Foundation of the unicentric model of the observable universe - UNIMOUN

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Abstract

In view of the growing difficulties of ΛCDM-cosmologies to compete with recent highly accurate cosmological observations, an alternative model is proposed here: the **Uni**centric **M**odel of the **O**bservable **UN**iverse (UNIMOUN). The model relies on employing a new time-dependent $\mathcal{H}$-metric for the GR field equations, which enables reversible phase transitions between normal compressible fluids and incompressible quantum superfluids, in order to study the cosmic evolution of the observable universe.
The main properties of UNIMOUN read as follows: 1) The observable universe was born in a flat environment, which is a tiny fraction of our infinitely large and flat parent universe, 2) Our big bang (BB) happened to occur in our neighbourhood, thereby endowing the universe the observed homogeneity and isotropy, 3) The energy density in the universe is upper-bounded by the universal critical density ρ_{cr}^{uni}, beyond which matter becomes purely incompressible, rendering formation of singular objects, e.g. black holes, impossible, 4) Big bangs are neither singular events nor invoked by external forces, but rather, they are common self-sustaining events in our parent universe, 5) The progenitors of BBs are created through the merger of cosmically dead and inactive neutron stars and/or through hyper-massive dark objects that are classified today as supermassive black holes thought to reside the centres of most massive galaxies, 6) The progenitors are made up of purely incompressible entropy-free superconducting gluon-quark superfluids with $\rho = \rho_{cr}^{uni}$ (SuSu-matter), which endows these giant objects measurable sizes, 7) Spacetimes embedding SuSu-matter are conformally flat.
It is shown that UNIMOUN is capable of dealing with and providing answers to several fundamental open questions in astrophysics and cosmology without invoking inflation, dark matter or dark energy.

Keywords: General Relativity: big bang, black holes, QSOs, neutron stars, QCD, condensed matter, incompressibility, superfluidity, super-conductivity

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