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Revisiting migration in a disc cavity to explain the high eccentricities of warm Jupiters

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The distribution of eccentricities of warm giant exoplanets is commonly explained through planet--planet interactions, although no physically sound argument favours the ubiquity of such interactions. No simple, generic explanation has been put forward to explain the high mean eccentricity of these planets.

In this talk, I will present a simple, plausible explanation to account for the eccentricities of warm Jupiters: migration inside a cavity in the protoplanetary disc. Such a scenario allows to excite the outer eccentric resonances, a working mechanism for higher mass planets, leading to a growth in the eccentricity while preventing the drag from non-corotating eccentric gas to damp eccentricity. This idea is tested with diverse numerical simulations, which show that the eccentricity of a Jupiter-mass planet around a Sun-like star can increase up and settle to ~ 0.4, a value never reached before with solely planet--disc interactions. This high eccentricity is comparable to, if not larger than, the median eccentricity of warm Saturn- to Jupiter-mass exoplanets.

I will finally discuss the effects such a scenario would have on observations, notably on the discs lifetime and the physics of inner disc dispersal.