

## From the white paper to the dark sky: quantifying the capabilities of the next-generation telescopes using simulations

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Modern astronomy is strongly supported by the considerable development of the technology: the effort towards probing new AO methods, building new instrumentation and systems is tightly correlated to the progress in science. The next generation of telescopes have to demonstrate to be up to the task, meeting the expectations of the astronomical community. This can be partially ensured conducting preliminary simulations to quantify their capability, usually selecting some key science cases presented in white books as science drivers. In this talk I will discuss how close-to-real simulations can serve as a tool to help the complex interaction of data construction. They also go simultaneously with the definition of some characteristics of the instrument itself, being one of the most efficient way to validate scientific proposals, flow down requirements into quality of the data products, or means for the solution of technical trade-off processes. In particular, I will refer to my experience in the context of the ELT+MAORY and MAVIS projects.

**Primary author:** Dr PORTALURI, Elisa (INAF - OAPD)

**Presenter:** Dr PORTALURI, Elisa (INAF - OAPD)

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