Constructing ALICE with Bricks: People engaging Science

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BUILD YOUR OWN PARTICLE DETECTOR
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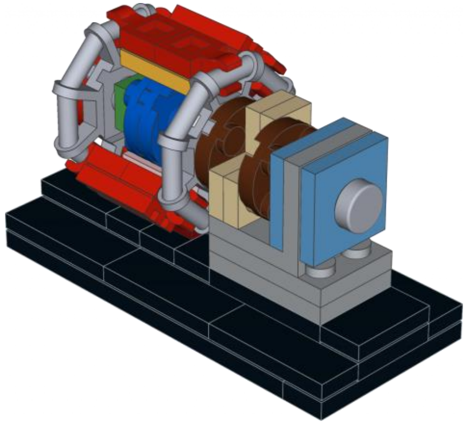
BMBF Forschungsschwerpunkt
ErUM-FSP T01
ALICE

NETZWERK
TEILCHENWELT



LEGO?

~~LEGO~~ Brick §?

Background: ALICE – Exhibition (ErUM-FSP Project)

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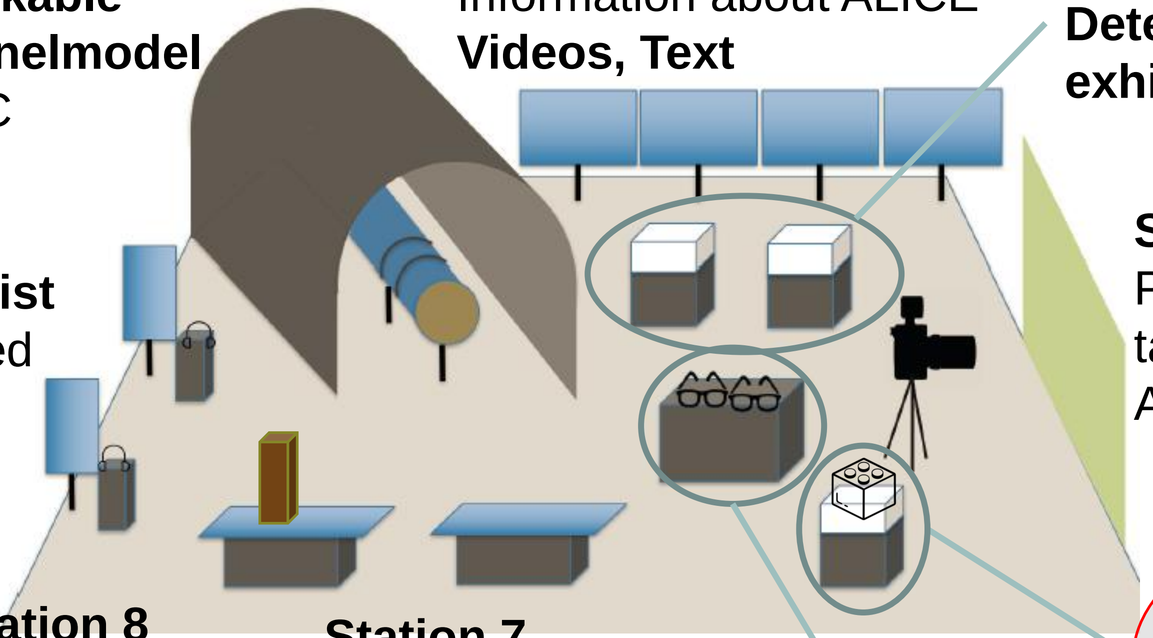
Station 1
Walkable tunnelmodel
LHC

