

The Cosmos: A Survey of Modern Astronomy — Short Course Description

The course will first focus on fundamentals such as the light and the black-body spectrum, the astronomical coordinate system, the motion of objects within our solar system, and the composition of Earth and the other planets. It will then proceed to our understanding of the nearby stars and the rest of our galaxy. At each step along the way we will emphasize not just what is known, but how it has been determined through the interplay of theory and observation. With these fundamentals, you will be prepared to move farther out into the cosmos, starting with what is known about nearby galaxies, then moving to the evidence for the Big Bang. Near the end of the course, we will get to the complications of the properties of galaxies and the expansion since the Big Bang that can only be explained by dark matter and dark energy.

The course will also have a hands-on component. Pairs of students will do a special project from among the many that are possible with a 130mm refractor, a high-performance CMOS sensor, and research-grade software to control the equipment and analyze data. Possible projects include astrophotography of galaxies and nebulae, imaging of planets, and variable star observation.