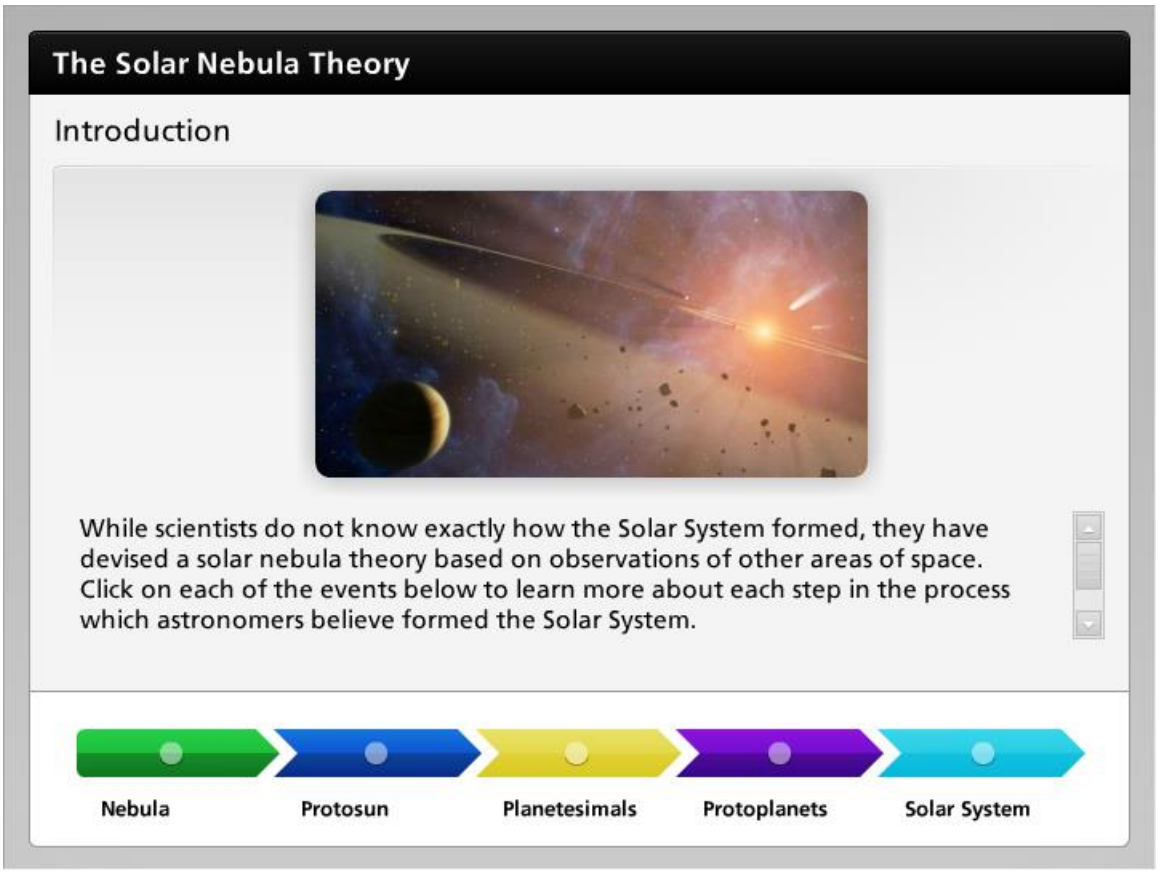
Module 9: The Solar System
Topic 1 Content: The Solar Nebula Theory

Introduction



While scientists do not know exactly how the Solar System formed, they have devised a solar nebula theory based on observations of other areas of space. Click on each of the events below to learn more about each step in the process which astronomers believe formed the Solar System.

