Vera C. Rubin Observatory Legacy Survey of Space and Time (LSST) Transients & Variable Stars (TVS) Science Collaboration

Sara (Rosaria) Bonito (she/her)
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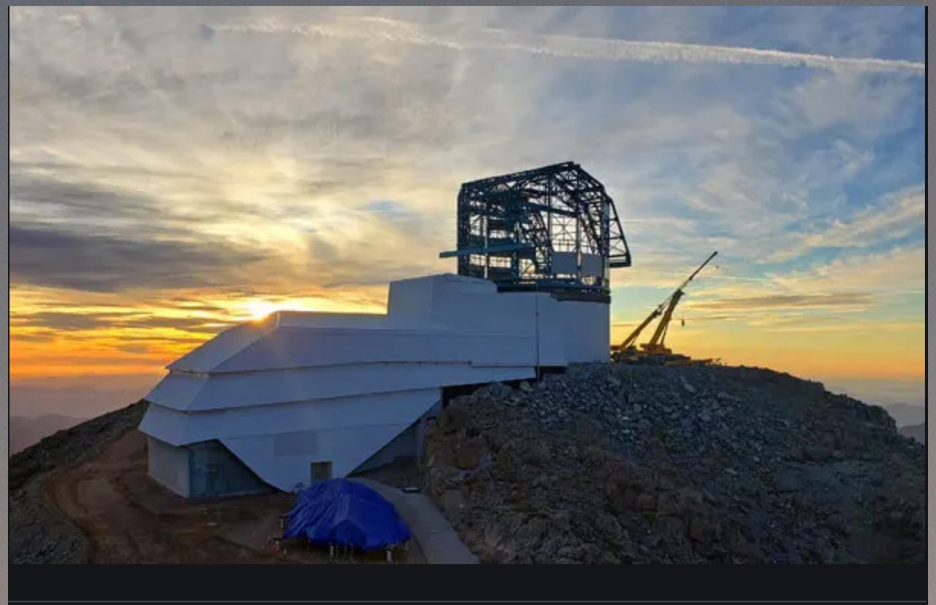
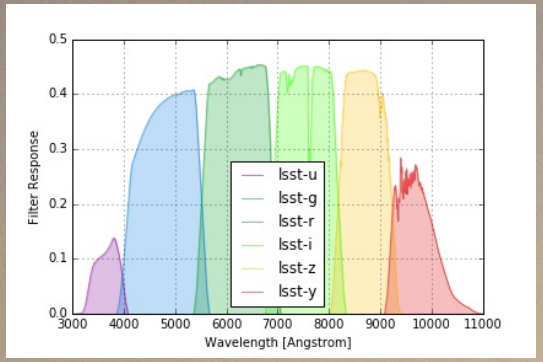
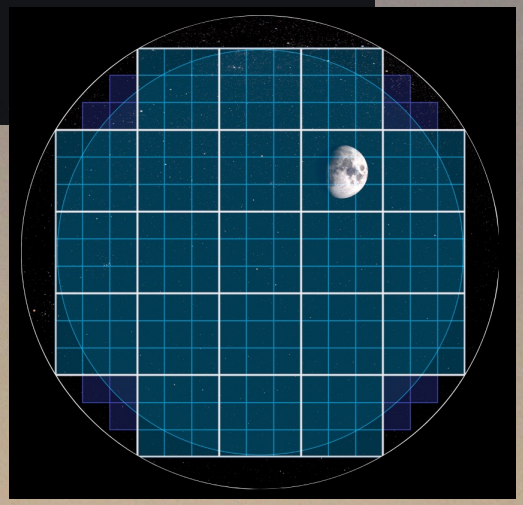


The New York Times

Vera Rubin Gets a Telescope of Her Own





VERA C. RUBIN OBSERVATORY
LEGACY SURVEY OF SPACE AND TIME

Decade-long, wide, fast, deep survey (optical)

8-meter class wide-field ground based telescope

Over 5 million images and catalogs with more than 37 billion objects and 7 trillion sources

Tens of billions of time-domain events will be detected and alerted on in real-time

Each image spans 9.6 square degrees

Rubin Observatory Receives Two Guinness World Records for Its Camera and Lenses

The project is recognized for having the highest-resolution digital camera and the largest lenses in the world

21 October 2021

Sara (Rosaria) Bonito – INAF – Osservatorio Astronomico di Palermo (Italy)

Telescope System:

- Etendue (AΩ) : 319 meter²degrees²
- Field of View : 3.5 degrees (9.6 square degrees)
- Primary mirror diameter : 8.4 m
- Mean effective aperture : 6.423 m (area weighted over FOV)
- Final f-ratio : f/1.234
- Camera weight : 6,746 lbs (3,060 kg)
- Mirror (M1+M3 glass mirror only) weight : 35,900 pounds (16,284 kg)

Imaging System:

- Pixel count : 3.2 Gpixels
- Focal plane : 189 4kx4k science CCD chips
- Pixel pitch : 0.2 arcsec/pixel
- Pixel size : 10 microns
- Filling factor : >90%
- Minimum exposure time : 1 sec

Throughput:

- 5-sigma point source depth: Single exposure and idealized for stationary sources after 10 years,
    - u : 23.9, 26.1
    - g : 25.0, 27.4
    - r : 24.7, 27.5
    - i : 24.0 , 26.8
    - z : 23.3, 26.1
    - y : 22.1, 24.9

(https://smtn-002.lsst.io : Calculating Rubin Observatory limiting magnitudes and SNR)

Site Stats:

- Median Atmospheric PSF with outer scale of 30m: 0.67" (Tokovinin)
- Site: El Penon, Cerro Pachon, Chile
- Site coordinates: latitude -30:14:40.68 longitude -70:44:57.90
- Altitude: 2647m
- Site observatory code: TBD
- Photometric time: 53% of night time (estimated)

Observation Properties:

- Standard visit exposures (expected) : 2 x 15 sec.
- Median (Mean) visit time : 39s (42.2s)
- Photometric accuracy : 10 mmag
- Astrometric accuracy : 50 mas
- Astrometric precision : 10 mas

Dataset properties:

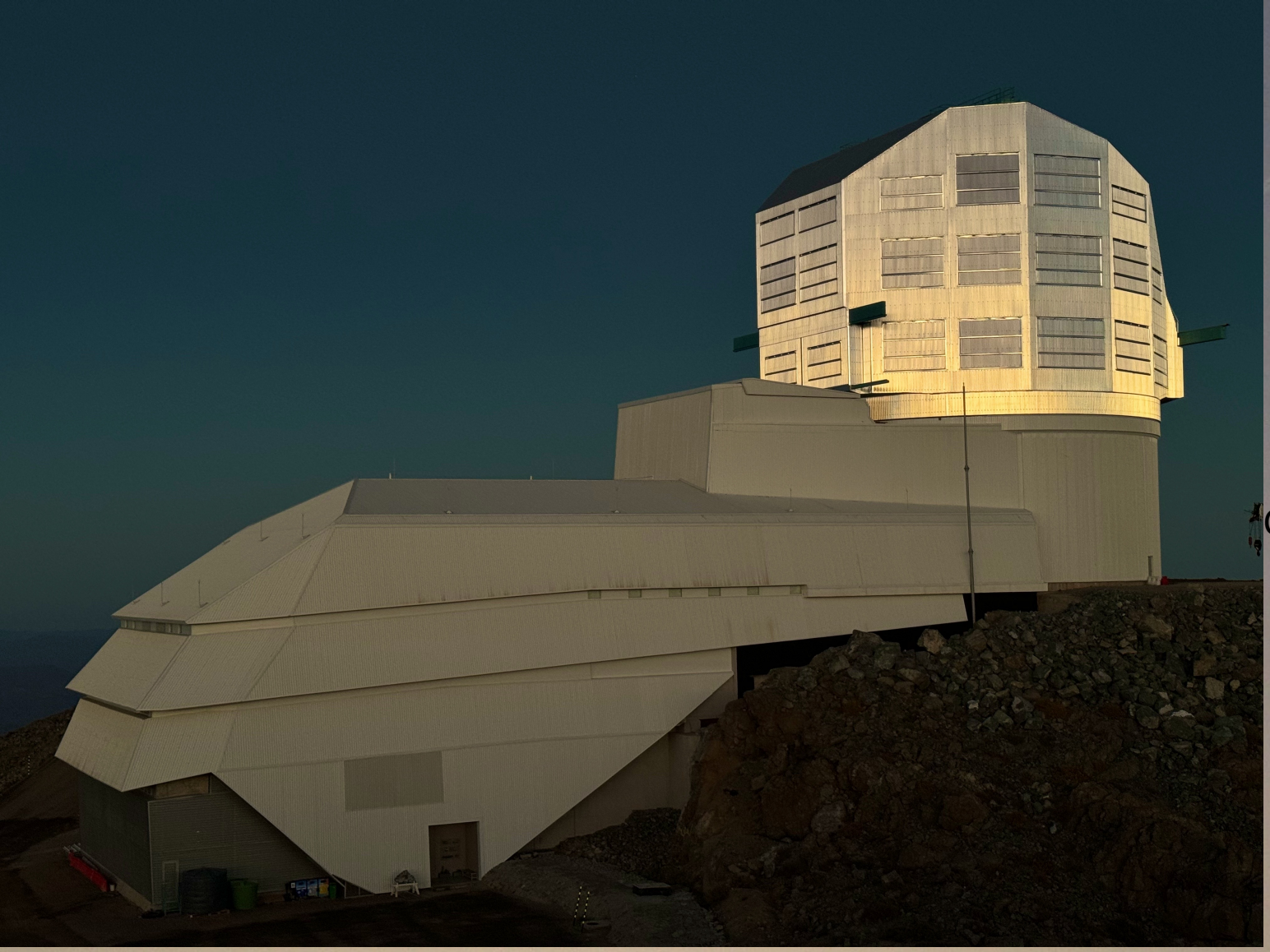
- Nightly data size: 20TB/night
- Final database size (DR11) : 15 PB
- Real-time alert latency : 60 seconds

Data Releases:

- Survey duration : 10 years
- Number of Data Releases : 11
- Number of objects (full survey, DR11):
    - 20B galaxies
    - 17B resolved stars
    - 6M orbits of solar system bodies
    - Average number of alerts per night: about 10 million

VERA C. RUBIN
OBSERVATORY

- Understanding Dark Energy and the nature of Dark Matter,
- Cataloging the Solar System
- Exploring the Transient and Variable Sky
- Exploring the Milky Way Structure & Formation



Cerro Pachón, Chile

Ph: Chris Walter

LSST data products are organized into three main categories:

The LSST data products are organized into three main categories.

