Lewes Astronomical Society

September Newsletter 2025

Contents

LAS - Upcoming Events

The UK Fireball Alliance and Fireballs Aotearoa

Talk by Jim Rowe FRAS
3rd September 2025
Lewes Subud Centre, BN7 2DS

Of 75,000 meteorites worldwide, only about 60 have accurate pre-impact orbits. This includes the UK's 2021 Winchcombe fall and New Zealand's 2024 Tekapo meteorite. Jim Rowe will explain why and how the twin organisations of UKFall and Fireballs Aotearoa are maximising the science done with fireballs, and how you can get involved.

Everyone is welcome. Non-members £4.

Left: Winchcombe fireball recorded by the AllSky7 network. Credit: Ben Stanley, processed by Markus Kempf.

Right: Winchcombe meteorite. Credit: Trustees of the Natural History Museum.

Astronomy in WWII

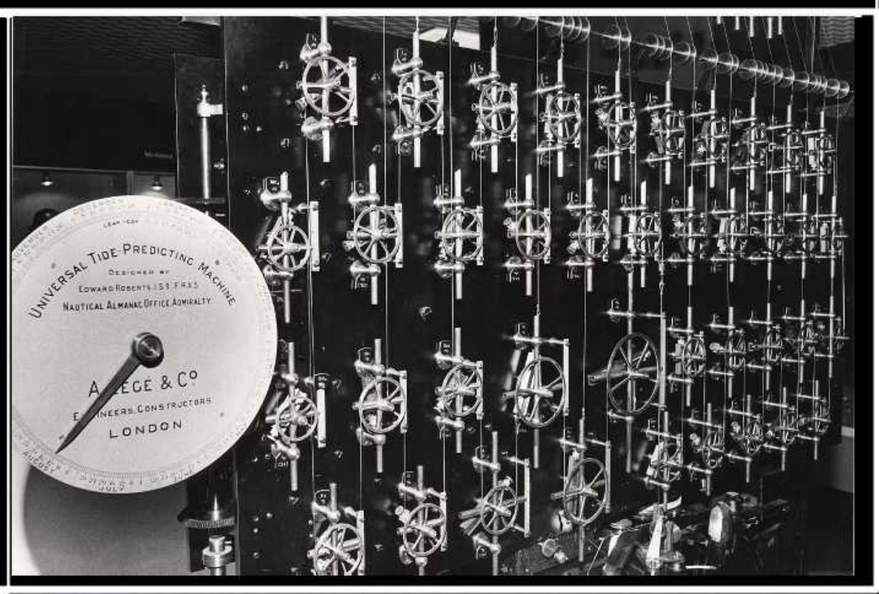
Talk by Dr Peter Chasseaud
1st October 2025
Lewes Subud Centre, BN7 2DS

Historian of military survey and cartography, Dr Peter Chasseaud examines the way in which astronomy was used in the First World War on land, at sea and in the air, including as part of complex weapons systems culminating in the bombardment of Paris by the Germans in 1918 at ranges up to 130km.

Everyone is welcome. Non-members £4.

Left: Coast Guard Chief Photographer's Mate Robert F. Sargent captured this famous D-Day image at about 7:40 a.m. on June 6, 1944. Credit: U.S. Coast Guard, Department of Defense

Right: The Roberts-Légé Machine was built in the early 1900s and played a pivotal role in helping predict tides during the Second World War. (National Oceanography Centre)



LAS News

Changes to the Newsletter: Farewell - Sarah Carson

For the last couple of years, I have had the pleasure of working on the LAS newsletter each month, meaning that I have been allowed to spend hours on end delving deep into astronomical breakthroughs, watching spectacular spaceflight events, and anxiously looking up layman explanations for many a scientific concept.

Regretfully, I am no longer able to dedicate the time required for writing and editing the newsletter, as circumstances in my work and home life have changed. This newsletter will be my last, and I would like to take the opportunity to say farewell to a position which has meant so much to me.

When I first volunteered, Tony Gwyther was in charge of producing and editing the newsletter every month, and he enthusiastically welcomed me into, what he called, a monster job. I had recently finished a course in Land and Wildlife Management and was looking for something to keep me occupied in the evenings, due to my sudden assignment deficiency. The mammoth task of the newsletter appealed as the perfect way to engage my brain and to make friends within the society.

Working with Tony was marvellous and I thoroughly enjoyed our monthly email exchanges about the most interesting news stories and upcoming events. Tony explained to me that he had started the newsletter a few years previously, and that it had grown to an epic length of 70+ PowerPoint slides after a Christmas special one year. It had never really returned to a manageable size, and so we discussed ways in which to reduce the length of the newsletter, but each month we fell at the hurdle of there being just too many interesting topics. We became drunk on power and knowledge.

Tony retired from the newsletter in November 2024, and I realised that I would most certainly need to reduce the size in order to be able to continue the mammoth project alone. Alongside my early attempts to reduce the content, which backfired quite spectacularly in the first few months after I began writing longer length articles instead, I reformatted the layout to an A4 design to include more pictures, and added contents page.

Since Easter, I have worked to reduce the content so that the newsletter is no longer an intimidating 40 pages, but a more manageable 15-20. It was tough to have to cut out interesting stories each month, but wholly necessary in order to keep each edition digestible.

So, thank you very much for reading and I hope that I have been successful at encouraging a deeper interest in different topics, and involving people with the society. Also, thank you very much to all society members who have contributed news items in the past few months. I sincerely hope that the newsletter will be taken over by a new society member quickly, and that it may continue to develop in its support of the society, to celebrate all that the committee members achieve in their roles.

LAS News

Changes to the Newsletter - Sarah Carson

As this month is my last, I have produced slightly different content for the newsletter. Instead of writing up news about recent astronomical events and discoveries, I have decided to include an article I wrote about Pluto. When I first started working with Tony, we discussed writing frequent articles to cover different astronomical concepts and to explore objects within our universe. The idea of creating an online resource for the amateur astronomer inspired talk about different subjects, and I wrote this article a couple of years ago but never brought it to publication.

The article highlights to me what I have found most valuable whilst writing the newsletter; the pursuit of understanding awesome concepts, of becoming familiar with distant worlds, of feeling the enormity of space. The frenzy of unstoppable, unfathomable forces rage for an eternity on every front, and the order of our world can feel more chaotic in comparison. I think that dreaming of space can, ironically, ground us on Earth, and return us to what is true beyond our control, because no one person will ever rule the cosmos, time, or space. Forces exist beyond our wildest control, and humble us into our roles as shephards of life on Earth.

This is comforting and, even though astronomy is an enormous subject with thousands of teams of researchers plundering its secrets on a daily basis, there is something more deeply personal about the individual connection to astronomy. Perhaps the fact that it cannot be handled and may only be visited in our imaginations means that we are all capable of exploring the deepest regions of our universe. The unending mystery keeps us all in a permanent state of wonder and intrigue.

Feature Piece: Exploring Pluto

Pluto exists as a source of unending interest for both professional and amateur astronomers alike, appealing to the masses as a romantic, somewhat tragic member of our Solar System. Despite only having been discovered 93 years ago, the story of Pluto's rise to fame and its demotion from planetary status in 2006, as well as our growing understanding of its orbital relationship to its largest moon, Charon, is rich with the passionate dedication of astronomers and tracked in their developing theories.

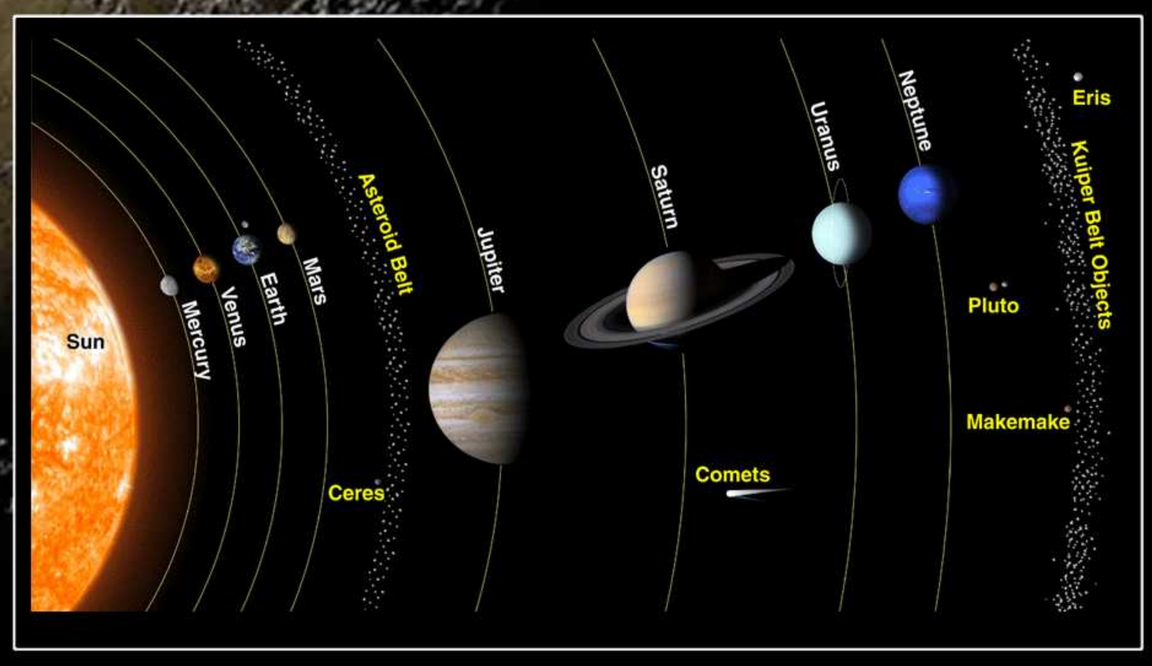
The Discovery of Pluto

Pluto was first discovered in 1930 by astronomer Clyde Tombaugh at the Lowell Observatory, after he compared two images taken six days apart and noticed the movement of an object against the starry background. The then planet inspired mass public excitement and the following inundation of letters filled with name suggestions and enthusiastic congratulations overwhelmed the observatory.

Photo: Clyde Tombaugh at the guide scope of the 13-inch strograph he would use to discover Pluto.

In this 18th century Dutch engraving, Pluto reclines in a chariot pulled by Cerberus.RijksmuseumPublic Domain

Pluto was officially named that same year after a letter from an 11-year-old girl put forward the mythological Roman God of the underworld. More recent geological features discovered on Pluto's surface, along with the discovery of its five moons, have seen naming kept in line with mythological references.