Image Courtesy of NASA

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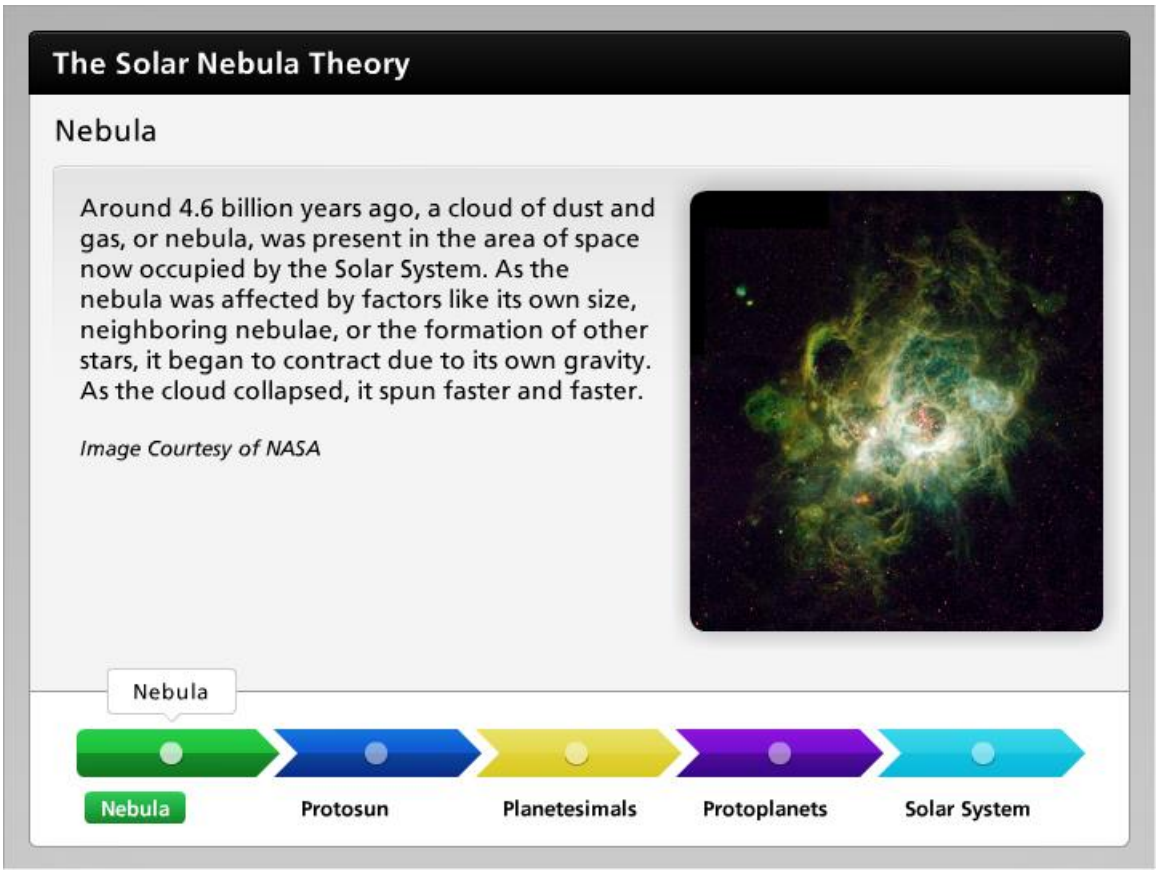
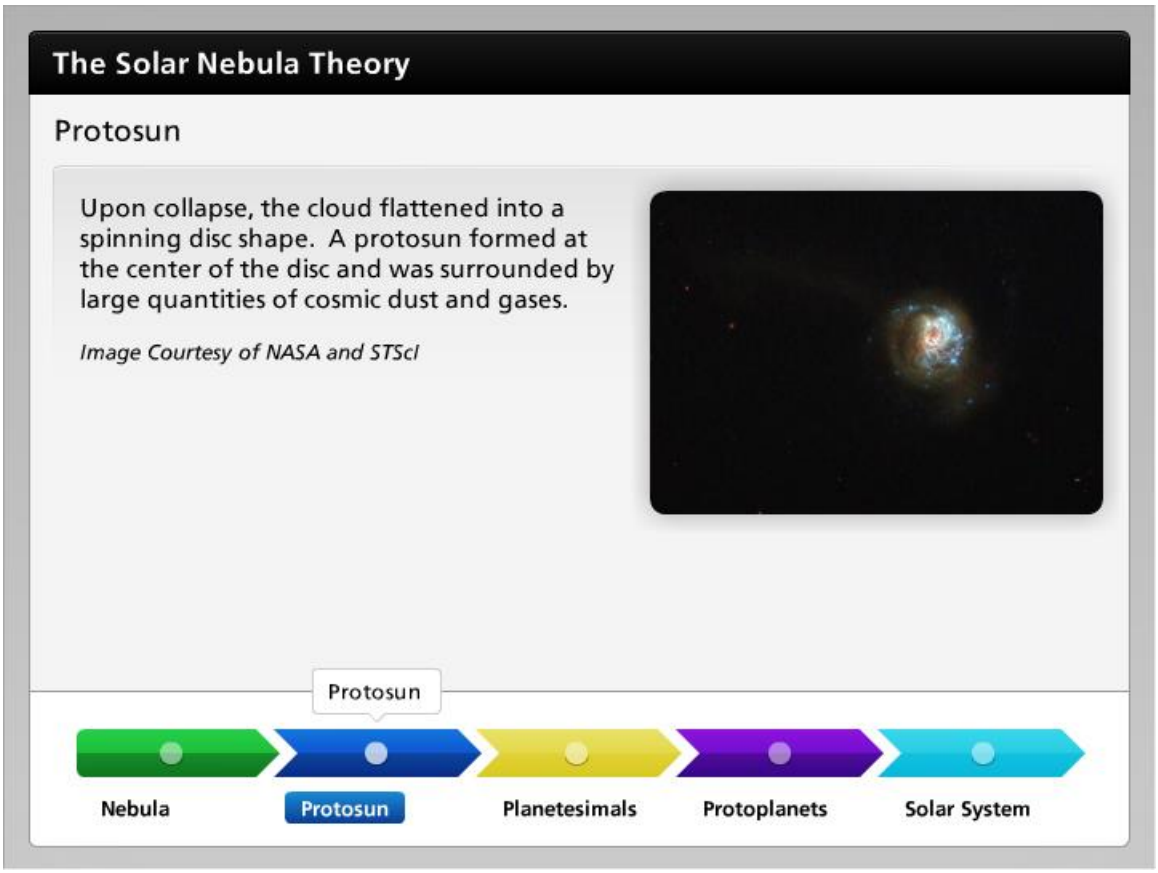
Nebula



