

Orbit

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Roger Hill, Editor

So often, astronomy, or observing, is something that is done alone, in the dark. Not all amateur astronomers are reclusive by nature, but I think there has to be a significant part of the psyche that enjoys spending time in solitude under the night sky. I think that this also means that the times when we do gather can be memorable. Such a time happened in April, at Heavy METUL Night #3, and you can read a fuller account of it later in Orbit.

It can also mean that having an observing partner can really enrich the time under the night sky.

Over the years I've had some amazing times under the night sky, and many of them have been when I've had company.

Why am I saying this? Because Les Nagy has returned from Chile.

Les and I were both mentored by Ken Chile, and back in the mid '70's while I was breaking ground for the main building, Les was making a sign for the gate.

We reconnected again in 1995 at Starfest, and for several years afterwards, we'd try to have an observing project. One of the best was when we observed all 9 planets in less than 24 hours. This started when we were enjoying a pleasant afternoon with the sky a lovely shade of deep blue interspersed with a number of fluffy white cumulus clouds. That was how we focussed our eyes and saw Venus. Using Venus to offset the setting circles on my C-8, our next planet was Mercury, seen within the hour. Mars, however, was not such easy prey. We knew that the four gas giants would be night time objects, so that was when we realized what we could achieve. Bill Parker and Charles Baetsen offered to find Uranus and Neptune when it got dark, and Les' task was to locate Pluto with his 8" Dob (that 'scope had superb optics).

Maps were printed as Les had brought along a portable printer. One by one, our targets fell as Bill, along with Charles and Patty Baetsen star-hopped to their respective targets. Finally, under a lovely deep dark night, Les found Pluto. His eyes are a bit better than mine, and so, for me, the last outpost of the solar system would sometimes pop in and out of view, Les was able to hold it steady using averted vision. Our final target, Mars, rose around 5am. Les and I woke Bill and Charles up so they could see the baleful red eye of Mars a couple of degrees above the eastern horizon.

Since then we've seen some amazing things, like the Veil Nebula, looking like a twisted green snake through Stewart Attlesey's 20" Obsession or M51 through a 36" beast in the dark skies of the Texas Star Party. Add to that a view of Jupiter through a 28" scope 8,000 feet above sea level in the Atacama under perfect seeing that was only bettered by Hubble and orbiters. Next year, we plan to add totality to that list, but it will be a titanic battle because when it comes to seeing a total solar eclipse I'm 4 for 4, while Les is 0 for 2!

So, to conclude, I think that if you want the most out of this hobby, you should find an observing buddy or two. And the best place to find one? At the Hamilton Centre Observatory on Heavy METUL Night #4—Friday, May 18th.

See you in the dark,

Roger

What's up in the May Sky from Troy McCoy



Friday, May 4 pre-dawn - Moon Hops over Saturn

In the southwest, the waning gibbous moon will be positioned about 6 degrees to the right of Saturn. On Saturday morning, the moon's orbit (green line) will carry it to a position to the left of Saturn. Look for the stars forming the large Teapot asterism of Sagittarius below Saturn all year.

Saturday, May 5 pre-dawn - Eta-Aquariid Meteor Shower Peak

This shower is material from Halley's Comet, and runs from April 19 to May 26. The Aquariids radiant is in Aquarius, near the eastern horizon. Normally it peaks at a few dozen meteors per hour, including some fireballs. The waning last quarter moon will degrade the sky for this shower.

Sunday, May 6 pre-dawn - Moon Meets Mars

In the pre-dawn sky of Sunday, May 6, the last quarter moon will sit 2 degrees above Mars. Both objects will fit into the field of view of binoculars (orange circle). The binocular field will also include the globular cluster Messier 75, which will be positioned 3 degrees to the left of Mars.



Sunday, May 20 evening - Venus meets Messier 35

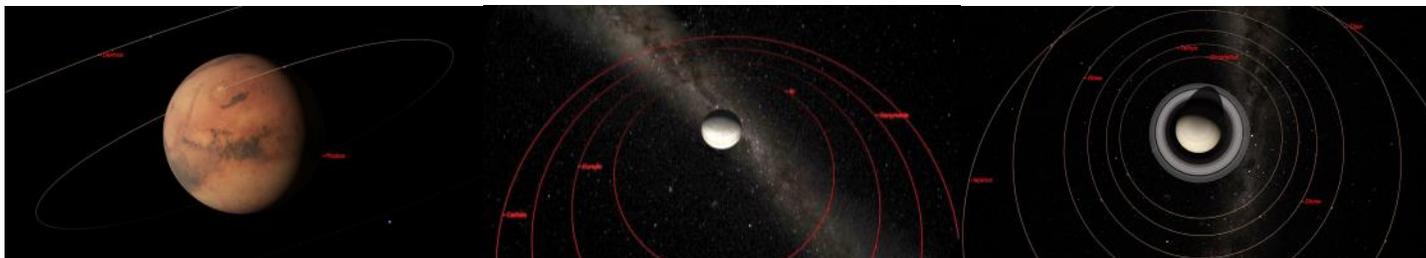
In the north-western evening sky of Sunday, May 30, Venus' orbital motion will carry it within a degree to the right of the bright open star cluster designated Messier 35 in Gemini. Both objects will appear together in the field of view of a low power telescope (orange circle) or binoculars.

