Teaching particle physics through educational games.

ICHEP 2020

30 July 2020

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on behalf of the ATLAS Collaboration

version 2007250851

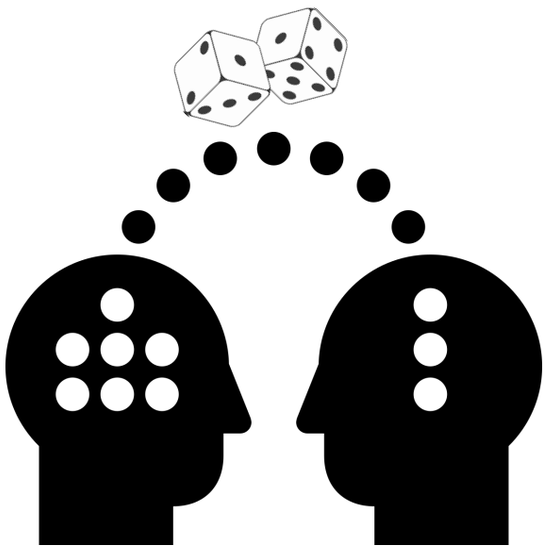
ATLAS, Play!

Playful approaches to reaching new target audiences

One of our goals in **science communication** is to **nurture support for science** in general and our field in particular to target groups as wide and diverse as possible.

Sometimes, if not often, it's **hard to leave our 'bubble' and reach new audiences**.

Here's a few ideas/attempts that **take a playful approach** to **create some attention** and yet **'transfer' some knowledge** to possibly/hopefully **new audiences**.



Educational games and activities have **proven benefits for achieving learning objectives**. They **motivate competition**, provide immediate rewards for success, and **encourage collaborative, problem-based learning**.

And they are **also fun for physicists** ;)

ATLAS, Play!

Making a Splash

Invite visitors to throw water-balloons at fixed targets or make them collide in mid air.

While smashing water-balloon protons, visitors can learn about ..

.. energy and momentum conservation,

.. why we need high-energy collisions at the LHC,

.. the challenge of actually making particles collide,

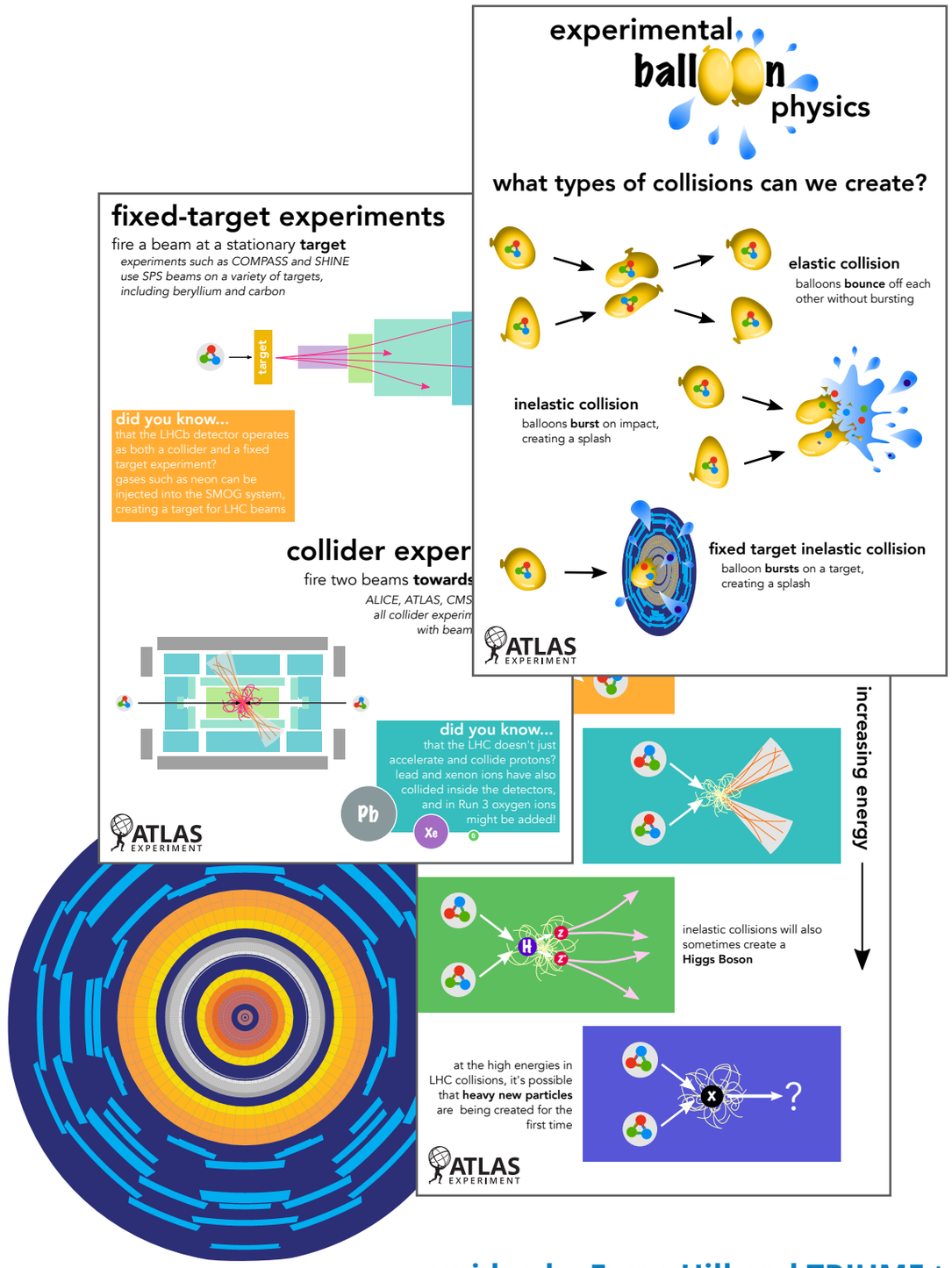
.. and more.

