We will study the out-of-equilibrium properties of superconducting nanoscopic hybrid devices consisting of active elements, e.g., a set of semiconducting nanowires, connected to superconducting leads. Such devices, apart from their applications in quantum information processing and sensor technology, provide an ideal setup to study quantum phenomena in controlled conditions. Using complementary methods previously developed and/or mastered by both collaborating teams, including numerical renormalization group, diagrammatic perturbation techniques and quantum Monte Carlo, we will evaluate linear response properties such as thermopower or microwave response, which have been only recently measured. Moreover, some of these methods will be further generalized to strong out-of-equilibrium situations to provide results on AC Josephson systems driven by finite voltage or quenched systems undergoing a sudden change of parameters. We plan to build up a toolbox of theoretical methods for a reliable description of nonequilibrium nanohybrids to address both existing as well as future experiments.