Math 209 - Number Theory Seminar

Gabriel Dorfsman-Hopkins
UC Berkeley

Untilting Line Bundles on Perfectoid Spaces

Abstract:
Let $X$ be a perfectoid space with tilt $X^b$. We build a natural map $\theta : \text{Pic}X^b \to \lim \text{Pic}X$ where the (inverse) limit is taken over the $p$-power map, and show that $\theta$ is an isomorphism if $R = \Gamma(X, \mathcal{O}_X)$ is a perfectoid ring.

As a consequence we obtain a characterization of when the Picard groups of $X$ and $X^b$ agree in terms of the $p$-divisibility of $\text{Pic}X$. The main technical ingredient is the vanishing of higher derived limits of the unit group $R^*$, whence the main result follows from the Grothendieck spectral sequence.

Special Note:
Pre-talk at 1:20pm.

Thursday, November 18, 2021
2:00 PM
APM 6402 and Zoom; see
https://www.math.ucsd.edu/~nts/