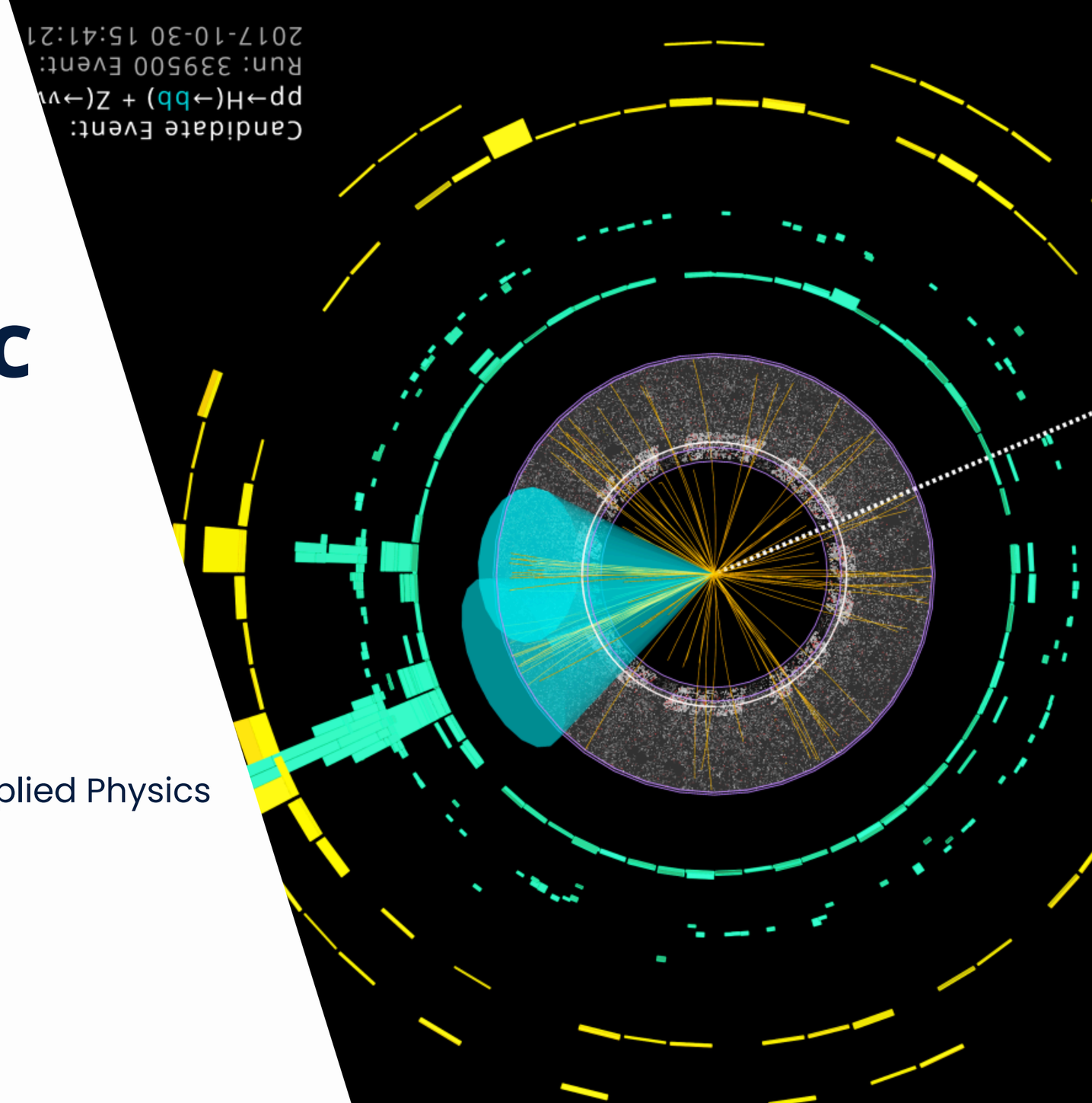
Introduction to the LHC Open Data Workshop



