



Rubin Operations

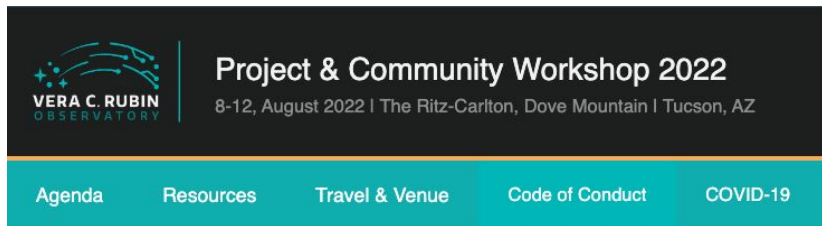
PCW 2022 Tuesday, August 09, 9 AM

Bob Blum, Director for Operations



U.S. DEPARTMENT OF
ENERGY

Friendly reminders - CoC & Covid




[Home](#) » [Code of Conduct](#)


Code of Conduct

Harassment and unprofessional conduct (including the use of offensive language) of any kind is not permitted at any time and should be reported.


Rubin Observatory adheres to the principles of kindness, trust, respect, diversity, and inclusiveness in order to provide a learning environment that produces rigor and excellence.



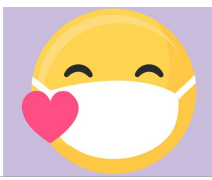
Handshakes OK
Fold Here



Elbow/Fist Bump OK
Fold Here



I Need My Space
Fold Here



Thank you for
masking indoors!

Check name-tags for these contact comfort level stickers.

Use the confidential email rubin2022-covid@lists.lsst.org to request a test, report your test results, or ask questions.

Reporting bullying, harassment, or aggression.

The Rubin 2022 Organizing Committee has appointed designated contacts:

- Ranpal Gill (rgill@lsst.org)
- Andrew Connolly (ajc@astro.washington.edu)
- Melissa Graham (mlg3k@uw.edu)

Contact via email, Slack, or the Community Forum.

Friendly reminders - virtual participation



Virtual participants should be muted when they're not speaking.



In-person participants should speak into the room microphone(s), or the chair should repeat all questions into the microphone, so that the virtual participants can hear what is said.



In the Rubin2022_PCW Slack Space, all participants can use the session's channel for Q&A and discussion.

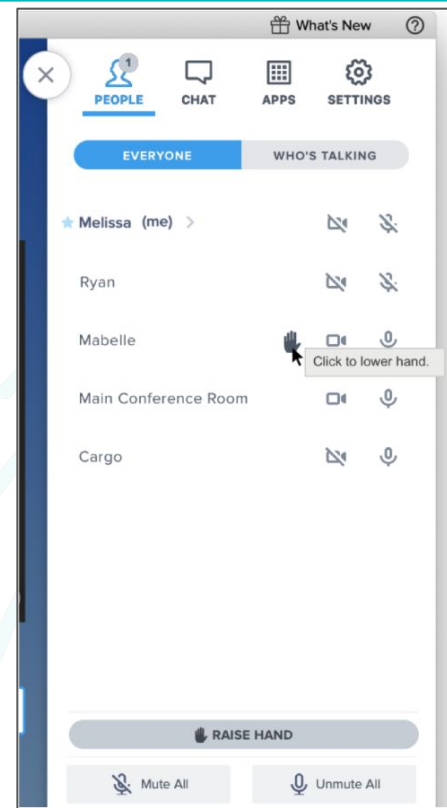
The channel name convention is, e.g.:
#day1-mon-slot3a-intro-to-rubin



Plenary, virtual participants should:

use the BlueJeans chat functionality to ask questions or make comments.

Staff are moderating the chat and will ask your question for you



Topics to Cover

- Status, data previews, schedule
 - DP0.2
 - In Kind Program
 - Sustainability
 - SCOC progress
 - Users Committee
 - Research Inclusion
 - New staff
 - Jobs
 - Related sessions
- 40 minutes
- Q&A
- 20 minutes

Rubin Operations Status Update

December 2021, initial survey cadence updated

February 2022, successful joint agency review, 5 yr funding proposal:

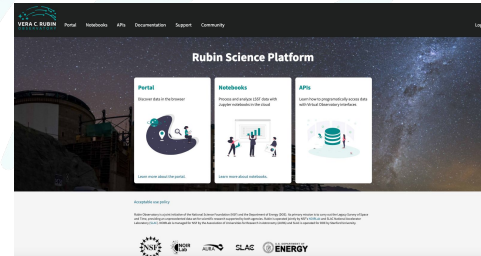
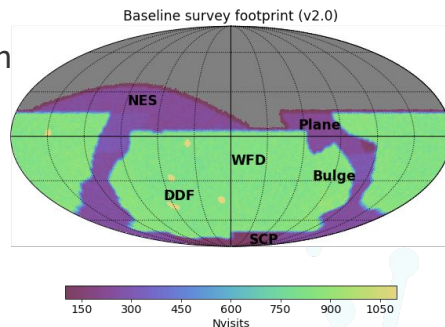
“The Rubin review panel would like to thank all members of the Rubin Operations program team, ...

- Excellent and high quality presentations
- Prompt answers to all our questions
- Engaging in constructive discussions with the panel
- and taking time to prepare the extensive material ahead and during the review process.

Since the last DOE/NSF Rubin Pre-Operations review in FY20, the team has considerably strengthened its organization structure and have made significant progress and are well on track to be ready for FY24 Operations.

