

# Microscopic approach to nuclear reactions

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The dynamics of quantum systems, and in particular nuclear systems, is very difficult to describe as it involves many degrees of freedom. In the last years, we have made progress in description of nuclear dynamics due to (i) the development of density functional theory, and its time dependent extension, and (ii) the extreme advances in computing capabilities, and particularly the use of graphics processing units. This has had implications for fission modeling, as it showed that the usual adiabatic approximation used to calculate fission fragments mass and charge distributions is inadequate, as most of the potential energy from saddle to scission dissipates into internal degrees of freedom, thus heating up the compound nucleus with consequences for neutron emission from excited fragments. In this talk, I will summarize the latest advances in describing the dynamics of nuclei and discuss future improvements and directions.