

Quantum mechanics predicts a possibility of correlations between systems without classical counterparts. These correlations raise hopes for using quantum system for more effective solutions of some communication and computation problems. However, these hope are held low due to both experimental challenges and a difficult description of large quantum systems. We therefore aim in proposing a new, simpler mathematical language for states of such systems. This will allow us to identify strictly quantum phenomena, such as entanglement and violation of Bell inequalities, more easily. We will also participate in experiments on using large systems in quantum communication and coding states to make them robust against possible errors in future quantum computers. We hope that our project will lead to a discovery of new practical applications of large quantum systems.