

NASTRO's 2012 Astronomy Course

The sessions on this course will consist of two components: a short lecture followed by a practical activity and/or a summary of the what's visible in the night sky during the coming month.

Part 1 (Thursday February 9th) — Eyes on the sky. Find out about the various designs of telescope available to amateur astronomers. Learn about alt-az and equatorial mounts and understand the how eyepieces influence factors such as magnification. Discover how to read star charts and go star hopping to find star clusters, nebulas and galaxies.

Part 2 (Thursday March 8th) — Pale blue dot. Discover how scientists and astronomers shaped our modern view of the cosmos. You'll see how revolutionary ideas and scientific evidence from Thales, Eratosthenes, Copernicus, Tycho, Galileo, Kepler, Newton, Einstein, Hubble and others have displaced our planet from the centre of the universe.

Part 3 (Thursday April 12th) — Window on the universe. This session will demonstrate the motion of the stars and planets as seen from our spinning planet. Why is the Southern Cross constellation never visible from the UK? And why was it visible from here 6,000 years ago? Why do some stars never rise, whilst others never set? Why is Orion visible in the winter but not the summer? This session will also include an introduction to how astronomers measure positions, distances, size and brightness of astronomical objects.

Part 4 (Thursday May 10th) — The private lives of stars. Stars are the factories where hydrogen is transformed into the elements that everything else, including us, is made from. In session you'll learn how stars shine - a process that was unknown until the 20th century. How do stars form and what happens when they die? The Sun is a star and you'll learn about its past, present and future in this session. And how can astronomers figure out these things merely by studying the light from a star?

Part 5 (Thursday June 14th) — Plutoed! Ancient astronomers knew what a planet was but recent discoveries have left modern astronomers divided. This session will explore the planets of the solar system - their orbits and physical characteristics. Then we'll review the evidence which led to the 2006 definition of 'planet' and the decision to exclude Pluto!

Part 6 (Thursday July 12th) — Vermin of the sky. The solar system contains numerous populations of small objects such as asteroids, comets and interplanetary dust. Find out how these small objects have shaped the history of our Earth and how studying them can reveal much about the earliest days of the solar system. Astronomers are aware of more than a thousand 'potentially hazardous asteroids' but just how real is the danger of impact?

Part 7 (Thursday August 9th) — Hairy stars make shooting stars. Comets have been noted throughout history for their terrifying and unpredictable appearances in the night sky. Where do comets come from? Why do they have tails? And how are meteors (shooting stars) related to these icy visitors to the inner solar system? This session will include guidance for comet and meteor observing.

Part 8 (Thursday September 13th) — Down the Black Hole. Gravity is a fundamental force in the universe. Find out how Kepler discovered laws governing the movements of the planets and how Newton developed a theory of gravity which has been one of the most successful theories in science; allowing astronomers to explain the tides, predict the motion of the stars planets and to send spacecraft across the solar system. Discover why Einstein constructed a new theory of gravity - one which predicted the existence of mysterious black holes and possibly time travel!

Part 9 (Thursday October 11th) — Powers of ten. In this session you'll learn about the cosmic distance ladder (how astronomers measure distances). How big is the universe? And what does it look like on the largest scales? This session will take you on journey from your seat to the edge of the observable universe and we'll speculate about what lies beyond the cosmic horizon!

Part 10 (Thursday November 8th) — In the Beginning. A brief summary of the Big Bang theory - currently the best scientific explanation we have of the origin of the universe - and the search for dark matter and dark energy. Find out why some scientists are speculating that our universe must be fine-tuned for life, or that we live in universe which endlessly cycles, or even that we are part of a multiverse.