Around 4.6 billion years ago, a cloud of dust and gas, or nebula, was present in the area of space now occupied by the Solar System. As the nebula was affected by factors like its own size, neighboring nebulae, or the formation of other stars, it began to contract due to its own gravity. As the cloud collapsed, it spun faster and faster.

Image Courtesy of NASA

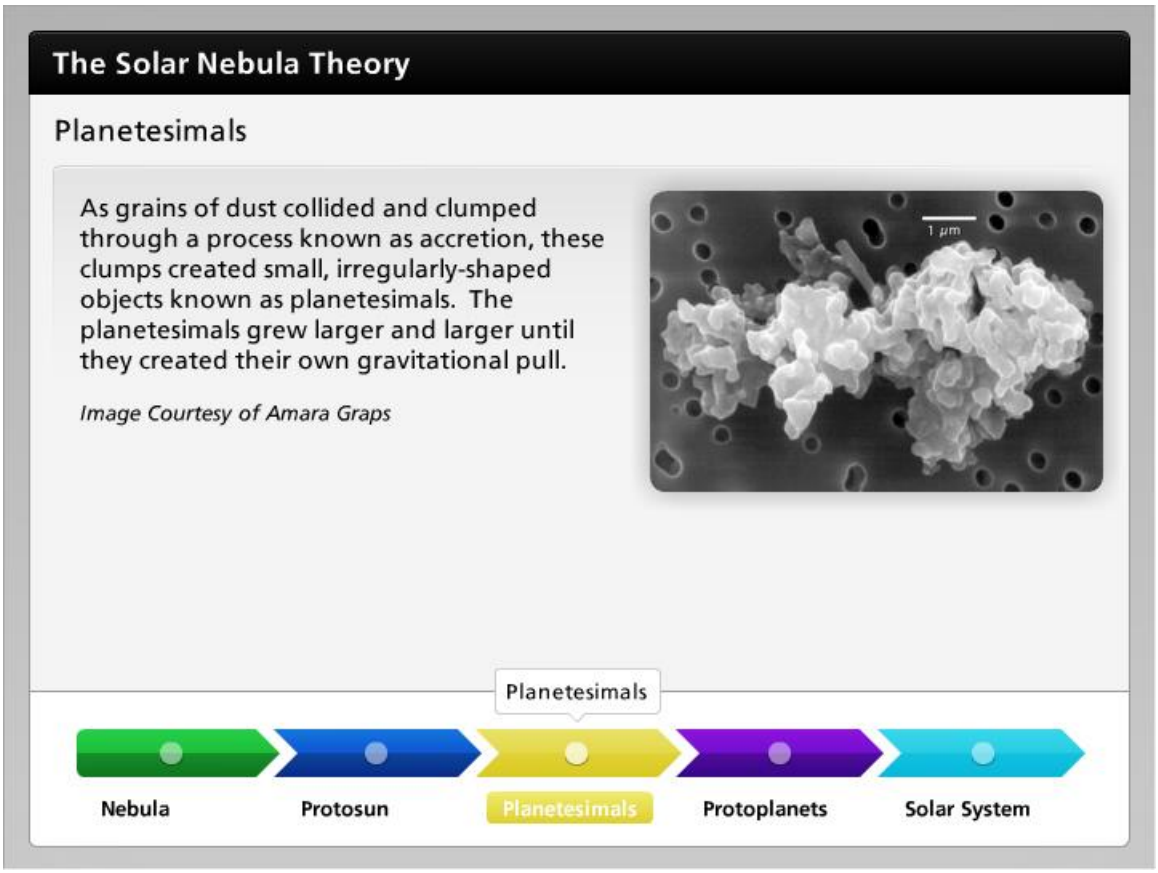
Protosun



