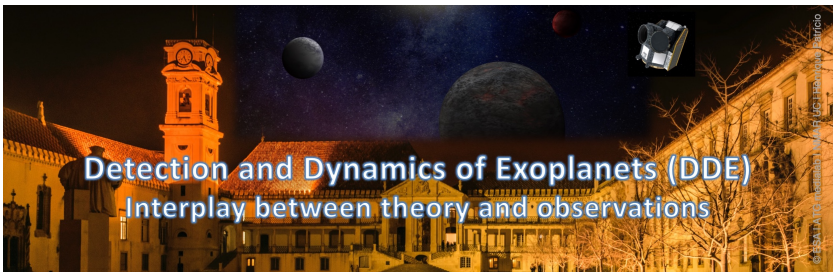

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General AMD-stability criterion for exoplanet systems

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The increasing discovery of extrasolar systems has made it necessary to study their stability. In this work, we present a generalization of the AMD-stability criterion defined by Laskar and Petit (2017), which defines a critical AMD-value below which close encounters are prevented and the system can be considered stable. This secular approach does not take into account mean-motion resonance overlap which can be considerable for compact multi-planet systems. We present a new AMD-framework that extends the resonance overlap criterion previously introduced by different authors. This more general approach highlights the importance of eccentricity diffusion and is also valid for 3D planetary systems. We evaluate the performance of the proposed framework on several compact two- and three-planet first-order resonant systems and discuss how the criterion could be useful for filtering observational data, thereby improving the robustness of stability predictions for newly discovered systems.
This is a joint work with A. C. Petit and A.-S. Libert.

Presenter: BODART, Justine (Université de Namur)

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