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RESEARCH INFRASTRUCTURES LST-1, THE FIRST CTA TELESCOPE, INAUGURATED

LST-1, the Large-Sized Telescope, prototype of the four LSTs planned on the north site of the CTA, Cherenkov Telescope Array, was inaugurated on 10 October at the Roque de los Muchachos Observatory on the

island of La Palma in the Canary Islands. LST-1 is, in fact, the first telescope on a CTA site. CTA is a global initiative, in which Italy is participating with INFN and INAF (National Institute for Astrophysics), which involves more than 1.400 scientists and engineers from 31 countries in the scientific and technical development of the biggest and most sensitive high-energy gamma-ray observatory in the world, with approximately 120 telescopes divided between two sites: one in the northern hemisphere at the Roque de los Muchachos Observatory, and the other in the southern hemisphere near the existing site of the Southern Observatory of Paranal, in Chile. The newly inaugurated LST-1 telescope has a parabolic reflecting surface of 23 metres in diameter, supported by a tubular structure in carbon fibre reinforced with steel tubes. The 415 sqm reflecting surface collects and focuses the Cherenkov light in the chamber, where photomultiplier tubes convert and amplify it into electrical signals that are processed by dedicated electronics. Although LST-1 is 45 metres high and weighs approximately 100 tonnes, it is able to swivel to any point in the sky in less than 20 seconds, in order to acquire signals as quickly as possible. The LSTs will extend the observational potential to weaker sources and at cosmological distances. Both the repositioning speed and the low energy threshold are fundamental for the study of gamma ray transient sources in our galaxy, and for the study of active galactic nuclei and high redshift gamma rays. Together with other telescopes, they will contribute to new results and possible new discoveries in the field of high energy astrophysics, cosmic ray physics and multi-messenger astronomy, in synergy with the neutrino and gravitational wave observatories.