**Speaker**: Carsten Peterson

**Title**: Quantum ergodicity on Bruhat-Tits buildings of type $\tilde{A}_2$

**Abstract**: Quantum ergodicity refers to equidistribution results for eigenfuntions of Laplacian-like operators which arise from ``quantizing'' an ergodic dynamical system. Recently, Anantharaman and Le Masson showed such a result for regular graphs (some of which arise as quotients of buildings for SL$(2, K)$ where $K$ is a non-Archimedean local field) and Brumley and Matz, building on work of Le Masson and Sahlsten, showed such a result for locally symmetric spaces associated to SL$(n, \mathbb{R})$. We establish analogous results for SL$(3, K)$. Specifically, consider a sequence $\{X_n\}$ of compact quotients of the Bruhat-Tits building associated to SL$(3, K)$ which converge in the sense of Benjamini-Schramm to the building. We prove that on average joint eigenfunctions of the spherical Hecke algebra of PGL$(3, K)$ acting on $L^2(X_n)$ (thought of as functions on the vertices) converge in a weak-* sense to the counting measure on vertices as $n \to \infty$. Some ingredients of the proof are the explicit decomposition of $\mathrm{L}^2(\mathrm{PGL}(3, K)/\mathrm{PGL}(3,\mathcal{O}_K))$ into irreducibles as a representation of $\mathrm{PGL}(3,K)$, a mean ergodic theorem for convolution operators on semisimple Lie groups, geometry of affine buildings, and Brion's formula for exponential sums over polytopes.