



The Data Services Initiative at W.M. Keck Observatory

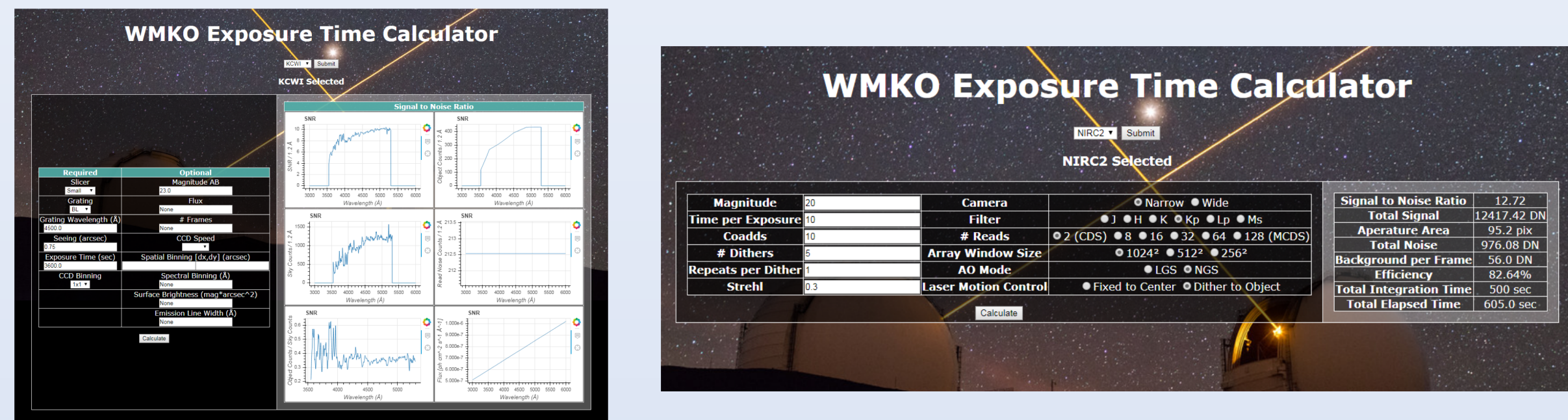
Luca Rizzi, Lead Scientist for Scientific Software Development

Matt Brown, Shui Kwok, Elysia Lucas, Jeff Mader, John O'Meara, Josh Riley, Josh Walawender



