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Stellar Black Holes at the Dawn of the Universe

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The 'final frontier' in studies of cosmic structure formation is the epoch of cosmic reionization, when the cold neutral Intergalactic Medium (IGM) was heated and reionized by primordial galaxies, a few hundred million years after the Big Bang. I propose that a large fraction of the first generations of massive stars in primordial galaxies ended as black holes and neutron stars in High Mass X-ray Binaries, and that besides the ultraviolet radiation from their massive stellar progenitors, feedback from accreting stellar black holes was an additional, important source of heating and reionization of the IGM. X-rays and relativistic jets from the large populations of HMXBs, determined the early thermal history of the universe and maintained it ionized over large volumes of space. This has a direct impact on the properties of the faintest galaxies at high redshifts, the smallest dwarf galaxies in the local universe, and on the existing and future surveys at radio wavelengths of atomic hydrogen in the early universe.

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