1131-20-167 **Arman Darbinyan*** (arman.darbinyan@vanderbilt.edu). *Word and Conjugacy Problems in Lacunary Hyperbolic Groups.*

In my talk I will discuss word and conjugacy problems in lacunary hyperbolic groups (LHG). In particular, I will discuss general framework and its applications which allowed us to construct lacunary hyperbolic groups with word and conjugacy problems highly controllable both in terms of computability and computational complexity.

As an application, we are able, to construct versions of well-known 'monster' groups with 'almost' linear time word and polynomial time conjugacy problems.

As another application, we show that for any recursively enumerable subset $\mathcal{L} \subseteq \mathcal{A}^*$, where $\mathcal{A}^*$ is the set of words over arbitrarily chosen non-empty finite alphabet $\mathcal{A}$, there exists a LHG $G_{\mathcal{L}}$ such that the membership problem for $\mathcal{L}$ is 'almost' linear time equivalent to the conjugacy problem in $G_{\mathcal{L}}$. Moreover, for the mentioned group the word and individual conjugacy problems are decidable in 'almost' linear time.

Yet another application is the construction of a LHG with 'almost' linear time word problem and with all the individual conjugacy problems being undecidable except the word problem.

Finally, as a consequence of the main results, we are able to answer several open questions. (Received July 12, 2017)