Prepare

Exposure time calculators for every instrument



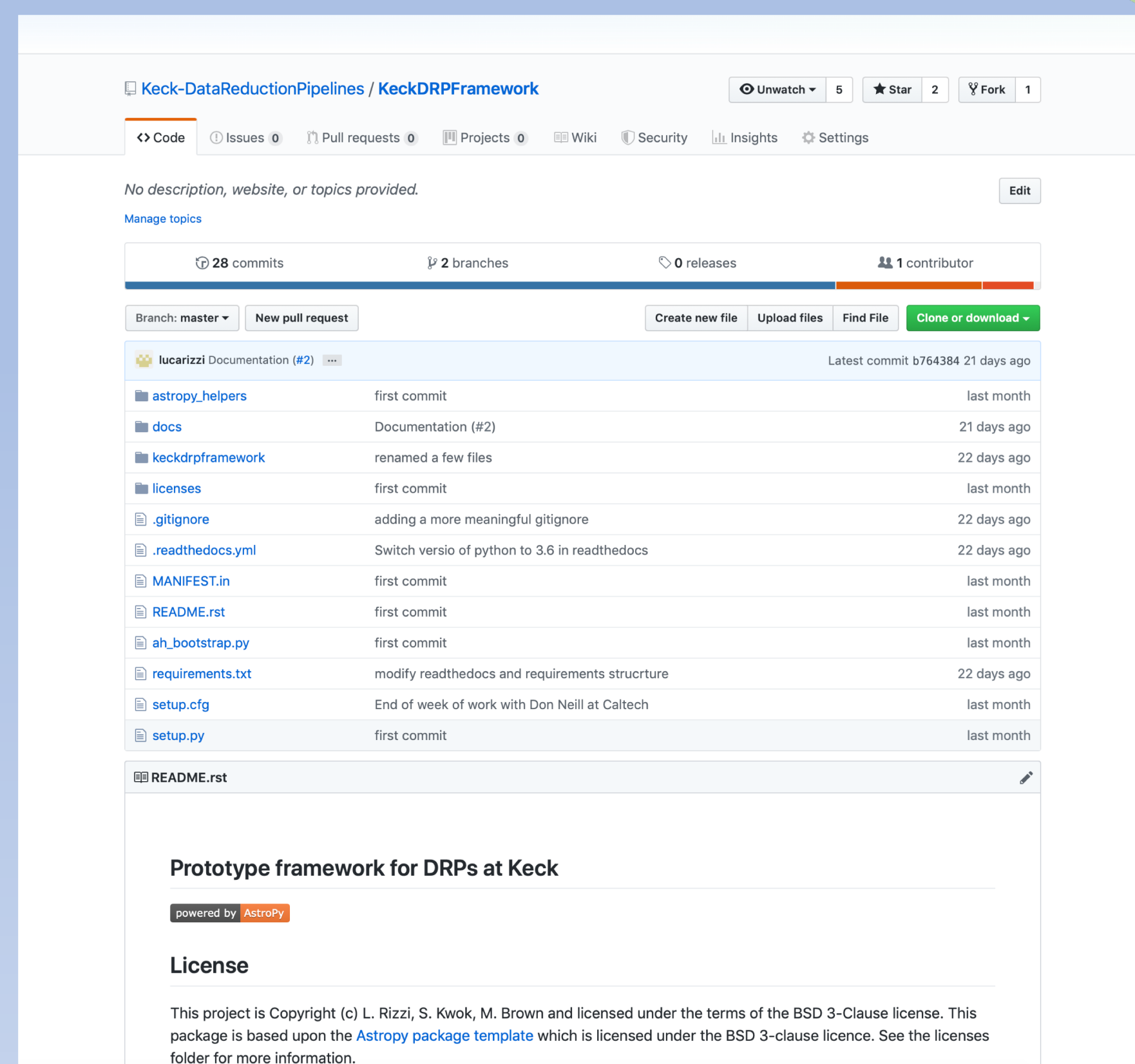
Observing definition tool (Phase II)

- Pre-defined observing templates for the entire suite of 10 instruments
- Engineering templates for focus and performance monitoring
- Calibration templates for automated calibration sequences
- User-defined templates for expert users
- Programmatic (API) access
- Direct connection to TOMs/TDA tools
- Survey design tools
- Manual/Automatic guide stars
- Manual/Automatic TT star for AO

