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A mechanism for galaxy nuclei formation from clusters of primordial black holes

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A model describing the formation of protogalaxies is developed. Compact supermassive clusters of primordial black holes assumed to act as a nuclei for the galaxy formation. The mechanism of PBH formation based on a collapse of massive walls of scalar field due to second order phase transition during inflation. Mass spectra of PBH are obtained analytically and shown possibility of the formation of PBH clusters with a total mass of $\sim 10^5 - 10^8 M_\odot$, having a size of ~ 10 parsec, in an amount of $\sim 10^{11}$, which corresponds to observational data on the values of galaxies in the visible Universe. The primary fractal structure of galaxies is naturally explained through the mechanism. Proposed approach is the cornerstone for a principally new scenario of the galaxy formation in the early Universe.

Primary author(s) : NIKULIN, Valeriy (NRNU MEPhI)

Co-author(s) : GROBOV, Alexey (NRNU MEPhI); Prof. RUBIN, Sergey (MEPhI)

Presenter(s) : NIKULIN, Valeriy (NRNU MEPhI)

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