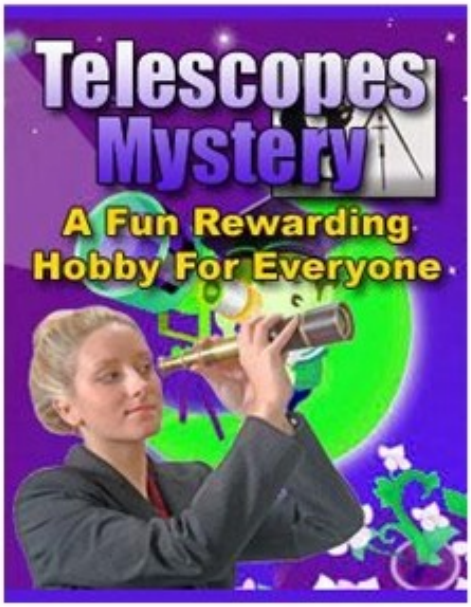


# Telescopes Mystery

A Fun Rewarding Hobby For Everyone

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# History of the Telescope

The history of the telescope dates back to the early 1600's when an Italian mathematician named Galileo Galilei peered through an odd new device he had invented to look at the stars in the night sky. Suddenly, this well known and familiar place revealed itself as a barely exposed mystery. It was then that Galileo knew that his telescope was a ground breaking device and history was made.

This first telescope used the same principle that all telescopes would eventually rely on. That principle held that the combination of the two lenses gathered more light than the human eye could collect on its own. The lenses would focus that light and form an image. Because the image was formed by the bending of light, or refraction, these telescopes came to be known as refracting telescopes, or simply, refractors.

History has shown that telescopes would evolve into powerful tools as the years passed. Refractors and reflectors would become the two basic types of telescope and as technology became more and more advanced, so did the telescopes. They became bigger as astronomers desired to see further and further into the night sky. In fact, in the history of the telescope, there was a time when the size of a telescope was almost cartoonish in proportion.

Modern day history of the telescope has really been made mostly in the field of commercial telescopes and those that are used by the government as well as professional astronomers. Telescopes such as the Hubbel used by NASA are very powerful and make it possible to see images hundreds of light years away.

Another exciting development in the history of telescopes occurred when manufacturers began to make some models with cameras attached to them. Over the years, this advancement has made for some amazing pictures of the galaxies that exist above us. If you have ever seen a picture of the Milky Way taken with a powerful telescope, the result is absolutely brilliant and breathtaking.

Now, there are millions of people who really enjoy going out on a clear night and looking at the stars, the moon, and the constellations. If Galileo hadn't made history by having the desire to make the first telescope, we would simply be relegated to looking with our naked eye. Luckily, we don't have to. Now we have the advantage of a variety of telescopes to meet all our needs - whether it be astronomy as a hobby or astronomy as a job.

# New Developments in Telescopes

In the hundreds of years since telescopes were invented, there have nearly literally been hundreds and hundreds of new developments that have come about as well. Constant improving and updating has been followed by technological advancements in telescope design as well as functionality.
One new development in telescopes has to do with the optical resolution. An optical telescope's resolution—the ability to see fine detail—increases with mirror or lens size. However, Earth's turbulent atmosphere provides a practical limit on resolution because it blurs incoming starlight. This effect makes stars appear to twinkle at night.
With the use of computers, astronomers are developing adaptive optics that essentially take the blur out of starlight. Astronomers use computers to analyze the blurring created by the atmosphere and compensate for it by rapidly distorting the mirrors in a reflecting telescope.

The Keck II telescope at Hawaii's Mauna Kea Observatory was outfitted with this new technology in 1999, enabling it to take pictures that are 20 times more detailed than before. Telescopes using adaptive optics can resolve something the size of a quarter at a distance of more than 50 kilometers (30 miles).

Optical interferometry is another new development in telescopes that has occurred in recent years. A new technique in optical astronomy is to combine signals from telescopes in separate locations so that the resulting image is equal to that received from one giant telescope, a method called optical interferometry.

In 2001 the European Southern Observatory opened the largest optical interferometer, the Very Large Telescope (VLT), in the Atacama Desert in northern Chile. The VLT combines the light from four 323-in (820-cm) telescopes and several smaller telescopes to produce an image equivalent to that of a 630-in (1,600-cm) telescope.

Optical interferometers are useful for resolving the separation between relatively bright, closely paired objects, such as double stars. Astronomers hope this technique will eventually make it possible to directly image small, Earth-sized planets orbiting distant stars.

New developments in telescopes are occurring all the time as technologies reveal more and more about our Earth and what is in the night sky. With these new developments, we are better able to understand our universe and how various planetary bodies are formed as well as how they co-exist with each other in the vastness of space.

Astronomy is an exciting science and new developments in telescopes make it even more exciting. Things will change yet still in years to come, and we will start to see more and more of what we couldn't before. New developments in telescopes are eagerly awaited.

# Telescope Timeline

It is actually quite easy to make a timeline with regards to the invention of the telescope as well as how it has evolved over the years. Much has been written about the telescope and good records have been kept with regards to new technologies and inventions. Basically, the telescope timeline looks something like this:

1609 - Galileo first invented the telescope. Though it was crude, it still did the trick and allowed him to look into space for the very first time other than with the naked eye. Galileo's telescope was a reflecting one causing light to bounce off a mirror when looked at through a lens.

Mid-1600's - Johannes Keplar came up with the idea of a refracting telescope that would widen the field of view as well as improve the quality of the image. He did this by changing the shape and the placement of the lenses, but doing this caused little circles of color that would surround bright objects - chromatic aberration.

Late 1600's - As the century began to draw to a close, telescope makers were realizing that with a bigger lens, you could see much more. With a bigger lens, the telescope had to be bigger to accommodate it. Eventually, telescopes were being built that we as long as a hundred feet!

It was at this point in the telescope timeline that Sir Isaac Newton began to change telescope lenses so that there would be no chromatic aberration. He also found a way to add mirrors to improve images without having to make the telescope longer. This appealed to people as Newton's telescope was small but had the same power as the larger ones.

Mid-1800's - The first photographic telescope is introduced. John William Draper found a way to focus the Moon's image on a light-sensitive photographic plate. He used a clockwork device to keep the light in place even as the Earth rotated and the moon moved through the sky. After an exposure of 20 minutes, he had taken the first ever photograph of the moon! After the introduction of the photographic telescope came about, we were able to see the skies up close and personal. And what a great accomplishment!

The early timeline of telescopes shows that many advances were made even before we advanced into what we think of as modern times. Since the 1800's, so many advancements were made in the field of producing telescopes that documenting each and every one would be able to fill up pages and pages of text.

Suffice it to say that now we are graced with telescopes that can see even the minutest parts of Saturn's rings and even realize that Pluto is just a little too small to be a real planet. The timeline of telescopes will continue. All we have to do now is sit back, watch, and document the advancements.

# How to Use a Telescope

If you are new to astronomy and are clueless as to how to use your telescope, rest assured, you are not alone. However, it's really not that difficult learning how to use a telescope. It just takes a few adjustments and knowing what equipment your telescope has. You must be familiar with the pieces of the telescope and how each of them work. The rest is easy.

The first thing you will need to know in learning how to use a telescope is does your telescope have a polar axis or not. A polar axis is intended to track. A telescope without a polar axis is merely a point and look, or what is called Alt-Az. Alt means altitude and Az means azimuth, where Alt is the distance above the horizon, and Az is the direction in a circle around the horizon. If you have an Alt-Az mount, just skip the polar alignment step. If you have a polar axis meaning that your telescope is intended to track the stars, then find north, and make sure the polar axis is approximately lined up in that direction. It does not have to be too accurate, but make sure it is pointing pretty close to north. If you are not sure where north is, either use a magnetic compass, or try to find Polaris, the North Star.

Now you are ready to align the finder scope. You will have to find a way to align your finder scope so that it is in line and points to the same thing you see in the eyepiece. Then you can use it to find objects of interest. This probably is the hardest part when learning how to use a telescope.

The best way to do this is to find the lowest power eyepiece you have, and use it to find a bright planet like Jupiter, or even the moon. Once you get Jupiter centered in the eyepiece of your telescope, and if your telescope tracks, lock down the drive to follow the planet so it will stay centered in the eyepiece. If your telescope does not track, then just re-center the planet in the eyepiece from time to time.

Now, look at the finder scope. It should have somewhere on the mount at least one set of three thumb screws holding the finder scope in place. Gently loosen the screws on the finder scope and look through its eyepiece. You should see a cross hair or "X". Align the planet on the cross hair by alternately adjusting the screws until it stays centered. When it is, try to tighten the screws so it holds the finder scope securely. Now your finder scope is aligned with the telescope eyepiece, and you should be able to use it to find other objects of interest.

Now you're all ready. Learning how to use a telescope involves more trial and error than anything. Fool around with the eyepiece and adjuster a little bit and you will be well on your way to star gazing with ease!

# Current Astronomy News for the Sky and Telescope

When it comes to finding current astronomy news, you have a lot of resources as you start perusing the sky with your telescope. There are advancements and discoveries made daily, so you will want to keep up with all the current astronomy news to get the most satisfaction from using your telescope to look into the sky.

