

# Molecular processes between the stars

## Content

The space between the stars is not empty but filled with a very dilute gas. In spite of the extremely low temperatures and densities, these clouds contain a surprisingly rich and interesting chemistry, as evidenced by the detection of more than 200 different molecules, from simple to complex.

These clouds are also the birthplaces of new stars and planets. New facilities such as the Atacama Large Millimeter Array and the James Webb Space Telescope allow us to zoom in on dense cloud cores and planetary system construction sites with unprecedented sharpness and sensitivity.

Spectral scans of young disks contain tens of thousands of rotational lines, revealing water and a surprisingly rich variety of organic materials, including simple sugars and high abundances of deuterated species.

How are these molecules formed and what molecular processes play a role? How common are they? How do abundances compare with those found in comets by the Rosetta mission to 67P? Can they be delivered to new planets and form the basis for life elsewhere in the Universe?

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**Contribution Type:** Invited talk