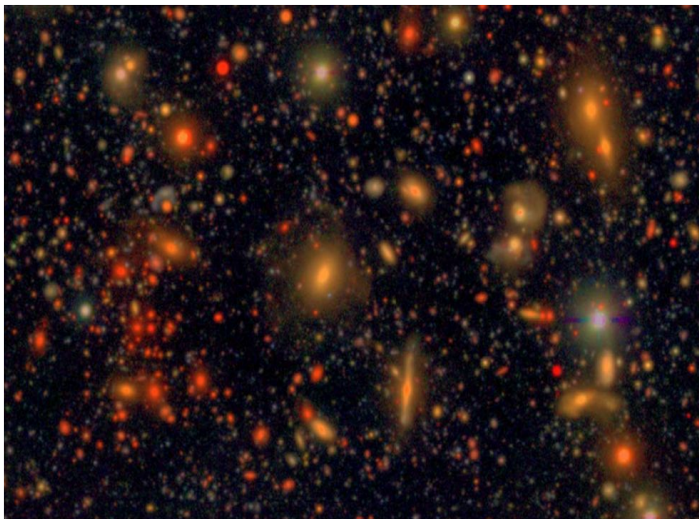
- Congratulations to the team”

June 2022, DP0.2

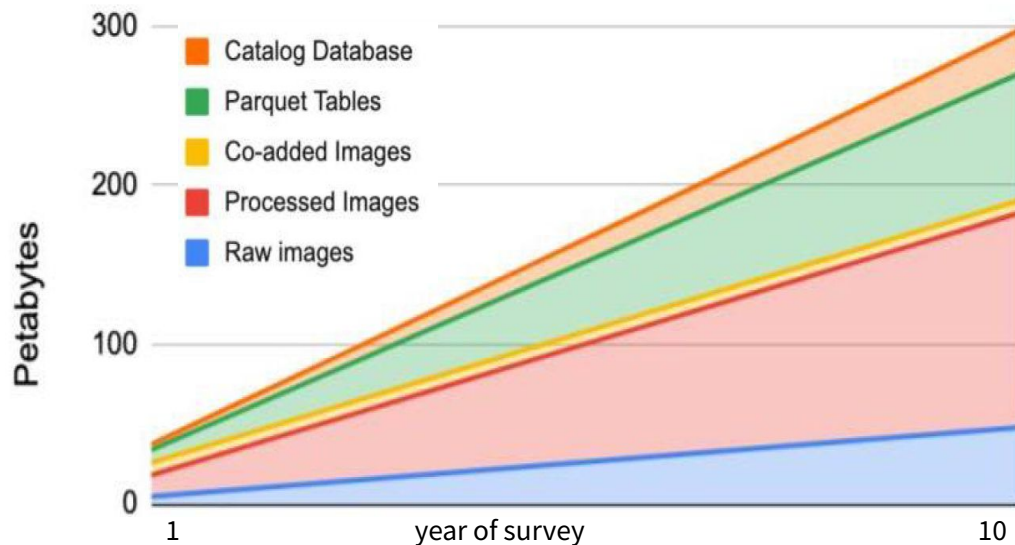


Transition to Operations: Building the Rubin User Experience

The final LSST 10-year sky map will be like having ~3 million of these, tiled over the entire southern sky.



The Rubin Observatory's total data holdings will start (after DR1) at ~40 PB and grow to ~300 PB over the 10-year LSST.



O'Mullane et al. 2021 (RTN-003.lsst.io)

Slide credit: M. Graham

Transition to Operations: Building the Rubin User Experience

Goal: Democratize science by removing barriers to participation in the Legacy Survey of Space and Time (LSST).

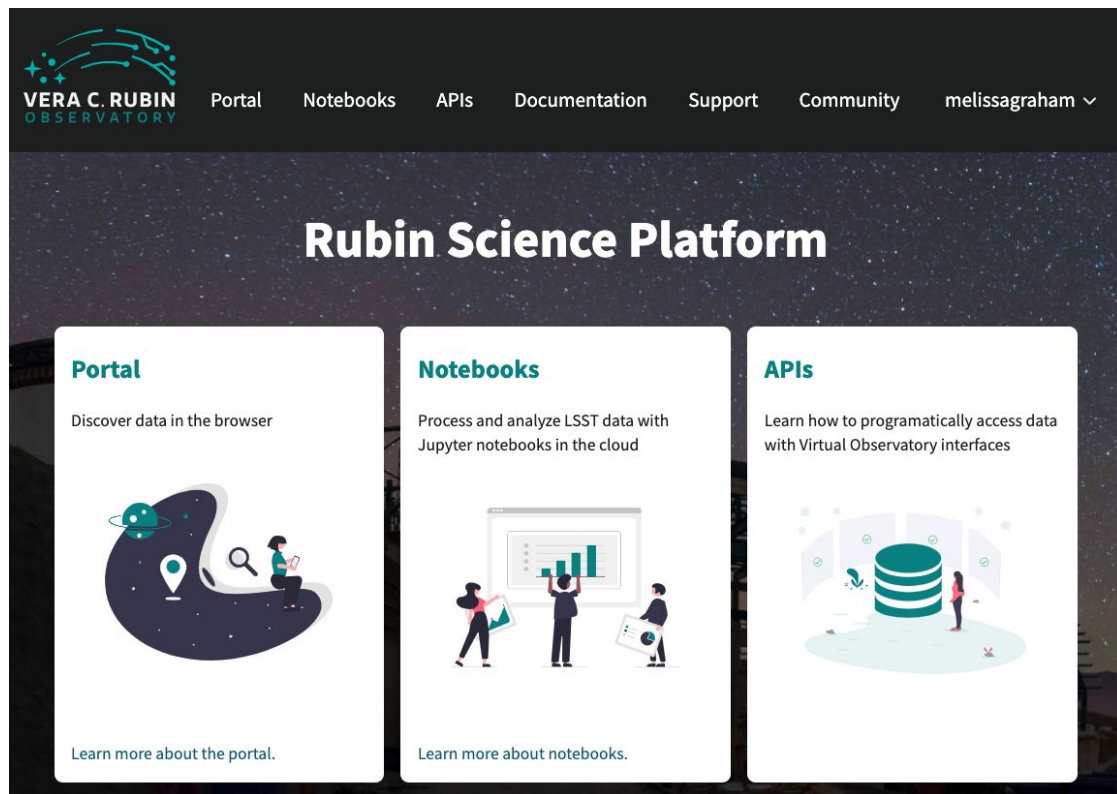
- abundant, discoverable documentation of the end-to-end system
- clear entry points and tutorials from beginner through advanced levels
- asynchronous, distributed, friendly support
- a stable software environment with compute resources
- prioritize research inclusion and seed expertise across the community
- enable anyone to become power user and push the cutting edge with LSST