Prompt Data Products

Real Time Difference Image Analysis (DIA)

- A stream of ~10 million time-domain events per night (Alerts), transmitted to event distribution networks within 60s of camera readout.
- Images, Object and Source catalogs derived from DIA, and an orbit catalog for ~6 million Solar System bodies within 24h.
- Enables discovery and rapid follow-up of time domain events

Data Release Data Products

Reduced single-epoch & deep co-added images, catalogs, reprocessed DIA products

- Catalogs of ~37 billion objects (20 billion galaxies, 17 billion stars), ~7 trillion sources and ~30 trillion forced source measurements.
- 11 Data Releases, produced ~annually over 10 years of operation
- Accessible via the LSST Science Platform & LSST Data Access Centers.

User Generated Data Products

User-produced derived, added-value data products

- Deep KBO/NEO, variable star classifications, shear maps, etc …
- Enabled by services & computing resources at the LSST DACs and via the LSST Science Platform (LSP).
- 10% of LSST computing resources will be allocated for User Generated data product storage & processing.

You will get LSST data via the Rubin Science Platform

LSST Data Product Categories & DM Data Products & LSST Key Numbers

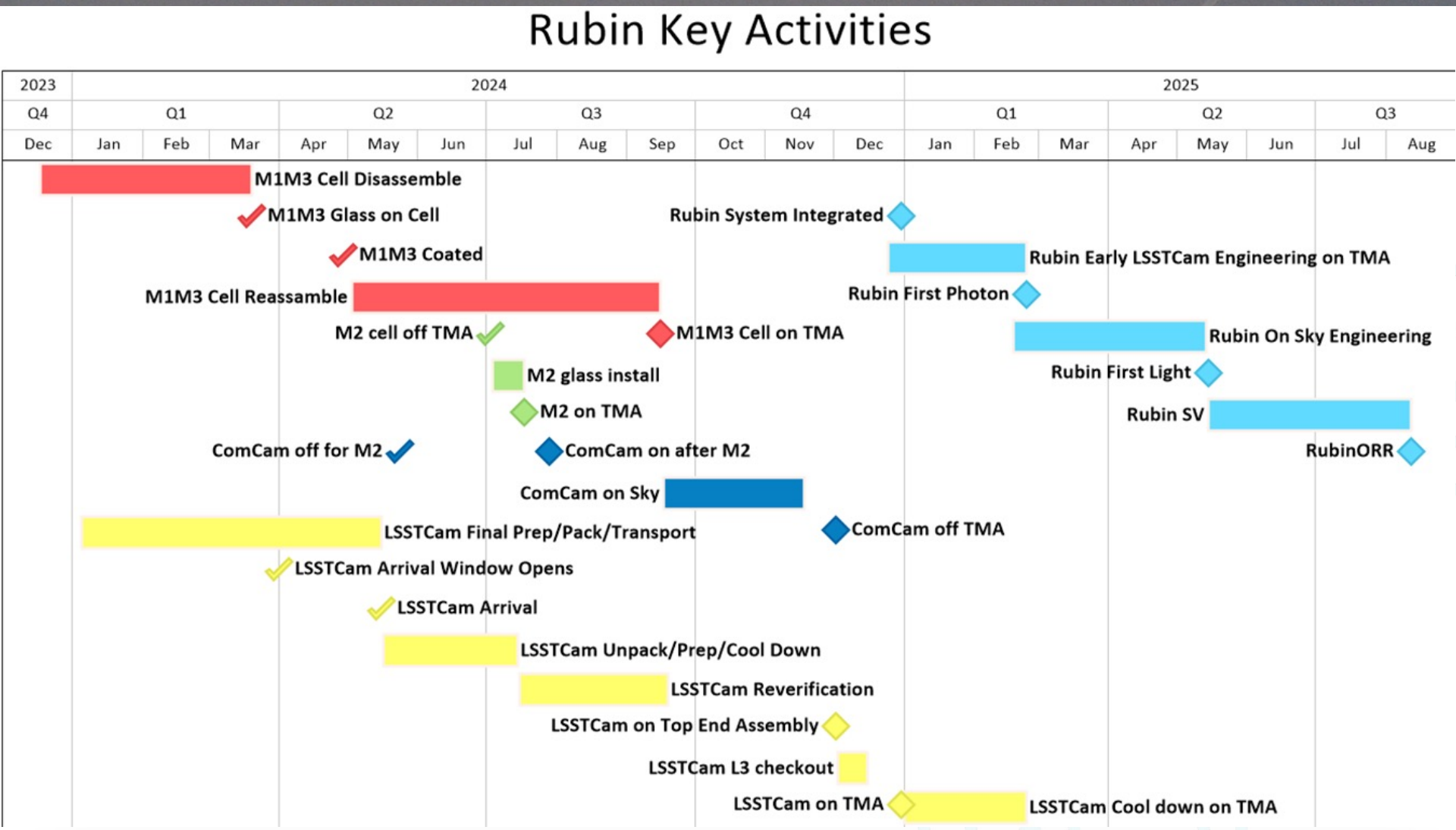
LSST Data Products: see http://ls.st/dpdd

by Željko Ivezić - Director of Rubin Observatory Construction

(Rubin LSST@Europe 4: organized in Rome with **LSST Corporation grants, PI: Bonito**)

Rubin LSST@Europe 4 – Rome (Oct. 24-28, 2022)

ls.st/dates

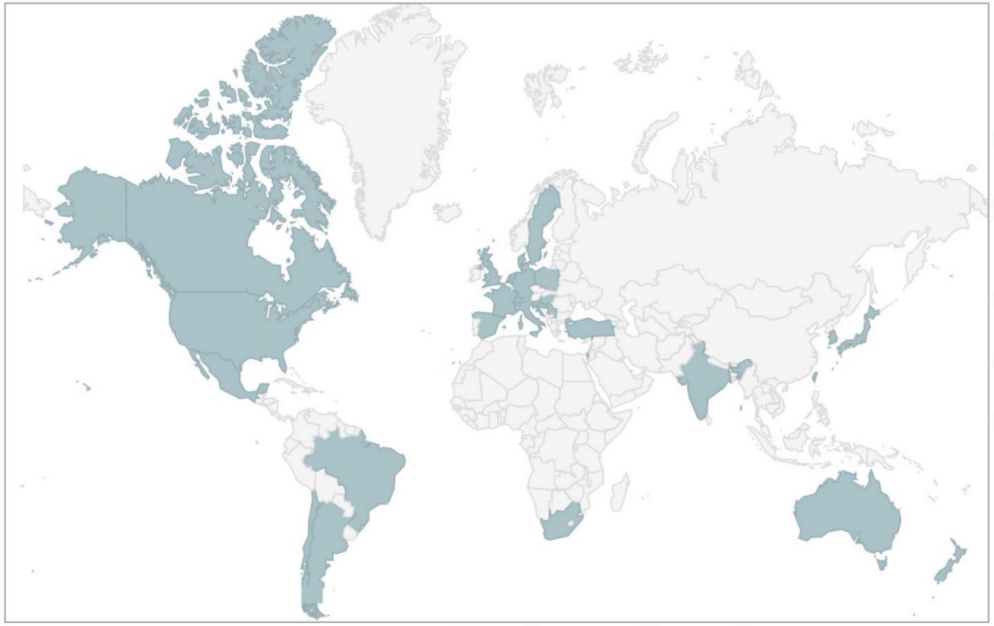

Rubin Key Activities
2023
2024
2025
Q4
Q1
Q2
Q3
Q4
Q1
Q2
Q3
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
M1M3 Cell Disassemble
M1M3 Glass on Cell
M1M3 Coated
M1M3 Cell Reassamble
M2 cell off TMA
M1M3 Cell on TMA
M2 glass install
M2 on TMA
ComCam off for M2
ComCam on after M2
ComCam on Sky
LSSTCam Final Prep/Pack/Transport
ComCam off TMA
LSSTCam Arrival Window Opens
LSSTCam Arrival
LSSTCam Unpack/Prep/Cool Down
LSSTCam Reverification
LSSTCam on Top End Assembly
LSSTCam L3 checkout
LSSTCam on TMA
Rubin System Integrated
Rubin Early LSSTCam Engineering on TMA
Rubin First Photon
Rubin On Sky Engineering
Rubin First Light
Rubin SV
RubinORR
LSSTCam Cool down on TMA

In-Kind Program and Science Collaborations

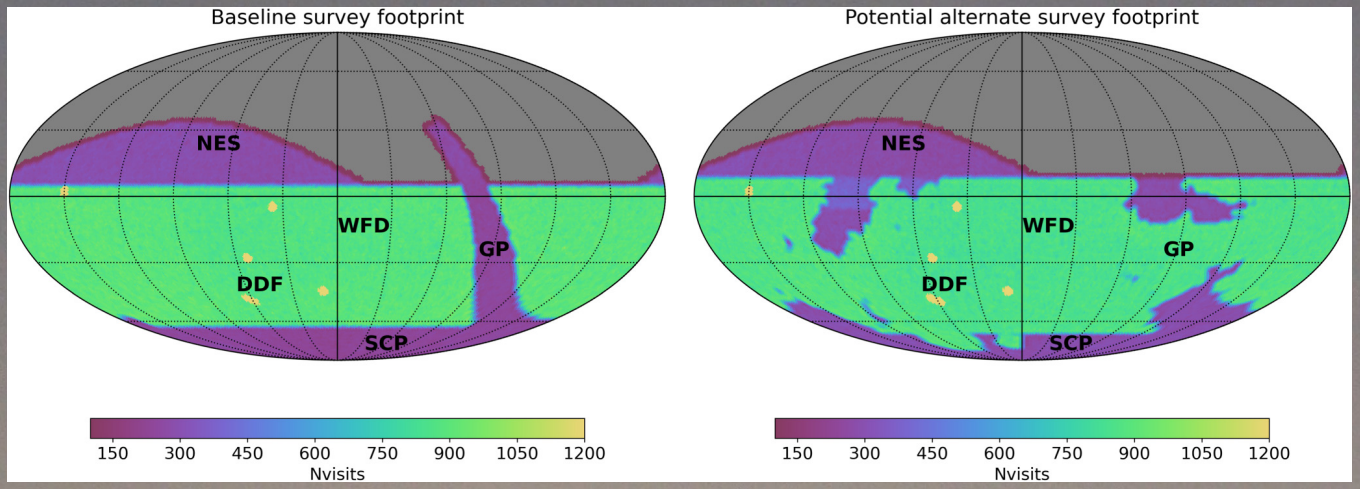
There are 43 individual international teams (30 countries) providing 153 in-kind contributions to Rubin and the LSST science community in return for LSST data rights.

