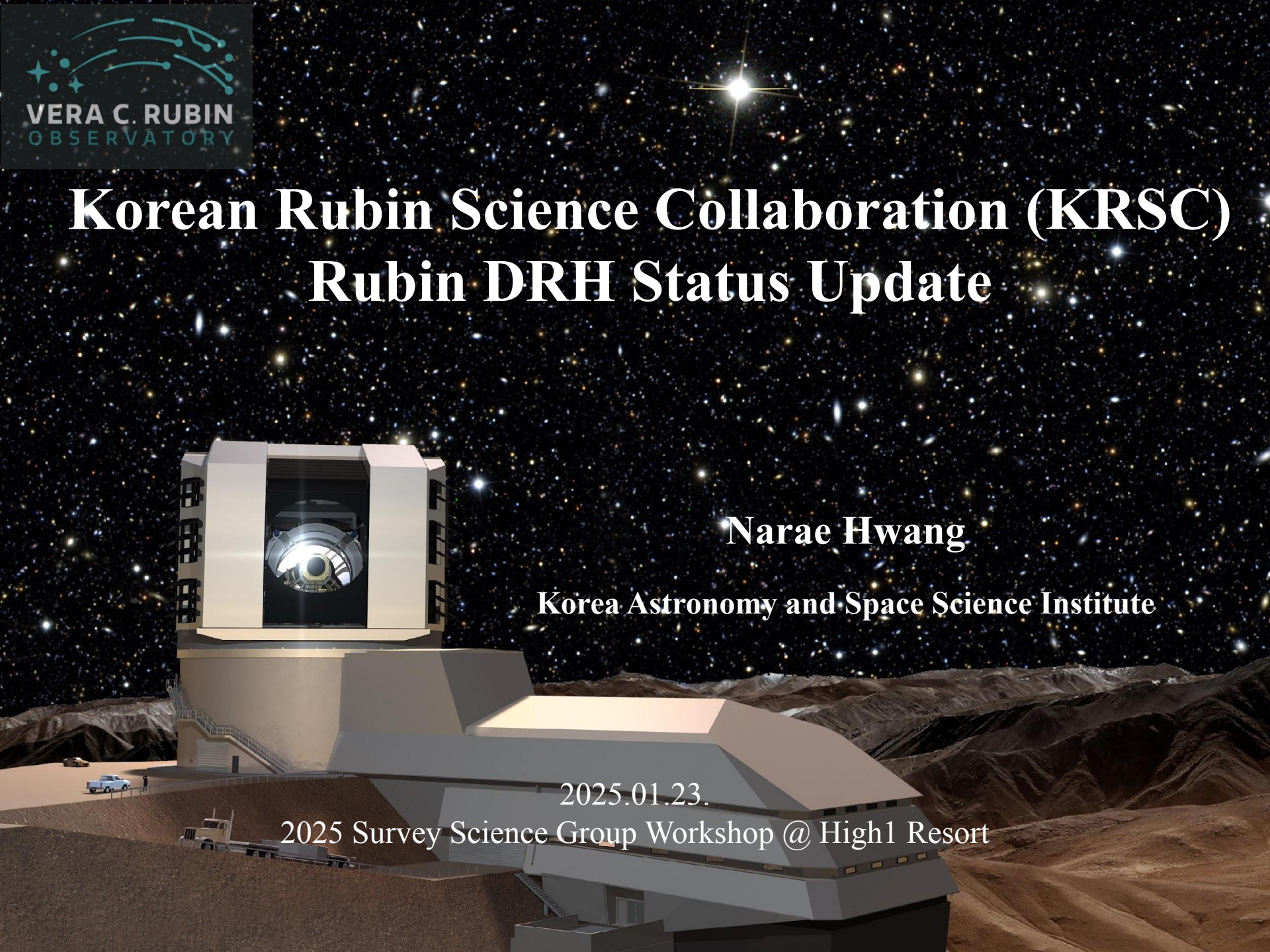
Korean Rubin Science Collaboration (KRSC)
Rubin DRH Status Update