On Monday, May 21 late evening, the Moon will Skim Regulus

, the brightest star in Leo. Both will fit into the field of view of a small telescope at low power (orange circle). By observing the relative positions of the two between dusk and moonset several hours later, the moon's eastward motion will be apparent. Minimum separation occurs about 11:15 p.m. EDT.

Mercury will open May in Pisces

The elusive planet will be visible with difficulty in the eastern pre-dawn sky for northern observers. The increasing tilt of the morning ecliptic will keep it in view by lifting it higher. Mercury will get brighter despite moving further away as it waxes to nearly full. The planet will be lost in the sun's glare by month's end.



Mars will spend May in the south-eastern pre-dawn sky

. Its prograde motion will carry it out of Sagittarius and into Capricornus on May 15th. During May, Earth's orbital motion will continue to reduce our distance to the Red Planet and Mars will double in brightness (mag. -0.38 to -1.2). Its apparent diameter will increase from 11 to 15 arc-seconds. The last quarter moon will sit 2 degrees above Mars on May 6th. On May 14th, Mars will pass only 18 arc-minutes (or 2/3 of the full moon's diameter) below the small globular cluster M75. Both will appear in the field of view of a telescope.

During May, very bright Jupiter (mag. -2.5) will be an all-night target in central Libra

, slowly moving westward in a retrograde loop that will last until July. Opposition is on May 9th, when it will be 43.8 arc-second in diameter and just 37 light-minutes away. This is a fine time to observe Jupiter's Galilean moons. In the southern sky on the evening of May 27th, the nearly full moon and Jupiter will be less than 5 degrees apart, and they will cross the sky together during the night. Their separation will increase as the moon moves eastwards. As May ends, Jupiter will be less than a degree north of Zubenelgenubi.

In May, Saturn is a medium bright (mag. 0.35) yellowish object moving retrograde in northern Sagittarius

. In early May, the ringed planet will rise in the east shortly after midnight, remaining visible until dawn, when it will be 23 degrees above the southern horizon. On May 4th, the waning gibbous moon will be about 6 degrees west of Saturn. The following morning, the moon will be on the planet's left. On the mornings surrounding May 14th, Saturn will move past M 22. Saturn will be 1.6 degrees away around May 14th, and directly above M22. Both will be seen together in a telescope at low power, or in binoculars.

During May, **Venus** continues a long and very good apparition that lasts into early autumn. Each evening through the month, our extremely bright sister planet will climb the western early evening sky – moving between the horns of Taurus in mid-month and passing into Gemini on May 19th. On May 1st, Venus will set about 10:45 p.m. local time. On May 31st, it will set after 11:30 p.m. local time. Venus will continually brighten throughout May, reaching magnitude -3.94 at month's end. Meanwhile, its apparent disk size will increase slightly and its illuminated phase will drop slightly, to 88%. After sunset on May 17, a very young crescent moon will be visible sitting six degrees to the left of the planet. On May 20, Venus will pass only a degree to the north of the bright open cluster M35. The pair will fit within the field of view of binoculars.

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

What's It Like Inside Mars? By Jessica Stoller-Conrad



Mars is Earth's neighbor in the solar system. NASA's robotic explorers have visited our neighbor quite a few times. By orbiting, landing and roving on the Red Planet, we've learned so much about Martian canyons, volcanoes, rocks and soil. However, we still don't know exactly what Mars is like on the *inside*. This information could give scientists some really important clues about how Mars and the rest of our solar system formed.

This spring, NASA is launching a new mission to study the inside of Mars. It's called Mars InSight. InSight—short for Interior Exploration using Seismic Investigations, Geodesy and Heat Transport—is a lander. When InSight lands on Mars later this year, it won't drive around on the surface of Mars like a rover does. Instead, InSight will land, place instruments on the ground nearby and begin collecting information.

Just like a doctor uses instruments to understand what's going on inside your body, InSight will use three science instruments to figure out what's going on inside Mars.

One of these instruments is called a seismometer. On Earth, scientists use seismometers to study the vibrations that happen during earthquakes. InSight's seismometer will measure the vibrations of earthquakes on Mars—known as marsquakes. We know that on Earth, different materials vibrate in different ways. By studying the vibrations from marsquakes, scientists hope to figure out what materials are found inside Mars.

InSight will also carry a heat probe that will take the temperature on Mars. The heat probe will dig almost 16 feet below Mars' surface. After it burrows into the ground, the heat probe will measure the heat coming from the interior of Mars. These measurements can also help us understand where Mars' heat comes from in the first place. This information will help scientists figure out how Mars formed and if it's made from the same stuff as Earth and the Moon.