Slide credit: M. Graham

Transition to Operations: Data Previews

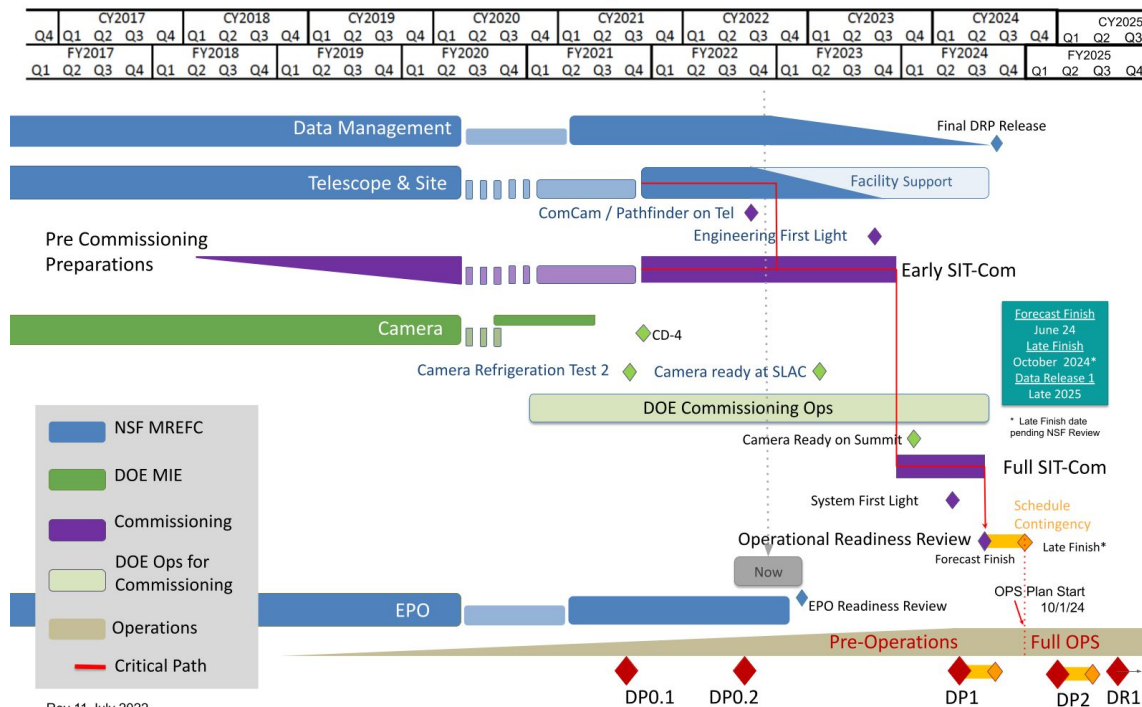
Data Previews

- Like a shared risk Data Release
- Key Operations Readiness Activity (for team and community)
- Three Previews
 - DP0, DC2 from DESC
 - DP1, ComCam
 - DP2, SV surveys
- Currently hosted on Google Cloud
- Access via [Rubin Science Platform](#)



Rubin Operations Status Update: Schedule

Rubin Observatory Schedule



Rubin Operations Status Update: Milestones

Rubin Operations Top Milestones

- | | | |
|------------------------------|--|--|
| ● 2021-06-30 | Deliver Data Preview 0.1 (DP0.1) (L1-RO-0040) | |
| ● 2022-06-30 | Complete Delivery of Data Preview Zero (L1-RO-0050) | |
| ● Mar 2024 - Jul 2024 | Complete Delivery of Data Preview One (DP1) (L1-RO-0060) | (= Optical testing on TMA complete + 6 months) |
| ● Jun 2024 - Oct 2024 | ("Survey"/"Full") Operations Begins (L1-RO-0100) | (= Operation Readiness Review Complete + 1 day) |
| ● Jun 2024 - Nov 2024 | Survey Start (L1-RO-0110) | (= ("Survey"/"Full") Operations Begins + 1 months) |
| ● Dec 2024 - Mar 2025 | Complete Delivery of Data Preview Two (DP2) (L1-RO-0070) | (= Mini-Survey 2 Complete + 6 months) |
| ● Oct 2025 - Jan 2026 | Complete Delivery of Data Release One (DR1) (L1-RO-0120) | (= Survey Start + 12 months) |

*Proposals THIS FALL to
do LSST DR1 research!*

- Main change: LSST starts ~Q4 of calendar 2024 (Project COVID-delayed by another 6 months)
- Uncertainty (date ranges) will narrow with time as Project nears completion
- Research grant proposal writers and science planners: you can expect
 - DP1 (ComCam) data release Q2 of calendar 2024 (i.e. Year 1 of a 3-year grant)
 - DP2 (LSSTCam SV) data release Q1 of calendar 2025 (i.e. Year 2 of 3)
 - DR1 (First LSST data) Q4 of calendar 2025 (i.e. Year 3 of 3)
- Proposers: refer to [10.5281/zenodo.5650106](https://doi.org/10.5281/zenodo.5650106) for what Rubin will provide

Slide credit: P. Marshall

Dedicated session: Tuesday 330pm Tortalita A. [Early Science](#) (Guy, Blum)

Early Science is defined as *any science enabled by Rubin for its community through and including the first data release, Data Release 1 (DR1).*

Schedule and content of data previews and DR1 follow from “best case” commissioning.

