

# THE CONE THEOREM FOR SMOOTH PROJECTIVE VARIETIES

JENNIFER LI

## ABSTRACT

The cone of curves of a smooth projective variety  $X$  over  $\mathbb{C}$  is the closure of the set generated by positive linear combinations of curve classes in  $H_2(X, \mathbb{R})$ . The cone of curves may be rational polyhedral, meaning it has finitely many generators which are extremal rays, or it may be round. The Cone Theorem, a major first step of Mori's Minimal Model Program, roughly describes the cone of curves as the union of two regions divided by a hyperplane: a part that is mostly rational polyhedral plus possible limiting behavior near this hyperplane, and a part that is unknown. Moreover, by a small tilt of this hyperplane, the limiting behavior of the former region can be removed, making this part of the cone entirely rational polyhedral. In this talk, I will first explain some basic concepts and important results for the cone of curves, and I will describe some examples. Then I will introduce the Cone Theorem and I will illustrate how it applies to these examples.