1120-42-266 **Azita Mayeli*** (amayeli@gc.cuny.edu). *Tiling and spectral sets in $\mathbb{Z}_p \times \mathbb{Z}_p$.* Preliminary report.

The equivalence relation between tiling and spectral property of a set has its root in the Fuglede Conjecture a.k.a Spectral Set Conjecture in $\mathbb{R}^d$, $d \geq 1$. In 1974, Fuglede stated that a Lebesgue measurable set $\Omega \subset \mathbb{R}^d$, with positive and finite measure, tiles $\mathbb{R}^d$ by its translations if and only if $L^2(\Omega)$ possesses an orthogonal basis of exponentials. A variety of results were proved for establishing connection between tiling and spectral property for some special cases of Ω. However, the conjecture is false in general for dimensions 3 and higher, and it is still open in $\mathbb{R}$ and $\mathbb{R}^2$.

In this talk, we will define the tiling and spectral sets in $\mathbb{Z}_p \times \mathbb{Z}_p$, p prime, and show that these two properties are equivalent for such sets. In other words, we prove that Fuglede's conjecture holds for $\mathbb{Z}_p \times \mathbb{Z}_p$. This is a joint work with Alex Iosevich and Jonathan Pakianathan. (Received February 23, 2016)