

The background features a gradient from light green at the top to dark blue at the bottom. On the left side, there are several circular elements: a large scale with numerical markings from 140 to 260, and several smaller circles with arrows indicating clockwise or counter-clockwise rotation. The overall aesthetic is technical and futuristic.

# Lucky to be unlucky

НИНА ДИМОВА И ДЖЕММА РУСЕВА



# OUR PROJECT CHOICE

4. Physics simulation in the ALICE experiment
2. High-precision mass measurements of radioactive isotopes
8. Looking for strange particles in ALICE
7. CMS RPC operation and efficiency simulations
11. Physics analysis at the CMS experiment

1. №11 Physics analysis at the CMS experiment
2. №4 Physics simulation in the ALICE experiment
3. №7 CMS RPC operation and efficiency simulations
4. №8 Looking for strange particles in ALICE
5. №2 High-precision mass measurements of radioactive isotopes

Finally we were assigned to (none of the above) : **Methods and tools enabling the distributed computing in ALICE**



The ALICE is a dedicated experiment studying nucleus-nucleus collisions at LHC energies



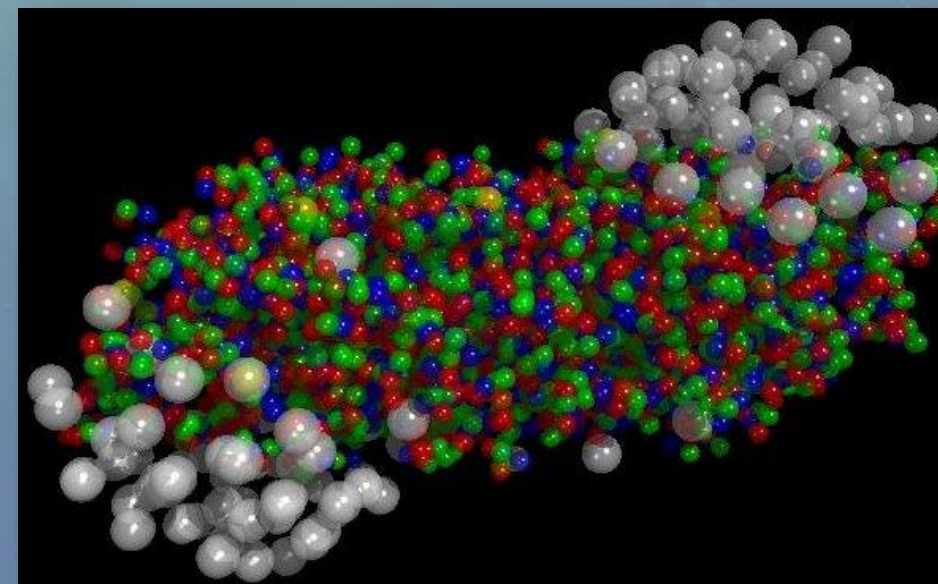
# ALICE

A Large Ion Collider Experiment

ALICE studies the physics of strongly interacting matter at the highest energies reached in a laboratory setting.



In such conditions, an extreme phase of matter - called the quark-gluon plasma, is created



## OUR PROJECTS

- Finally, we worked on three projects
  - Distributed computing
  - Physics simulation
  - Physics analysis

