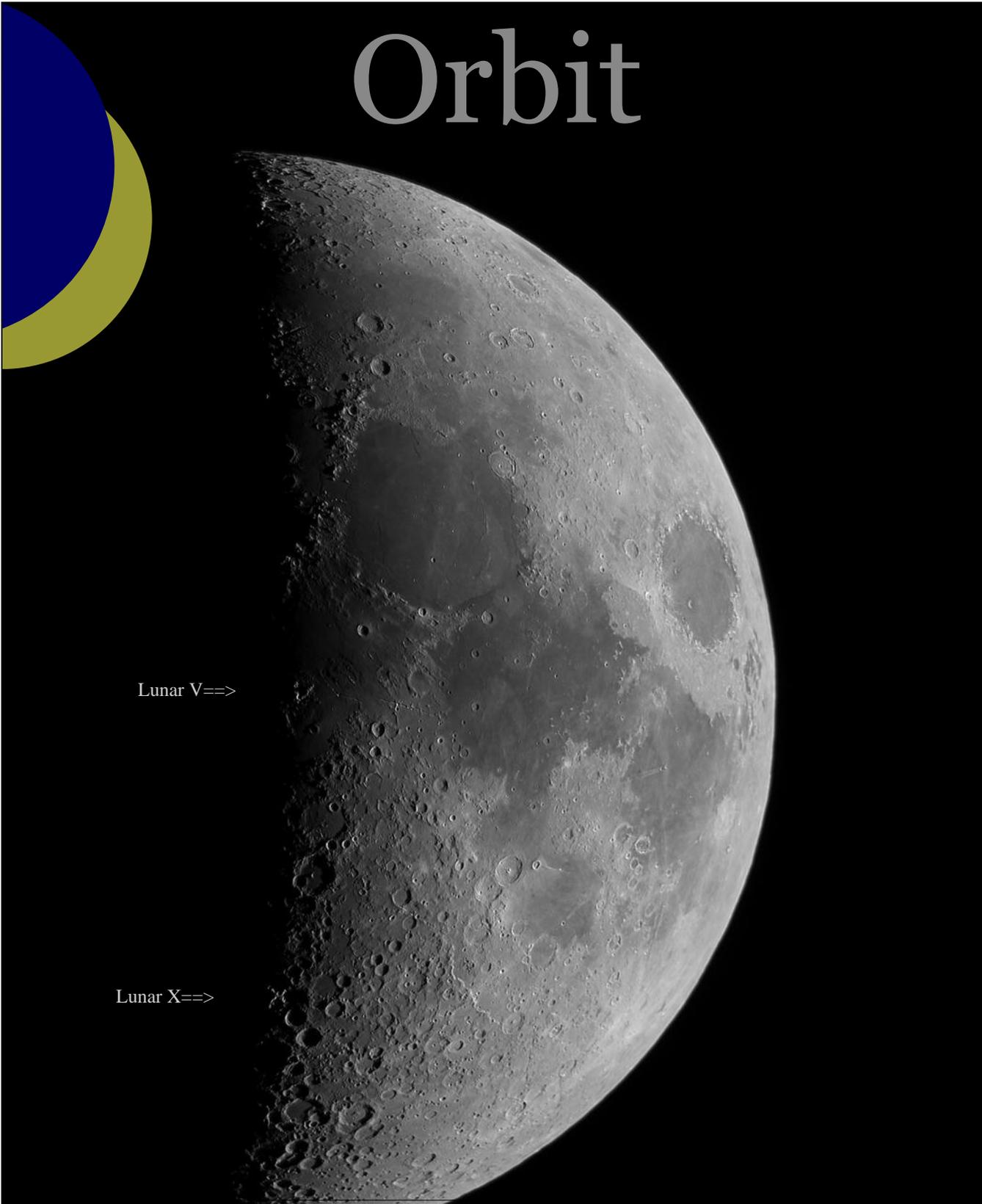


Orbit



Lunar V==>

Lunar X==>

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Issue Number 2, December, 2018

Roger Hill, Editor

November was one lousy month for astronomy, well, for observing, anyway. There were only a couple of nights that were clear, when I wasn't working, and I always seemed to have things to do on those nights.

There was a single exception, but clouds rolled in just as I had everything set up. I know...an observatory should mean that your telescope is ready to go almost instantly, but that's not been the reality for me, recently. The screen on the hand box of my scope is dying, one of the 2 comm. ports is dead, and it will now just run away in Dec, at random times. I'm thinking of de-forking my optical tube and getting a new mount. It's beginning to feel that I have to wrestle with it every time I go outside. The problem is what to get. The optical tube of a 12" LX200 weighs about 18 kilograms, and when I add my 6" RC, guidescope, cameras, diagonals, eyepieces, etc., I will be closer to 30. I like the look of iOptron's centre-balanced mount and the CEM60 and the payload capacity of it should be ok. I won't need a tripod, as I have a Meade heavy-duty tripod for the times when I will be using it outside of my observatory.

It will be easier to transport, too, as I get close to retirement, since I should have three pieces to carry, rather than 2. I'll have to keep my eyes open for a used one.

