



Clear Skies

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Greetings!

Welcome to the Cowichan Valley Starfinders Astronomy club's "Clear Skies" monthly newsletter.

The beginning of August was an exciting month for Bryon and I as we ventured forth to northern Alberta for the annual family reunion. Seeing friends and family was filled with fun and laughter and we managed to take part in a renewal of wedding vows celebration, a couple of sack races and a round of karaoke before the rain turned everything into a giant mud puddle. We did get a break one night just to see the Space Station pass by and watch a brief dance of the aurora borealis (northern lights)..spectacular.

Back in Edmonton it was no better, we spent our time going to the Space, Science Centre (now the TELUS World of Science) looking at some great exhibits such as "the Body Fantastic" and the "Green House" and taking in the Dinosaurs live IMAX presentation. We also made a new friend, Bruce McCurdy who on one cloudy day was out in the observatory hoping for clear skies. Bruce is a member of the Edmonton RASC centre and once he found out we were amateur astronomers he gave us the royal tour of the telescopes the club owns plus I also got a copy of the 50th Anniversary Edition of "Stardust" the clubs newsletter. We also got invited to attend a Perseids celebration about 50kms out of Edmonton at the Blackfoot Staging area (Edmonton's Observing site). Unfortunately the weather was against us and we did not attend, but I'm sure Bruce and the rest of the gang had fun frolicking in the rain ☺ for more information on the Edmonton RASC click on the link [Edmonton Centre of the Royal Astronomical Society of Canada](#). All in all weather aside the trip was great, we arrived home on the 16th and are now heading to the Shuswap to attend a Bluegrass Workshop and festival.

Many thanks to this month's contributors: Moe Raven, Norm Willey and Bryon Thompson.

Freda Eckstein

"Shoot for the moon. Even if you miss, you'll land among the stars". ~Les Brown

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Meeting Highlights

Our monthly meetings will resume starting September. Please watch your email for the upcoming dates and times plus directions to our new meeting location (CMHA Office).

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Upcoming Events

Star Parties

Don't forget about the RASCALS Star Party; if you missed the CVSF Island star

party or would like another chance to see the stars and mingle with astronomers 2 then mark your calendars for:

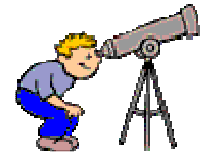


The Seventh Annual RASCALS Star Party - August 24-26

To be held at the Victoria Fish and Game club (at the top of the Malahat). For more information on the RASCALS Star Party check out the website: Victoria.rasc.ca.

Observers Night

Our president (Norm Willey) is working on organizing an observer's night in September. Notifications will be sent out by Norm regarding dates and locations for this great event.



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Web News

Aurora are some of the most beautiful consequences of space weather. Space weather is caused by storms of matter and energy from the sun that interact with Earth's space environment. For more information on Aurora's click on the following link [Aurora FAQs](#)

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Cool Pics

Want to show off your latest pics? Well here's your chance; email the editor at [My Cool Pics](#) and we will try to post them in the next edition of "Clear Skies"

Even with inexpensive equipment, beginners can take satisfying photos of the night sky. Click on the link below to explore the basics and learn from the pro's how to capture images with film and digital cameras

http://www.space.com/spacewatch/lc_astrophotography.html

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Featured Articles

Meet Frank, Saturn's 60th Moon - July 23/07 credit News In Science

A new moon has been discovered orbiting Saturn - bringing the planet's latest moon tally up to 60. The body was spotted in a series of images taken by cameras onboard the Cassini spacecraft.



There's mighty Jupiter, dubbed after the paramount god of Roman mythology; Pluto, whose name was inspired by the god of the underworld; Mercury, its title bestowed in honour of the winged messenger.

Then there's Frank.