We will discuss scenarios other than best case in the Early Science Session this afternoon, and what such scenarios might mean for the data preview and DR1 schedule and content.

[Grant proposers, please come the Early Science Session!](#)

Data Preview 0 (DP0)

Rubin's DP0 Goals

- enable the community to prepare for early LSST science with the RSP
- end to end processing and verification in operations environment
- test integration of the LSST science pipelines and the RSP
- use feedback on data products and RSP functionality to inform future development

DP0 Data Set

- simulated LSST-like images and catalogs from the DESC's Data Challenge 2 (DC2)
- future DP data sets will be based on LSST commissioning data from Rubin Observatory

DP0 Timeline

- DP0.1, June 2021: *DC2 as processed by the DESC available in the RSP*
- DP0.2, June 2022: *DC2 as reprocessed by Rubin Data Production available in the RSP*

Data Preview Zero Point Two (DP0.2)

- Second preview of simulated images
- Raw simulated images from DESC's DC2 processed by Operations Rubin Data Production Team (RDP)
- Processed data products verified and validated by Operations Rubin System Performance Team (RPF)
 - *New in DP0.2: difference image analysis and light curves*
- Expanded cohort of delegates up to 600 (from 300 for DP0.1). Still some slots left and we will be working on filling out the full 600. (we need to accommodate ~10K eventually.)
- See dp0-2.lsst.io and community.lsst.org

The DP0 Simulated Data Set

Simulated LSST-like images and catalogs generated by the LSST Dark Energy Science Collaboration (DESC) for their Data Challenge 2 (DC2; [arXiv:2101.04855](https://arxiv.org/abs/2101.04855)).

Simulated images over 300 square degrees with a baseline (fiducial) survey strategy for the wide-fast-deep (WFD) region and cadence only (i.e., no deep drilling fields).

Simulated astrophysical objects in the WFD images include galaxies (with large-scale structure), Type Ia supernovae, and stars (10% have variability).

Imaging data products include:

- processed visit images (PVI), deep coadds, and difference images

Catalog data products include:

- SNR>5 detections and forced photometry in all image types

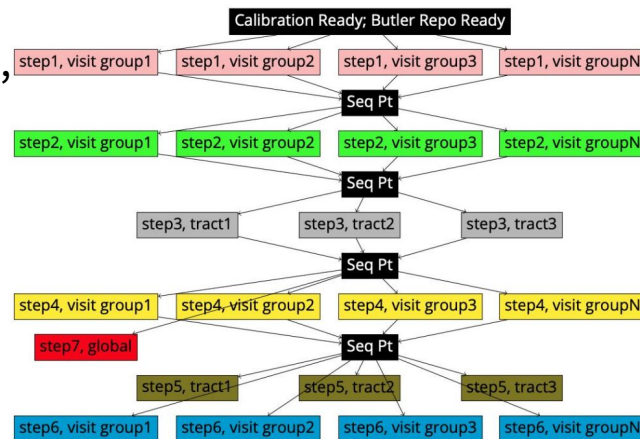
**DP0.2 Data
Products
Definitions
and Schema:**
dp0-2.lsst.io

Rubin Data Production & System Performance

A large team of Rubin staff from the Data Production and System Performance departments have worked hard to bring you to DP0.2:

- Building the LSST science pipelines and middleware (Construction),
- Processing the DC2 data, verifying and validating the data products (Operations),
- Building the Qserv database, loading the catalogs and testing the performance (Construction, Operations),
- Building the Rubin Science Platform (Construction),
- Deploying RSP on Google Cloud (Operations),
- Supporting science community by developing documentation and tutorials (Operations)

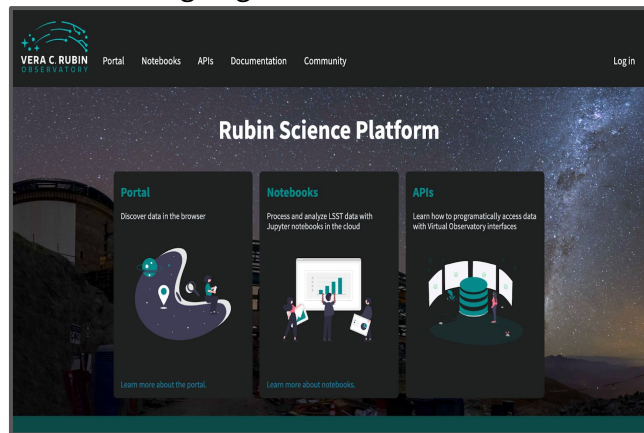
Rubin Operations is very excited to continue working with the community as you start to do science with DP0.2.



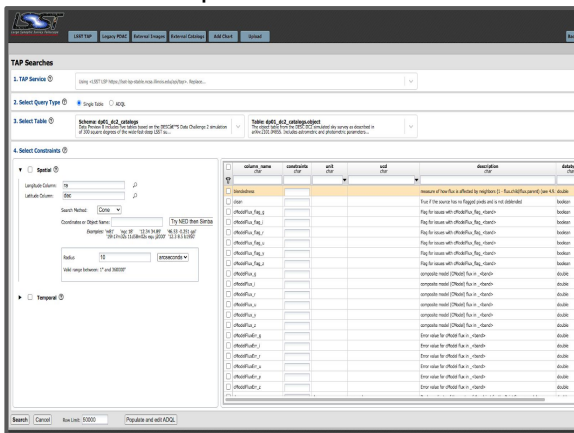
The DP0-Era Rubin Science Platform

The DP0-era RSP provides delegates with access to the data set via the Portal, Notebook, and API* Aspects. All three aspects have tools to query, subset, visualize, and analyze the DP0 data set, as well as documentation and tutorials for users. The LSST Science Pipelines (and many other common software packages) are pre-installed in the Notebook environment.

