

---

# Carbon Chemistry in AGB stars. The first results of the Nanocosmos Project

José Cernicharo\*<sup>†1</sup> and Jose Angel Martin-Gago

<sup>1</sup>INSITUTO DE CIENCIAS DE MATERIALES DE MADRID (ICMM-CSIC) – Spain

## Abstract

We present in this talk the first results of the Stardust machine concerning Carbon-chemistry. In evolved stars chemical models have problems to produce abundant C<sub>n</sub> species for n > 3 due to the presence of many competitive reactions, mainly those producing C<sub>2</sub>H<sub>2</sub>, CH<sub>4</sub> and C<sub>2</sub>H<sub>4</sub>. In our experiments we have observed that the yield of nanoparticles from a cloud of atomic carbon is very low compared to other materials. Our interpretation is based on the difficulty to produce large clusters from small ones due to many forbidden reactions involving small clusters. We have modelled the formation of C<sub>2</sub>, C<sub>3</sub>, and larger carbon clusters, together with silicon-carbon clusters, in the atmosphere of carbon-rich evolved stars and contrasted these models with observations from ALMA, the 30m IRAM telescope. The first results from the stardust machine will be also shown.

---

\*Speaker

<sup>†</sup>Corresponding author: jose.cernicharo@csic.es