The oddball name has been temporarily given to Saturn's 60th moon, the

Articles

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Astronomers led by Professor Carl Murray of Queen Mary College at the University of London spotted the newly discovered satellite of the solar system's second largest planet. The researchers used the powerful US-European probe Cassini, which is in orbit around the ringed giant, to spotted "a very faint dot" near the moons of Methone and Pallene, the ESA says. Looking back on previous images, they found a match on previous Cassini fly-bys from June 2004 to June 2007.

Frank is about 2 kilometers across and, like other Saturnian moons, appears to consist mainly of ice and rock. When the Cassini mission launched back in 1997, we knew of only 18 moons orbiting Saturn," says Murray. "Now, between Earth-based telescopes and Cassini we have more than tripled that number. And each and every new discovery adds another piece to the puzzle and becomes another new world to explore."

Frank's name is only a working name for the moon, until a more appropriate title is confirmed by the Paris-based International Astronomical Union.

To date, 48 moons of Saturn have been officially named. In alphabetic order, they are: Aegir, Albiorix, Atlas, Bebhionn, Bergelmir, Bestla, Calypso, Daphnis, Dione, Enceladus, Epimetheus, Erriapo, Farbauti, Fenrir, Fornjot, Hati, Helene, Hyperion, Hyrokkin, Iapetus, Ijiraq, Janus, Kari, Kiviuaq, Loge, Methone, Mimas, Mundilfari, Narvi, Paaliaq, Pallene, Pan, Pandora, Phoebe, Polydeuces, Prometheus, Rhea, Siarnaq, Skadi, Skoll, Surtur, Suttung, Tarvos, Telesto, Tethys, Thrym, Titan and Ymir.

Those awaiting a name are given an official denomination in figures, based on the year in which they were discovered.

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Today in History: NASA Created – July 29, 2007 credit NASA

While its birthday is officially October 1, NASA had its beginnings on July 29, 1958, when the US Congress passed legislation establishing the National Aeronautics and Space Administration (NASA), a civilian agency responsible for coordinating America's activities in space.

Described in its preamble as "an Act to provide for research into the problems of flight within and outside the Earth's atmosphere, and for other purposes," this legislation absorbed the earlier National Advisory Committee for Aeronautics (NACA) intact: its 8,000 employees, an annual budget of \$100 million, three major research laboratories-Langley Aeronautical Laboratory, Ames Aeronautical Laboratory, and Lewis Flight Propulsion Laboratory-and two smaller test facilities.



The crowning achievement of NASA's early years was Project Apollo. When President John F. Kennedy announced "I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to Earth," NASA, itself was committed to placing a man on the moon. On July 20, 1969, Neil A. Armstrong made his now famous remarks, "That's

one small step for (a) man, one giant leap for mankind," as he stepped onto the Lunar surface during the Apollo 11 mission.

NASA continues its efforts today, despite roadblocks and tragedies along the way. There are now plans to return to the Moon by 2020 and establish an extended human presence there that could lead to a future human exploration of Mars.

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Team Finds Largest Exoplanet Yet – August 7, 2007 credit BBC News

An international team of astronomers has discovered the largest known planet

orbiting another star. The "transiting" planet - meaning one that passes in front of its parent star as seen from Earth - is about 70% larger than Jupiter.

But the gas giant has a much lower mass than Jupiter - the biggest planet in our Solar System - making it of extremely low density. Details of the work are to appear in the *Astrophysical Journal*.

The new exoplanet, called TrES-4, is located in the constellation of Hercules and was discovered by a team working on the Transatlantic Exoplanet Survey (TrES). It is mostly made up of hydrogen. TrES-4 circles the star GSC02620-00648, which lies about 1,435 light-years away from Earth. Being only about seven million km (4.5 million miles) from its parent star, the planet is also very hot, about 1,327C (1,600 K; 2,300F). Because of the relatively weak pull exerted by TrES-4 on its upper atmosphere, some of the atmosphere probably escapes in a curved comet-like tail. "TrES-4 is the largest known exoplanet," said lead author Georgi Mandushev, from the Lowell Observatory in Flagstaff, US.