I gave a talk at the end of November to a group of photographers in Grimsby. Ron Zabel, a long time friend and member of the group, asked me last spring if I could give a talk about astrophotography, and since I have rarely turned down a request to stand in front of an audience and talk to them, I agreed. It didn't take long to put together a rough idea of what to cover, but the problem arose when moving to the specific.

You see, I have a pretty good idea of the level of expertise found in astronomy clubs, but a photography group? I didn't want to insult them by speaking down to them, and neither did I want to bore them to tears with the arcana of our hobby. It took many more hours to put together than any single presentation I've ever done. And, since I included a couple of movies of things moving in the sky, the PowerPoint deck I finally produced less than 24 hours before I was to give the talk, was enormous: just over 2.9 gigabytes. I took two computers with me, both of which had the presentation on it, and three USB sticks. I actually had doubts about the ability of one of the laptops being able to run the presentation, but I didn't actually have to use it.

The talk went off with barely a hitch, and there were appreciative chuckles at all the right moments, and gasps of wonder at things like the Rosette and Horsehead nebulas. I told them about photographing lunar eclipses, and the opportunities to take intriguing images; but it was the star trail I have of the southern pole that elicited gasps of wonder, particularly when I said that all it took was an intervalometer, a dual-battery grip for my DSLR, and a neck pillow for a tripod. Oh, and there were sounds of sheer horror when I showed some pictures of a camera undergoing IR blocking filter replacement surgery!

There were lots of questions at the end, and a number of people who came up to me afterwards, so I'd judge that the evening was a complete success. And, I thoroughly enjoyed myself!

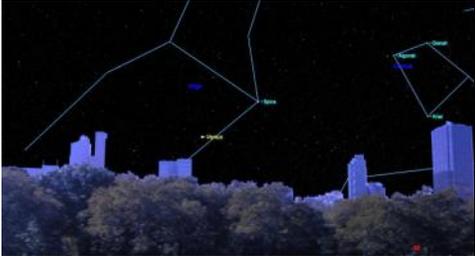
That's enough for this month, I think.

See you in the dark,

Roger

Front cover image **Image Credit & Copyright:** [Henrik Adamsson](#) . It was the Amateur Astronomy Picture of the Day on March 1, 2018.

What's up in the December Sky from Troy McCoy



Sunday, December 2 pre-dawn - Venus at Greatest Illuminated Extent for the current morning apparition. In a telescope, the planet will show a crescent phase, but Venus, only 0.418 AU away, will be at visual magnitude of -4.87. The very bright planet will be visible in the eastern pre-dawn sky after it rises at about 4 a.m. local time.



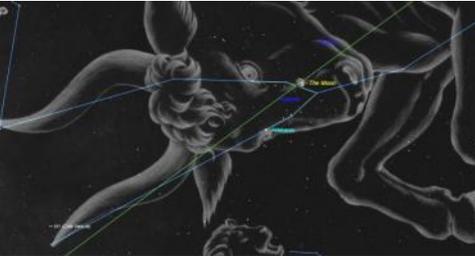
Friday, December 14 evening - Moon Meets Mars In the southwestern evening sky on Friday, December 14, the nearly first quarter moon will be positioned 4 degrees (4 finger widths) to the lower left of reddish Mars. The duo will set in the west at about 11:45 p.m. local time.



Saturday, December 15 at 6:49 a.m. EST - First Quarter Moon After the moon has completed the first quarter of its orbit around Earth, we see it half-illuminated - on its eastern side. It will rise around noon and set around midnight, and visible during the day. This is the best times to look at the lunar terrain while it is dramatically lit by low-angled sunlight.



Sunday, December 16 evening - Comet Wirtanen passes the Pleiades In the eastern sky during early evening, 46P/Wirtanen will be within 4 degrees of the Pleiades. The comet (red path) will show noticeable movement from hour to hour. Wirtanen will move from Cetus to Taurus and Auriga, moving towards Dubhe in the Big Dipper in December



Thursday, December 20 overnight - Moon Crosses the Bull Starting in mid-evening, the waxing gibbous Moon will pass directly through the Hyades star cluster. The moon will enter the cluster at about 8 p.m. EST, and exit by 4 a.m. EST, the after passing within a degree above the bright foreground star Aldebaran.



Friday, December 21 at 5:23 p.m. EST - Northern Winter Solstice At 11:28 a.m. EST, the sun will reach the solstice - its southernmost declination for the year, resulting in the shortest day of the year for the northern hemisphere and the longest for the southern. After the solstice, the amount of daylight will increase daily for the Northern Hemisphere.



Mercury will spend December in the eastern pre-dawn sky. This will be an excellent appearance for Northern Hemisphere observers, and a poor one for those in the Southern Hemisphere. The best viewing times for us will occur before 7 a.m. On December 15, Mercury will reach a maximum 21 degrees west of the Sun. In a telescope, the planet will wax from a thin crescent on December 1 to 89% illuminated at month end, as the apparent diameter shrinks by almost half. On the morning of December 21, Mercury will pass within one degree of brighter Jupiter. The two planets will be close enough to appear together in the field of view of a telescope at low magnification



Mars remains well-positioned in the southwestern evening sky as a bright reddish, naked-eye object because the evening ecliptic has lifted it higher. The planet will travel rapidly east through Aquarius and into Pisces. On December 6-7, Mars will move past Neptune, allowing owners of small telescopes to find Neptune using Mars. For the Americas, on December 6, Mars will be situated less than 0.5 degrees west of Neptune. The following evening, Mars will land 0.25 degrees east of Neptune. On both nights, the pair will be seen in a telescope at medium to high power. Minimum separation occurs at 14:05 UT on December 7, only 2 arc-minutes apart. Mars will dim to magnitude 0.5 and shrink from 9.3 to 7.6 arc-seconds.



