

### **The Echo of the Early Universe**

By applying quantum informational and optical tools to quantum gravity theories in the very early universe, we show that the fluctuations of quantum fields as seen by late comoving observers are significantly influenced by the history of the early universe, transmitting information about the nature of the universe in timescales when quantum gravitational effects were non-negligible. This might be observable even nowadays thus used to build falsifiability tests of quantum gravity theories.