To get ourselves soaked we ..

.. got tons of proton balloons,

.. turned a kids pool into a fixed-target experiment,

.. developed some accompanying material.



an idea by Ewan Hill and TRIUMF team
posters mainly by Heather Russell

ATLAS, Play!

Making a Splash

the setup

fixed-target collisions

adding some energy

balloon–balloon collision

heavy-balloon peripheral collisions

ATLAS, Play!

Proton Cookies

Invite visitors to build a ‘proton’ using candy quarks and gluon icing.

While ‘building’ the proton (or any other hadron), visitors can learn about ..

.. quarks, gluons, the strong interaction, binding energy,

.. why and where protons matter at the LHC,

.. what happens when we collide hadrons,

.. and more.

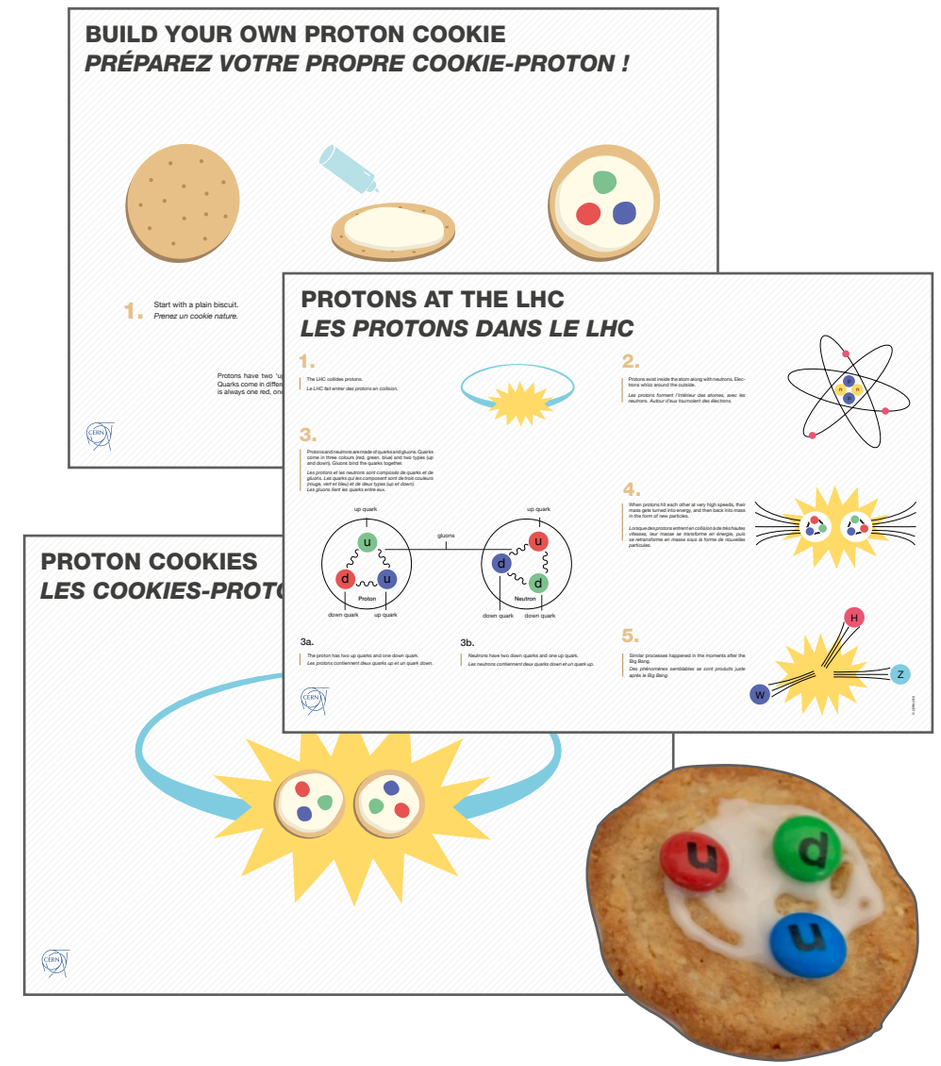
To open our proton bakery we provide ingredients like ..

.. ready-made cookies from the grocery store,

.. quark-labelled multi-coloured button-shaped chocolates,