For the opening days of December, **Saturn** will remain visible for a short time after sunset as a medium-bright (magnitude 0.55), yellowish object sitting low over the southwestern horizon. For the rest of the month, Saturn will disappear while it migrates towards the sun and will reach solar conjunction on January 2. On December 8 and 9, the young crescent moon will hop over Saturn, landing 4 degrees west on the 8th and 7 degrees east of Saturn on the following evening.

Venus will shine brightly in the eastern pre-dawn sky, visible until just before sunrise due to its brilliance. The planet will pass from Virgo into Libra at mid-month. As Venus swings farther from the sun throughout December, its disk will wax from 26% to 47% illuminated and decrease in apparent diameter by a third. Despite only a fraction of its surface reflecting sunlight towards Earth, Venus will peak in brightness at magnitude -4.9 on December 4 being relative close to Earth.

Jupiter will be visible low in the eastern pre-dawn sky after the first week of December, and the magnitude -1.75 planet will escape the morning twilight after mid-month as it climbs away from the sun. Also at mid-month, Jupiter will cross from Scorpius into Ophiuchus. On December 21, faster-moving Mercury will pass within a degree of slightly brighter Jupiter. Both should be visible during twilight beyond 7 a.m. local time and be visible as a duo for several mornings.

Blue-green **Uranus** (magnitude 5.8) will be well positioned for evening observing with binoculars and backyard telescopes during December. Uranus will move slowly west, roughly 1.25 degrees to the northeast of the naked-eye star Omicron (o) Piscium.

Deep blue **Neptune** will be visible in the western sky before midnight. The distant planet will spend the month moving eastward through the stars of Aquarius - shifting slowly away from that constellation's naked-eye star, Hydor (Lambda (λ) Aquarii). That star will sit about 2 degrees to the west of Neptune all month.

Monthly Sky watching information is provided by Chris Vaughn of Starry Night Education. Chris is a member of the Toronto Centre of the RASC. Follow Starry Night on Twitter @starrynightedu and Chris at @astrogoegy

NASA Night Sky Notes: Observe Apollo 8's Lunar Milestones By David Prosper



December marks the 50th anniversary of NASA's Apollo 8 mission, when humans first orbited the Moon in a triumph of human engineering. The mission may be most famous for "Earthrise," the iconic photograph of Earth suspended over the rugged lunar surface. "Earthrise" inspired the imaginations of people around the world and remains one of the most famous photos ever taken. This month also brings a great potential display of the Geminids and a close approach by Comet 46P/Wirtanen

You can take note of Apollo 8's mission milestones while observing the Moon this month. Watch the nearly full Moon rise just before sunset on December 21, exactly 50 years after Apollo 8 launched; it will be near the bright orange star Aldebaran in Taurus. The following evenings watch it pass over the top of Orion and on through Gemini; on those days five decades earlier, astronauts Frank Borman, Jim Lovell, and Bill Anders sped towards the Moon in their fully crewed command module. Notice how the Moon rises later each evening, and how its phase wanes from full on Dec 22 to gibbous through the rest of the week. Can you imagine what phase Earth would appear as if you were standing on the Moon, looking back? The three brave astronauts spent 20 sleepless hours in orbit around the Moon, starting on Dec 24, 1968. During those ten orbits they became the first humans to see with their own eyes both the far side of the Moon and an Earthrise! The crew telecast a holiday message on December 25 to a record number of Earthbound viewers as they orbited over the lifeless lunar terrain; "Good night, good luck, a merry Christmas and God bless all of you - all of you on the good Earth." 50 years later, spot the Moon on these holiday evenings as it travels through Cancer and Leo. Just two days later the astronauts splashed down into the Pacific Ocean after achieving all the mission's test objectives, paving the way for another giant leap in space exploration the following year.

The Geminids, an excellent annual meteor shower, peaks the evening of December 13 through the morning of the 14th. They get their chance to truly shine after a waxing crescent Moon sets around 10:30 pm on the 13th. Expert Geminid observers can spot around 100 meteors per hour under ideal conditions. You'll spot quite a few meteors by avoiding bad weather and light pollution if you can, and of course make sure to bundle up and take frequent warming breaks. The Geminids have an unusual origin compared to most meteor showers, which generally spring from icy comets. The tiny particles Earth passes through these evenings come from a strange "rock comet" named asteroid 3200 Phaethon. This dusty asteroid experiences faint outbursts of fine particles of rock instead of ice.