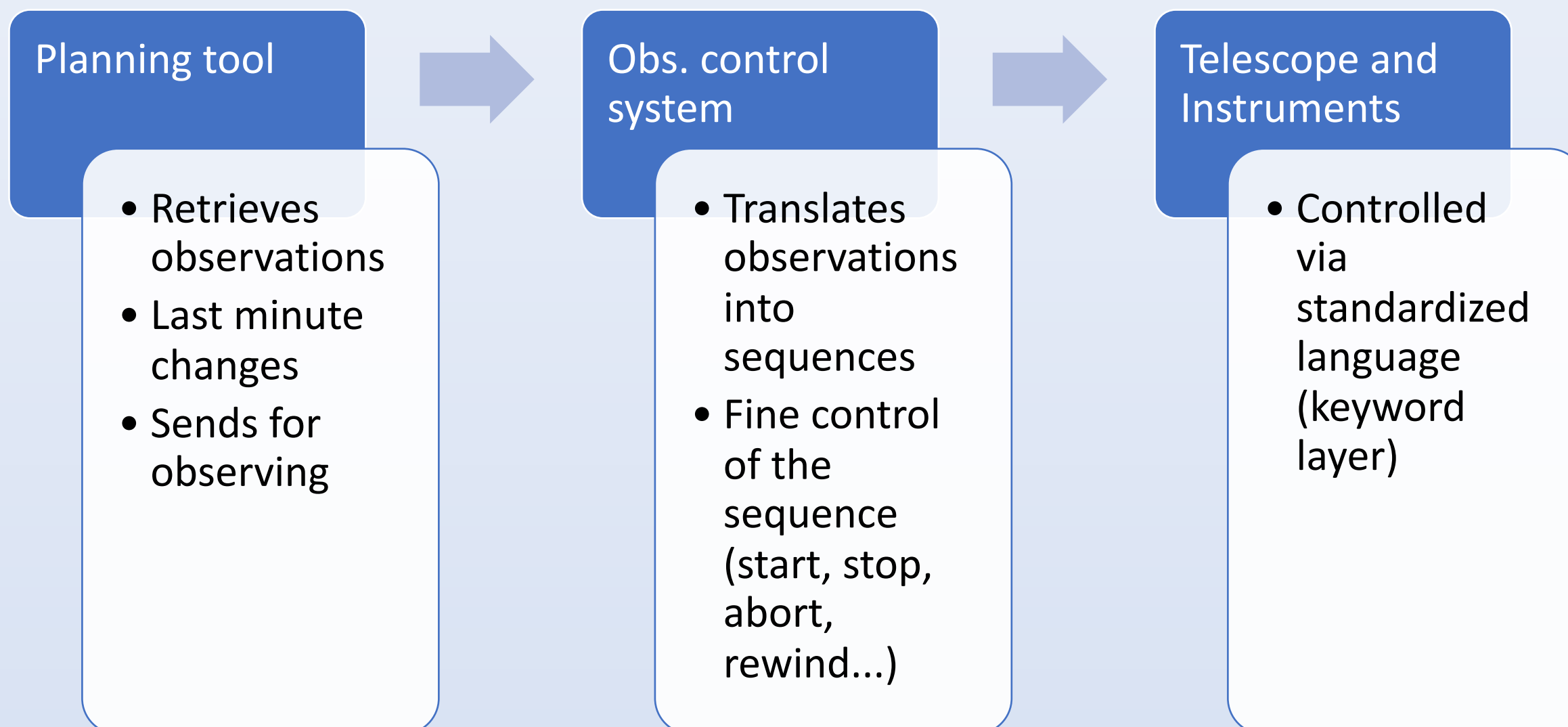
Design guidelines are focused on providing the look and feel of queue observing while preserving the flexibility of classically scheduled operations

Reduce

Event-driven, Python based framework for pipelines for all Keck instruments, capable of running arbitrary code on arbitrary data in arbitrary order (acyclic directed graphs). Provides quick-look, automatic and user-driven data reduction.



