

Self-assembly is a spontaneous creation of organised macroscopic structures in physical systems consisting of two or more components. In various experiments emergence of many interesting structures is observed. Among them there are nanowires and quantum dots, both used in many practical applications such as solar cells, LEDs or diode lasers. It is known that the properties of the matter on the microscopic level are responsible for self-assembly, however, some unifying theory of the phenomena is still lacking. In our project we would like to analyse emergence of the structures observed in the experiments using theoretical methods. Having a theoretical model we shall propose new experiments that can be carried out by experimental groups. Our research will contribute to better understanding of the observed phenomena which will help in designing various nanostructures in the future.