

# Stanford Department of Mathematics Number Theory Seminar

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2:30–3:30pm, 383N

**mod- $p$  Poincaré duality in  $p$ -adic geometry**

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## Abstract

Étale cohomology of  $\mathbf{F}_p$ -local systems does not behave nicely on general smooth  $p$ -adic rigid-analytic spaces; e.g., the  $\mathbf{F}_p$ -cohomology of the 1-dimensional closed unit ball is infinite.

It turns out that perfectoid spaces are very useful to understand such cohomology groups. For example, Scholze used them to show that *proper*  $p$ -adic rigid-analytic spaces have finite cohomology for any  $\mathbf{F}_p$ -local system.

I will introduce the concept of almost coherent sheaves and use it to “localize” (in an appropriate sense) some problems in the étale cohomology of rigid-analytic spaces. For example, this theory (together with perfectoid spaces) can be used to give a new proof of the finiteness theorem and a proof of Poincaré Duality for  $p$ -torsion coefficients on smooth and proper  $p$ -adic rigid-analytic spaces.

This is work in progress.