Detecting an active supermassive black hole at an unprecedented distance

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As well as observing specific objects such as galaxies and distant planets in our solar system, the world's most modern Space Telescope James Webb is also being used to conduct wide-ranging surveys of various components of the universe.

Surveys of this kind are often aimed at identifying important but less-accessible targets such as galaxies located at extremely distant distances, as well as observing gravitational objects such as black holes. And a recent survey has found an active supermassive black hole at the furthest distance ever recorded in the history of astronomical research.

Normally, a typical black hole can have about 10 times the mass of the sun. However, supermassive black holes are usually much more massive, with masses that can be millions or even billions of times that of the sun. These veritable monsters are found at the centers of galaxies, and are believed to have played an important role in the formation and merger of galaxies.

One of the earliest examples of a supermassive black hole has been discovered recently, dating to an estimated 570 million years after the big bang. Located in a galaxy called CEERS 1019, the black hole is part of a survey called Cosmic Evolution Early Release Science (CEERS) that uses James Webb to take giant pictures of different observational regions. By focusing on regions far from the Milky Way's bright center and without nearby bright galaxies blocking the view, scientists were able to identify very faint and distant objects.

' *Observing this distant object with modern telescopes like James Webb is very similar to observing data from black holes that exist in galaxies near us,' lead* researcher Dr Rebecca Larson said in a statement.

The galaxy containing the supermassive black hole itself also possesses many interesting features. A thorough study of their features could help find clues about how galaxies form, possibly by collisions with other nearby galaxies.

In addition to this supermassive black hole, CEERS also identified 11 extremely old galaxies, dating from when the universe was 470 million to 675 million years old. By studying such early galaxies, researchers hope to learn about how galaxies have formed and evolved throughout the history of the universe.

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