Narae Hwang

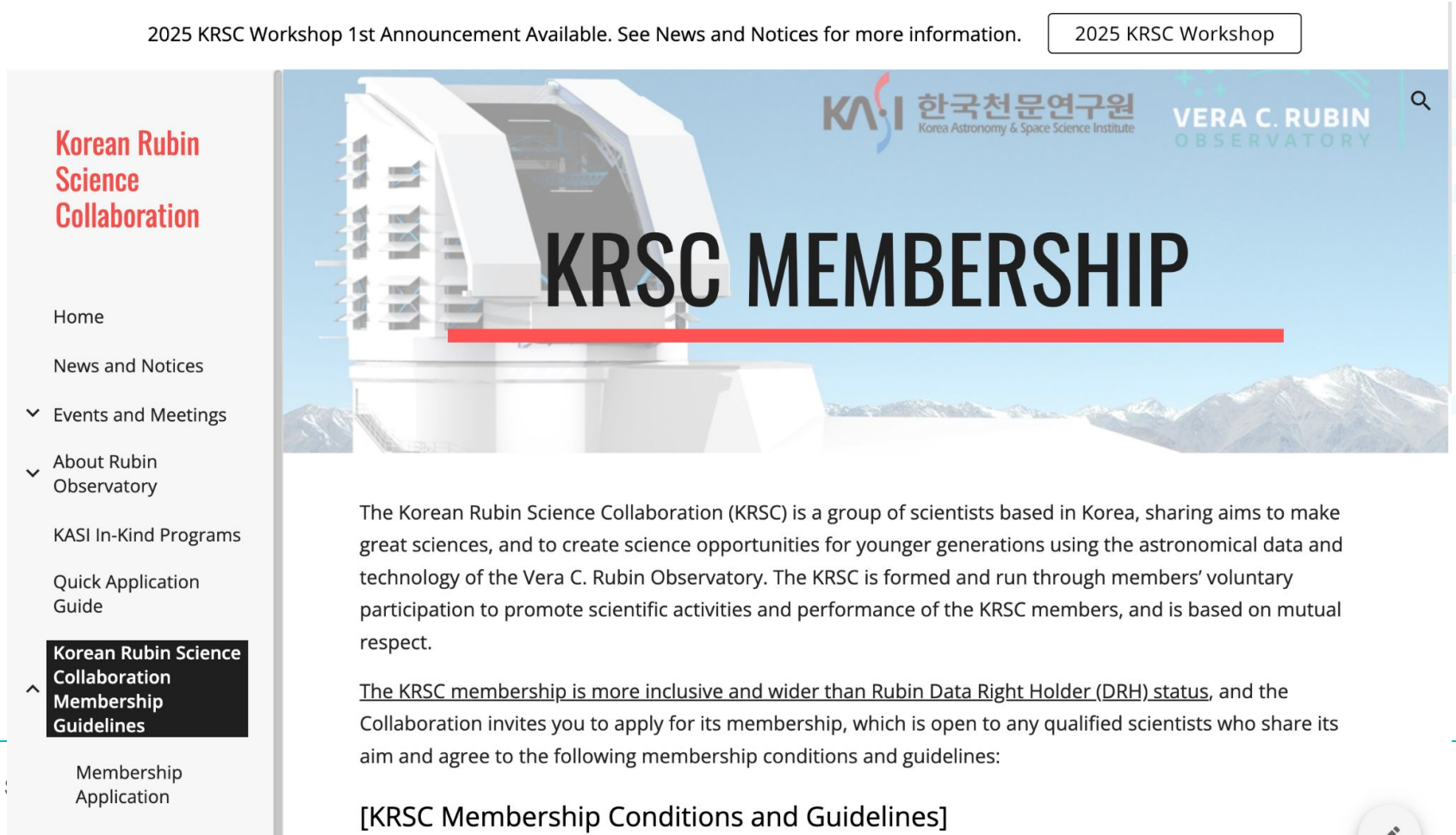
Korea Astronomy and Space Science Institute

2025.01.23.

2025 Survey Science Group Workshop @ High1 Resort

Korean Rubin Science Collaboration

- Please visit KRSC web: https://sites.google.com/view/koreanrubinscience/home
- Welcome to join KRSC



