Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Seminar

Drive-specific adaptation in disordered mechanical networks of bistable springs

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Systems with many stable configurations abound in nature, both in living and inanimate matter. Their inherent nonlinearity and sensitivity to small perturbations make them challenging to study, particularly in the presence of external driving, which can alter the relative stability of different attractors. Under such circumstances, one may ask whether any clear relationship holds between the specific pattern of external driving and the particular attractor states selected by a driven multi-stable system. To gain insight into this question, I will present a numerical study of driven disordered mechanical networks of bistable springs which possess a vast number of stable configurations arising from the two stable rest lengths of each spring, thereby capturing the essential physical properties of a broad class of multi-stable systems. I will show that the attractor states of driven disordered multi-stable mechanical networks are fine-tuned with respect to the pattern of external forcing to have atypically low work absorption from it. Furthermore, I will demonstrate that these drive-specific attractor states are even more stable than expected for a given level of work absorption.

Thursday, Jan 2nd 2020

4:00 PM (Tea/Coffee at 3:30 PM)

Auditorium, TIFR-H