



## *Joint Physics & IA/FORTH Colloquium*

Thursday, 24 October 2019 | 17:00 – 18:00, Seminar Room, 3rd floor

### **Two milestones in the life of the Universe: the last scattering surface and the black body photosphere of the Universe**

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#### **ABSTRACT**

*Hydrogen recombination at redshifts  $z \sim 1100 - 1500$  leads to the rapid decrease of the optical depth of the Universe due to Thomson scattering. As a result CMB photons previously strongly coupled with baryonic matter become free and able to reach us. The observed acoustic peaks in the CMB angular distribution and the shape of BAOs are formed in the vicinity of the last scattering surface. The question remains how and at which redshifts the observed practically ideal black body spectrum of CMB was formed. I plan to describe the nature of the black body photosphere of the Universe, the physical processes leading to formation of the characteristic spectral distortions of CMB and to discuss in detail the unavoidable spectral distortions of CMB due to cosmological recombination, Silk damping and presence of the hot gas in the early Universe. It will be mentioned why we will never observe in the spectrum of CMB the traces of electron-positron annihilation in the early Universe or due to decay of tritium and conversion of Be-7 to Li-7 at  $z \sim 30\,000$ .*