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A possible role of Primordial Black Holes in the Early Universe?

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The cosmic X-ray background radiation has been almost completely resolved into discrete objects, mainly from the growth of massive black holes in the universe. However, a few years ago, evidence for a new population of black holes from the early universe emerged from the correlation of fluctuations in the X-ray and infrared backgrounds. Similarly, quasars have been discovered with astonishingly massive black holes already formed shortly after the Big Bang. The detection of gravitational waves from the merger of pairs of very heavy, apparently non-rotating stellar black holes presents another puzzle. Recently, using the micro-lensing effect and distance determination with the ESA satellite GAIA, about 20 black holes in our galaxy have been discovered with masses that cannot be generated by stellar processes. In the past few months, the discovery of several galaxies that formed very early in the universe with the James Webb Space Telescope has been surprising, seeming to contradict the classical expectations of cosmology. These phenomena might be explained by a contribution of primordial black holes that formed immediately after the Big Bang to the dark matter.

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