

ATLAS Outreach

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on behalf of the ATLAS Collaboration



HELLENIC REPUBLIC

**National and Kapodistrian
University of Athens**

EST. 1837

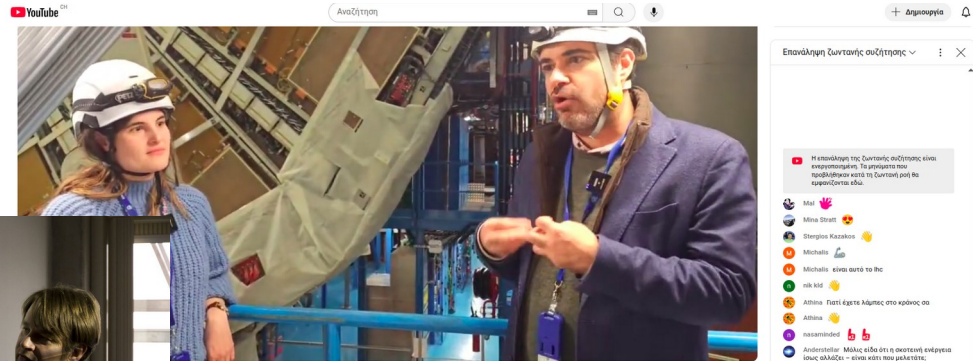


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ATLAS Outreach - Connecting Science with Society



- **Engage** the public through interactive experiences that make particle physics tangible.
- **Ignite** curiosity by revealing the wonders and breakthroughs of the ATLAS experiment.
- **Show** how fundamental research drives innovation and benefits society.
- **Inspire** young minds to pursue science, engineering, and creative problem-solving.



Target Audience

- General public
- Students in their classrooms
- STEM teachers
- University students
- Physicists
- Citizen scientist volunteers
- Media
- Policy makers



Resources

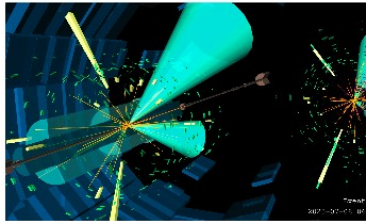
- Public webpage
- Masterclasses
- AVC visits
- Virtual Visits
- Open data releases
- Outreach projects/Educational scenarios
- Social media
- Live videos
- ATLAS printables (posters, fact sheets etc)

The ATLAS Webpage — A Global Gateway

- Main public site: atlas.cern — designed for broad audiences.
- Hosts news, physics highlights, educational content, and collaboration updates.
- Central hub for outreach programs: open data, masterclasses, media resources, event access.

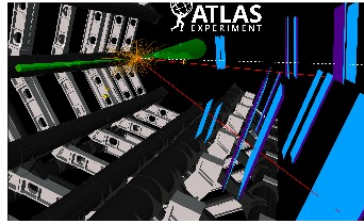


Latest News



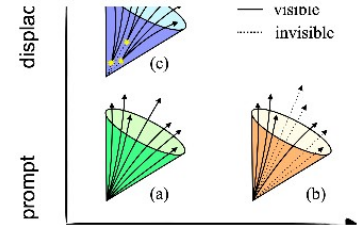
ATLAS sets record limits on Higgs self-interaction using Run 3 data

Physics Briefing | 22 May 2025



Studying the Higgs boson across the scales

Physics Briefing | 16 May 2025



Shedding light with jets from the dark side

Physics Briefing | 15 May 2025

[See more](#)

ATLAS Virtual Visits

- Live guided tours of the ATLAS experiment via video platforms.
- Include detector views, control room walk-throughs, and Q&A with physicists.
- Tailored sessions for schools, universities, and general audiences.
- Accessible worldwide — no travel needed, just curiosity!
- In 2024, 122 virtual visits were requested; in 2025, 83 have already taken place so far.