Surprising size

It is so big, in fact, that its size is difficult to explain using current theories about superheated giant planets." We continue to be surprised by how relatively large these giant planets can be," says Francis O'Donovan, a graduate student in astronomy at the California Institute of Technology (Caltech) which operates one of the TrES telescopes. "But if we can explain the sizes of these bloated planets in their harsh environments, it may help us better understand our own Solar System planets and their formation." Its density of 0.2 grams per cubic centimeter is so low that the planet would, in theory, float on water.

By definition, a transiting planet passes directly between the Earth and the star, blocking some of the star's light and causing a slight drop in its brightness. "TrES-4 blocks off about 1% of the light of the star as it passes in front of it," said Dr Mandushev. "With our telescopes and observing techniques, we can measure this tiny drop in the star's brightness and deduce the presence of a planet there."

Planet TrES-4 makes a complete revolution around its parent star every 3.55 days, so a year on this planet is shorter than a week on Earth. The TrES is a network of three 10cm telescopes in Arizona, California and the Canary Islands. In order to accurately measure the size of the TrES-4 planet, astronomers used the 0.8m telescope at the Lowell Observatory in Arizona, the 1.2m telescope at the Whipple Observatory, also in Arizona, and the 10m Keck telescope in Hawaii.

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Galaxies Clash in Four-way Merger – August 6, 2007 credit BBC News

Four gigantic galaxies have been seen crashing into one another in one of the biggest cosmic collisions ever seen.

A US team of astronomers observed the four-way cosmic smash-up using Nasa's Spitzer and Chandra space telescopes along with ground-based observatories. The clashing galaxies are expected to eventually merge into a single, behemoth galaxy up to 10 times as massive as our own Milky Way. Details of the research appear in *Astrophysical Journal Letters*.

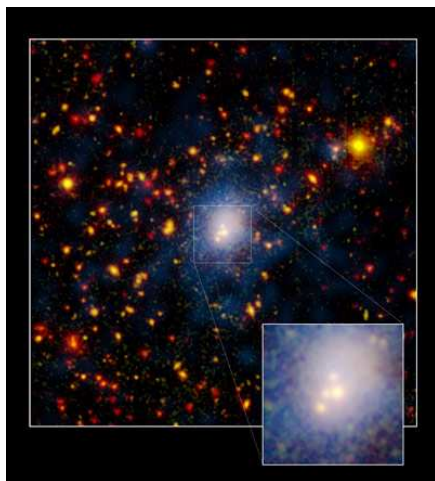
The rare observation offers an unprecedented look at how the most massive galaxies in the Universe are formed. Collisions, or mergers, between galaxies are common in the Universe. Mergers between one large galaxy and several small ones, called "minor mergers", have been well documented. Astronomers have also observed "major" mergers among pairs of galaxies that are similar in size. But, until now, no major mergers between multiple large galaxies have been seen.

"It's the first one that I know about. So far, nobody has written to me to say they've found another four-way merger," said co-author Kenneth Rines, of the Harvard-Smithsonian Center for Astrophysics, in Cambridge, US.

Plume of stars

Dr Rines likened the collision to "four sand trucks smashing together, flinging sand everywhere". The new quadruple merger was discovered serendipitously during a survey of massive galaxy clusters consisting of tens to hundreds of galaxies.

The Spitzer Space Telescope spotted an unusually large fan-shaped plume of light emerging from a gathering of four elliptical galaxies in the cluster CL0958+4702, which is located nearly five billion light-years from Earth.



"The galaxies that live in the middle of clusters like this are the biggest galaxies anywhere in the Universe," Dr Rines told the BBC News website. "When this merger finishes, the giant galaxy left at the end will be one of the biggest ones in the Universe. This shows how these giant galaxies get assembled." All the galaxies in the merger are categorized as large; three are about the size of our own Milky Way, while the biggest one is about three times the size.

