

# Analysis of the Cherenkov Telescope Array first Large-Sized Telescope real data using convolutional neural networks

Thomas Vuillaume, Mikaël Jacquemont,  
Mathieu de Bony de Lavergne, David A. Sanchez,  
Vincent Poireau, Gilles Maurin, Alexandre Benoit,  
Patrick Lambert, Giovanni Lamanna,  
for the CTA LST project

The Cherenkov Telescope Array (CTA) is the future of ground-based gamma-ray astronomy and the volume of data that will be produced is asking for efficient analysis methods to reach its the full potential. Convolutional neural networks (CNNs) have shown to be very efficient in many image analysis domains. In this contribution, a first analysis of CTA Large-Sized Telescope real data using a CNN able to do the full event reconstruction is proposed. After showing the gain in sensitivity on Monte-Carlo simulations, we apply our CNN to two observed sources (the Crab Nebula and Markarian 501) and compare the obtained significance with the reference analysis. Finally, we show gains in gamma-ray excess of the order of 30%, demonstrating the interest of these methods on real data for the first time.