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## **Alexander Dolgov (NSU and ITEP, Moscow): Massive Primordial Black Holes and Dark Matter**

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Recent astronomical observations, indicating that the universe at high redshifts,  $z=5-10$ , is unexpectedly densely populated by bright galaxies, supermassive black holes (quasars), gamma-bursts, supernovae and is very dusty, are reviewed. It is argued that the origin of these early formed objects is at odds with the conventional theory of their formations. Moreover, similar and probably related phenomena or objects are abundant in the contemporary universe. The origin of the observed MACHOs, supermassive black holes in every large galaxy and even SMBHs in practically empty space remains mysterious.

All these puzzles are simply and naturally solved in our model of 1993 of massive black hole formation in the early universe. The model predicted log-normal mass distribution of the primordial black holes (PBHs), which became popular in the recent year or two. It explains the puzzling properties of the LIGO-observed gravitational waves and allows for dark matter to be made mostly or solely by PBHs.

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