Teachers and AI applied to Astronomy: the need for specific training programs

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Teachers' needs and project's structure

Secondary school teachers may feel uncomfortable introducing contemporary Physics topics and new technologies in their lessons (*see M. L. Ruggiero's talk*).

A collaboration among different institutions:

- Physics Department of Turin University
- Regional Education Office (USR)
- Territorial Training Équipe (EFT) of Piedmont
- Association of Physics Teachers (AIF)

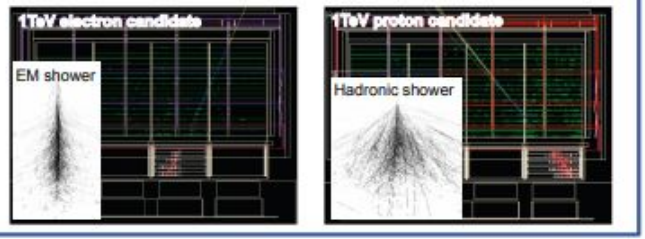
The training project:

- five meetings on site/online (2 hours each):

    1. updates from scientific and educational research
    2. tools and suggestions from expert teachers
    3. teaching-learning activities with students in the classrooms (optional)

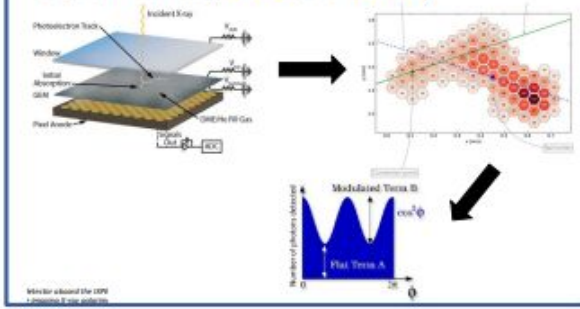
1. AI and Astronomy: hints from Research

Event selection (e.g. CR electrons Vs protons)

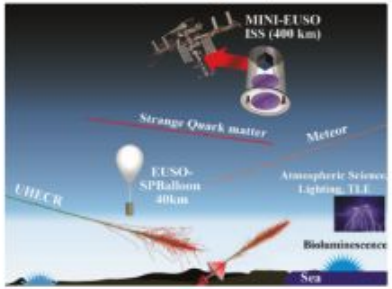


Detection and tracking of **space debris**

Track reconstruction in X-ray polarimetry experiments (**IXPE** and **eXTP**)



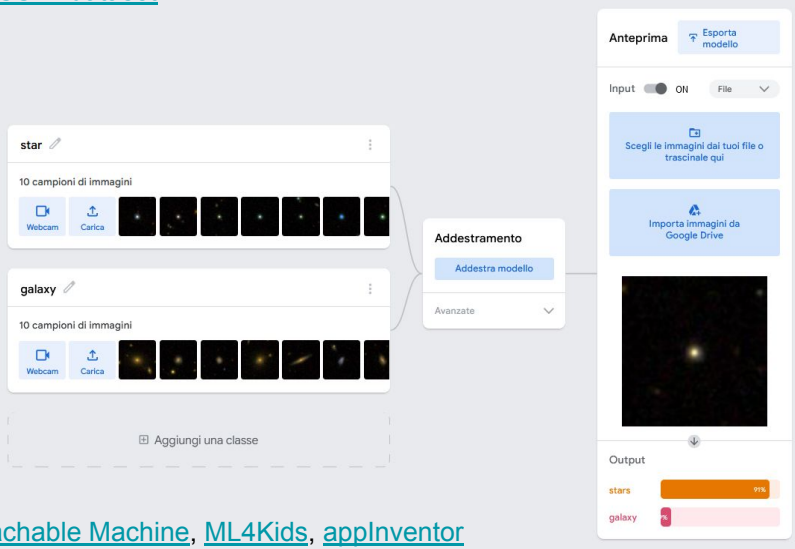
Imaging of atmospheric phenomena, meteors, bio-luminescence, strange quark matter



2. AI and Astronomy: teaching tools

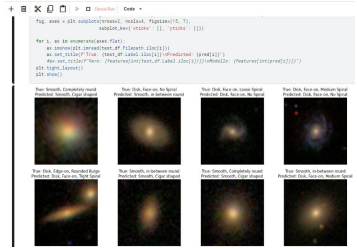
Different kinds of tools for any level

SDSS17 dataset

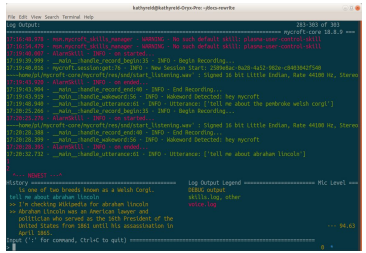


Teachable Machine, ML4Kids, appInventor

Galaxy10 SDSS dataset



Python notebooks



Mycroft AI with Picroft

3. AI and Astronomy: an example of classroom activity

The context:

- Humanities high school, limited curriculum in Physics
- 12th grade class, 16 students with no coding experience
- 2 hours deepening activity

The structure of the lesson

- Brief introduction on AI [30']
- Classification of Stars vs. Galaxies [30']
- Classification of different kinds of Galaxies [30']
- Discussion and applications [30']