Uninterrupted series of successes of quantum mechanics grounded a belief that it is the most fundamental theory of Nature to date. As such it should explain in some way the everyday world, in particular its objective character. It turns out that this problem, being an aspect of a fundamental for the whole of science quantum-to-classical transition mechanism, has not been yet studied well. It is the aim of this project to carry on such a research. Natural setup here are quantum open systems, where the system of interest is not considered in isolation but rather interacting with its environment. And unlike in standard approaches to open systems, the environment is considered as an information carrier, which can be justified e.g. by realizing that most observations in macroscopic world are performed indirectly, through the environment (we see because we register part of the photon environment of the observed objects). Proliferation of many identical 'information fingerprints' of the system in its environment leads then to a form of an objectivity of certain system features. This idea, known as quantum Darwinism, is the starting point for the project. As we see, information flow between the system and the environment is crucial here and since quantum states provide the most complete up to date information about any system, it is natural then to study this flow on the fundamental level of quantum states. The main research tool, apart form the standard quantum information methods, are recently introduced so called Spectrum Broadcast Structures - multipartite quantum state structures shown to be responsible for a certain form of objectivity. This is a novel tool, used so far only in some situations, however important and convincing enough to justify further, deeper analysis. The latter encompasses a wide spectrum of problems: From studies of concrete models of open systems, through models including gravitation to general problems, e.g. connected to the quantum measurement problem. The expected impact of the project results on the science is potentially quite remarkable. For example, opening of novel research areas on the border between quantum information and open systems theories or building new links between quantum mechanics and general relativity.