1036-11-102 **Cristina M Ballantine*** (cballant@holycross.edu). *Combinatorics and representation theory of p-adic groups.* Preliminary report.

We use the Hecke algebra of $GL_n(\mathbb{Q}_p)$ with respect to $GL_n(\mathbb{Z}_p)$ to explore the relationship between representations of $GL_n(\mathbb{Q}_p)$ and the combinatorial properties of its Bruhat-Tits building. On the one hand, for $n = 2$ or 3, using the classification of the unramified representations of $GL_2(\mathbb{Q}_p)$, resp. $U_3(\mathbb{Q}_p)$, we show that quotients of the corresponding building are Ramanujan graphs. On the other hand, we use combinatorial properties of the building to produce new p-adic representations of $GL_n(\mathbb{Q}_p), n = 2, 3$. (Received January 17, 2008)