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Physics of the Early Universe

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The discovering of the Cosmic Microwave Background (CMB) radiation in the sixties and its subsequent interpretation, the numerous experiments that followed with the enumerable observation data they produced. We see that the energy in the form of radiation has the equation of state p = ρ/3. This applies to all massless particles. It is also valid for massive particles when they are moving with momenta much larger than their masses. This is known as the extreme relativistic or ER limit opposite to the non-relativistic or NR limit where the momenta are much smaller than the mass of the particles. Matter in the Early Universe, from the study of isotropic of gas at times much before the development of any structure, can be viewed as a gas of relativistic particles in thermodynamics. To provide insight into the behaviour of matter in early stages of the universe. The research framework mainly focuses on discussing the basic ideas that have shaped our current understanding of the Early Universe like the behaviour of matter under extreme conditions. We aim to discuss cosmological observables, principles and solutions which is the physics that governs the scope of this project specifically the relativistic thermodynamics. The simulation and establishment of the data handling analysis work will be based on the number density as a function of temperature, number of particles for both bosons and fermions particles as a function of temperature using high programming language (MATLAB). Temperature is an independent variable and time is kept as reference. The validation of the data analysis will be compared to the cosmological solutions the Empty de Sitter Universe, Vacuum Energy Dominated Universe, Radiation Dominated Universe and the Matter Dominated Universe.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

N/A

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