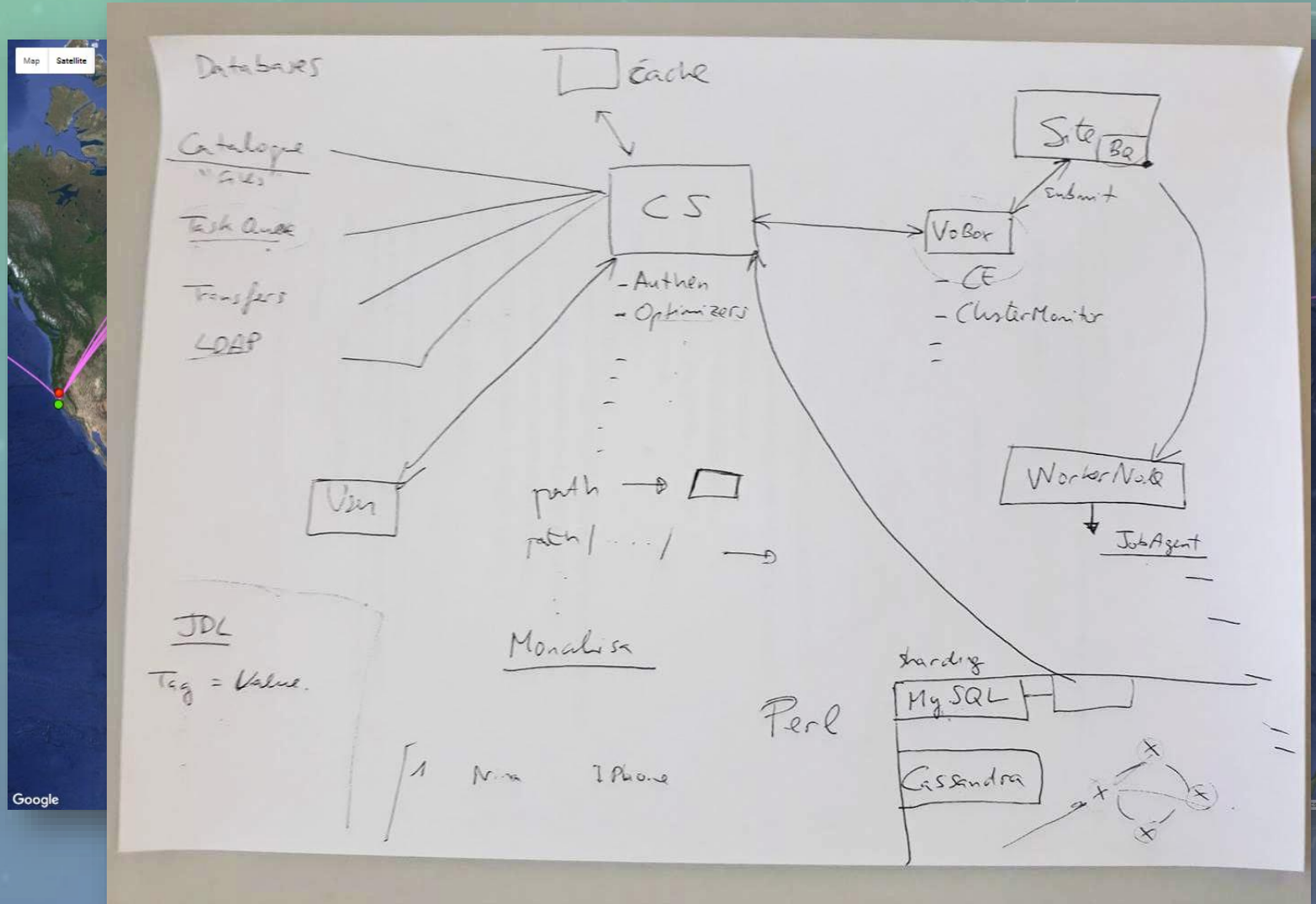




# DISTRIBUTED COMPUTING

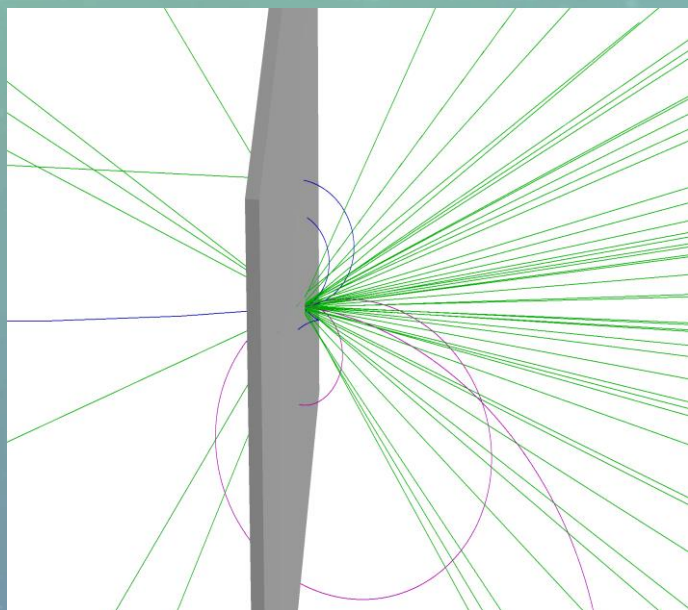
Grid – a collaborating assembly of hundreds computing centres on 5 continents, providing CPU and storage resources to the LHC experiments

We got a basic understanding of how complex the system is.

