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Hiding resonant planets behind a big friend

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The characterization of the interplay between the inner and outer parts of planetary systems has long been impractical due to the separated detection ranges of the corresponding observation techniques. However, this gap is closing thanks to the technical improvements of the instruments and the longer observational baselines, and statistical insights are already within reach on the impact of cold Jupiters on super Earths. In this talk, I would like to present a theoretical study on the influence of an external giant planet misaligned with inner resonant planets, within the circular restricted problem. The behavior of the system depends on the relative strength between the coupling of the planets and the perturbations from the outer body. We demonstrated that mean-motion resonance strengthens the inner coupling and is very resilient to the perturbation, surviving periodic relative inclination increases of tens of degrees between the inner planets. This study has applications for the indirect detection of exoplanets, as well as the understanding of their formation and evolution, in particular the role of mean-motion resonance and relative inclinations.