Upon collapse, the cloud flattened into a spinning disc shape. A protosun formed at the center of the disc and was surrounded by large quantities of cosmic dust and gases.

Image Courtesy of NASA and STScI

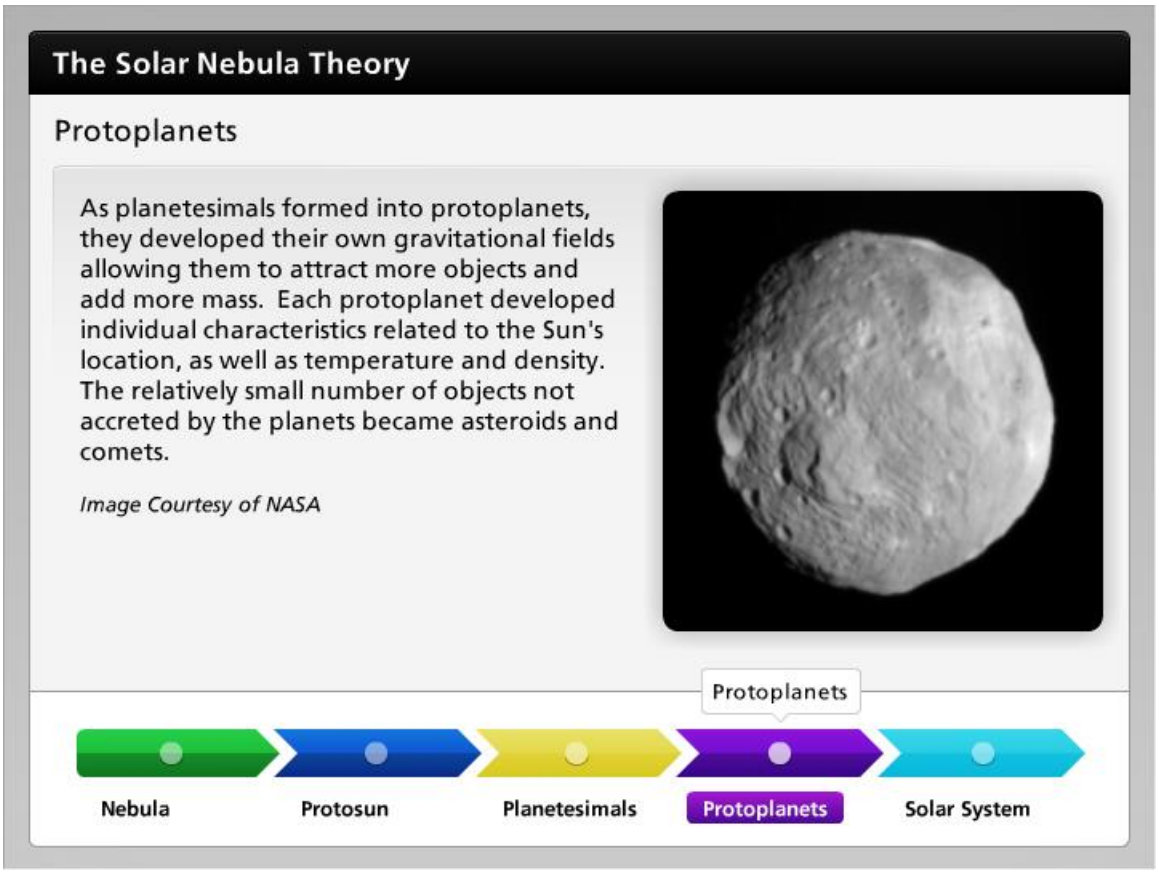
Planetesimals



As grains of dust collided and clumped through a process known as accretion, these clumps created small, irregularly-shaped objects known as planetesimals. The planetesimals grew larger and larger until they created their own gravitational pull.