Station 2
Information about ALICE
Videos, Text

Station 3
Detector component exhibits



Station 4
Pop-Up Frame to take „**selfies**“ with ALICE background

Station 5
ALICE-Brick model
&
Build your own Particle Detector

Station 6
VR-Visit of ALICE

Station 7
Scattering Board
For experiencing principles of scatter experiments

Station 8
Quarktower
„Jenga“ like game with quarks

Station 9
Meet a scientist
due to recorded interviews of scientist

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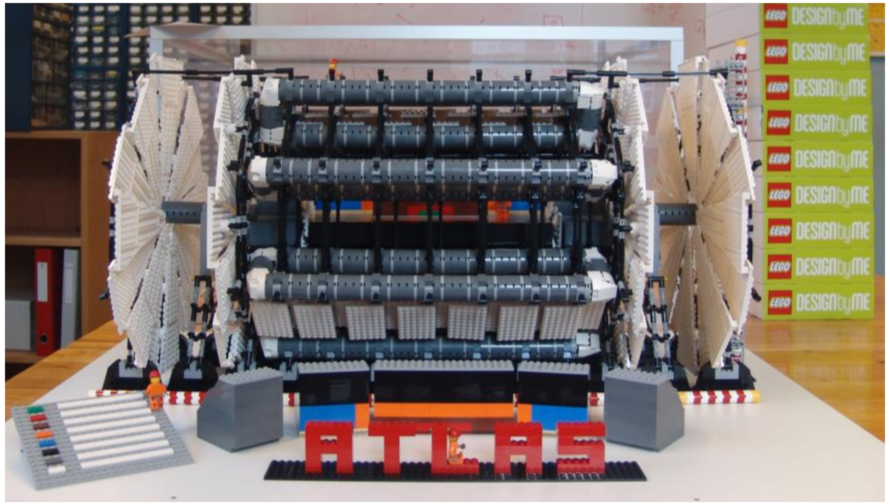
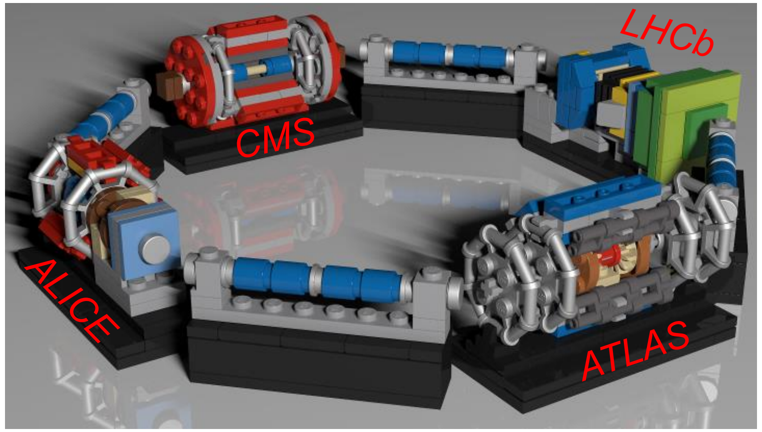
LHC and Bricks

- Project of Sascha Mehlhase ([@saschamehlhase]()): BYOPD
- Already **existing (big) models** for ATLAS and CMS
- **Small models** representing accelerator
  - These models got 10k voters to be considered by LEGO, but were not approved



ATLAS

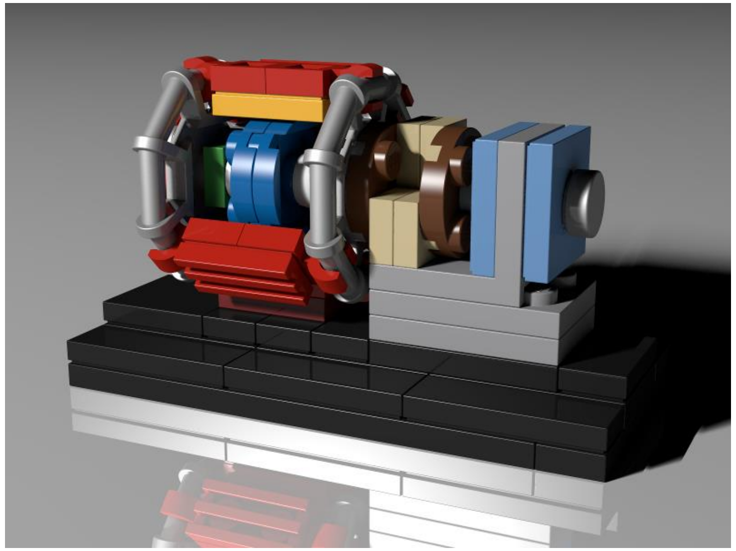
CMS



LHC-Minimodel

What are we doing?

