

# Set-Oriented Numerical Methods for Dynamical Systems

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Over the past few years so-called set-oriented numerical methods have been developed for the numerical study of dynamical systems. These methods do not just allow to compute *directly* – i.e. by avoiding long term simulations of the underlying system – invariant sets or invariant manifolds but they can also be used to approximate statistical quantities such as natural invariant measures. In this talk an overview about recent accomplishments in this area will be given. In particular, three concrete applications of these techniques will be presented: the approximation of so-called *almost invariant sets*, the construction of reliable global zero finding procedures and the detection of energetically efficient spacecraft trajectories.