This diagram shows the order in which the planets are distanced from the Sun and the position of Pluto,.Credit: NASA

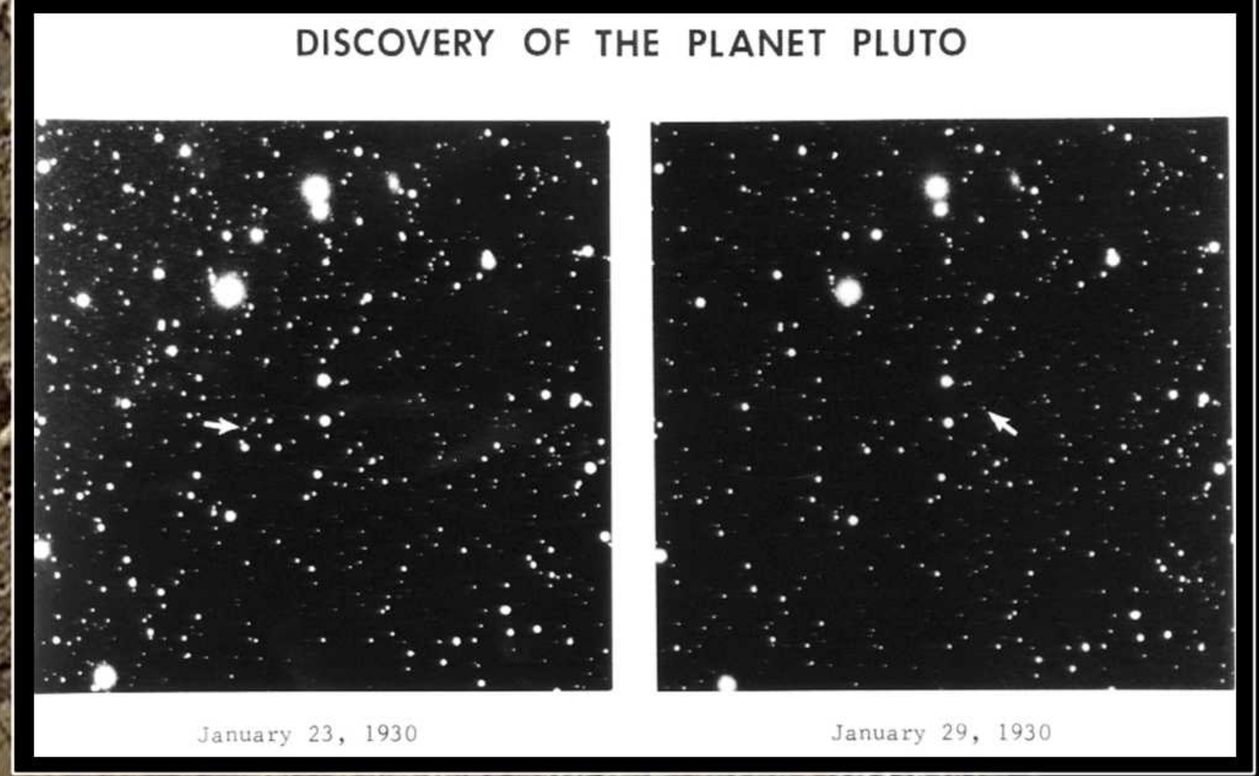
The discovery of Pluto was thought to be immensely important in providing an explanation of observed influences on Neptune and Uranus, which astronomers believed could only be caused by the presence of a 9th planet. Pluto was reclassified as a Dwarf Planet, on the 24th August 2006, just 7 months after the launch of New Horizons, and many astronomers now state that there is no need for a 'planet X' within our current model of the Solar System.

Feature Piece: Exploring Pluto

New Frontiers: New Horizon Mission to Pluto - Part 1

With a radius of 1,188 km and an average distance of 5.1 billion km from the Earth (5.9 billion km from the Sun), the small world of Pluto is incredibly difficult to observe. Prior to the flyby of the New Horizons space probe, the best observations recorded presented blurry, undefined images, or bright specs of light displaying the locations of Pluto and a few of its moons.

In order to gain a better understanding of our Solar System and its evolution, scientists at NASA launched the New Frontiers Program. Their aim was to focus on planetary science investigations, to explore the elements of our solar system, and to map planetary surfaces, orbits, and interactions with moons and other masses. The program links together several individual missions, which have been carefully selected due to budget and required time investments, launching approximately one mission per decade.



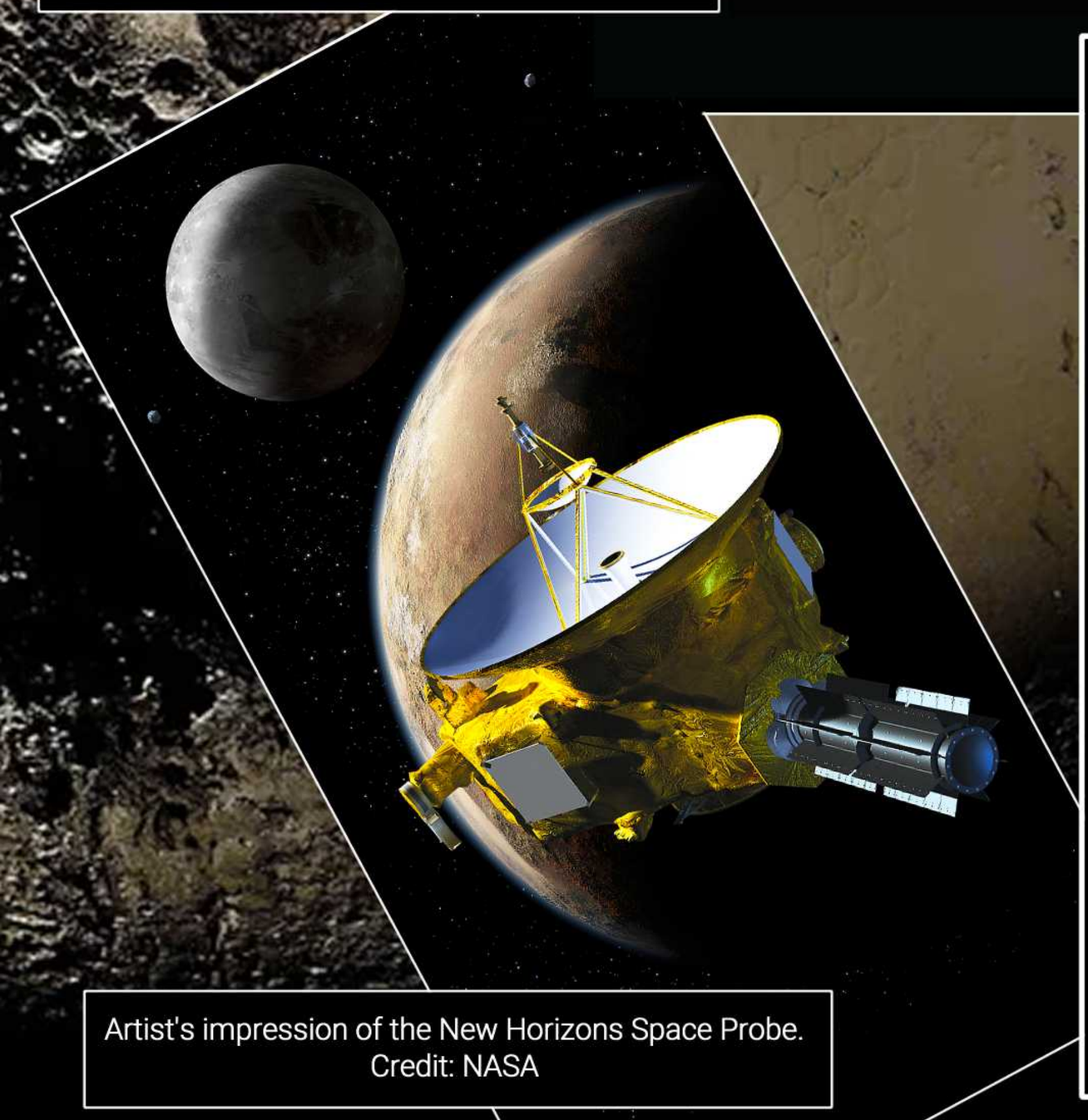
The above plates show the images which Clyde Tombaugh was able to use to determine Pluto's existence.The small white arrows in each image indicate the location of Pluto, which had moved from its original position in the 6 days between each image being captured.
Credit: Lowell Observatory

The series of three images on the right exhibits one of the most detailed views of the entire surface of the dwarf planet Pluto, as constructed from multiple NASA Hubble Space Telescope photographs taken from 2002 to 2003.

Image Credit: NASA, ESA, and M. Buie (Southwest Research Institute)

New Horizons, the first of the New Frontiers missions, was launched on the 19th of January 2006 from Cape Canaveral in Florida, with the specific goal to reach Pluto as quickly as possible. With an ultra-light spacecraft on board the most powerful rocket of the day, the Atlas V, New Horizons shot past the moon in only 9 hours, covering the same distance as the Apollo mission in approximately one ninth of the time. The spacecraft remains the fastest to ever reach Jupiter with a flyby at 405 days, post-launch.

During the flyby of Jupiter on the 28th of February 2007, New Horizons tested out its onboard instruments by taking stunning photographs of the planet and its moons, while also using the gas giant as a gravity assist to slingshot itself further into the depths of our Solar System and reduce its arrival time at Pluto by 3 years. At this point, New Horizons entered hibernation to preserve its onboard equipment during the further 2.7 billion km journey to Pluto, which was completed over the following 8 years.



Artist's impression of the New Horizons Space Probe.
Credit: NASA

Feature Piece: Exploring Pluto

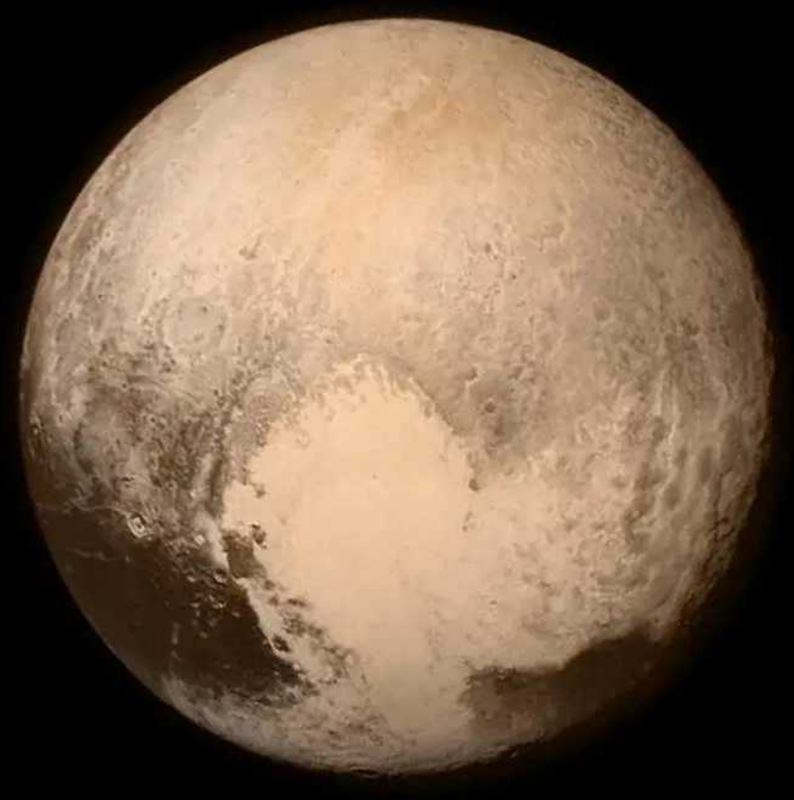
New Frontiers: New Horizon Mission to Pluto - Part 2

On the 6th of December 2014, as New Horizons made its approach to Pluto, the spacecraft was revived from hibernation. Daily photos were returned to Earth over the proceeding five months as the dwarf planet loomed ever closer, showing off increased definition and revealing distinct features.

