

# **Introductory Astronomy Lab (PHY1221) – Course Objectives**

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Using online tutorials and planetarium software:

- Use a scale version of the Universe to get a feel for the distances involved.
- Observe the motion of the stars as time passes
- Study how the stars and planets move in relation to the celestial sphere
- Observe how the orbit of the Earth around the Sun explains the Seasonal Constellations
- Study the effect of the tilt of the Earth on the Seasons of the Earth
- Determine the conditions necessary for Solar and Lunar eclipses
- Investigate how the distance from the sun relates to the orbit time for a planet
- Change the eccentricities of the elliptical orbits to see the ranges of orbit velocities
- See (and hear) how the relative motion of a sound or light object affects the frequency/wavelength (Doppler)
- Compare the radial temperatures in the solar system to the composition of the planets formed
- Investigate how extra-solar planets are discovered (making use of the Doppler effect again)
- Study the motion of asteroids and comets in the Solar System
- Track the trajectories of various satellites or interplanetary probes in the Solar system
- Categorize stars based on their spectral signatures and brightness (HR diagrams)
- Investigate characteristics of Blackholes, including escape velocities and event horizons
- Relate the motion of galaxies in the Universe to the variables in Hubble's Law