Diverse set and scope

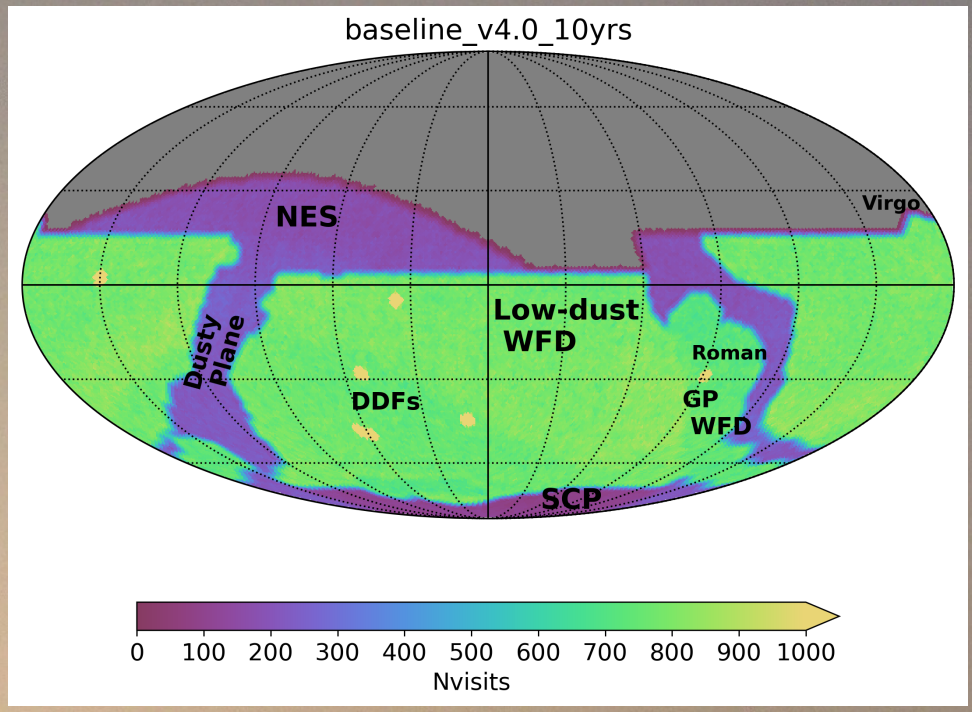
- Observatory offsets/operations
- Telescope Time
- IDACs/SPC
- Datasets
- Software



Rubin LSST OpSim



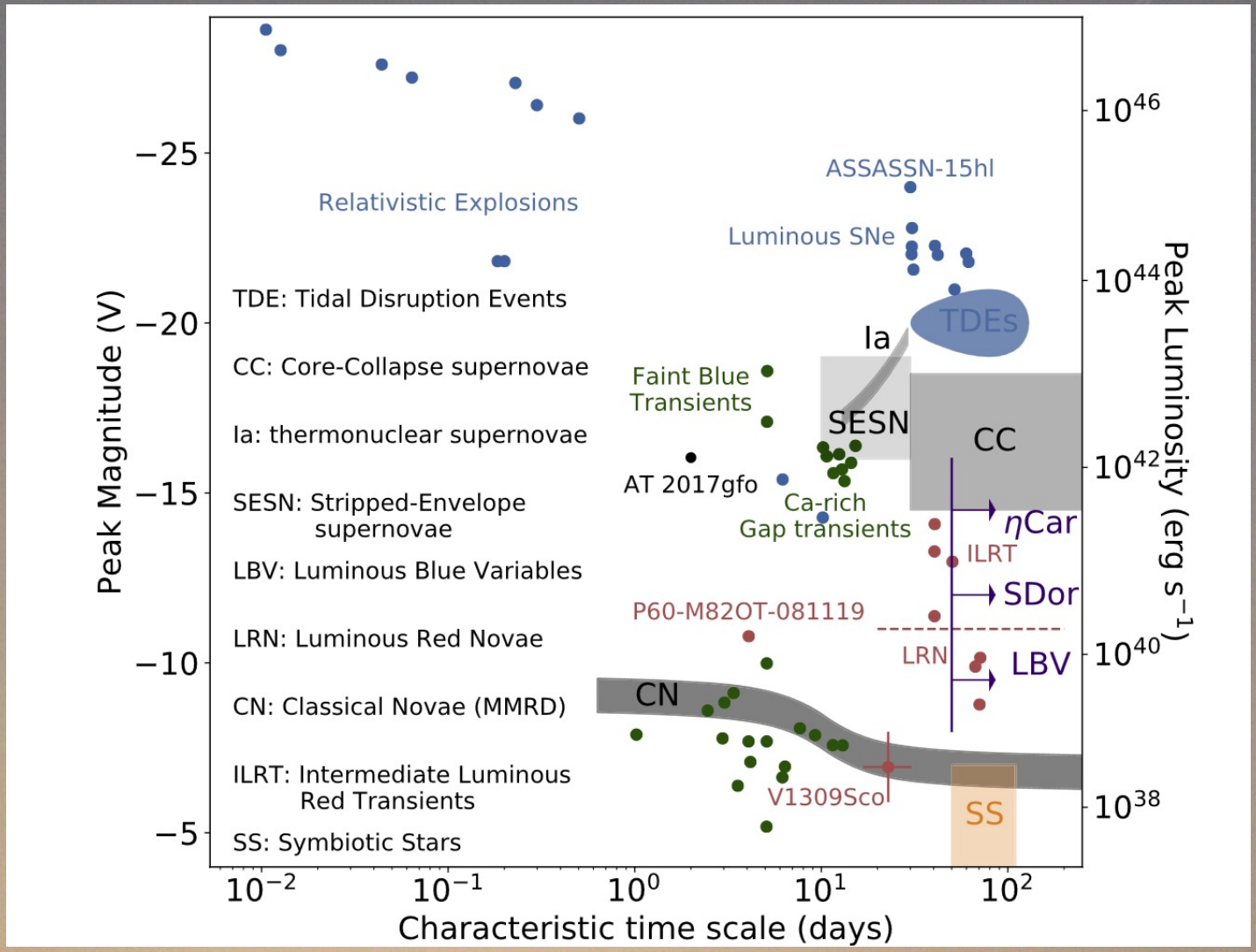
Bianco et al. 2022, ApJS



Survey Cadence Optimization Committee's Phase 3 Recommendations
The Rubin Observatory Survey Cadence Optimization Committee
PSTN-056
Latest Revision: 2024-10-01

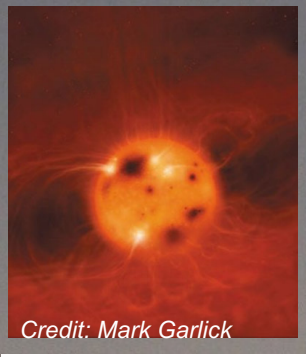
Sara (Rosaria) Bonito – INAF – Osservatorio Astronomico di Palermo (Italy)

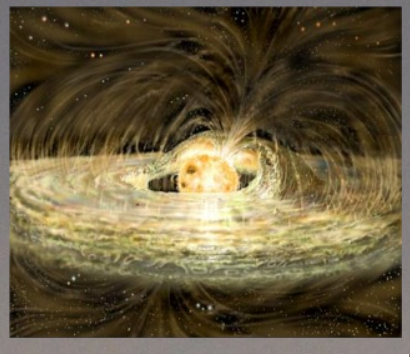
Rubin LSST Timescales



Ivezic et al. 2019

The photometric variability of young stars





Artist's impressions of the surface of a young star (left) and of a young star accreting from the circumstellar disk (right).

- *Young stars are intrinsically variable at all wavelengths and on any given timescale from hours to decades.*
- Although not necessarily the most intense, *the typically predominant variability is that observed over timescales of days to weeks* (corresponding to the timescales over which a young star completes a full rotation cycle around its axis).