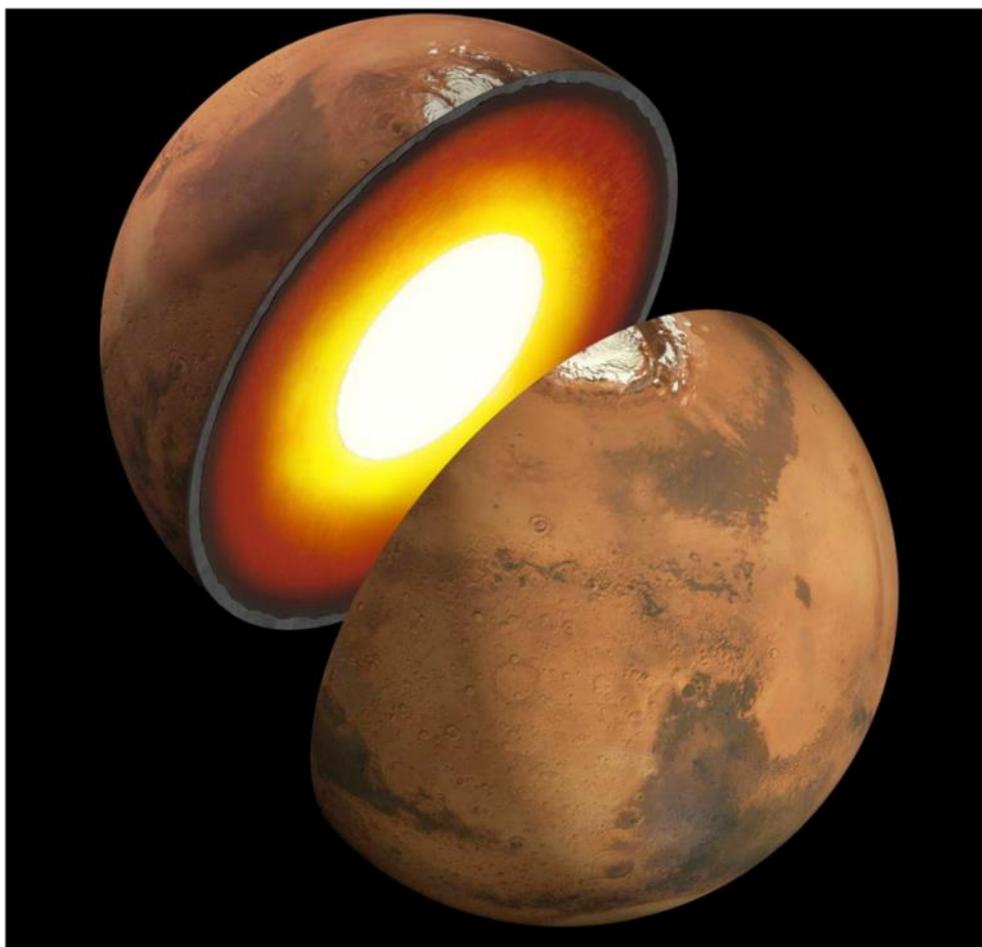
Scientists know that the very center of Mars, called the core, is made of iron. But what else is in there? InSight has an instrument called the Rotation and Interior Structure Experiment, or RISE, that will hopefully help us to find out.

Although the InSight lander stays in one spot on Mars, Mars wobbles around as it orbits the Sun. RISE will keep track of InSight's location so that scientists will have a way to measure these wobbles. This information will help determine what materials are in Mars' core and whether the core is liquid or solid.

InSight will collect tons of information about what Mars is like under the surface. One day, these new details from InSight will help us understand more about how planets like Mars—and our home, Earth—came to be.

For more information about earthquakes and marsquakes, visit: <https://spaceplace.nasa.gov/earthquakes>

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Caption: An artist's illustration showing a possible inner structure of Mars. Image credit: NASA/JPL-Caltech

Heavy M.E.T.U.L. Night #4: FRIDAY May 18, 2018—Your host: Roger Hill

If we measure the success of these nights by the number of people who attend, then Night #3 was a huge success.

So it seems that a Friday night was a good thing. Given that, what phase should the Moon be? Should I opt for a new Moon weekend, or First quarter (-ish)? Also in the mix is that we are rapidly approaching mosquito season. Those that have done some evening observing in the summer months at the observatory know that this is no idle question. In years past we had a “Mosquito Magnet”, and while it did a good job of reducing the population, we needed a tank of propane every three weeks or so, and if this was not replenished, the local mosquito population rapidly increased. Another good answer is something called a ThermaCell, which does a very good job of keeping mosquitoes out of a zone about 4-5 metres in diameter. This is about the size of the Chilton (roll-off roof) Building. Personal repellents work as well, but you should avoid anything containing DEET as it can do nasty things to optical coatings and some plastics. I’m going to gamble and go for May 18th, the Friday night of the May long weekend.

What will we see? There will be a 4 day old Moon in the sky, and Venus will be visible early on, with Jupiter rising and might make it above the trees by 10:30pm or so. The ETU folks can look for the waxing crescent Moon, Mare Crisium and Mare Fecunditatis, the Spring constellations of Ursa Major, Ursa Minor, Libra, Leo and Bootes, there’s a nice Iridium flare (Mag. 5.3) that will be visible near the Moon (so go out to the road to watch it at 10:49:46pm). M5 and M13 (globular clusters common to the ETU and the Messier certificate) will be 35 and 44 degrees above the horizon, respectively. If there is something that you’re working on, let me know when you arrive, and I (or another experienced observer) can help you. Otherwise, I’ll just wander around being nosy and asking if I can help!

As always, everyone is welcome.