Analysis of the plume coming from the merger revealed it was made up of billions of stars flung out and abandoned in the ongoing clash. About half of the stars in the plume will later fall back into the galaxies. "It seems as if there are several galaxies-worth of stars being thrown out by this collision," said the Cambridge-based astronomer. "There are more stars in that plume than there are in the Milky Way. So an incredible amount of material is being tossed out."

Missing gas

The stars studied so far from the merger all appear to have formed within the first three billion years after the Big Bang. The quadruple merger itself took place some nine billion years after the Big Bang. The observation that large galaxies contained many old stars used to be problematic for a popular theory of galaxy assembly - the hierarchical model. This proposed that smaller structures underwent successive mergers to form larger ones. Under this model, the largest galaxies should be sites of star formation and therefore contain young stars. One way to resolve the problem is through the idea of gas-rich and gas-poor mergers. In gas-rich mergers, the galaxies are soaked with gas that ignites to form new stars. But in gas-poor mergers, no new stars are formed. Gas-poor mergers, then, were one way that large galaxies might merge without accompanying star formation.

Indeed, the Spitzer observations demonstrate that gas is a missing component in the new quadruple merger, perhaps explaining why only old stars have been found. In addition to Spitzer, the team used Nasa's Chandra X-ray Observatory to weigh the mass of the giant cluster of galaxies in which the merger was discovered. Two ground-based observatories were also used in the study: the MMT and WIYN observatories, both of which are based in Tucson, Arizona.

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Before the Beginning: The Big Bang Theory Challenged – August 7, 2007 credit The Daily Galaxy

New discoveries about another universe whose collapse appears to have given birth to the one we live in today as it traveled through a "Big Bounce," has been proposed by Martin Bojowald, assistant professor of physics at Penn State. The "Big Bounce" would replace the classical idea of a Big Bang as the beginning of our universe,

Bojowald's research also suggests that, although it is possible to learn about many properties of the earlier universe, we always will be uncertain about some of these properties because his calculations reveal a "cosmic forgetfulness" that results from the extreme quantum forces during the Big Bounce.



As described by Einstein's Theory of General Relativity, the origin of the Big Bang is a mathematically nonsensical state -- a "singularity" of zero volume that nevertheless contained infinite density and infinitely large energy.

Bojowald and other physicists at Penn State are exploring territory unknown even to Einstein -- the time before the Big Bang -- using a mathematical time machine called Loop Quantum Gravity. This theory, which combines Einstein's Theory of General Relativity with equations of quantum physics that did not exist in Einstein's day, is the first mathematical description to systematically establish the existence of the Big Bounce and to deduce properties of the earlier universe from which our own may have sprung.

For quantum physicists, "The Big Bounce" opens a breach in the huge wall that was the Big Bang.

"Einstein's Theory of General Relativity does not include the quantum physics that you must have in order to describe the extremely high energies that dominated our universe during its very early evolution," Bojowald explained, "but we now have Loop Quantum Gravity, a theory that does include the necessary quantum physics."

Loop Quantum Gravity was pioneered and is being developed in the Penn State Institute for Gravitational Physics and Geometry, and is now a leading approach to the goal of unifying general relativity with quantum physics. Scientists using this theory to trace our universe backward in time have found that its beginning point had a minimum volume that is not zero and a maximum energy that is not infinite. As a result of these limits, the theory's equations continue to produce valid mathematical results past the point of the classical Big Bang, giving scientists a window into the time before the Big Bounce.

Instead of vanishing into infinity as predicted by Einstein's Theory of General Relativity, the universe rebounded in the Big Bounce that gave birth to our expanding universe. The theory reveals a contracting universe before the Big Bounce, with space-time geometry that otherwise was similar to that of our universe today.

The Quantum Loop model's equations require parameters that describe the state of our current universe accurately so that scientists then can use the model to travel backward in time, mathematically "un-evolving" the universe to reveal its state at earlier times.