<u>Causes for day-to-week variability in young stars</u>:

- *Magnetic activity* -> flux modulation by starspots along the stellar rotation period (analogous to sunspots)
- *Star–disk interaction* -> variable emission from accretion shocks and variable mass load onto accretion columns
- *Star–disk geometry* -> varying visibility of different structures of the star-inner disk enviroment
- All abovementioned effects are typically blended in the specific variability behavior we observe for a given star

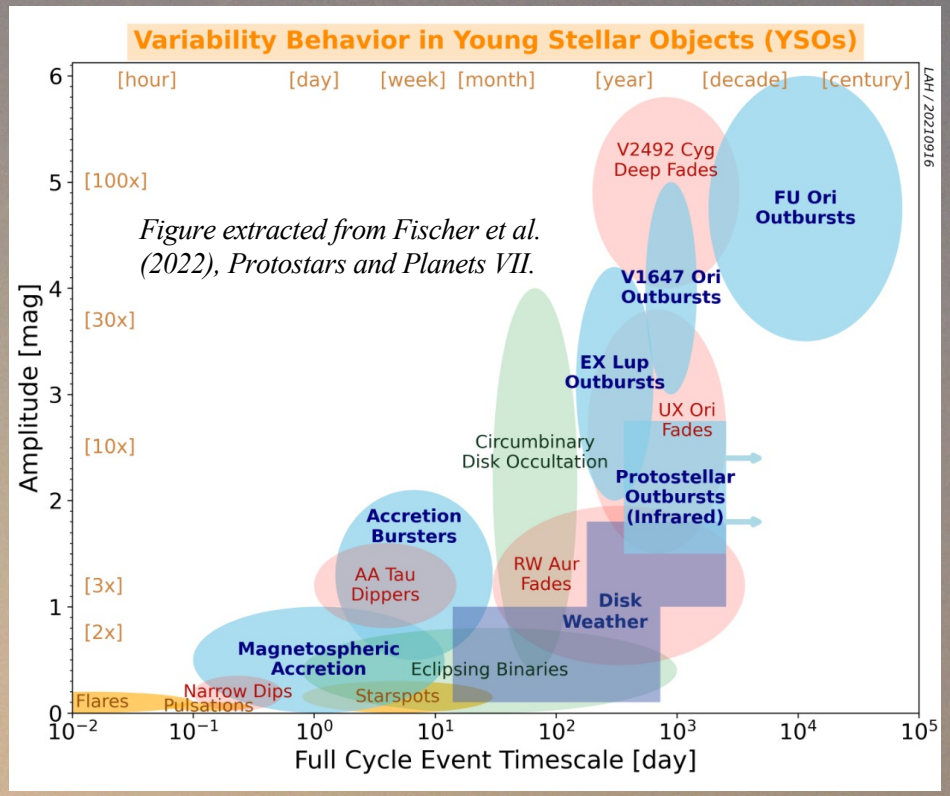


Figure extracted from Fischer et al. (2022), Protostars and Planets VII.

Courtesy of Laura Venuti

Rubin Science Platform

Portal

Discover data in the browser

Learn more about the portal.

Notebooks

Process and analyze LSST data with Jupyter notebooks in the cloud

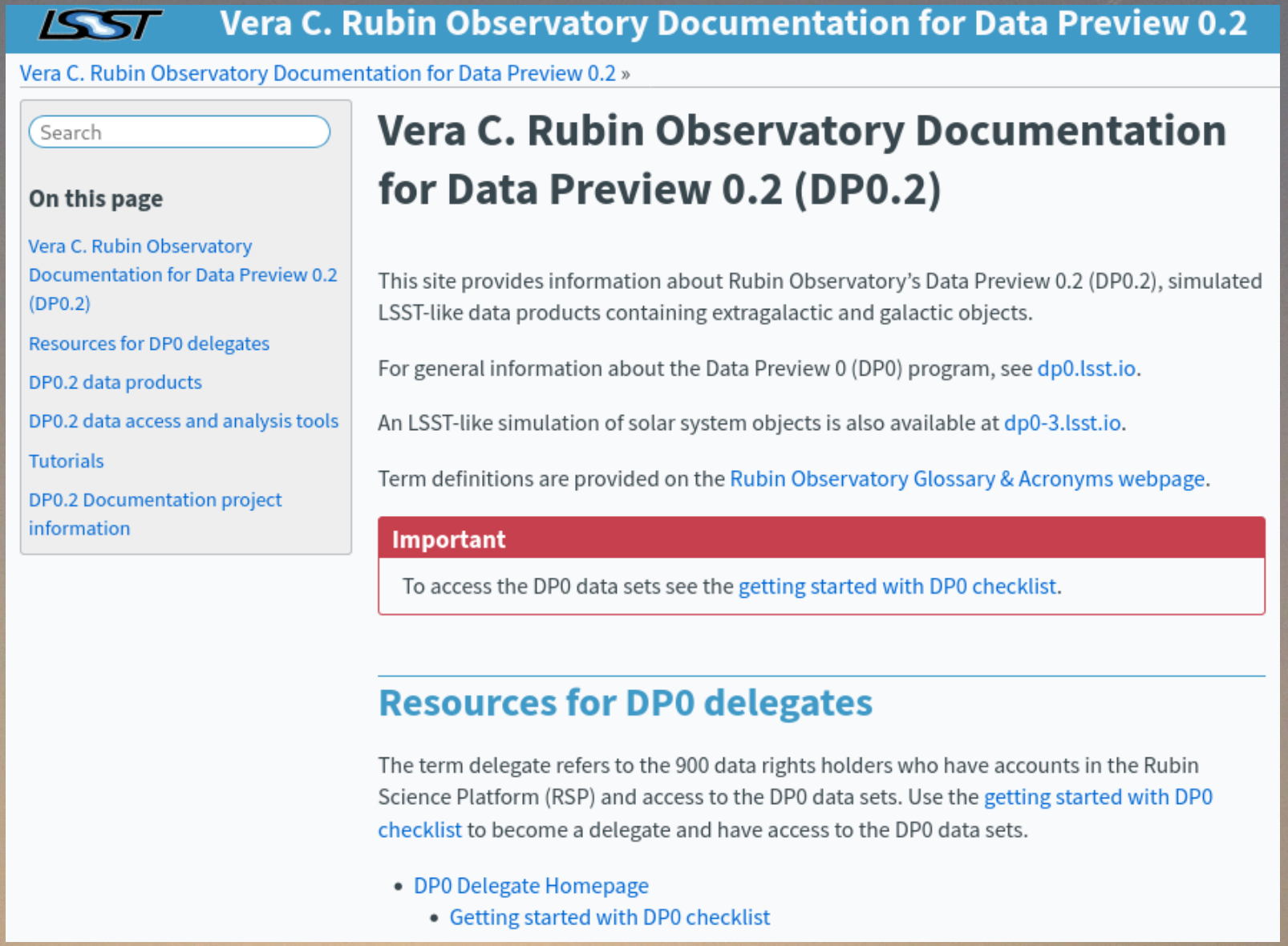
Learn more about notebooks.

APIs

Learn how to programatically access data with Virtual Observatory interfaces

RUBIN LSST DATA PREVIEW 0

https://dp0-2.lsst.io/



Vera C. Rubin Observatory Documentation for Data Preview 0.2

Vera C. Rubin Observatory Documentation for Data Preview 0.2 »

Search

On this page

- Vera C. Rubin Observatory Documentation for Data Preview 0.2 (DP0.2)
- Resources for DP0 delegates
- DP0.2 data products
- DP0.2 data access and analysis tools
- Tutorials
- DP0.2 Documentation project information

Vera C. Rubin Observatory Documentation for Data Preview 0.2 (DP0.2)

This site provides information about Rubin Observatory's Data Preview 0.2 (DP0.2), simulated LSST-like data products containing extragalactic and galactic objects.

For general information about the Data Preview 0 (DP0) program, see dp0.lsst.io.

An LSST-like simulation of solar system objects is also available at dp0-3.lsst.io.

Term definitions are provided on the Rubin Observatory Glossary & Acronyms webpage.

Important

To access the DP0 data sets see the getting started with DP0 checklist.

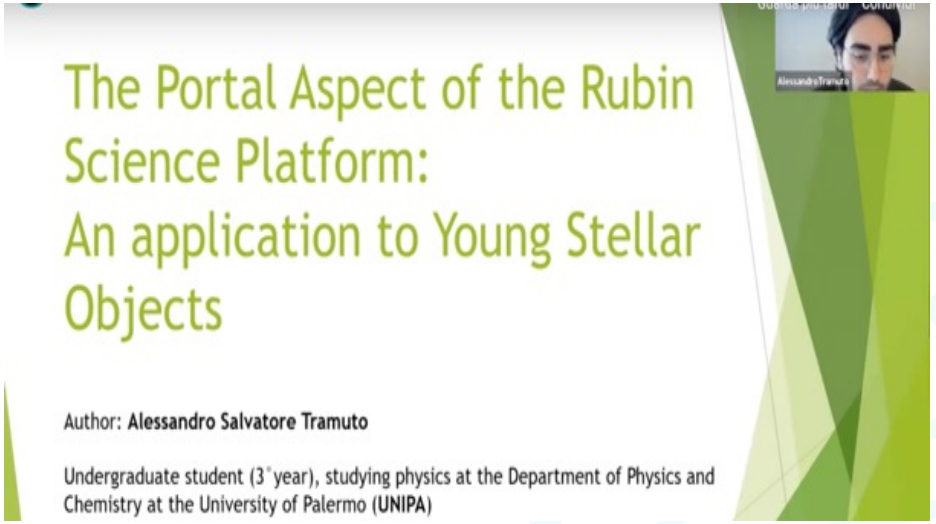
Resources for DP0 delegates

The term delegate refers to the 900 data rights holders who have accounts in the Rubin Science Platform (RSP) and access to the DP0 data sets. Use the getting started with DP0 checklist to become a delegate and have access to the DP0 data sets.