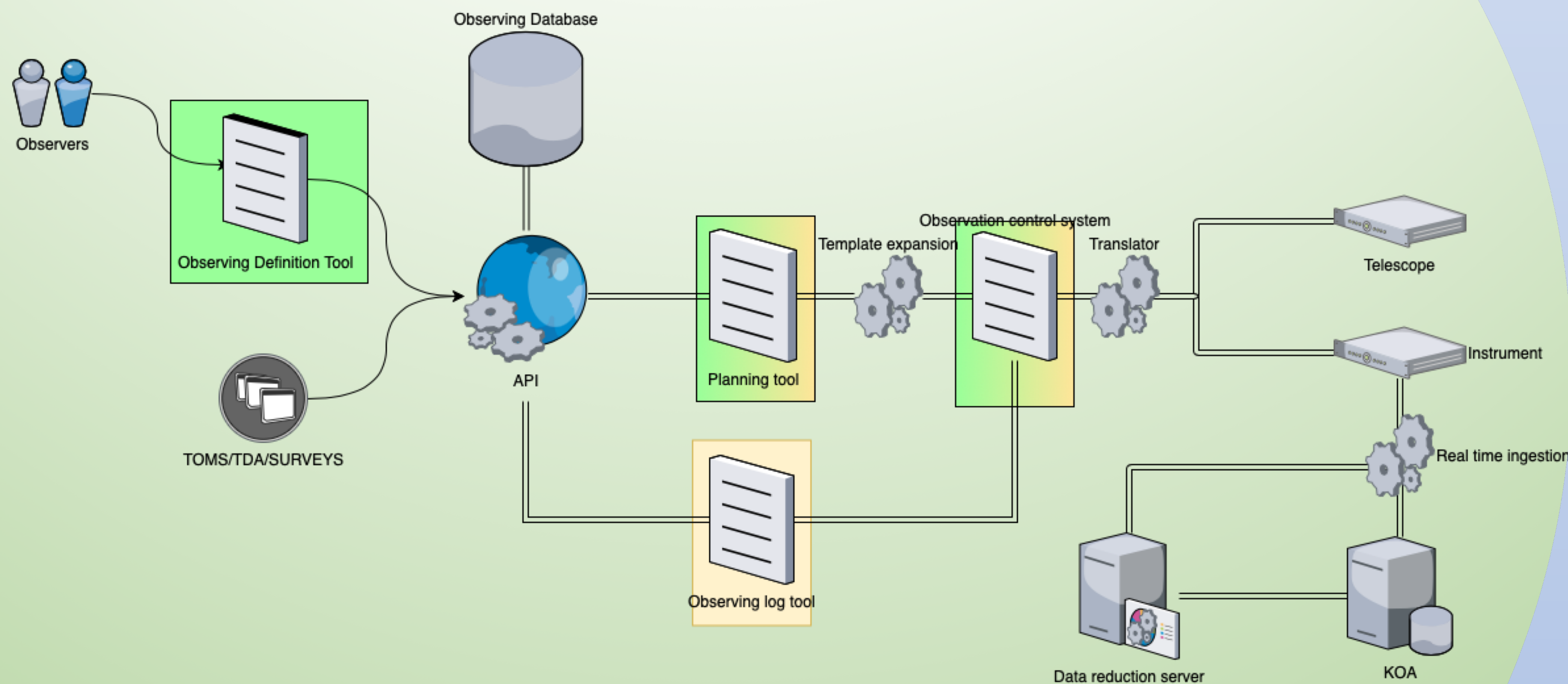
Execute



Introduction

To modernize the observing infrastructure, Keck Observatory has launched a large project called Data Services Initiative. The purpose is to create an end-to-end coordinated data management infrastructure able to bring the tools and advantages of flexible, database-driven observing to a classically scheduled facility.

Design guidelines are focused on tools that facilitate semi-automatic execution of the observations, collaboration between the observing assistant and the observer, and the flexibility of real-time decisions that is the strength of classical observing.



Four aspects of the observing process are affected: prepare, execute, reduce, and archive. While most of the tools needed for this project will be developed in house, the DRPs will be managed as an open source/open development effort and the data will be hosted by the Keck Observatory Archive, a joint NASA/Keck project.

Archive

Real time ingestion of raw data at Keck, with immediate access to PIs and CoIs.

- Data is stored at Caltech/NExSci
- Raw and reduced data
- TAP/Astroquery tools
- Advanced processing for radial velocity studies
- Hosting of reduced data sets

Status

- ETCs: available for about half of the instruments
- Observing definition tool: prototype for 1 instrument
- API and Database: design phase
- Planning tool and observing control system: design phase
- DRP framework: passed PDR, prototype being tested
- Real time ingestion: design phase
- Archive: API and Python query tools in development and testing