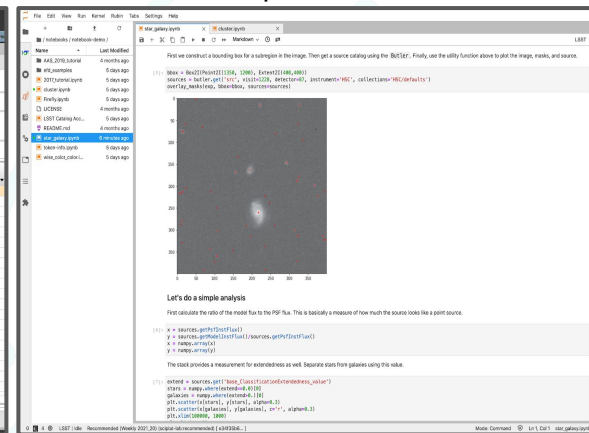
RSP Landing Page



RSP Portal Aspect



RSP Notebook Aspect

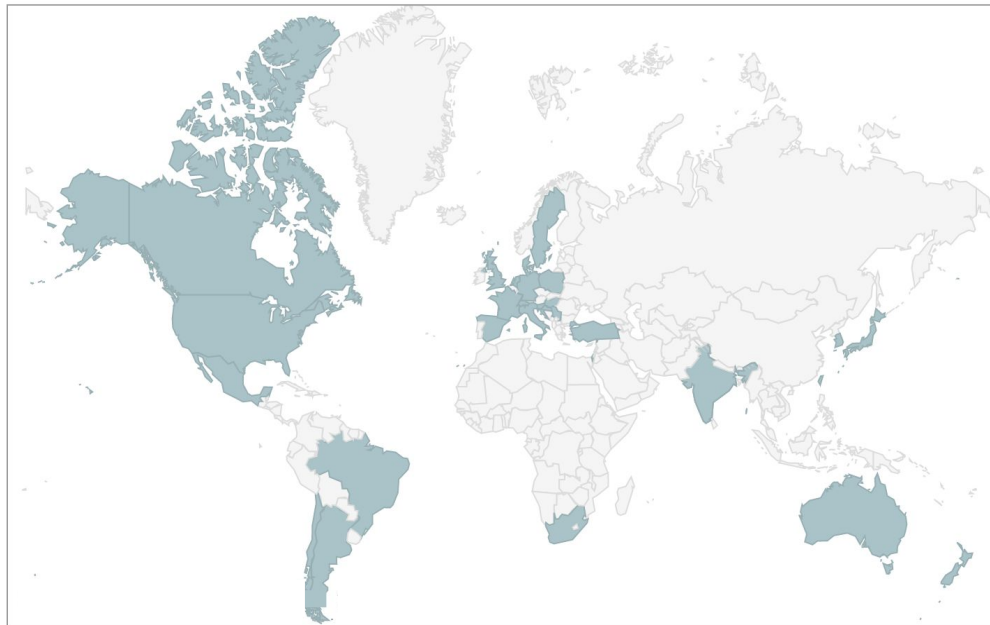


In-Kind Program and Science Collaborations

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



In-Kind Program and Science Collaborations

- Motivation
 - Support Operations with services or hardware for core activities
 - Support US science. This means practically supporting Chilean community too and the Rubin/LSST science collaborations with resources to extend analyses, support follow-up, add complementary data sets, computing
 - Keep faith with the international community
- Challenges
 - Management of program development, contribution review, tracking, data rights agreements.
 - Recipient groups effort to make effective use of contributions
- Wednesday 130pm Tortolita A. [Follow-up Facilities for Time Domain Astronomy](#) (Corsi, Street, Sobek)
- Thursday 130pm Ballroom. [Connecting the Community to IDACs and SPCs](#) (Olsen)
- Thursday 330pm Ballroom. [Rubin In-Kind Program](#) (Verma)