This discovery implies further limitations for discovering whether the matter in the universe before the Big Bang was dominated more strongly by quantum or classical properties.

"A problem with the earlier numerical model is you don't see so clearly what the free parameters really are and what their influence is," Bojowald said. "This mathematical model gives you an improved expression that contains all the free parameters and you can immediately see the influence of each one," he explained. "After the equations were solved, it was rather immediate to reach conclusions from the results."

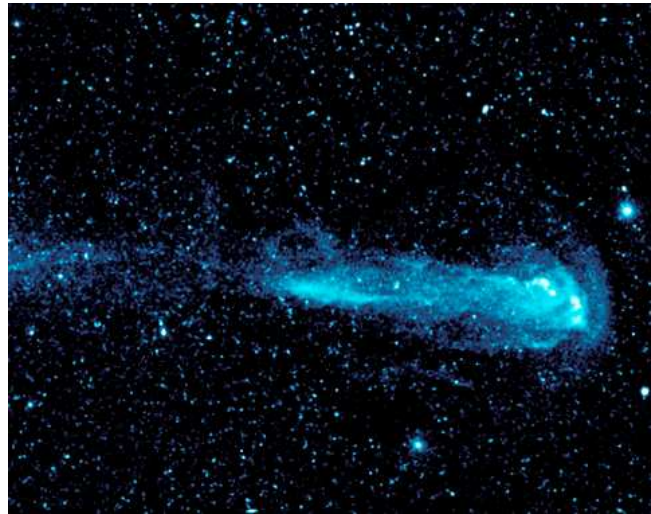
Bojowald reached an additional conclusion after finding that at least one of the

parameters of the previous universe did not survive its trip through the Big Bounce -7 - that successive universes likely will not be perfect replicas of each other. He said, "the eternal recurrence of absolutely identical universes would seem to be prevented by the apparent existence of an intrinsic cosmic forgetfulness."

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Comet-like Tail Trails Mira - August 15 Credit Carnegie Institution

Material blowing off Mira is forming a wake 13 light-years long, or thousands of times the length of our solar system. The space-based Galaxy Evolution Explorer (GALEX) was scanning the star during its ongoing sky survey in ultraviolet light when astronomers noticed what looked like a comet with a gargantuan tail.



Mira, Latin for "wonderful," has been a favorite of astronomers for about 400 years. It is a fast-moving red giant, which sheds massive amounts of surface material, but nothing like this has ever been seen before around a star.

"This is an utterly new phenomenon to us, and we are still in the process of understanding the physics involved," said

Mark Seibert of Carnegie Observatories in Pasadena, California. "We hope to be able to read Mira's tail like a ticker tape to learn about the star's life."

Astronomers say Mira's tail offers a unique opportunity to study how stars like our sun die and ultimately seed new solar systems. As Mira hurls along, its tail drops off carbon, oxygen and other important elements needed for new stars, planets, and possibly even life to form. This tail material, visible now for the first time, has been shed over the past 30,000 years.

Billions of years ago, Mira was like our Sun. Over time, it began to swell into a variable red giant — a pulsating, puffed-up star that periodically grows bright enough to see with the naked eye. Mira will eventually eject all of its remaining gas into space, forming a colorful shell, or a planetary nebula. The nebula will fade with time, leaving only the burnt-out core of the original star (a white dwarf).

Compared to other red giants, Mira is traveling unusually fast, possibly due to gravitational boosts from other passing stars. It now plows along at 291,000 mph (130 kilometers per second). Racing along with Mira is a small, distant companion thought to be a white dwarf. The pair, also known as Mira A (the red giant) and Mira B, orbit slowly around each other as they travel together in the constellation Cetus, 350 light-years from Earth.

