

## Physics Department of the University of Rome-Tor Vergata



**Title:** Development of MIDDLE, a new method to identify muons from Heavy-Flavour decays in top quark events with the ATLAS detector at LHC

**Deadline:** March 10<sup>th</sup> 2024

### **Job description:**

The ATLAS Rome Tor Vergata group invites applications for a Post-Doctoral research position of 18 months based on PRIN Italian fundings. Candidates must: have a Master Degree in one of the fields specified in the call, have earned the PhD title by the application deadline and have a CV demonstrating their competences in Particle Physics.

The ATLAS Rome Tor Vergata group is involved in the ATLAS experiment since its proposal. In particular, current group interests and activities include: operations and upgrades of the TDAQ and Muon systems and data analyses on the physics of Top Quarks, Standard Model and beyond, B and Light States, and Higgs boson.

The goal of the project is to develop and setup a new algorithm called MIDDLE, based on advanced Machine Learning techniques, to identify muons from the decay of Heavy-Flavour hadrons (i.e. hadrons made of beauty or charm quarks) in top-antitop events using data collected by the ATLAS experiment at LHC. This algorithm will be then used to shed light on the dynamics of the b-quark fragmentation and to measure the top quark mass using, as a proxy, the invariant mass of the lepton (electron or muon) coming from the W boson in the  $t \rightarrow bW$  decay and the muon identified by MIDDLE in the b-quark decay chain.

The position is based in Rome with possibility to travel to CERN for short periods.

The University of Rome Tor Vergata is an equal opportunity employer.

Candidates should fill the online form at this page <https://pica.cineca.it/uniroma2/f3-2024-0003/> where all details about the eligibility are reported and arrange for 2 reference letters to be uploaded to the same webpage during the application process.

For any further detail or question, please contact Prof. Umberto De Sanctis <[umberto.de.sanctis@cern.ch](mailto:umberto.de.sanctis@cern.ch)>.