Virtual Visit Area

*FEEDBACK:
Three high-schools in Sri Lanka
on 18/11/2022 @ 8 a.m.
(right after the floods!)*



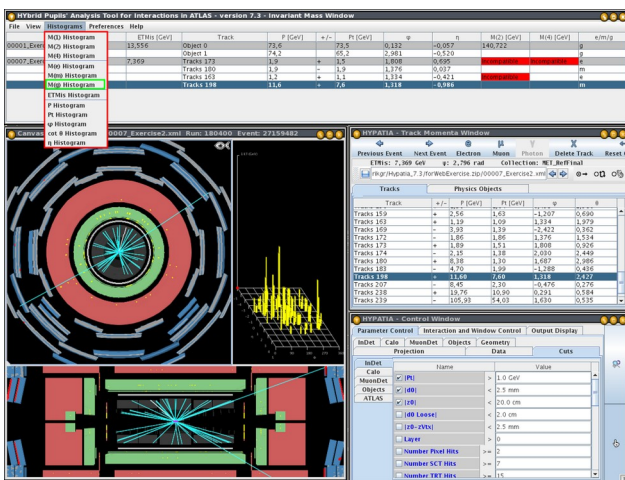
ATLAS Visitor Centre (AVC)

- Located outside the ATLAS control room.
- Features a permanent exhibit with interactive screens
- Includes a 3D movie explaining the detector and physics goals, and a short video about the Higgs boson discovery and the motivation for searching for New Physics
- Part of CERN's broader outreach, now centered around the new Science Gateway exhibition.



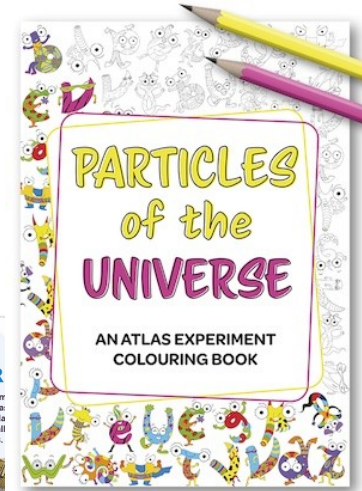
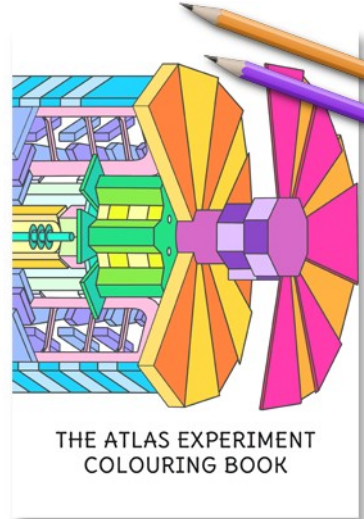
ATLAS Masterclasses

- Part of the annual CERN Masterclass Program, coordinated by IPPOG.
- High-school students analyze real ATLAS data — e.g. reconstructing Z bosons from event displays.
- Held worldwide, concluding with live videoconferences between participating institutes.
- Inspire the next generation through hands-on learning and global scientific exchange.
- ATLAS supports local Masterclasses at schools and institutes throughout the year.



ATLAS Educational Printables

- Diverse educational materials tailored for **all ages and expertise levels**.
- **Engaging**, visually appealing, and easy to understand.
- **Freely accessible** and printable from the ATLAS website — ideal for classroom.
- Available in multiple languages.



MAKE YOUR OWN STANDARD MODEL!
Cut out and stick in the elementary particles into the activity sheet.
Choose between the blank sheet or the one with clues.



MUON SPECTROMETER
The outer layer of the ATLAS experiment is r of muon detectors. They identify and mea the momenta of muons – particles simila electrons but 200 times heavier, which all them to cross the thick calorimeter layers.

CISION DETECTORS
tors of the Muon Spectrometer are able to son of a muon, to an accuracy of less than cent

ie (MDTs) detectors are composed of 3 km ses. Filled with a gas mixture. Muons pass through the tubes, knocking electrons out of the gas. These then drift to a wire at the tube's centre to induce a signal. Over 380,000 aluminum tubes are stacked up in several layers in order to precisely trace the trajectory of each muon.