In addition to Mira's tail, GALEX also discovered a bow shock, a buildup of hot gas, in front of the star, and two sinuous streams of material coming out of the star's front and back. Astronomers think hot gas in the bow shock is heating up the gas blowing off the star, causing it to fluoresce with ultraviolet light. This glowing material then swirls around behind the star, creating a turbulent, tail-like wake. The process is similar to a speeding boat leaving a choppy wake, or a steam train producing a trail of smoke.

"GALEX is so exquisitely sensitive to ultraviolet light and it has such a wide field of view that it is uniquely poised to scan the sky for previously-undiscovered ultraviolet activity," said Barry F. Madore, senior research astronomer at the Carnegie Observatories. The fact that Mira's tail only glows with ultraviolet light

"We never would have predicted a turbulent wake behind a star that glows only with ultraviolet light," said Seibert. "Survey missions like the Galaxy Evolution Explorer can provide many surprises."

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Buy and Sell

Here's your chance to clean out the closet and find a home for your slightly used treasures. Post your buy and sell items by emailing the [Editor](#) with your details.

Observatory Free To a Good Home

The owners of Frank's home in the Properties have asked that we post Frank's old observatory in the buy and sell as "free to a good home" the only catch is you have to move it. For more information you can call Carrie at 748-8525.

Newtonian for Sale

Good permanent Newtonian scope (not portable) with 13 1/2 inch mirror, 4" Steel Alt Azimuth mount with concrete counter balance. Includes various eyepieces. More info contact John MacArthur at jandlmac@shaw.ca

Single 8" Meade Looking for an Astronomer

Lonely 8" Meade Newtonian with motorized German equatorial steel post mount is looking for a pair of lovely eyes to spend long nights gazing at the stars together. Includes homemade Dobsonian mount, one 40 mm eyepiece and telescope carrying bag. Asking \$750.00 OBO contact Bryon Thompson at bryonjt@shaw.ca.

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Ask an Expert

Have you been thumbing through the Astronomy or Sky and Telescope magazine and have some questions on the latest and greatest in astronomy gear? Or maybe you're narrowing down your search for just the right telescope and want to know the difference between Dobsonians, Schmidt-Cassegrains, Reflector and Refractors. Well wonder no more, email [Brian Robilliard](#) our resident expert to get the "inside scoop" on what's hot or not in astronomy gear.

Are you seeing double or unable to focus? Chances are you need to collimate your scope. Are you looking for a good eyepiece? Why do you need to know the focal length of your telescope's mirror and how do you determine the focal length? For answers to these and other telescope questions email [Ed Maxfield](#) our expert on telescope tips, hints and suggestions.

Are you new to astronomy? Want to know the how to find objects in the sky? Or just wondering what that bright object in the evening sky is? Well wonder no more; email [Byron Thompson](#) our Public Outreach Officer and master of Astronomy 101 basics.

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Kids Korner

For the younger astronomers. We want your input on what you would like to see happening at the club. Tell us a bit about yourself and why you love astronomy. Email the [Editor](#) with your submissions.

For the older folks, if you have any ideas that might spark the interest of a young upcoming astronomer, please send your submissions to the editor.

Solar System Word Search

Words can go horizontally, vertically and diagonally in all eight directions.
Words may overlap and share 1 or more letters.

y h r k l r l r r n c n w j m m s t x n k b f t
 j k p n s x f m l n m f n b m l d l r q v f y b
 d s c h r u n s g f t f c m w d i x g i p r t t
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asteroid	io	rings
callisto	jupiter	rocky
ceres	mars	satellite
charon	mercury	saturn
comet	meteor	solar
corona	meteoroids	sun
deimos	moon	sunspot
earth	neptune	system
europa	phobos	titan
ganymede	planet	uranus
halley	pluto	venus

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Editor Note: Couldn't track down my RASCs contact prior to the deadline of this publication. However, we know the RASC are "up to their eyeballs" organizing their **Seventh Annual RASCALS Star Party** which is happening this weekend August 24-26. Watch for an update in the October issue on how the event went. Enjoy your party folks.

