Meeting: 1005, Newark, Delaware, SS 9A, Special Session on Arithmetic Groups and Related Topics

1005-22-31 **Gopal Prasad*** (gprasad@umich.edu), Department of Mathematics, University of Michigan, Ann Arbor, MI 48109-1109. *Zariski-dense subgroups of semisimple Lie groups and Number theory.*

I will report on some recent joint work with Andrei Rapinchuk.

Given a finitely generated subfield K of $\mathbb{R}$, a finitely generated extension field L of K, a semisimple algebraic group G defined over K, and a Zariski-dense subgroup Γ of $G(K)$, we prove that Γ contains a regular $\mathbb{R}$-regular element g such that the K-torus $T := Z_G(g)^\circ$ is anisotropic over L and the cyclic subgroup generated by g is Zariski-dense in T. Existence of such elements allows us to settle questions of Margulis-Soifer, Hitchman-Spatzier and Benoist. Using these elements, we have also proved some results on the lengths of periodic geodesics in locally symmetric spaces. (Received January 13, 2005)