

Seeds Of Life In Space (SOLIS): An IRAM-NOEMA large programme to investigate organic chemistry in solar-type star forming regions

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Terrestrial life is based on organic chemistry, which appears to originate in interstellar clouds, the progenitors of Solar-like systems. Indeed, a large number of organic molecules are present in the interstellar medium. These are referred to as iCOMS (interstellar Complex Organic Molecules), and are typically defined as carbon-bearing molecules with six or more atoms.

How did organic chemistry develop during the formation our Solar System and Earth, where chemical complexity has reached its highest known level, i.e life? Addressing these two major questions is the main goal of SOLIS (Seeds Of Life In Space), an IRAM large program that makes use of NOEMA (NOthern Extended Millimetre Array) interferometer to systematically study a set of key iCOMS in a well-known sample of sources that covers the early phases of solar-type star formation. In this contribution, I will give an overview of SOLIS [1] and present a selection of its first results, which mainly regard the growth of cyanopolyynes (HC₃N, HC₅N) [2] and the formation of the prebiotic precursor formamide (NH₂CHO) [3].

Finally, while sensitive spectral observations are a crucial ingredient to meet our goals, I will also stress the importance of joining efforts with experts on both theoretical and experimental chemistry in order to make progress.

References

[1] Ceccarelli, C., Caselli, P. Fontani, F. et al., *ApJ*, 850, 176 (2017)

[2] Fontani, F., Ceccarelli, C., Favre, C. et al., *A&A*, 605, A57 (2017)

[3] Codella, C., Ceccarelli, C., Caselli, P. et al., *A&A*, 605, L3 (2017)