Cathode Strip Chambers (CSCs) complement this task at the ends of the ATLAS experiment. CSCs are composed of copper strips covered by rings of wires in a gas mixture. Muons travelling through the gas are detected by both electron-collecting wires and ion-collecting strips.

FAST-RESPONSE DETECTORS
ATLAS uses fast-response detectors to quickly select collision events that are potentially interesting for physics analysis. They make this decision within 2.5 ps (400,000th of a second).

The Resolver Plate Chambers (RPCs) surround the central region of the ATLAS experiment. They consist of pairs of parallel plastic plates at an electric potential difference, separated by a gas volume. Thin Gap Chambers (TGCs) are found at the ends of the ATLAS experiment and consist of parallel 20 µm wires in a gas mixture. Both chambers detect muons when they ionise the gas mixture and generate a signal.

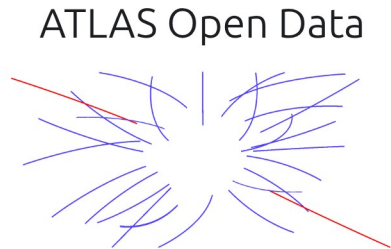
The combined data from fast-response detectors gives a coarse measurement of a muon's momentum, allowing ATLAS to choose whether to keep or discard a collision event.

<https://atlas.com>



ATLAS Open Data

- Provides real ATLAS data from pp collisions (8 and 13 TeV), as well as from heavy-ion collisions.
- Accessible through browser tools, Jupyter notebooks, and full ROOT/Python environments.
- Includes step-by-step tutorials, virtual machines, and video guides.
- Designed for learners at all levels: high schools, universities, and educators.



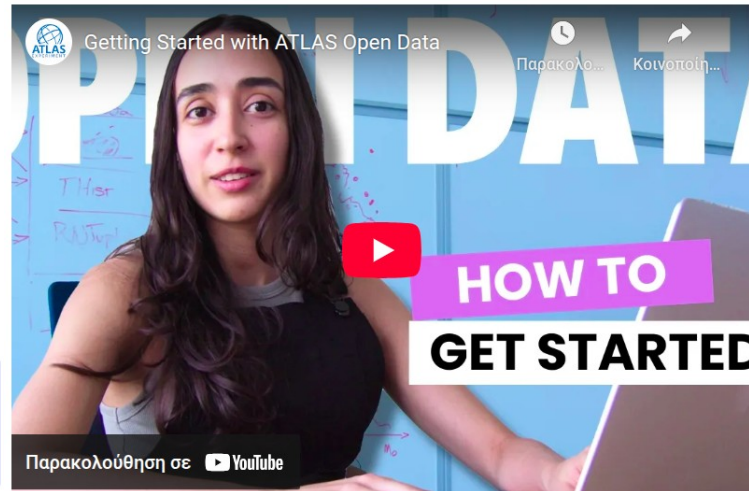
High Energy Physics data for everyone.

For Education

To provide data and tools to high school, undergraduate and graduate students, as well as teachers and lecturers, to help educate them and exercise in physics analysis techniques used in experimental particle physics.

For Research

To provide researchers with high-quality data recorded by the ATLAS detector, enabling them to conduct state of the art analyses in particle physics.



<https://opendata.atlas.cern>

ATLAS Open Data




- Released under Creative Commons (CC0) with DOIs for proper citation
- Follows CERN Open Data policy: transparency, reuse, and public engagement
- Supports classroom education and independent research worldwide
- Empowers students to "rediscover" the Higgs, search for new particles, and understand event reconstruction.


🏠 > Get Started

Get Started


In this section you will find different suggested paths to get involved with ATLAS Open Data. This are just suggestions on what we think it will be more usefull to check in each case. However, feel free to check the website freely.

 **Quick start**


The quickest way to start learning with ATLAS Open Data.

 **Deep Dive**

For extended use. Let's dive into what ATLAS has to offer!

