Geometric properties of the microcanonical surface in the Discrete Non-Linear Schrödinger equation

Abstract: In this talk I will discuss few topological and analytical problems naturally arising form the
study of localization phenomena for the Discrete Non-Linear Scrödinger Equation, following a joint work with
Balducci-Piergallini-Scardicchio and Vanoni. By a detailed inspection of topological and analytic (Morse theoretic)
structure of the potential energy surface, we can then observe that the infinite-temperature localization phase transition
is not due to topology but conjecturally to a crucial quantitative change in behaviour of the spectrum of the Laplace operator.
I'll relate this question to few similar known geometric problems and discuss recent progresses.

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