

# Dust in the Outer Solar System

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Cosmic dust is, as the name suggests, all across the universe. It exists between galaxies, in galaxies, between stars, and close to the stars, where the dust is either primordial and represent building material for planets or is secondary being produced in mutual collisions of planetesimals. In the latter case these so-called debris dust is detected via infrared excess or in resolved images. The link between the dust and the dust-producing planetesimal belt can then be established by modelers. Here we show, using the example of the Kuiper belt, that this link is not always unique at least for tenuous debris disks. It may not be possible to infer properties of planetesimals from dust or vice versa, because it is unseen mid-sized objects that set the properties of the dust distribution.

In the model presented here we found in the Kuiper belt that only objects smaller than a hundred meters are responsible for the dust production, while larger objects are not yet part of the collisional cascade. Staying consistent with dust impact and thermal emission measurements, we show that it is still possible to have different size distributions for the dust, using the same population of transneptunian objects as parent bodies.