Image Courtesy of Amara Graps

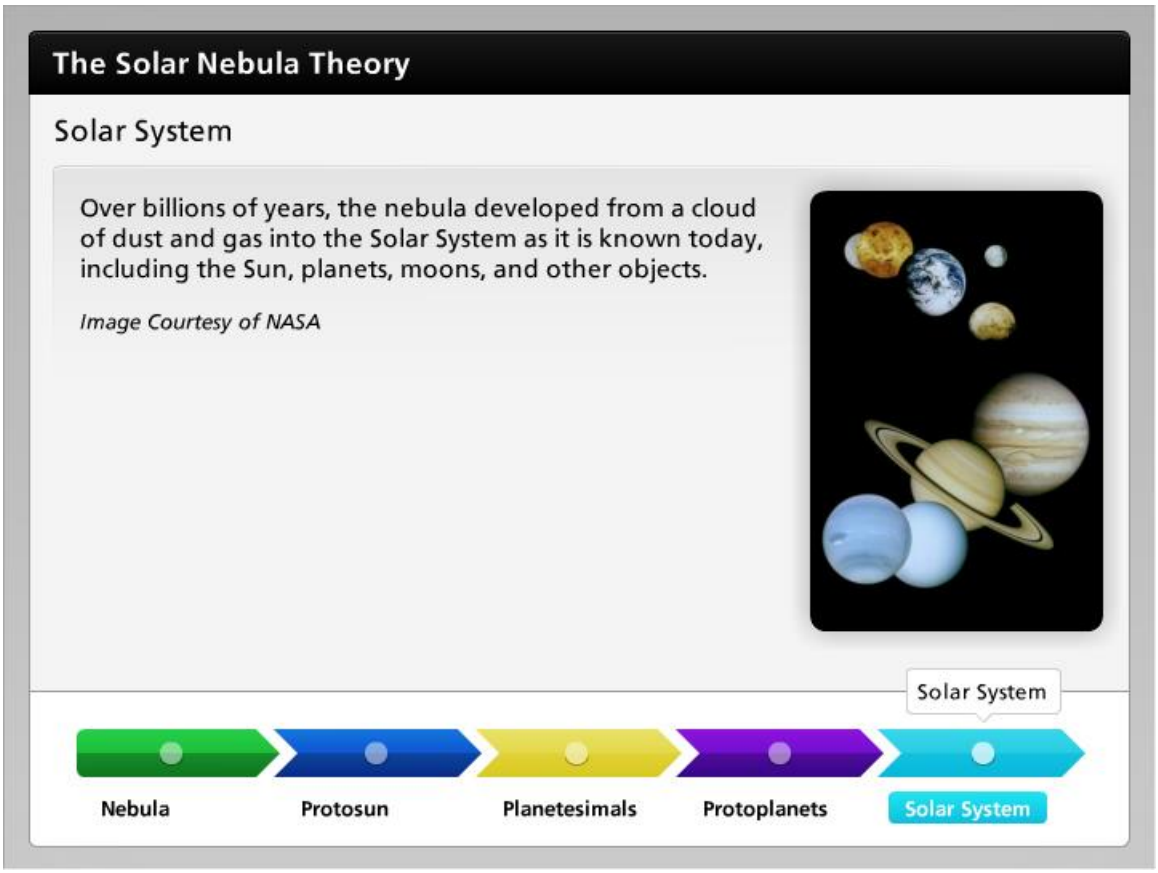
Protoplanets



As planetesimals formed into protoplanets, they developed their own gravitational fields allowing them to attract more objects and add more mass. Each protoplanet developed individual characteristics related to the Sun's location, as well as temperature and density. The relatively small number of objects not accreted by the planets became asteroids and comets.

Image Courtesy of NASA

Solar System



Over billions of years, the nebula developed from a cloud of dust and gas into the Solar System as it is known today, including the Sun, planets, moons, and other objects.

Image Courtesy of NASA