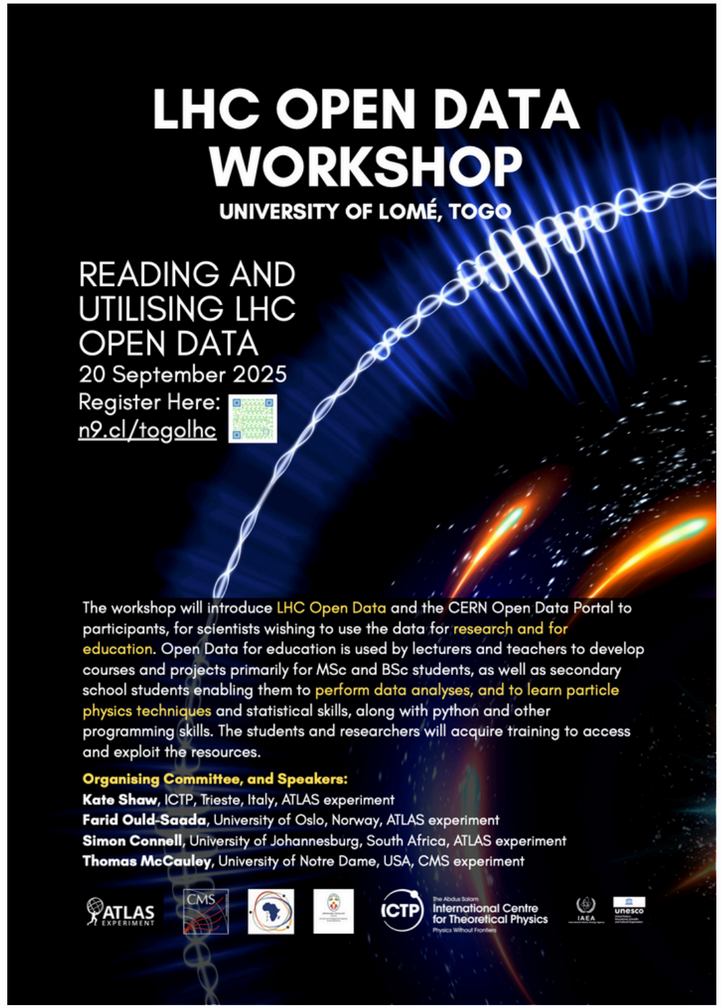
KATE SHAW

UNIVERSITY OF SUSSEX & ICTP

African Conference on Fundamental and Applied Physics

20 SEPTEMBER 2025

LHC OPEN DATA WORKSHOP



TOM MCCAULEY (EN)
UNIVERSITY OF NOTRE DAME
CMS EXPERIMENT
OPEN DATA CO-COORDINATOR FOR CMS 2024-PRESENT

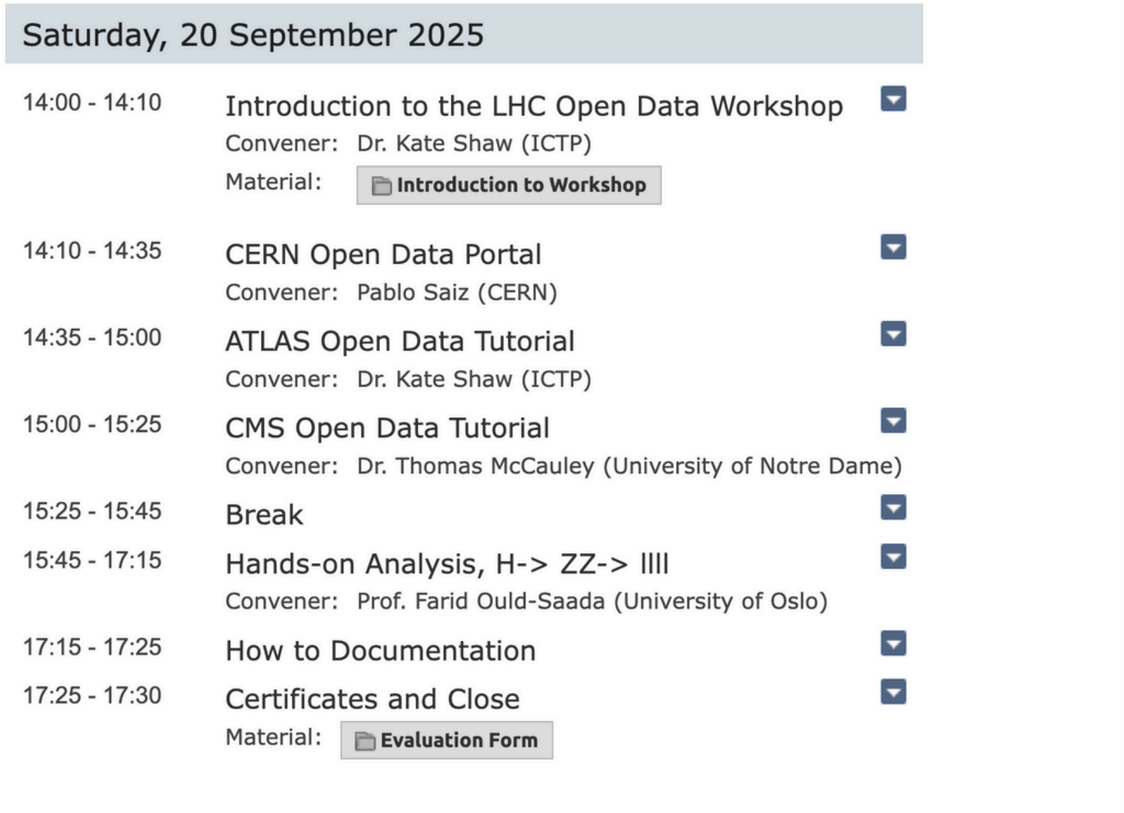
FARID OULD-SAADA (FR)
OLSO UNIVERSITY
ATLAS EXPERIMENT
ATLAS OPEN DATA DEVELOPER

KATE SHAW (EN)
ICTP & UNIVETSITY OF SUSSEX
ATLAS EXPERIMENT
OPEN DATA COORDINATOR FOR ATLAS 2014-2025

TODAY we intend to provide you training on how to access and use the LHC Open Data from the ATLAS experiment and the CMS experiment

LHC OPEN DATA WORKSHOP

https://indico.ictp.it/event/11099/other-view?view=ictptimetable
ZOOM Connection: https://indico.cern.ch/event/1458227/videoconference/



Saturday, 20 September 2025

14:00 - 14:10	Introduction to the LHC Open Data Workshop Convener: Dr. Kate Shaw (ICTP) Material: Introduction to Workshop	
14:10 - 14:35	CERN Open Data Portal Convener: Pablo Saiz (CERN)	
14:35 - 15:00	ATLAS Open Data Tutorial Convener: Dr. Kate Shaw (ICTP)	
15:00 - 15:25	CMS Open Data Tutorial Convener: Dr. Thomas McCauley (University of Notre Dame)	
15:25 - 15:45	Break	
15:45 - 17:15	Hands-on Analysis, H-> ZZ-> llll Convener: Prof. Farid Ould-Saada (University of Oslo)	
17:15 - 17:25	How to Documentation	
17:25 - 17:30	Certificates and Close Material: Evaluation Form	