You can also look for comet 46P/Wirtanen while you're out meteor watching. Its closest approach to Earth brings it within 7.1 million miles of us on December 16. That's 30 times the average Earth-Moon distance! While passing near enough to rank as the 10th closest cometary approach in modern times, there is no danger of this object striking our planet. Cometary brightness is hard to predict, and while there is a chance comet 46P/Wirtanen may flare up to naked eye visibility, it will likely remain visible only via binoculars or telescopes. You'll be able to see for yourself how much 46P/Wirtanen actually brightens. Some of the best nights to hunt for it will be December 15 and 16 as it passes between two prominent star clusters in Taurus: the Pleiades and the V-shaped Hyades. Happy hunting!



Catch up on all of NASA's past, current, and future missions at [nasa.gov](https://www.nasa.gov)

Caption: This finder chart shows the path of the asteroid 3 Juno as it glides past 32 Eridani in November 2018. The asteroid's position is highlighted for selected dates, including its position on the 17th. Image created in Stellarium for NASA Night Sky Network.

Introducing the New Club Library! By Abigail Hughes

Our club library has now entered the 21st century with an online database, accessible by everyone. All of the club books are now visible online at <https://raschamilton.libib.com/>. With the books available to browse online, a new lending system will be inaugurated to accommodate members and promote accessibility. The new system will be run through the email address library@hamilrasc.ca.

Process:

The member will email library address with the title and author of the book they wish to borrow

Within 48 hours, the librarian will respond notifying the member if the book is available

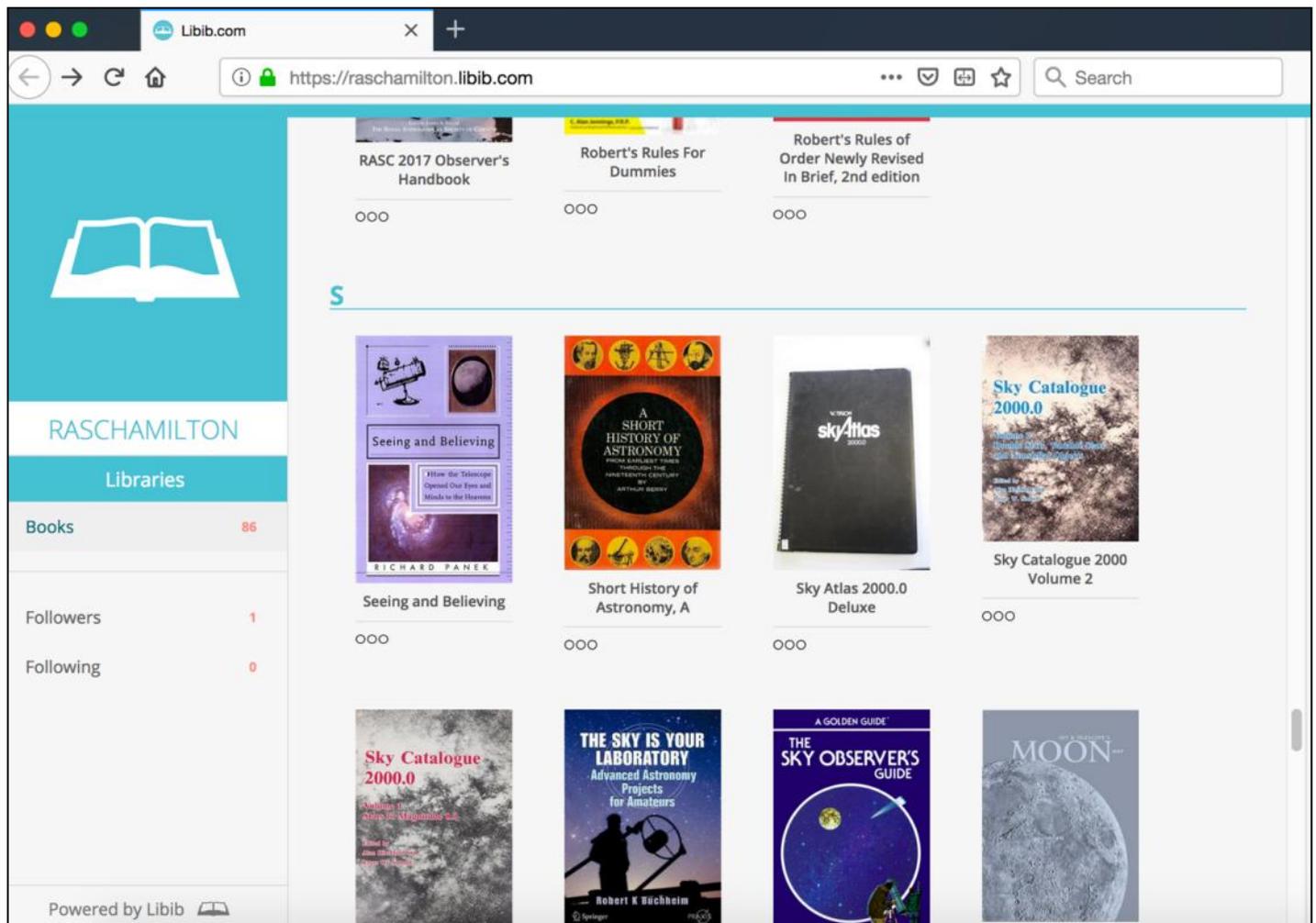
If the book is not available, the member can request to hold the book and be emailed when the book is returned to the library

Once the book is available, the date and time for pickup will be arranged

Members can arrange for books to be brought to club meetings for pick up

Member can return books at club meetings or arrange a time to drop off the book

Members are also encouraged to email their reviews of the books which will be visible on the online catalog.