.. a few bottles of icing prepared on the spot,

.. some accompanying material.



an idea by Katharine Leney and Katy Tschann-Grimm aka @PhysicsCakes

ATLAS, Play!

Proton Cookies

interactions

quarks

gluons

ATLAS, Play!

Build Your Own Particle Detector

Invite visitors to build a ‘particle detector’ using LEGO pieces.

While constructing their experiments,
visitors can learn about ..

.. parts and purposes of real particle detectors,

.. challenges of design and construction,

.. the scale of particle detectors and the reason behind it,

.. and more.

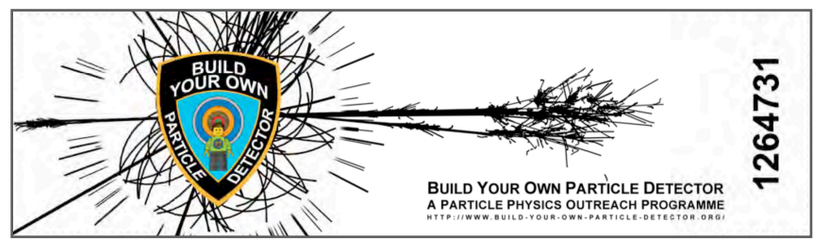
To get visitors hooked on LEGO we set up ..

.. a few kilograms of (more or less) random LEGO pieces,

.. posters and screens to inspire visitors with detector images,

.. a website to host the competition (byopd.org),

.. tickets, a camera and some prizes.



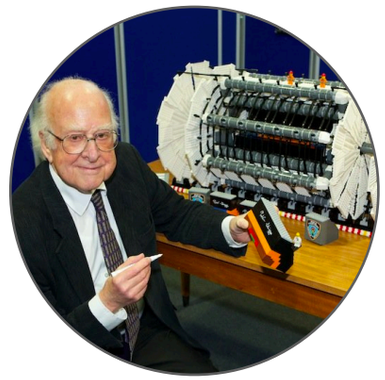
find out more at
build-your-own-particle-detector.org

ATLAS, Play!