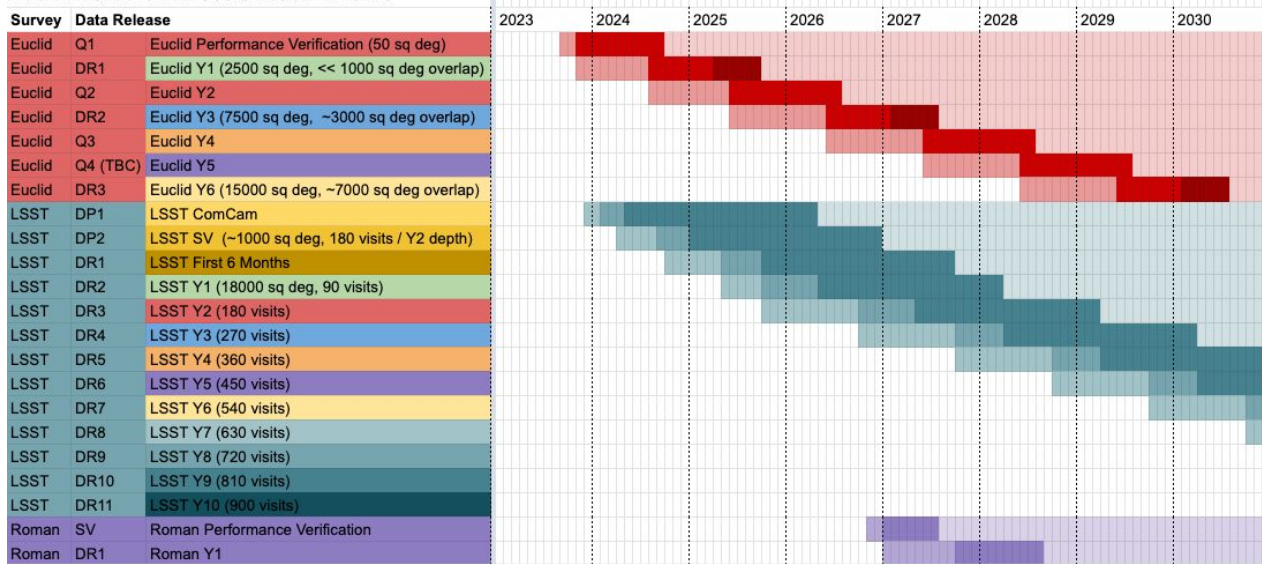
Rubin Research Inclusion

- Demonstrated Research Inclusion is a key goal of Rubin Operations Leadership
 - Established a Research Inclusion Working Group (Rubin RIWG)
 - Engaging with a cohort of researchers, educators, students from small and underserved institutions in the US. Initially for DP0.
 - Coordinating with NOIRLab RI experts (D. Norman, Tim Sacco, USELTP, best practice)
 - Hired RI postdoc as part of the Community Engagement Team.
 - Coordinating with LSSTC (Catalyst Fellowship program, RIWG)
- Tuesday 11am Tortalita B. [Equity and Inclusion Workshop](#) (Shugart)
- Wednesday 9am Ballroom. [The LSST Science Collaborations](#)
- Thursday 130pm Tortalita C. [Rubin-related Initiatives Toward DEI](#) (Bianco)

Rubin-Euclid-Roman Synergy

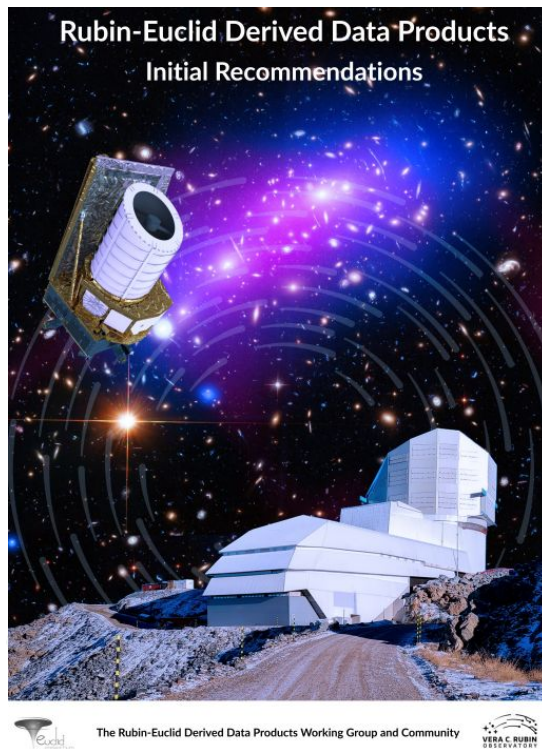
- Rubin-Euclid observations/data production overlap is 2024-2030
- Rubin-Roman observations/data production overlap is 2026-2032
- Data from all three projects will be available from ~2026.

Rubin-Euclid-Roman Coordination Timeline



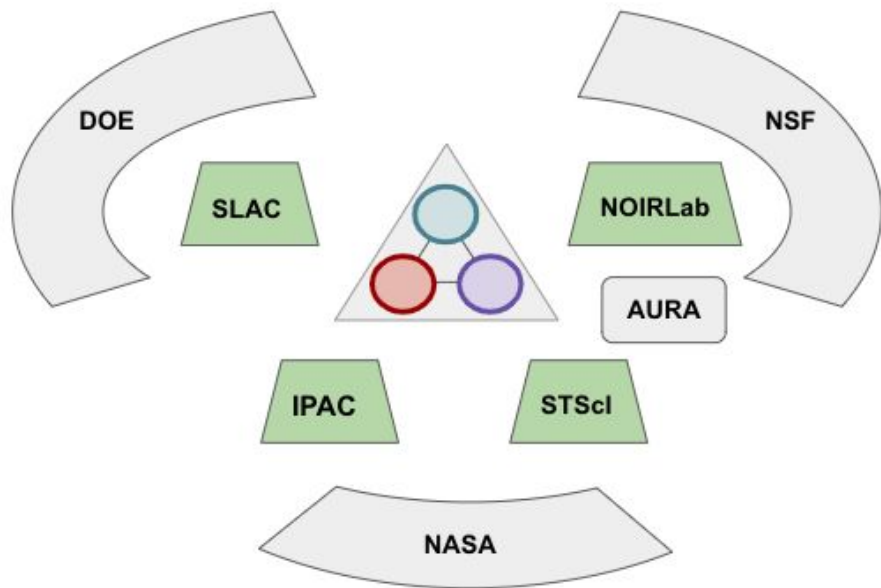
Rubin-Euclid-Roman Synergy

- Rubin has committed to observing in the Euclid Deep Field
 - All EDF data from both missions to be shared simultaneously with both communities
 - No impact on Rubin survey strategy
 - SAC recommended, Rubin Leadership approved
 - Euclid Board has approved
 - Need to implement agreement with Euclid
- Rubin and Euclid completed a [community and science based process](#) to identify mutually beneficial derived data products last December. See [arXiv:2201.03862](#)
- Euclid Board accepted recommendations
- Rubin discussing with its management board and US agencies.
- Next step: Rubin-Euclid letter of intent
- DDPs not funded or resourced in the current Rubin Operations plan - but idea is for all DDPs to be available to all LSST data rights holders and Euclid Consortium members



Rubin-Euclid-Roman Synergy

- Rubin is coordinating with Roman and Euclid to advance planning and implementation of joint processing, analysis, and data products.
- March workshop with mission, agency, and science center participation
- Culminated in “proposal” to US agencies to support joint survey processing
- Need to coordinate with European colleagues too
- Need further Rubin-Roman community and science based view of joint data products



Committees

- Science Advisory Committee remains active advising both Construction and Operations. Topics moving toward Operations issues.
- [Users Committee](#)* now active. Matthew Holman Chair.
- Survey Cadence Optimization Committee driving toward final initial strategy for Operations Director, end of 2022
- Contribution Evaluation Committee reviewed several delayed contributions in 2021, on standby for future contributions. Will oversee the upcoming annual evaluation.

