Conjugated organic systems have attracted much attention in recent times due to the possibility of their use as active species in molecular electronic devices. Therefore, a comprehensive understanding of their electronic structure has become very important. Although conjugated systems were some of the earliest systems studied in quantum chemistry, the models as well as the methods employed did not consider the role of electron correlations adequately. While the development of exact diagonalization techniques was reasonably adequate for understanding the low-lying states in polyenes, other polymers of interest such as poly para phenylenes and poly para phenylene vinylenes could not be adequately studied by these methods. Introduction of the density matrix renormalization group (DMRG) method which is highly accurate for quasi-one-dimensional systems provided the impetus to study conjugated polymers. In this talk after a brief overview of models for conjugated systems, developments of exact diagonalization and DMRG methods for studying low-lying states as well as dynamical nonlinear optic responses using these methods will be discussed. Some of our recent studies using real time quantum-many-body dynamics for understanding intermolecular electronic processes such as electron-hole recombination, triplet-triplet annihilation and excitation transfer processes would also be discussed.