787	20,612	556	223	452	110	1789
2024	186	12,362	12,304	6805	352	92	506	87	2331
2025	109	2633	58,594	1523	345	117	377	40	1183

Types of Outreach Events

Year	Presentation	Night Observing	Day Observing	Youth Group	School Talks	Exhibition	Observ./ Planet'm
2016	31	55	39	19	54	11	10
2017	61	89	22	19	50	6	1
2018	50	80	13	18	20	5	1
2019	73	94	10	22	36	5	0
2020	86	43	5	8	29	0	0
2021	65	48	6	1	11	0	0
2022	72	52	6	4	34	4	0
2023	60	13	8	14	69	4	0
2024	101	23	8	15	33	6	0
2025	51	20	7	21	9	1	0