Bifurcations in random dynamical systems

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Random dynamical systems have equations of motion that depend in part on a stochastic process or random variable. They are relevant in many modelling situations in the sciences and engineering. The challenge is to extend the successful theory of deterministic dynamical systems to dynamical systems "with noise". We discuss recent results on the development of bifurcation theory in this setting, emphasizing the importance of probabilistic and topological aspects.