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Unveiling the Physics of the Cosmic Dawn and the Epoch of Reionisation in the SKA era (AS SKA / LOFAR)

Direct observation of the Cosmic Dawn and Epoch of Reionization via the redshifted 21-cm line will have unprecedented implications on the study of structure formation in the early Universe. This exciting goal is challenged by the difficulty of extracting the feeble 21-cm signal buried under bright astrophysical foregrounds and contaminated by numerous systematics. Several experiments such as LOFAR, MWA, HERA, and NenuFAR are underway aiming at statistically detecting the 21-cm signal fluctuations from the EoR and CD, and paving the way for the SKA EoR CD experiment which will be capable of directly image the large-scale neutral hydrogen structures from these distance epochs. In this talk, I will present recent results from the LOFAR-EoR and NenuFAR Cosmic Dawn collaborations. After publishing the deepest upper limit on the signal power-spectra at $z\sim 9$, which has made it possible to set constraints on the physics of the IGM during the EoR, the LOFAR-EoR team is progressing towards a deeper upper limit on a broader range of redshift. On the Cosmic Dawn front, the NenuFAR CD team recently published a first upper limit on the signal power-spectra at $z\sim 20$. These new results will be discussed, as well as the improvements in instrument calibration and foreground mitigation that enabled these achievements.