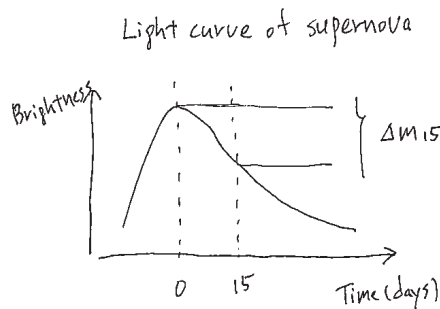


Phillips Relation

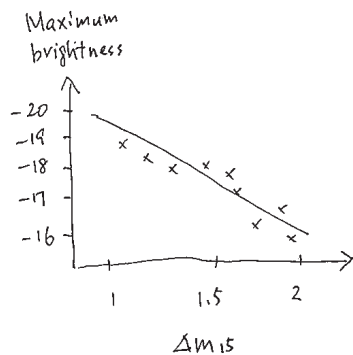
Naoki Yasuda

Kavli IPMU Professor

Phillips relation is the relation in the sense that type Ia supernova with slower decline rate has brighter maximum luminosity. Although a large dispersion of maximum luminosity is known, Type Ia supernova can be used as an accurate distance indicator by calibrating its maximum luminosity using this relation. This Phillips relation or, more generally, the light curve shape-luminosity relation, is the basis of the discovery of the accelerating expansion of the Universe through observation of distant supernova. The discovery was awarded the 2011 Nobel Prize in Physics.



Define the decline rate as the magnitude difference between the maximum brightness and the brightness 15 days after that.



The correlation between Δm_{15} and the maximum brightness.

\Rightarrow Phillips relation