Name _____

Exploring the Mysteries of Our Galaxy: Are There Black Holes in Our Milky Way?

Short Answer Key

1. Astronomers detect black holes by observing the unusual orbits of nearby stars. When a black hole is present, its massive gravity alters the motion of surrounding stars, leading to distinctive orbit patterns.
2. X-ray binaries are binary star systems where a black hole and a companion star are in close proximity. The black hole's gravitational pull can pull matter from its companion star, creating an X-ray binary. These intense X-ray emissions are indicators of the presence of a black hole.
3. Supermassive black holes are typically found in the cores of galaxies, including the Milky Way. They differ from other black holes in terms of their massive size, with masses ranging from millions to billions of times that of our Sun.
4. Black holes are considered regions with incredibly intense gravity because their mass is concentrated within an incredibly small volume. This concentration of mass results in a gravitational field so strong that nothing, not even light, can escape from its grasp.
5. Astronomers would use advanced telescopes and instruments, such as space telescopes sensitive to X-rays and high-energy radiation. They would observe the orbits of nearby stars, looking for unusual patterns that indicate the presence of a black hole. Additionally, they might search for X-ray emissions from X-ray binaries.