Understanding of distinct catastrophic events and their transitions in complex dynamical systems

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Complex dynamical systems have received considerable attention during the past few decades due to surprising dynamical effects, such as sudden transitions, extreme events, and regime shifts. Specifically, extreme events (EE) occur unexpectedly, creating disastrous consequences in both nature and society. Understanding the dynamical origin of EE, distinct transitions, and their possible earlier prediction is a pressing problem in recent times to minimize the impact or forecast unanticipated disastrous events and global warming. Using the dynamical system theory in a wide range of complex systems will help to enhance the understanding of EE formations. In the first part of this talk, I would like to explain the distinct formation of EE and their transition in different complex systems. In the second part, I will explore the intriguing connection between hyperchaos and large-intensity events in a few nonlinear dynamical systems.

References:

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