

Name: Aiara Lobo Gomes
Email: gomes@mpia.de
Institution: Max-Planck-Institut fuer Astronomie
Title: Vortices being killed by planets in disks under thermal relaxation
Type: Contributed Talk
Session: Planet Formation and Migration Theories
Abstract: Observed vortices in disks have recently been associated with planets, e.g. that the vortex has formed in the pressure maxima at the outer edge of the gap in the disk created by the planet. Here we show that the mechanism that can create vortices in radial stratified accretion disks - the disk needs to be buoyantly unstable in the radial direction and have a thermal relaxation in the order of one orbital period - will here damp the vortex, because the outer wall of a gap is buoyantly stable. When pressure and entropy radially decrease, or more general the entropy and pressure gradient have the same sign, then vortices can get amplified. But in the case of a gap rim pressure increases, while entropy decreases, thus the stratification is stable. We show in analytical arguments and by numerical simulations, that the detection of a vortex is a good argument that inside to this structure there is no planet.