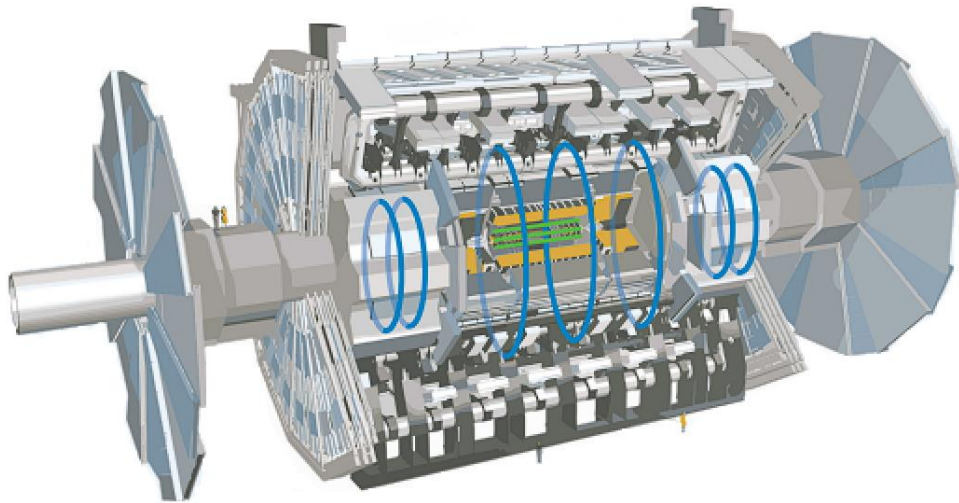


# AR BOOK

## Augmented reality ATLAS fact sheet extension

Development stage presentation

Draft presentation with QR code scanner



ATLAS-GTU TAI Agreement Workshop



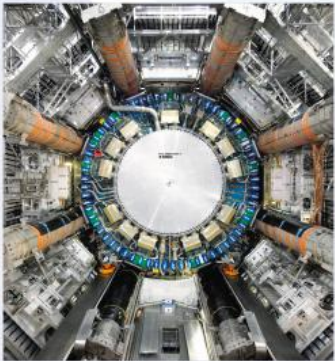
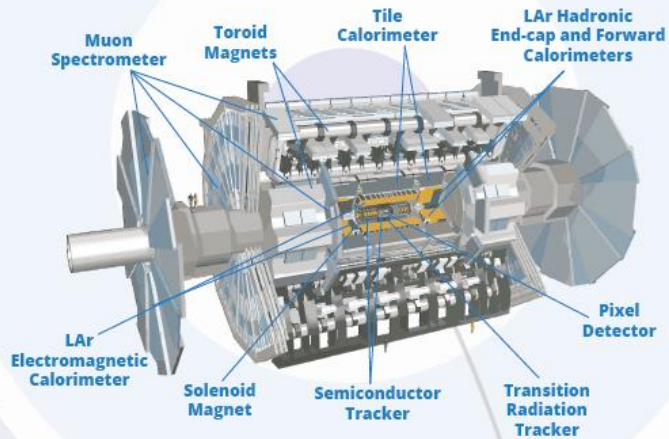
Georgian Team: Vladimir Dolinski

Responsible: Alexander Sharmazanashvili

ATLAS Outreach Weekly 7 June 2023

# PROJECT HIGHLIGHT

## DETECTOR OVERVIEW



ATLAS is the largest detector ever constructed for a particle collider: 46 metres long and 25 metres in diameter. Its construction pushed the limits of existing technology.

ATLAS is designed to record the billions of high-energy proton or ion collisions at the LHC. New particles fly out from the collision point in all directions and interact with the different ATLAS sub-detectors.

Each sub-detector makes up a different layer of the detector and plays a unique role. More than 100 million sensitive electronics channels are used to record the particles produced by the collisions, which are then analysed by ATLAS scientists to identify and reconstruct individual particles.



<https://atlas.cern>

## AGENDA

- 1 Introduction
- 2 Project basis
- 3 Project main functions
- 4 Draft presentation
- 5 QA

# INTRODUCTION

## GOALS

1 Who am I

2 Goal of AR Book

3 Projects

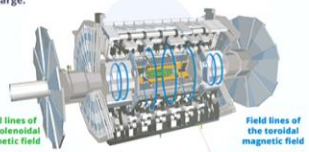
1. Be extension of numerous Fact Sheets and not only

2. Be easy accessible from browser

3. Be informative

### MAGNET SYSTEM

ATLAS uses two different types of superconducting magnet systems – solenoidal and toroidal. When cooled to about 4.5 K (-268°C), these are able to provide strong magnetic fields that bend the trajectories of charged particles. This allows physicists to measure their momentum and charge.