One terrific way to keep apprised of all the current astronomy news is to look on the Internet. There are many websites devoted to updating all of the current advancements and discoveries made regarding observing the sky through the lens of a telescope. These websites are updated frequently, so you can take advantage of the information super-highway to stay current. Here are a few websites you can check out for all the current astronomy news:

* www.nightskyobserver.com - this site not only contains current astronomy news, it also has articles, blogs, and suggestions as to where in the sky you can point your telescope to see new and exciting things.
* www.skytonight.com - this is another great website where you can find all sorts of new discoveries in the sky along with tips and tricks on how to maximize your telescope and articles on all the current news on the astronomy front.
* www.stargazing.net - this site has an amazing picture gallery that shows all sorts of images taken through the eye of a telescope plus all sorts of information about space launches and what's up in the sky at any given time.

Of course, these are only a few of the many, many websites that are dedicated to current astronomy news and helping the amateur astronomer know what to look for in the sky with their telescope. A quick Google search will direct you to other helpful websites.

You can also subscribe to astronomy magazines if you are interested in current astronomy news. There are many available, and most are actually quite inexpensive for subscriptions. Here are just a few to look at:

* Sky and Telescope - this magazine sponsors the Sky Tonight website listed above. They offer a free trial offer and United States subscription rates for a year run $42.95. * Astronomy Magazine - made for both the seasoned astronomer as well as beginners, this is a great magazine for staying current on astronomy news. They have detailed sky charts so that you can point your telescope in the right direction for amazing sights. One year subscriptions are $42.95 as well for this monthly magazine.

There are all sorts of ways to stay current with astronomy news so you can use your telescope to observe the night sky.

# Optical Telescope

An optical telescope is a telescope that is used to gather and focus light mainly from the visible part of the electromagnetic spectrum. The optical telescope allows the user to directly view a magnified image of something far away. The term is used especially for a monocular with static mounting for observing the sky.

There are three primary types of optical telescope:

* Refractors which use lenses
* Reflectors which use mirrors
* Combined Lens-Mirror Systems which use both lenses and mirrors

The basic idea of an optical telescope is that the primary light-gathering element - the objective lens or the concave mirror - focuses light from a distant object to a focal plane where it forms a real image. This image can be recorded with a camera or simply viewed through an eyepiece which acts like a magnifying glass. The naked eye sees a magnified virtual image that is a very long way away.

Telescopes that have two convex lenses causing the image to appear inverted. Terrestrial versions of such telescopes employ prisms or a relay lens between the object and the eyepiece to invert the image again making it appear as it truly is thus an upright image appears in the eyepiece.

Early versions of the optical telescope often provided blurry images with chromatic aberrations that would put rings of color around bright objects. However, advancements made in the telescope field over the years have all but done away with these flaws and astronomers - both amateur and professional alike - are now able to see clear images free from distortion.

Almost all large research telescopes are optical telescopes and are reflectors. The reason for this is that for research purposes, the images must be free from imperfection in order for it to be studied accurately. Also, reflectors work in a wider spectrum of light allowing for better imaging.

The term optical telescope almost seems like an oxymoron as —optical|| means with the eye. We can't imagine what other type of telescope there might be that wouldn't employ the use of the eye for viewing. However, in technical terms, we must address the fact that the telescope is an optical image device and thus should be referred to as such. Although there are optical telescopes that have cameras attached as well so they are referred to as photographic telescopes.

From large and powerful to small and compact, there are a variety of optical telescopes available to the amateur astronomer. Do a little research and find the optical telescope that meets your needs and then be introduced to the cosmos in an amazing way!

# Radio Telescope

A radio telescope is a form of directional radio antenna and is most often used in radio astronomy as well as for tracking and collecting data from satellites and space probes. In their astronomical role, they differ from optical telescopes in that they operate in the radio frequency potion of the electromagnetic spectrum where they can detect and collect data on radio sources.

Radio telescopes are typically large dish antennas used singularly or in an array with several telescopes pointed in the same direction. Radio observatories are located far from major centers of population so that they can avoid electromagnetic interference from regular radios, televisions radar and other electromagnetic emitting devices.

This is similar to the locating of optical telescopes to avoid light pollution. However the different is that radio observatories will generally be place in valleys to further shield them from the electromagnetic interferences as opposed to clear air mountain tops where optical observatories are often located.

Many astronomical objects are not only observable in visible light, but they also emit radiation at radio wave lengths. Besides observing energetic objects like pulsars and quasars, radio telescopes are able to image most astronomical objects like galaxies, nebulae, and even radio emissions from planets.

Radio telescopes play an important role in the world as they are used to track information from satellites in space that give us important insights into what is happening not only in space but also in our world. They can find important weather events like hurricanes and tropical storms as well as show information about things like global warming and other trends.

The ordinary astronomer will not use radio telescopes in their astronomical quests. They are very large and look like huge satellite dishes. As we've said, they are not used to —see‖ space objects but more to gather information through radio waves let off by various objects in the cosmos.

The largest radio telescope is located in Pune, India, and is called the Giant Metrewave Radio Telescope. There is another enormous radio telescope that is currently being constructed in Europe and contains over 25,000 small antennas over an area that is several hundred kilometers in diameter.

Radio telescopes are a very important part of our world today and are essential as we continue to learn more and more about the world we live in as well as the world we don't - space. The advancements that are being made make a difference in our lives and we really don't even know about it. But rest assured that radio telescopes will continue to evolve and become more advanced providing us with even more information over the years.

# Famous Telescopes

Over the years, there have been many famous telescopes that have helped to shape the world of astronomy. Certain telescopes are made famous for a couple of reasons. Some telescopes are famous because they paved the way for newer and better products. They also become famous for what they have been proven to do. Here are some of the more famous telescopes we know today.

* The Hubble Space Telescope is probably the most famous and well-know of all telescopes. The Hubble Space Telescope is a 2.4 meter telescope located in space.

Deployed on April 25, 1990, the Hubble Telescope is a giant observatory aboard a spacecraft. It can make observations of the universe using visible, near-ultraviolet and near-infrared light spectra above the filtering effect of earth's atmosphere.

Because of its ability to capture faint light in fine detail and the precision of its observations the Hubble Space Telescope is rapidly expanding astronomers understanding of the cosmos.

* In August of 2003, the Spitzer Space Telescope was launched into space by a Delta rocked launched from Cape Canaveral, Florida. The Spitzer's mission is to obtain images and spectra by detecting the infrared energy, or heat, radiated by objects in space between wavelengths of 3 and 180 microns (1 micron is one-millionth of a meter). Most of this infrared radiation is blocked by the Earth's atmosphere and cannot be observed from the ground.

* The Isaac Newton Telescope was originally placed in Sussex, England, but now is located on the Canary Islands. It is a 2.5 meter optical telescope originally constructed in 1967 and has proven to provide many amazing pictures of space in the astronomical world.

* The Keck Observatory is home to two of the largest optical telescopes in the world called the Keck Telescopes. It is located at the summit of Mauna Kea in Hawaii. These telescopes are famous not only for their size but because their sensors are controlled by advanced computer technologies that allow for precise observations with little interference.

* The Hale Telescope is a 200 inch optical telescope located in Washington and is famous mainly because it was very successful in leading to the rapid advance in understanding of the scale of the Universe and advancing telescope technology to what it is today.

There are many other famous telescopes, but all of them are important in the field of astronomy in their own unique ways. Without them, we wouldn't have any idea about the vastness of the world beyond the Earth and into space.

# Hubble Space Telescope

The Hubble Space Telescope is a telescope in orbit around the Earth. It was launched into space on April 25, 1990, and is basically a giant observatory on board a space station. Its position outside the Earth's atmosphere provides a significant advantage over ground based telescopes as the images are not blurred by the atmosphere, there is no background light scattered from the atmosphere, and it can observe ultra-violet light that is absorbed by the ozone layer.

Since launched into space, the Hubble Space Telescope has become one of the most important instruments in the history of astronomy. It has been responsible for many ground breaking observations and has helped astronomers achieve a better understanding of many fundamental problems in astrophysics. Hubble's ultra deep field is the most sensitive astronomical optical image ever taken.

Originally conceived in 1946, the Hubble Space Telescope was imagined as one of the most advance telescopes of its kind. The project to build this space telescope was plagued by delays and budget problems. Immediately after its launch, it was found that the main mirror suffered from spherical aberration which severely compromised the telescope's capabilities.

In 1993, NASA sent astronauts into space to make repairs to this problem and the telescope was restored to its intended quality. The Hubble Space Telescope has proven to be a vital research tool as well as a public relations boost for astronomy. It is one of the most famous telescopes in the world and a valuable teaching tool for many.

As with any telescope, maintenance and care will keep it operating properly. Because the Hubble Telescope is located in space, that makes it difficult to do. The future of the telescope depends a lot on the success of its next servicing mission. Several of its stabilizing gyroscopes have failed. The gyroscopes are used to point the telescope in various directions. Another failure will seriously compromise the ability to point the telescope. Servicing these gyroscopes will require a manned service mission so that they can be replaced.

Another problem that is occurring with the Hubble Space Telescope is that its main camera stopped working in late January of 2007. Without manned servicing, only its ultraviolet channel will be usable. Also a reboost is needed to increase the diameter of the orbit or else drag will cause Hubble to re-enter the Earth's atmosphere sometime after 2010. Right now a manned service mission is planned for September of 2008.

The Hubble Space Telescope has been responsible for many important discoveries and losing it could be a blow to the world of astronomy. However, it is going to be replaced sometime in 2013 by the James Webb Space Telescope. Until then, we need the Hubble Space Telescope to make further advancements in astronomy.

# History of Hubble Space Telescope

The history of the Hubble Space Telescope can be traced back to as far as 1946 when astronomer Lyman Spitzer wrote a paper entitled —Astronomical Advantages of an ExtraTerrestrial Observatory||. In the paper, he discussed two main advantages that a space-based observatory would have over ground-based telescopes.

