

Contributed Talk

Splinter Exoplanets

DEBRIS DISKS IN PLANETARY SYSTEMS

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Debris disks are belts of comets, asteroids, and their dust around main-sequence stars. This circumstellar material represents a natural component of planetary systems – just as planets themselves. The incidence rate of debris disks, about one-fifth for solar-type stars, is roughly comparable to the frequency of exoplanet detections with current techniques. Debris disks serve as tracers of directly invisible small bodies and carry signatures of as yet undiscovered planets. They also reflect the accretion history and composition of planetesimals and bear imprints of the dynamical evolution of the entire systems, including planetary migration and scattering. Warm debris dust observed in some of the systems may indicate the ongoing terrestrial planet formation, as well as violent dynamical instabilities leading to orbital re-arrangement of planets. Thus debris disks have a vast potential as a source of information on planetary systems, complementary to the direct studies on exoplanets and their host stars.

In 2015, the German Research Foundation (DFG) established the Research Unit FOR 2285 “Debris disks in Planetary Systems”. The Research Unit, running till at least 2019, is the first large-scale coordinated program in the German research landscape to focus on debris disks. The program is a joint effort of the University of Jena, Technical University of Braunschweig, University of Kiel, and the Hamburg Observatory. We employ state-of-the-art theoretical and laboratory methods to deeply analyze a wealth of observational data available and to prepare future observations of debris disks. We also carry out and interpret our own observations with facilities such as ALMA and SOFIA. This talk will briefly characterize the Research Unit and present some of the recent highlights from our ongoing research. It will also discuss the placement of the Research Unit among the other coordinated programs on exoplanets in Germany.