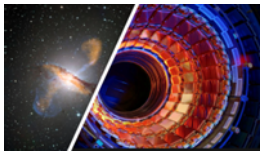
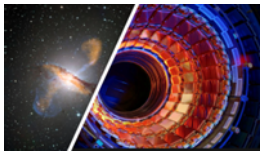
t 

PhD course of National Interest in Technologies for Fundamental Research in Physics and Astrophysics

Annual report

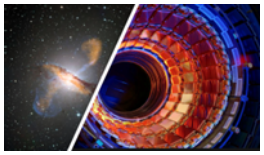
Name and surname: Robert Panai
Cycle and a.a.: XXXIX - 2023/2024
Supervisor: Andrea Contu

- **Research activity carried out during the year**

t 

-**Development and testing of quantum computing and quantum machine learning algorithms** with the intention of applying them in the second year to data analysis pipelines for gravitational waves, to explore the potential of QC. Currently, the main limitation is hardware, as the few qubits available and quantum noise make some algorithms practically unusable.

-**Development of a normalizing flow model** to map the distribution of galaxies in the universe, with the idea of using it for fast data sampling during the search for host galaxies of gravitational waves.

t 

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PhD course of National Interest in Technologies for Fundamental Research in Physics and Astrophysics

- **List of attended courses and passed exams**

  Machine learning for physics

  Advanced and scientific computing in Matlab

- **List of attended conferences, workshops and schools, with mention of the presented talks**

  .....

- **List of published papers/proceedings**

  -https://iris.unica.it/handle/11584/393463

  -https://inspirehep.net/literature/2774720

- **Thesis title (even temporary) enhancing gravitational waves research with machine learning and quantum computing**

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Date, … 12/09/2024 **Signature…**

Seen, the supervisor