According to the so-called Standard Model of particle physics there are four known fundamental forces in nature:

- gravitational (example: an apple falling down from tree),
- electromagnetic (example: radio and telephones),
- weak force (example: radioactivity),
- strong force holding the constituent quarks of a hadron together.

The strong force gets its name by being the strongest attractive force and it acts only at extremely small distances holding the quarks together. The residual force holds hadrons together with each other, such as the proton and neutrons in a nucleus. It is responsible for binding together the fundamental particles of matter to form larger particles and finally the world which we know. The strong force is 137 times more powerful than the electromagnetic one, 100 000 times more powerful than the weak force and $6 \cdot 10^9$ times more powerful than gravity.

In our studies we focus on a "nucleons level" trying to understand the interaction in systems composed of three nucleons. First, in 1934, a Japanese scientist Yukawa, developed the theory of nuclear forces. Since then, there have been tremendous research to explore the nuclear forces in detail. Today we understand exactly how the nuclear force works between two nucleons and we are able to formulate theoretical models to explain it. However, when we add at least one more nucleon, this theories failed to explain the force acting in such system. This problem was solved in recent decades when new theories were developed with addition of so-called three-nucleon force (3NF). The 3NF appears when there are 3 or more nucleons. Adding the 3NF models into calculations helps to better describe the interaction, however, some puzzles still remain unexplained. . . especially at higher energies. At about 200 MeV energy per nucleon relativistic effects start to play a significant role in the interaction as well as the 3NF effects become more seizable. Both effects are enhanced and appear with different strength in different part of the phase space. They can also interfere. To understand the system dynamics which stays behind, both, very precise data and calculations are needed. Currently, theoretical calculations are able to predict observables with various interaction models and can distinguish between different dynamical components. Such calculations can then be tested with precise data and in this way we can deepen our understanding of the nuclear forces.

Therefore, to better understand the nature of the nuclear interaction a new experiment will be performed at Cyclotron Center Bronowice in Kraków, aiming at investigation of the relativistic effects at 200 MeV. A proton beam will imping on solid deuteron target (deuterated poliethylen) and the two protons from the deuteron breakup reaction will be registered by the KRATTA (Kraków Triple Telescope Array) detectors arranged in a planar configuration. The results will answer the question of the role and the importance of the relativistic effects in the calculations and the 3N system dynamics.

The research aims at exploring fundamental sciences and the experiment will be the next piece of the nuclear-interaction puzzle.