- Monday 9am Ballroom. [Science Advisory Committee](#) (Strauss)
- Wednesday 11am Tortalita A. [Survey Strategy I](#) (Jones)
- Friday 9am Ballroom. [Users Committee Meeting](#) (Holman, Graham)

Users Committee

The Rubin Users Committee is charged with soliciting feedback from the science community (LSST “users”) about the LSST data products and Rubin Science Platform, and recommending improvements in their twice-yearly reports that are delivered to the Rubin Operations director.

Charge: rdo-051.lsst.io

Website: lsst.org/scientists/users-committee

Reports: available in the Rubin Community Forum (tag = “users-committee”)

Meetings: first ~hour open to community members to attend (join @PCW on Fri 9am)

Contact: via the Rubin Community Forum (Community.lsst.org; direct message to individuals or to the @Users-Committee group) or via email to RubinObs-Users-Committee@lists.lsst.org

The Rubin Users Committee looks forward to hearing from you.

Igor Andreoni*

Dominique Boutigny*

Alejandra Muñoz Arancibia*

Alessandra Corsi*

Qingling Ni

Markus Rabus

Francisco Javier Sanchez Lopez

Matthew Holman*

V. Ashley Villar

Anja von der Linden

Matthew P. Wiesner*

Michael Wood-Vasey*

**Are at the PCW in-person; the rest are attending remotely.*

Users Committee



**Igor
Andreoni**



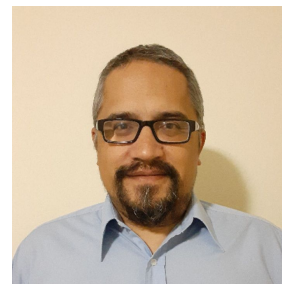
Qingling Ni



**Ashley
Villar**



**Dominique
Boutigny**



**Markus
Rabus**



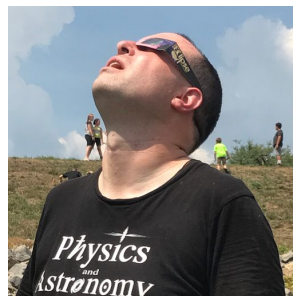
**Anja von
der Linden**



**Alejandra
Muñoz
Arancibia**



Javi Sanchez



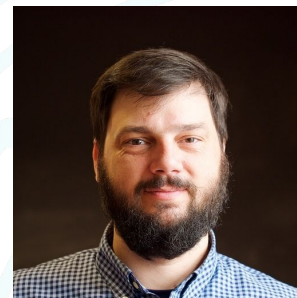
Matt Wiesner



Alessandra Corsi



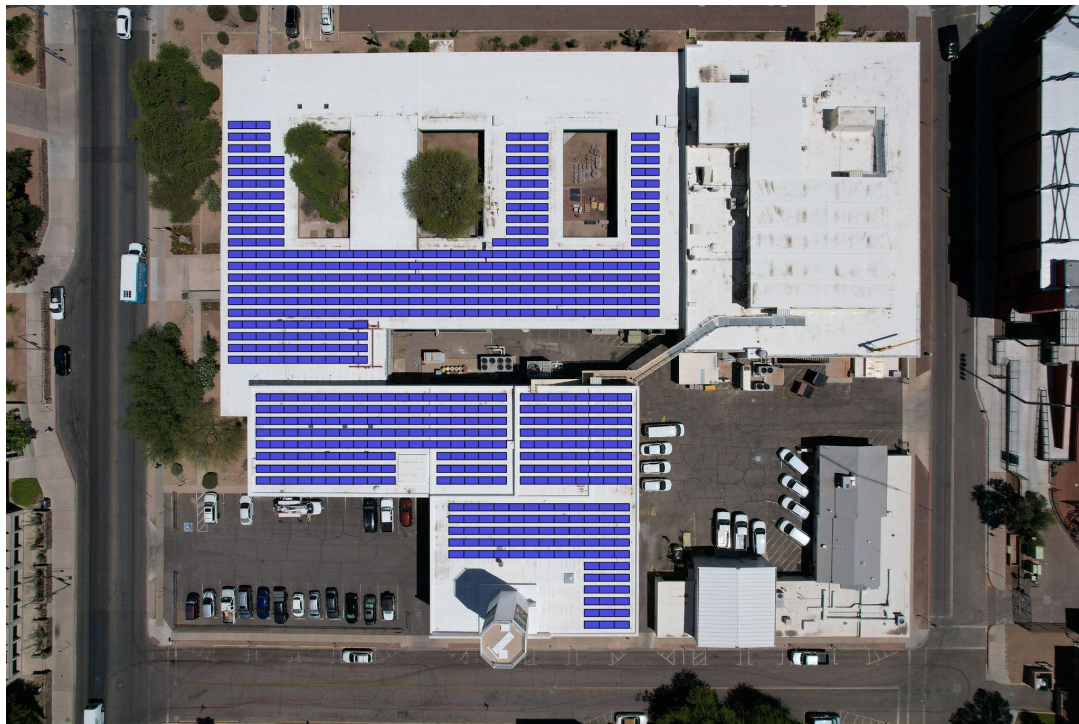
**Matthew
Holman**



**Michael
Wood-Vasey**

- Rubin and its operating partners, SLAC and NOIRLab are committed to an operations footprint that is ultimately sustainable.
- Stanford Research Computing Facility 2, host of the Rubin USDF, is being built to have very high energy efficiency: SRCF holds a 100/100 Energy Star score
- NOIRLab Rubin base and mountain facilities are implementing expanded photovoltaic (PV) power generation following Gemini lead. Current plan: 8300 tons CO2 equivalent in 2019 reduced to 6300 in 2027.
- Rubin and NOIRLab reducing staff travel by 50% in 2023-2027 (part of our five year proposal, reduces footprint, helps fund PV effort).
- Looking at other energy saving enhancements, particularly in Tucson facility.
- Further discussions with NSF and DOE about making Rubin Pachón facility carbon neutral. A proposal to make Gemini South telescope facility carbon neutral has been submitted to NSF.

