Name _____

Black Holes' Cosmic Influence: Effects on Nearby Stars and Planets

Short Answer Key

1. When a star approaches a black hole, its orbit can be altered due to the black hole's intense gravitational pull. Instead of following its usual path, the star may have its trajectory drastically changed.
2. A Tidal Disruption Event (TDE) occurs when a star gets too close to a black hole, resulting in the star being torn apart by the black hole's tidal forces. The star's material is then accreted by the black hole, creating a luminous flare that can be observed by astronomers.
3. Accretion disks are flattened structures of gas and dust that emit high-energy radiation, including X-rays, as matter falls into a black hole. Jets are powerful streams of particles and energy produced by some black holes. Both accretion disks and jets can impact nearby celestial bodies by emitting radiation and affecting their surroundings.
4. Tidal forces near a black hole are gravitational forces that stretch and compress objects. When a celestial body approaches a black hole, these tidal forces can cause it to be elongated or even torn apart.
5. Tidal Disruption Events (TDEs) are valuable for astronomers because they provide insights into black hole properties, such as their mass and spin. By studying the light emitted during a TDE, astronomers can learn more about the behavior of matter in extreme conditions and gain a better understanding of black holes.