A composite of enhanced color images of Pluto (lower right) and Charon (upper left), taken by NASA's New Horizons spacecraft as it passed through the Pluto system on 14th July, 2015.
Credit: NASA

The closest approach to Pluto was achieved on the 14th of July 2015, as New Horizons zoomed past Pluto at a distance of 12,500km from its surface. The spacecraft shot as many photographs as possible during this flyby window in order to capture plenty of high-definition images of Pluto's surface, of its features, and of its moons. It was so engrossed in its mission that screens at ground control remained blank for hours, leaving the team to live in hope that the mission had been a success.

Images finally began to trickle back through the 4.5-hour latency period between the position of New Horizons and Earth, with an uplink speed of only 1kbit/sec, to reveal the dwarf planet in incredible, never before seen definition. These images have been thoroughly assessed by astronomers to reveal more about the icy dwarf planet.



This image was taken on 13th July, 2015, when New Horizons was 476,000 miles (768,000 kilometers) from the surface of Pluto. This is the last and most detailed image sent to Earth before the spacecraft's closest approach to Pluto on 14th July.
Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute

So, what have New Horizon's images allowed us to discover about our distant icy dwarf? And how may these discoveries expand upon what we already knew or guessed about Pluto's geology, atmosphere, and orbital relationships?

Feature Piece: Exploring Pluto

The Heart of Pluto

After New Horizon's images were received back on Earth, the world became infatuated with an enormous heart-shaped basin the size of Texas, spreading across approximately 1,200 km of Pluto's surface and with a depth of up to 4km. The colour contrast between the snowy ice plain basin and the copper red of the surrounding area is near impossible to observe through Earth-based telescopes, and the discovery quickly inspired theories proposing how the region had formed.

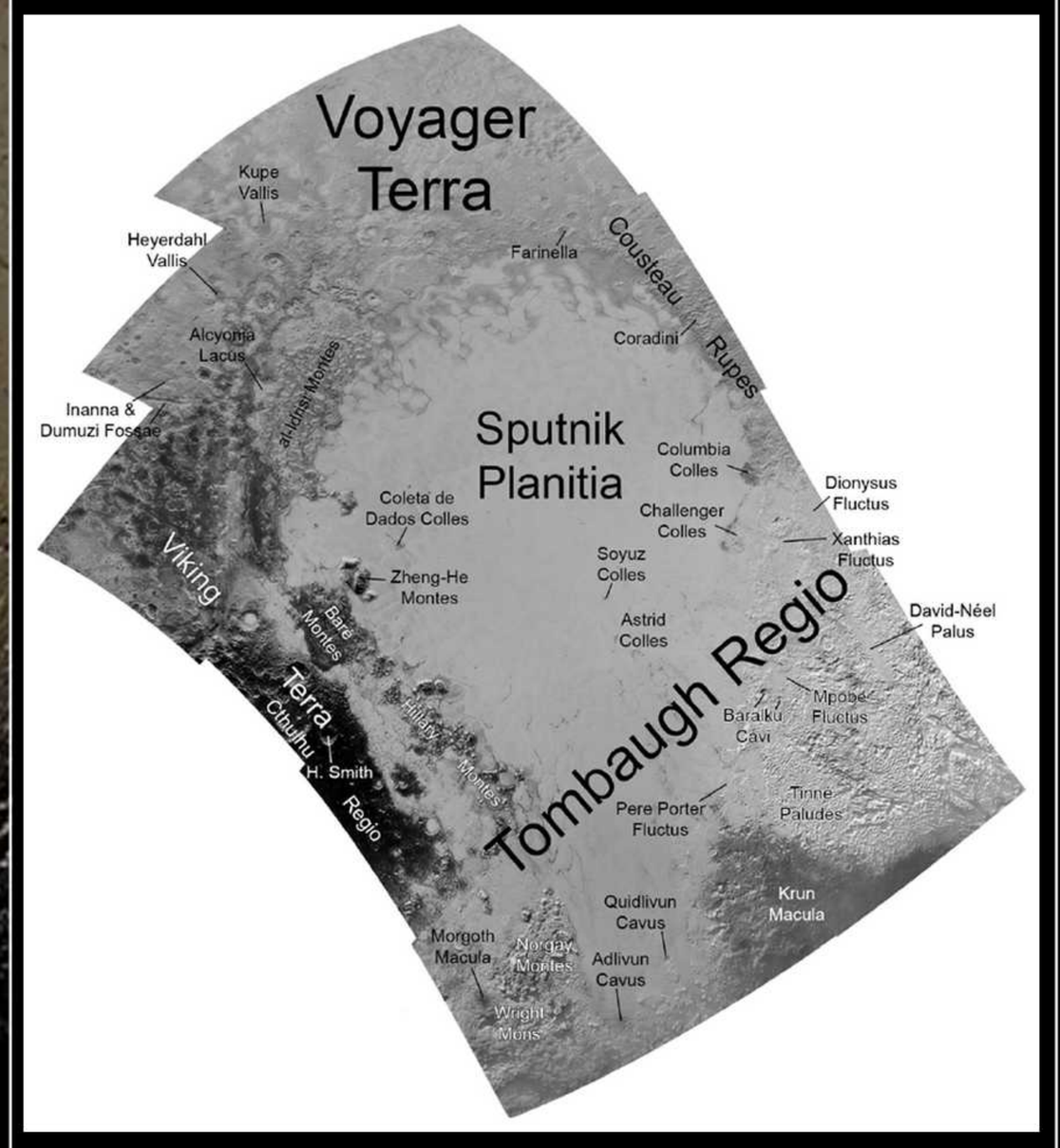
Within the larger heart shaped feature, known as Tombaugh Regio, a smaller region of icy plains, named Sputnik Planitia, form giant polygonal shapes, averaging 33km in diameter and interweaved by shallow trough borders. The Sputnik Planitia stretches across 1,000km of the Tombaugh Regio "left lobe", mainly within the northern hemisphere but extending down beyond the equator.

New Horizons confirmed that 98% of Pluto's surface is comprised of nitrogen ice at an average surface temperature of -229°C, which behaves on Pluto in the same way as water does on Earth. Sputnik Planitia has, therefore, been determined to be comprised of convective cells of soft nitrogen ice with peaks and hills located within the intersecting valleys. These troughs are potentially formed by sublimation; nitrogen ice turning directly into nitrogen gas without first becoming a liquid, in the same way as dry ice behaves on earth.

One theory suggests that the region may have formed following an impact from a large object, with nitrogen ice flowing in to fill a huge crater from a subsurface liquid ocean, although new simulations performed in 2024 suggest that there may be no subsurface ocean on Pluto. Click here for more details on recent findings.

The fact that the region has been observed to be clean of craters suggests that it is a relatively young formation, potentially only having formed within the previous 10 million years, or that it is renewing itself over time.

This image of the western side of the Tombaugh Regio, named the Sputnik Planitia after the first major satellite in space, combines blue, red and infrared images taken by the Ralph/Multispectral Visual Imaging Camera (MVIC)
Credit: NASA/JHUAPL/SwRI



Annotated map of the Sputnik Planitia, noting other geological points of interest.
Credit: NASA

Feature Piece: Exploring Pluto

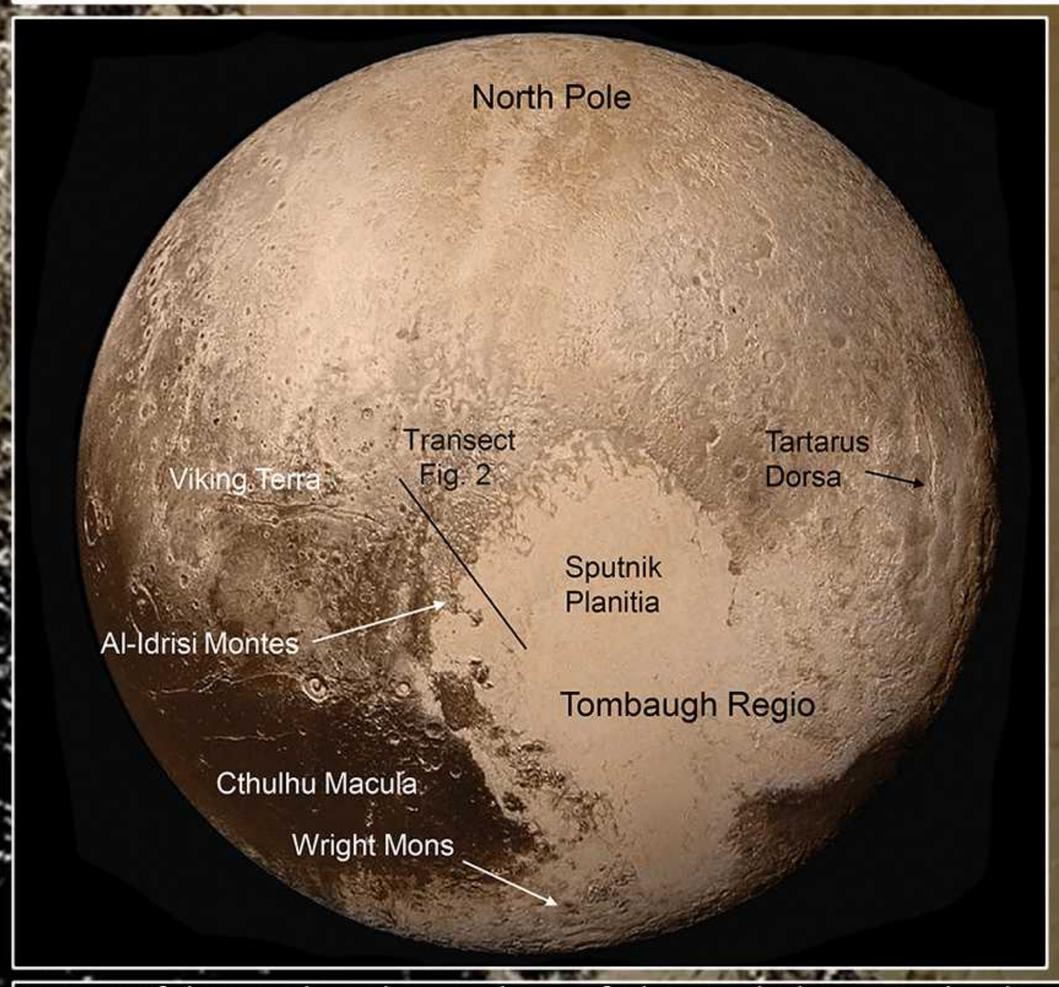
Pluto's Icy Mountains

Pluto's youthful surface may also be influenced by the presence of cryovolcanoes – a volcano which erupts with ice, water, and other low temperature liquid materials, such as ammonia and methane.

