

## Short survey of matter in the Universe

*Monday, 16 May 2022 13:40 (20 minutes)*

I survey our current research addressing evolution of matter in the Universe: Origin of matter is the quark-gluon phase of primordial Universe. Matter components evolve, at first we see hadronic universe, later we encounter lepton  $e+e$ -pair period followed by neutrino-photon free streaming towards recombination, dark matter and dark energy emergence. I show in detail the disappearance of antimatter at  $T=20.4\text{keV}$  demonstrating the big-bang nucleosynthesis is occurring in a dense  $e+e$ - plasma. We explore the role of strong magnetic fields in early Universe and will propose how such field could alter our understanding of primordial processes.

Over the past 10 years in my astro-particle work I benefited from academic contact with ICRANet and Remo Ruffini in particular.

Happy 80th Remo: We wish you continued success in advancing our understanding of the relativistic astrophysics world.

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**Session Classification:** Connection with Prof. Ruffini for greetings