**CENTRAL SOLENOID MAGNET**  
The ATLAS solenoid surrounds the inner detector at the core of the experiment. This powerful magnet is 5.8 m long, 2.56 m in diameter and weighs over 5 tonnes. It provides a 2 Tesla magnetic field in just 4.5 cm thickness. This is achieved by embedding over 9 km of niobium-titanium superconductor wires into strengthened, pure aluminum strips, thus minimising possible interactions between the magnet and the particles being studied.

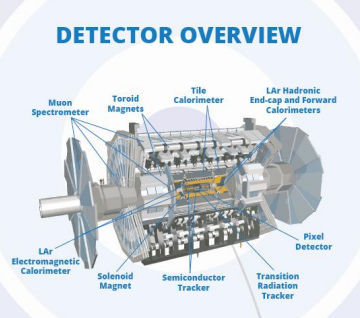
**TOROID MAGNET**  
The ATLAS toroids use a series of eight coils to provide a magnetic field of up to 3.5 Tesla, used to measure the momentum of muons. There are three toroid magnets in ATLAS, two at the ends of the experiment, and one massive toroid surrounding the centre of the experiment.

At 25.3 m in length, the central toroid is the largest toroidal magnet ever constructed and is an iconic element of ATLAS. It uses over 56 km of superconducting wire and weighs about 830 tonnes. The end-cap toroids extend the magnetic field to particles leaving the detector close to the beam pipe. Each end-cap is 10.7 m in diameter and weighs 240 tonnes.

<https://atlas.cern>



### DETECTOR OVERVIEW




Labels in the diagram: Muon Spectrometer, Toroid Magnet, Tile Calorimeter, LAr Hadronic End-cap and Forward Calorimeters, LAr Electromagnetic Calorimeter, Solenoid Magnet, Semiconductor Tracker, Transition Radiation Tracker, Pixel Detector.

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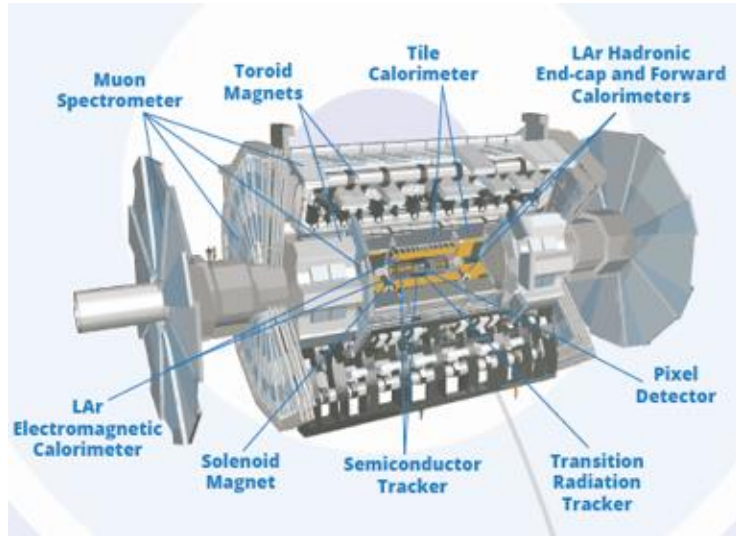
FUTURE NEEDS



FUTURE NEEDS

# PROJECT BASIS

## SHOW ATLAS DETECTOR GEOMETRY IN AR



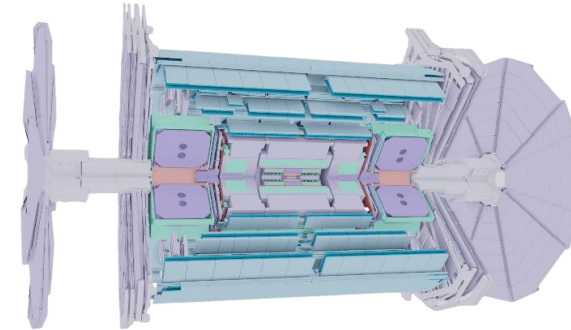
We need to show:

1 The geometry of Detector Subsystems

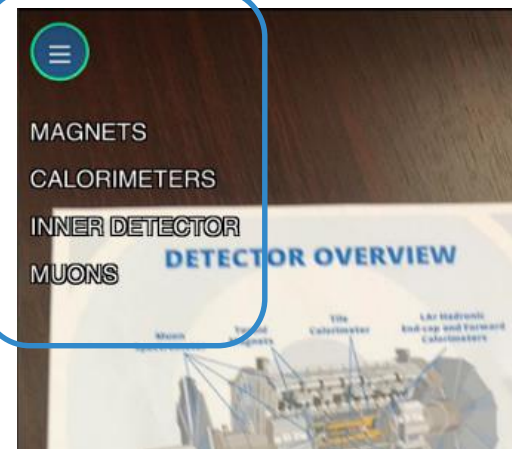
2 Menu

AR APP of Detector Overview contains MENU button with 4 main groups with multiple geometries to be able select them separately.