First, the angular resolution (smallest separation at which objects can be clearly distinguished) would be limited only by diffraction, rather than by the turbulence in the atmosphere which, causes stars to twinkle and is known to astronomers as seeing. Second, a space-based telescope could observe infrared and ultraviolet lights, which are strongly absorbed by the atmosphere.

Spitzer devoted much of his career to pushing for a space telescope to be developed. In 1962, the USA's National Academy of Sciences recommended building a large space telescope. In 1965 Spitzer was appointed as head of a committee given the task of defining the scientific objectives for a large space telescope. After a long battle looking for funding for the project, Congress finally voted to fund the project in 1977 allowing construction of the Hubble Space Telescope to begin.

A huge setback in the history of the Hubble Space Telescope occurred in 1986. The original launch was planned for October of that year, but the space shuttle Challenger encountered disaster in January when it exploded after launch. That disaster caused the space program to come to a halt grounding the space shuttle program and delaying the launch of Hubble.

Following the resumption of shuttle flights in 1988, the launch of the telescope was scheduled for 1990. In preparation for its final launch, dust which had accumulated on the mirror since its completion had to be removed with jets of nitrogen. All systems were tested extensively to insure that they were fully functional. On April 24, 1990, the space shuttle Discovery went into space with Hubble on board to launch the telescope successfully into its planned orbit.

The Hubble Space Telescope was named after Edwin Hubble, the man who discovered the cosmos. As a result of Hubble's work, our perception of mankind's place in the Universe has changed forever: humans have once again been set aside from the centre of the Universe. When scientists decided to name the Space Telescope after the founder of modern cosmology the choice could not have been more appropriate.

The history of the Hubble Space Telescope has been dotted with problems as well as successes. But without this important piece of equipment floating around in space, we would not know nearly as much as we do about the universe we live in.

# Facts about the Hubble Space Telescope

When it comes to what is probably the most famous telescope of all time, the facts about the Hubble Space Telescope can be fascinating. Other than just specifications regarding its capabilities, there is much to be learned when we look at the facts surrounding the Hubble Space Telescope.

It was launched into space in 1990 aboard the space shuttle discovery. Hubble's orbit above the Earth's distorting atmosphere allows astronomers to make the very high resolution observations that are essential to open new windows onto planets, stars and galaxies.

Hubble was designed as a high standard flagship mission and has paved the way for other space-based observatories. Notably it can access the otherwise invisible ultraviolet part of the spectrum, and also has access to areas of the infrared not visible from the ground. That makes this fact about the Hubble Space Telescope especially important for astronomers.

At the heart of Hubble are a 2.4 m primary mirror and a collection of five science instruments that work across the entire optical spectrum - from infrared, through the visible, to ultraviolet light. There is one camera, three combined camera/spectrographs and a set of fine guidance sensors onboard Hubble.

Hubble was designed to be serviced in space, allowing outdated instruments to be replaced. The telescope was placed into a low-Earth orbit by the Space Shuttle and uses modular components so that it can be recovered on subsequent Shuttle Servicing missions and faulty or outdated parts more easily replaced before being re-released into orbit.

Here are some specific facts about the Hubble Space Telescope:

* It is powered by two solar panels as well as six nickel-hydrogen batteries
* A system of reaction wheels maneuvers the telescope into place and its position in space is monitored by gyroscopes. Fine Guidance Sensors (FGS) are used to lock onto guide stars to ensure the extremely high pointing accuracy needed to make very accurate observations.
* It is 13.3 meters in length and 4.2 meters in diameter
* It weighed 11,110 kilograms at the time of its launch
* Instruments on board include two cameras, a spectrograph and a spectrometer
* It has a circular orbit of 589 kilometers above the ground and is inclined at 28.5 degrees to the Equator. The time for one orbit is between 96 and 97 minutes.

The Hubble Space Telescope has provided facts and information to astronomers that have proven to be very valuable in the field. Without it, we wouldn't know as much as we do about space and the Earth as well. The fact is that the Hubble Space Telescope is a very important part of the history of the space program.

# When Was the Hubble Telescope Launched Into Space

When the Hubble Space Telescope was launched into space, it had already been met with its own unique set of challenges and setbacks. From its original conception in 1946 to when it would eventually be launched into space, the Hubble Space Telescope was destined to make history.

In 1977, Congress voted unanimously to fund the building of the Hubble Space Telescope and construction of the unit began. It was completed in 1981 with the final polishing of the mirrors and a launch date was set for October of 1984. The company responsible for the mirrors was performing questionable work and NASA had lost its confidence in them.
However, they continued to allow the work to progress and because they wouldn't approve the device completely, launch was once again set back to April of 1985.

After gaining final approval from NASA, the Hubble Space Telescope was finally ready to be put into space and a launch date was set for October of 1986. However, January of 1986 saw the space shuttle Challenger explode over the Earth and the space shuttle program was shut down for several years.

This is when supporters of the Hubble Space Telescope began to feel that their project would never be launched into space, but they held out hope. After all, this was a very important part of astronomical history and when the Hubble Space Telescope would finally be launched into space, it would be ground-breaking.

Shuttle flights resumed in 1988, and a launch was scheduled for 1990 as NASA struggled to catch up with projects that had been put on hold for two years. In preparation for its final launch, dust which had accumulated on the mirror since its completion had to be removed with jets of nitrogen, and all systems were tested extensively to ensure they were fully functional. Finally, on April 24, 1990, the space shuttle Discovery went into space with Hubble aboard and launched it successfully into its planned orbit.

When the Hubble Space Telescope was launched into space, it almost immediately began to show promise as one of the most valuable tools that would ever be used by astronomers. The cameras on board started capturing images of galaxies, nebulae, and planets that had never been seen before. It provided all types of information to researchers and continues to do so today even though many of its systems are showing considerable wear and even break down.

# The Next Generation Space Telescope

Originally dubbed the Next Generation Space Telescope, what is now known today as the James Webb Space Telescope is the successor to the Hubble Space Telescope. Scheduled to launch sometime in 2013, the Next Generation Space Telescope is being designed to be bigger and better than the Hubble with many more capabilities.

The James Webb Space Telescope (JWST) is a large, infrared-optimized space telescope. JWST will find the first galaxies that formed in the early Universe, connecting the Big Bang to our own Milky Way Galaxy. It will peer through dusty clouds to see stars forming planetary systems, connecting the Milky Way to our own Solar System. The next generation in space telescopes will have instruments that are designed to work primarily in the infrared range of the electromagnetic spectrum, with some capability in the visible range.

JWST will have a large mirror, 6.5 meters (21.3 feet) in diameter and a sunshield the size of a tennis court. Both the mirror and sunshade won't fit onto the rocket fully open, so both will fold up and open only once it is in outer space. JWST will reside in an orbit about 1.5 million km (1 million miles) from the Earth.

When you consider that the next generation of space telescopes should be much more powerful than any other space telescopes, the technology that goes into producing them has to be much more advanced than we have ever known. Of course, advancements have been made, and observation of the current space telescope point to areas that need to be improved upon as construction continues on the JWST.

This telescope will be the premier observatory of the next decade serving thousands of astronomers worldwide. It will study every phase in the history of our universe ranging from the first glows after the Big Bang (if you're so inclined to believe this story of how we got here) to the formation of solar systems capable of supporting life on planets like Earth as well as the evolution of our own solar system.

There are several innovative technologies that have been developed for this next generation of space telescopes. Among them are a folding, segmented primary mirror that will adjust to the shape after launch, and detectors that are able to record weak signals.

Just as with the Hubble, this next generation space telescope will be equipped with cameras and spectrographs designed to work in the infrared range of the electromagnetic spectrum. It will be sensitive to light from .6 to 27 micrometers in wavelength.

This next generation in space telescopes is an exciting and interesting venture as it is expected to tell us things we never imagined we could know from space.

# Galileo's Telescope

In 1609, an Italian mathematician named Galileo Galilei fashioned a device that would eventually come to be known as a telescope. Looking through this new instrument, Galileo was able to see shadows and bright spots on the surface of the moon. He could see that the moon also had mountains and valleys. This new telescope had Galileo so excited, he had to share what he had found and published his findings in a bulletin named —Message from the Stars||.

Galileo's telescope was a simple instrument compared with the ones we use today. It was a tube with two lenses: the convex primary lens that curved outward and the concave eyepiece lens that curved inward. He built the device after hearing about the newly invented spyglass which was an instrument used by the military to peer into enemy camps.

This first telescope used the same principle that all telescopes would eventually rely on. That principle held that the combination of the two lenses gathered more light than the human eye could collect on its own. The lenses would focus that light and form an image. Because the image was formed by the bending of light, or refraction, these telescopes came to be known as refracting telescopes, or simply, refractors.

Galileo's best telescope magnified objects about thirty times. Because of flaws in its design such as the shape of the lens, the images tended to be blurry and distorted. However, the early telescope was good enough for Galileo to explore the sky.

Even though the introduction of the telescope was met with excitement, as his investigations progressed, Galileo began to make enemies. Some people argued that the telescope made people see illusions. Others claimed that the planets' details couldn't be seen with the naked eye and therefore didn't matter.

The hostility arose from a dispute about the way the universe worked. After all, this was a radical new concept that refuted the accepted norm of how people looked at the world. Remember at one time, people thought the world was flat until Christopher Columbus provided proof that it wasn't!

