

Students' Annual Seminar

Encoding Robust and Fast Memories in Bulk and Nanoscale Amorphous Solids

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Memory is a pervasive concept and is often thought of as a defining feature of non-equilibrium systems. Amorphous materials, for instance, show a tendency to remember the amplitude of cyclic driving they were subjected to.

In my talk, using simulation studies, I will address two significant shortcomings in the literature dealing with memory encoding in cyclically sheared amorphous solids: First, I will discuss protocols to encode memories that eliminate the need for prior knowledge for reading, resulting in robust memories that are immune to memory corruption, which is liable to occur otherwise. Second, I will highlight the challenges of encoding memory in thermodynamically large systems and provide a practical alternative to bulk memory storage devices by successfully demonstrating memory encoding and reading in glass nanorods, using tension-compression cycles. This opens the possibility for creating better memory devices that are both fault-tolerant to reading errors and provide faster access to memory input/output operations.

References:

[1] "Encoding Robust and Fast Memories in Bulk and Nanoscale Amorphous Solids" - M Adhikari, R Sharma, S Karmakar, arXiv preprint arXiv:2309.10682

Friday, Apr 26th 2024

16:00 Hrs (Tea / Coffee 15:45 Hrs)

Seminar Hall, TIFR-H