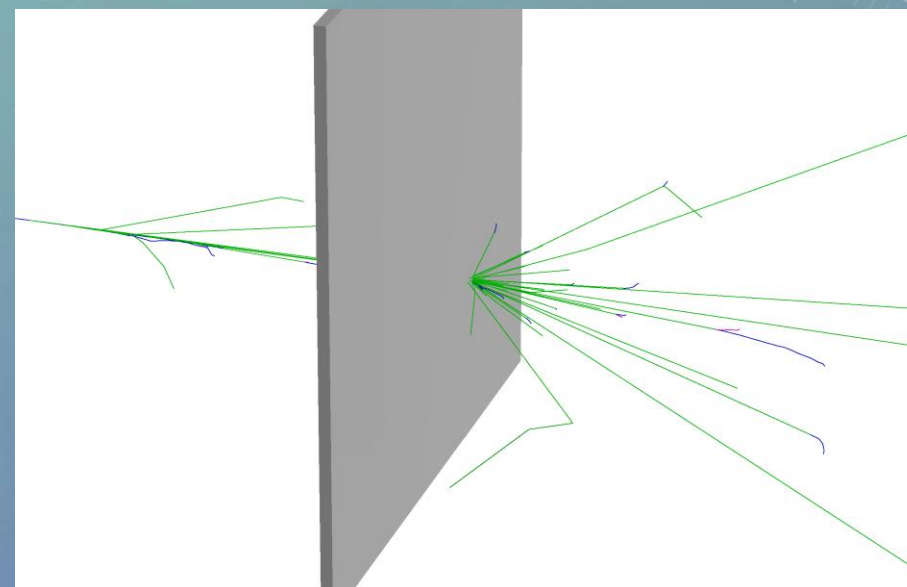


# PHYSICS SIMULATION

- Particle with target collision
  - Particle transport – GEANT3
  - Tracking, statistical analysis and visualization – ROOT



