

PerAPS

2025 MERCOLEDÌ

9 APRILE

ORE 15:00 – AULA A



A.D. 1308
unipg

DIPARTIMENTO
DI FISICA E GEOLOGIA



A constellation of ASTRI to study the Universe

Simone Iovenitti



ASTRI is an Italian project dedicated to the study of very high-energy astrophysical phenomena up to 100 TeV and beyond. Following the success of the first prototype instrument, ASTRI-Horn, located in Italy, the project has now entered the realization phase of the Mini Array: a system of nine identical Cherenkov telescopes operating in stereoscopic mode in Tenerife, Canary Islands. Moreover, the ASTRI design has also been adopted for the Small Size Telescopes (SSTs) of the Cherenkov Telescope Array Observatory (CTAO) in Chile, where more than 50 telescopes will be installed.

The ASTRI instruments feature a unique design. They implement a dual-mirror Schwarzschild-Couder optical configuration (never adopted before in gamma-ray astronomy) and use a custom Cherenkov camera based on miniaturized SiPM sensors instead of traditional large photomultiplier tubes. While these technological advancements provide ASTRI with unprecedented scientific opportunities, they also introduce significant calibration challenges. For instance, ASTRI telescopes are almost blind to the steady flux of stars in their field of view, making pointing calibration particularly critical, as the compact structure of the telescopes prevents the installation of auxiliary monitoring cameras sharing the same optical system. For the same reason, the alignment and focusing of the 18 segments of the primary mirror represent another challenge, requiring specialized strategies and procedures.

During this seminar, we will explore the operating principles of Imaging Atmospheric Cherenkov Telescopes (IACTs). We will then discuss the scientific goals and perspectives of the ASTRI project, examining both its strengths and critical aspects. Finally, we will present the current status of the array... directly from Tenerife!