All materials and links can be found on the ICTP indico page for the workshop

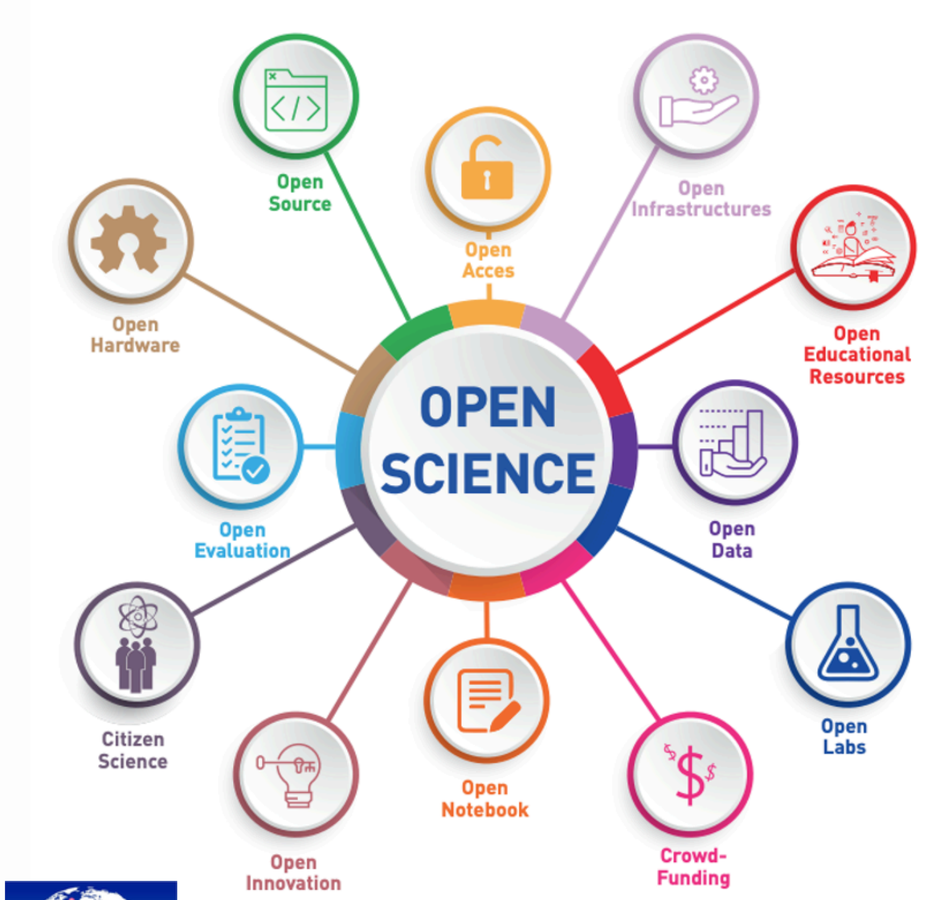
The session will be in French and English

PLEASE ask plenty of questions in French or English (online use the zoom chat)

Please follow along, and we will come around to help you, raise your hand if you need help.

LINK TO TOM CMS TALK
LINK TO FARID ATLAS TALK

Open Science Movement



UNESCO Open Science website

Open science is an **accelerator** for the **Sustainable Development Goals (SDGs) 2030** and a powerful tool to bridge the science divide between and within countries