$e^-$  - Pb foil, in vacuum,  
in a magnetic field

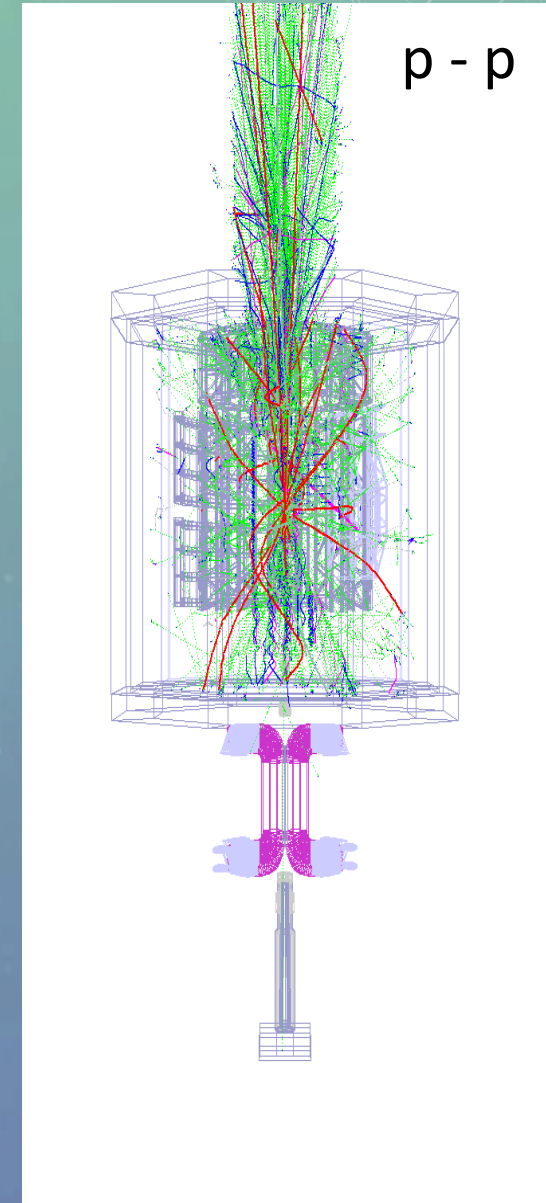
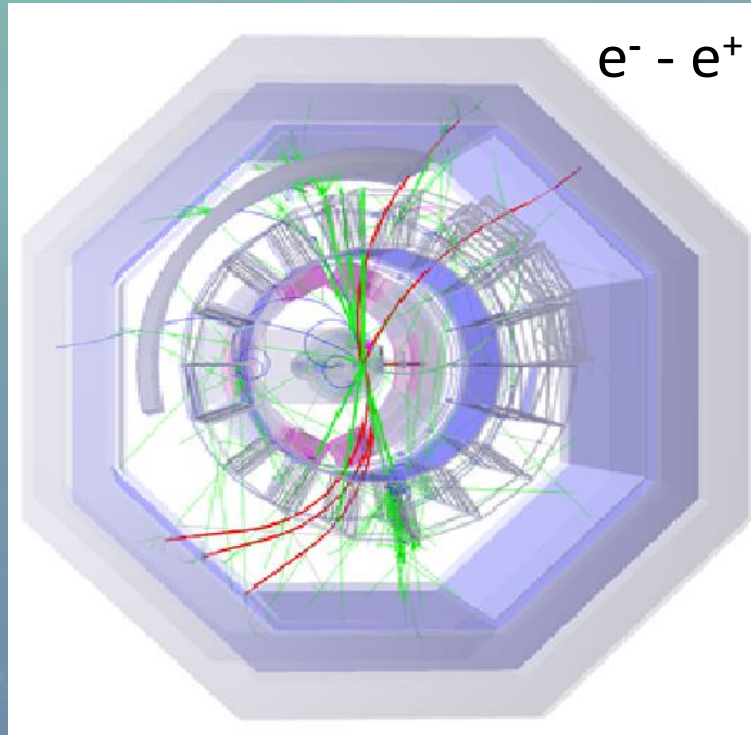
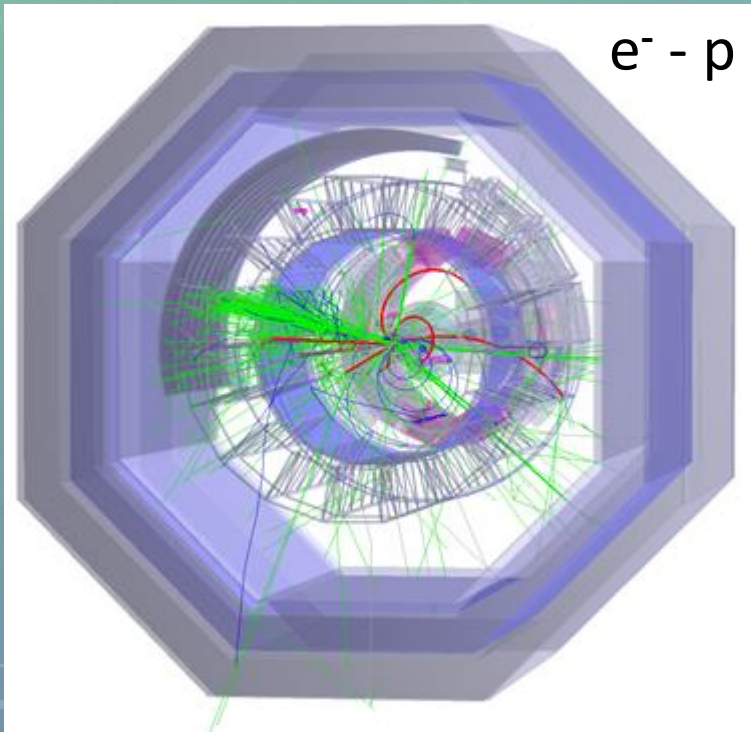


