



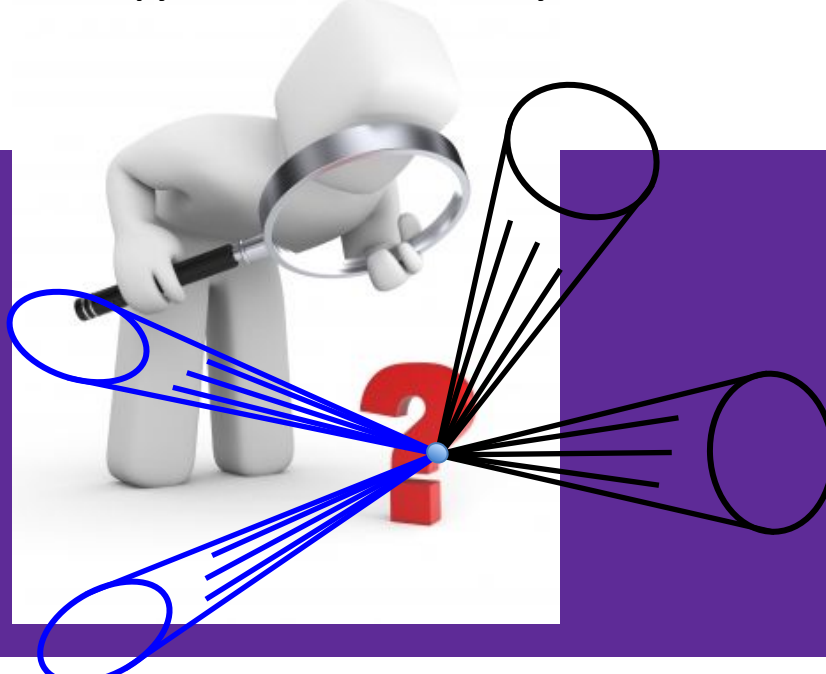
Thoughts and Ideas from Atlas OpenData



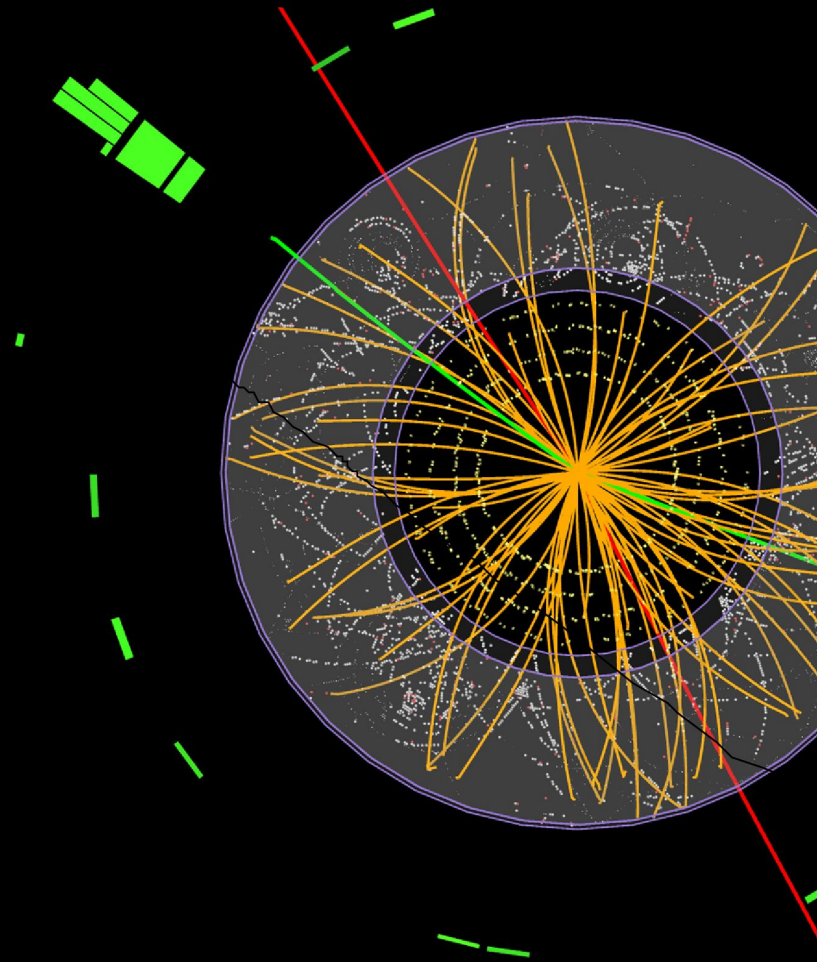
Arturo Sánchez

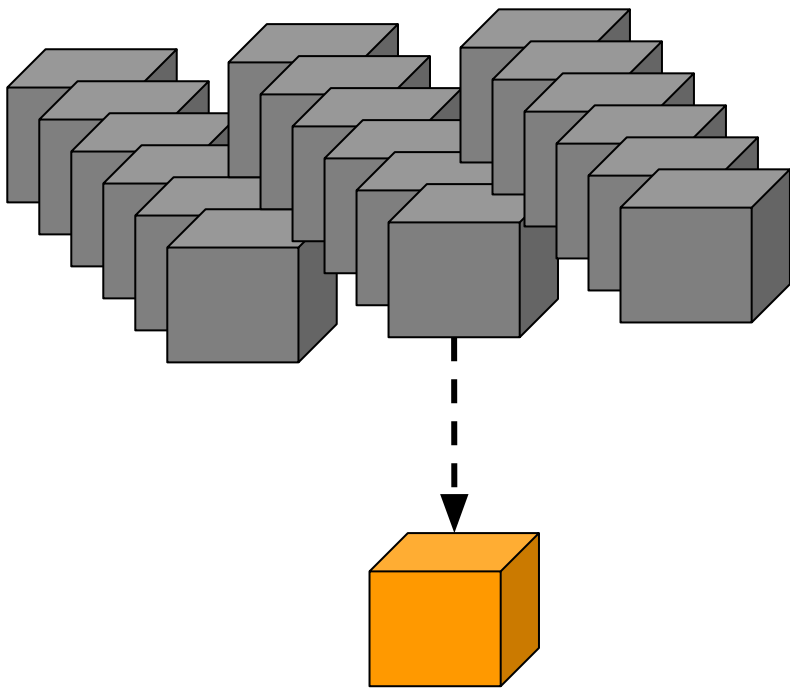
University of Naples and INFN

Jupyter for Science, February 5th, 2016



The ATLAS
collaboration is
preparing the
release of $1/\text{fb}$ of
real data and MC
this 2016...





The release...

...contains millions of events we
the hope to be use by:

- Students
 - Advance High School and University
 - PhD Students
 - Researches
 - Training for new analyzers
 - Outside ATLAS scientific community
 - General Public
 - Outreach and divulgation
 - Curious people!
-

The release is done into the CERN project: OpenData portal for the Outreach Team



ATLAS Outreach and Education

An internal website for the ATLAS Outreach Project

- Home
- Communication
- Education
- Visits & Events
- Projects
- PubCom
- Internals
- Design

ATLAS Outreach & Education

View Edit Revisions Log

Welcome

Welcome to the **ATLAS Outreach** site. This is an **internal** site describing the **organization** of the ATLAS Education & Outreach Project. It also provides links to **resources** and information useful for collaboration members contributing to outreach.

OUTREACH WORKSHOPS

[Sign up for February session](#)

QUICK LINKS

- [ATLAS Outreach e-group archives](#)
- [ATLAS Outreach FaceBook Group](#)
- [ATLAS Outreach on Indico](#)
- [ATLAS Public Website](#)
- [ATLAS Collaboration Page](#)
- [ATLAS Photo Selection \(CDS\)](#)
- [CERN Press Office](#)


opendata.cern.ch

Education

The CMS (Compact Muon Solenoid) experiment is one of two large general-purpose detectors built on the Large Hadron Collider (LHC). Its goal is to investigate a wide range of physics such as the characteristics of the Higgs boson, extra dimensions or dark matter.


[Explore CMS >](#)

For education purposes, the complex primary data need to be processed into a format (examples below) that is good for simple applications. Get in touch if you wish to build your own applications similar to those shown here




ALICE (A Large Ion Collider Experiment) is a heavy-ion detector designed to study the physics of strongly interacting matter at extreme energy densities, where a phase of matter called quark-gluon plasma forms. More than 1000 scientists are part of the collaboration.