- We are **designing an ALICE Model** and want to **build it for the Exhibition**

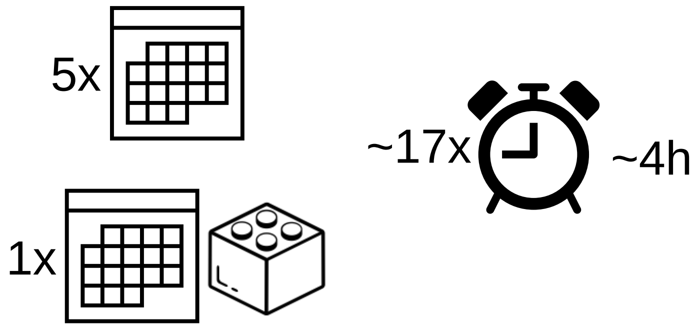


Design and **Construction** of big model with **pupils and students** (15+ years to 3rd semester at university):

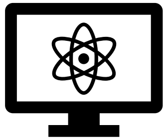
- Material cost: ca. **2000 €**
- About 9000 Pieces

Structure and content of workshop

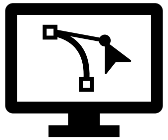
- Timeframe
  - more than **5 month of designing** *(nearly finished)*
    - close to **every Monday ca. 4 hours** in Zoom
  - ca. **One month to order Bricks** at bricklink.com *(alredy started)*
  - **one Weekend to build** the model *(planned for end of June)*



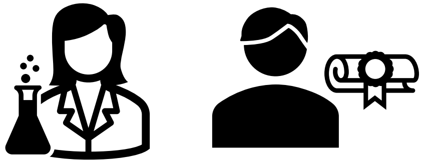
- Content of Workshop
  - Input
    - What is ALICE? What is the **science behind ALICE**?
    - How does the **different layers of detectors work**?
    - How does the detectors **look like**? What are the core element of each detector?



  - Design
    - Using **Pictures, technical drawings and a 3D model** as illustrative material
    - Designing happens in **small groups** using Studio 2.0



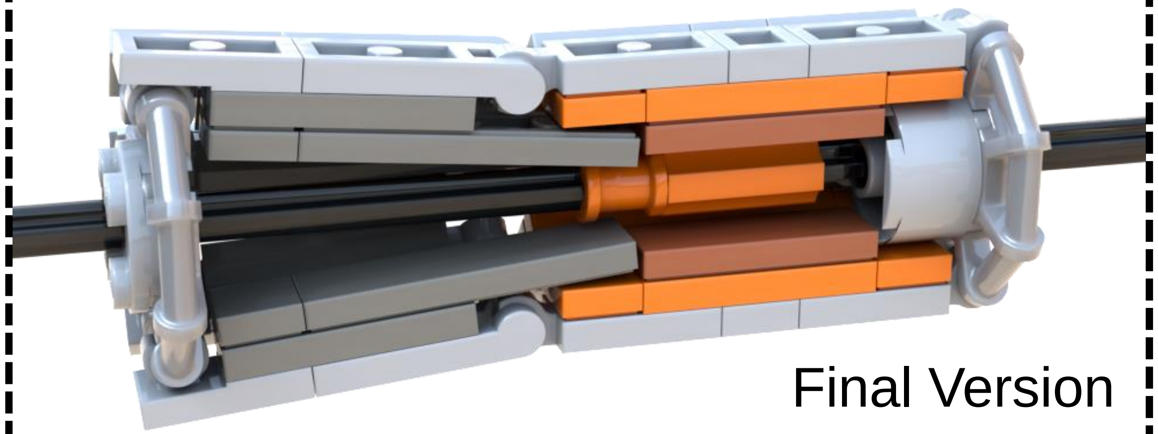
  - Career Guidance
    - Physics
    - Science illustration
    - Genderstudies



