Contact binaries are a very special case of the binary stars. In such systems stars orbit so close to each other that they remain in a permanent physical contact. Extreme velocities, rotations and exchange of the material between the stars are causing strange phenomena on the common surface of the binary system. Needless to say, nobody really knows, what happens under the surface of the contact binary star. That is particularly problematic for those, who want to understand, how the phenomena occurring on the binary actually work.

This project utilizes a novel approach to the study of contact binaries. Thanks to the modern space borne observatories, like the Kepler spacecraft, we are now able to study the flux of contact binaries almost continuously for a long time. Here we aim to exploit this new possibility to show that it is possible to disentangle the signals from the surface phenomena from the signals coming from the contact binary itself. Our new method, the Light Curve Morphology Analysis, is designed for studying how the flux of the observed system evolves in time. In other words, we are using the information about the changes of changes of the flux coming from the binary star. Our theoretical study will be put to the test during the observational verification we plan to conduct with a large telescope.

Our goal is to incorporate this new method to the multiwavelength observations, which should allow us to understand how the surface phenomena work, better than ever before. If everything will go accordingly to the preliminary analysis, we will provide a set of tools for fast analysis of large databases produced in the forthcoming space borne missions like WFIRST, TESS, PLATO or JWST.