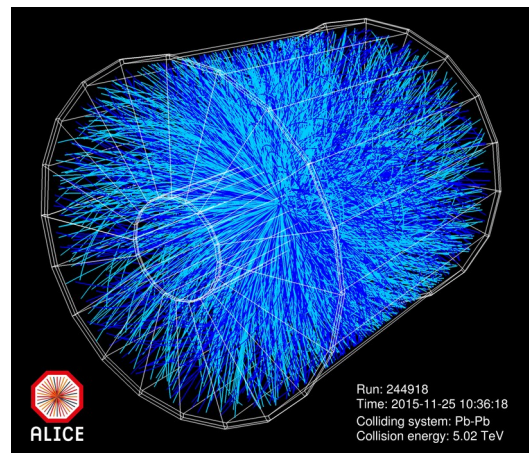
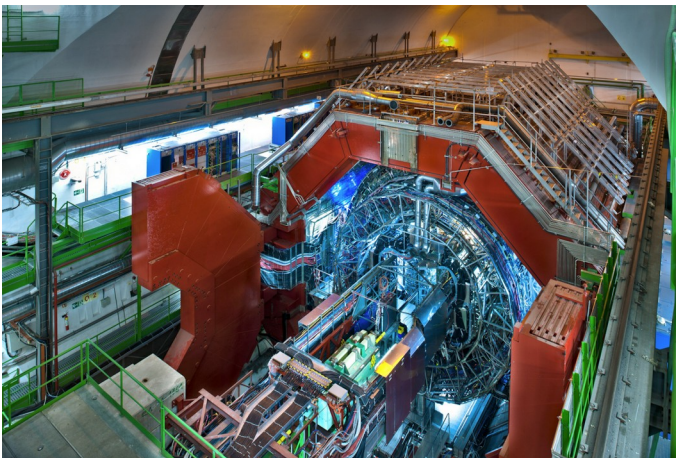


## ALICE

ALICE (A Large Ion Collider Experiment) is one of four the biggest experiments working at the Large Hadron Collider (LHC) which is currently the biggest accelerator and collider in the world. Studies carried out at the LHC led to many discoveries of particles predicted by the Standard Model of Elementary particles, in particular, the discovery of the Higgs boson that confirmed the existence of a Higgs field and therefore the theory that explains the mass of particles. Each of the experiments is dedicated to different purposes leading to more or less groundbreaking results. However, the ALICE experiment is one of the most unique because has been designed to study heavy-ion collisions that lead to Quark-Gluon Plasma (QGP) creation. In the QGP quarks and gluons, the smallest currently known elements of the matter are no longer confined inside individual nucleons. This state of matter corresponds to the state that existed shortly after The Big Bang which was the beginning of our universe. The experiment is managed by many groups from all over the world and one of them is a group from the Faculty of Physics at Warsaw University of Technology.



### Purpose and methodology

The project is based on the femtoscopy technique that analyzes two-particle correlations in momentum space. Thanks to the femtoscopy we can measure various interesting properties and effects, however, here the main goals are the study of light ions' production mechanism in the QGP and the study of their interactions with other particles. The first of goals can be carried out through the measurements of particle emitting source size created after heavy-ion collisions. In this way, we can try to judge the production mechanism of particles (builed by more than one nuclei) after collisions where the QGP is created. One of the possible scenario of creation is when the particle is emitted in the final form directly from the QGP fireball, second is when the particle is created due to interactions between other particles emitted from the QGP. Another goal of the study is to measure properties of interactions that occurs with light ions. This can be done through the analysis of the shape of correlation functions that will depend on ingredients of the interactions.

### Impact of results

The project allows for getting additional information about the creation of light nuclei after heavy-ion collisions as well as the study of the nature of their interactions with other particles. This project will be the first that study correlations between particles pair created after heavy-ion collisions when one of the particles consists of more than one nucleon. Information obtained during the study will contribute to the interpretation of current and future researches that try to build the bigger picture of particle creation and provide crucial information about hadron-hadron interactions.