THE TOM TOOLKIT

TOOLS TO MANAGE OBSERVING PROGRAMS AND DATA PRODUCTS

on behalf of LCO Software and Science Teams

Rachel Street

HEISING-SIMONS FOUNDATION

ZEGAR FAMILY FOUNDATION
ASTRONOMY'S DISCOVERY CHAIN

- LSST
- ZTF
- TESS
- + many others

Discovery engines → Broker services → Broker → Target & Observation Manager Systems → Observing facilities
FOLLOW-UP OBSERVATION - REQUIREMENTS

- Large target catalogs and increasingly high rates of discovery: need to manage both new + existing targets
- Already have more targets than we can follow-up: *algorithmic* prioritization required
- Observations need to be coordinated across multiple facilities: observatories, instruments, wavelengths/messengers, ground and space geographically distributed
- Highly responsive, flexible scheduling: rapid response, timed window and long-term monitoring
- Data management: data products can reach terabytes and thousands of files

Image credits: BFulton, NASA, ESO, NASA
Database-driven software to manage of targets, observing programs and data products

- User-friendly open source software package
- Highly customizable for different science projects
- Designed to be easily extended by users

Credit: Austin Riba, David Collom, Mark Bowman, Rachel Street, Todd Boroson
Contributors: Jamie Burke, Curtis McCully, Kay-Sebastian Nikolaus, Edward Gomez, Todd Boroson, Bryan Miller, Roy Williams, Sandy Seale
TARGET AND OBSERVATION MANAGERS (TOM)

TOM system uses DB to keep track of targets, observations and data products

Provides customizable information displays and interactive tools
TARGET AND OBSERVATION MANAGERS (TOM)

Interfaces with alert brokers and data archives to receive target alerts and ingest target catalogs.
TARGET AND OBSERVATION MANAGERS (TOM)

Lasair broker query form,

written by Roy Williams, Royal Observatory Edinburgh
TARGET AND OBSERVATION MANAGERS (TOM)

Interfaces with observing facilities, submitting observation requests and monitoring their progress

Built-in observation planning tools
Supports observations with LCO, SOAR and Gemini; exploring links with additional partners.
Interfaces with data archives to harvest catalog and observation data products
Includes tools for plotting spectra, light curve data...
TARGET AND OBSERVATION MANAGERS (TOM)

- Customized scientific displays
- Target selection prioritization
- Observing strategy
- Customized data analysis

Interfaces with user-developed software for science-specific tasks

Enables fully-automated observing programs
TARGET AND OBSERVATION MANAGERS (TOM)

Handles exchange/sharing of data with external projects and services.
Managing Follow-up Observations in the Era of ZTF and LSST

Carnegie Observatory, Pasadena, CA

Sept 30 – Oct 4, 2019

http://ls.st/uyh

Interactive introduction to the TOM Toolkit and all other technologies and services that will drive time-domain astronomy in the LSST era.

** Exclusive proposal opportunity will be open to attendees only **
Attendees of the workshop will have exclusive access to a proposal call with:

- ~1000 hours of time on LCO Network
- ~50 hours of time on Gemini Telescopes
- ~50 hours of time at SOAR Telescope
- Development mini-grants ~$45,000
- Observing programs will run Dec 2019 - Dec 2020, timed to coincide with the last year of ZTF

Participating teams will be encouraged to contribute to a developer’s community, coordinated through a Github organization

User-developed plugin modules encouraged, curated by professional software team

KnowledgeBase for users to share experience
Visit our websites to find out more:

https://tomtoolkit.github.io
https://lco.global/tomtoolkit/

Workshop materials will be available online

Come talk to our team throughout this meeting!