

Shaping the Italian contribution to HWO



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AI Assisted observational strategies for HWO

Friday 11 July 2025 14:05 (15 minutes)

In this talk we will present how Machine Learning and AI-Assisted algorithms, based on fully Bayesian methods, may help to define the observational strategies of the Habitable Worlds Observatory (HWO) mission by maximizing the scientific returns while making the best possible use of the available observing time.

We will focus on the proposed fully-bayesian approach for radial-velocity follow up of TESS targets (e.g. Loredó et al 2012; Burt et al 2018; Cabona et al 2021) and we will review how this kind of methodologies for automatic scheduling will be used, in the next very few months, for ground-based spectrographic instrumentation (where scheduling constraints are more challenging compared to space-based observations.) for the European Southern Observatory NTT Son-Of-Xshooter (e.g. Asquini et al 2024).

The ability to leverage these algorithms will be relevant not only for an operational mission, which may still be far in the future, but also for assessing the scientific return on simulated observation plans. Taking into account the current expected performance of HWO instrumentations and the Bayesian-informed observation plans computed, it is possible to analytically assess the scientific return expected from the observations and how synergies between HWO and the next-generation ground-based instrumentation for extremely large telescopes (such as ANDES for the ESO-ELT) could be developed.

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