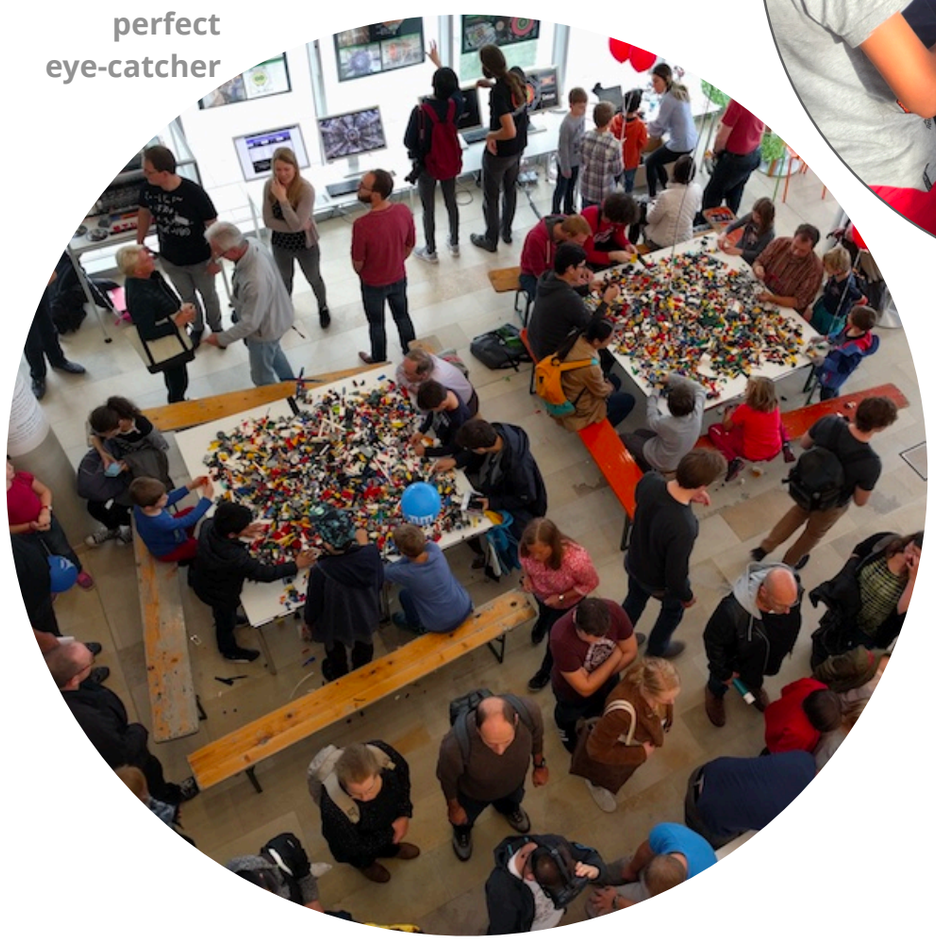
Build Your Own Particle Detector

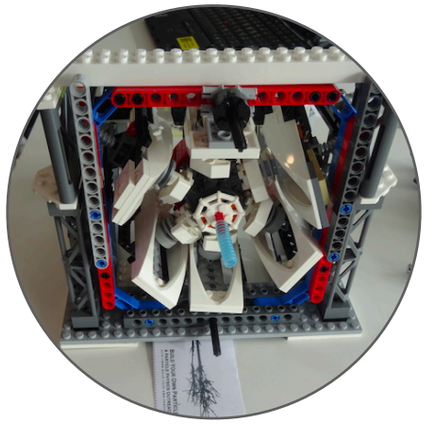
whatever particles
you want to detect

parts list and manual
on the BYOPD website



perfect
eye-catcher





everybody
loves LEGO

dedicated
workshops

ATLAS, Play!

Particle Twister

Invite visitors to a particle-physics game with a twist.

While visitors combine physical and physics education, they can learn about ..

.. the ingredients of the Standard Model,

.. interactions and quantum numbers,

.. and more.