The Popularization of Science
A Book Review of *Astrophysics for People in a Hurry* by Neil DeGrasse Tyson

Astrophysics for People in a Hurry. Pages 222. New York, W.W. Norton & Company, Inc., 2017. ISBN 978-393-60939-4. Available at the observatory library.

Before I begin, I want to provide the disclaimer that this month's review is a little long winded. I wanted to express my ongoing frustration with different subjects of sciences after they become popularized. If this review starts to appear as more of an essay than a review per-say, then please accept that that's exactly what this is. Every time I tried to shorten this review I ended up tangentially ranting about the overall issue which is modeled by the book. Either this review would have been two paragraphs or two pages, so please forgive the chaotic nature of this review. For those who are only interested in learning if this a good book for you to read then here's a shortcut: if I were to say that Mercury is the hottest planet in the solar system, and you say "totally" then this book is for you. However, if your response is "no it's Venus, how are you qualified to be reviewing anything related to astronomy?!", then this book is absolutely unequivocally not for you. Now, with this not-so-brief warning over and done with I say this: it is up to you to read onward into the mad ravings of a lunatic. Skip now or forever hold your peace.

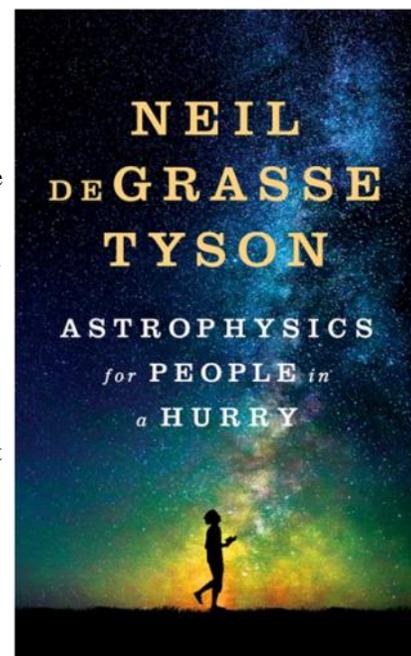
For this month's review, I have commented on the issues with the popularization of subjects in science as demonstrated through Neil DeGrasse Tyson's book. I, for one, have a special place in my heart for introductory books on different topics written with the average person in mind. After all, that's what lead me to, and helped develop, my passion for astronomy. However, there is an art to balancing content with accessibility, an art which I do not believe Tyson achieved in his book.

Tyson starts the book with a brief introduction which states that the book is intended to be "brief but meaningful introduction to the field" (12). The key phrase being "brief but meaningful"; a totally subjective concept. After reading the first two chapters I knew that this book was not what I expected or wanted it to be. Brief but meaningful to me meant the recent history of physics, the origin of the fundamental equations and theories still used currently, and the pressing issues astrophysicists are facing today. I wanted charts, diagrams, graphs, equations. But what I want and what the mass wants are, apparently, two very different things.

With astrophysics in the title (not to mention it being the first word), I would expect a strong emphasis on the technicalities of astronomy. This book, although not the only one guilty of these effects, is the direct result of the popularization of a complex subject. Much of the book focuses on the history of astronomy and its development as a science. There is a focus on some complex subjects such as dark matter and energy, the fabric of space-time, and the nature of spheres. However, there is a lack of depth, leaving the reader with a rudimentary understanding of the concepts. Ultimately what this book exemplifies is how the popularization of a subject causes the "fluffification" (a made-up word I invented for this phenomenon) of the subject. Essentially the subject becomes light and fluffy with all the interesting content lost so that the average person can grasp some of the fundamental concepts of the subject. This phenomenon has also been seen in before with medicine, law, computer science, and chemistry, to name a few.

Despite all my complaints about false advertising, pandering to mass audiences, and creating fluffy content, this book does offer value to people with little to no knowledge about astronomy. This book was not written with somewhat knowledgeable hobbyists in mind, a fact I had to keep reminding myself of while reading. There are countless books which introduce the average person to astronomy, ones with more detail, information, and objective content. However, updating these introductory books allows a new generation and audience to read the writing of a relevant social figure head. Tyson has a strong social influence, just as previously seen by Carl Sagan. Tyson is simply capitalizing on his and astronomy's booming popularity in order to share the wonders of the universe; and as much as I might try, I cannot be upset with that. As promised by the book's title, it is consumable by people in a hurry. Despite a hectic schedule, I was able to read the book in one week which is more than reasonable considering the size of the book. For the most part the writing is simple and easy to comprehend and able to reach the point in an understandable way. A variety of subjects are covered, allowing the reader to learn about more topics briefly, probably the most ideal format for the general public.

