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## Black Holes at Cosmic Dawn

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Theoretical models and observations suggest that large fractions of Pop III stars end as black holes (BHs) in High-Mass-X-ray Binaries (BH-HMXBs), which are sources of hard X-rays and synchrotron relativistic jets called Microquasars (MQs ref.1). The hard X-rays from these accreting BHs of Pop III have long free paths, pre-heat the Intergalactic Medium (IGM), and lead to a smooth end of the re-ionization epoch (ref. 2). We will show that the relativistic jets from the remnants of Pop III stars, namely, the BH-HMXB-MQs of Pop III, produce a Synchrotron Cosmic Radio Background (CRB) that can account for the excess amplitude and bottom-flat absorption of atomic hydrogen at  $z \sim 17$  (78 MHz), tentatively reported by EDGES (ref. 3). In fact, the existence of a Synchrotron CRB had been inferred from the NASA ARCADE 2 Experiment (ref. 4). Recently, it was proposed that –along with the hard X-ray cosmic background– that CRB is the smoking gun of Pop III stars (ref. 5).

References:

- 1) Mirabel, I.F. & Rodríguez, L.F. 1998, Nature, 392, 673-677
- 2) Mirabel I. F., Dijkstra M., Laurent Ph., Loeb A., Pritchard J. R., 2011, A&A, 528, A149
- 3) Bowman J. D., Rogers A. E. E., Monsalve R. A., Mozdzen T. J., Mahesh N., 2018, Nature, 555, 67 EP
- 4) Fixsen D.J., Kogut A., Levin, S. et. al. 2011, ApJ, 734, 5
- 5) Mirabel (2019): Review at IAU Symp. 346 (arXiv#1902.00511)

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