## PREVIEW



## MENU BUTTONS



# PROJECT BASIS

**DIVIDE MULTIPLE PARTS ON GROUPS**

**1 MAGNETS**

**BARREL TOROID MAGNETS; ENDCAP MAGNETS;  
(Solenoid model is missing)**

**2 CALORIMETERS**

**LAR, TILE**

**3 INNER DETECTOR**

**SCT, TRT, PIXEL**

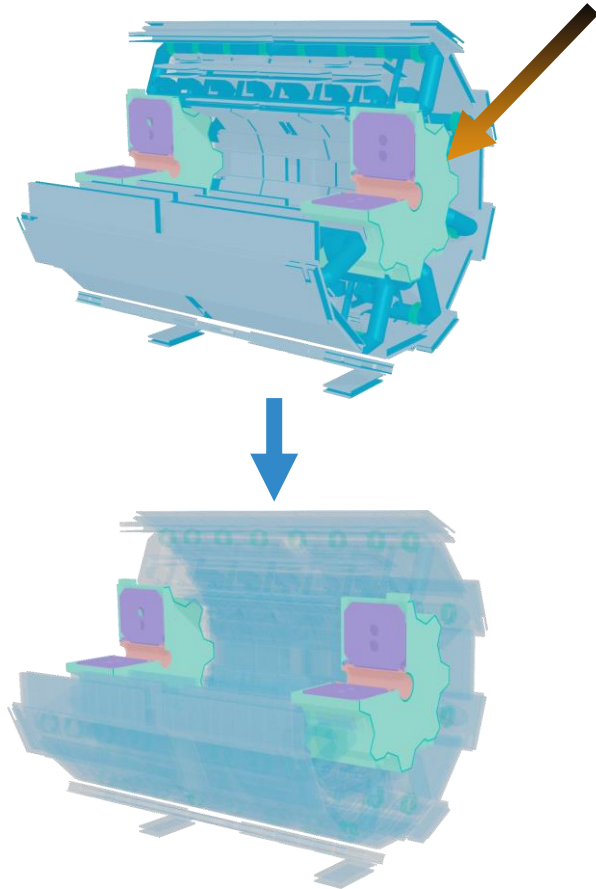
**4 MUONS**

**MUON BARREL INNER, MIDDLE, OUTER;  
EXTRA WHEEL, SMALL WHEEL, TGC WHEELS +  
FORWARD SHIELDING**

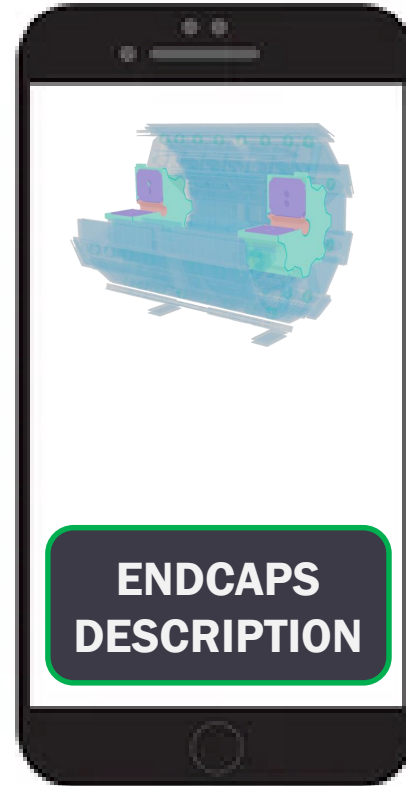
# PROJECT BASIS

## AR PROJECT GOALS

**1 SELECT SUBSYSTEM ON CLICK**



**2 MAKE VISIBLE WINDOW WITH DETECTOR  
SUBSYSTEM AFTER SELECTION**



# PROJECT MAIN FUNCTIONS

## BUTTON-BOUND FUNCTIONS

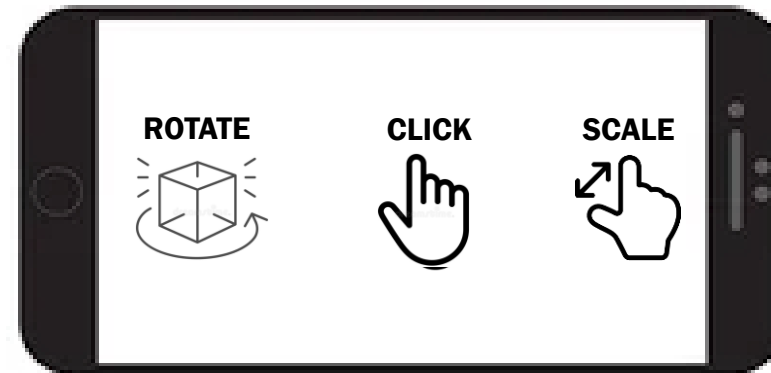


## TWO MAIN BUTTONS

**BUTTON-1 IS MENU BUTTON WHICH HAS GEOMETRY SHOW/HIDE FUNCTION, TO NOT BLOCK VIEW; &FULLSCREEN ENABLE(works in chrome, wip)**