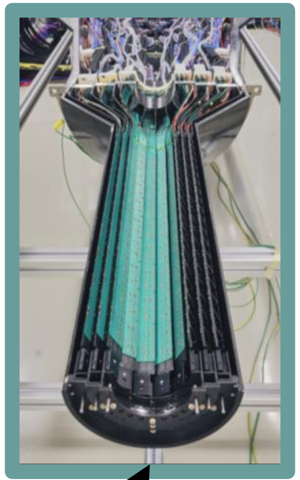
Problems we encountered

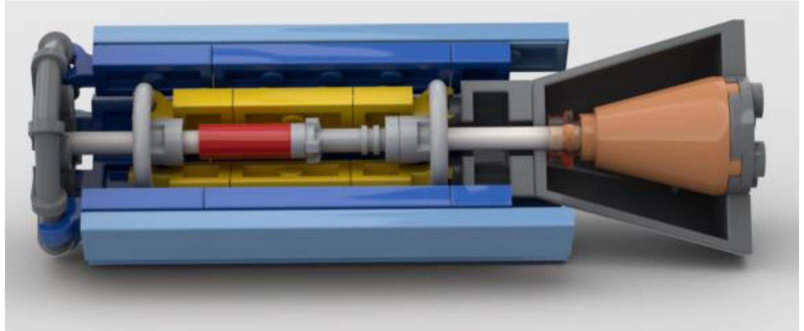
- The Project is **huge**
  - Participants need to invest quite some time, **every week**
  - Nearly **30% drop** out during the first three meetings, **nearly 50%** at the end of design phase
  - **Organization Team** needs to meet regularly to plan project in detail
- Ordering Bricks is **complicated** and **takes <u>a lot</u> of time**

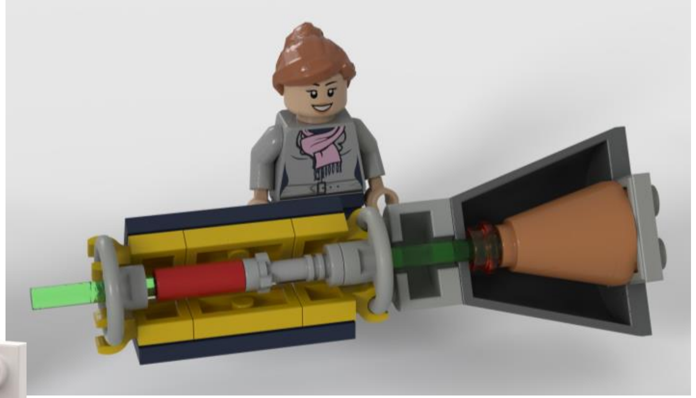
Results: ITS (Detectorpart of ALICE)

