Let \( T/S \) an algebraic stack, \( F \) a sheaf on \( \text{Lisse-étale site of } X \). Then \( F \) is quasi-coherent if for all objects \( T \rightarrow X \) in \( \text{Lisse-étale} \), \( \pi^* F \) is f. coherent on \( T \) \( \Rightarrow \) \( A F \text{to } T \).

\[
\text{Proof: } \ F/S \text{ q.coh } \iff \ F \text{ smooth surjection } X \rightarrow X
\]

\( \text{s.t. } \pi^* F \text{ is q.coh on } X. \)

**Computation cohomology:** 
\[
\text{9.a.2.}
\text{given a alg stack } X \text{ smooth surjection } X \rightarrow X
\]

\[
X \times_X X \Rightarrow X \left( \rightarrow X \right)
\]

**Simplicial objects:** 
\[
\Delta = \text{finite ordered sets, order preserving maps}
\]

\[
\text{oh} = \{ [0, 1, \ldots, n] \}
\]

\[
\text{Simp}(C) = \text{Fun}(\Delta^{op}, C)
\]

\[
C_2 \equiv C_1 \equiv C_0
\]

\[
[0,1,2] \quad [0,1] \quad [0]
\]

\[
\Rightarrow \text{a morphism } \ a \rightarrow b \quad C
\]
If \( C \) is a site, with final object \( e \) (Sch/S)

then we can consider the map \( X \to e \) with simplicial object

\[
X_\bullet = (\exists X \times X \Rightarrow X)
\]

\( C/X_\bullet \).

**General statement:** If \( C \) is a site, with final object \( X \to e \) cover, then \( H^i(C, F) = H^i(C/X_\bullet, \pi^* F) \).

**Example:** Stacks as stacks \( X \to Y \) semi-surjective \( F \)-coherent.

then \( H^i(X, F) = H^i(X_\bullet, \pi^* F) \).

Even better! Combinatorial way to compute cohom. at least for "simplicial sites".

Čech spectral seq: \( H^0(X_\bullet, F) \Rightarrow H^{p+q}(X, F) \)

\( \Rightarrow E_1 \).

Not translate to alg. spaces from stacks as above:

Let \( f : X \to Y \) a compact, separated morphism of

\( \bullet \ldots \)
Prop if $X \to S$ smooth surjective, then $R^if_*F$ are $q.coh$.

There is an equivalence of categories $\text{QCoh}(\mathcal{E}t(X)/X_0) \cong \text{QCoh}(X)$ (require each sheaf complex objects to be $q.coh$).