# *FELIX KLEIN SEMINAR*

**Speaker: Ilya Gekhtman**
**Technion**

*Date:* Thursday, April 25, 2024
*Time:* 2:00 PM
*Location:* 125 Hayes-Healy Bldg
*Zoom URL:* NA



*Lecture Title:*

**Stationary random subgroups and injectivity radius of hyperbolic manifolds**

*Abstract*

There is a long tradition of using probabilistic methods to solve geometric problems. I will present one such result. Namely, I will show that if the bottom of the spectrum of the Laplacian on a hyperbolic n manifold M is equal to that of its universal cover (or equivalently the fundamental group has exponential growth rate at most $(n-1)/2$) then M has points with arbitrary large injectivity radius. This is (in some sense the optimal) rank 1 analogue of a recent result of Fraczyk-Gelander which asserts that any infinite volume higher rank locally symmetric space has points with arbitrary large injectivity radius. The proof will depend on a probabilistic result showing that non-free stationary actions of random walks on hyperbolic groups have "large" stabilizers. Namely, if the stabilizers are discrete then they have full limit sets and exponential growth rate greater than half of the entropy divided by the drift of the random walk, in particular bounded away from 0. This is joint work with Arie Levit.