If you have managed to stick through these ramblings then quite frankly, you deserve an award. *Astrophysics for People in a Hurry* is not a terrible book, it's not even a bad book. It's simply a bad book for people who already have some knowledge of astrophysics and astronomy. If you are entirely new to the subject, then do not let this review prevent you from reading the book. If utilized properly, Tyson's book could be excellent for helping people find direction to the type of astronomy they are most drawn to. If you are going to read this book, then please keep in mind these 3 things: 1. this is barely scraping the surface of any subject mentioned in the book; 2. it is not all-inclusive of the numerous subjects involved and connected to astrophysics; 3. if there is any part of the book that draws your interest, consider doing further research on the subject.



Could We Actually Achieve “Warp Speed”? By Anna Kucirkova

Everybody knows ‘the speed of light’ is fast. The only thing faster is Chuck Norris, who, the legend goes, can turn the lights and be under the covers before the room gets dark.

But just how fast is light?

And does it always move the exact same speed? Can we use light to transmit data in a way that harnesses its speed as one of the fastest actors in the known universe? There is has always been a dream of teleportation or using wormholes to jump across time and space at warpspeed, but some scientists now believe that such technology may be more feasible than once thought.

And even if we are centuries away from transporting anything meaningful at the speed of light, the idea of light speed may soon jump from the realm of *Star Wars* to something much more tangible.

How Fast Is Light?

In a vacuum, light travels 299,792,458 meters per second, which translates to over 670 thousand miles per hour. Light is so fast that it’s difficult to comprehend what that even means.

The second you turn on a light switch, the entire room is flooded with light. But our universe is big. So light from the sun takes seven minutes to reach earth, while light from distant stars experiences so much latency that scientists say we can still see light from stars that burned out many years ago.

It’s a mind-bender to contemplate light covering a distance so long that we could still see it after ‘the lights go out.’ In our observable realm on earth, that idea seems impossible.

Another seemingly impossible idea?

That light might travel at different speeds depending on external factors. This goes in the face of Einstein’s theories about light, but this hypothesis has recently been posited by many modern scientists.

New theories suggest that light moved much faster in the nascent universe, when ambient temperatures were hotter and gravity was lower than it is today. There was also a theoretical phenomenon known as ‘inflation,’ in which the fledgling universe’s rapid expansion essentially bent the rules of every aspect of physics.

Scientists now say that if the speed of light is indeed variable as they now propose, everything about the inflation theory is no longer applicable.

These theories suggest something along the lines of light experiencing air resistance and gravity, much like tangible objects do. This revelation does not disprove Einstein’s theory; rather, it clarifies that while the speed of light is constant in a vacuum, outer space has not been a scientifically-perfect vacuum across history.

The updated theory proposes that different temperatures, gravities, and bodies all change the way light travels. And this means that some measurements made assuming uniform speed of light may be incorrect, thus changing scientists’ understanding of the size of the universe and distance to various celestial bodies.

Before you make your brain hurt *too* much thinking about measuring the size of the universe using a variable for the speed of light, let’s be clear about what light speed means for humanity.



Achieving Warp Speed

Outside of references to warp speed in *Star Wars* and warp drive in *Star Trek* and other intergalactic sci-fi, humans have never achieved travel at anything close to the speed of light. The U.S. government has put some money and research into the idea of warp drive and other such sci-fi-sounding technology applications.

The conclusion of the study was, predictably, that traveling at or near the speed of light—or even creating warp-drive-like conditions in a strictly scientific setting—is nowhere near possible.

The theory behind warp drive is actually far crazier than simply propelling an object at the speed of light. Instead, it entails using something akin to wormholes to create an interruption in the space-time continuum that would allow whatever enters the wormhole to travel far faster than the speed of light.

However, this theory relies less on next-generation propulsion techniques and more on our ability to one day physically manipulate the fabric of space-time. The fact that this study was lumped in with UFO research should provide some color to the government's general stance on warp drive.

With phrases like “dark energy” and “extra dimension” featured prominently in the report, it is clear that this possibility, even if it is theoretically plausible, lies squarely in the realm of science fiction.

Still, scientists have lately decided that warp drive is far more imminently possible than once thought. The largest hindrance to warp drive is the amount of energy required to interrupt the space-time continuum in any meaningful way.

Yet, recent advances in power storage and delivery technology and achievements in disrupting the natural state of being at the molecular level using CERN have renewed scientists' belief and interest in the idea of achieving warp drive, if only at the scale of transporting a single cell via warp drive.

The Power of Fiber Optics

You may have heard the line that “fiber optics transfer data at the speed of light.” This is, strictly speaking, true, but there is a big caveat to it.

Light travels 31% slower through a perfect fiber optic cable than it does through a vacuum—and not every fiber optic cable is in perfect condition or made of the purest materials possible. So, again, we run into the idea that the speed of light is variable. It encounters resistance in the form of fiber cables just the same way scientists have theorized it does with gravity and varying temperatures in the universe.

But, thanks to technological advances in materials and power transfer, researchers have created fiber optic cables that transfer data at 99.7% of the theoretical maximum speed of light—a full 1,000 times faster than today's average fiber optic cables. This is an application of light speed that is pertinent to humans immediately and in the near future.

Achieving near light speed on earth through fiber optics could allow for data transfer speeds far beyond anything we have witnessed, allowing all-but-instant transmission of signals for everything from consumer grade internet to controlling hypersensitive factory operations and robotic devices with lower latency than ever before.

