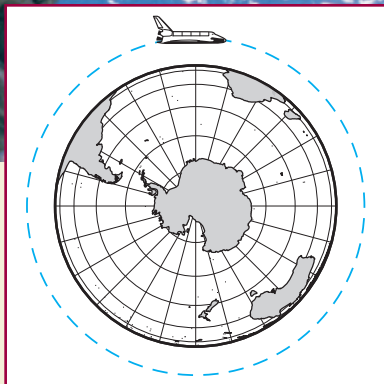


Circular Motion and Gravitation



The astronaut shown in this photograph is walking out onto the cargo bay area of the space shuttle to attempt repair of a satellite. Although the astronaut's initial attempt to capture the satellite was unsuccessful, this task was later accomplished by a robotic arm. The astronauts were then able to repair the satellite.

WHAT TO EXPECT

In this chapter, you will learn how to describe circular motion and the forces associated with it, including the force due to gravity.

Why it Matters

Circular motion is present all around you—from a rotating Ferris wheel in an amusement park to a space shuttle orbiting Earth to Earth's orbit around the sun.

CHAPTER PREVIEW

1 Circular Motion

- Centripetal Acceleration
- Centripetal Force
- Describing a Rotating System

2 Newton's Law of Universal Gravitation

- Gravitational Force
- Applying the Law of Gravitation

3 Motion in Space

- Kepler's Laws
- Weight and Weightlessness

4 Torque and Simple Machines

- Rotational Motion
- The Magnitude of a Torque
- The Sign of a Torque