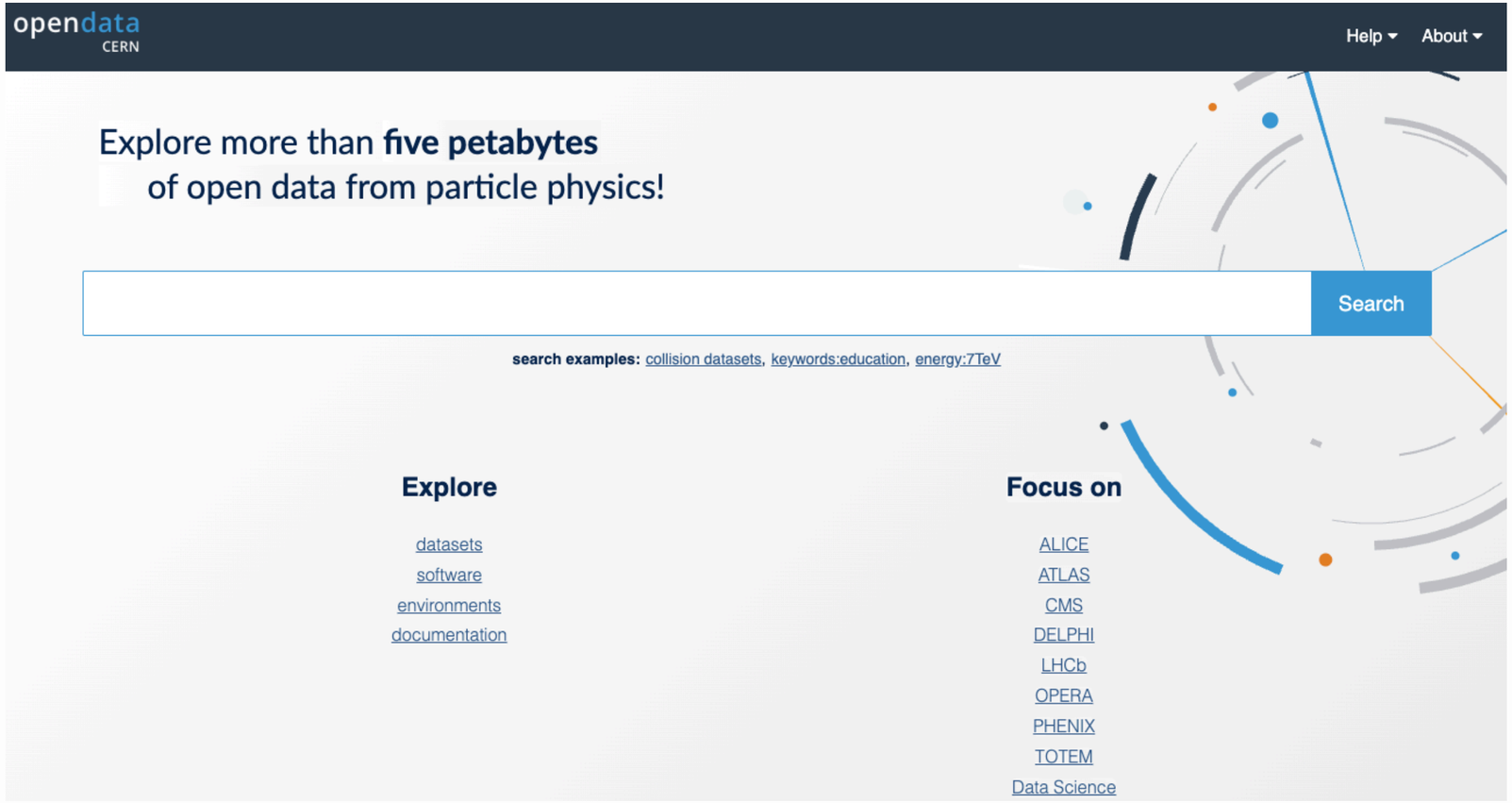
Open science aims at making scientific knowledge openly **available**, **accessible** and **reusable**.

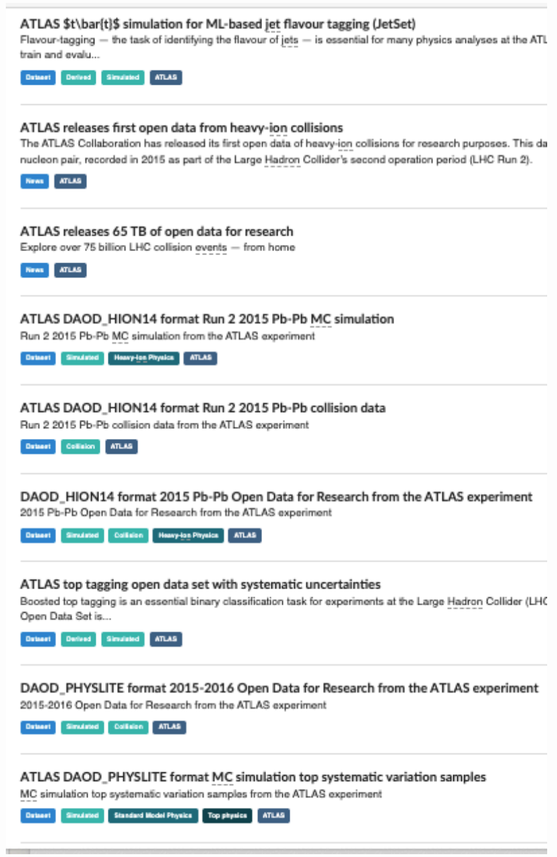
The key elements include open access to scientific publications, **data**, educational resources, software and hardware, and open infrastructures