Rubin/LSST back in 2016

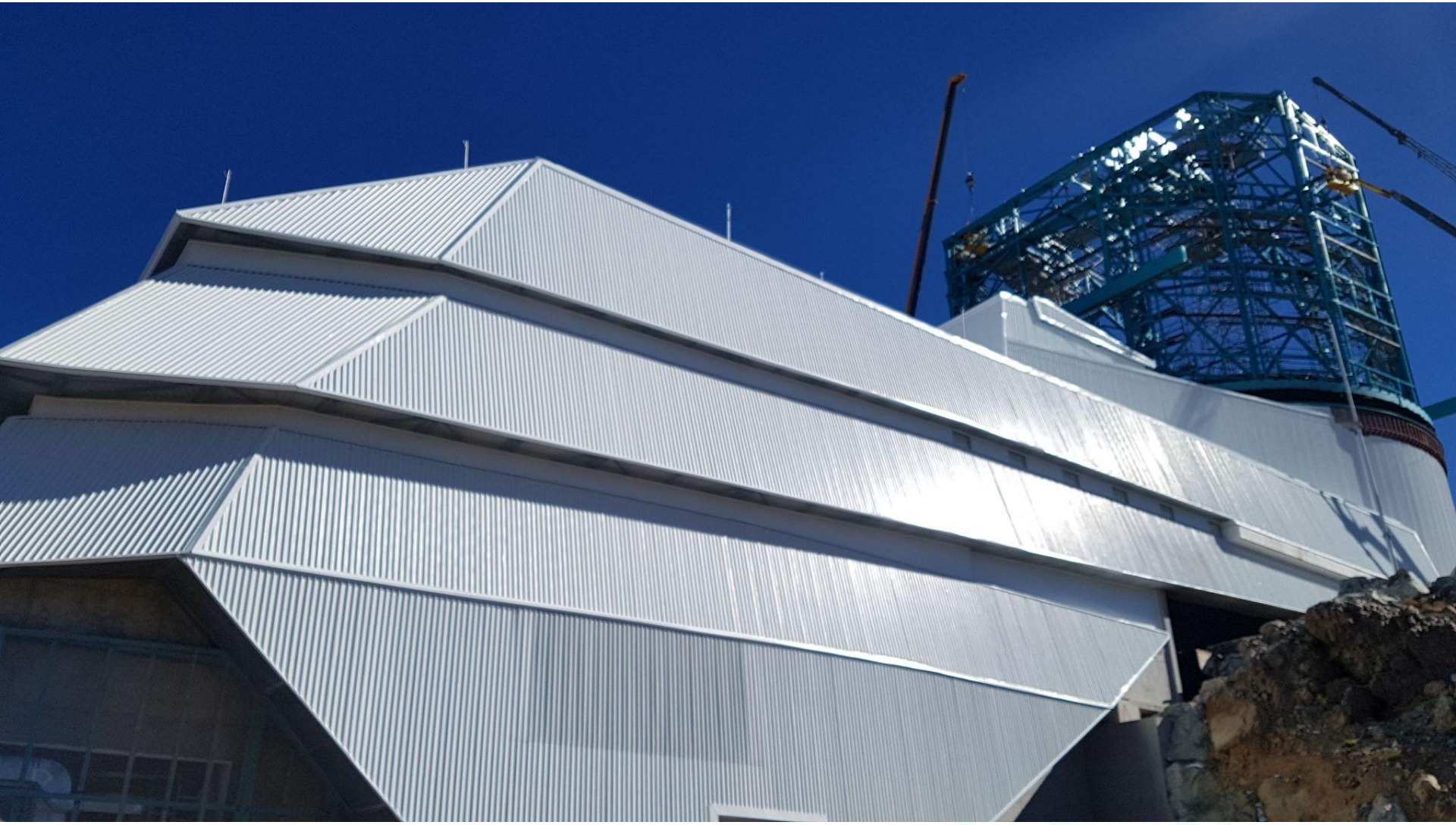


Rubin/LSST back in 201

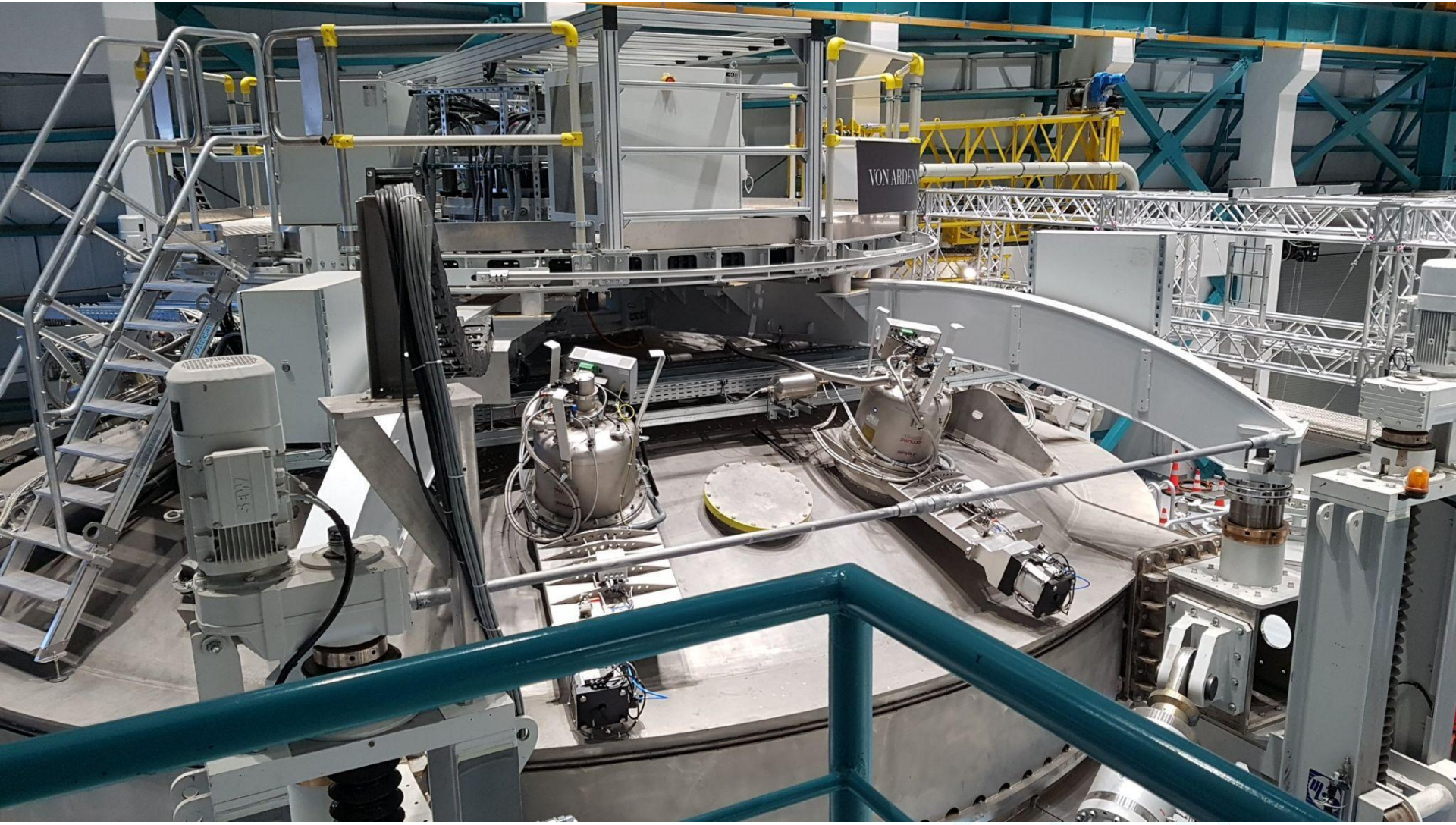




Rubin/LSST back in 2019



Rubin/LSST back in 2019

