# Photometric Reverberation Mapping using LSST



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## Overview

To develop a software for time delay measurements in LSST photometric channels suitable for typical AGN (continuum + line emission components)

- Retrieving the expected number of quasars per square degree as a function of **redshift** and the quasar magnitude in one of the bands (like, g band)
- **Mock catalog** of light curves (1 deg<sup>2</sup> of the night sky will account for ~1000-4000 quasars): to produce *artificial photometric light curves* for each quasar
- With **real** light curves
- **Time-delay measurements**: (a) subtraction method; (b) summation method

#### More on this very soon!

### Best Case Scenario



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#### Suitability of quasar



EWASS 2019 (S2: Quasars for Cosmology): Generating AGN spectra for LSST: Photometric Channels, Cadence and Time-lags

## Highlight

Using a set of prepared AGN templates for a range of AGN parameters that are based on SED broad band modelling, we calculate the contribution of the major lines (H $\beta$ , Mg II, CIV) to the photometric channels, taking into account the Balmer continuum, FeII pseudo-continuum and other lines. The simulations are then performed for representative objects using several cadences which are now under consideration. This method improves the current standards of photometric reverberation method – using multi-channel and time-lag estimations from various methods.



### LSST STATS Fun Facts & Key Numbers

The concept behind the LSST project is remarkably simple: conduct a deep survey over an enormous area of sky; do it with a frequency that enables images of every part of the visible sky to be obtained every few nights; and continue in this mode for 10 years to achieve astronomical catalogs thousands of times larger than ever previously compiled – the first time a telescope will catalog more galaxies than there are people on Earth.

3.2 15 77 Foot primary mirror Gigapixed detector Terabytes of data per night 10 Year survey of the sky Billion stars & galaxies Find more at https://lsst.slac.stanford.edu/#science-goals