

Volume entropy rigidity

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at

ETH in Zurich, Switzerland

organized by

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This workshop, sponsored by AIM, ETH, and the NSF, will be devoted to volume entropy rigidity for higher rank symmetric spaces and piecewise Riemannian manifolds such as buildings and polyhedral complexes. We want to bring together mathematicians from different related fields such as differential geometry, ergodic theory and geometric group theory to attack the problem of characterizing the "symmetric" metrics by normalized volume entropy.

For any piecewise Riemannian manifold the volume entropy is defined as the exponential growth rate of volumes of balls in the universal cover. It seems to be a rather coarse asymptotic invariant, but it is related to Gromov's simplicial volume, the bottom of the spectrum of Laplacian, the Cheeger isoperimetric constant, the growth of fundamental groups, etc. The entropy rigidity conjecture due to Gromov and Katok states that among all Riemannian metrics on a closed Riemannian manifold of non-positive curvature the locally symmetric metric minimizes the normalized entropy. This conjecture was first shown by Katok for surfaces. Later, Besson, Courtois and Gallot proved that for a manifold which carries a rank one symmetric metric the normalized entropy is minimal if and only if the metric is rank one symmetric. The conjecture is still open for higher rank symmetric spaces, although some work has already been carried out in this direction by Connell and Farb.

Remarkably enough, not much attention has been paid so far to the natural question whether there exists an entropy rigidity for singular spaces. Besides analyzing the question of volume entropy rigidity in higher rank symmetric spaces, one of our goals in this workshop is to consider buildings, hyperbolic or Euclidian, which are piecewise Riemannian manifolds and yet have "a lot of symmetries". In this case the combinatorics of the space can give us some information about the volume entropy and its rigidity.

Related problems such as the question when Liouville measure, harmonic measure and Bowen-Margulis measure coincide will also be addressed.

We hope that the collaboration and exchange of ideas in the frame of the workshop will lead to an improved understanding of volume entropy rigidity.

The workshop will differ from typical conferences in some regards. Participants will be invited to suggest open problems and questions before the workshop begins, and these will be posted on the workshop website. These include specific problems on which there is hope of making some progress during the workshop, as well as more ambitious problems which may influence the future activity of the field. Lectures at the workshop will be focused on familiarizing the participants with the background material leading up to specific problems, and the schedule will include discussion and parallel working sessions.

The deadline to apply for funding to participate in this workshop has passed.

For more information email workshops@aimath.org