## 10th International Conference on Gravitation and Cosmology: New Horizons and Singularities in Gravity (ICGC 2023)



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## Do the Fundamental Constants change with Time?

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Temporal evolution in low-energy fundamental constants such as the fine structure constant and the protonelectron mass ratio is a generic prediction of theories that attempt to unify the Standard Model of particle physics and general relativity. The exciting possibility of low-energy tests of such unification theories has inspired a number of methods to probe fundamental constant evolution on a range of timescales, from years to billions of years. Astrophysical studies of redshifted spectral lines provide a powerful probe of such putative changes in the low-energy fundamental constants across a large fraction of the age of the Universe. After reviewing the current state of the field, I will describe new high-sensitivity results on changes in the protonelectron mass ratio over the last 8 Gyr using methanol radio spectral transitions. Finally, if time permits, I will discuss present limitations of such studies and the improvements that are likely to be possible with the advent of new experimental and observational facilities over the next decade.

**Presenter:** KANEKAR, Nissim (National Centre for Radio Astrophysics, India) Session Classification: Plenary