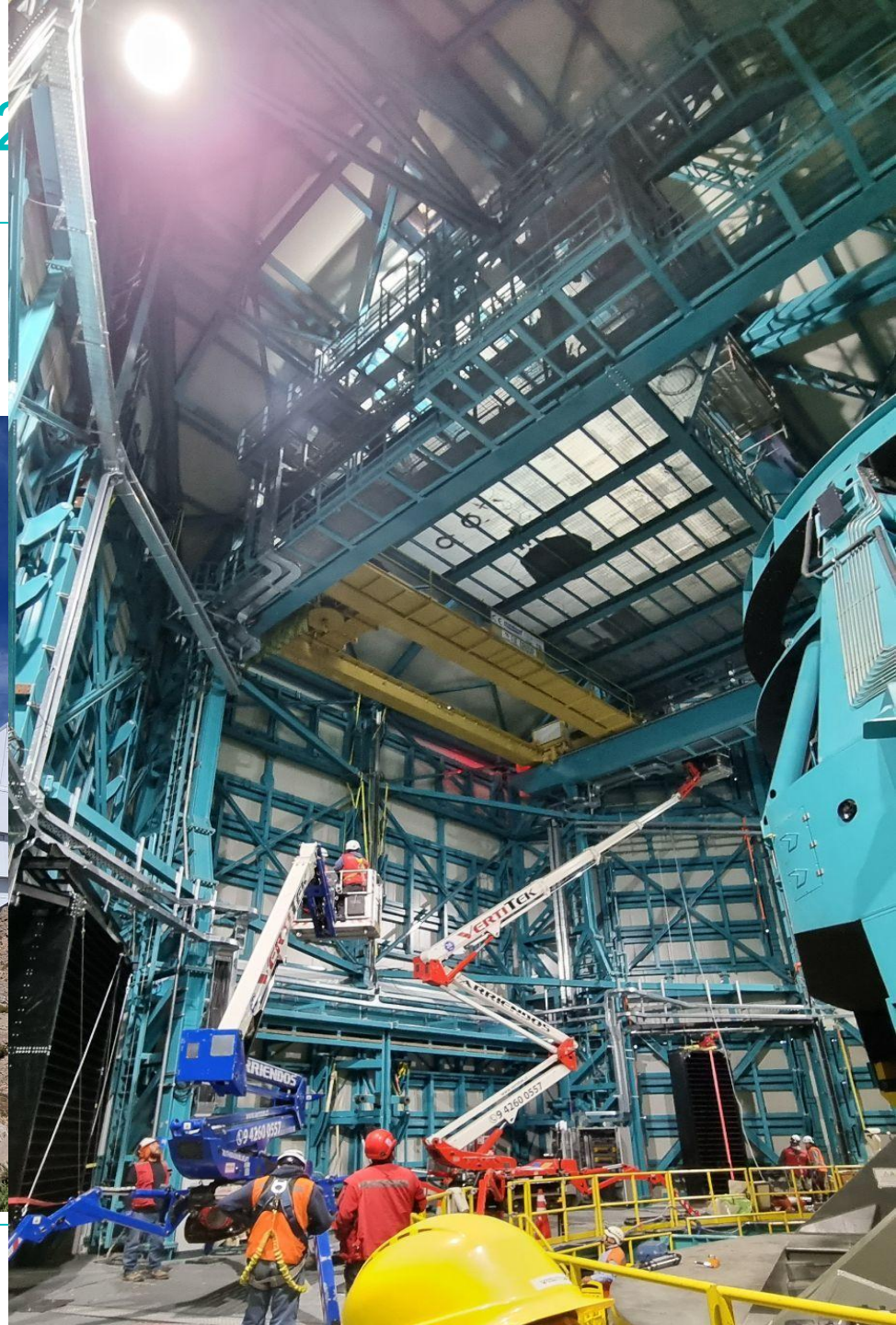


Rubin/LSST in 2022



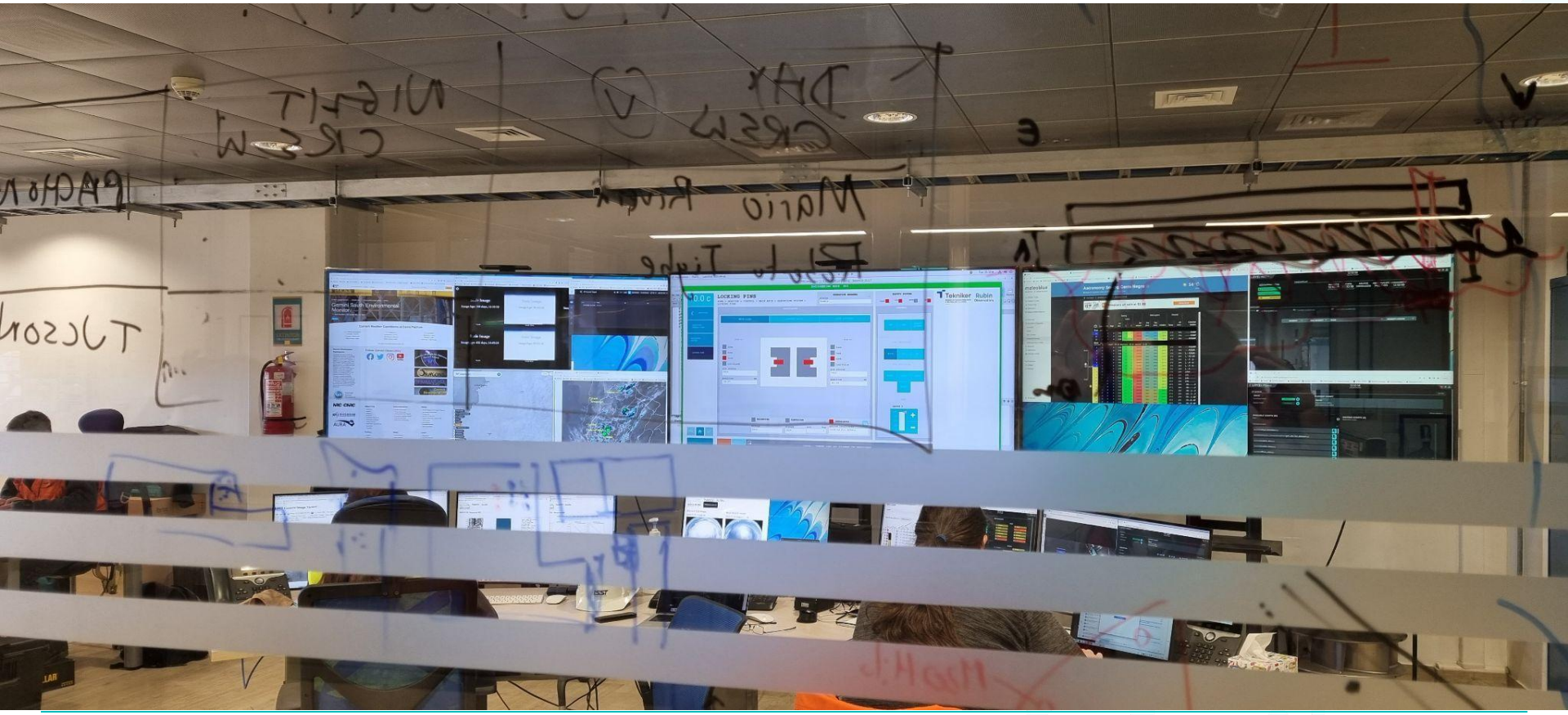
Rubin/LSST in 2022





Rubin/LSST in 2022

- control room

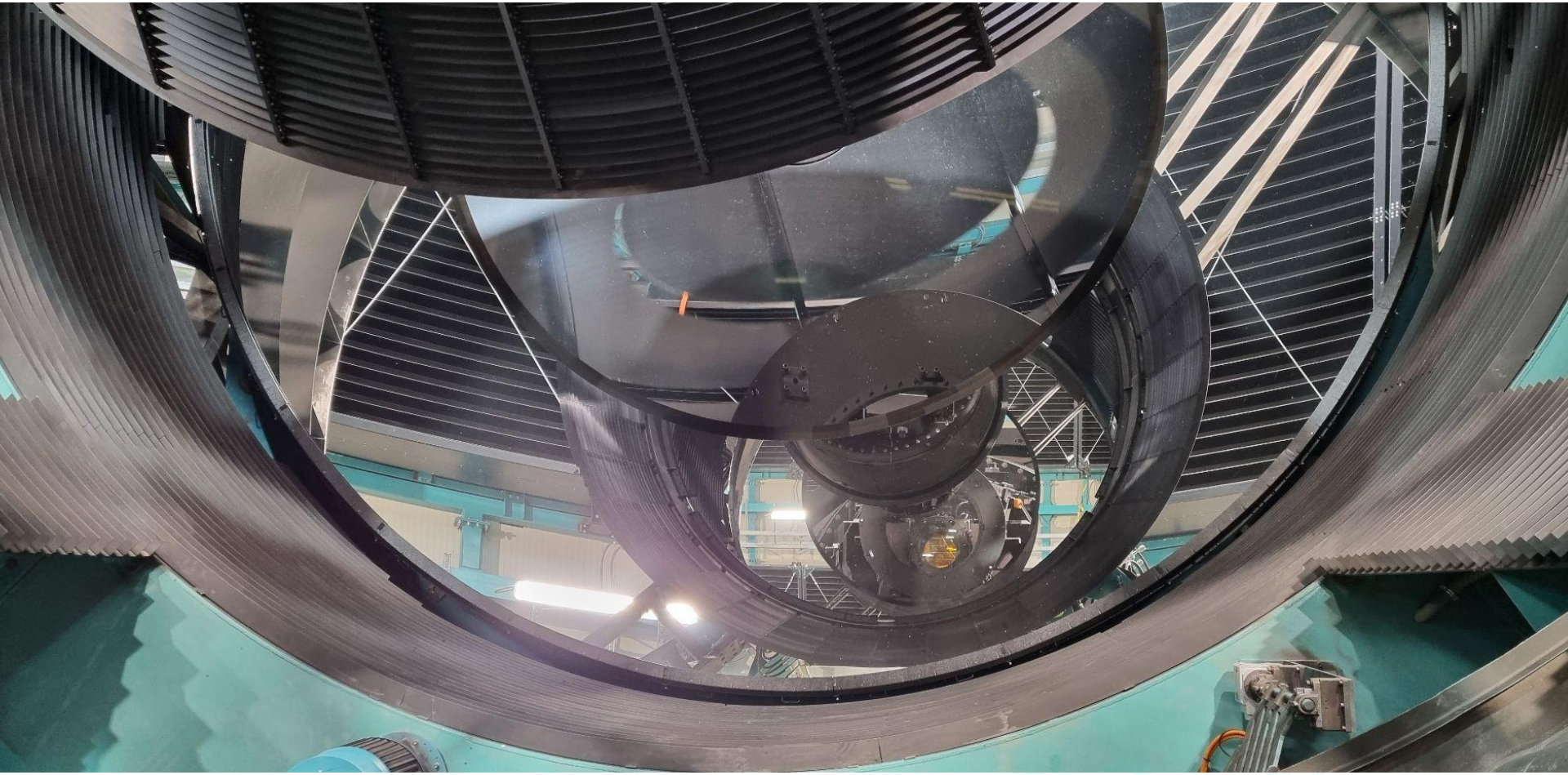


Rubin/LSST in Dec 2024