During the 2015 flyby, New Horizons identified a 4km high peak with a huge central depression, located on the southwest border of Sputnik Planitia, known as Wright Mons, which has been determined to be one of the highest peaks on Pluto. The relatively unmarked and youthful surface of the surrounding terrain suggests that Wright Mons is an active cryovolcano, with eruptions working to cleanse evidence of craters, sublimation, and erosion.

A 2023–2024 re-analysis of New Horizons topographic and compositional data suggested that Wright Mons and Piccard Mons show signs of relatively recent eruptions, within the last few hundred million years. No plumes were observed directly, but the surface morphology is consistent with ongoing or recent cryovolcanic activity, making Pluto one of the few known icy bodies with potential active volcanism.

The suspected cryovolcano, Wright Mons, is visible in the centre section of this image, at 90 miles across and 2.5 miles tall.
Credit: NASA/JHUAPL/SwRI



A view of the southern hemisphere of Pluto with the major landmarks labelled. Tartarus Dorsa sits at the northeast of Tombaugh Regio, and Wright Mons sits at the southwest.
Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute

Water ice was identified as forming the crustal bedrock upon Pluto by New Horizons' Ralph/Linear Etalon Imaging Spectral Array (LEISA) instrument, which used infrared light to map Pluto's surface materials. However, issues in determining how much of the bedrock consists of water ice were experienced due to the spectral signature of water ice being easily masked by methane ice.

The mountainous areas surrounding the Tombaugh Regio are also predicted to be formed of water ice due to it being the only type of ice which could be strong enough to support peaks over several km high at such temperatures. Pluto's gravity is too weak to pull the water ice mountains back down, with the result that high peaks appear enormous relative to the dwarf planet's size.

Running along the eastern border of the Tombaugh Regia, a highly distinctive set of 500-metre-high mountains were observed by New Horizons. This mountainous region was named Tartarus Dorsa, and startling imagery displays textural terrain with a snakeskin or tree bark like appearance. The ridges have regular spacings of around 3,000 to 5,000 metres, depressions of 500 metres and are thought to be a type of penitente – snow and ice features formed by erosion - which have so far only ever been observed on Earth at high altitudes more than 4,000 metres above sea level, and which only range from a few centimetres to 5 metres in size.

In analysing the timescale of development of Pluto's youngest terrains, it is theorised that the potential penitente on Pluto will have originally been formed from topographical variations 10s of metres in size, but that they then grew over a timescale of several tens of millions of years, under fluctuations in atmospheric pressure and influenced by the extremely cold, dry environment, to form the dramatic ridges observed by New Horizons.

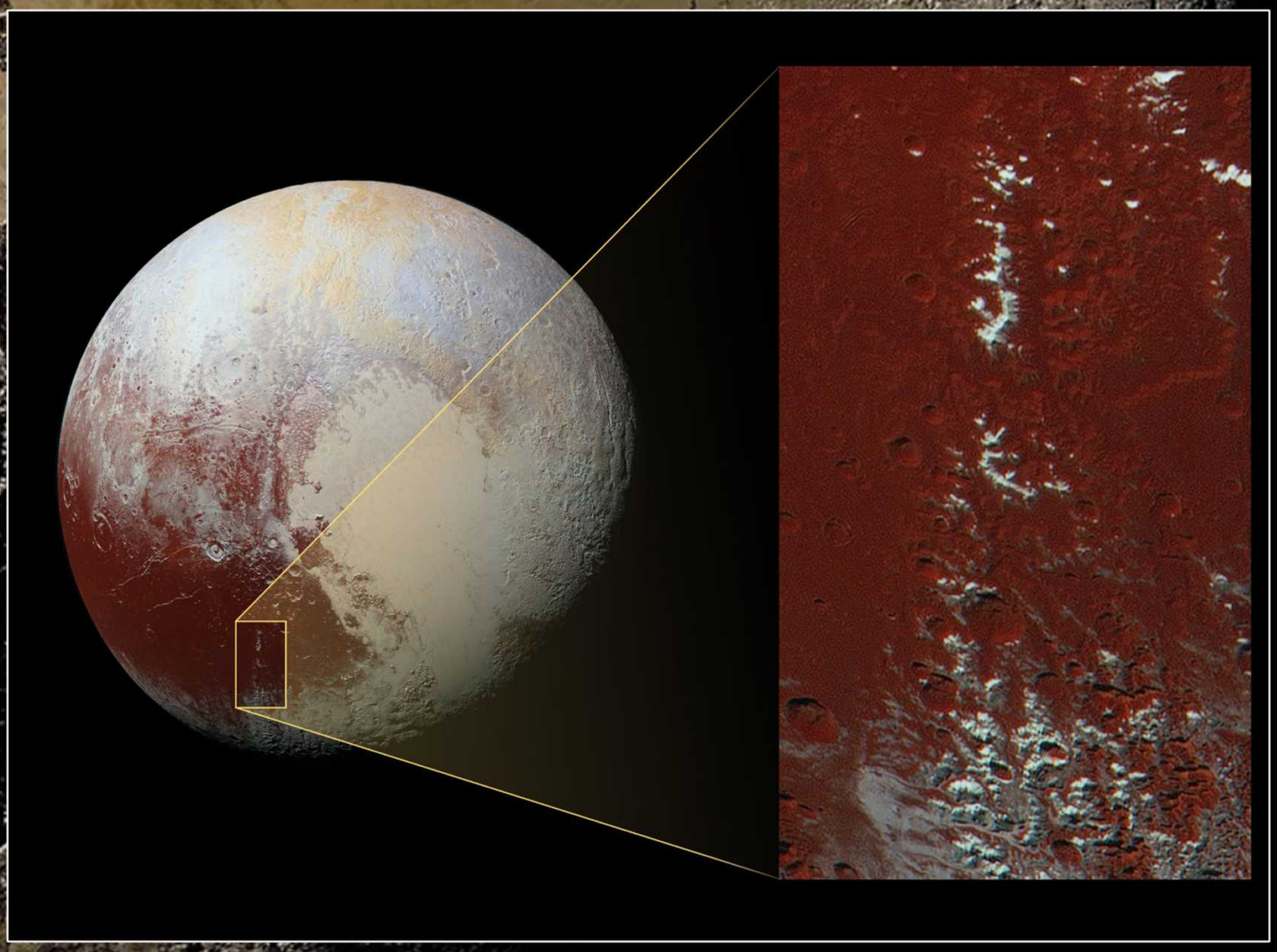
Feature Piece: Exploring Pluto

Tholins

The Whale Shaped Belton Regio, known informally as the Cthulu Macula, is located to the West of the Tombough Regio in Pluto's southern hemisphere, and is far more heavily cratered than its heart-shaped neighbour, suggesting that it is far older. Its distinctive red colouration contrasts with the white ice plains of its neighbouring region, and may be the result of deposited tholins, similar to those found on Saturn's moon; Lapetus.

Theories suggest that Pluto's tholins are created when compounds containing carbon, such as carbon dioxide or methane, are cooked by ultraviolet or cosmic radiation within the atmosphere to create organic compounds, or hydrocarbons. These then rain down to settle on the dwarf planet's surface.

However, new experiments, carried out by researchers at the Delft University of Technology in the Netherlands, have been unable to recreate similar results by mirroring conditions on Pluto, because the synthesised tholins absorb more light than the Cthulu Macula. This suggests that there may be another, as yet unknown, influencing factor in the creation of tholins which causes these dark red scatterings.



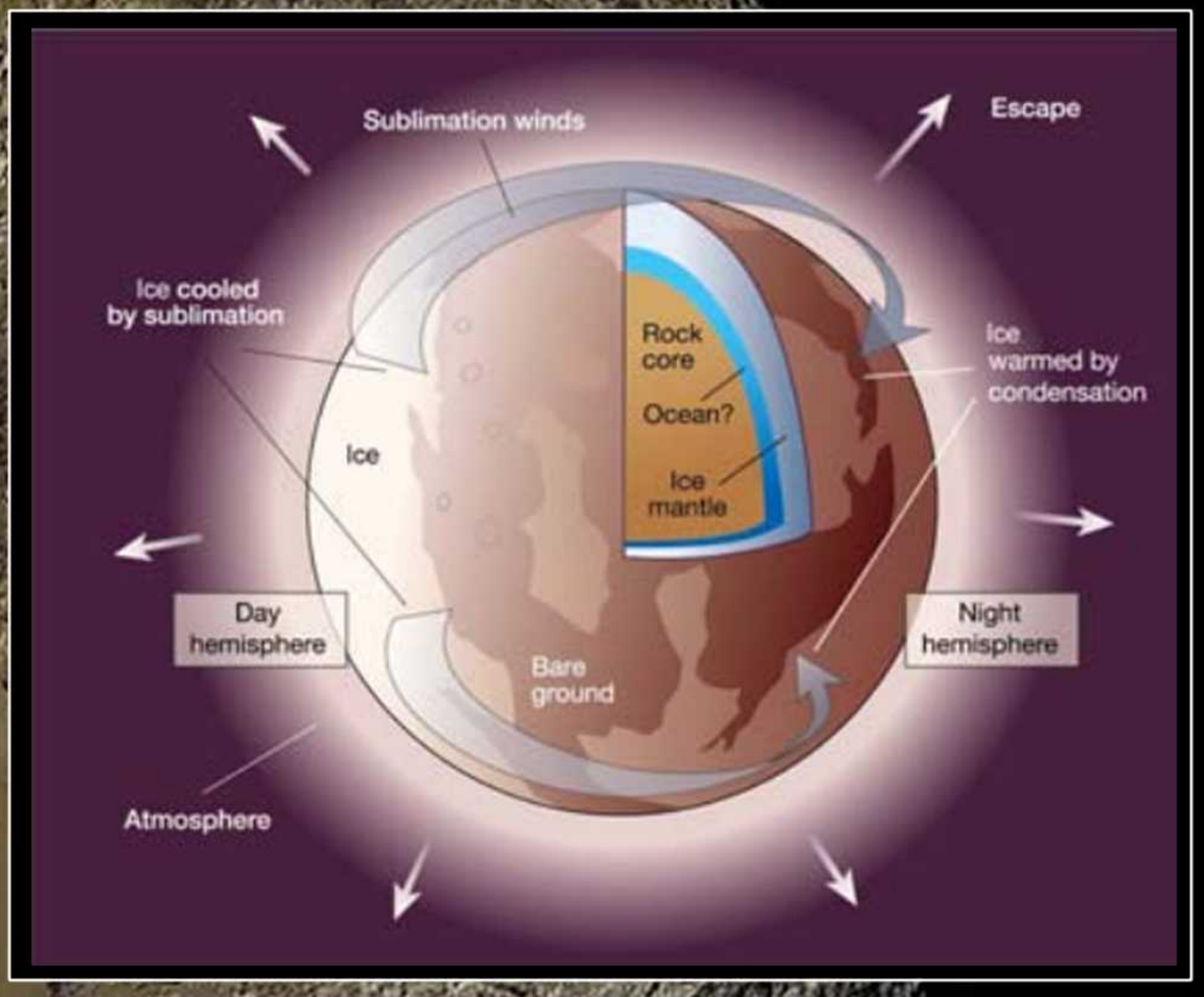
The image highlights the red areas on Pluto thought to be caused by the raining down of organic compounds, created from methane interacting with ultraviolet light in Pluto's surface and atmosphere.
Credit: NASA/JHUAPL/SwRI

Feature Piece: Exploring Pluto

Pluto's Atmosphere

Pluto was confirmed to have an atmosphere in 1988 when astronomers noted the more gradual blocking of light of an occulted star than would be expected to be observed of a passing airless body; with no atmosphere, the light of the star would blink on an off as Pluto passed across, with no backlit haze or gradual dimming.