Galileo's telescope caused a rift with him and the Catholic Church who actually took a stand on the belief that the sun was the center of the universe as opposed to the Earth being the center of the universe. Even though Galileo was actually proving the Church's stance through the use of his telescope, his findings were controversial enough for them to be at battle, so to speak.

With his invention of the telescope, Galileo made astronomical history as his telescope gave birth to many others. New technologies would emerge over the years to progress toward the telescopes that we use today. Without the Galileo telescope, we wouldn't know nearly as much as our world as we do today.

# Galileo's First Telescope

Italian mathematician Galileo Galilei was responsible for inventing the first telescope. His telescope was a simple instrument compared with the ones we use today. It was a tube with two lenses: the convex primary lens that curved outward and the concave eyepiece lens that curved inward. He built the device after hearing about the newly invented spyglass which was an instrument used by the military to peer into enemy camps.

This first telescope that Galielo came up with used the same principle that all telescopes would eventually rely on. That principle held that the combination of the two lenses gathered more light than the human eye could collect on its own. The lenses would focus that light and form an image. Because the image was formed by the bending of light, or refraction, these telescopes came to be known as refracting telescopes, or simply, refractors.

Galileo's first telescope magnified objects about thirty times. Because of flaws in its design such as the shape of the lens, the images tended to be blurry and distorted. However, the early telescope was good enough for Galileo to explore the sky. Using this first telescope, he could see shadows and bright spots on the moon. He could also see that the moon had mountains and valleys.

Galileo was an excellent experimentalist, and working with different lenses, he realized that the magnification was proportional to the ratio of the power of the concave (eyepiece) lens to the convex (more distant) lens. In other words, to get high magnification he needed a weak convex lens and a strong concave lens.

The problem was that the opticians only made glasses in a narrow range of strengths, and three or so was the best magnification available with off the shelf lenses. Galileo therefore learned to grind his own lenses, and by August, he had achieved about nine-fold linear magnification.

This was an enormous improvement over everything else on the market. Galileo therefore approached the Senate of Venice to demonstrate his instrument. Many senators climbed the highest bell towers in Venice to look through the glass at ships far out at sea, and were impressed by the obvious military potential of the invention.

With the invention of the first telescope, Galileo sent shockwaves throughout the world, and people began to copy his design to make it better and better. Over the years, technology would improve on Galileo's first telescope and provide insight into the world that had never before been explored.

# Amateur Telescope Making

When Galileo made the first telescope, he was an amateur at telescope making. He was in the same place as you probably are. That is, he was interested in the sky and the stars and was curious about how to better see what was up in the night sky. So he decided to make a device that would let him do just that and the first telescope was born.

Today, you can easily buy a telescope, but for the amateur astronomer, telescope making is an exciting venture that they deeply want to try. And the truth is that you can make your own telescope although it might prove to be an undertaking that takes up a lot of time and technicalities. However, if you are an amateur who is interested in telescope making, then good for you! That means you're adventurous.

Building a telescope isn't difficult, but it is much easier if you have the help of someone who has made a few before, so consider getting a mentor. If you don't know of anyone who builds telescopes, try a local astronomy club. Many astronomy clubs have at least a couple of members who have built telescopes, and in my experience most people are eager to help out beginners.

Amateur telescope making can be a painstaking process, so be patient and don't panic. Some of the greatest discoveries have been made through trial and error. You may want to check a few books out before you start as you need to know the mechanics of a telescope before you get started. There are a lot of good books out there on amateur telescope making and you can probably find many of them at your local library.

As far as the supplies you need to make your telescope, you are going to need mirror, lenses, housing for the whole thing, materials for polishing your mirror, mounting, and much more. Many of these materials can be purchased at a hobby shop or online. You can try to grind your own mirror if you want to, but be aware this is a painstaking process.

Amateur telescope making is a long, slow process. Work neatly. Every mess you avoid making is one less that you have to clean up later. Spread lots of newspaper around to catch loose grit. Keep a log describing what you did, and for how long. This can be useful in later stages of figuring when you might work for just a few minutes at a time. It is easy to forget what you are doing and what you tried.

Amateur telescope making can be a very satisfying process for the amateur astronomer. But instead of buying each piece separately, you may also want to consider buying a kit.

# How to Make a Telescope

If you want to know how to make a telescope, the first thing you need to know is how a telescope works. A telescope is a device that magnifies objects that are far away and brings them into focus as you look through a lens. Learning how to make a telescope can be done in many ways.

You can look online as there are many websites dedicated to telescope making and many people even consider this an art form. Some of the telescopes made by amateur astronomers are on par with those you can buy commercially and some can even work better. There are also a number of books on the subject of how to make a telescope many of which are probably available at your local library.

We can give you instructions on how to make a simple telescope in this article as well! Just gather up the following objects:

* Two magnifying lenses - these can be from magnifying glasses or even simple reading glasses you can buy at the drugstore. One should be larger or stronger than the other * A long cardboard tube - a paper towel roll or gift wrap paper tube will work best
* Tape - duct tape will work best
* A marker - no need to worry about color!
* Scissors
* A ruler
* A paper with printing on it

Take the larger magnifying glass and place the paper on top of it. Take the other lens and place it on top of the paper so that the paper is sandwiched between the two lenses. The printing will be blurry. Move the lenses forward and backward until the image comes into focus. Have someone measure the distance between the lenses.

On the cardboard tube, take and measure one inch from the end of it with the marker and use the scissors to cut a slot in the tube that will be able to hold the large magnifying glass. Then take the measurement you got above and cut another slot that will hold the smaller magnifying glass.

Place the two glasses in their slots - the big one in the front and the little one in the back and tape them with duct tape so they stay put. You may want to cut off the cardboard tube about two inches past the small magnifying glass to make it easier to handle. Look through your telescope to see if the paper is in focus. You may have to adjust it so that it is focused.

You have just learned how to make a simple refracting telescope!

# Reflector Telescope

The reflector telescope uses a mirror to gather and focus light. All celestial objects (including those in our solar system) are so far away that all of the light rays coming from them reach the Earth as parallel rays. Because the light rays are parallel to each other, the reflector telescope's mirror has a parabolic shape.

The parabolic-shaped mirror focuses the parallel lights rays to a single point. All modern research telescopes and large amateur ones are of the reflector type because of its advantages over the refractor telescope.

There are many advantages to using a reflector telescope as opposed to a refractor telescope. Reflector telescopes do not suffer from chromatic aberration because all wavelengths will reflect off the mirror in the same way. Support for the objective mirror is all along the back side so they can be made very BIG!

Reflector telescopes are cheaper to make than refractors of the same size. Because light is reflecting off the objective, rather than passing through it, only one side of the reflector telescope's objective needs to be perfect.

Even with these advantages, there are some disadvantages to a reflector telescope. First, it is easy to get the optics out of alignment. A reflector telescope's tube is open to the outside and the optics need frequent cleaning. Often a secondary mirror is used to redirect the light into a more convenient viewing spot. The secondary mirror and its supports can produce diffraction effects: bright objects have spikes (the —Christmas star effect").
In both the reflector and refractor telescopes, the focus is before the eyepiece, so the image in astronomical telescopes is upside down. Telescopes used to look at things on the Earth's surface use another lens to re-invert the image right-side up.

Most reflector telescopes will use a smaller secondary mirror in front of the large primary mirror to reflect the light to a more convenient viewing spot. Isaac Newton used a flat secondary mirror at a 45° angle to reflect the light to an eyepiece at the side of the telescope tube near the top. Such an arrangement, called a Newtonian design is used by many amateur telescopes.

Many reflector telescope use another light path design called the Cassegrain design to reflect the light back through a hole in the primary mirror, so that detectors or the eyepiece can be conveniently placed behind the telescope. Most of the large telescopes used for research, including the Hubble Space Telescope, are of this design.

# Telescope Kit

When you decide that want to undertake making your own telescope, you could try to amass all the supplies you need separately, or you could simply buy a telescope kit and get everything you need in one fell swoop. Telescope kits come with step-by-step instructions along with all the supplies to make an effective telescope made especially for star gazing.

Many kits are available for making a Dobsonian type telescope. They usually come with a primary as well as a secondary mirror, a spider which is the secondary mirror's support system, a focuser, an eyepiece and a finder scope. They generally do not come with the tube that will hold the whole thing, the base the telescope sits on or the mirror cell.

Making your own telescope from a kit can save you a lot of money if you are interested in astronomy. Some telescopes are available for sale that can cost hundreds and hundreds of dollars. Telescope kits run in the $200 to $300 range and are readily available in hobby stores as well as online.

Telescope kits are great for teachers who want to show their students the power of the stars as well as the power of themselves. Basic telescope kits can be purchased so that each student can make his or her own telescope and then use it to look skyward at night. It's a great teaching tool and a great learning opportunity for kids of all ages!

The best part about telescope kits is that they are aimed at absolute beginners. You don't have to have any special skills or know how and they can easily be put together by almost anyone. The telescope kits are really designed to give amateur astronomers a finished product that will produce a decent image at moderate power.

Someone using a telescope kit to assemble their own telescope can probably complete the building process in about 15 to 20 hours which would be about two or three days - easily done over the weekend! You don't have to worry about missing pieces or missing components - well unless the kit is faulty in which case, you just contact the company and either ask for the missing pieces or ask for a new kit.

Of course, you could option to make or amass the parts for your own telescope yourself - as we said before. But if you want a time-saving, less expensive way to make your own telescope, a telescope kit is really the way to go!

