Deuterium (D) was produced in the first thousand years after the Big Bang, and it is destroyed in the interior of stars.

Primordial (Big Bang) abundance of D/H is \((2.55\pm0.03)\times10^{-5}\) (Zavarygin et al. 2018).

Since there is no other source of deuterium, the D/H ratio in the Universe is expected to decrease with time.

The study of the evolution of D/H in the ISM of galaxies will directly tell us about its degree of gas processing, the star formation history, and the nucleosynthesis evolution of the galaxy, including the possible events of gas accretion.

**ALMA OBSERVATIONS**
- The superb sensitivity of ALMA allows the observations of deuterated species in external galaxies.
- We present for the first time the D/H ratio in the starburst galaxy NGC 253 (d=3.5 Mpc).
- ALMA Bands 4 & 5
- Beam of ~1.5" (25 pc)
- High sensitivity of ~200 µJy (in 20 km/s)
• First detection of DCN in a external galaxy
• Upper limits for DCO⁺ and N₂D⁺.

**PRELIMINARY CONCLUSIONS**

1) Evidence of HCN deuteration.

2) D/H limit from HCO⁺ consistent with the cosmic value.

3) The lower D/H ratio in the centre of the galaxy suggests that the gas is strongly processed without substantial gas accretion of fresh material toward the central black hole.

Credit: ESO/INAF-VST