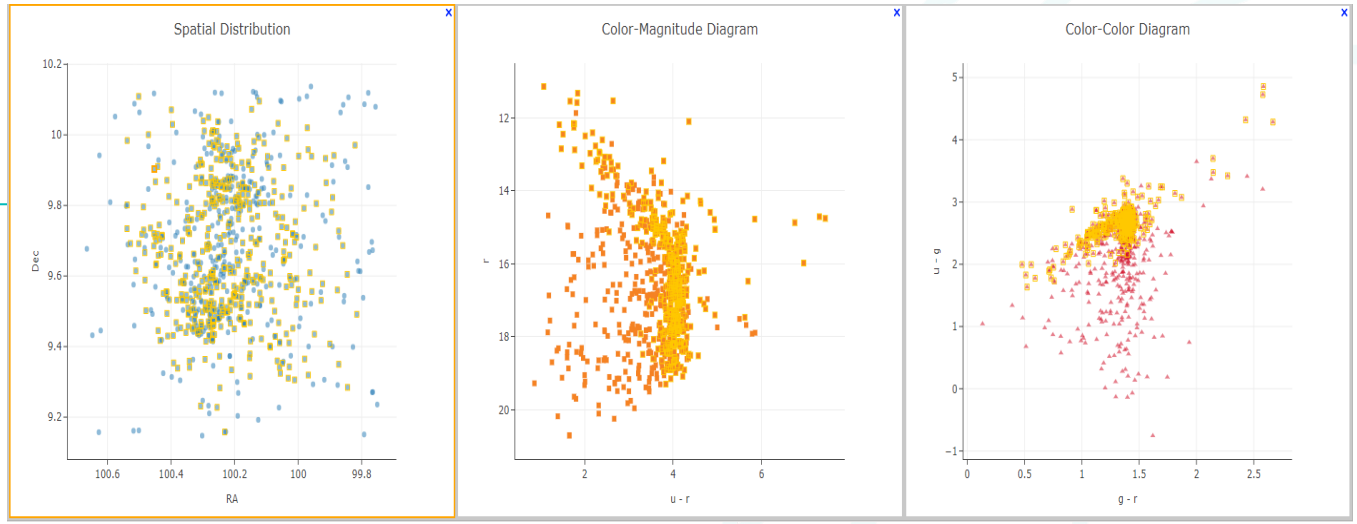
- DP0 Delegate Homepage
  - Getting started with DP0 checklist

DP0 education activity
(RCW 2024 DP0 Session – Vincenzo Petrecca)

Internship for an undergrad student **Alessandro Salvatore Tramuto** from Univ. Palermo (Italy) with Sara Bonito



- DP0.1 Delegate Assembly, May 6 2022 (recording)
- Interactive diagrams to select candidate YSOs
- Use of external catalogues with the RSP portal aspect



File Edit View Run Kernel LSST Tabs Settings Help

/ notebooks / StackClubCourse /

Name	Last Modified
Session01	2 months ago
Session02	a month ago
Session03	17 days ago
Session04	2 months ago
Session05	2 months ago
Session06	17 days ago
testdata_cfht	Jul 27, 2020 8:07 PM
bokeh_NGC2264_CF...	9 days ago
bokeh_NGC2264_exa...	a month ago
bokeh_NGC6569_all_...	5 days ago
bokeh_NGC6569_exa...	a month ago
bokeh_NGC6569_exa...	22 days ago
bokeh_NGC6569_RRL...	5 days ago
bokeh_V1118Ori_exam...	17 days ago
bokeh_V1118Ori_exam...	20 days ago
butlertutorial.ipynb	2 months ago
catalogaccess.ipynb	a month ago
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LICENSE	2 months ago
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README.md	2 months ago
RRall.fits	5 days ago
sara-2.ipynb	a month ago
sara-carina.ipynb	22 days ago

cluster.ipynb | DataInventory.ipynb | Exploring_A_Data_Repo.ipy | sara-exploring-data-repo-

Markdown git LSST

LSST Ca | cataloga | bokeh_ir | bokeh_h | afw_disp | matplotli | DataProc | IntroToD | bot_proc | intro-prc

Markdown git LSST

Stack Club Course Session 6: Data Products To Science

Owner(s): **Bryce Kalmbach** (@jbkalmbach)

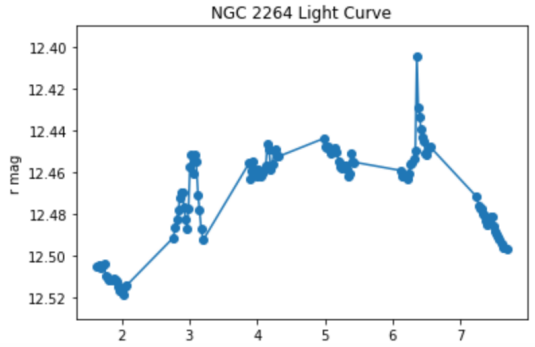
Last Verified to Run: **2020-06-11**

sara.ipyr | sara-car | sara-NG | sara-NG | sara-NG | sara-hol | sara-NG | sara-NG | sara-EX(| sara-EX(

Code git LSST

```
plt.plot(HJD, r, marker='o')
plt.ylim(12.53,12.39)
plt.xlabel('HJD')
plt.ylabel('r mag')
plt.title('NGC 2264 Light Curve')
```

[10]: `Text(0.5, 1.0, 'NGC 2264 Light Curve')`



Bonito & Hartigan et al. 2018 (WP for Rubin LSST Cadence Optimization)

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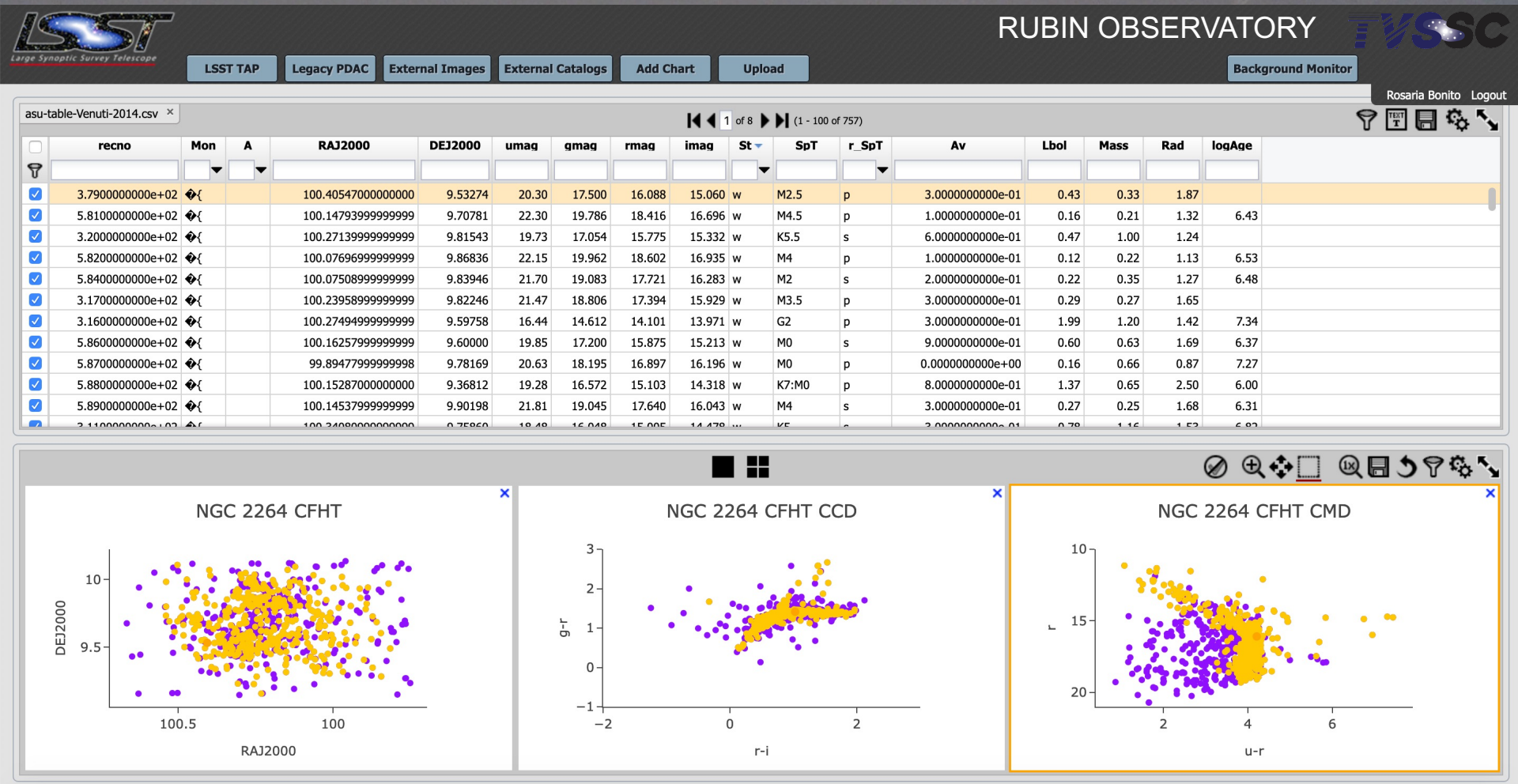


Venuti et al. 2014

Rubin Observatory

https://youtu.be/MXQQzbC5HxY

https://lsst-tvssc.github.io/

Transients and Variable Stars Science Collaboration

CO-CHAIRS

Igor Andreoni

University of Maryland

NASA Goddard Space Flight Center

Sara Bonito

INAF

Osservatorio Astronomico di Palermo

CONTACT

Contact the co-Chairs for more information:

