# Title

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# Table of Contents

# Contents

# 1 | Lecture 09

Last time:

- The Čech-to-derived spectral sequence,
- The Mayer Vietoris LES,
  - Computes the étale cohomology of a scheme using a Zariski open cover.
- Étale cohomology of quasicoherent sheaves,
  - Agrees with Zariski cohomology, first legitimate computation!
  - Use this to compute:
- Étale cohomology of $\underline{\mathbb{F}_p}$ in characteristic $p$.

Last time we had a scheme $X_{/\mathbb{F}_p}$ and the *Artin-Schreier* exact sequence of sheaves of $X_{\text{ét}}$:

$$0 \to \underline{\mathbb{F}_p} \to \mathcal{O}_X^{\text{ét}} \xrightarrow{t \mapsto t^p - t} \mathcal{O}_X^{\text{ét}} \to 0.$$

The map appearing here is referred to as the *Artin-Schreier* map $f$ This works over arbitrary fields of characteristic $p$, with a modified definition replacing $t^p$.

**Exercise 1.0.1** ***(?):*** Check that this is an additive homomorphism of abelian sheaves. This follows from the fact that Frobenius itself is.

Recall that we had a theorem last time showing that the étale cohomology of quasicoherent sheaves is equivalent to the usual Zariski cohomology. From this we got a long exact sequence:

$$\begin{tikzcd}
 & \cdots \arrow[r] & H^i(X,\mathcal{O}_X) \arrow[dll, "\delta"] \\
H^i(X_{\text{ét}},\underline{\mathbb{F}_p}) & H^i(X,\mathcal{O}_X) \arrow[r, "f"] & H^i(X,\mathcal{O}_X)
\end{tikzcd}$$