These new ‘light fibers’ are made almost entirely of air and allow optic data to travel much the same way light does in a vacuum—unencumbered by physical resistance. While this technology is not yet ready to be applied in long-distance fiber optics applications, it has nearly immediate potential to provide radically increased speeds in short-distance applications.



The Speed of Light in Your Life

While we may not achieve light speed travel in any of our lifetimes, the speed of light is imminently relevant to all of our lives. As internet providers bring fiber optics to more cities and technology companies sink more research into fiber optic cables themselves, there is ever more reason to believe that we may experience light speed internet connectivity in the not-so-distant future.

And as scientists continue to refine their understanding of the variable speed of light, we may even learn of radical new theories behind the size, age, and origin of the Universe itself.

Observatory Night—Friday, December 14, 2018

Our next Observatory Night is on Friday, December 14th, starting at 8pm. The gates will be open by 7:30pm.

However, shortly after it gets dark, the Lunar “X” will be visible (see front cover image), peaking at about 5:45pm. The Lunar V is visible for longer, and should still be visible at 8pm.

The Lunar “X” is a transient optical feature of the Moon that occurs for about 4 hours near First Quarter phase of the Moon. Because the Earth is not always in the same place when the Moon is in this ideal sunlight location, not everywhere on Earth will always see the Lunar “X” phenomenon every month.

Both of these effects are easily seen in small telescopes, and can be captured with a phone camera held up to an eyepiece.

If it’s going to be clear, I’m thinking of going to the Observatory about 5pm to see it, and then going into Waterdown for supper. Or...perhaps a few people would like to have pizza at the site? Let me know on the Forum if you’re interested.

Another interesting object to view might be Comet Wirtanen. Binoculars will be suitable, although the Moon might interfere. I think it will be best after the Moon sets around 11pm, as the comet will still be 25° above the western horizon. We might have to go out to the road to see it as the trees may interfere.

The astrophotographers may have some fun, too, as a series of short (10-15 second exposures, stacked, should pick up the comet nicely. Just bring a camera and tripod.



The Messier people will have a good evening, too. Bright M31, with its accompanying satellite galaxies M32 and M110 will be high overhead. M33 will be, too, but with its low surface brightness and the Moon, will make it difficult to see. The **Pleiades** will be nice and high, too, with glorious Orion showing up later in the evening.

Explore the Universe aficionados will welcome some Fall and Winter constellations, with Pegasus, Andromeda, Cassiopeia, Ares and Perseus from the former with Taurus, Orion, Gemini, Canis Major and Auriga from the latter.

As always, please bring your own telescope! There will be someone happy to give you any help you may wish for. And although you could use one of the Centre’s “loaner” scopes, these tend to go fast on such nights.

Both of the big ‘scopes should be kept busy, too!

See you there!

Mum's outrage over £50 Smyths telescope that doesn't show the moon

The 23-year-old says she is "devastated" that she has now been left £50 out of pocket

A furious mum has claimed that a telescope bought for her son is not good enough to even see the moon and planets.

Emma Selby went into Smyths Toy Store at Friary Retail Park with her family to purchase a telescope for her eldest child, Billy, aged four, but they were both left disappointed after they were unable to see the 'moon's craters and Saturn's rings'. The 23-year-old from [Cornwall](#) says she is "devastated" that she has now been left £50 out of pocket after they splurged on the most expensive telescope in the store, which her children will never use. The mum-of-three said: "It was a [Christmas present](#) for my son as he's been learning about the moon and stars at school and is really interested in it.

"It was really wobbly and it was just really useless. He was getting really cold and bored because he couldn't see the moon craters."



Emma says a Smyths worker "promised" that she could take the telescope back if they were not happy with the product and it did not function as it stated on the box. Emma said: "We asked a man who worked there if the £50 one was any good and if we would be able to see stars, the moon and mars and he said yes. "We even asked if we could return it if it was no good, and he said we could. So we came home to Dobwalls and try it out but struggled to see anything at all, even on the clearest night.

"We did what the instructions said but saw nothing and really struggled to do anything with it. We took it back to the store and asked if we could return it, we were told no, it would have to be investigated and left with them."

The Fusion Science 700m refractor telescope for 'land and sky' is the most expensive telescope the toy giant sells and the product description states that the telescope will pick up some incredible views of space. It states: "The TM7060 has been designed to provide views of the moon's craters, Jupiter's major moons, and Saturn's rings, in addition to dozens of galaxies, star clusters, and nebulae."

Emma said after left the telescope at the store she received a phone call the following day to say the product was not faulty, and she would not receive a refund. She said: "I asked if they were able to see the moon and he said I can't say as it wasn't me who tested it. The whole reason we bought it was to see the moon closer. "So now we're left with a telescope we can't even use and a store refusing to refund us even though they originally said we could bring it back if it wasn't right."

Emma said that her son was "really excited" to try the telescope, but now "it's just £50 wasted".

She said: "That's £50 we could've used for something the kids would actually enjoy we are devastated. If the guy in store had said he had no idea if it was any good we wouldn't of bought it but he said we would definitely be able to see some things and we can't."

