Condensed Matter of Ukrainian Academy of Sciences in Lviv.
The visit took place between 05 April and 05 May of 2013.

1. During my stay in Lviv together with dr P. Bryk I attended several discussions on the following topics: The phase behavior of thin films of block copolymers consisting of two chemically different segments, the possible structural phase transitions in such systems, topology of the phase diagrams.

2. Over entire period of the visit I worked on adsorption of short block copolymers on solids. The molecule consists of either fully flexible or rigid parts. Rod coil block polymers can self-assemble into various morphologies that greatly affect the optical and physical properties of the system. We determine full topology of the phase diagrams for a series of symmetric copolymers. We have found three distinct phases, gas, a disordered liquid and the ordered liquid phase. The critical chemical potential and critical density for the gas-disordered liquid transition changes non-monotonically, whereas the critical temperature increases monotonically with chain length. In order to better characterize the structure of the adsorbed phases we have also determined Minkowski measures.

3. With prof. A. Trokhymchuk I discussed the mechanism of melting transition in two-dimensional system of hard discs with a rectangular-well attraction potential and possibility to solve this problem in efficient way using Monte Cralo simulations. L.M Pomirchi et al., (Theoretical and Mathematical Physics, v. 130 pp. 101-110 (2002)) has shown that the melting could occured via a single first-order transition as well as continuously in accordance with the Kosterlitz-Thouless-Halperin-Nelson-Young theory. In particular, if the width of attracting part of the potential was equal to zero (the hard-disc system), melting occured as first-order transition. As the attraction radius increases, the first-order transition is replaced by a continuous transition.