Igor Andreoni - andreoni at umd.edu

Sara Bonito - rosaria.bonito at inaf.it

TVSSC

INTERNATIONAL COLLABORATION

MEMBERS

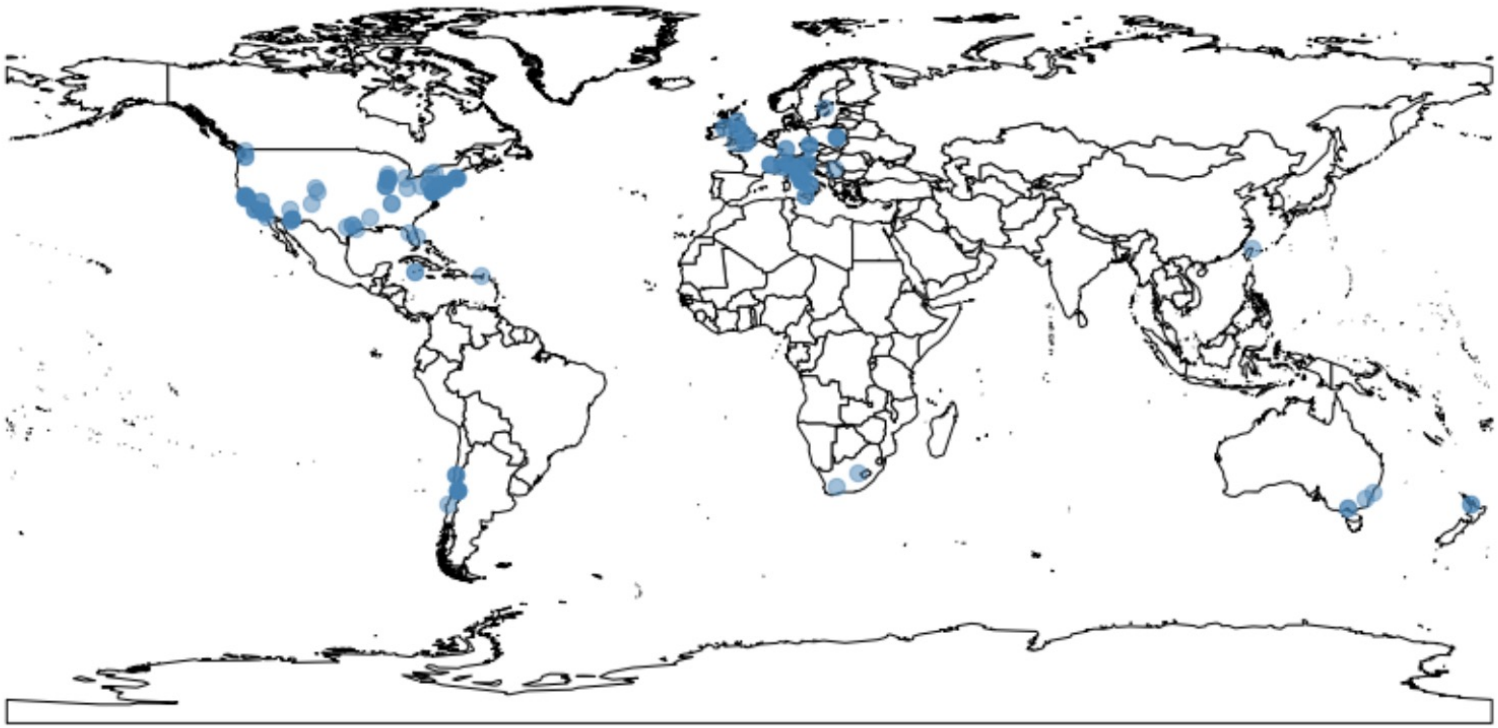
JUNE 2020

TVSSC

VERA C. RUBIN OBSERVATORY

TVS HAS OVER 400 MEMBERS IN 17 COUNTRIES WORLDWIDE

500



TVSSC

VERA C. RUBIN OBSERVATORY

SUBGROUPS

JEDI: JUSTICE, EQUITY, DIVERSITY & INCLUSION

coordinators: Sara Bonito, INAF - Osservatorio Astronomico di Palermo

ANOMALIES AND TRUE NOVELTIES

coordinator: Federica Bianco, University of Delaware

CLASSIFICATION & CHARACTERIZATION

coordinators: Nina Hernitschek, Vanderbilt

DATA VISUALIZATIONS AND CHARACTERIZATIONS

coordinators: Sabina Ustamujic, Sally Macfarlane

FAST TRANSIENTS

coordinator:
Shar Daniels, Unviersity of Delaware

SUPERNOVAE

coordinators: Fabio Ragosta, UW

TIDAL DISRUPTION EVENTS

coordinators: Sjoert van Velzen, Leiden Observatory

NON-DEGENERATE ERUPTIVE VARIABLES

coordinators: Sara Bonito, INAF

PULSATING VARIABLES

coordinators: Kelly Hambleton, Villanova

DISTANCE SCALES

coordinators: Marcella Marconi, INAF - Osservatorio Astronomico di Capodimonte Lovro Palaversa, Ruđer Bošković Institute

INTERACTING BINARIES

coordinator:
Andrej Prsa, Villanova Paula Szkody, UW

MICROLENSING SUBGROUP

coordinators: Somayeh Khakpash, UDelaware

MULTIWAVELENGTH CHARACTERIZATION AND COUNTERPARTS

coordinators: Raffaella Margutti, NorthWestern

TASK FORCES

VERA C. RUBIN OBSERVATORY

TVSSC

2021-2022 TVS TASK FORCES

SURVEY STRATEGY TASK FORCE

Coordinator: Rachel Street

This task force coordinates work by TVS members relating to all aspects of survey strategy, in particular working on papers for the planned special edition publication of Cadence Notes. The group also coordinates with similar task forces from other Science Collaborations with overlapping science interests.

DATA PREVIEW 0 TASK FORCE

Coordinator: Sara Bonito

Vincenzo Petrecca

This task force is working on a range of projects undertaken for Data Preview 0, and serves as a forum for members to share their progress and troubleshoot issues. In the course of these projects, members will evaluate the functionality of the Rubin Science Platform for their science.

SOFTWARE TASK FORCE

Coordinator: Federica Bianco

All of the science that TVS will do during LSST will depend on having access to software tools capable of handling LSST data, the rate at which it is delivered, and interfacing with key services in the Rubin "ecosystem" such as alert brokers and the Rubin Science Platform. Rubin's recent call to solicit international in-kind contributions has resulted in a number of teams committing to providing software development effort to be guided by TVS towards software that will benefit our members. This task force will help to conceive and design software that needs to created from scratch or adapted for Rubin, and begin to work with international teams to oversee the development of that software.

CROWDED FIELDS PHOTOMETRY TASK FORCE

Coordinator: Massimo Dall'Ora

This task force will continue the productive collaboration started in previous years. It will continue to evaluate the quality of photometry that can be produced from Rubin data products in crowded star fields, and its application for variable star science. We suggest this task also focuses on writing a comprehensive report of their activities up to now.

COMMISSIONING TASK FORCE

Coordinator: Markus Rabus

This task force will liaise with the Rubin commissioning staff, continuing to provide scientific input on activities and observations that benefit TVS science in the commissioning phase of the project.

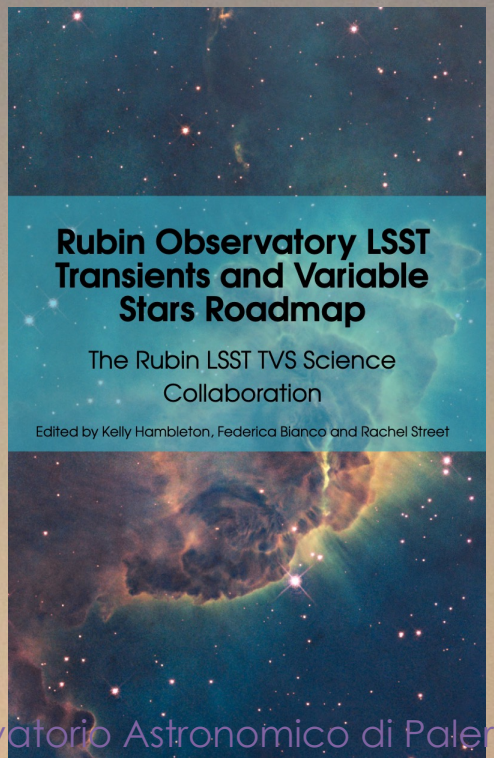
TVS ROADMAP

https://doi.org/10.1088/1538-3873/acdb9a

(Peer reviewed paper, Hambleton et al., PASP)

Microlensing
Eclipsing Binary Stars
Cataclysmic Variables
Intermediate-Luminosity Optical Transients
Light Echoes of eruptions and explosions
EM counterparts of GW events
Neutron Star Binaries
Black Hole Binaries
Supernovae
Tidal Disruption Events

Young stellar objects
Pulsating Stars
Cepheids and RR Lyrae Stars
Long Period Variables
Brown Dwarfs
GRB
Blazars
Inclusion
Alert Brokers
SETI



VERA C. RUBIN OBSERVATORY

TVSSC

Sara (Rosaria) Bonito – INAF – Osservatorio Astronomico di Palermo (Italy)

TVS ROADMAP

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paper, Hambleton et al., PAS