Open Science at CERN website

CERN OPEN DATA PORTAL

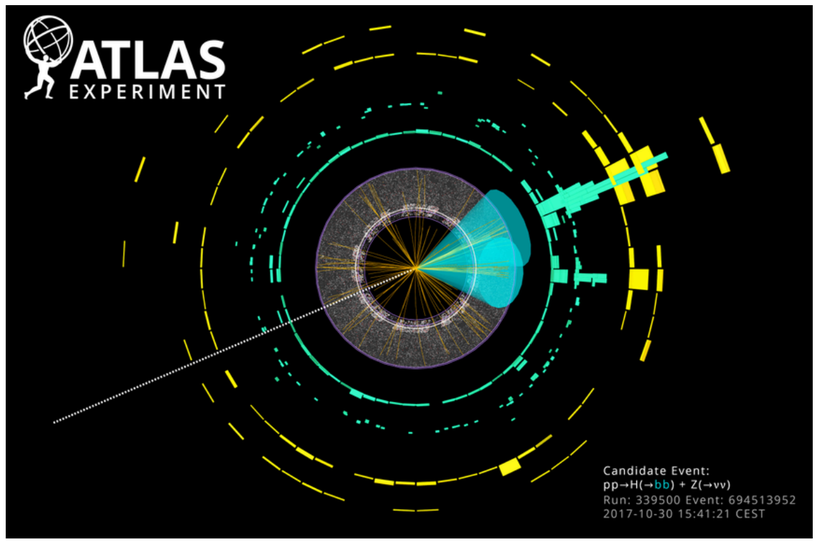
Datasets available for Research, and for Education

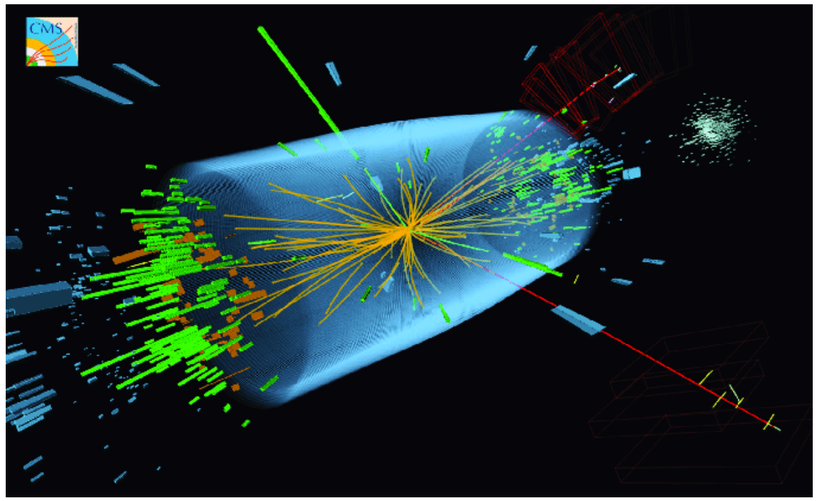




https://opendata.cern

OPEN DATA: WHAT IS IT?





Each proton proton collision creates some particles, heavy ones decay into lighter particles.