Having been confirmed to exist, the scale of Pluto's atmosphere was only realised after the flyby of New Horizons in 2015. Due to the icy Dwarf's small size and weak gravity, the atmosphere extends out high above the surface, with low density and an exceptionally low pressure of roughly 11 microbars, 100,000-1 million times weaker than the surface pressure on Earth.



The above diagram displays Pluto's atmospheric details. As Pluto nears the Sun, the warming surface temperatures causes the ice to sublimate, turning directly into gas and forming a thin atmosphere. The process of sublimation cools the ice, and the resulting winds circulate Pluto's atmosphere and helps to form methane dunes upon the surface.
Credit: NASA/JHUAPL

This photo was taken by New Horizons and displays Pluto's atmospheric haze. Particles such as methane, carbon monoxide, and nitrogen dominate the haze. Recently, the James Webb Space Telescope has confirmed that this haze acts to cool Pluto's atmosphere.
Credit: NASA/JHUAPL/SwRI

The atmosphere on Pluto consists mainly of nitrogen, with smaller quantities of methane and other trace gases. Upon interaction with sunlight, these gases undergo chemical reactions to create complex hydrocarbons and other molecules. These then gather to form small solid particles or aerosols within the atmosphere, causing a scattering of sunlight and a resulting blue hue. This haze is distributed unevenly across Pluto's surface, with local temperature, pressure, altitude and seasonal changes impacting variations in density and opacity.

Current seasonal variations see Pluto on the cusp of a 100-year winter, during which it was previously predicted that Pluto's atmosphere would freeze onto its surface. However, recent research has suggested that this may not occur. Like a comet, as Pluto moves further away from the Sun, the sublimation of its surface ice forms an additional thin layer of atmosphere. As it moves away from the Sun, the atmosphere freezes and shrinks, possibly snowing back onto the surface.

Feature Piece: Exploring Pluto

Pluto and Charon: Part 1

Perhaps the most intriguing discoveries made by New Horizons are those which shed light on Pluto's relationship with its largest moon, Charon. The romantic nature of the two bodies' orbital dance is incredibly rare and has not been observed in any other partnership within our solar system. For this reason, whilst Pluto is distinguished from other objects within the Kuiper Belt as being the largest dwarf planet observed, it is also exceptional due to the relationship it maintains with its largest moon.

New Horizons didn't discover any new moons orbiting Pluto, but we have been able to determine far more about the relationship of previously discovered moons with the dwarf planet. Charon was the first of Pluto's moons to be discovered due to its comparatively large size, with a diameter of 1,208km making it just over half the size of Pluto and the largest known satellite relative to its primary object.

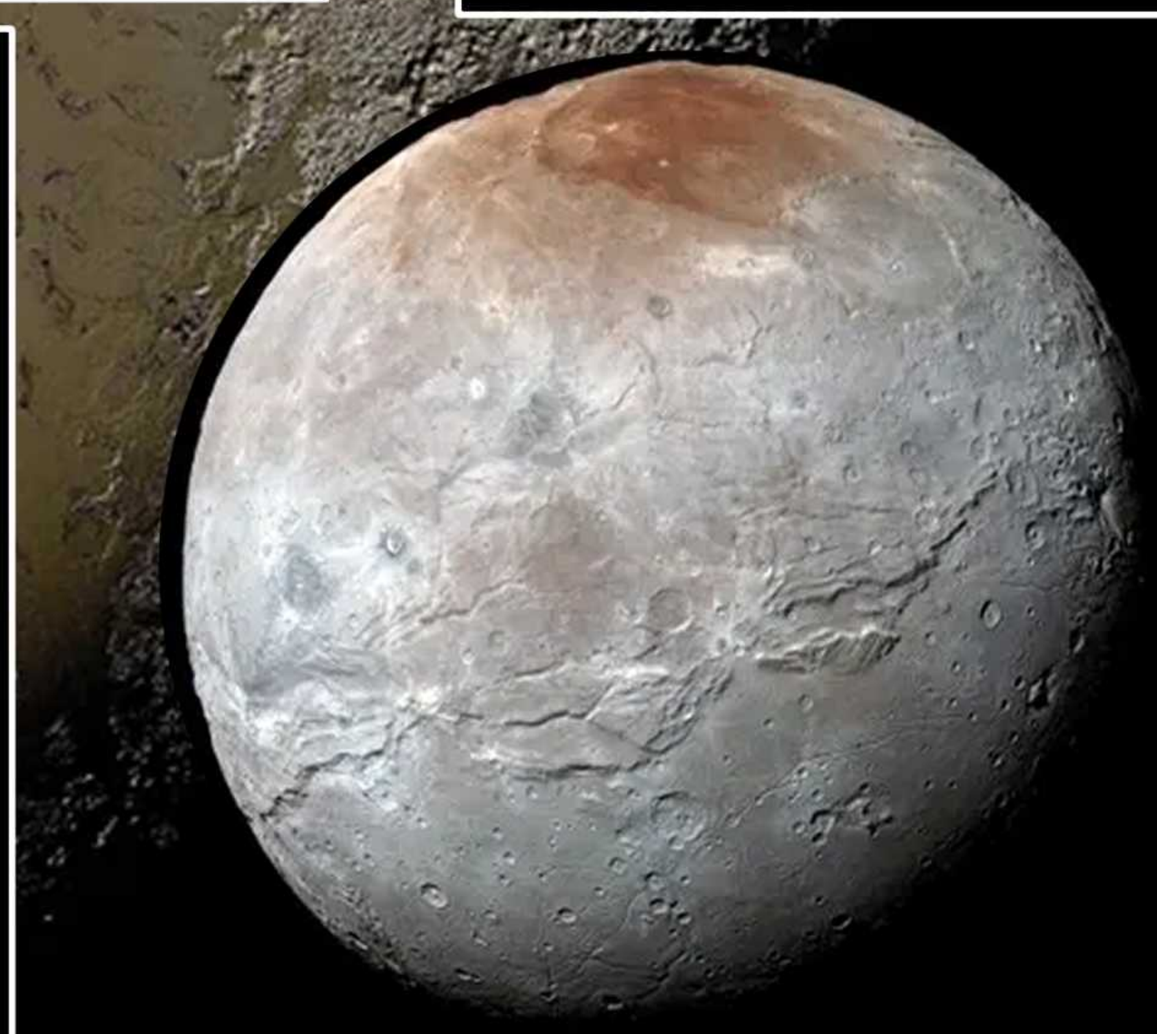
Pluto's moons to scale. The largest, Charon, is displayed along the bottom.
Credit: NASA/JHUAPL

The large moon was discovered in 1978 by James Christy and Robert Harrington at the U.S. Naval Observatory in Flagstaff, Arizona.

Nix and Hydra were discovered by the Hubble Space Telescope in 2005 during observations of the Pluto system, and Kerberos was also later discovered by Hubble in 2011. Styx was then discovered in 2012 by the New Horizons team as they scanned for potential hazards to the 2015 flyby, also with use of the Hubble telescope.

Charon, named after the ferryman of dead souls to the realm of Hades in Greek mythology, orbits extremely close to Pluto at around 20,000km, only one sixth of the distance between our own moon and the Earth, and the two exist as our solar system's only known double planetary system, due to their similar masses. Both Pluto and Charon orbit a point in space between them known as a barycentre – a dynamic central point of mass around which two orbiting objects rotate.

When observing the orbits of moons around planets, the phenomenon of tidal locking is not uncommon; our own moon is tidally locked to Earth, meaning that we only ever see one side of its face as its own rotation comes full circle as it completes a full orbit. Similarly, Jupiter's moon, Io, and Saturn's moon, Enceladus, are also tidally locked to their respective planets, and even Mercury is close to being tidally locked to the Sun, rotating only three times around its axis for every two complete orbits.



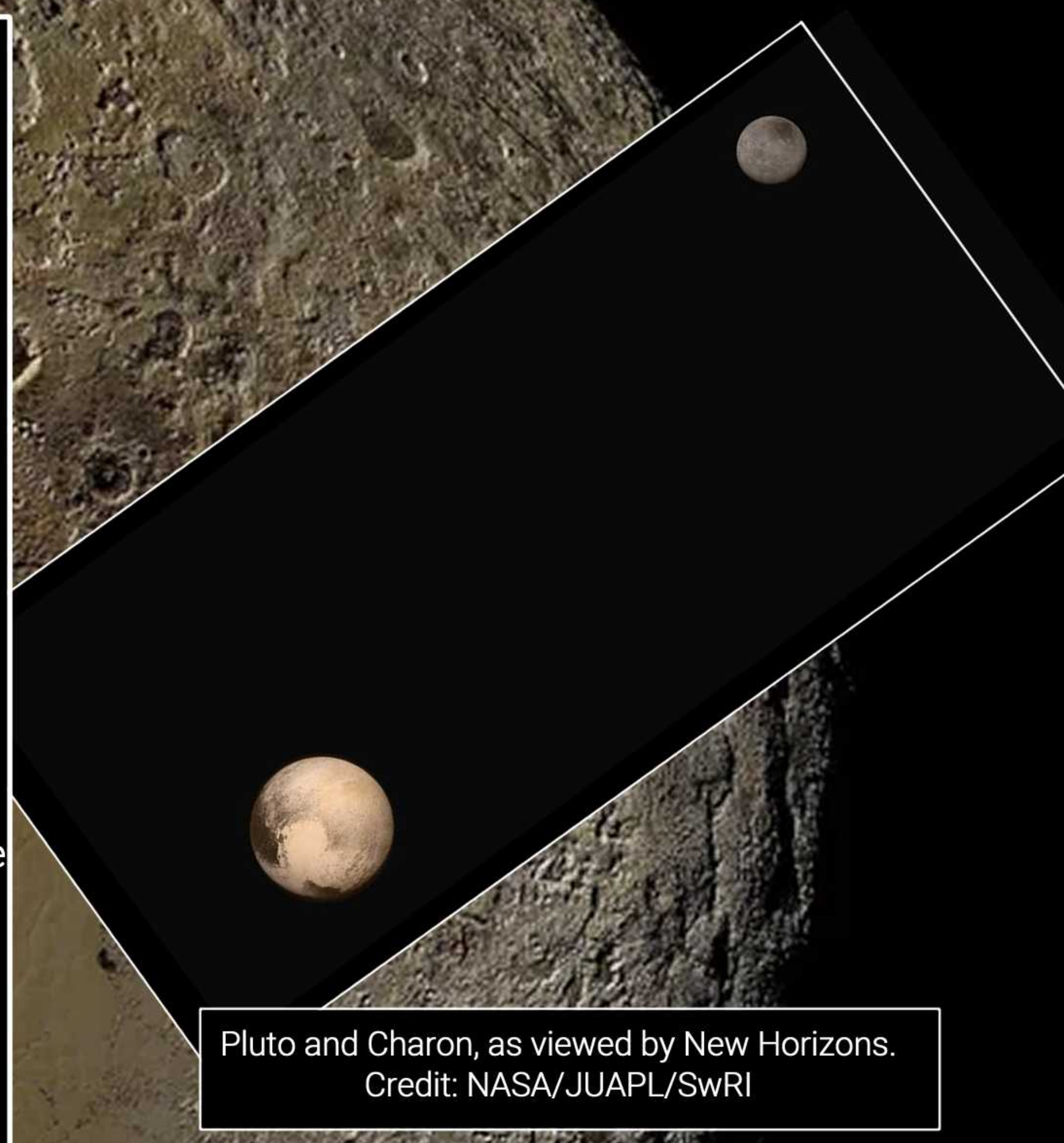
Charon, as pictured by New Horizons. The startling red contrast of Mordor Macula at the North Pole is seen in enhanced colour.
Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute

Feature Piece: Exploring Pluto

Pluto and Charon: Part 2

In the case of Pluto and Charon, both bodies are tidally locked to each other, meaning that if you were standing on Pluto and looking up at Charon the moon would always show the same face, and occupy the same space in the sky. It is greatly unusual for a planet to be tidally locked to its moon, and astronomers have theorised that Pluto's own tidal lock with Charon may have been accelerated after the rotation of the dwarf planet was slowed by a collision. However, the close proximity of Charon to Pluto, as well as the similar mass of the two bodies, is the main supporting cause for the system's slow tango through space.

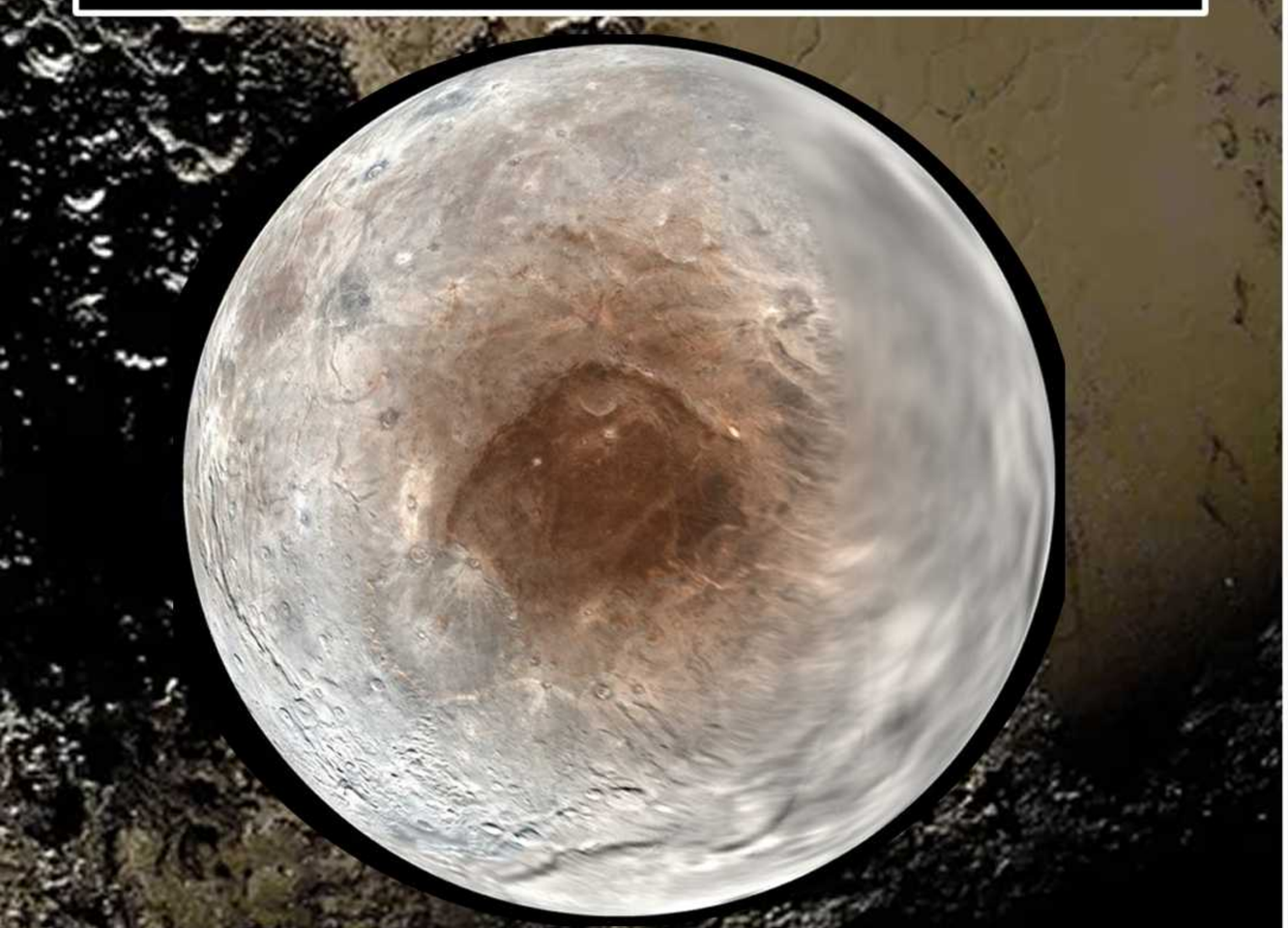
Another theory as to how Pluto remains tidally locked to Charon may be found within the Tombaugh Regio and, in particular, in Sputnik Planitia, which is positioned on the "dark side" of Pluto, directly opposite to Charon, meaning that Pluto is always hiding its heart from its companion. Astronomers propose that the thick nitrogen ice caps within these regions may be covering a vast ocean, accounting for additional weight, and impacting the positive gravitational anomaly. No other theories are able to account for the anomaly without the presence of a deep subsurface ocean, which theorists suggest will mainly consist of a combination of water and some type of anti-freeze, such as ammonia.



Pluto and Charon, as viewed by New Horizons.
Credit: NASA/JUAPL/SwRI

The combined weak atmosphere and gravity of Pluto, as well as its proximity to Charon, is thought to cause a sharing of atmospheric gases between the two bodies. The red cap at Charon's north pole indicates the presence of tholins, which were thought to be impossible for Charon to create due to its lack of atmosphere. The theory stated that shared hydrocarbons and methane gases from Pluto's atmosphere were cooked by ultraviolet and cosmic radiation before settling as tholins at Charon's pole.

However, new experiments conducted at SwRI's Center for Laboratory Astrophysics and Space Science Experiments recreated conditions on Charon, with results suggesting that the moon experiences a four-year surge of activity due to surface warming during Pluto's equinox; when the planet was at its closest point to the sun in its 248-year orbit, most recently occurring in 1988. The subsequent rapid sublimation of frozen methane and release of frozen ethane at the affected pole creates a short-lived exosphere, allowing solar wind to directly interact with the solid ethane, creating tholins.



Red material located at Charon's north pole may be present as a result of the sharing of atmospheric gases with Pluto, or due to surges of activity on Charon.
Credit: NASA / JHUAPL / SWRI

Feature Piece: Exploring Pluto

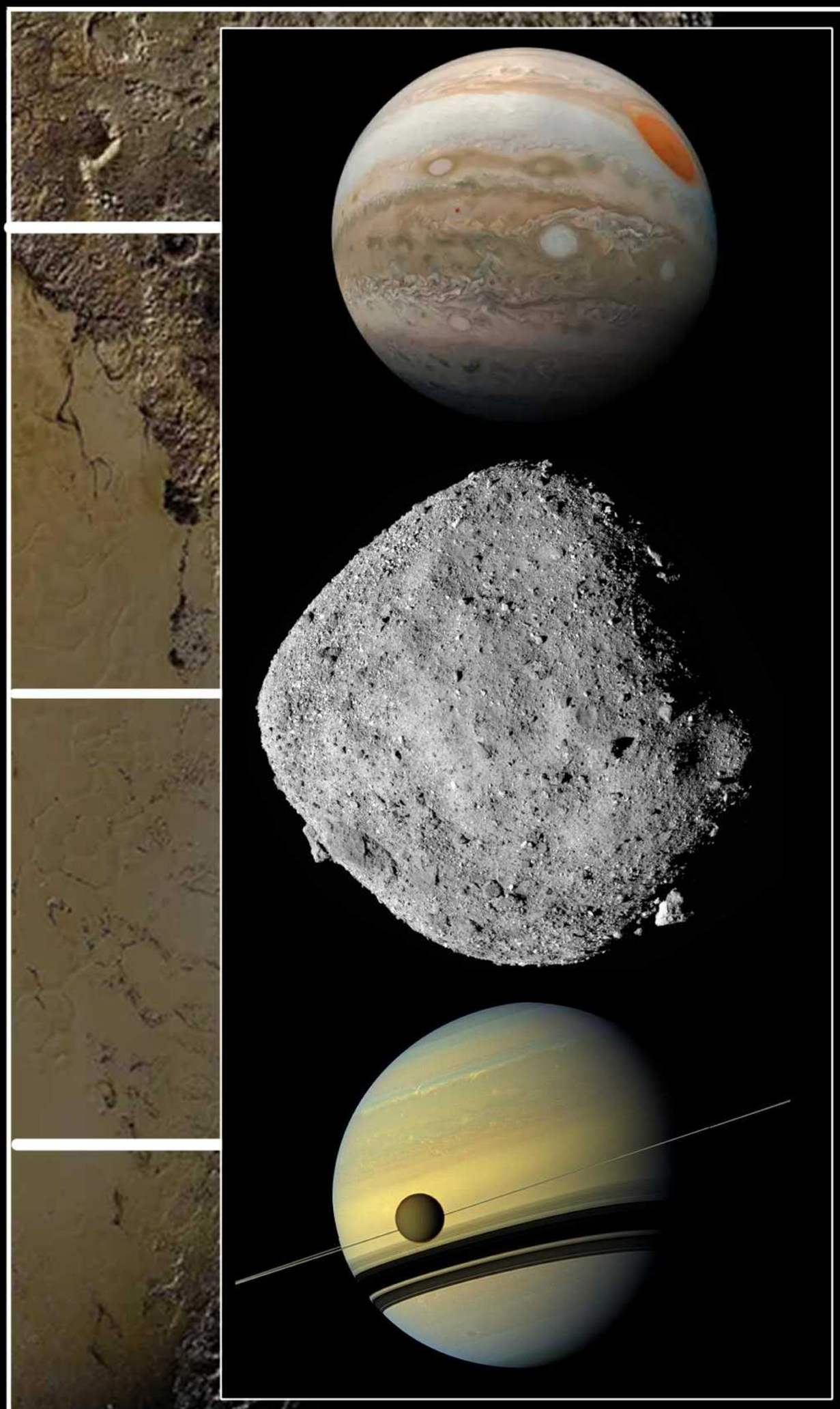
Next Steps and Future Missions

There are no definite answers so far on how Pluto may help us to unravel the mysteries of our solar system, or on how life may have been introduced on Earth, yet the dwarf planet remains one of the more fascinating worlds within our reach. Further exploration and observations are required to support and prove existing theories, which may be provided in part by the James Webb Space Telescope and by future missions to explore the history of our Solar System, including further planned missions within the New Frontiers program.