# Telescope Lens

In a refracting telescope, the lens is what bends the light and makes it possible to view faraway objects as if they are close up. One of the lenses in this type of telescope is usually larger than the other and they work together to magnify the object you are looking at bringing it into closer view.

Some people consider the telescope lens the eyepiece that you look through and it is a type of lens as well. When you are talking about the eyepiece, it is probably the most important part of the telescope aside from the device itself.

Most telescopes come with one eyepiece (low power), while some telescopes come with none. Therefore, you may have to purchase eyepieces so that you can vary the magnification of your telescope. Eyepieces come in many designs and different magnifications. Which one you choose is a matter of personal preference.
The designs vary in terms of the number and types of lenses, or elements, they use.

Eyepieces should be evaluated for the following:

* optical quality
* field size
* brightness
* sharpness
* lack of aberrations (chromatic aberrations, ghost images)
* eye relief (distance from focal point, your eye, to the lens -- especially important for eyeglass wearers)
* barrel size - 0.965 inches, 1.25 inches, 2 inches *
price

The oldest telescope lens designs are Huygens and Ramsden. They are often included with cheaper, department store type telescopes and aren't very good lenses to use if you are an experienced astronomer. They often have many chromatic aberrations or circles of light around bright objects which can be distracting for some people.

A great telescope lens for both experienced as well as amateur sky gazers would be an orthoscopic design. They have four lenses in the eyepiece and a 45-degree apparent field of view which is somewhat narrow. This optical design, however, gives a crisp view, has good eye relief and is considered excellent for planetary viewing.

An economical choice for a telescope eyepiece is the Barlow lens. They can increase magnification and provide better eye relief with an existing eyepiece. The eyepiece fits into the lens which then fits into the eyepiece holder. The Barlow lens ranges in price from $30 to $70.

When you are looking at telescopes, look for a lens that is adjustable or which can be adapted for either star gazing or planet viewing and then enjoy the view!

# How to Buy a Telescope

There are actually some technicalities that you need to consider when learning how to buy a telescope. Many times what people think they want and what they really want are two very different things. Just like with any other large purchase, you have to ask yourself two simple questions:

1. What do you really want to do with your telescope?
2. How much money do you want to spend?

Knowing how to buy a telescope often depends on these two simple questions. It's often a good idea to start out small and work your way up to —bigger and better||. If you don't have much money to invest, you may want to start out with a pair of binoculars. Even the cheap ones will amaze you with how much you can see of the night sky.

The main thing you'll want to do before you rush out and plunk down a few hundred dollars is to do some research. Look at what kinds of telescopes are available and what they each have to offer. Check out different aspects of the telescope and find out what's most important to you so you know you'll be spending your money wisely.

Knowing how to buy a telescope entails knowing what parts of the telescope are most important. The eyepiece is probably the most important part of the telescope itself since that's what you will be looking through to see the skies. Ideally, you'll want a telescope that will have an adjustable eyepiece so you can adjust the magnification. The eyepiece should have a crisp, clear view and little to no chromatic aberration or little halos of color around bright objects.

You will also want to consider where you will be doing most of your star gazing. Will you be in a highly populated area or a desolate part of the country? This makes a difference because if you have interference from outside factors such as pollution or noise, you will want to have a telescope that can overcome these factors.

A telescope's main function is to gather light. If you don't gather enough light, you won't see anything, no matter how much magnification you throw at it. The aperture, or opening through which skylight passes, is what matters.

Every telescope has either a primary lens or mirror that is used for collecting light. This is called the telescope's "objective" -- and the width of that objective's aperture is key. In the world of telescopes, size -- or at least proportion -- matters, because a telescope's lightgathering power is proportional to the objective's surface area, not its diameter.

The general rule you should keep in mind when considering how to buy a telescope is to buy something that will meet your basic criteria without going overboard too much on price. Never buy a telescope on power alone. Make sure all the elements work together to give you the best view for the least amount of money, but don't do too cheap or you'll be disappointed!

# Telescope Review

When you are considering buying a telescope, you may want to check out some of the reviews of the more popular ones before you plunk money down on the counter for a product with a bad reputation. There are many people who are more than willing to provide reviews of certain telescopes and they are often published online or in astronomy magazines.

A good telescope review will tell you about the specific device being evaluated and then list its good points along with its bad points. Then the reviewer should tell you his or her honest opinion about the telescope from both an amateur as well as experienced astronomer's point of view.

Most of the popular astronomy websites will provide extensive reviews of telescopes that are available right on their site for easy viewing. These reviews are done by experts who know what they are talking about and can give a valid opinion of a variety of telescopes for everyone.

Astronomy magazines also have telescope review sections where you can find out all the information you need about new products as well as products that have been on the market for awhile. If you are looking for a new or an old telescope, chances are good that they have done a review of the one you are looking at. If they haven't, just drop them a line and they will probably be happy to oblige.

Another great trend in the telescope review field is in the increasing number of blogs on the subject that are found in many places on the Internet. These reviews are done by everyday people just like you and me who have a particular fondness - or dislike - of a specific type of telescope and want to share it with the world.

If you are depending on an amateur's review of a telescope, do so with an open mind. While you are getting the review from the point of view of an Everyday Joe, you may also not be getting accurate information or even the most up-to-date information. People who aren't experts or at least quasi-experts in the field can often get things wrong so be sure and follow up with some research instead of depending on the recommendation of someone who may or may not know what they are truly talking about.

A telescope review can be a powerful tool if you are looking to buy your first telescope or if you want to upgrade to a new and possibly better one. Just look for a review that is credible along with a reviewer who has some experience in the field. The rest is up to you!

# Coronado Telescope Review

The Coronado brand in telescopes is one of the most well-known among solar astronomers and reviews of their various products abound. Their products tend to be among the best in the business and users are often quick to give their thumbs up - or thumbs down - when it comes to various Coronado products.

Coronado produces a variety of solar telescopes as well as filters that can make daytime sky viewing easier and much more exciting. Their top-of-the-line products are the personal choice of sun gazers and their filters are known to bring a new excitement to the phenomenon of solar astronomy.

For example, Coronado makes a Personal Solar Telescope (PST) for daytime viewing of the skies that has been reviewed on many websites. Viewing the sun is much more challenging than viewing the sky at night because the opportunities for clear viewing are often quick and ever-changing unless you have a completely clear sky. One review of the Coronado Personal Solar Telescope we've read said that viewing the sun through this device is simplicity itself. Very little negative has been written in a review on this Coronado telescope.

Reviews of the Coronado solar telescopes are varied and provide little negative feedback when it comes to their products. The only negative comments we've found is that some products come with incomplete instructions. By that we mean that reviewers have said that they would have liked a little more information on the best ways to find the sun and what to look for when gazing through the eyepiece.

In general a Coronado telescope review will be favorable among experienced solar astronomers. Their products are pricey, so having a favorable review is good for the company as well as for the user. Because you will be spending such a large amount of money on a Coronado telescope having an accurate review is important.

Look in many places to find reviews of the Coronado telescopes. Most of the astronomy websites - even though they are generally dedicated to night sky gazing will have reviews of the Coronado telescopes. Before you make a commitment to their product, do your research and read these reviews.

Personal users of the Coronado telescopes are also happy to post their own reviews of the products on personal blogs as well as on various websites like clearskies.com and epinions.com. When you are reading a review from a personal user, keep in mind that these are people who have probably used the product but probably have little experience with other products so they don't have much to compare them to. While it's nice to have the opinion of someone who has used the product, don't based your purchase of a Coronado telescope solely on their review alone.

# Celestron CPC 800 telescope review

The Celestron CPC 800 telescope is one of the more well-known telescopes in the world of astronomy and you can easily find many reviews of this telescope. This telescope is one of the more moderately priced models varying in cost from $1,800 to $2,000. Before you put down that kind of money, however, you will want to know what you are buying. Here's some of the things we've read in reviews of the Celestron CPC 800 telescope.

—The Celestron 8" Schmidt Cassegrain Telescope (SCT) may be the most mature optical product in production. Yep, Period. The CPC 800 combines this optical tube with a third generation computer driven geared mount.

This is perhaps interesting itself because this is the first ground-up Goto telescope system with this level of system design experience behind it, and after using one, it is pretty easy to conclude it is perhaps perfect. And this makes a difference in what form the system has taken.

The annoying oversights have been weeded out in previous variants. This models follows on the heels of the mighty NexStar 8 GPS, which not only was the first to have GPS location and time referencing, but it has shown it stands the test of time and continues to function reliably with continuing use.||

—The Celestron CPC 800 is a lot of telescope, and it is in a very user-friendly package. This design is extremely mature, and the "Gotcha" faults of a new product simply are not part of this picture. A lot of specialty telescopes like small refractors get a lot of attention because they are slick looking, and do a good job for their size. But at the end of the day, an 8" SCT is simply at higher level of capability. Given that current offerings by Celestron have these available at a little under $1900 for a turn-key highly capable observing system, they really are the best value for a telescope there is.||

—The tripod that comes with the Celestron CPC 800 is strong and well worth the money you will pay for this great telescope. While the accessories that come with it are pretty standard, the NexStar system it is equipped with makes this telescope one of the best in the industry.||

We have done extensive research in looking for review on the Celestron CPC 800 telescope and very little negative has been written about this telescope. This is Celestron's newest product and some say it is the company's best product. Not only is it priced right, it gives both amateur as well as experienced astronomers the beautiful clarity that the night sky can offer.

# Telescope Review of LX200R

Made by the Meade company who has been producing quality telescopes for years, the LX 200R has been getting rave reviews since it came on the market. The Meade company is one of the most respected in the world of astronomy and this product is one of its best ever made according to what users are saying about this great telescope.

