BOSTON UNIVERSITY NUMBER THEORY SEMINAR

Projective geometry for perfectoid spaces

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Monday, December 10 at 4:15 pm
111 Cummington Mall, MCS B21
Tea and cookies in MCS 144 at 4:00 pm

Abstract: To understand the structure of an algebraic variety we often embed it in various projective spaces. This develops the notion of projective geometry which has been an invaluable tool in algebraic geometry. We develop a perfectoid analog of projective geometry, and explore how equipping a perfectoid space with a map to a certain analog of projective space can be a powerful tool to understand its geometric and arithmetic structure. In particular, we show that maps from a perfectoid space X to the perfectoid analog of projective space correspond to line bundles on X together with some extra data, reflecting the classical theory. Along the way we give a complete classification of vector bundles on the perfectoid unit disk, and compute the Picard group of the perfectoid analog of projective space.