- ◆ If you bring your own telescope, park on the north side of the parking lot (to your left as you drive in).
- ◆ The corollary is that if you don’t have a telescope, park on the south side unless there aren’t any spots.
- ◆ Turn your headlights off as quickly as you can.
- ◆ Dress as if it was 10° C cooler than it’s supposed to be.
- ◆ Bring a clipboard, a couple of pencils, and one of those Canadian Tire headlamp flashlights that has a red LED setting.
- ◆ Beware of people and telescopes if you arrive after dark.
- ◆ Keep the observatory door closed, and only turn on the lights that you need.
- ◆ There is power available, but bring your own extension cord. If you do, bring a power bar too, but don’t unplug anything without asking first...some telescopes need to go through an elaborate routine at start-up, or someone may be in the middle of an exposure.
- ◆ If you use the whiteboard to make, or illustrate, a point, please clean it off when you’re done.
- ◆ Take away your coffee cups and other garbage...if you carried it to the site, you can carry it home!

See you in the dark!

RASC Archive Open House: Join Us!

- ◆ **Who? RASC Members and their guests.**
- ◆ **When? Saturday May 12, 2018**
- ◆ **Where? 4920 Dundas St W, Unit 203**
- ◆ **Time? 1:00pm to 4:00pm**

2018 marks 150 years of lasting organized astronomy in Canada, and that story is pre-eminently the story of the RASC. Join us on the afternoon of **May 12th** for an open house launching the official opening of our new Archives space! This invitation is extended to all RASC members, and their guests. The refurbished Archives facility is a RASC sesquicentennial project, providing improved storage, display, and consultation space for the RASC's material heritage, and a congenial location for select meetings and programming, in a setting richly evocative of our history. The fabric of our history is a resource the entire Society can draw on as we build our future.

If you've ever wondered if any of the telescopes in the iconic earliest RASC star-party images survived, or ever wanted to hear the probable sound of Galileo's clock mechanism, or look at documents from our earliest years, or peer at Voltaire's contribution to the Newton wars, or discover which famous astronomers left their mark in our archives and books, come to the open house! The history of the RASC is *your* history.

The event runs from 1 to 4 PM, with the official program commencing at 1:30. The National President will welcome everyone, James Maloney MP for Etobicoke—Lakeshore will bring greetings on behalf of the Government of Canada, CASCA President Roberto Abraham will be on hand, the Executive Director will speak on programs and the RASC, and the Archivist will introduce some of our artifacts. Light refreshments will be served.

OPEN HOUSE AGENDA

- space opens for guests at 1 PM
 - 1:30-1:35 National President Colin Haig welcomes guests
 - 1:35-1:40 MP James Maloney conveys greetings on behalf of the Government of Canada
 - 1:40-1:45 CASCA President Prof. Roberto Abraham represents CASCA, and himself as a professional *and* amateur astronomer, and long-time RASC member
 - 1:45-1:55 Executive Director Randy Attwood talks about the uses of the space, and future programming
 - 1:55-2:15 Archivist *briefly* address the place of the RASC's history in the cultural fabric of the country, and introduces a few of the artifacts on display
 - 2:30-2:35 Raffle draw – 150th prize package
 - 2:35 – 4:00 Various RASC artifacts available for viewing
- speaker timings are approximate*

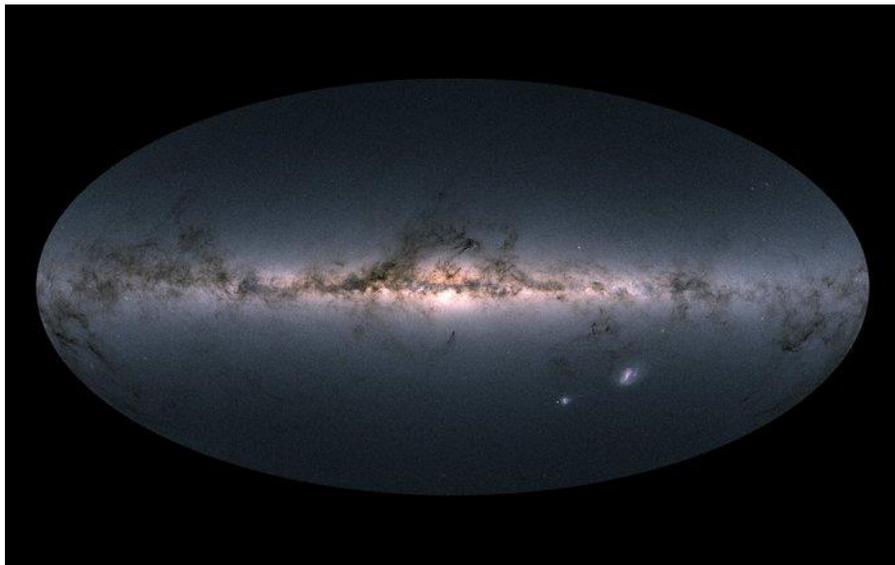
Guests are welcome to drop-in and stay for any length of time!



Gaia creates richest star map of our Galaxy—and Beyond!

25 April 2018 ESA's Gaia mission has produced the richest star catalogue to date, including high-precision measurements of nearly 1.7 billion stars and revealing previously unseen details of our home Galaxy.