Robert from North Carolina says:

—I've owned the Meade 80mm, 125ETX and a 10" LX200. The 14" LX200R is awesome! This is a research-grade instrument with an enhanced RA drive (same as the RCX drive) and built like a tank! It was a hit at the recent MASP star party and this is the last large transportable scope I will buy! Love it! Thanks Meade for making such a fine instrument!!||

Such a rave review for the LX200R telescope is not unheard of in the telescope world. This telescope is quite pricey at an average price of about $6,500. That's a lot of money to most people, but to experienced star gazers, it's an investment they are willing to make in order to get the most out of their experiences.

Another review of the LX200R telescope done by Lana of Virginia tells us:

—Meade is a name that most of my astronomy buddies rely on. After owning a cheap telescope, I decided to take a chance and spend the extra money to buy the LX200R. Am I glad I did! The images I saw through the eyepiece were strikingly clear and it was easy to use on top of it. Many people in my astronomy club own this telescope, so I wasn't really all that apprehensive of spending so much money, but hearing them rave about this telescope, I gave it a try and was pleasantly rewarded with a quality instrument that I don't think I'll ever outgrow!||

Those two reviews of the LX200R telescope are not uncommon. What we've found, after reading many, many reviews show that this product is one that can be trusted and one that is well worth the money. In fact, the price is the only thing that people listed as a negative side. However, they also report that when they can get a professional quality telescope at a price like that, it is well worth the investment as owners say they will probably keep and use this telescope for a very, very long time.

# Tasco 48t telescope

The Tasco 48t Telescope is for high-resolution astrophotography - the study and photographing of the celestial stars. It is often sold in children's stores as an educational toy because it is very basic, easy to assemble, smaller than the adult sized professional telescope models and easy for a child to understand and use.

The Tasco 48t is an older manual model and not that easy to find nowadays unless you luck out and find a used one on one of the many online e-commerce or auction sites. If your child is asking for a telescope, if she or he is eager to study the stars, but you know little or nothing about astronomy or telescopes, the Tasco 48t sky telescope is probably the best buy for your child.

Your Tasco 48t educational telescope has what's known as an Alt-azimuth Mount. This is a sturdy platform for the telescope, which you can adjust either from side to side or up or down, so that you can aim the Tasco 48t at the part of the sky you and your child want to observe. The mount allows you to hold your telescope in place once you find just the right astronomical spot to view.

You can purchase a Barlow Lens for your child's Tasco 48t as well. You'll put this lens over the telescope's eyepiece and she or he will be able to search the night sky that much better. You can buy Barlow lenses for your Tasco 48t children's telescope in a wide range of magnifications starting at 2x (which simply means twice as large).

Even though the Tasco 48t is an older telescope, it is still a great telescope for beginners and provides a great view of the night sky. You will find that even though this telescope is quite basic, basic is good when you are just starting out in astronomy. That’s why the Tasco 48t is so good for children.

When looking for a Tasco 48t, try e-bay or yahoo auction sites. You may even be able to find one at a garage sale or even in a hobby shop or flea market. It likely won’t cost you a ton of money like other telescopes and it will be a great teaching tool for you or your child.

Then you can share the magnificence that is space. You can look together through your Tasco 48t telescope and see the stars, the planets, and the sky in a new way discovering new sights and amazing vistas like never before.

# Unitron Telescope

Many stargazers have grown up with the Unitron name on their favorite telescope list. They have been designing and manufacturing celestial and terrestrial telescopes since 1952 and there have been many exciting developments along the way. These telescopes offer an automatic celestial navigation system - one touch and your telescope finds the object you want. That in and of itself is amazing!

Unitron has been making great telescopes for years and they keep up with emerging technology in developing new products such as binoculars and microscopes that are number one in the market. They are known for great optics that can provide beautiful views of the night sky when looking through the eyepiece of one of their telescopes.

Like some other telescopes, Unitron telescopes are generally easy to use and can give the user a sense of control when gazing at the stars. They have a variety of products available for sale from beginning telescopes to research quality ones that even the most experienced astronomer can appreciate.

If you are looking to buy a Unitron telescope, especially a used one, be aware that some of the older models don't perform as well as the newer ones. In fact, the older models are available - most often on auction sites like e-bay - and are great for the beginning star gazer and even children.

Telescope enthusiasts can even take older Unitron telescopes and modify them so that they are more on par with powerful telescopes like the ones that Unitron sells on their website. In fact, experienced astronomers like to take older telescopes and upgrade them. They take great satisfaction in knowing that they have taken an almost obsolete product and made it better.

Which brings about another point - is any telescope ever really obsolete. Unitron says no. You can make a telescope out of common household objects like paper towel tubes, duct tape, and old binoculars. Of course, a homemade telescope won't be as effective as a commercially made one, but it can still get you the images you want just not with the same clarity and focus.

So why should you buy a Unitron telescope? Because it is a trusted name and they produce quality products. You could opt for a more expensive brand, but Unitron prides themselves on the fact that they produce and sell great telescopes for less money and with the most reliability. Star gazers have known this for years - and now you know it too. Unitron is a company you can count on for a great telescope and a great view of the night sky.

# Telescope Photos

One of the most exciting innovations when it comes to telescopes is the opportunity to take photos of the night sky. Many telescopes come equipped with cameras on them, but it is still possible to take photos of what you see through your eyepiece even if you just have a regular telescope.

Whether you have a digital camera or a regular camera, it doesn't matter when it comes to taking photos through the eyepiece of your telescope. All you have to do is get focused on an object and then place the camera where your eye would go, click, and you're all set!

Taking photos of the images in the night sky through your telescope can be an uplifting experience - especially if you have a powerful telescope that can magnify all of the nebulae, stars, and planets that are in our galaxy. Even if you are an amateur photographer and an amateur astronomer, you can still get great photos of what you see through your telescope.

One of the first things you may want to try photographing is Constellations or the stars of the Milky Way. Be sure your camera is set to the "B" setting and set the lens to its lowest F stop number. This opens the lens all the way and lets it the in the maximum amount of light. Most 28 to 50mm lenses have an F number of 1.7 to 2.8 for their fastest setting.

When you have the area you want to photograph centered, focus your camera on a star to where it appears the smallest and sharpest. You can shoot up to 30 second exposures with a 50mm lens before stars will start to show trails due to the Earth's rotation. Be sure not to jiggle the camera during the exposure or your photo will blur and all your stars will be doubles.

Use a fast film like Fuji 800 or 1600 or try Konica 3200 if you can find it. It is amazingly fast but is somewhat grainy. If you have a digital camera, be sure that it is set to the highest resolution it can handle to take the best pictures. You won't be able to take as many photos, but you will be able to get the best quality photos through your telescope.

Taking great photos with your telescope doesn't mean that you have to have a whole lot of fancy equipment. All you need is a little know-how along with the desire to capture what you are seeing. Then you might want to look to a blog or a website that allows amateur photos to be posted so that you can share what you've seen with other people.

# Hubble Telescope Photos

From the moment it was launched into space, the Hubble Telescope began taking amazing photos of space and transmitting them back to Earth. The cameras aboard the Hubble Telescope were made to capture the highest quality photos, and since 1986, it hasn't let astronomers down.

Some of the photos taken by the Hubble Telescope are utterly amazing. Never before has any telescope produced photos like what we have seen from the Hubble. The excitement that has been generated from these images has caused a buzz in the astronomy world and continues to cause that same buzz even years after its launch.

Unfortunately, as of 2007, the Hubble's main camera has stopped working. This requires a manned space mission to perform maintenance on the Hubble Telescope so that it can start taking amazing photos once again until it is replaced by the James Webb Space Telescope.

But we digress. The Hubble Telescope has produced amazing quality photos of various galaxial objects for years. These photos have helped researchers learn so much about space that even they have been amazed at what has come back. From its inception in 1946, the Hubble Telescope continued to amaze experts for many, many years with the photos that it has sent back.

Probably one of the most innovative technologies to ever hit the world of astronomy was the Hubble Telescope. Its photos have served as lessons and teachable moments for the world's school teachers as they could finally show their students the world of space.
When you take a moment to look at some of the images that are sent back from the Hubble, we think you'll agree that they are utterly amazing!

The technology that went into put a camera on the Hubble telescope so that it could send photos back to NASA was years in the making. In fact, cameras themselves have come along way over the years as well. Once the Hubble began construction in the late 1970's, the builders knew that they would have to wait until the last minute to install the camera because technology was bound to evolve over the years until the telescope would be able to be released into space.

It's very true that the Hubble telescope has produced incredible images and the photos really can speak for themselves. Just do a Google search under the images tab and marvel at the wondrousness of space!

# Space Telescope Photos

Is it possible to take great photos of space with a telescope? Of course it is! Many telescopes come equipped with a camera that allow for amazing quality photos of space, but they are quite pricey. You can actually take your own photos of space with your telescope using your own camera.

What you first need to do is get a clean focus on the image that you want to capture. Make sure that it is in clear clarity and then fix your eyepiece so that you don't lose it. Then take any old camera and put it up to the eyepiece. After that, you are free to click away!

Of course, taking photos of space through the lens of your telescope isn't always as easy as it sounds. You will first need to set your camera to the highest resolution it can handle. For a digital camera, that's the largest pixel size. You will not be able to take as many photos through your telescope, but they will be of the best quality.

If you have a high-quality camera, you will want to set the —F Stop|| to its lowest number. That way when you start clicking, the shutter will be able to capture the best photos through your telescopes and be able to capture space in a still image that will amaze your friends and family!