$e^-$  - Pb foil, in water



# PHYSICS SIMULATION

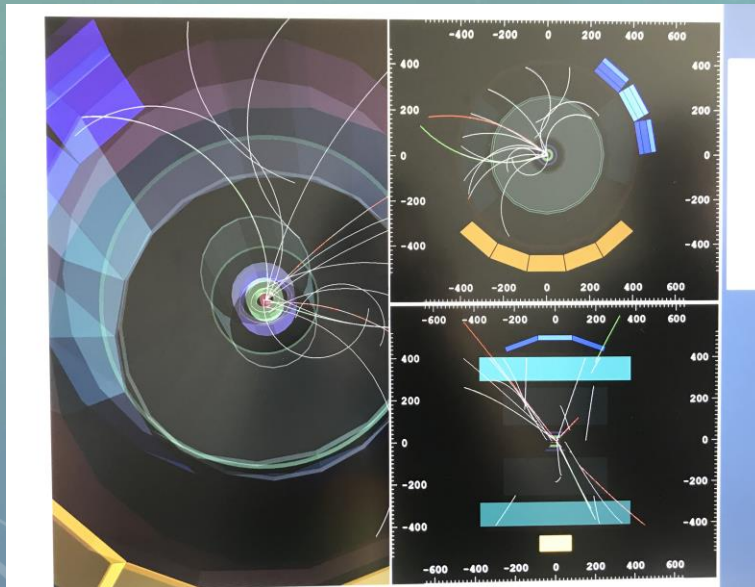
- Particle with particle collision
  - Generator (simulation of primary interactions) – Pythia
  - Particle transport – GEANT3





# PHYSICS ANALYSIS

- Strange particles decay visualization (V0s, cascades)
  - Alice MasterClass, based on ROOT



ALICE MasterClass - DEMO MODE

Browser Eve

Student Eve

Student Instructions

Instructions

Analysis Instructions

Event Navigation

Previous Current Next

4 / 1

Event analysed!