- Layout of 222 kW PV system in Tucson NOIRLab building which hosts Rubin Observatory.
- Funding requested in 5-year renewal proposal.



Evolution of the PCW

- We expect the PCW to evolve into a more science based meeting as data begin to flow in the next few years.
- PCW 2023 and 2024 could be “transition” meetings as the project completes.
- We’d like to hear from you about how to make the transition most effective, including thoughts on:
 - Alternating virtual and f2f/hybrid meetings (sustainability and inclusion)?
 - Timing during the year (prior queries have come back with August preferred)?
 - Location? How to think about the annual meeting in relation to LSST@Asia and LSST@Europe
 - Meeting format and content. How to retain observatory aspects (some at the annual meeting, plus focused work at a separate meeting?)
- An exit survey from this PCW will seek your input on these questions!

New Rubin Operations Staff 2022-2023

- We have hired new scientists at SLAC and NOIRLab into the Community Engagement, In-kind Program Coordination, Night-time Operations and US Data Facility teams.
- Several hires onto Construction made in the last year with trajectory into Operations.
- 77 Folks starting role on OPS in 2022-2023.
- 29 New to Rubin+OPS.

New Rubin Operations Staff 2022-2023

RDO

- Margheim, Steve
- Ferté, Agnès

ROO

- Fagrelus, Parker
- Liang, Shuang
- Kang, Yijung

RDP

- Villareal, Sierra
- Guo, Yuyi
- Hernandez, Fabio
- Jammes, Fabrice
- Elles, Sabine
- Mainetti, Gabriele
- Eiger, Orion
- Veraldi, Riccardo
- Jen Adelman-McCarthy
- Le Boulc'h, Quentin
- Guan, Wen
- Yang, Zhaoyu
- Hernandez, Fabio
- Karavakis, Eddie
- Ferté, Agnès

RPF

- Gangler, Emmanuel
- Banovetz, John
- Williams, Christina
- Lau, Ryan
- Choi, Yumi
- Greenstreet, Sarah
- Fonseca Alvarez, Gloria
- Nord, Brian
- Jarugula, Sreevani
- Lintott, Chris

New Rubin Operations Staff 2022-2023



Brian Nord



Chris Lintott



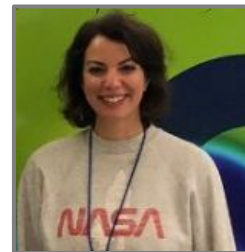
**Gabriele
Mainetti**



Tina Adair



**Gloria Fonseca
Alvarez**



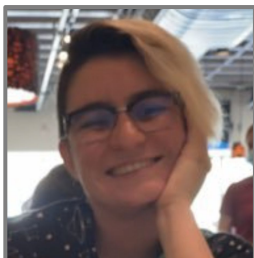
Agnès Ferté



Yijung Kang



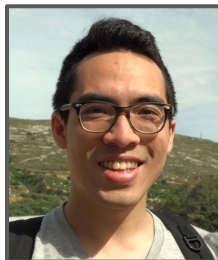
**Sreevani
Jarugula**



Orion Eiger



Shuang Liang



Ryan Lau



**Steve
Margheim**

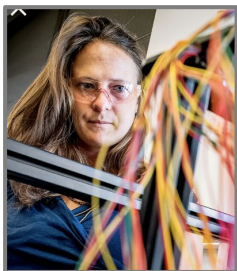


**Christina
Williams**



**Sarah
Greenstreet**

New Rubin Operations Staff 2022-2023



**Parker
Fagrelius**



**Sierra
Villareal**



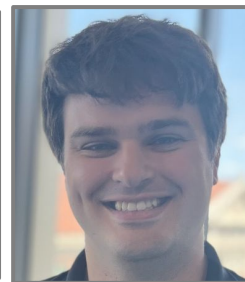
Yuyi Guo



**Eddie
Karavakis**



**Manu
Gangler**



**John
Banovetz**



**Fabrice
Jammes**



Yumi Choi



Wen Guan



**Riccardo
Veraldi**



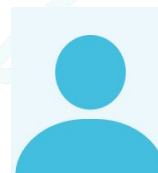
**Jen
Adelman-
McCarthy**



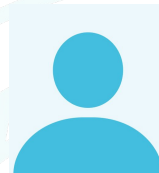
**Quentin
Le Boulc'h**



**Fabio
Hernandez**



**Zhaoyu
Yang**



**Sabine
Elles**

Job Opportunities with Rubin Operations

- Community Engagement Team Documentation Scientist, NOIRLab
- Rubin Observatory/LSST Computational Physics Developer, SLAC (Fermilab)
- Rubin Observatory/LSST Cosmological Survey - Applications Physicist I, SLAC (Fermilab)
- Rubin Software Developer, SLAC

Related Sessions

- Monday 9am Ballroom. [Science Advisory Committee](#) (Strauss)
- Tuesday 11am Tortalita B. [Equity and Inclusion Workshop](#) (Shugart)
- Tuesday 130pm Tortalita A. [MMA with Rubin Observatory](#) (Bellm, Margutti)
- Tuesday 330pm Tortalita A. [Early Science](#) (Guy, Blum)
- Tuesday 330pm Tortalita B. [Safety and Env in Commissioning and Ops](#) (Corvetto)
- Wednesday 9am Ballroom. [Science Collaborations Plenary](#) (Clarkson)
- Wednesday 11am Tortalita A. [Survey Strategy I](#) (Jones)
- Wednesday 130pm Tortolita A. [Follow-up Facilities for Time Domain Astronomy](#) (Corsi, Street, Sobek)
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Summary

- Great progress in 2022
- Activities concentrate on plan development and operations readiness
- Team is expanding
- Building for Operations on inclusive and sustainable future