The vastness of space is really quite humiliating in a way. When you gaze at the night sky through a telescope, you often realize that you are only a part of something that is much larger than you could ever fathom. After all, do we really know whether or not space has any limits? Of course we don't.

However, taking photos of space with your telescope can help you overcome that —small|| feeling by realizing that you are really a part of this whole huge universe and that no matter how small you feel, you are still an integral part of the world as we know it.

While that may sound a big —New Agey||, it still is the truth. By exploring space through a telescope and taking photos of what you see, you will realize the amazing beauty that exists over us. Then you can share that beauty with others who will benefit from it as well.

So the next time you get out your telescope and start looking at the night sky, take a few space photos and then marvel at what you see. It's an art in and of itself to take photos like this, but even if you have no experience, you will still be amazed at what space can teach us with a telescope and a camera that produces a photo that probably can't be duplicated.

# Pictures of the Spitzer Space Telescope

The Spitzer Space Telescope is just one part of NASA's push to launch as many space telescopes into space that they can so they can obtain as many pictures of galaxies, stars, constellations, and planets as they can. The Spitzer Space Telescope was launched in 2003. It follows a rather unusual orbit which is heliocentric instead of geocentric, following Earth in its orbit, and drifting away from Earth at approximately 0.1 astronomical unit per year (a so-called "earth-trailing" orbit).

The primary mirror of the Spitzer Space Telescope is 85 cm in diameter, f/12 (i. e. the focal length is 12 times the diameter of the primary mirror) and made of beryllium. The satellite contains three instruments that will allow it to take pictures as well as photometry from 3 to 180 micrometers, spectroscopy from 5 to 40 micrometers, and spectrophotometry from 5 to 100 micrometers.

So what does this mean to us? Basically, it means that the Spitzer Space Telescope can take pictures at a higher clarity than any other space telescope including the Hubble. That makes it one of the most promising space telescopes to ever be launched. The pictures that the Spitzer Space Telescope can provide might be some of the most amazing images that we might see.

When we have telescopes in space, we are able to get up close and personal pictures of the galaxies from a vantage point that we could never have here on Earth. The Spitzer Space Telescope will be able to provide scientists and researchers with pictures that will help us gain new knowledge about the cosmos and space in general.

The Spitzer space telescope is the only one of the great space observatories that was not launched by a space shuttle. It was originally intended to be launched by the space shuttle, but like the Hubble space telescope, its launch was delayed by the Challenge disaster which shut down NASA's space shuttle program for nearly two years.

Now that it is up in space, the Spitzer space telescope is starting to provide amazing pictures to astronomers of the cosmos that have only been seen before by the Hubble telescope. By being right there in the middle of deep space, it is able to obtain pictures that have not been realized by any other space telescope making the Spitzer one of a kind.

What do pictures of space - like those taken by the Spitzer space telescope - tell us? They can show us new galaxies, new constellations, new stars, and even new planets. In fact, thanks to the Spitzer space telescope, the planet Pluto has been —undeclared|| a planet thus messing up every acronym for remembering the planets in the solar system for everyone!

# Telescope Accessories

There are all types of accessories that you can buy to complement whatever telescope you decide to buy. Even if you already own a telescope, you can get all sorts of accessories to make your telescope everything you ever wanted it to be. What types of accessories can you find for your telescope?

Because the eyepiece is probably one of the most important components of your telescope, you might want to look into interchangeable eyepieces that can give you a different view of the skies. If your telescope already has an adjustable eyepiece, of course, you won't need additional eyepieces, but those telescopes with a static eyepiece will require a couple of different lenses in order for you to see things with more clarity.

The mount of your telescope is probably the second most important accessory that you can have. You can have a telescope that cost thousands of dollars, but if you put it on a $20 mount, you will not have acceptable results from your star gazing. The mount will shake and not give you accurate images when you look into your telescope, so pick a mount as an accessory that will complement the grade of telescope that you have.

Perhaps you have decided that you want to upgrade your present telescope. What accessories should you look for in a new telescope package? Well, it might be helpful if you have a case that comes with your set-up for easy transportation. A hard case is better than a soft case but when it comes to telescope accessories, this can be very important - especially if you are star gazing away from home and having to transport your equipment.

You may also want to invest some money in filters so that if you have a refracting telescope that is prone to chromatic aberration, you can minimize the way it looks. Filters can actually be obtained quite cheaply from many places that supply telescope accessories and could mean the difference between a clear image and a blurry one!

Another essential telescope accessory comes in paper form. It is a star chart and makes it amazingly easier to find what you are looking for in the night sky rather than relying on chance. A star chart will give you coordinates so that you can point your telescope in the right direction and see what you are looking for without having to go through the trial and error process.

# Telescope Parts

If you buy a telescope from a retail outlet, it will come with all the parts it needs to be fully functional. However, if you are looking to make your own telescope, you will need to amass several different parts in order to build a telescope that is fully functional. Of course, it always helps that you know the parts of your telescope whether you plan to build one or just use one.

Knowing the parts of your telescope depends on what type of telescope you will be using. There are refracting telescopes that bend the light and then there are reflecting telescopes that reflect the light. While some of the parts of each type of telescope are the same, there are still some huge differences between them.

Both types of telescopes contain a tube that houses the lenses that make the telescope work. They also have a base that holds the entire unit along with a mounting unit that keeps it stable. Both types of telescopes will also have eyepieces that you look through to see images. That's where the telescope parts split between the types of telescope you are talking about.

A refracting telescope will contain two separate types of lenses. One of them is a primary lens which is bigger and a secondary lens which is slightly smaller than the primary lens. They are inserted into the tubing and adjusted so that they can make small images appear larger. The eyepiece will usually be adjustable in a refracting telescope so that images will also appear clearer.

In a reflecting telescope, you will find much different parts. The reflecting telescope employs a primary lens to magnify objects, but instead of a secondary lens, it has a mirror that will project the image you are seeing into the lens and then invert it. Reflecting telescopes also come with parts inside them that will invert the inverted image so that it appears correctly when you look through the eyepiece.

Another telescope part you might want to look at is a camera that is attachable to your eyepiece. Having a camera attached to your eyepiece will allow you to take pictures of what you are seeing. These pictures can be life changing as you look at the images of the cosmos that you are able to see through the lenses of the telescope.

While each type of telescope contains different parts, they are still essentially the same. They allow small objects to be viewed in larger form and faraway objects become clearer. But overall, you will find many parts are the same while others are markedly different.

# Tasco Telescope Accessories

A Tasco telescope is generally thought of as an obsolete device, but there are still accessories that you can buy to update an older model Tasco telescope that will make it more able to become the type of telescope that can compete with modern telescopes. Well, almost.

The Tasco Company went out of business in 2002 and was bought out by some of the founders of Celstron, one of the leading telescope companies in the industry. Finding accessories for a Tasco telescope might be a bit difficult, but it can be done. You can also adapt regular telescope accessories to fit your Tasco telescope as well.

Some of the accessories you might want to look at to update your Tasco telescope include an eyepiece with extra focusing power, a better base, a bigger aperture, and a larger mounting unit that will help keep the telescope stable and steady.

Because the Tasco telescope is generally considered a low-end telescope best for beginners and even children, they come with inferior eyepieces that don't provide as much clarity as would be required from more experienced astronomers. That's why you will want to look at additional eyepieces to accessorize your older Tasco telescope.

The base of your telescope is important because it holds the whole entire apparatus. Having a strong base is important because it will help the telescope itself provide stable images. Generally, the Tasco telescope was known to have a weak base. By replacing the base accessory, you will be upgrading your Tasco telescope and making it up to par with some of the better telescopes.

The aperture is what you look through that gives you a field of sight through the eyepiece. The larger the aperture, the larger your view of sight will be. You can purchase lenses with larger apertures that will make the Tasco telescope have a larger view of sight and you will be able to see more objects than you ever thought possible. Finding a larger aperture as an accessory for your Tasco telescope, once again, will upgrade a once obsolete device.

Finally, a mounting unit is sort of like a tripod. It is what the telescope, the base, and everything else sit on so that the image you see through the eyepiece is stable and free from movement. Many times, the mounting unit is shaky and not as stable as you would like. Having a strong mounting unit as an additional accessory will make your Tasco telescope perform much more efficiently.

# Celestron Nexstar 80 Telescope Accessories

For years and year, Celstron has been producing quality telescopes for both the amateur as well as the experienced astronomer. The Celestron Nexstar 80 is another one of their quality telescopes, and you will want to find some quality accessories to go with this great piece of equipment.

Celestron is known for manufacturing telescopes that are of high performance at a price that almost anyone can afford. The accessories you can find for the Celestron Nexstar 80 telescope are also of high performance and are also priced reasonably so that even an amateur astronomer can invest in these products making their telescope better than it ever was straight out of the box.

One of the accessories that you can buy for your Celestron Nexstar 80 telescope is a Barlow lens. This lens fits into the eyepiece of your telescope and helps make the viewing of the cosmos easier as well as more dramatic. When you purchase a Barlow lens as an accessory for your Celestron telescope, you will get a better picture of the stars and planets when you are star gazing.

Because the Celestron Nexstar 80 telescope comes with a built-in camera, you can also purchase an A/C cable as an accessory. This is a plug-in power source that will give you more power for your Celestron Nexstar 80 telescope and the price is set to sell at under $20.

