ICTS Statistical Physics Journal Club Seminar

Title : Singularities in Hessian element distributions of amorphous media

Speaker : Kabir Ramola (TIFR Hyderabad)

Date : Thursday, 12th November, 2020

Time : 03:00 pm (IST)

Abstract : We show that the distribution of elements H in the Hessian matrices associated with amorphous materials exhibit singularities $P(H) \sim |H|^\gamma$ with an exponent $\gamma < 0$, as $|H| \to 0$. We exploit the rotational invariance of the underlying disorder in amorphous structures to derive these exponents exactly for systems interacting via radially symmetric potentials. We show that γ depends only on the degree of smoothness n of the potential of interaction between the constituent particles at the cut-off distance, independent of the details of interaction in both two and three dimensions. We verify our predictions with numerical simulations of models of structural glass formers. Finally, we show that such singularities affect the stability of amorphous solids, through the distributions of the minimum eigenvalue of the Hessian matrix.

Venue : Online Seminar
Please click on the below link to join the zoom meeting
https://zoom.us/j/99168101465?pwd=dU9NRWFaU3U1Z05aaDFrWFk2eWYzZz09
Meeting ID: 991 6810 1465
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