Since the launch of New Horizons in 2006, two subsequent New Frontiers missions have enthused public interest. Juno, launched on the 5th of August 2011, is approaching the end of an extended mission to investigate the ring system, moons and interior of the gas giant, Jupiter (top right). The missions discoveries have revolutionised our understanding of the gas giant. Click here for more details on Juno.

OSIRIS-Rex, launched on the 8th of September 2016, returned to Earth on the 24th of September 2023 with samples of rocks and dust collected from the surface of a near-Earth asteroid, known as Bennu (middle right). Scientists are currently studying these collected samples in the hope that they may shed light on how life began within our Solar System and provide further understanding of how asteroids might impact Earth. Recent findings have revealed that Bennu carries molecules which are the key to life. Click here for more details on the OSIRIS-REX and the new OSIRIS-APEX missions.

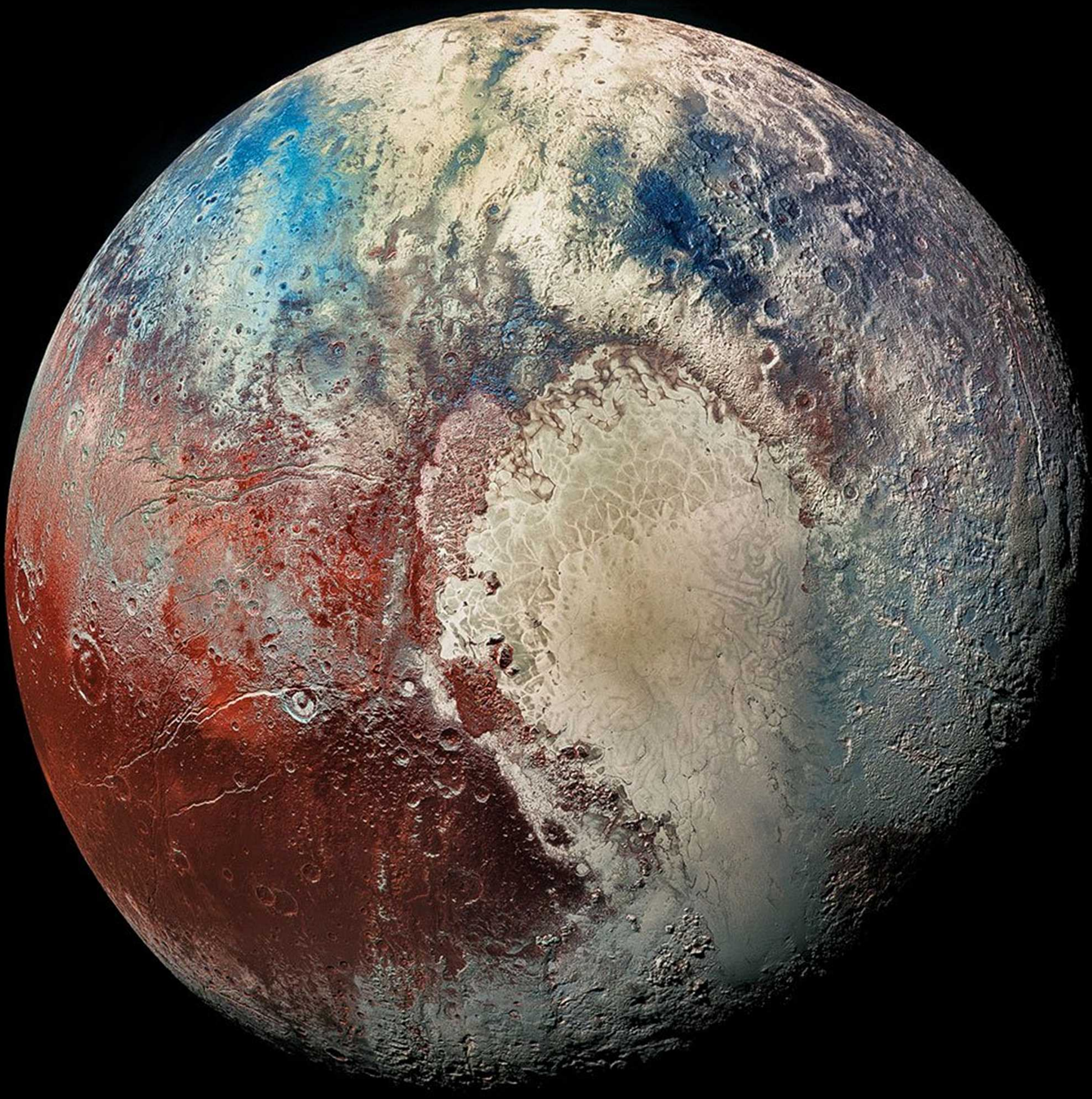
The fourth New Frontiers mission. Dragonfly, is scheduled to launch no earlier than 2028 and will arrive at Saturn's largest moon, Titan (bottom right), at some point in the 2030s. During its 2.7-year baseline mission, the rotorcraft will look for prebiotic chemical processes common on both Titan and Earth in order to gain information about the origins of life within our Solar System. Click here for more information on the Dragonfly mission.



It is safe to say that New Horizons has broadened our understanding of Pluto, its geological processes, and its orbital relationships beyond any conclusions we would have been able to draw from mere observations of light specs through Earth-based telescopes. Having said that, even with the thousands of theories, postulations and conclusions that have so far been drawn in an attempt to explain Pluto's processes and origins, the icy dwarf remains shrouded in mystery, with more enticingly fantastical appeal and dramatic other worldly features than many science fiction books.

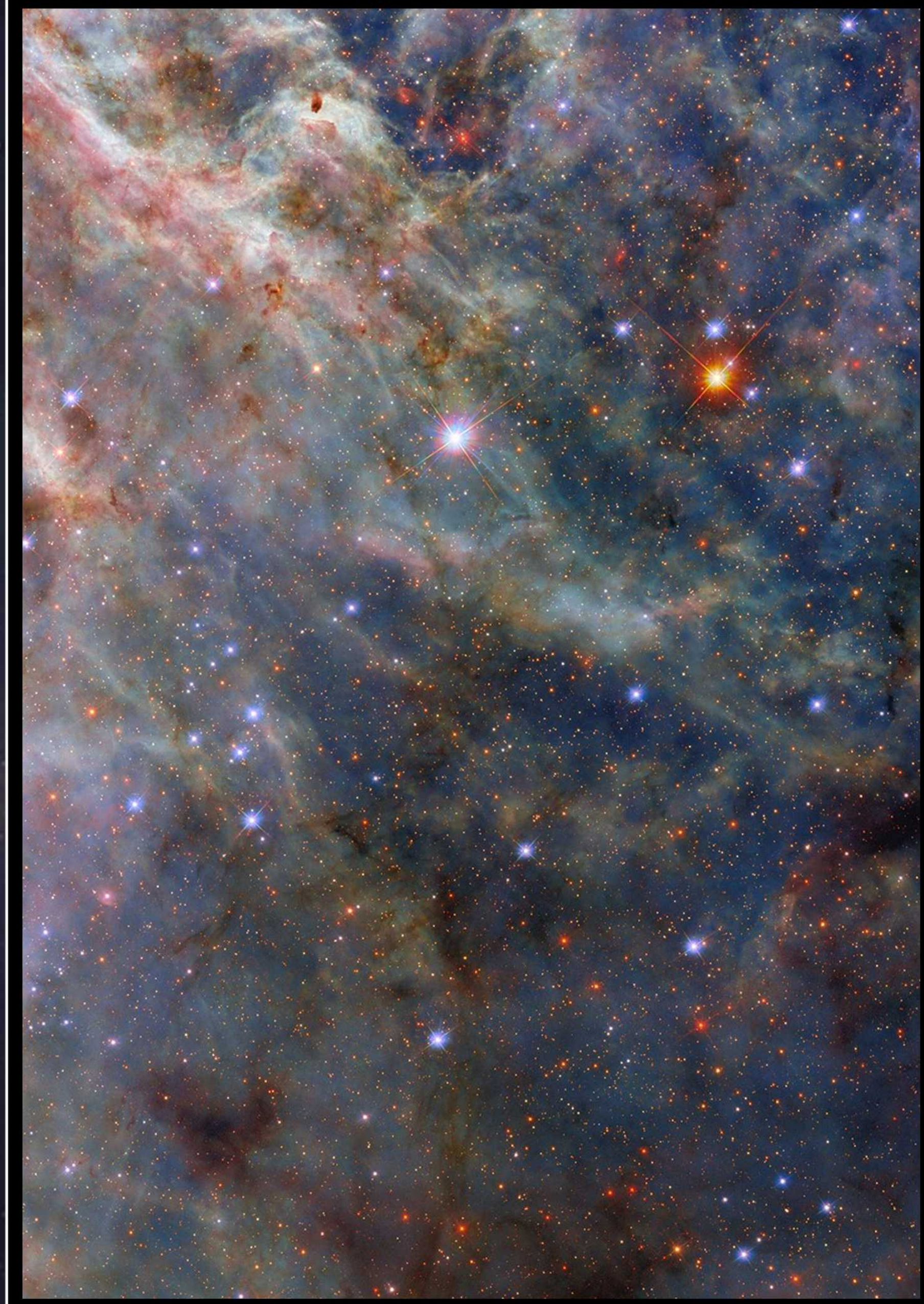
Image Credits - Top to Bottom: NASA/JPL-Caltech/SwRI/MSSS/Kevin M. Gill (CC-BY)
NASA/Goddard/University of Arizona
NASA-Cassini

Feature Piece: Exploring Pluto



This stunning high-definition image was taken by New Horizons and has been colour enhanced.
Credit: NASA/ JHUAPL/ SwRI/ The University of Arizona

Hubble Captures Tarantula Nebula



The Tarantula Nebula is located about 160,000 light-years away, in the dwarf galaxy known as the Large Magellanic Cloud. The stellar nursery is pictured here in incredible detail, and is the largest and brightest star-forming region in the entire 50 galaxies of the Local Group, to which the Milky Way also belongs.