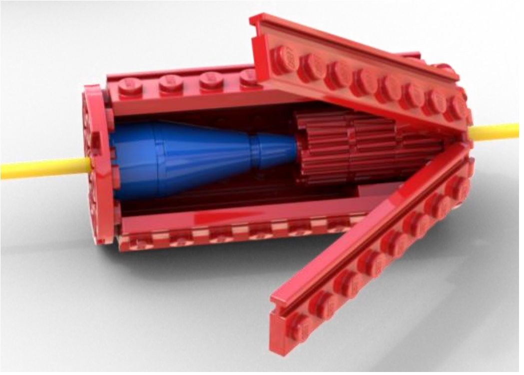


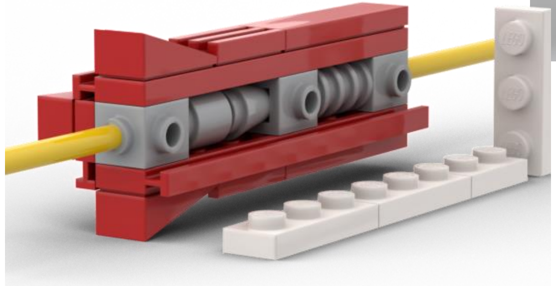
Final Version

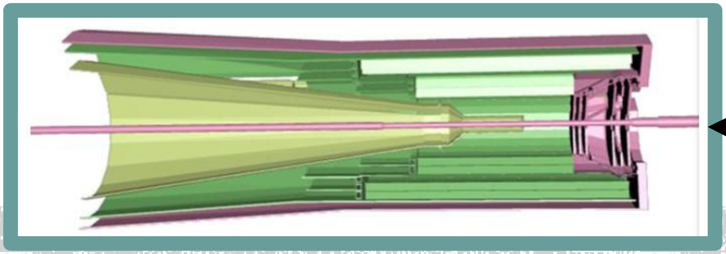












Original

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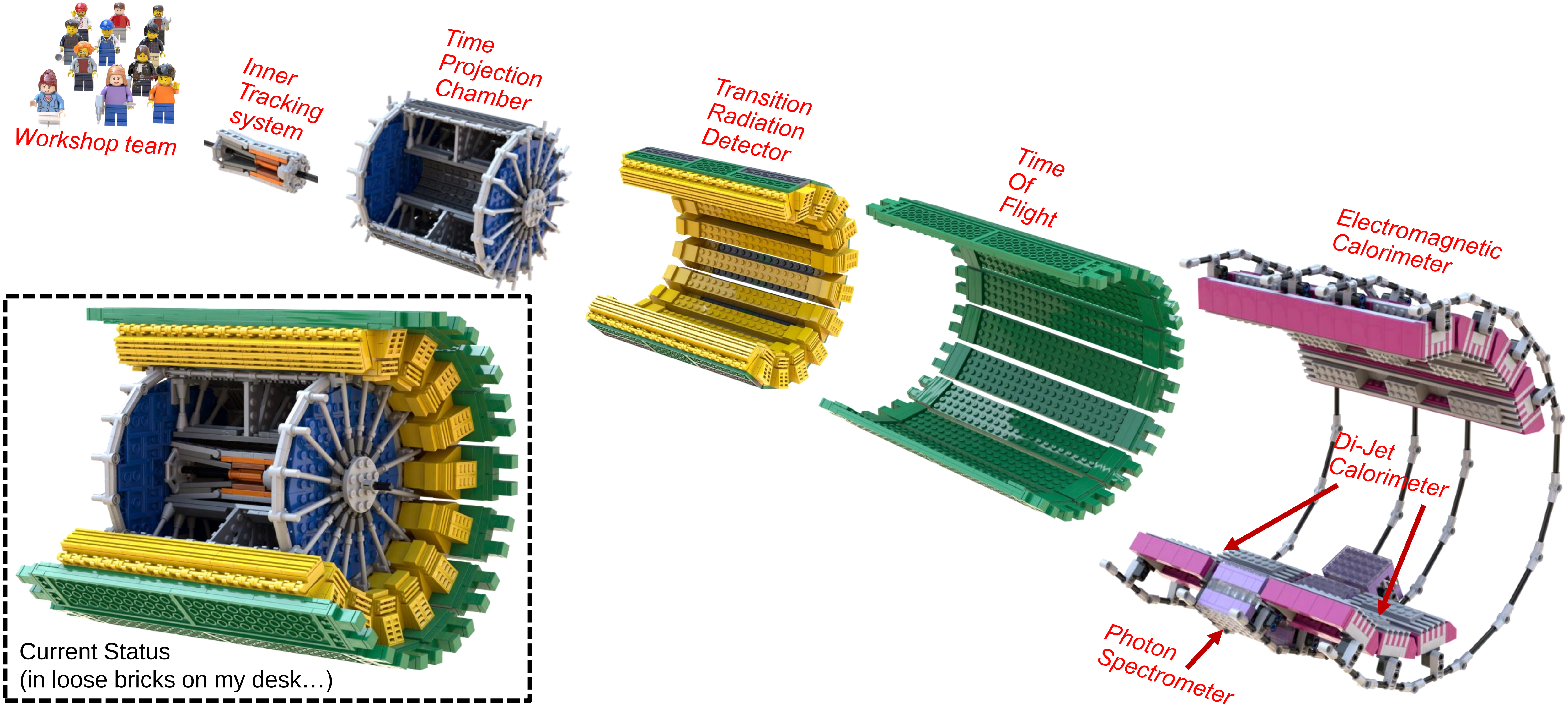
Results: ITS, TPC, TRD, TOF, PHOS, Dcal+EMCal