A multitude of discoveries are on the horizon after this much awaited release, which is based on 22 months of charting the sky. The new data includes positions, distance indicators and motions of more than one billion stars, along with high-precision measurements of asteroids within our Solar System and stars beyond our own Milky Way Galaxy.



Preliminary analysis of this phenomenal data reveals fine details about the make-up of the Milky Way's stellar population and about how stars move, essential information for investigating the formation and evolution of our home Galaxy.

"The observations collected by Gaia are redefining the foundations of astronomy," says Günther Hasinger, ESA Director of Science.

"Gaia is an ambitious mission that relies on a huge human collaboration to make sense of a large volume of highly complex data. It demonstrates the need for long-term projects to guarantee progress in space science and technology and to implement even more daring scientific missions of the coming decades."

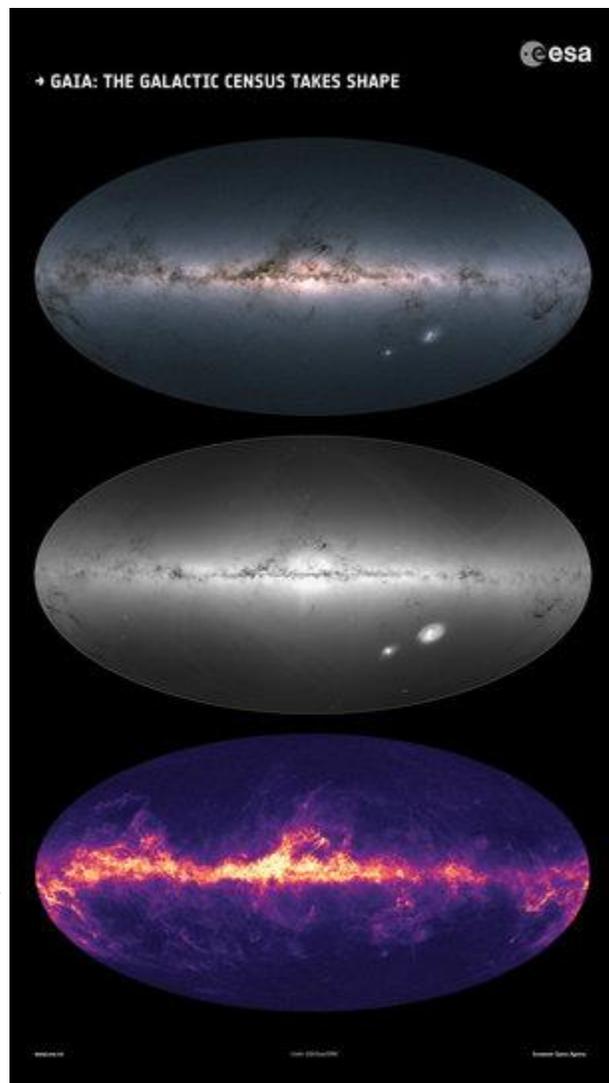
Gaia was launched in December 2013 and started science operations the following year. The [first data release](#), based on just over one year of observations, was published in 2016; it contained distances and motions of two million stars.

The new data release, which covers the period between 25 July 2014 and 23 May 2016, pins down the positions of nearly 1.7 billion stars, and with a much greater precision. For some of the brightest stars in the survey, the level of precision equates to Earth-bound observers being able to spot a Euro coin lying on the surface of the Moon.

With these accurate measurements it is possible to separate the parallax of stars – an apparent shift on the sky caused by Earth's yearly orbit around the Sun – from their true movements through the Galaxy.

The new catalogue lists the parallax and velocity across the sky, or proper motion, for more than 1.3 billion stars. From the most accurate parallax measurements, about ten per cent of the total, astronomers can directly estimate distances to individual stars.

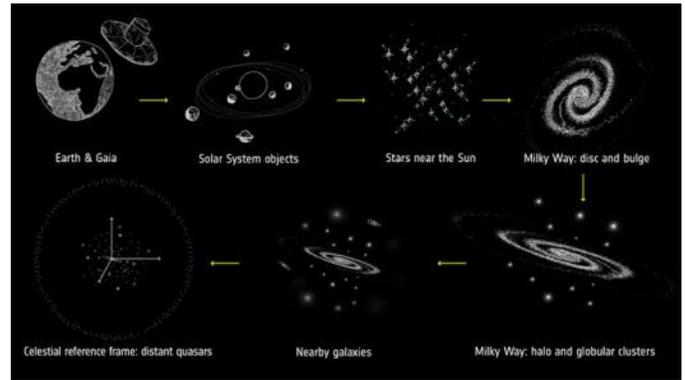
"The second Gaia data release represents a huge leap forward with respect to ESA's Hipparcos satellite, Gaia's predecessor and the first space mission for astrometry, which surveyed some 118 000 stars almost thirty years ago," says Anthony Brown of Leiden University, The Netherlands.



Anthony is the chair of the Gaia Data Processing and Analysis Consortium Executive, overseeing the large collaboration of about 450 scientists and software engineers entrusted with the task of creating the Gaia catalogue from the satellite data.

“The sheer number of stars alone, with their positions and motions, would make Gaia’s new catalogue already quite astonishing,” adds Anthony.

