Black Holes and the Recent Discoveries from the James Webb Space Telescope Black holes have been a highly confidential and baffling occurrence since the evolution of the universe began. These belts of space are so thick that they contain a great deal of gravitational force to the extent that even light cannot be drawn to them. The past decades observed the revolution of knowledge of the black holes because of the ground-breaking and the observational discoveries. It has also had a fresh start with the introduction of the James Webb Space Telescope (JWST) in December 2021 where scientists were able to have a glimpse into the universe like never before due to the fact that they were now able to study these cosmic giants bigger than ever. Being so endowed with infrared, the JWST is designed to observe the faraway objects and phenomena, which the optical telescopes can not observe. As one of its significant contributions towards the research of black holes, the fact that they are observable during the process of propagating and developing in the early universe is paramount. Scientists are even guessing that the black holes might have been applied in knowing the figure of the galaxies. The telescope has infrared sensors that can penetrate through cloudy dusts of clouds that would have otherwise obscured the optical view of the distant galaxies hence providing the view of the supermassive black holes at their cores in a clearer vision (NASA, 2022). This force is necessary to know the way the black holes and galaxies co-evolve. It is discovered that black holes were created during the first billion years of the Big Bang that can be defined as one of the most significant findings made with the assistance of the JWST. It also implies that these primordial black holes were far larger than expected and that would be raising new doubts on the way black holes are formed (Jha et al., 2023). The simulations have given evidence that these black holes might have swiftly swelled through the accumulation of gases and dust surrounding them and might have contributed

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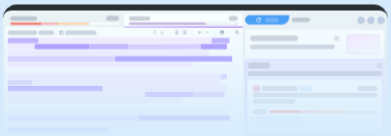

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through the accumulation of gases and dust surrounding them and might have contributed significantly to the prevailing of the formation of the original galaxies. Researchers do hope through the study of these primitive black holes to gain some information as to how the universe evolved and the role played by these objects towards the formation of the universe in the early stages. The other fascinating observation of the JWST is that the telescope will beam the behavior of matter in and around the black holes. Since there is a lot of sharpness that is formed by the telescope, the scientists can now examine the accretion disks that surround the black holes in more detail than they have ever been able to do. These disks are made of gases and dusts orbiting about the black hole and when colliding with each other it generates strong radiations. Through this radiation, astronomers will get improved information about the properties of black holes such as the spin and mass (Mukai et al., 2023). These phenomena have also been observed by the JWST thus providing fresh evidence that can help scientists to have a clearer picture of the physics of the black holes and most particularly in terms of studying how matter responds to the extreme gravitational fields. In addition, the JWST is also contributing to the study of the gravitational waves which are vibrations of space as an effect of collision and merge of massive bodies like black holes. The information given by telescope is an addition to the contribution made by other detectors of gravitational waves such as Laser Interferometer Gravitational-Wave Observatory (LIGO). By choosing to examine both the electromagnetic particles of the same phenomena and the gravitational ones, the scientists can better understand the black holes mergers work and the character of the effect they have on the space-time structure (Abbott et al., 2016). The observations aid in the validation of the predictions to be made by the general relativity in addition to offering the explanation of the basic forces of the universe. In conclusion, James Webb Space Telescope is transforming our

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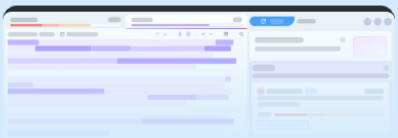

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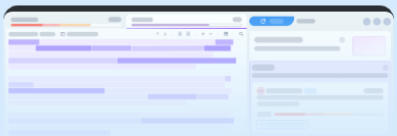

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