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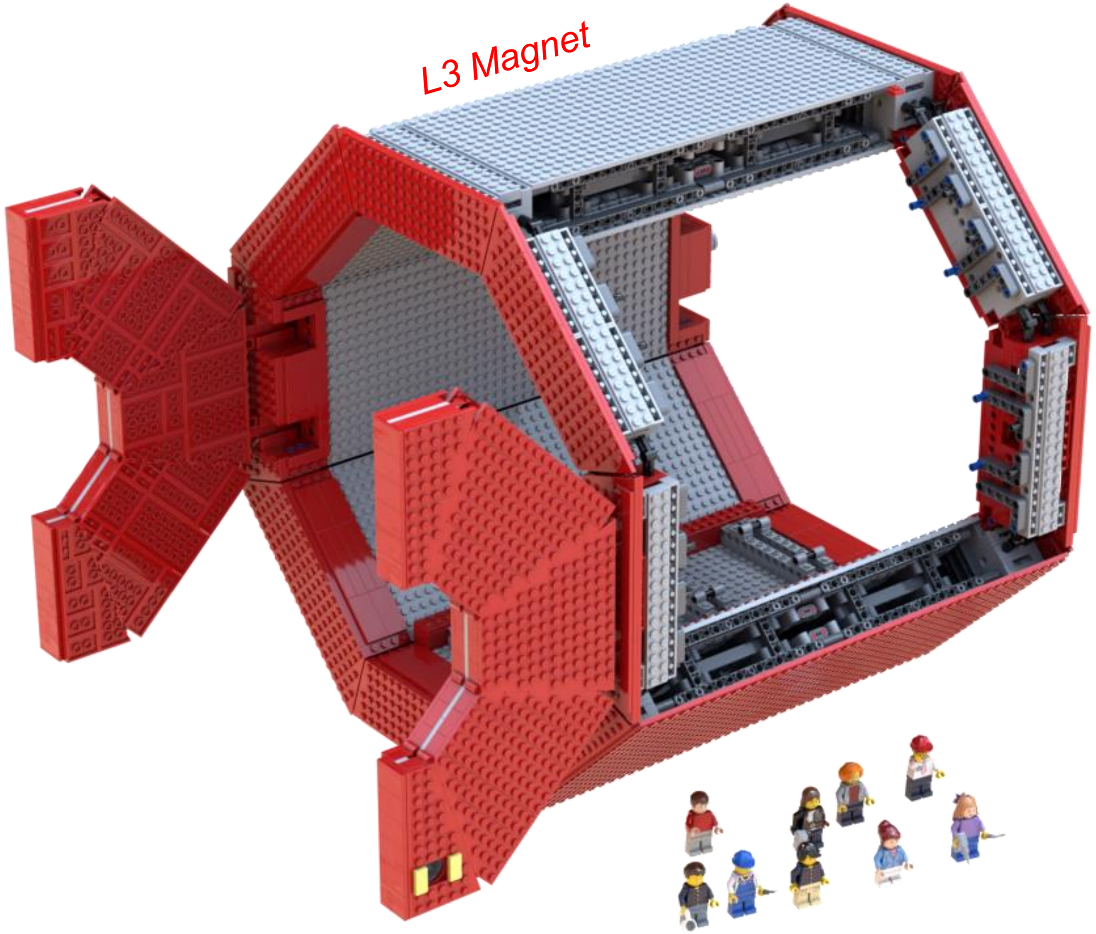
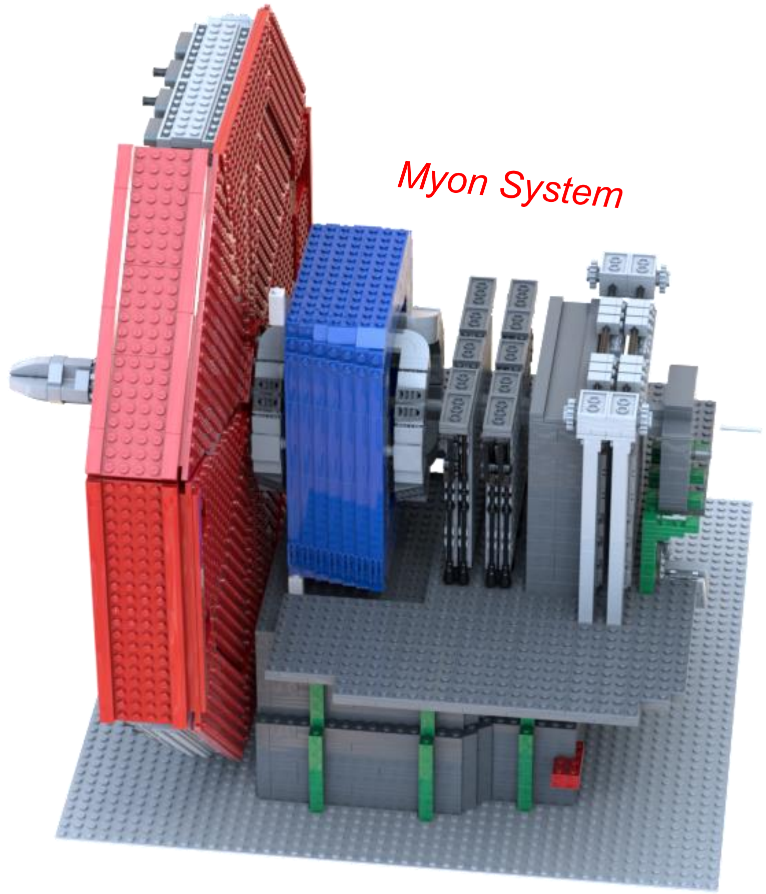
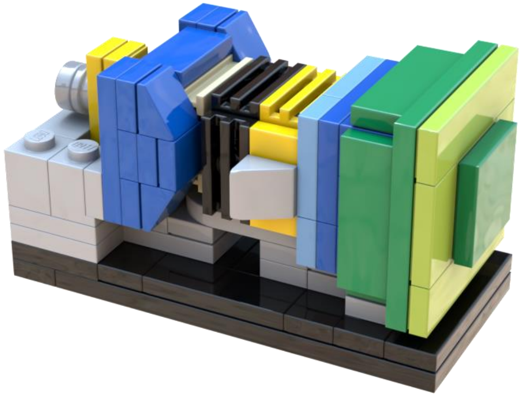
Coming soon...