Credit: ESA/Hubble & NASA, C. Murray

Hubble Looks to Orion and the Birth Place of Stars

The four bright stars at the centre of this image, known as Trapezium, form the core of the dense Orion Nebula Star Cluster, 1,500 light-years from Earth. A black hole might exist within the cluster, causing the high velocities of these stars.

Credit: Data: Hubble Legacy Archive, Processing: Robert Gendler

Perseids at Durdle Door

This stunning picture, made from merged images taken over a few weeks, was taken at the limestone arch, Durdle Door, in Dorset. The wide-angle lens of the camera causes the meteor paths of the Perseids to appear curved and captured the central band of the Milky Way galaxy.
Credit: Josh Dury

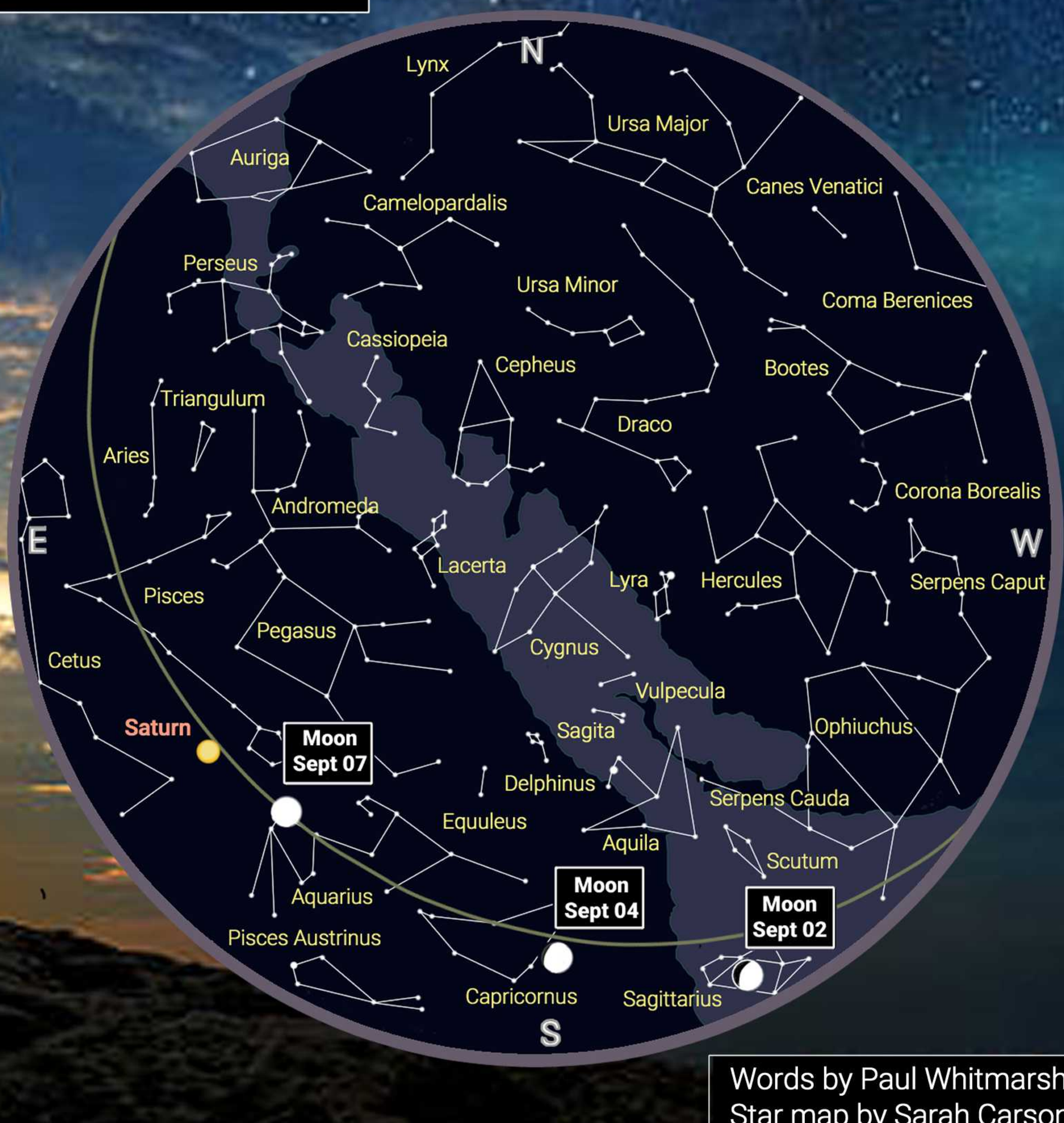
September Star Map

The chart depicts how the night sky will appear at 11pm at the start of September, 10pm in mid-September, and 9pm at the end of September. The positions and phases of the Moon are given for the 2nd, 4th and 7th September.

On September 7th in Lewes the full Moon rises at 7:29pm during the second total lunar eclipse of 2025. The Moon will be completely within the Earth's shadow as it rises above the eastern horizon. The Moon takes on a brick-red colour as some sunlight passes around the Earth's atmosphere. The total eclipse phase lasts until 7:52pm, when the Moon leaves the darker red part of the shadow (the umbra). You will need to have a good unobstructed view of the eastern horizon to see the Moon fully eclipsed in the darkening sky, but the view of our neighbouring world emerging from an eclipse is a great spectacle.

Looking at the rest of the solar system, on 20th-21st September Saturn reaches opposition, which means that the ringed world is due south at midnight, and is visible all night. If you are an early riser then look out for brilliant Venus, the closest planet to the Earth and by far the brightest object in the eastern sky.

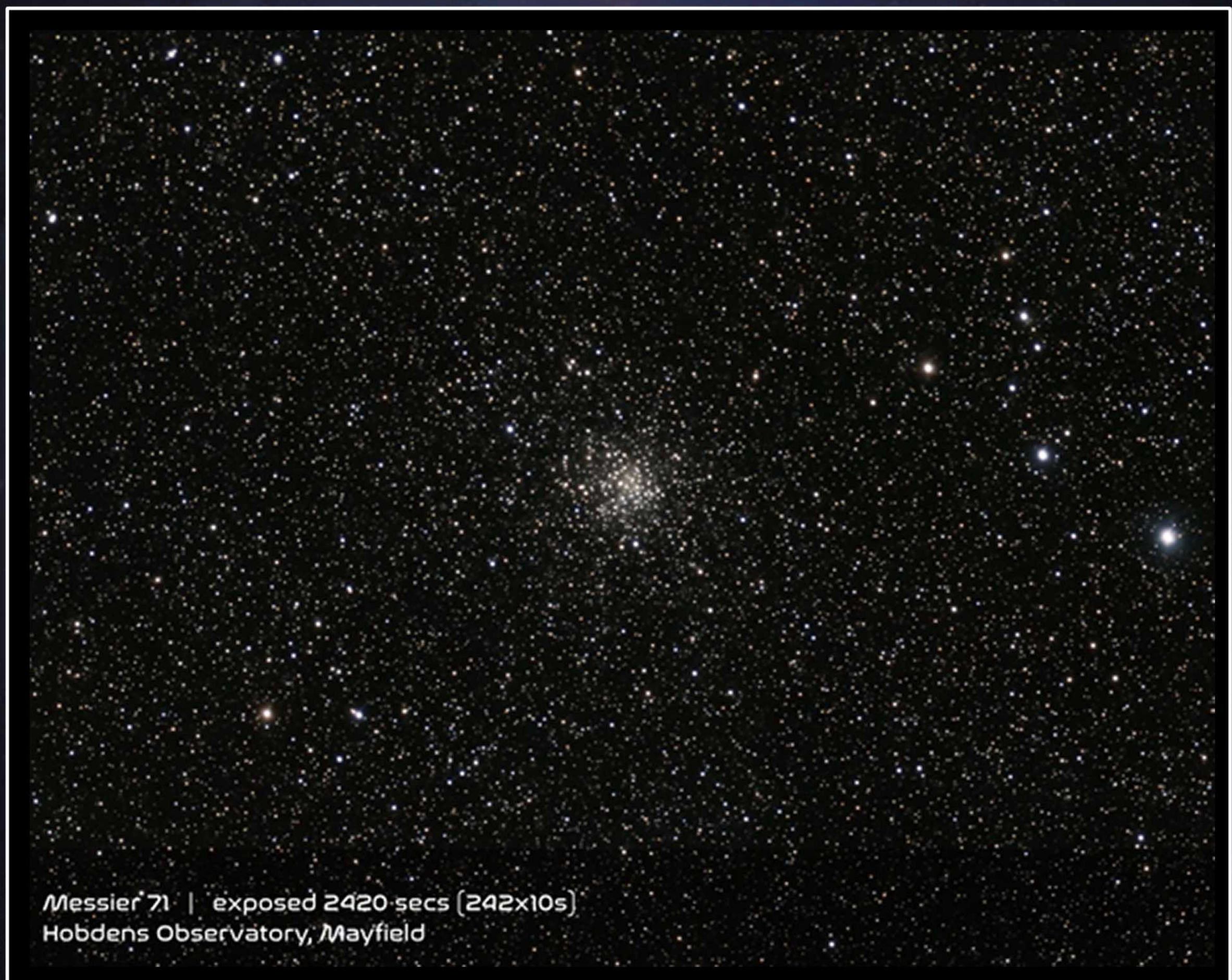
September constellations include a dolphin (Delphinus) and an arrow (Sagitta), both marked on our map. If you have binoculars or a small telescope, then follow the line between Delphinus and Sagitta and keep going by half the distance again, and you will see a nod to haute couture, an upside-down coat hanger in the night sky.



Words by Paul Whitmarsh
Star map by Sarah Carson

LAS Gallery

Messier 71 - a loose globular originally thought to be an open cluster
Exposure: 40 mins, 10 second subs, pre midnight



By Gerard Fox

LAS Gallery

The Dumbbell Nebula - Messier 27
Located 1,360 light years away in the constellation Vulpecula

Credit: Richie Jarvis

Adverts

Ever thought of volunteering for LAS? We're looking for members who are willing to contribute to the monthly newsletter.

At the LAS, we are very much for encouraging the growth of community, and this means providing open discussion and promoting the voice of our valued members.

We believe that a newsletter should be about more than just news. Your contribution could be about any topic within astronomy that youfind interesting, such as a closer look at a news topic that has caught your attention, or advice for other members on how to buy the right telescope and begin their stargazing adventures.

If you're interested in making a monthly, one-off, or an "every now and then" contribution, please contact us via email at secretary@lewesas.org.uk, or speak to us in person at one of our events or monthly meetings.