Events done: 0

Strange Particles

V0s

Cascades

Calculator

Calculator

Table of Results

Display

Clusters

Tracks

Geometry

Axes

Background

Encyclopaedia

ALICE Detector

V0 Patterns

2.76 TeV PbPb

ALICE

Viewer 1 Multi View Invariant Mass

I'm ready! Start Exercise

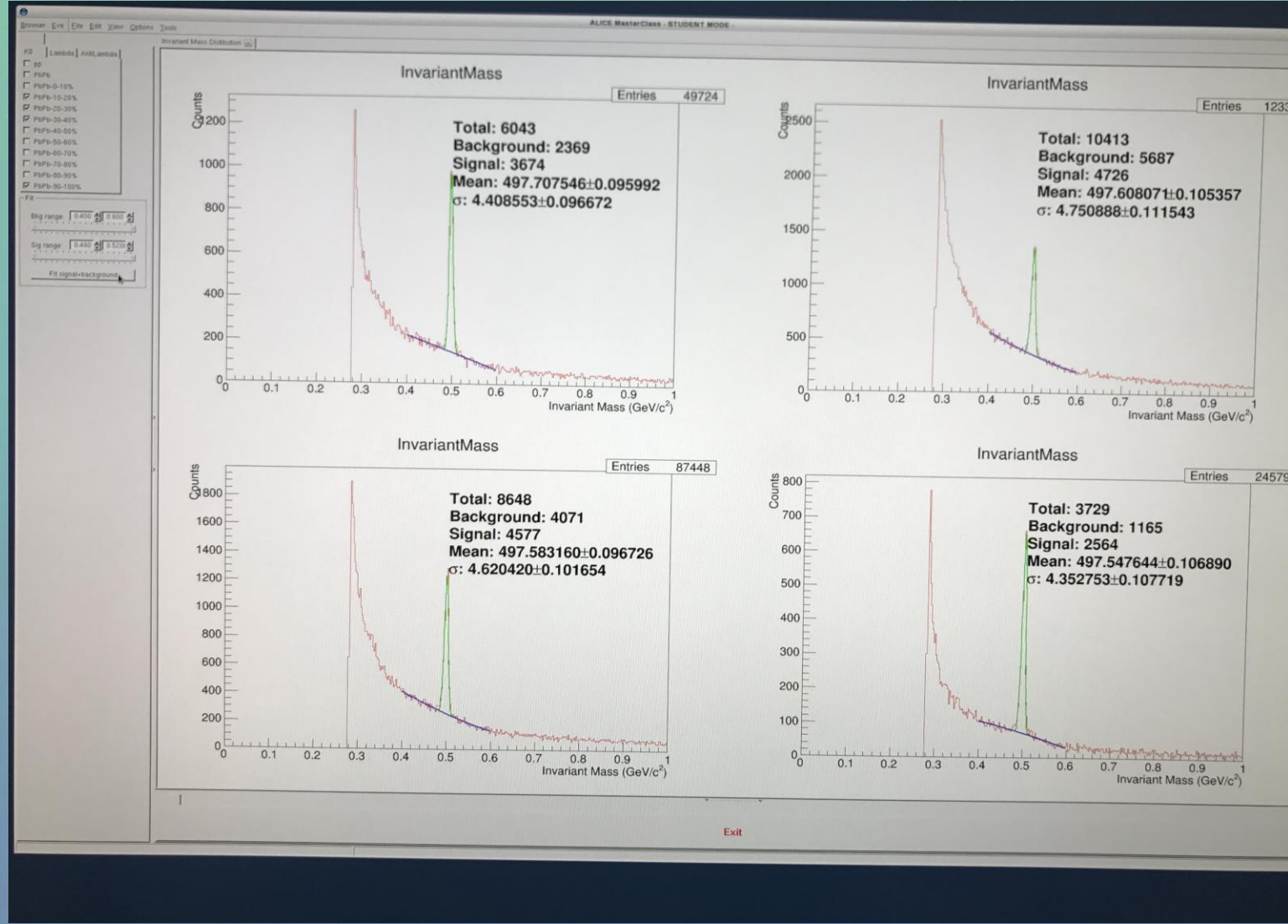
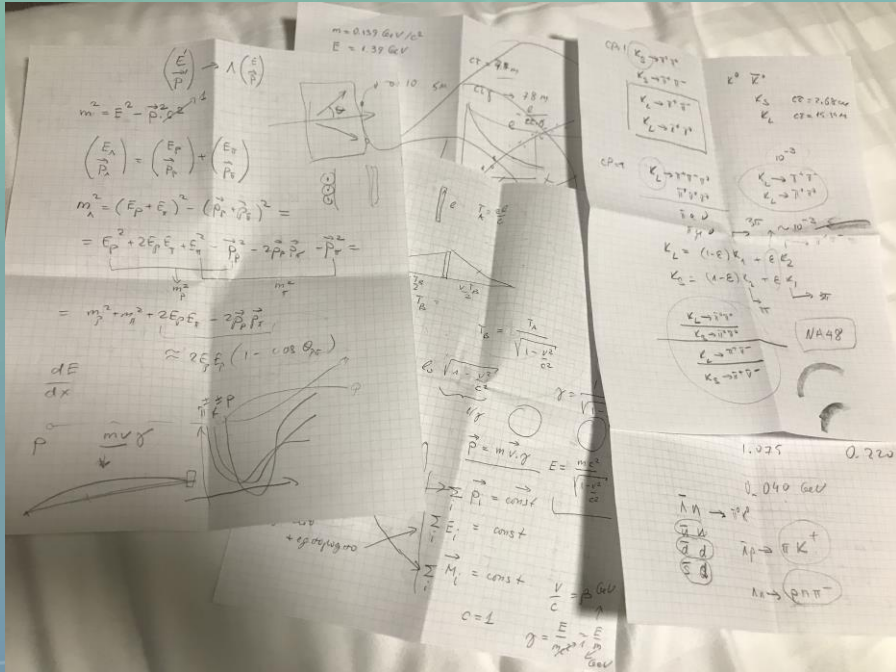
Exit





