



# Sommerfeld Theory Colloquium

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Near-Pristine Gas at High Redshifts:  
First Stars, Big-Bang Nucleosynthesis,  
and Limits on Dark Radiation

In this seminar, I shall describe recent work by our group on identifying pockets of gas at high redshift that have undergone minimum processing through stars. The chemical composition of such gas still bears the imprints of the first few generations of stars that formed only a few hundred million years after the Big Bang, and thereby gives us clues to the physical properties of these still mysterious objects which heralded the so-called ‘epoch of reionisation’. Near-pristine gas at high redshift is also the astrophysical environment where the primordial abundance of deuterium can be measured most precisely. I will show how determinations of the cosmic density of baryons from Big-Bang Nucleosynthesis and from the Cosmic Microwave Background have now reached comparable precision, in both cases of order of a few percent. The excellent agreement between these two measures at widely different cosmic epochs places interesting limits on the existence of relativistic particles beyond the standard model of physics.

Wednesday, 4 December 2013, 16:15h, Room A348/349, Theresienstr. 37/III

Prof. V. Mukhanov, Prof. G. Dvali, Prof. I. Sachs