

ONU Astronomy Viewing

IYA celebration and Geminid Meteor Shower

8-10 PM, Dec 13, 2009

Sponsored by the ONU Astronomy Club and Department of Physics and Astronomy

The IYA and Galileo.

The **IYA** is the **International Year of Astronomy**. 2009 was designated the IYA because it is the 400th anniversary of Galileo's first use of the telescope for astronomy!

Galileo's telescopes were simple refractors (lens-based telescopes). His first only provided 8X magnification and the one he used for his reported observations had 20X power with only a 1" diameter lens at the front of the tube. And yet Galileo made many discoveries, including ...

1) [The 4 brightest moons of Jupiter.](#)

Now called the "Galilean Moons", these include Io, Europa, Ganymede, and Callisto. One can easily see them change position from one night to the next as they orbit around Jupiter. Io orbits Jupiter in 1.77 days and Jupiter rotates once in 9.8 hours.

2) [The rings of Saturn.](#)

Saturn rises at 1:21 AM, so it is not available during tonight's session.

3) [The Milky Way is made up of stars.](#)

Many previously thought that the Milky Way consisted only of some nebulosity but closer inspection shows it to be the combined light of closely crowded stars.

4) [The phases of Venus.](#)

Galileo could easily see that Venus changed in appearance from a large crescent to a small gibbous phase. (The gibbous phase is between half and full.) It is gibbous when it is on the far side of the Sun. This observation disproved the geocentric model which was preferred at the time.

Venus rises just before the Sun at 7:19 AM tomorrow. We can't see it tonight, unfortunately.

Galileoscopes!

Try one of our black **Galileoscopes** tonight. They are located at the sign-in table. This hand-held telescope is similar to Galileo's, although its lens is bigger and its tube is shorter. You can relive Galileo's discovery of the Moons of Jupiter!

What can you see tonight?

Jupiter: is the 5th planet from the Sun. It is the largest planet in the Solar System, with 318 times the mass of the Earth, and 11 times the diameter of the Earth. Jupiter sets at ~9:52 PM tonight. Try to see all 4 moons and also the dark belts running parallel to its equator. The Great Red Spot (GRS) may also be facing us. As it gets low on the horizon, atmospheric refraction will make it look red on one side and blue on the other.

The Milky Way: this is our home galaxy. We live in the outer arms of a spiral galaxy. (Galaxies are systems of stars, gas and dark matter.) Since we are embedded in our galaxy, the Milky Way appears to be wrapped around us, 360°. It appears as a dim, whitish glow. Tonight, look for the Milky Way running through the constellations Cygnus, Cassiopeia, Perseus, and Gemini (left of Orion). Use a **Galileoscope** or binoculars to see that it is crowded with stars.

The Andromeda Galaxy: this is the closest spiral galaxy to our own Milky Way. It lies at a distance of about 2.2 million light years (1.3×10^{19} miles). It is even bigger than the Milky Way. It is located

between the Great Square of Pegasus and the "W" of Cassiopeia. It subtends about 3 degrees (6 full Moon diameters) in the sky, and yet it is difficult to see with the eye because it is faint.

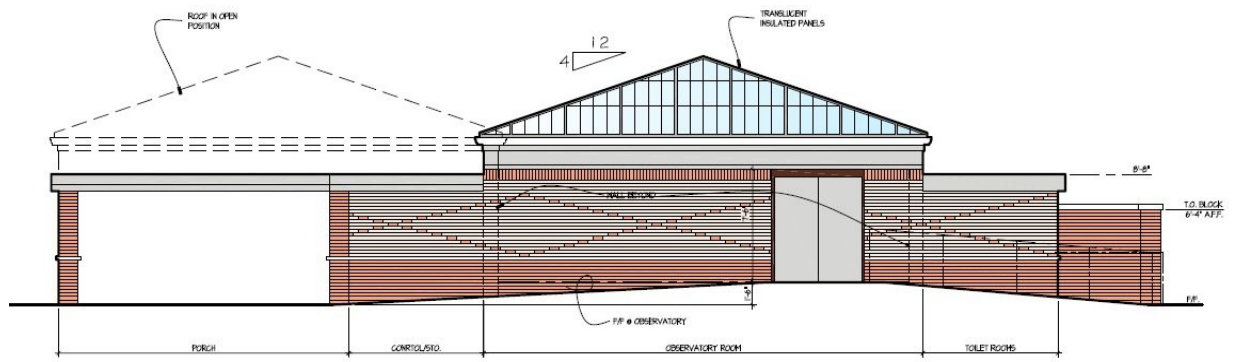
The Orion Nebula: this is a star formation region below the belt of Orion. Stars are formed out of clouds of gas and dust. In this region the cloud is illuminated by hot stars at its center. The hydrogen in the cloud gives off light at distinct wavelengths giving it an overall pinkish hue. Look for the 4 hot stars (called the "trapezium") at the center which excite the whole nebula.

The Pleiades: A cluster of young stars which is easily visible to the eye. It is called "the seven sisters" because about 7 stars can be seen to those with good eyesight and dark skies. See how many more stars you can see in a telescope (or even binoculars) than with the naked eye. The Pleiades is an asterism in the constellation Taurus.

The Geminid Meteor Shower: no telescope is needed for this, just stretch out on a blanket. A meteor is a display of light that occurs when a meteoroid enters the Earth's atmosphere at speeds ranging from 10 to 50 miles *per second*. Most meteors originate as Cometary fragments which are smaller than a pea. They get vaporized and rarely reach the ground. A meteor *shower* features a higher than average rate of meteors which happens when the Earth passes through a comet's orbital path. The Geminid Meteors all radiate away (appear to be leaving) a point in the constellation Gemini. Their peak rate is predicted to be as high as 120 per hour and will occur at about midnight on Dec 13. The Geminid meteors are unusual in that they are thought to originate from an asteroid rather than a comet.

Coming Soon: The ONU Observatory

ONU is going to build a new astronomical observatory just west of Wander Field. Completion is expected sometime next fall. The observatory will have a roll-off roof design. The open-air portion will have three piers for permanently mounting telescopes. There will be rest rooms, handicapped accessibility, video monitors showing the telescopic views, and a control room in the covered portions of the structure.



WEST ELEVATION
1/4" = 1'-0"