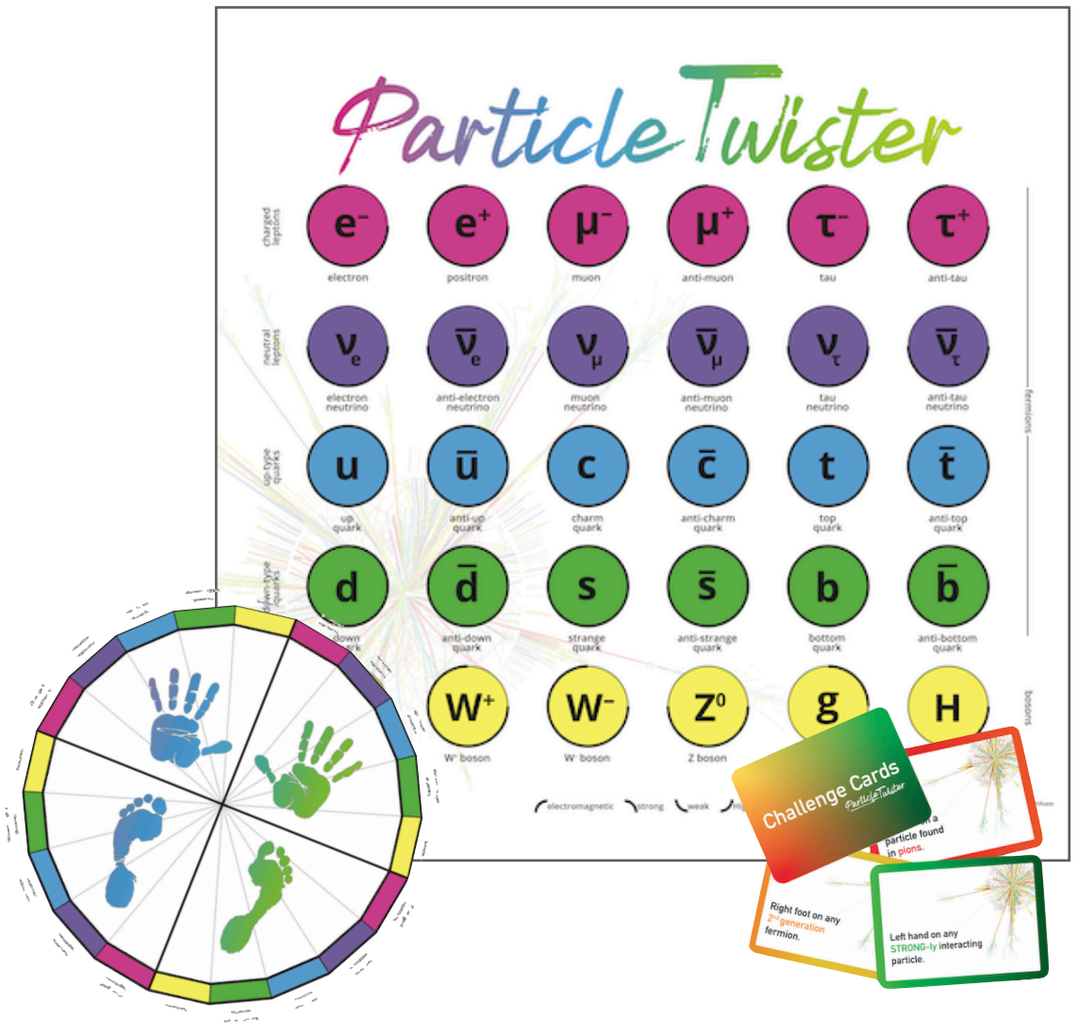
To get you and your visitors moving ..

.. get the board,

.. build a spinner,

.. print some cards,

.. stretch before exercising.