“But there is more: this unique scientific catalogue includes many other data types, with information about the properties of the stars and other celestial objects, making this release truly exceptional.”



Cosmic scales covered by Gaia

Something for Everybody

The comprehensive dataset provides a wide range of topics for the astronomy community.

As well as positions, the data include brightness information of all surveyed stars and colour measurements of nearly all, plus information on how the brightness and colour of half a million variable stars change over time. It also contains the velocities along the line of sight of a subset of seven million stars, the surface temperatures of about a hundred million and the effect of interstellar dust on 87 million.

Gaia also observes objects in our Solar System: the second data release comprises the positions of more than 14 000 known asteroids, which allows precise determination of their orbits. A much larger asteroid sample will be compiled in Gaia’s future releases.

Further afield, Gaia closed in on the positions of half a million distant quasars, bright galaxies powered by the activity of the super-massive black holes at their cores. These sources are used to define a reference frame for the celestial coordinates of all objects in the Gaia catalogue, something that is routinely done in radio waves but now for the first time is also available at optical wavelengths.

Major discoveries are expected to come once scientists start exploring Gaia’s new release. An initial examination performed by the data consortium to validate the quality of the catalogue has already unveiled some promising surprises – including new insights on the evolution of stars.

Galactic archaeology

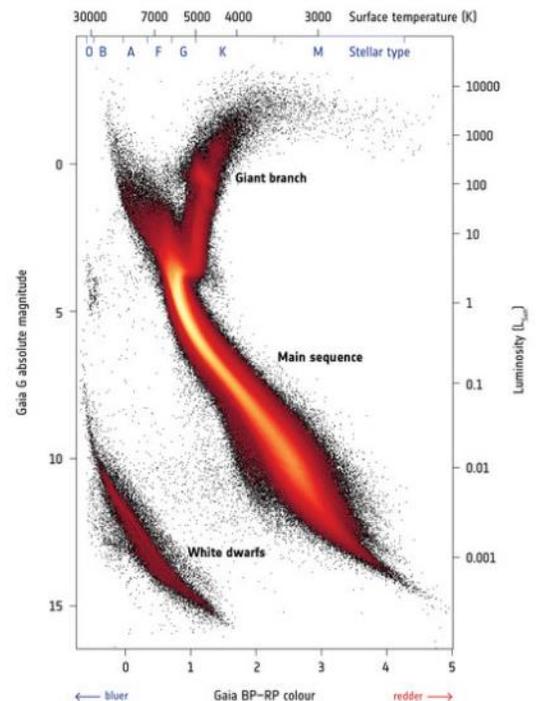
“The new Gaia data are so powerful that exciting results are just jumping at us,” says Antonella Vallenari from the Istituto Nazionale di Astrofisica (INAF) and the Astronomical Observatory of Padua, Italy, deputy chair of the data processing consortium executive board.

“For example, we have built the most detailed Hertzsprung-Russell diagram of stars ever made on the full sky and we can already spot some interesting trends. It feels like we are inaugurating a new era of Galactic archaeology.”

Named after the two astronomers who devised it in the early twentieth century, the Hertzsprung-Russell diagram compares the intrinsic brightness of stars with their colour and is a fundamental tool to study populations of stars and their evolution.

A new version of this diagram, based on four million stars within five thousand light-years from the Sun selected from the Gaia catalogue, reveals many fine details for the first time. This includes the signature of different types of white dwarfs – the dead remnants of stars like our Sun – such that a differentiation can be made between those with hydrogen-rich cores and those dominated by helium.

→ GAIA'S HERTZSPRUNG-RUSSELL DIAGRAM



Combined with Gaia measurements of star velocities, the diagram enables astronomers to distinguish between various populations of stars of different ages that are located in different regions of the Milky Way, such as [the disc and the halo](#), and that formed in different ways. Further scrutiny suggests that the fast-moving stars thought to belong to the halo encompass two stellar populations that originated via two different formation scenarios, calling for more detailed investigations.

“Gaia will greatly advance our understanding of the Universe on all cosmic scales,” says Timo Prusti, Gaia project scientist at ESA.

“Even in the neighbourhood of the Sun, which is the region we thought we understood best, Gaia is revealing new and exciting features.”

Galaxy in 3D For a subset of stars within a few thousand light-years of the Sun, Gaia has measured the velocity in all three dimensions, revealing patterns in the motions of stars that are orbiting the Galaxy at similar speeds.

