

## Updates on ARC: R&Ds for ET, cryogenic strategies without cryo-liquids

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The Amaldi Research Center (ARC), located in Sapienza University of Rome, will host the first experiment of a cooling system for an actual-sized cryogenic payload. Following the solid conduction cooling scenario, two refrigeration lines, each driven by two Pulse Tubes cryocoolers, will be used to cooldown a cryogenic payload hosted in a specifically designed 3 m tall cryostat.

While one refrigeration line has already been built, the other, along with the cryostat and the payload, is now under construction and will be ready in 2025.

Before that date, the entire system must be properly designed and simulated to ensure the success of the cooling and to optimize the cooling time.

Hence, several experimental tests and simulations are progressing.

The goal is to investigate the thermal properties of the components of the solid conduction path from the cryocoolers to the mirror and the mechanical properties of the sapphire elements of the payload suspensions.

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