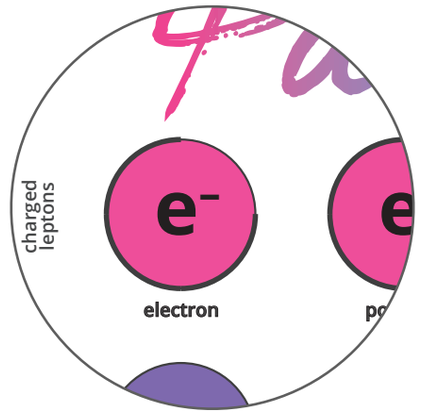
developed by Katarina Anthony and SM
find out more at particle-twister.web.cern.ch

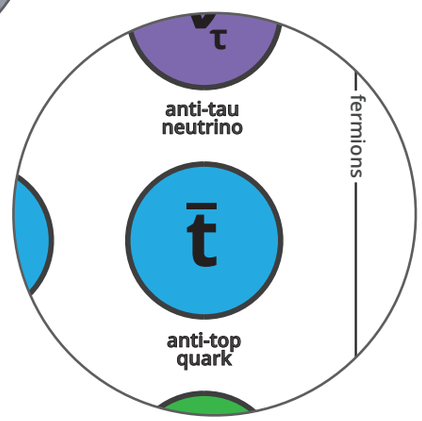
ATLAS, Play!

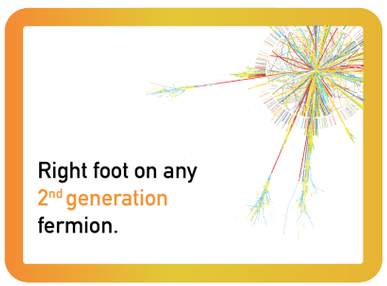
Particle Twister

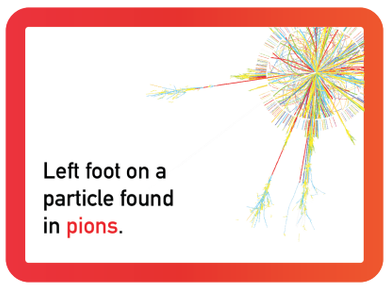
easy rules
for beginners

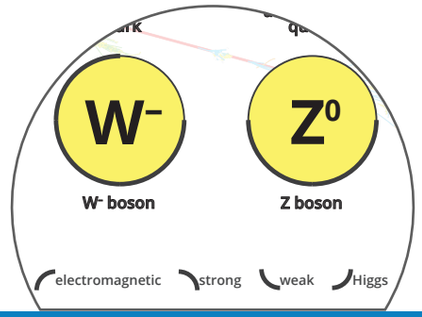
tougher rules
for experts











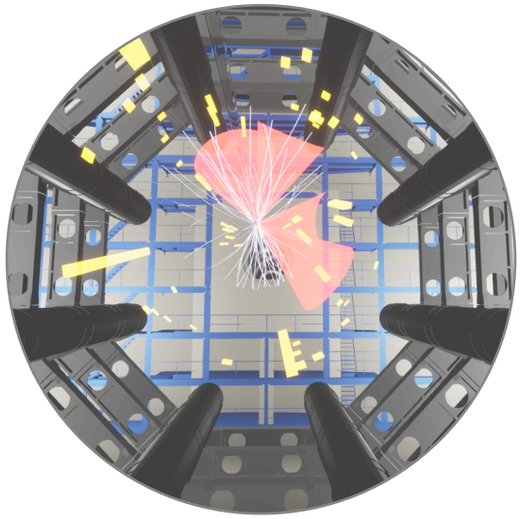
ATLAS, Play!

And many many more

ATLASrift

Dive into the ATLAS cavern and experience the detector in virtual reality as well as on your screen.

