Research topics - M. Robbiati, S. Carrazza, J. M. Cruz-Martinez

My group works on some fronts involving QTI and TH department since 2020:

</> Middleware software

Development of a full-stack software for self-hosted quantum chips with simulation, control and calibration.

- *"Qibo: a framework for quantum simulation with hardware acceleration"* arXiv:2009.01845;
- *"Quantum simulation with just-in-time compilation"* arXiv:2203.08826;
- *"An open-source modular framework for quantum computing"* arXiv:2202.07017.

Quantum models for HEP

An example: Quantum Machine Learning (QML):

- *"Style-based quantum generative adversarial networks for Monte Carlo events"* arXiv:2110.06933;
- *"Determining the proton content with a quantum computer"* arXiv:2011.13934.

About me

- focus on hardware-compatible optimization techniques for QML in HEP:
  - : *"A quantum analytical Adam descent through parameter shift rule using `qibo`"* arXiv:2210.10787;
  - : quantum models for Monte Carlo integration (data generation, probability density estimation, etc.).