**BUTTON-2 HAS 'CLICK FUNCTION' ENABLE/DISABLE(wip)**

## GESTURE CONTROL FUNCTIONS



# PROJECT MAIN FUNCTIONS

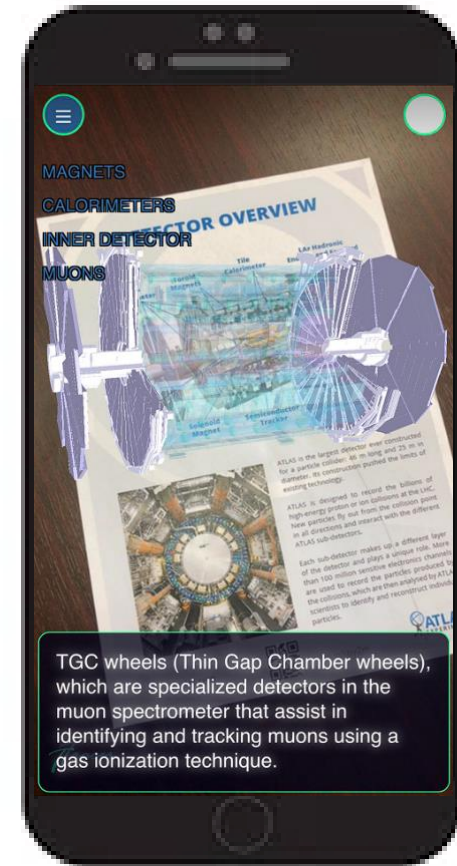
## PREVIEW



FIRST START



GEOMETRY SELECTION

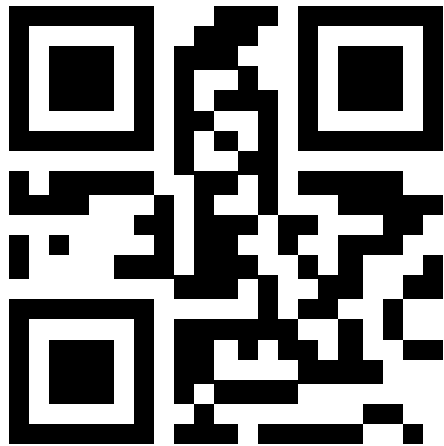


CLICKING ON GEOMETRY

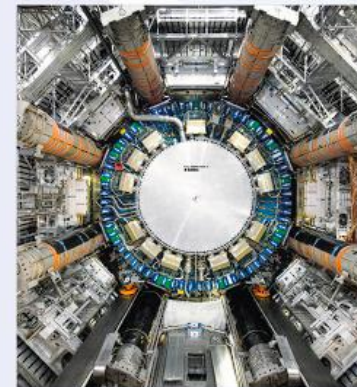
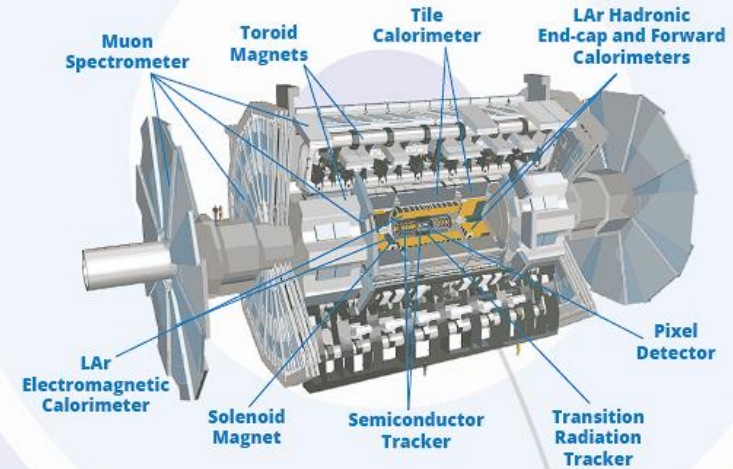


# DRAFT PRESENTATION

QR Code



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<https://atlas.cern>



# END OF PRESENTATION

**THANK  
YOU**

**Comments are Welcome**

vladimir.dolinski@cern.ch

agnetic field  
the beam pipe. Each  
and weighs 240 tonnes.

