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High-redshift Lyman-α galaxies

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A strong Lyman-α line enables relatively easy detection of high redshift galaxies. Lyman-α galaxies are now known from $z = 3$ to 6.6. No evolution is discerned in the Lyman-α line luminosity function in this redshift range. This implies that the intergalactic medium at $z = 6$ is at least 50 % ionized over more than 50 % of the volume. Recent continuum detections of these galaxies from *HST*, MMT and *Spitzer* are now allowing us to address questions about the nature of these Lyman-α emitters, their stellar populations and ages. We find that by and large the Lyman-α galaxies are young galaxies dominated by stellar populations that are less than 25 Myr old.

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Cosmic microwave background: probing the universe from $z = 6$ to 1100

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Observations of cosmic microwave background temperature and polarization fluctuations are sensitive to both physical conditions at recombination ($z = 1100$) and physical process along the line of sight. I will discuss recent results from the Wilkinson Microwave Anisotropy Probe and planned ground and space-based observations. The talk will emphasize the role of CMB observations in determining the initial conditions for the growth of structure and as a probe of the physics of re-ionization.