

# Involving the public into HEP through IT challenges and projects

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The ATLAS collaboration has recently setup three outreach projects and global challenges which have a strong IT component and could not have been envisaged without the growth of general public computing resources and network connectivity.

HEP has exciting and difficult problems like the extraction of the Higgs boson signal, and at the same time data scientists have advanced algorithms. The goal of the Higgs Machine Learning (HiggsML) project was to bring the two together by a “challenge”: machine learning experts could compete online to obtain the best Higgs $\rightarrow\tau\tau$  signal significance on a set of ATLAS fully simulated Monte Carlo signal and background events. The first challenge of this kind ran from May to September 2014, drawing considerable attention, and new projects followed in the context of the CERN open data initiative.

Higgs Hunters is the only physics-related project hosted on a web-based citizen science platform called Zooniverse. Volunteers usually contributing to space, natural world and humanities projects are asked to scan ATLAS events, looking for secondary vertices. Their results are compared to the ATLAS secondary vertex finding algorithm in the context of the search for long-lived particles in supersymmetric models.

ATLAS@home belongs to the well established family of BOINC projects: volunteers run simulations of collisions in the ATLAS detector on their highly distributed and heterogeneous personal computers, thanks to the Virtual Machine and ARC technologies. So far many thousands of members of the public signed up and already provide a significant fraction of ATLAS computing resources.

Each of these three axes of interaction with very specific communities are in development. In this talk, the setup, current success and future of such projects will be reviewed.

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