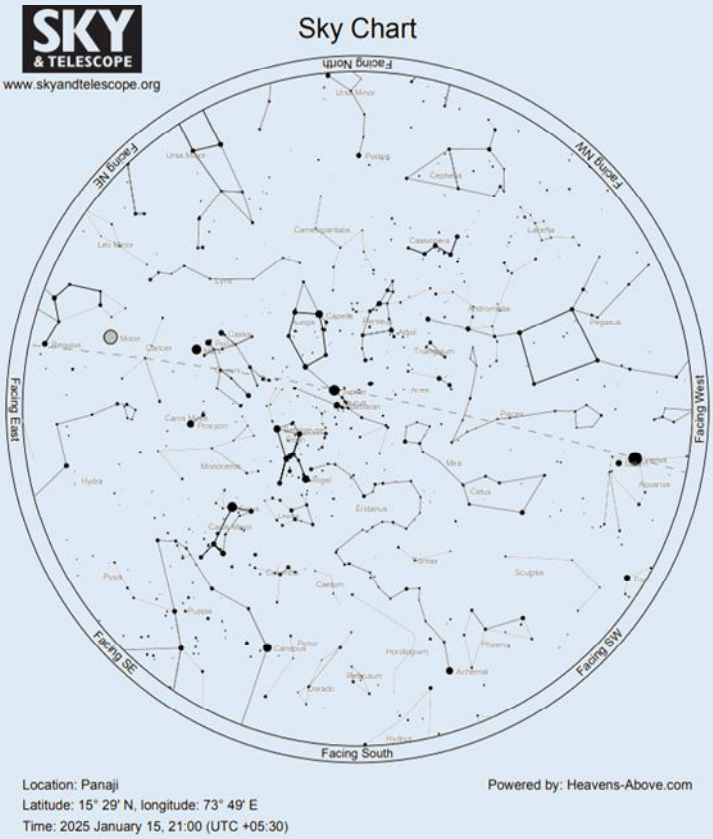
ASTRONOMY OF THE MONTH

JANUARY NIGHT SKY



Compared to December Orion arm of Milky way rises early and can be seen throughout the night. As this is one of the arm of our spiral galaxy we see many deep sky objects in this arm compared to other area of sky.

For astrophotographers this is time to click some object in Orion arm of Milky way.

1. Orion Nebula
2. Horsehead Nebula
3. Flame Nebula
4. Andromeda Galaxy
5. Pleiades

New Moon : 29th January

Full Moon : 14th January

ASTRONOMICAL EVENTS

Quadrantids Meteor Shower

January 3, 4 - The Quadrantids is an above average shower, with up to 40 meteors per hour at its peak. It is thought to be produced by dust grains left behind by an extinct comet known as 2003 EH1, which was discovered in 2003. The shower runs annually from January 1-5. It peaks this year on the night of the 3rd and morning of the 4th. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Bootes, but can appear anywhere in the sky

Moon Saturn Conjunction

On night of 4th Saturn will be making a close approach to the Moon, and they will appear to be close together in the sky. Both will be just 2° apart from one another. A good chance for astrophotographers to get shots of both celestial bodies in the same frame.

Mars at Opposition

On 16th the red planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. It will be brighter than any other time of the year and will be visible all night long. This is the best time to view and photograph Mars. A medium-sized telescope will allow you to see some of the dark details on the planet's orange surface.

Comet C/2024 G3 (ATLAS)

Comet C/2024 G3 (ATLAS) was discovered on April 5, 2024, by the ATLAS astronomical survey. Judging by its orbit, it might be a dynamically new comet, which means it enters the inner Solar System for the first time. In January 2025, comet C/2024 G3 (ATLAS) will get closest to the Sun and might reach naked-eye visibility. Comet C/2024 G3 (ATLAS) will make its closest approach to the Earth on 13 January, at a distance of 0.94 AU.

VENUS AND SATURN CONJUNCTION

On January 18 and 19, catch the dazzling planet Venus and much fainter planet Saturn near each other after sunset. Start looking near where the sun just set as twilight falls. At their closest, Venus will pass 2.25 degrees from Saturn on the sky's dome.

