# Unveiling the hot corinos nature combining mm and cm wavelengths: A new era with SKA

Marta De Simone*[1,2]

[1]Institut de Planétologie et dÁstrophysique de Grenoble – Université Grenoble Alpes – 414, Rue de la Piscine BP 53 38041 Grenoble Cedex 9, France
[2]INAF - Osservatorio Astrofisico di Arcetri – Italy

**Abstract**

Authors: **M. De Simone**, C. Ceccarelli, C. Codella, B.E. Svoboda, C.J. Chandler, M. Bouvier, S. Yamamoto, N. Sakai, P. Caselli, C. Favre, L. Loinard, B. Lefloch, H. B. Liu, A. Lopez-Sepulcre, J. E. Pineda, L. Testi
Hot corinos are the central planet-forming regions of Solar-like protostars enriched in interstellar complex organic molecules (iCOMs). Evidence shows that they are the likely analogues of the early Solar System.
Deceivingly, after almost 20 years of hunting, only less than twenty hot corinos are known. Many of them are binaries with the two components showing different millimeter molecular spectra. There are two possible explanations for why hot corinos are so difficult to find and why the millimeter spectra of coeval objects are so different: 1) the dust is so optically thick that hides the molecular lines; 2) the different observed spectra reflect an intrinsic chemical diversity probably due to the different composition of the grain mantles, formed in the prestellar phase.

Pilot projects performed using JVLA observations of CH3OH and NH3 toward a sample of objects in Perseus, demonstrated that indeed dust hides hot corinos with the large dust column densities, that the history of their ice mantles can be different, and that abundances derived at sub-mm regimes can be severely underestimated.
These studies pave the way to the strict collaboration of (sub-)millimeter facilities, such as IRAM/NOEMA, with centimeter ones, like the Square Kilometre Array (SKA) observatory. The latter promises to be the perfect and only facility capable to overcome the current limits in sensibility and spatial resolution in the cm range. In particular, SKA observations at high frequencies (band 6) will provide an unprecedented combination of high sensitivity and high angular resolution, as it will allow to observe more complex iCOMs with abundances lower than the CH3OH one (of at least few order of magnitude) at small angular scales ($< 10$ au) fully sampling the planet-forming hot corinos region.

*Speaker