

Abstract Submitted  
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**Physics of prime gas and its connection to blackhole** CHARLI PAL, SUBODHA MISHRA, Siksha O Anushandhan (Deemed to be University) — While studying quantum and classical aspects of a system, it is important to know how to treat an abstract prime number system which is nondynamical, as a dynamical one in physics. Here we study the hidden nonlinear dynamics of an interacting quantum many particle system in 1 dimension representing prime numbers after we derive the 2-body interaction potential between particles through Schrödinger equation. The density for prime gas representing prime numbers is constructed from the asymptotic form of prime counting function. By taking the quantum mechanics formalism we induce the calculation of gaps through expectation value. In the corresponding classical system, the trajectories and associated fixed points, which are half stable are analysed. The famous Lambert W function arises naturally as a solution of fixed points. The connection between prime number and blackhole appears serendipitously in the solution of fixed points as a simple mathematical identification with different times associated with blackhole. REFERENCES: S. Mishra and C. C Pal, Preprint: DOI:10.13140/RG.2.2.33589.29926 B. Julia, Physica A 203, 425 (1994) H. C. Rosu, Mod. Phys. Lett. A 18, 1205 (2003)

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