

## **Correlation inequalities for point processes: popular overview**

This project states three objectives in the field of point processes all of them related to stochastic models encountered for example in physics, biology, telecommunication and other applied areas. It concentrates on so called correlation inequalities which are related to operator spectral theory, limit theorems, speed of convergence in limiting procedures, comparison of processes in a stochastic sense, comparison of clustering and other phenomena. These objectives are devoted to three classes of point processes which are in the main stream of the contemporary research: Gibbs point processes, determinantal/permanental (alpha-permanental in general) point processes and Boolean models. From a practical point of view the aim of this project is to obtain for example mathematical results useful in the theory and practice of simulation. More precisely, the aim of this research is to find bounds on the burn-in time, in order to be able to assess the speed of simulation procedures (algorithms) which simulate some complicated distributions (not available by analytical methods) describing some real phenomena encountered in physics or in random networks of different types such as computer networks, social networks, telecommunication networks etc.