Contribution ID: **6** Type: **not specified**

Analytical model for black hole evaporation in cosmological space-time [Chair: Notari]

Current constraints suggest the primordial black holes(PBHs) in mass windows $10^{17} - 10^{23}$ gm are potential dark matter candidates. It has been argued that the PBHs less than 10^{15} gm would have evaporated by now. These analyses assume black holes are in an asymptotically flat space-time. However, realistic black holes are surrounded by local mass distributions and they are embedded in the expanding universe. In this talk, we focus on evaporating black holes in cosmological space-time. We analyze the evaporation process of an exact model for dynamical black hole space-time in general relativity. Our analysis shows that the decay rate of black holes in the cosmological background is different from the black holes in asymptotically flat space-time. We show that cosmological black hole decay is faster than the Schwarzschild black hole for larger masses. Our analysis has important implications for the PBHs as a dark matter candidate. Our model suggests that the decay rate of the PBHs falls for lower masses, which is the opposite compared to the black holes in asymptotically flat space-time. In other words, it is not possible to completely rule out PBHs less than 10^{15} gm.

Are you interested in publishing a 2-4 pages proceeding at the MDPI Journal?

Yes

Primary author: XAVIER, Semin (Indian Institute of Technology Bombay, India)

Co-authors: Mr SUNNY, Alan (INAF - Istituto di Astrofisica e Planetologia Spaziali, Via del Fosso del Cavaliere 100, and Department of Physics, University of Rome "Tor Vergata", Via Cracovia 90, Italy); Dr SUBRAMANIAM, Shankaranarayanan (Indian Institute of Technology Bombay, India)

Presenter: XAVIER, Semin (Indian Institute of Technology Bombay, India)