Curves - from the de Rham to crystalline cohomology

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ABSTRACT

Roughly speaking, de Rham cohomology measures the extent to which the fundamental theorem of calculus fails in higher dimensions and on general manifolds. I will begin the talk by reviewing this classical notion for topological manifolds and algebraic varieties. Given a variety X over Z/p, there may be many ways to lift it to Q. However, it turns out that all such lifts have the same de Rham cohomology. This invariant is known as the crystalline cohomology of X. In the talk, I will present various results concerning both types of cohomology for curves equipped with an action of a finite group.