Coming soon...

- **Finishing last Details** on Model
- Hoping that every ordered Brick will arrive
- Hoping to have a **real live event** in Frankfurt or Münster with the students **to build the model**
- **Advertising the model** to the ALICE community
- **Encouraging** others to design and/or build **their own Detector (…LHCb?)**



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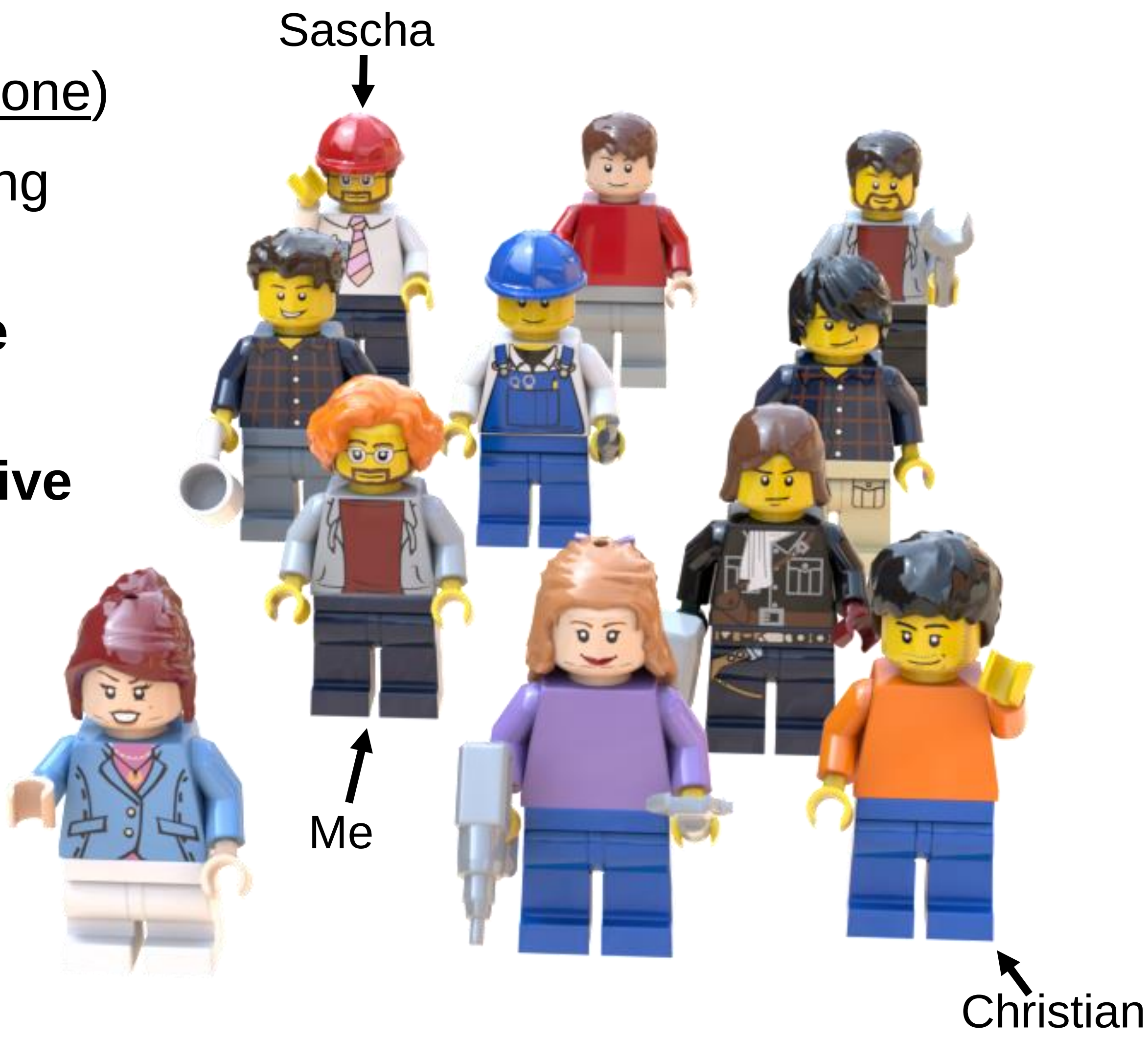
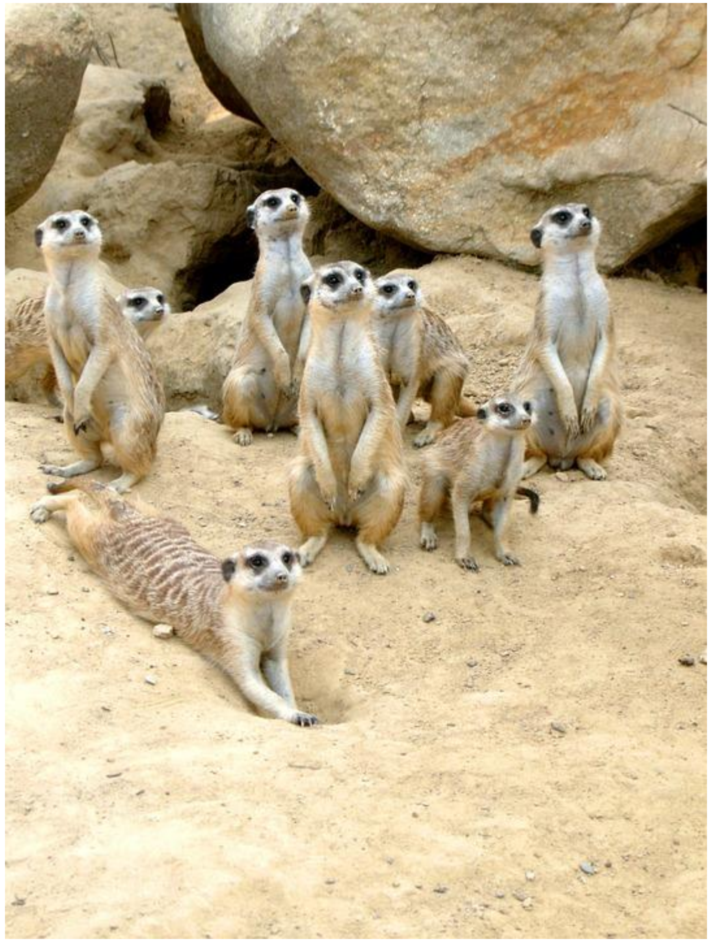
Take Home Message

- It is a **very fun** project (for everyone)
- It is a **very time consuming** project (also for everyone)
- **Engaging students with science** through designing process
- Building such a model can be a nice event to **invite students to your institute**
- Having a nice model afterwards as eyecatcher for **live events**
- Learning how to design yourself as Mini-Me☺



Thank you for your attention!

Any Questions?



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