In the present thesis we study superconductivity using approaches based on the two-particle T-matrix. With the multiple scattering corrections the Galitskii-Feynman ladder T-matrix approximation becomes applicable to the superconducting state. This theory describes the superconducting and normal states within the same approximation. In this thesis, the original equilibrium theory is generalized to nonequilibrium systems using the generalized Kadanoff-Baym formalizm. The obtained theory of nonequilibrium superconductors is suitable for bulk systems where the momentum is a good quantum number. We have reformulated the theory for nanosystems, where the momentum is no longer a good quantum number. The modification was aimed at nanospheres, where one can benefit from the expansion in eigenstates of the angular momentum. High degeneracy of energy levels leads to high critical temperatures of sheres with a magical number of electrons, which makes them good candidates for observation of phenomena beyond the weak coupling limit. As a suitable experimental technique we discuss the tunneling spectroscopy.