

## Gas flows in distant galaxies: from current facilities to ELT (Roberto Maiolino) (I)

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Galaxy formation and evolution is critically regulated by the flow of gas into and out of galaxies. While theoretical models and cosmological simulations have extensively investigated these phenomena and provided detailed predictions, observations still lag behind due to observational difficulties in detecting signatures of these processes, especially at early cosmological epochs, when these mechanisms are thought to be most relevant.

I will illustrate some progress in this area by reporting some results obtained by combining an ESO-KMOS Large Programme (KLEVER), MUSE data and ALMA observations, which provide important direct or indirect information on gas flows in galaxies and quasar hosts at  $z > 1$  out to  $z \sim 7$ .

I will then discuss the limitations of the currently available observations and the main outstanding open issues. I will therefore illustrate how the cutting edge instrumentation at the forthcoming ELTs will enable major progress in this field.

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