Title: Dust in debris disks, from exo-Kuiper belts to exozodis

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One of the most prominent goals of astronomical sciences is to unravel whether we are alone in the Universe or not. In its recently issued decadal survey, the whole astronomical community identified future space missions dedicated to this endeavor as an utmost priority. As a result, the next decade of the field of exoplanetary sciences will be focused on developing the technology and instruments that will allow for the direct observation of exoplanets in the so-called Habitable Zone (HZ) of their host stars. As these exoplanets orbit where water could exist in liquid form, they seem at first to be excellent candidates to search for biomarkers in their atmospheres. However, the early stages of planet formation often lead planets forming there to undergo extreme radiations from their host star, leading them to be sterile.

This means that it takes more than orbiting in the HZ to make a given planet a relevant target for the search for exolife. The actual best candidate systems are those in which we have indications that water and volatiles frozen beyond the iceline have been transported towards the HZ. Beyond the ice-line, the mass of km-sized bodies that make up reservoirs analogues to the Solar System's Kuiper Belt and Asteroid Belt -- called "debris disks -- is essentially dominated by water and simple organic molecular ices. It is through interactions between planets and these reservoirs that seeds for life can be transported to the innermost parts of a system, under the form of exocomets. These in turn can also deliver dust in the HZ as they sublimate, generating analogues to the Solar System’s Zodiacal Cloud, an exozodi.

I am a global specialist of planets and debris disks interactions, and of the dynamical production of exocomets and exozodis. In this talk, I want to take you through a tour of exoplanetary systems from their outermost icy comet belts to the star’s sublimation radius. I want to brush for your a broad picture of how planets, comets, dust grains are interconnected, how the study of dust is central to this picture, and what techniques I use to get informations on this dust (ALMA, LBTI).