 **Researchers Toolkit**

Detailed information and resources for researchers

 **Online Data Analyser**

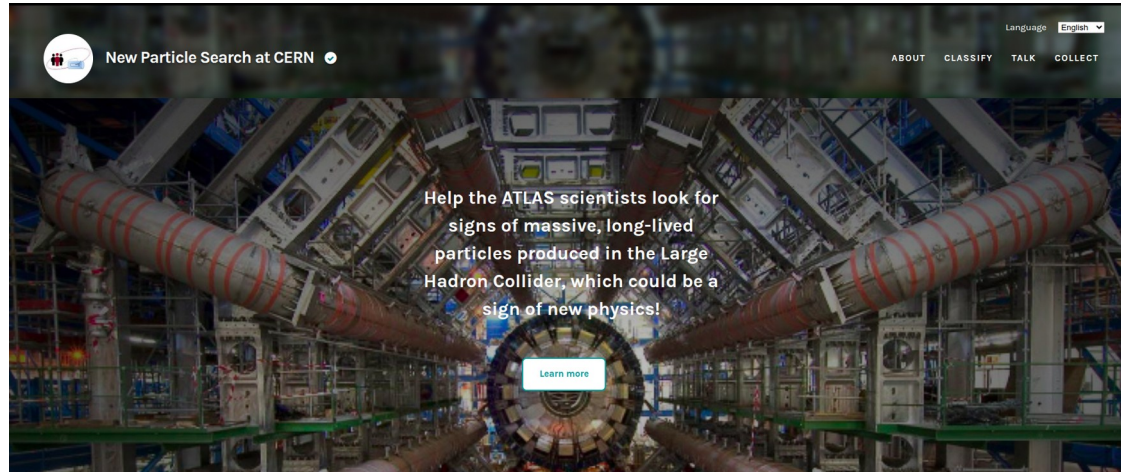
Explore ATLAS Open Data at a glance!

ATLAS — Citizen Science



ATLAS actively supports citizen science initiatives that invite the public to engage directly with real open data and contribute to frontier research.

- **REINFORCE:** Over 260,000 classifications from ~4,200 volunteers (ATLAS WP only) practicing on the identification of particles and displaced vertices in ATLAS events, via the Zooniverse platform.
→ Includes sonification tools, allowing visually impaired participants to analyze data!
- **Higgs Hunters:** Over 37,000 participants from 179 countries helped mark unusual features in proton-proton collision images.



ATLAS on Social Media

Leading LHC experiment in all social media platforms


- Active in all popular Social Media
- CERN Alumni platform
- Newer social media too: Threads, Mastodon, Hive, Flickt etc.

Social Media Statistics – Snapshot taken on June 26, 2025



  ● 95.4K Followers

  ● 10.3K Followers

  ● 10.3K Subscribers
● 137 Videos

  ● 44K Followers
● 38K Likes

  ● 50.6K Followers
● 603.1K Likes

  ● 71K Followers
● 849 Posts

ATLAS on Social Media



Livestreamed guided tours (25 so far), with active global audience participation.



Visite Virtuelle en Direct de l'Expérience ATLAS au CERN (en français )


978 προβολές · Μεταδόθηκε πριν από 6 μήνες



Virtuelle Live-Führung durch das ATLAS-Experiment am CERN

583 προβολές · Μεταδόθηκε πριν από 4 μήνες



Visita virtual em direto da Experiência ATLAS no CERN (em português )

1,4 χιλ. προβολές · Μεταδόθηκε πριν από 4 μήνες



Visita virtual en directo desde el experimento ATLAS en el CERN (en español)

2,2 χιλ. προβολές · Μεταδόθηκε πριν από 4 μήνες



Ζωντανή Διαδικτυακή Επίσκεψη στο ATLAS μέσω Livestream

280 προβολές · Μεταδόθηκε πριν από 3 μήνες

- Include live views of the ATLAS control room
- Offer detector explanations and physics deep dives
- All are filmed in the ATLAS cavern, with guides walking through areas not accessible to visitors

Conclusion — ATLAS Outreach Impact

- Reaches diverse audiences worldwide: students, educators, media, and the public
- Provides hands-on learning and access to real data through multiple programs
- Supports public understanding and awareness of fundamental physics research
- Continues to expand outreach efforts with new tools and initiatives

