Solar cells are relatively new but dynamically evolving branch of energy generation in ecological way. The well-known silica solar cells can reach high efficiency of solar energy conversion into electricity but with the high production costs. For this reason, other types of solar cells are needed. The newest type of photovoltaic cells based on a combination of inorganic and organic compounds, called hybrid solar cells, shows promising properties. The high efficiency of conversion is achieved at low production cost of the material. What is more, they possess excellent mechanical properties which broaden their application capabilities. One of the newest studied hybrid solar cell is based on perovskite materials.

The following project is focused on studying the parasitic recombination processes which impacts the power conversion efficiency of perovskite solar cell. The project is planned for two years. In this time, the self-written numerical drift-diffusion model is used to study trap-assisted monomolecular and surface recombination processes. For the following project, the two types of $CH_3NH_3PbI_3$ and mixed dual A-cation (2C) perovskite materials are going to be used for numerical studies.

The results of the project will make possible to better understand electronic processes that take place in the perovskite structures and most importantly to further improve power conversion efficiencies of the perovskite solar cell to its theoretical limits.