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The Sky This Month

By Bryon Thompson

Observing Site

Duncan, 48.783°N, 123.700°W

September skies beckon us to come out and enjoy mildly crisp evenings and clear skies. If you have a clear view to the south in the early half of the month you will see Jupiter glowing brightly just above Scorpius. The telescopic image you see may not be as clear as you'd like because you're looking through more atmosphere than when you look straight up at the Zenith, (the circle of dark sky directly overhead is called the Zenith). Space is only about 250 miles (416 Km) away directly overhead but more than 600 miles (1000Km) away when your gaze is angled closer to the horizon. This is due to the curvature of the earth and its' atmosphere. Therefore the more sky (air) you look through the fuzzier objects appear. In the later half of the month Jupiter sets shortly after the sun does and becomes more and more difficult to see.

Still, the big planet will show off its' northern and southern cloud belts and the constantly changing dance of its' four large moons (Callisto, Io, Ganemede and Europa). You may see one of those moons pass in front of Jupiter and trail its shadow on the storm clouds below or pass into Jupiter's shadow and wink out of view. Either way Jupiter is the planet to see early in the month. Watch for Europa on September 8th.

Saturn is pretty much lost to September viewers as it is on the other side of the sun. It will be a better sight next month when it will start to return to our night sky. Mars is a clearer planet to shoot for as it rises shortly before midnight in Taurus. It is not as bright as it was last year but you can still make out its orange/red glow against the background stars. The best telescope views of Mars are near the end of September as the red planet is racing towards opposition this December. Opposition means that the Sun, Earth and Mars are directly in line with each other. In mid September however, Mars is at 'Quadrature' meaning the angle between Sun, Earth and Mars is exactly 90 degrees.

Uranus, seen as a small blue/green dot in the south reaches opposition on September 9th. The gas giant is over 1.7 billion miles away and can be found in Aquarius glowing at magnitude 5.7, less than a moon's width northeast of "Phi Aquarii".

Although the most well known meteor shower, the Perseids, was last month, we may be treated to an unusually busy September meteor shower called the Aurigids. Comet Kiess, which last rounded the sun in 1911, is responsible for this group of meteors. The Aurigids are normally unremarkable but with a few surprise peaks in activity in years past; 1935, 1986 and 1994. On September 1, the experts tell us that we may be in for a shower of sorts with up to 3 meteors per minute in a show that should last for a couple of hours. A special treat may be in store for those observers beneath a clear dark sky who also happen to have the radiant (near Alpha Aurigae) directly overhead. Some of the estimates run as high as 100 to 1000 meteors may be seen during the two hour peak for those lucky few, most of whom live on the west coast of North America and in Hawaii; so keep your fingers crossed and your eyes trained Northeast. It is also interesting to note that the dust particles that cause this month's rare sight were blasted off the comet on its previous visit through our neighborhood in 83 BC. In other words, Julius Caesar himself may have seen the tail of the comet when it was here way back then. Only now are we set to benefit from that sight. I hope you all have clear skies for

this rare opportunity.