# PHYSICS ANALYSIS

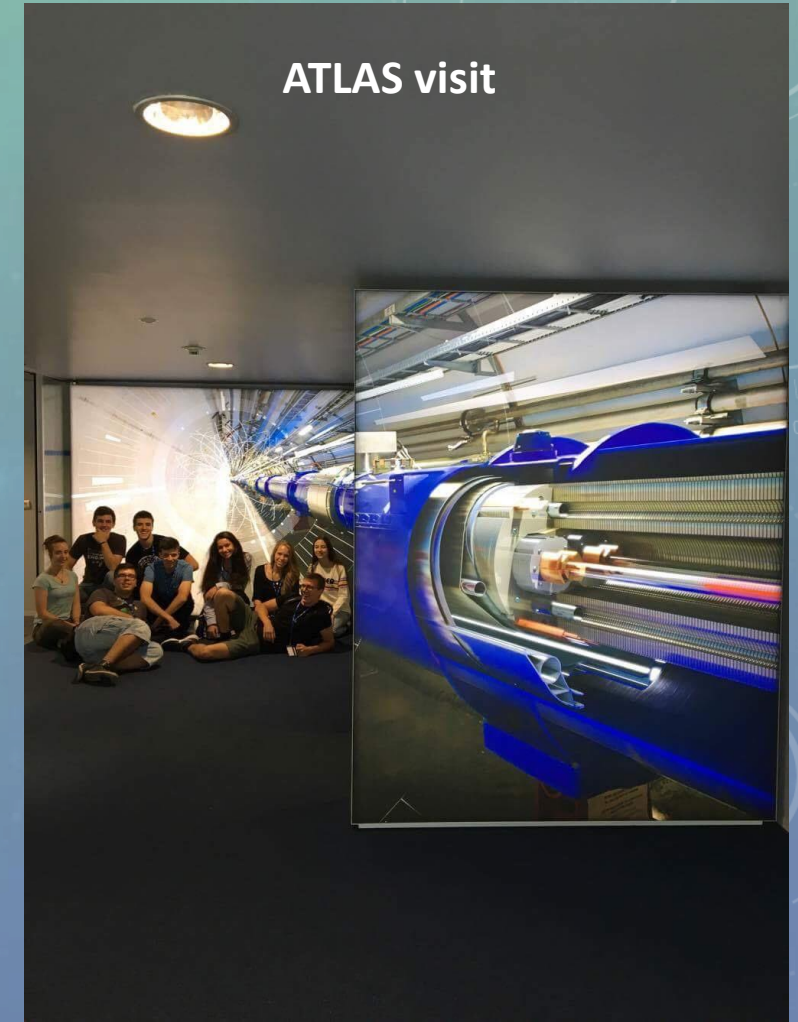
- Signal and background approximation, histograms





# MORE THAN THE PROJECTS

- Talks: Maria Fidecaro; Manjit Dosanjh; Jim Virdee, Peter Jenni, Mike Lamont; Todor Ivanov; John Ellis
- Visits: SC; CCC; AMS; SM18; ATLAS VC; CMS CAVERN; ISOLDE; DATA CENTER; AD; LEIR; ALICE





# VISITS

ALICE cavern



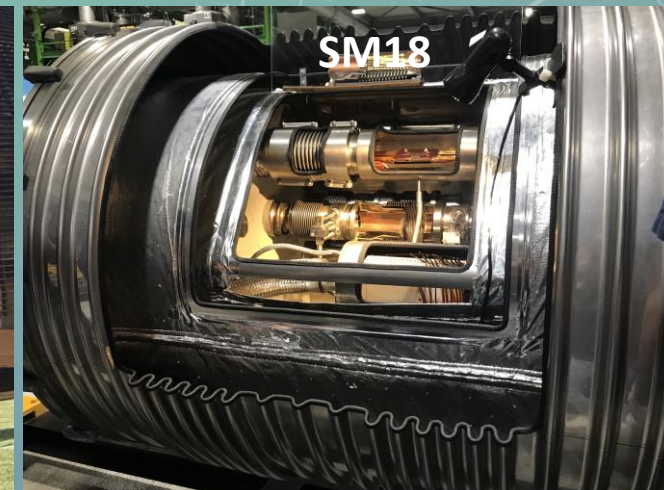
ALICE control room



The Globe



SM18



# MEMORABLE QUOTES AND TAKE-AWAY

- Jumping from failure to failure is the big secret to success.
- The things which are the least important for our survival are the very things that make us human.
- Nothing is impossible, there are just many problems to solve.



# THANK YOU

Miguel Martinez Pedreira

Costin Grigoras

Latchezar Betev

Roberto Preghenella

Peter Hristov

Cvetan Cheshkov

Zornitsa Zaharieva

Svejina Dimitrova

Roumyana Hadjiiska

