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Hypermassive Black Holes in the Universe

In reference to supermassive black holes (SMBHs) in the mass range of millions to several billions of solar masses, we predicted hypermassive black holes (HMBHs) in the mass range of 10 to 1000 billions of solar masses and possibly even higher in the Universe including the early Universe as results of dynamic gravitational collapses of sufficiently large mass reservoirs. Observational evidence, consequences and implications of HMBHs and SMBHs in the Universe are presented. We indicate generation of gravitational waves by inevitable convective and circulative turbulence, magnetohydrodynamic (MHD) dynamo processes, acceleration of ultra-high energy cosmic rays (UHECRs), bursts of electromagnetic waves when random magnetic fields are involved in such dynamic gravitational collapses. We discuss dark matter black holes (DMBHs) and mixed matter black holes (MMBHs) in the Universe including the early Universe. We also show the possibility of forming chains of gravitationally collapsed on various mass scales. It is anticipated that Hubble Space Telescope, James Webb Space Telescope, LOFAR, Square Kilometer Array and so forth can provide more valuable diagnostic clues of HMBHs and SMBHs.

Biography

Yu-Qing Lou, winner of 1981 China-US Physics Examination and Application (CUSPEA) sponsored by Professor T.D. Lee, has completed his physics PhD in 1987 from Harvard University. He became High Altitude Observatory and Advanced Study Program Fellow at National Center for Atmospheric Research (NCAR) 1987-1989. He has published more than 140 international journal papers (including Nature, Science, The Astrophysical Journal (Letters), Monthly Notices of the Royal Astronomical Society (Letters), Journal of Geophysical Research, Geophysical Research Letters, Astronomy and Astrophysics). In 2002, he became distinguished Yangtze Professor in Physics Department of Tsinghua University. He has served in review panels in USA, China and others.

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