Everything flies out for the centre of the collision into ATLAS / CMS detector

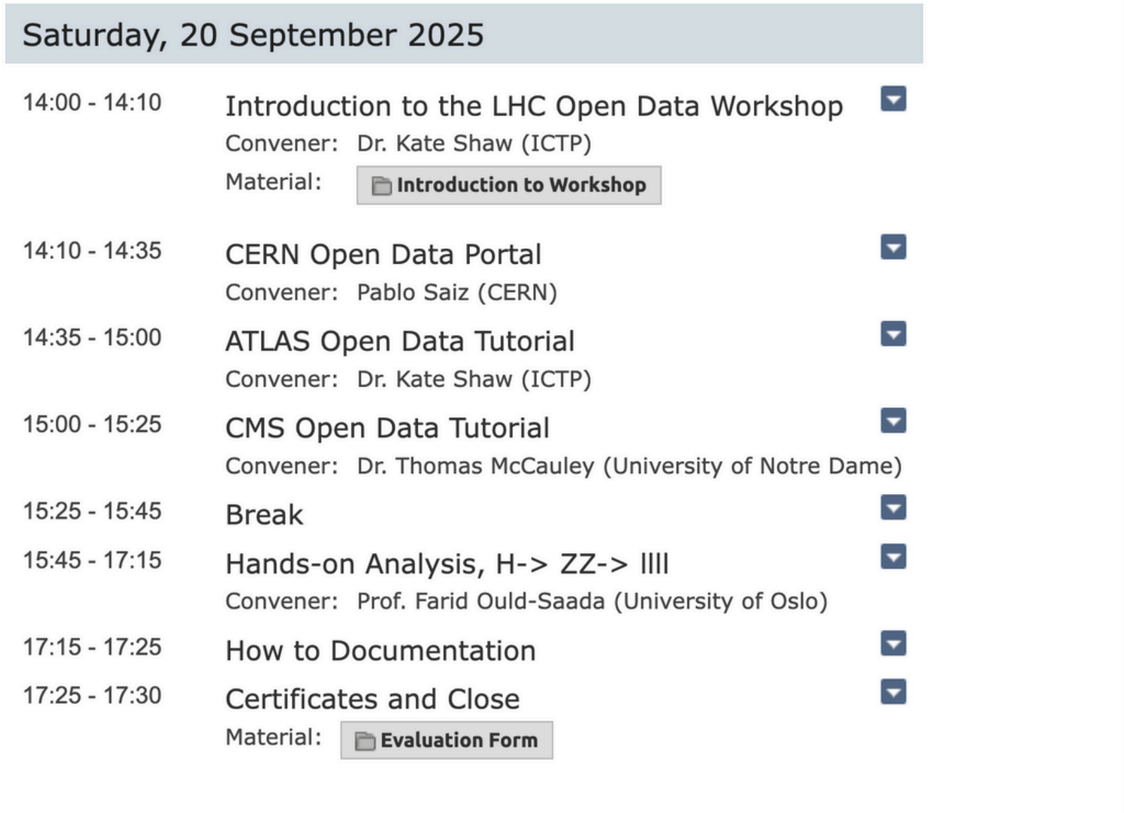
The particles interact with the detectors, and our reconstruction algorithms get to work to **reconstruct** '**objects**' such as electrons, muons, taus, jets missing ET, photons.

The NTUPLE has information such as:

- number of objects (jets, electrons, muons)
- Transverse momentum (PT) for each object
- Where the object is, in Phi and eta
- Amount of Missing Energy (GeV)

LHC OPEN DATA WORKSHOP

https://indico.ictp.it/event/11099/other-view?view=ictptimetable
ZOOM Connection: https://indico.cern.ch/event/1458227/videoconference/



Saturday, 20 September 2025

14:00 - 14:10	Introduction to the LHC Open Data Workshop Convener: Dr. Kate Shaw (ICTP) Material: Introduction to Workshop	
14:10 - 14:35	CERN Open Data Portal Convener: Pablo Saiz (CERN)	
14:35 - 15:00	ATLAS Open Data Tutorial Convener: Dr. Kate Shaw (ICTP)	
15:00 - 15:25	CMS Open Data Tutorial Convener: Dr. Thomas McCauley (University of Notre Dame)	
15:25 - 15:45	Break	
15:45 - 17:15	Hands-on Analysis, H-> ZZ-> llll Convener: Prof. Farid Ould-Saada (University of Oslo)	
17:15 - 17:25	How to Documentation	
17:25 - 17:30	Certificates and Close Material: Evaluation Form	

All materials and links can be found on the ICTP indico page for the workshop

The session will be in French and English

PLEASE ask plenty of questions in French or English (online use the zoom chat)

Please follow along, and we will come around to help you, raise your hand if you need help.

LINK TO TOM CMS TALK
LINK TO FARID ATLAS TALK