[Explore ALICE >](#)



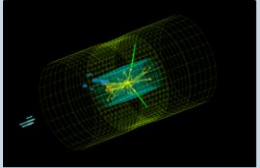
The ATLAS (A Toroidal LHC Apparatus) experiment is a general purpose detector exploring topics like the properties of the Higgs-like particle, extra dimensions of space, unification of fundamental forces, and evidence for dark matter candidates in the Universe.

[Explore ATLAS >](#)

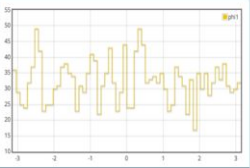


The LHCb (Large Hadron Collider beauty) experiment aims to record the decay of particles containing b and anti-b quarks, known as B mesons. The detector is designed to gather information about the identity, trajectory, momentum and energy of each particle.

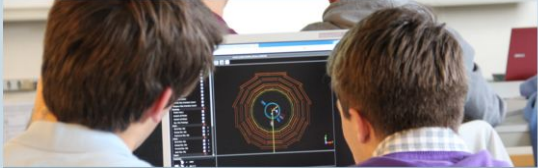
[Explore LHCb >](#)



[Visualise events >](#)



[Visualise histograms >](#)



[Learning Resources >](#)

One of the 3 (planned) levels of interaction with the samples...

It's service of RootBooks (NoteBooks + Root Kernel)

that users can use to interact with the samples!

PyROOT_Example

Terminal

Cell Toolbar: None

How to write a Python ROOTBook

In order to use [ROOT](#) in a Python notebook, we first need to import the ROOT module. During the import, all notebook related functionalities are activated. That's it. We will see also how the user can mark cells containing C++ statements with the %%`cpp` magic, producing *de facto* multilanguage ROOTBooks.

```
In [1]: import ROOT
```

Welcome to JupyterROOT 6.07/03

Now we are ready to use [PyROOT](#), the [ROOT](#) Python bindings. For example, we create a [ROOT histogram](#) and fill it with [random numbers](#) distributed according to a Gaussian.

ROOT

Data Analysis Framework

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ROOT is ...

A modular scientific software framework. It provides all the functionalities needed to deal with big data processing, statistical analysis, visualisation and storage. It is mainly written in C++ but integrated with other languages such as Python and R. [Try it in your browser!](#) (Beta)

Download or Read More ...

CMS pp ($\sqrt{s} = 13$ TeV, $N_{ch}^{min} \geq 105$)
 $1 < p_T < 3$ GeV/c

(b)

$\frac{1}{N} \frac{d^2N}{d\eta d\Delta\eta}$

$\Delta\eta$

Previous Pause Next

...We are now writing the
Notebooks that read
those samples and
create example physics
analysis under **ROOT**...