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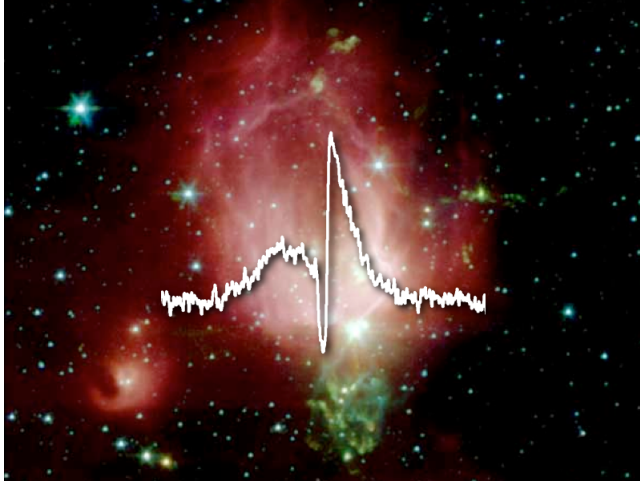
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MOLECULES FROM CLOUDS TO PLANETS: SWEET RESULTS FROM ALMA

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One of the most exciting developments in astronomy is the discovery of thousands of planets around stars other than our Sun. But how do these exo-planets form, and which chemical ingredients are available to build them? Thanks to powerful new telescopes, especially the Atacama Large Millimeter/submillimeter Array (ALMA), astronomers are starting to address these age-old questions scientifically. Stars and planets are born in the cold and tenuous clouds between the stars in the Milky Way. In spite of the extremely low temperatures and densities, a surprisingly rich and interesting chemistry occurs in these interstellar clouds, as evidenced by the detection of more than 180 different molecules. Highly accurate spectroscopic data are key to their identification, and examples of the continued need and close interaction between laboratory work and astronomical observations will be given.

ALMA now allows us to zoom in on solar system construction for the first time. Spectral scans of the birth sites of young stars contain tens of thousands of rotational lines. Water and a surprisingly rich variety of organic materials are found, including simple sugars and high abundances of deuterated species. How are these molecules formed? Can these pre-biotic molecules end up on new planets and form the basis for life elsewhere in the universe? Stay tuned for the latest analyses and also a comparison with recent results from the Rosetta mission to comet 67 P/C-G in our own Solar System.