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Constraining the chemistry of the first stars from the most metal-poor sub-damped Lyman alpha systems

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Quasar absorption line systems are an excellent probe of chemical evolution across time. In absorption line systems associated with the interstellar and circumgalactic medium of galaxies, the column densities of gas are sufficiently high that detailed and accurate chemical abundance patterns can be obtained and compared to complimentary stellar abundance analyses. These detailed chemical abundance measurements of the most metal-poor absorbers have placed important constraints on the properties of the first stars. However, these studies of the most metal-poor absorbers have focused on damped Lyman alpha systems (DLAs; HI column densities of logN(HI)>=20.3), which are rare on the sky. Fortunately, high redshift (z>3.2) subDLAs (19.0<=logN(HI)<20.3) offer potentially larger samples as they are typically more metal-poor than DLAs and at least 5x more frequently observed towards quasars. In this talk I will highlight results from an ongoing survey of metal-poor subDLAs identified in XQ-100 legacy survey. In particular, I will share some of the initial results along with some of the challenges of using subDLAs to investigate the nature of the first stars.

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