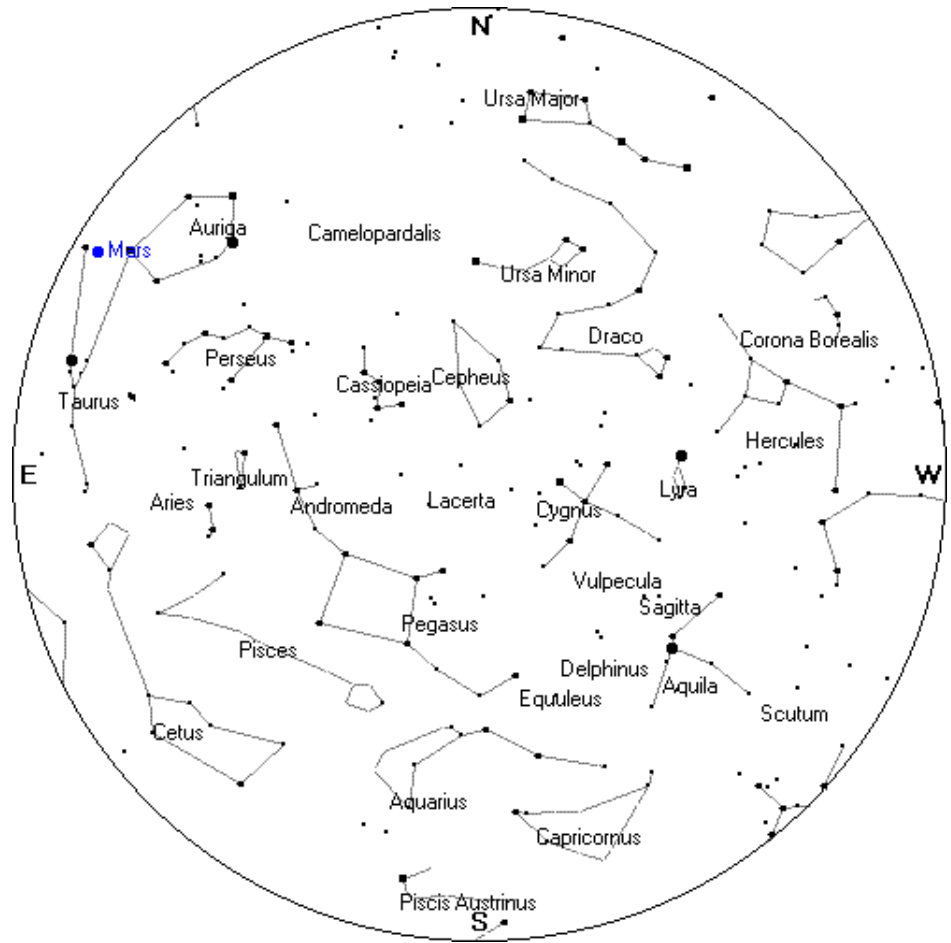
Early risers who find a clear sky may be treated to a view of the zodiacal light this month. This is a faint angled glow in the sky seen a couple hours before sunrise. The glow is widest near the horizon and thins out as it climbs up at an angle. What you're really seeing is the reflected (scattered) sunlight on countless microscopic bits of dust. These dust particles are 50 to 100 times smaller than the width of a human hair and are left over by comets and asteroids that inhabit in the planetary plane of our solar system. This plane is called the ecliptic. The ecliptic marks the path that the planets and the sun trace across our sky. It is also where the constellations that form the 'signs of the zodiac' are found.

September 23rd at 02:51 PST is the beginning of the autumnal equinox which marks the start of our fall. Yes, our short lived summer is over. For my cousin Susan in Australia, it marks the return of her spring. I hope you have good summer Susan! Until next month stay curious and remember; The weather may not be agreeable but astronomy is looking up! ;)

September 2007 (all times are in Pacific Daylight Time).

01	04:30am	A short peak of the Aurigid meteor shower
11	05:44am	New Moon
15	14:00pm	Moon is at Apogee (furthest from the earth – 252,054 miles)
23	02:51am	Autumn Equinox in Northern Hemisphere, Spring Equinox in Southern Hemisphere
23	16:00pm	Venus at greatest brilliancy in morning sky (magnitude -4.4)
26	12:45pm	Full Moon
29	10:00am	Mercury's greatest elongation east. Visible after sunset

Sky Chart –Here's your mid-September midnight sky chart. In order to use the sky chart properly remember the centre of the chart is the sky directly above your head (or the Zenith). Turn the chart so that the direction you are facing is at the bottom of the chart (or pointed toward your toes). The star field directly in front of you will be between the bottom of the chart and the centre.



Sky Chart Courtesy of Heavens-Above

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