

# Gravitational Physics and Astronomy 2022



## Online Conference on Gravitational Physics and Astronomy

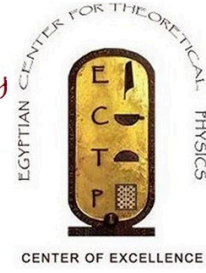
4-9 December 2022



<https://indico.cern.ch/e/GPA2022>



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## Various cosmological distances in Hubble-Hawking universe

With reference to our recently proposed light speed expanding Hubble-Hawking universe, in this contribution, up to  $(z + 1) \cong 1100$ , with a marginal error, we make an attempt to fit light travel distances, comoving distances and luminosity distances with very simple relations. Key point to be understood is that, red shift can also be defined as the ratio of increase in photon wavelength to observed photon wave length. Mathematically, if  $z_{new} \cong \frac{\lambda_{Observed} - \lambda_{Lab}}{\lambda_{Observed}} \cong \frac{z}{1+z}$ , Light Travel Distance can be approximated with,  $LTD \cong z_{new} \left( \frac{c}{H_0} \right)$ , Comoving Distance can be approximated with,  $CD \cong \exp(z_{new}) LTD$ , and Luminosity Distance can be approximated with,  $LD \cong \frac{CD}{1-z_{new}}$ . With further research, Lambda cosmology and Hubble-Hawking cosmology can be studied in a unified manner.

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