VENUS AT HIGHEST ALTITUDE

26th January Venus will reach its highest point in the sky in its 2025 evening apparition. It will be shining brightly at mag -4.4. This apparition will be reasonably placed and prominent, reaching a peak altitude of 43° above the horizon at sunset on 26 January 2025.

Visibility of Planets for the month of November.

Planet Name	Visibility Start	Visibility Ends
Venus	After Sunset	Till about 8:45PM
Saturn	After Sunset	Till Midnight
Jupiter	After 6:00 PM	Till 6:00AM
Mars	After 10:00PM	Till Sunrise

PAO Panaji : Public Astronomical Observatory at Junta House, Panjim will be open for public on all weekdays (Monday to Saturday) from 14th November onwards at 7:00PM to 9:00 PM

PAO Margao : Public Astronomical Observatory at Ravindra Bhavan, Margao will be open for public on Tuesdays and Saturdays from 16th November onwards at 7:00PM to 9:00 PM

For more information about PAO and AFA you can contact
Satish Nayak (9518502404) or
Gaurav Dhumatker (9923544025)

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TELESCOPES AND MOUNTS (PART 3)

REFLECTOR TELESCOPE

The core principle behind a reflector telescope is the use of a curved mirror to collect light and bring it to a focal point. The key components that enable the telescope's functionality are:

1. **Primary Mirror**: This is the largest mirror in the telescope, responsible for gathering light from distant celestial objects. The primary mirror is usually spherical or parabolic in shape, and its curvature is designed to direct incoming light toward a common focal point. The larger the mirror, the more light it can collect, which allows it to observe fainter and more distant objects.

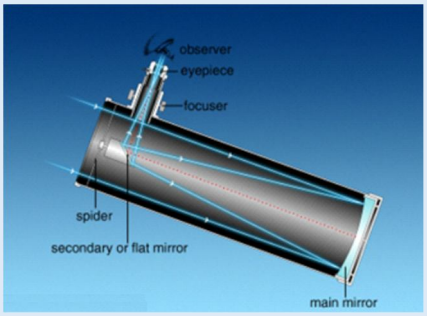
2. **Secondary Mirror**: Reflector telescopes often employ a secondary mirror, which reflects the light gathered by the primary mirror toward an eyepiece or camera. The secondary mirror is positioned in such a way that it redirects light through a hole in the center of the primary mirror or to the side of the telescope, depending on the specific design.

3. **Eyepiece**: The eyepiece is the final optical component that allows the observer to view the magnified image produced by the telescope.

The reflective optics of the telescope operate on the laws of reflection. When light strikes a curved mirror, it bounces off the surface and converges at a focal point. Depending on the shape of the mirror, the light converges at varying distances, and this is adjusted through the placement of the eyepiece or camera.

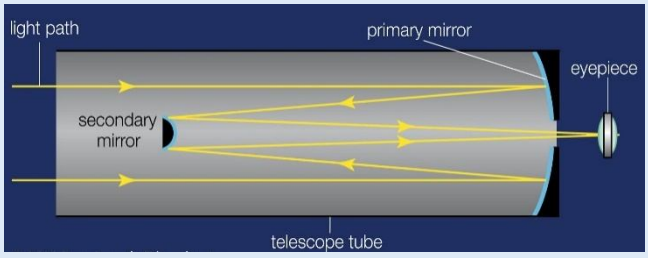
Reflector telescopes come in different designs based on how the light is directed after it is gathered by the primary mirror. Some of the common types include:

1. **Newtonian Reflector**: The most common type of reflector telescope, designed by Sir Isaac Newton in 1668. The primary mirror is a parabolic shape, and the plain secondary mirror reflects light to an eyepiece on the side of the telescope tube.



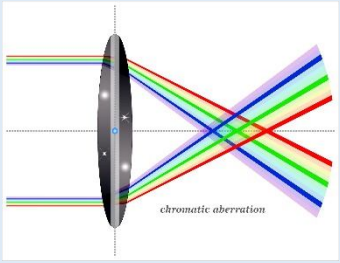
2. **Cassegrain Reflector**: This design uses both a concave primary mirror and a convex secondary mirror. The secondary mirror redirects light back through a hole in the primary mirror, directing it to an eyepiece or camera. This design allows for a more compact telescope.

