

Dark Matter and Dark Energy

Course Description

With a series of videos and lectured, this course explores why cosmologists believe 25% of the universe is dark matter and 70% is dark energy with ordinary matter accounting for only 5%.

Weekly Layout:

The fundamental building blocks of a smooth, expanding universe

Cosmology in Einstein's universe: space, time and gravity

Galaxies and clusters explored with gravitational lensing

Atoms, particles and the standard model of particle physics

Relics from the Big Bang and primordial atomic nuclei

The cosmic microwave background, dark stars and black holes

WIMPs and Supersymmetry

The accelerating universe and the geometry of space

Vacuum energy, smooth tension and acceleration

Quintessence -- maybe dark energy is dynamic

Was Einstein correct?

Inflation, strings and extra dimensions

Beyond the observable universe and future experiments