TOPIC 2 - Observations of debris disks: far-IR to mm

Debris disks observations from the far-infrared to millimeter: recent perspectives and future outlooks

Our Invited Speaker

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Observations of debris disks in the far-infrared and millimeter provide unique insights into the structure, evolution, composition and dynamics of cold outer belts, at radii spanning 10s--100s of au. Whilst in the far-infrared, Herschel provided ground-breaking insights to typical disk properties, in recent years progress in these wavelength regimes has been dominated by longer wavelength sub-/millimeter observations, in particular ALMA. ALMA's high angular resolution and sensitivity has enabled resolved spatial mapping of now dozens of debris disks in their continuum dust and gas via CO observations, expanding on core discoveries made by the SMA, NOEMA and JCMT. New sub-/millimeter observations are now readily enabling the extraction of debris disk radial and vertical structures, and in many cases the first spatially resolved sub-structures in planetesimal belts, such as rings, gaps, and clumps.

In this talk I will broadly review the past decade of key insights and advances for debris disk observations beyond 40um. I will primarily focus on the most recent results and trends, and discuss the connections that have been made to our broader understanding of planetary system evolution, and planet-debris disk interactions. I will also discuss the future landscape for far-infrared to millimeter instruments and observations for debris disk science, covering planned science programs (e.g. ARKS), observatory upgrades (e.g., SMA, ALMA), and proposals for new space-based telescopes and ground-based facilities.