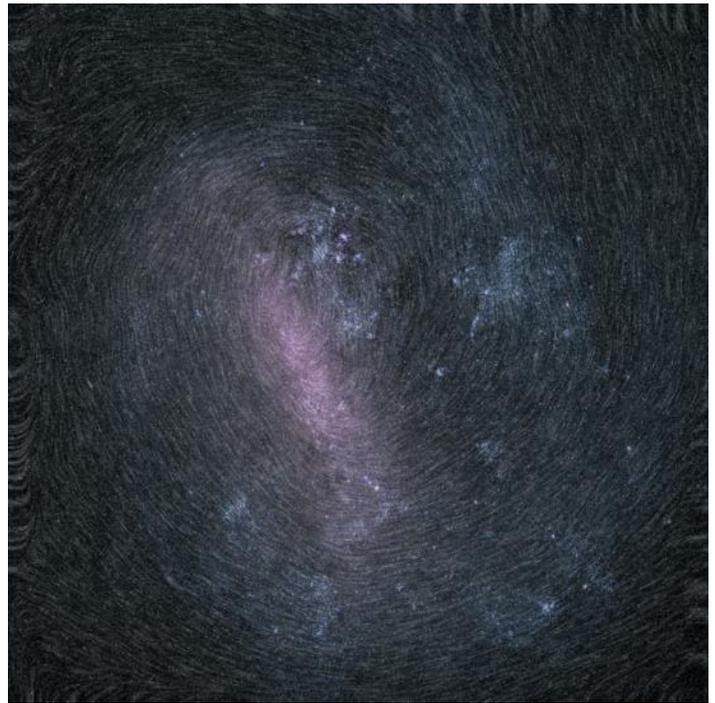
Future studies will confirm whether these patterns are linked to perturbations produced by the Galactic bar, a denser concentration of stars with an elongated shape at the centre of the Galaxy, by the spiral arm architecture of the Milky Way, or by the interaction with smaller galaxies that merged with it billions of years ago.

At Gaia’s precision, it is also possible to see the motions of stars within some globular clusters – ancient systems of stars bound together by gravity and found in the halo of the Milky Way – and within our neighbouring galaxies, the Small and Large Magellanic Clouds.

Gaia data were used to derive the orbits of 75 globular clusters and 12 dwarf galaxies that revolve around the Milky Way, providing all-important information to study the past evolution of our Galaxy and its environment, the gravitational forces that are at play, and the distribution of the elusive dark matter that permeates galaxies.

“Gaia is astronomy at its finest,” says Fred Jansen, Gaia mission manager at ESA.

“Scientists will be busy with this data for many years, and we are ready to be surprised by the avalanche of discoveries that will unlock the secrets of our Galaxy.”



Rotation of the Large Magellanic Cloud



How Do You Make A Galaxy Without Dark Matter? Astronomers discover ghostly galaxy with almost no dark matter

[TORONTO] A team of astronomers has discovered a unique galaxy—the first of its kind—that appears to contain virtually no dark matter. It is an exceptional find since galaxies are commonly thought to contain more dark matter than the ordinary matter that makes up a galaxy’s stars, gas and dust.

Also, it is generally accepted that galaxies first formed from concentrations of dark matter that act like “galaxy starters.” They gravitationally attract ordinary, or baryonic, matter which eventually settles within the extant cloud of dark matter.

April 2018 Monthly Meeting

On April 5, 2018, the Hamilton Centre met for its regular monthly meeting. There were about 40 people present, including some from the general public, and we had a full and varied agenda.

Ed Mizzi began the proceedings with a welcome to everyone. He displayed a slide with the agenda on it and briefly introduced the topics for the meeting. He mentioned two upcoming outreach events and encouraged members to get involved. Ed also recognized several club members for stepping up to help with club activities and business. They included Roger Hill and his never-ending work with Orbit, as well as Roger's new Heavy M.E.T.U.L. initiative, an attempt to get more people involved with observing the night sky. Ed thanked Martin Palenik for the countless hours of work he did on refurbishing our Celestron Edge 14" telescope. Dilip Mahto assisted with getting the mount and OTA back onto the pier in the observatory. John Devonshire was also recognized for his work with getting the club exposure by regularly updating, monitoring and adding items to our website, Twitter account and Facebook page. Chris Talpas was thanked for filming monthly talks and uploading them to YouTube and Troy McCoy was thanked for his monthly What's UP in the Sky slides and descriptions. Andy was recognized for his great work on organizing our October 2018 banquet. And last, but far from least, in his absence, we thanked Ron Shields and wished him luck with his new home in Elliott Lake. Ron was an avid amateur astronomer, helping out in any way he could, including at the observatory, outreach and being a Board member. He always found time to help, regardless of when and where. Ron will be greatly missed.

Ed gave an update on membership. Our total is now 113. The two newest members are Barry Stephens and Eric Gaydos. We welcome them to our club and to the RASC.

Ed reported that there are two outreach events on the books, both involving Girl Guide groups, one on June 2 and the other on June 22. Members are welcome and encouraged to help with these fun events.

Next up was a short video describing the night sky for April and highlighting planets, deep sky objects and the Lyrid meteor shower, which occurs on April 22. However, meteors from this shower may be visible several days before and after that date. Best to look late at night, after midnight.

Ed then talked about Roger Hill's work with his Heavy M.E.T.U.L. (Messier Explore the Universe Lunar) nights, when members and non-members could join him at the observatory and make attempts at procuring RASC certificates for studying the night sky. We have had two successful nights and a third is scheduled for April 20. Club members and members of the public are welcome to bring their own telescopes or use one of the club's loaner Dobs.

Andy Blanchard then took the floor. He discussed our sister club in New Zealand and that we had sent them one of our MallinCams. He is excited that, at some point, we will be able to look in (via video conferencing) on their meetings and vice versa. He also indicated that they should be able to share the southern sky with us once they get the MallinCam up and running.

Andy continued with an announcement about our October Club Banquet, to be held on October 13 at the Legion Hall. Our guest speaker will be none other than James Edgar. Tickets are now on sale for \$35 each, cash or cheque.