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Variables

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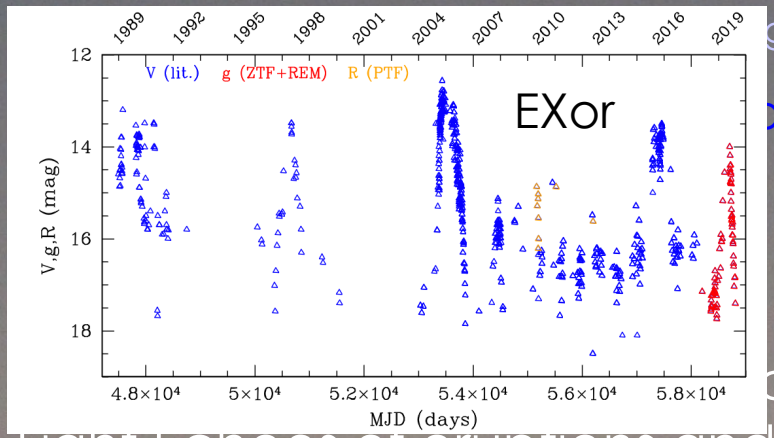
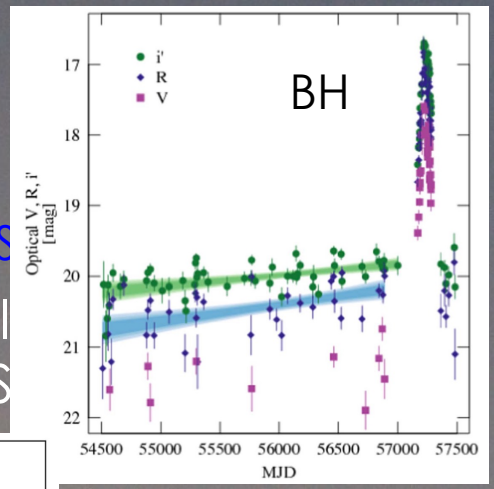
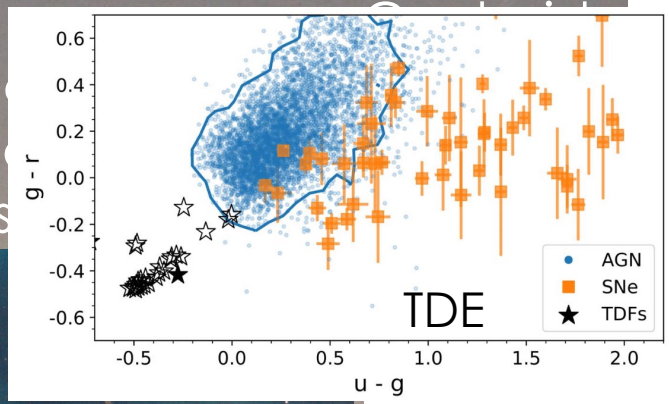
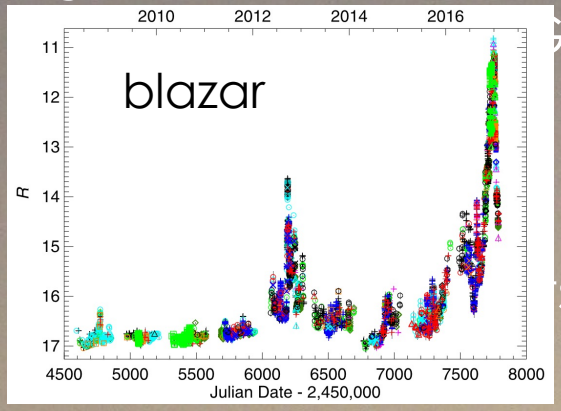
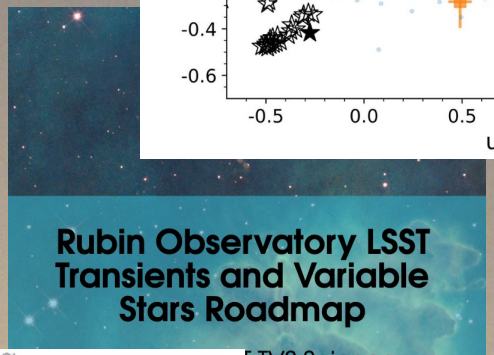
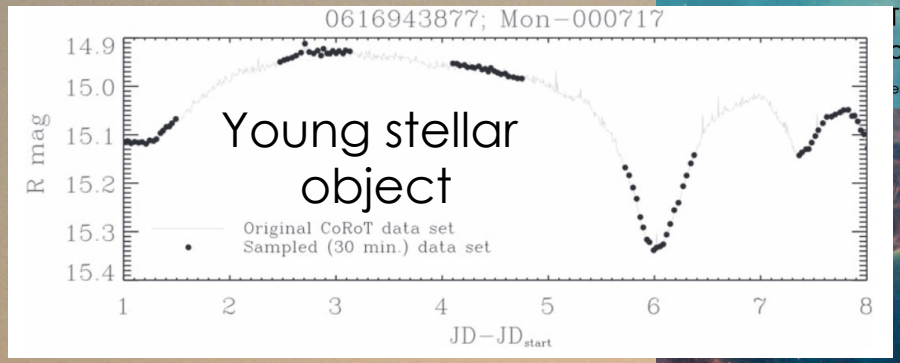


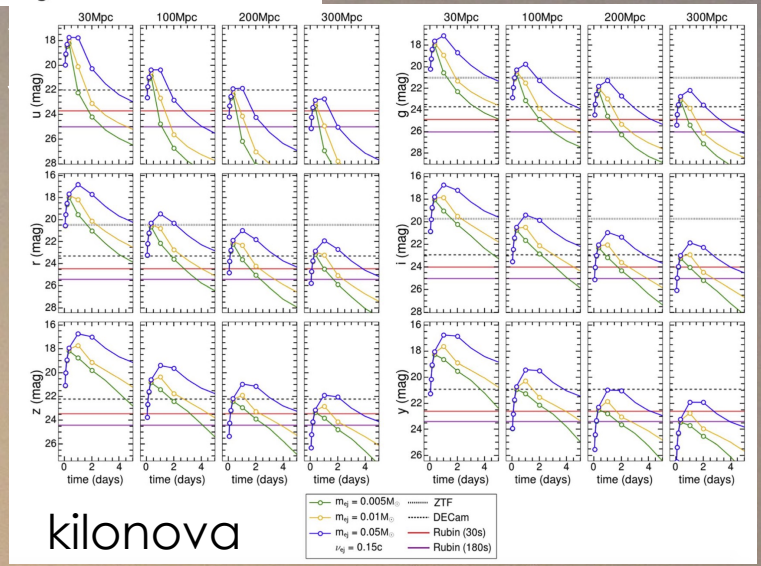












Sara (Rosaria) Bonito – INAF – Osservatorio Astronomico di Palermo (Italy)

Rubin LSST Survey Strategy Optimization

Preparing to Discover the Unknown with Rubin LSST: Time Domain - X. Li+ 2022 ApJS 258 2
Blazar Variability with the Vera C. Rubin Legacy Survey of Space and Time - C. M. Raiteri+ 2022 ApJS 258 3
The Impact of Observing Strategy on the Reliable Classification of Standard Candle Stars: Detection of Amplitude, Period, and Phase Modulation (Blazhko Effect) of RR Lyrae Stars with LSST - N. Hernitschek+ 2022 ApJS 258 4
Optimizing Cadences with Realistic Light-curve Filtering for Serendipitous Kilonova Discovery with Vera Rubin Observatory - I. Andreoni+ 2022 ApJS 258 5
Give Me a Few Hours: Exploring Short Timescales in Rubin Obs. Cadence Simulations - E. Bellm, ..., IA+ 2022 ApJS 258 13
Target-of-opportunity Observations of Gravitational-wave Events with Vera Rubin Obs. - I.Andreoni+ 2022 ApJS 260 18
The LSST Era of Supermassive Black Hole Accretion Disk Reverberation Mapping - A. B. Kovačević+ 2022 ApJS 262 49
Young Stellar Objects, Accretion Disks, and Their Variability with Rubin Observatory LSST - R. Bonito & Venuti+ 2023 ApJS 265 27
Light-curve Recovery with the Vera Rubin Observatory's LSST. I. Pulsating Stars in Local Group Dwarf Galaxies - M. Di Criscienzo+ 2023 ApJS 265 41
LSST Survey Strategy in the Galactic Plane and Magellanic Clouds - R. A. Street+ 2023 ApJS267 15
Rubin Observatory's Survey Strategy Performance for Tidal Disruption Events - K. BučarBricman+ 2023 ApJS 268 13
An Evenly Spaced LSST Cadence for Rapidly Variable Stars - E. Feigelson + 2023 ApJS 268 11
Rubin LSST Observing Strategies to Maximize Volume and Uniformity Coverage of Star-forming Regions in the Galactic Plane - L. Prisinzano + 2023 ApJS 265 39

Microlensing Discovery and Characterization Efficiency in the Vera C. Rubin Legacy Survey of Space and Time - N. S. Abrams, M. Hunterdmark et al., in review
Transient Dwarf Novae detection using the LSST Marais, Buckley et al., in review
Kilonova parameters estimation with LSST at Vera C. Rubin Observatory – Ragosta et al., accepted

Every Datapoint Counts: Stellar Flares as a Case Study of Atmosphere Aided Studies of Transients in the LSST Era - Clarke et al., in review

Sara (Rosaria) Bonito – INAF – Osservatorio Astronomico di Palermo (Italy)

LIAISONS

TVSSC

Survey Cadence Optimization Committee (SCOC)

- **Rachel Street**, Las Cubres Observatory (TVS SC liaison)
- **Adam Miller**, Northwestern University (TVS SC liaison)
- **Colin Slater**, University of Washington (TVS SC liaison)

Anomaly Detection Interest Group, Informatics and Statistics Science Collaboration (ISSC)

Ashish Mahabal

in-kind proposal reviewers

Michael Stroh, Ashish Mahabal, Andres Prsa

(thanks to previous reviewers:
Rachel Street, Federica Bianco, Alessandra Corsi)

Diversity, Equity, and Inclusion (DEI) Council

VERA C. RUBIN OBSERVATORY

Develop and implement research inclusion practices (Courtesy of Will Clarkson)

The Rubin SCs aspire to be an inclusive and supportive environment for anyone interested in pursuing LSST-based science.

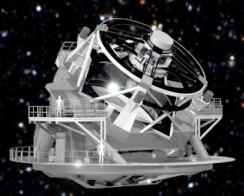
All the Rubin SC's are active in improving research inclusion within their collaboration.

The SC's DEI Council exists to help harness and coordinate these efforts, to share knowledge and experience, and (where appropriate) to promote effective DEI practices within the SC's and the Rubin organizations. Members:

AGN	Matthew Temple	SLSC	Aprajita Verma	SC's	Will Clarkson (chair)
DESC	Ian Dell'Antonio	SMWLV	Sara Bonito	AURA/NSF	Sandrine Thomas
Galaxies	Manda Banerji	SSSC	Laura Inno	SLAC/DoE	Phil Marshall
ISSC	Lior Shamir	TVS	Federica Bianco	NOIRLab	Ameera McBride

Education & Public Outreach (EPO)

Ashish Mahabal
Sara Bonito



Preparing for Astrophysics with LSST

Transients & Variable Stars *Stars, Milky Way & Local Volume* *Solar System Science Collaborations*

Community awards managed by LCO

Program Lead: Rachel Street

With support from HEISING-SIMONS FOUNDATION

APRIL 2021

THE HEISING-SIMONS FOUNDATION AWARDED $900,000 TO ENABLE ALL ASTRONOMERS TO EXPLORE THE POTENTIAL OF RUBIN OBSERVATORY FOR GALACTIC, STELLAR, AND SOLAR SYSTEM SCIENCE, THROUGH THE WORK OF SCIENCE COLLABORATIONS THAT ARE DEDICATED TO THESE TOPICS.

