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Climate and Habitability of Tidally Locked Planets

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Among the 4000 exoplanets confirmed since the year of 1992, most of them are orbiting around M dwarfs. About 15 exoplanets are most likely to have a rocky composition and meanwhile in the habitable zone within which the surface is temperate to maintain liquid water. Most of the 15 planets are likely in tidally locked orbits due to the effect of strong tidal forces. In this talk, I will introduce recent outstanding on the climate and habitability of tidally locked planets, based on the results of 3D planetary global climate models. I will focus on the effects of clouds for planets near the inner edge of the habitable zone, oceanic heat transport in the middle regions of the habitable zone, and sea ice flows in the outer ranges of the habitable zone.

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