You can also purchase a PC cable that will transfer all of your amazing images from your telescope over to your computer in one easy step. This is thought of as an essential accessory for many people who have chosen the Celestron Nexstar 80 as their primary telescope. Being able to download the photos they take of the night sky to their computer makes sharing with others easy and quick.

While these accessories for the Celestron Nexstar 80 telescope might seem frivolous to some, they are essential to others. Experienced astronomers know that having a variety of accessories at your disposal is important to the hobby of astronomy - probably as important as the telescope itself.

The best part about these accessories is that they are priced to sell for nearly any astronomer. They are some of the best accessories on the market as is the Celestron Nexstar 80 telescope. Rest assured that when you buy a Celestron product, you are getting quality at a great price.

# Telescope Outdoor Furniture

When you think of the word —telescope||, you probably wouldn't think of outdoor furniture. But the truth is that there is a brand of outdoor furniture called Telescope! The actual name of the company is Telescope Casual, and they produce a line of outdoor furniture that is unmatched by any other company.

The various styles of outdoor furniture that Telescope Casual produces are in style and comfortable to boot! Plus, the price is well within most people's budget. Telescope outdoor furniture has many different pieces you can buy either as a set or individually. An entire patio set will run you just under $600.

The Telescope Outdoor Furniture collection has a variety of style available. They come in wicker, steel, as well as good old-fashioned plastic. The good news is that all of the Telescope outdoor furniture is durable and long lasting so your investment is well worth the money. You can have style as well as function.

Telescope's Mission is to consistently supply products that customer can rely on for quality and value. Telescope is committed to provide customer with the best service possible, whether they order one unit or thousand. That makes Telescope outdoor furniture among the most trusted names in the outdoor furniture industry.

An outdoor living patio area filled with cast aluminum sounds a bit cold and hard, which is exactly why furniture at Telescope Casual must be far more than yard art. Telescope Casual outdoor patio furniture cast aluminum collections are more comfortable and better made than any product out there.

Telescope Casual has been building patio furniture for more than 100 years, Telescope knows what kind of patio furniture to make that are both pleasing to the eye and relaxing for the body, regardless of the construction material. The number one priority is creating quality patio furniture that is comfortable.

Telescope Causal has been on the cutting edge of design trends, particularly so in the last three years. Telescope Causal has changed nearly half of all their collections to meet consumer demand for more sophisticated colors, textures and styles.

Telescope is introducing a variety of new tops in different shapes and sizes, from cast and powder-coated aluminum to faux stone and melamine surfaces. Telescope Casual is well positioned to meet the needs of both mid-tier and high-end shoppers. Telescope Causal patio furniture products stands the test of time and Telescope will stand behind every one of them.

When you choose Telescope outdoor furniture to fashion your patio or deck, you can rest assured that you will be getting a quality product that will look great and function even better.

# Homemade Telescope Roof Mount

It only goes to say that the higher you can get with your telescope, the better images you will get. That's why you might want to try making a homemade roof mount for your telescope so that you can see more images at a better clarity rate.

How many of you amateur astronomers have climbed up on your house's roof just so you could get a better look at the stars? I bet most of you nodded your head in agreement. That's because the closer you can get to the sky, the better view you'll have. So it only makes sense that a roof mount for your telescope will give you the best images of all.

You can buy a roof mount for your telescope, but you can also make a homemade one that would be easier and probably sturdier. All you need is some lumber and nails along with a little know-how!

The main thing you want to keep in mind when making a homemade telescope roof mount is stability. Don't try to alter the natural shape of the roof - go with it. Take the lumber and mold it to whatever type of roof you have. A homemade telescope roof mount should be stable which is why you should embrace the roof and not try to alter anything about it.

Build your homemade roof mount out of quality supplies. You won't want to skimp when it comes to a place to put your expensive new telescope - or old telescope - whichever you own! You won't be storing the telescope outside so your roof mount should be easy to use and easily accessible. Don't try climbing through that little attic opening. You should only have a roof mount for your telescope when it is easy to get to with little effort.

You can find many different building plans for a homemade telescope roof mount. They are available online as well as in many different books on the subject. Of course, you will want to have a little bit of building experience before you try to undertake this project, so proceed with caution and build with strength.

Putting your telescope on your roof could be one of the most rewarding experiences you have ever had as an astronomer. Making your own homemade roof mount for your telescope can also be a very rewarding experience as well. There's nothing quite like knowing that you are making your star gazing expeditions as personally fulfilled as they can be.

# Meade Telescope Accessories

The Meade Company has long been known as one of the most well-known as well as trusted companies for telescopes and telescope accessories. They produce quality products at prices that even the beginning astronomer can afford, but experienced star gazers can also benefit from their products.

Meade telescope accessories are wide and varied. After all, when it comes to telescopes, you want quality accessories at a great price and with many choices. That's what you will get with Meade telescope accessories. They have an amazingly diverse catalog full of accessories for your telescope.

The Meade eyepieces are among the best in the business. They have all sorts of different apertures that will accommodate most eyepiece housings and at all sorts of clarity levels. You want to have a quality eyepiece with your telescope. When you buy a Meade eyepiece, you will have a great accessory for your telescope and at a great price as well!

The Barlow lens is another of Meade's telescope accessories. The Barlow lens goes into your telescope's eyepiece and allows you to view the cosmos in startling clarity. But when you buy your telescope accessories from Meade, you are getting quality at a fraction of the price!

Filters can make the difference between a clear image and a blurry image. Meade provides filters as well for your telescope - and, as usual, at a discount price. The filter will help cut out chromatic aberration in your reflecting telescope and having accessories like quality filters will make your astronomical observances much more satisfying.

Having a case that you can —house|| your telescope in can be very important - especially if you are doing most of your star gazing away from home. Meade has an extensive line of telescope cases that can easily accommodate all of your telescope accessories along with your all-important telescope.

Many Meade telescopes are equipped with cameras, so you will also want to explore a cable that will allow you to interface your telescope with your computer. Being able to capture images in your telescope through a camera is one of the best parts about star gazing. However, you will still want to be able to save those images someplace. Your computer is the logical place, so if you have a Meade telescope equipped with a camera, by all means, you should have accessories that will help you transfer your images to your computer through a coaxial cable.

# Telescopes for Kids

There is really no better learning opportunity for kids when it comes to space than allowing them to look through the lens of a telescope and see the vastness of space close up. When you are looking for a telescope for kids, you won't need anything fancy, but you will want to provide them with something that will let them see the stars and planets as close up and personal as possible.

If you are looking for a great telescope for kids, don't spend a lot of money. There's plenty of time to let them upgrade. What you want to focus on is getting them interested in the cosmos in the first place. Once they have seen their first nebulae close up, they are sure to yearn for more.

A good beginning telescope is one that isn't too —fancy|| and is basic and easy to use. You really don't have to have many bells and whistles to get a kid interested in astronomy. As soon as they have their first look at the Milky Way or can see the craters in the moon, you'll have their curiosity aroused and they'll be hooked for life.

Discovery Kids is a website that has a beginning telescope for kids that is moderately priced at $169.95 and is perfect for even the youngest astronomer. There are also many other places where you can buy a telescope for kids and at a discount price. All you really have to do is do a little research and then do your kids a favor and buy them a telescope that will allow them a clear view of the night sky.

You can also encourage your kids to try and make their own telescope. This can be accomplished easily with products that can be found around the house. Find a cardboard paper tube, some duct tape, a couple of lenses such as those that are in drugstore reading glasses or binoculars, and you can make a basic refracting telescope in a matter of minutes!

Once you find a great telescope for kids, you can open up a whole new world to them. That world is one that exists above us. They can be completely fascinated and even enchanted with what can be seen in the night sky. When you are lying on a blanket under the moon and stars, you can only see so much. But when you introduce kids to telescopes, they will get a whole new appreciation for the night sky.

## Kid's Toy Telescope

A kid's toy telescope is the ultimate educational learning tool. Children can learn so much just by looking through them lens of a telescope. While a new telescope might seem like a toy, it really is a learning opportunity when you take the time to teach kids how to look at the night sky and see everything that is out there in the vast universe.

While a kid's telescope is much more than just a toy, it is still fun as well as educational. Just take a moment to sit with your child as he or she look through the eyepiece and glimpses a brief view of the craters on the moon. That's not even close to what they will be feeling the first time they see the rings of Saturn or Jupiter in its full glory.

There are many places you can buy a kid's first telescope. But don't let them think of it as a toy - even if it is. You need to instill in them that their telescope is a powerful tool that will allow them to explore so much more than that which that they can touch. When they realize that the world extends way beyond what they know, they will grow in knowledge and yearn for more.

A great place to go to find a kid's toy telescope is Discovery Kids. Besides being a great cable television station, they also have many learning devices available for sale including a telescope. Their telescopes are moderately priced so that you won't have to invest a lot of money into your child's new venture that is called astronomy.

Another great way to get a kid's toy telescope is to make one for them - or, even better, with them! You can fashion a basic telescope from products that you have around the house. All it takes is a cardboard tube, some duct tape, and a couple of lenses like that you can find in reading glasses or binoculars.

There are many websites that can give you instructions on how to build a kid's toy telescope from these products. It's actually quite easy and can be a great learning opportunity for both you and your child. Even though a telescope like the one that can be made from household product won't be able to magnify the stars as much as a commercially made one, you can still give your child the basic concept of a telescope and introduce them to a world that once was far away but can be viewed close up with this amazing tool.

## Conclusion

No matter what age, we will always be amazed at the vastness and mysteries presented by the universe. While we await the technology that will be able to bring people like you and me to see the planets and stars up close, looking at them through the eye of a telescope will have to suffice for now.