- Fund science publications
- Support meetings and workshops
- Provide access to software training and tools
- Kickstarter Grants

Initiative to provide resources and training to enable researchers to get involved in Rubin research and overcome barriers to entry

Preparing for Astrophysics with LSST Program

Program Lead: Rachel Street

For more information, see: https://lsst-sci-prep.github.io/

Kickstarter Grants

Funding opportunities for Rubin research designed to promote inclusive and collaborative research, open to members world wide

Individual/team awards: up to $20,000

Collaborative awards: up to $30,000

Duration: 1yr

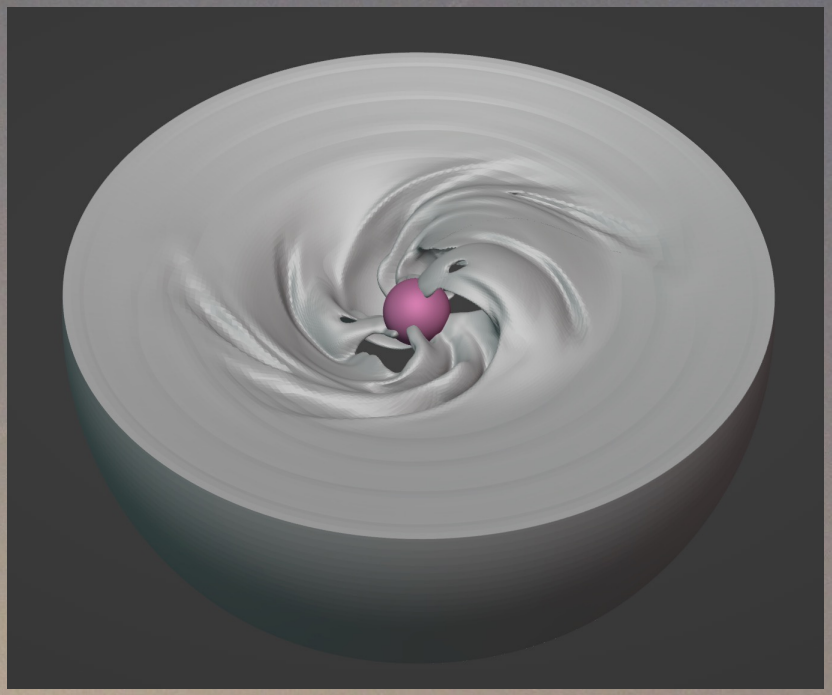
35 Kickstarter grants awarded to PIs from 9 countries

20 TVS-led

- Mentoring (Cucchiara et al.)
- Sonification (Bianco et al.)
- 3D models and Accessibility (Bonito & Venuti et al.)
- Inclusion (Bonito & Bianco)

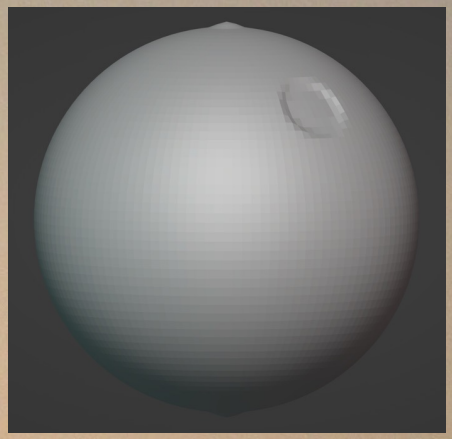
3D Printable Models for a more Inclusive Science

Catalogue of publicly available interactive 3D graphics and 3D printed kits to adequately present Rubin/TVS science to visually impaired researchers and members of the community.



3D models and **printed** kits for a more inclusive Science with Rubin LSST:

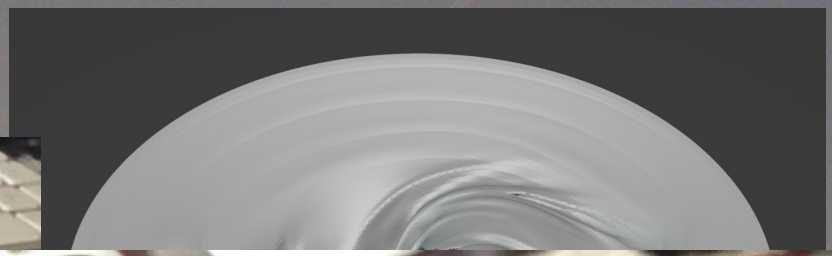
to make more **accessible** our results to **visually impaired** students/researchers project funded by **Kickstarter Grant**, Bonito & Venuti et al. (*supported by the Preparing for Astrophysics with LSST Program*); PostDoc Fellow developing 3D models: Sabina Ustamujic



TVSSC

3D Printable Models for a more Inclusive Science

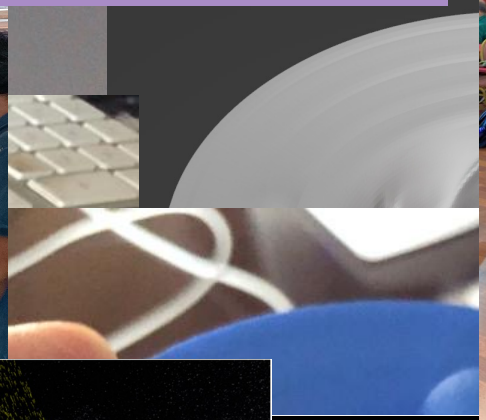
Catalogue of publicly available interactive 3D

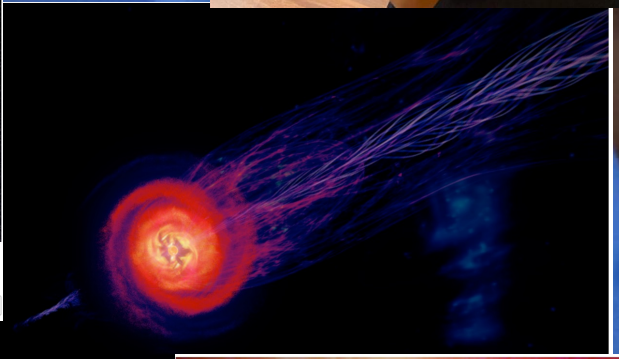


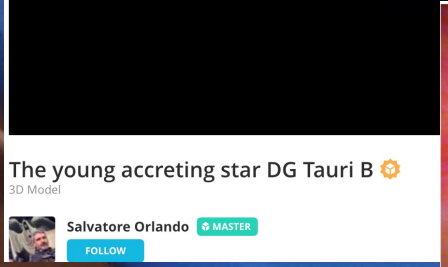
Courtesy of Salvatore Orlando

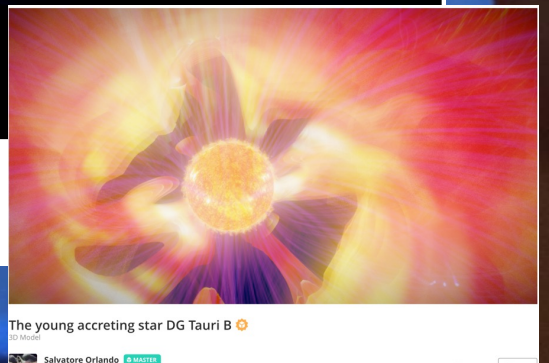
3D Printable Models for a more Inclusive Science

Virtual Reality (VR) as well









Courtesy of Salvatore Orlando

https://lsstdiscoveryalliance.org/about-lsst-discovery-alliance/staff-board/

LSST Discovery Alliance

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Board of Directors

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- **Will Clarkson**, University of Michigan – Dearborn
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- **Buell Jannuzi**, University of Arizona
- **Kathryn Johnston**, Columbia University
- **David MacFarlane**, SLAC/Stanford University
- **Knut Olsen**, NSF's NOIRLab
- **Ian Shipsey**, University of Oxford
- **Risa Wechsler**, Stanford University
- **Michael Wood-Vasey**, University of Pittsburgh

Catalyst Fellowship

Our flagship program, funded by the Templeton Foundation, is a unique three- to four-year fellowship designed for post-doctoral, early-career researchers in both astrophysics and social sciences. *(Director, J. Sokoloski – LSST-DA)*

READ MORE ▸

Inclusive Collaboration Initiatives

A set of initiatives to foster a diverse Rubin LSST community, including child care support, inclusive collaboration best practices, and expansion partnerships.

READ MORE ▸

Data Science Fellowship

A two-year training program, based at Northwestern University, that develops diverse astronomy graduate students with the essential skills for science with large, complex datasets. *(Director, A. Miller – NW)*

READ MORE ▸

Science Catalyst Grants

Previously the Enabling Science Grants, these small grants have a big impact by supporting bold ideas, inclusive participation, and interdisciplinarity while engaging students and early-career researchers.

READ MORE ▸

LINCC Frameworks

This program will develop advances in software infrastructure to analyze the enormous volume and complexity of Rubin LSST data. *(PIs A. Connolly – UW, R. Mandelbaum – CMU, J. Sokoloski – LSST-DA)*

Summer Student Program

A program for students to attend the annual Rubin LSST meeting, present LSST-related research, and receive professional development, cohort building, and networking opportunities. *(Director, R. Oelkers – TAMU)*

LSST
Discovery Alliance

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Inclusive Collaboration Projects

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General Training

Nurturing the future generations of Rubin scientists with effective, culturally responsive mentoring

Awardees: F. Bianco (University of Delaware), Rachel Street, Sara Bonito

Award: $17,000

TVS: https://lsst-tvssc.github.io/

Highlights 2022-2024 at a glance:

- **>540** members, **16** requests in the last 2 months
- **>17** refereed papers published 2022-24 (input for survey strategy)
- **20** Kickstarter projects
- **33** in-kind projects for which TVS is recipient
- TVS Colloquia: restarted and on-going
- Workshops/conferences organized
- 2022/23 Science Highlights SLIDE DECK created for the PCW23

GROUPS/TASK FORCE INFO

VERA C. RUBIN OBSERVATORY

Get in the conversation on Slack:

- # tvs
- # tvs_classif_char
- # tvs-anomalies
- # tvs-dataviz
- # tvs-dp0
- # tvs-jedi
- # tvs-ndev
- # tvs-science_platform
- # tvs-software-training
- # tvs-taskforce-survey-strategy
- # tvs-whos-in-the-what-now

TVSSC

Join a TVS Task Force and subgroup : **https://lsst-tvssc.github.io/**