Find out more at atlasrift.web.cern.ch

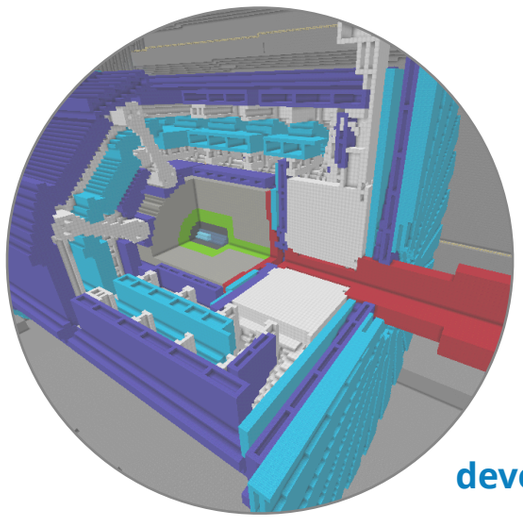


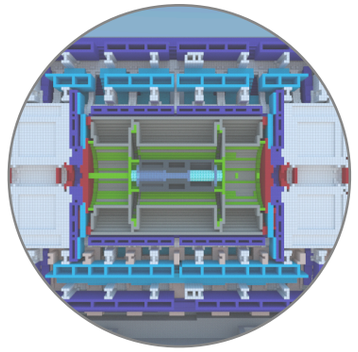
primary developed by Ilija Vukotic of University of Chicago

ATLAScraft

Be there, as a square! Explore the ATLAS detector, physics and many more things, all within the Minecraft Universe.

Find out more at atlascraft.web.cern.ch



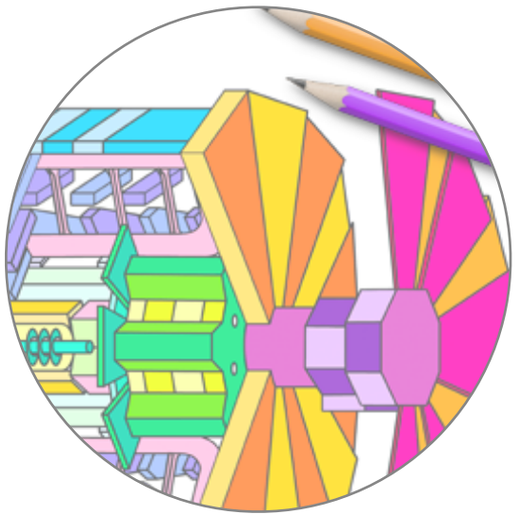


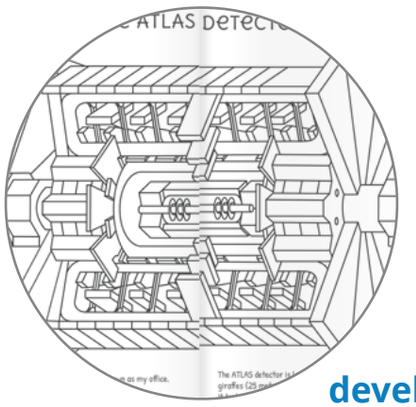
developed by University of Oxford and University of Birmingham

ATLAS Colouring Book

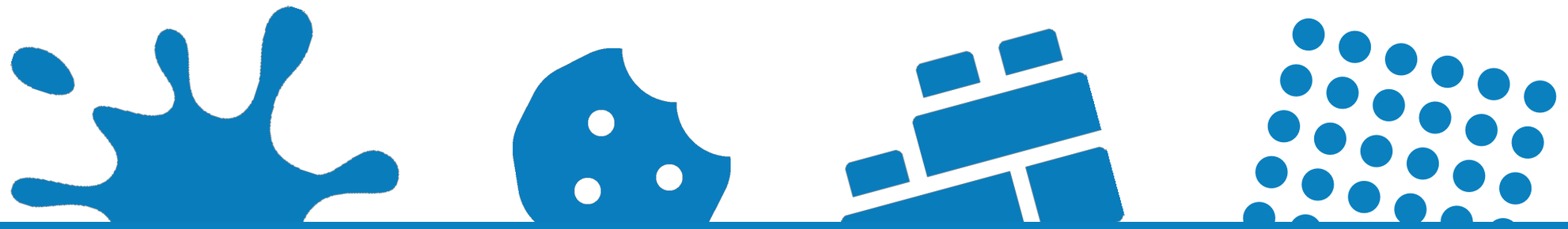
Painting is playing too! Colour your own ATLAS experiment and learn something while doing so.

Find out more at atlas.cern/colouring-book





developed by Veronica Ruberti and Katarina Anthony



So, go out and play some outreach!

Please get in touch, if you want to

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