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# Bifurcations, Global Change, Tipping Points and All That

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In this talk, we will attempt to cover, as time permits, issues pertaining to a self-consistent, unified treatment of the climate system's natural and forced variability, i.e. climate change, sensitivity and intrinsic variability. To set the stage, key features of short-, intermediate, and long-term prediction will be sketched, followed by the effects of the system's multiple scales of motion. After summarizing the main results and uncertainties of successive assessment reports of the International Panel on Climate Change (IPCC), time-dependent forcing will be introduced, in both its natural and anthropogenic forms.

We will outline the generalization of strange attractors to this non-autonomous setting, namely pullback and random attractors (PBAs & RAs), as well as the generalization of the bifurcations known from classical, autonomous dynamical systems to the tipping points (TPs) of non-autonomous ones. The case of the Lorenz convection model with stochastic forcing and of its RA will be used as an illustrative example. The talk will conclude with a list of questions and a selected bibliography.