Emma contacted the Smyths team on Facebook, and received the following response: "Hi Emma, we are terribly sorry to hear of this issue. We have looked into this with our Plymouth store. Unfortunately, we are unable to accept the item outside of our terms and conditions unless the item is deemed faulty. Apologies. Please be advised we can accept the return within 28 days, provided the goods are unopened. The discretion to accept the item outside of these terms is at the discretion of the store manager. Apologies we cannot advise any further in relation to this matter."

From the Plymouth (U.K.) Herald, December 4, 2018

Monthly Meeting – November 1, 2018 by Abigail Hughes

On November 2, 2018 the Hamilton Centre met for its regular monthly meeting and as the first meeting of the new Board. Approximately 30 people attended despite the terribly rainy weather conditions. The majority of attendees were club members and returning non-members. I would like to thank Muhammad Ahmad for bringing complimentary snacks and refreshments for the attendees to enjoy during the meeting.

Muhammad commenced the meeting at 8:00 pm, starting with an agenda for the evening. The first order of business was to elect the National Representative, something that was postponed from the Annual General Meeting in October. I was elected to the role after the motion was moved by Bob Prociuk, seconded by Eric Golding and approved by a majority vote. After the vote, Muhammad publicised the sale of the 2019 calendars being sold for \$20 each. If you have not bought one already, be sure to grab yours at the December meeting.

Next, Bob Prociuk stated that the club membership has not changed since the previous meeting. Muhammad then thanked Gavin Hill for successfully running a clean-up day at the observatory. Thanks to Gavin and the team of volunteers, the observatory grounds and buildings are all cleaned up and ready to be used over the winter. Next on the agenda was informing the attendees about Outreach and Social Media, more specifically to announce the new Instagram page for the club (@RASCHamilton). Now with the observatory all dolled up, Roger Hill has graciously agreed to run observing nights once again, come rain or clear skies. The idea of creating a club photo contest, proposed by Erin Vassair at the October board meeting, was well received by the attending members. Further details about the contest will be finalized and posted soon. Muhammad brought up that CAPS has been picked up by Mark Smith and that volunteers would be appreciated to help run the event.

To conclude the first half of the meeting, Sam Crane, a relatively new member, presented his work on the *Exploring the Universe Certificate*. In order to fulfill the requirements of the certificate, Sam had to locate and identify 55 or more objects in the night sky, record his observations, and have the work checked by a verified club member. Sam was able to complete the requirements for the certificate in less than a year. Sam brought the sketch book which he used for the certificate so that the members could look through it. Many of the club members were impressed by his work and skills regarding the certificate documentation. Next, there was a 15-minute break for attendees to grab more snacks, look at Sam's book, purchase a calendar, and talk amongst themselves.

At 8:40 Muhammad resumed the meeting, taking a moment to thank Ed Mizzi for his time as president over the last year. A small painting of M33 with the dates of service as president and a card signed by the members at the meeting was presented to Ed as a token of appreciation.

Muhammad then introduced Michael Watson, the guest speaker for the evening. Michael is a long time, non-attached member of RASC who has travelled to Australia about 6 times. For his most recent trip he was only able to travel for 4 weeks instead of his usual 3 months. Due to the shorter travel time, Michael's trip was streamlined, optimizing the best preparation and equipment to maximize quality output. Michael went through his planning processes and preferred equipment for the trip. In order to best use his limited time, he would key out what objects he would photograph in advance and created custom star charts. The entire presentation was complimented all the way through with gorgeous pictures that Michael took throughout his trip (available on his Flickr page). At the end of his presentation, Muhammad thanked Michael for talking to the club and presented him with a RASC toque. The November meeting was brought to a close at 9:40 pm.



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- [The Royal Coachman](#)
1 Main St N Waterdown, ON L0R, Canada
- [Dundas Street, Tim Hortons](#)
530 Dundas St E Waterdown, ON L0R, Ca
- [Tim Hortons, Brant Street](#)
2201 Brant St Burlington, ON L7P, Canada
- [Tim Hortons, Guelph Line](#)
2400 Guelph Line Burlington, ON L7P, Car

576 Concession 7 East, Flamborough ON
 N43° 23' 27" W79° 55' 20"
**RASC Hamilton, P.O. Box 969,
 Waterdown, Ontario L0R 2H0**

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President	Muhammad Ahmad	Orbit Editor, Observing Director	Roger Hill
Vice President	Bob Prociuk	Outreach	Abigail Hughes
Recording Secretary	Erin Vassair	Councillor	Eric Golding
Treasurer	Bill Leggit	Councillor	Bob Speck

I chose this image by new member Gavin Hill for this months back page image.

What I like about this is the simple equipment that was used, and yet how effective it was to get a nice, sharp, image of the Moon.

Long time amateurs like myself would call this the Afocal Method of imaging, when you use the camera in place of your eye.

You focus your telescope with your eyes as relaxed as possible, thus focussing the 'scope for infinity, and then pointing your camera through the eyepiece.

There are adapters you can use (the Centre has two) that will hold the camera steady, but with a bright object like the Moon, if you take a number of pictures, one or two are likely to be sharp.

Such a technique is idea for the Lunar X and V visible on the evening of December 14th. Why not give it a try yourself?