Ed then discussed the May 3 meeting and what will be on the agenda, highlighting Paul Delaney from York University speaking about "Saturn and the Cassini mission".

We then took a 10 minute break to give people a chance to stretch and chat with fellow members.

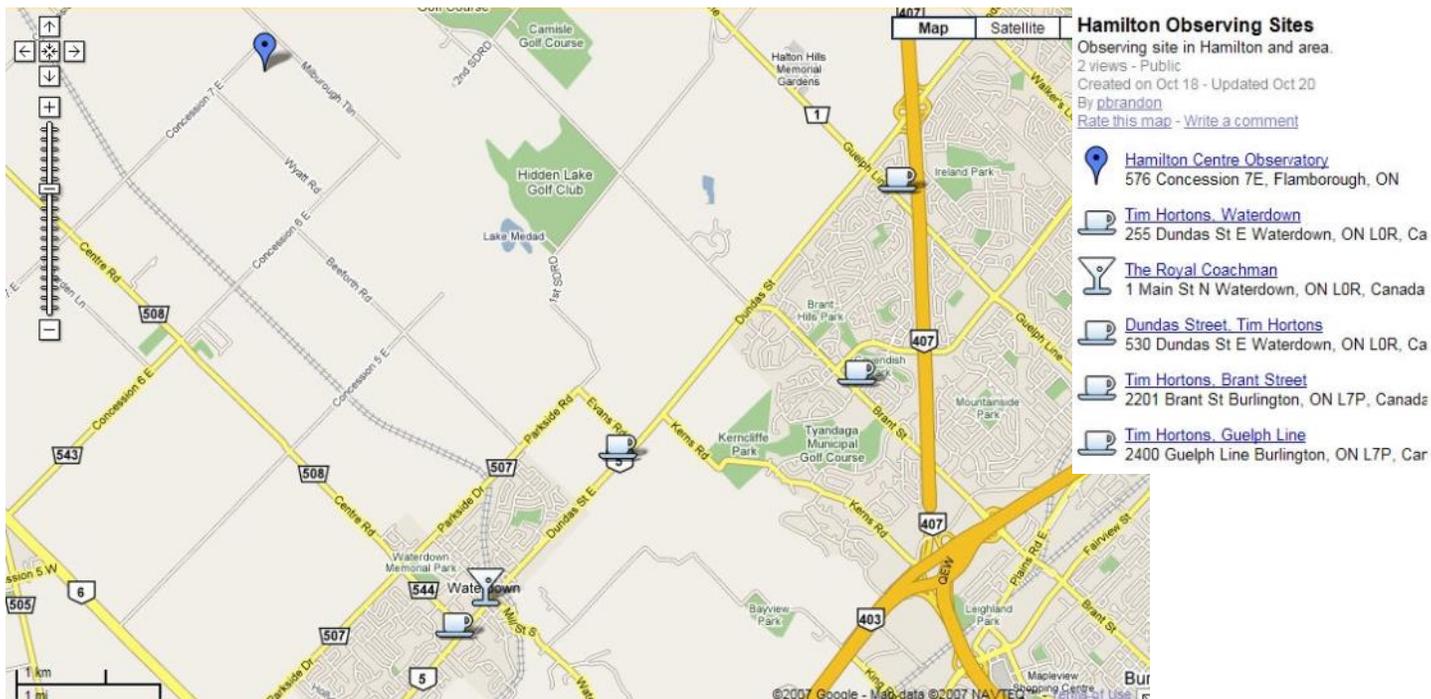
After the break, Andy Blanchard introduced the night's guest speaker, giving an excellent summary of the work that Peter Jedicke has been involved with and a brief introduction to his topic. Peter's lecture title was "Those Pesky Neutrinos", an overview of the history of discovering neutrinos, the people involved and where do we go from here. Andy thanked Peter with a gift of appreciation for the time he spent both preparing and providing his findings.

Ed then adjourned the meeting but not before informing members of three upcoming meetings:

- April Board meeting, at the observatory, Apr. 12, 8 PM. All members are welcome.
- May Monthly meeting, at the Legion, May 3, 8 PM. Members and the Public are welcome.
- May Board meeting, at the observatory, May 10, 8 PM. All members are welcome.

Thanks to all who attended.
Meeting adjourned at 10:00 PM.





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Vice President	Bob Prociuk	Councillor	Andy Blanchard
Secretary	Chris Talpas	Councillor	Eric Golding
Treasurer	Bill Leggit	Councillor	Muhammad Ahmad
Past President	Gary Bennett	Councillor	Troy McCoy
Orbit Editor	Roger Hill		

Martin Palenik and Chris Talpas have been producing some incredible images recently. Martin gets the front cover this month with an awesome image of Orion. To see it in its full glory, go to <https://www.astrobin.com/340945/>

Chris Talpas took the one of the Jellyfish, to the right. Chris is doing some amazing work with his monochrome CCD and some narrowband filters. It's hard to believe that this image was made in Milton!

These two guys aren't the only ones producing amazing images. Gary Caldwell, for instance, has just bought a 12" F/4 imaging Newtonian. The combination of aperture, fast optics and dark skies should produce some truly awesome images.

Either way, if you like the front and back pages, you need to check out our Forum

