A New Telescope and the Future of Supernova Research

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Image Credit: noao.edu
The Large Synoptic Survey Telescope (LSST): Observing Changes in Faint Objects

For Scale – the Size of the Mirror on LSST

Model of LSST

Credit: lsst.org
LSST’s Observing Strategy

Number of Visits
(all-band, 10 years)

Credit: lsst.org
Find the Best Observing Strategy for Supernovae

Compare with a Different Observing Strategy
Supernovae – the Death of Massive Stars

Credit: NASA’s Ames Research Center
Lightcurves – Determining the Physics Behind Supernovae

Supernova

Increasing Brightness

Original Lightcurve

Magnitude

Day
Determining LSST’s Ability to Observe Supernovae

Start with a Template Supernova

See how the Telescope would sample the Supernova

Compare the Sampled Supernova to the Template

By NASA, ESA, J. Hester and A. Loll (Arizona State University) - HubbleSite: gallery, release., Public Domain

Image Credit: lsst.org
Analyzing the Usability of the Telescope’s Data

Start with a template Supernova

Run through LSST’s Simulation

Fit a Curve

Analyze Accuracy of our New Light Curve

Original Lightcurve

Resampled Lightcurve

Fitted Curve

Compare Lightcurves
Accuracy of Our Fitted Curves
Comparing Observing Strategies

Number of Visits per Area of the Sky

Image Credit: lsst.org

Number of Visits

Compare with a Different Observing Strategy
Future Goals

**Graph:**
- **Original Lightcurve**
  - Y-axis: Magnitude
  - X-axis: Day

**Map:**
- **Map of Sky – Percent of Supernovae Observed by Location**
  - Color gradient from blue to red
  - Legend: 0 to 100
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