3. **Schmidt-Cassegrain Reflector**: An advanced version of the Cassegrain design, this telescope uses a corrector plate at the front of the telescope to eliminate optical aberrations and improve image quality.



4. **Maksutov-Cassegrain**: Another variation of the Cassegrain design, this telescope features a meniscus lens (a curved lens) at the front of the tube to correct for optical distortion.

Advantages of Reflector Telescopes

1. **No Chromatic Aberration**: One of the most significant advantages of reflector telescopes is the elimination of chromatic aberration. 

Unlike lenses, mirrors reflect all wavelengths of light at the same angle, so they do not suffer from the colour distortion that refracting telescopes experience.

2. **Large Apertures**: The design of reflector telescopes allows for much larger mirrors than would be practical with lenses. A larger mirror collects more light, which means the telescope can observe fainter objects, thus extending the range of observable objects in the sky.

3. **Compact and Lightweight**: Reflector telescopes can be made more compact and lighter than refracting telescopes of the same aperture size. This is because mirrors can be made of lightweight materials and don't need to be supported across their entire surface.

4. **Cost-Effective**: Because mirrors are easier and cheaper to manufacture than large lenses, reflector telescopes tend to be more affordable, especially in larger sizes.

Disadvantages of Reflector Telescopes

1. **Maintenance**: Reflector telescopes require more maintenance than refractors. Mirrors, especially larger ones, are prone to collecting dust and dirt, which can degrade image quality. The mirrors also need to be regularly realigned, or "collimated," to ensure the best optical performance. This can be time-consuming and requires a certain level of expertise.

2. **Mirror Support**: While the mirrors in reflector telescopes are typically supported only at the edges, this can sometimes lead to distortions in the image if the support structure is not properly designed. Additionally, in some designs, the secondary mirror is suspended in the light path, which can introduce slight obstructions to the light path, reducing contrast.

3. **Obstruction**: In designs such as the Newtonian reflector, the secondary mirror and its supporting structure can obstruct part of the incoming light. While this doesn't drastically affect the telescope's ability to gather light, it can reduce contrast and lead to slightly less sharp images compared to a fully unobstructed optical system, like a refractor.

4. **Exposure to the Elements**: Reflector telescopes are usually open-tube designs (though some have closed tubes), which means they are more susceptible to environmental factors like temperature, humidity, and dust. These elements can have a negative effect on the performance of the telescope, particularly the mirror's reflective surface.

AFA EVENTS OF NOVEMBER 2024

WINTER STAR PARTY

Astro Club Inauguration

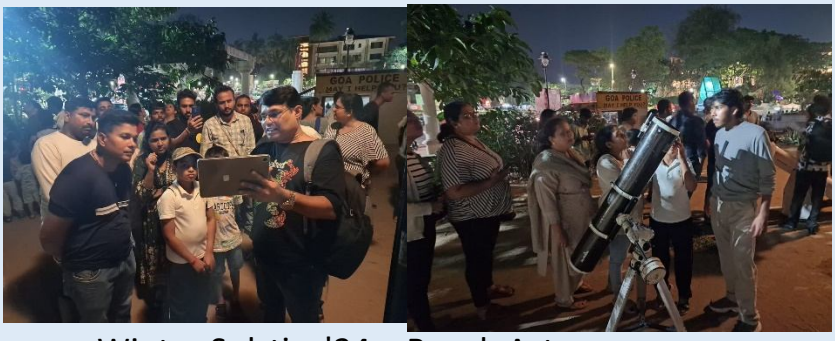
South Goa Astronomy Quiz

Jupiter Opposition

STRUCTURE OF THE UNIVERSE - by Harshda Saxena, reaserch scholar from California Institute of Technology, CALTECH, Pasadena,US.

Hon. Director of Department of Science, Technology and Waste Management, Govt of Goa, Shri Ankit Yadav, IAS, paid a visit to the Public Astronomical Observatory at Panjim

AFA HARMAL CENTER INSTALLATION at hands of Former CM of Goa Shri. Laxmikant Parsekar



Winter Solstice'24 – Beach Astronomy

Other Programs Conducted by AFA

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