

13 Lecture - PHY101

Important Subjective

What is angular momentum?

Angular momentum is a measure of an object's rotational motion. It is a vector quantity that depends on both the object's moment of inertia and its angular velocity.

How is angular momentum related to torque?

Angular momentum is directly proportional to torque, which is the force that causes an object to rotate. The greater the torque applied to an object, the greater its angular momentum will be.

How is angular momentum conserved?

Angular momentum is conserved when there is no external torque acting on a system. This means that the total angular momentum of a system before an event will be equal to the total angular momentum after the event.

What is the difference between linear momentum and angular momentum?

Linear momentum is a measure of an object's motion in a straight line, while angular momentum is a measure of an object's rotational motion. Linear momentum depends on an object's mass and velocity, while angular momentum depends on its moment of inertia and angular velocity.

What is a moment of inertia?

Moment of inertia is a measure of an object's resistance to rotational motion. It depends on the object's mass distribution and its shape. Objects with a larger moment of inertia require more torque to produce the same angular acceleration as objects with a smaller moment of inertia.

How does the moment of inertia affect an object's angular momentum?

The moment of inertia affects an object's angular momentum by determining how quickly it can rotate for a given amount of torque. Objects with a larger moment of inertia will have a smaller angular velocity for a given torque and thus a smaller angular momentum.

What is the conservation of angular momentum?

The conservation of angular momentum states that the total angular momentum of a system is conserved when there is no external torque acting on the system. This means that the sum of the angular momenta of all the objects in the system will remain constant.

How is angular momentum related to the Earth's rotation?

The angular momentum of the Earth's rotation is what keeps it spinning on its axis. The Earth's moment of inertia and its rotation rate determine its angular momentum.

How do you calculate angular momentum?

Angular momentum is calculated by multiplying an object's moment of inertia by its angular velocity. The equation for angular momentum is $L = I\omega$, where L is the angular momentum, I is the moment of inertia, and ω is the angular velocity.

How can you increase an object's angular momentum?

An object's angular momentum can be increased by either increasing its angular velocity or increasing its moment of inertia. This can be achieved by applying torque to the object or by changing its shape or mass distribution.