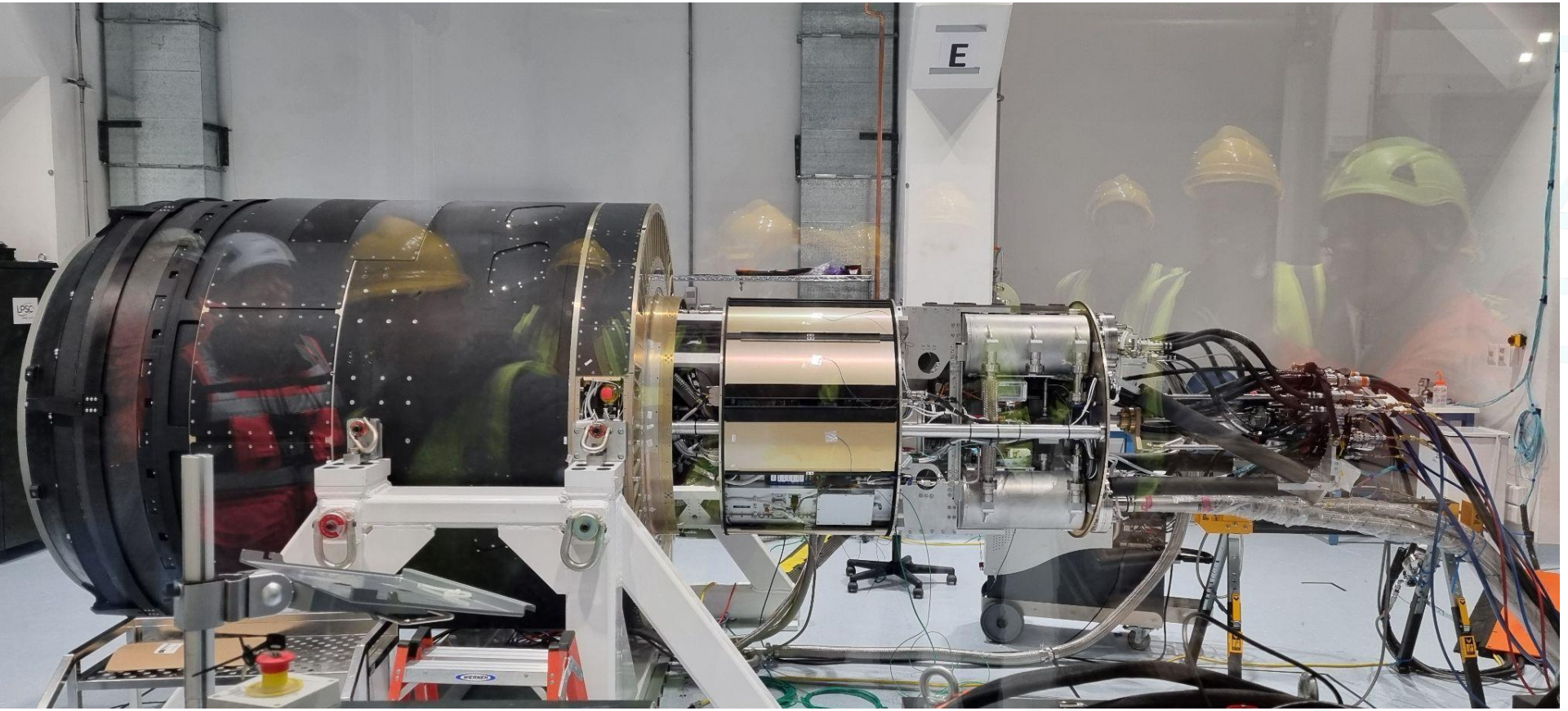
Rubin/LSST in Dec 2024

- Telescope/Mirror w/ComCam installed



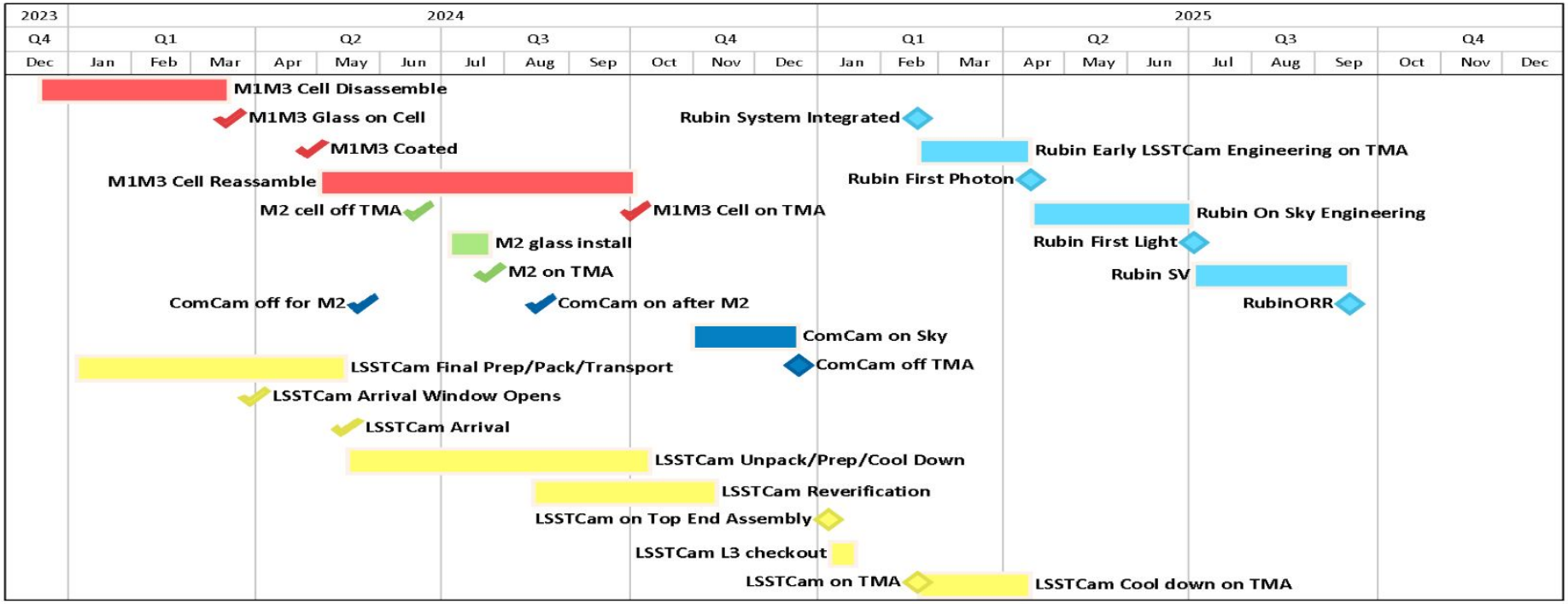
Rubin/LSST in Dec 2024

- LSSTCam in the summit clean room
- LSSTCam is scheduled to on telescope in Mar 2025



Rubin LSST Project Schedule

Rubin Key Activities October 2024



Rubin Project Major Milestones

19-Aug-2024	ComCam Installed on TMA	**Completed**
04-Oct-2024	M1M3 Glass on TMA	12-Nov-2024
01-Nov-2024	ComCam First Photon	12-Nov-2024
13-Nov-2024	LSSTCam Reverification End	19-Nov-2024
16-Dec-2024	ComCam off Sky	16-Dec-2024
23-Dec-2024	ComCam off TMA	23-Dec-2024
06-Jan-2025	LSSTCam on Top End Assembly	06-Jan-2025
20-Jan-2025	LSSTCam L3 Checkout Done	20-Jan-2025
19-Feb-2025	LSSTCam on TMA	04-Feb-2025
26-Feb-2025	TMA Aligned	11-Feb-2025
15-Apr-2025	Rubin First Photon	31-Mar-2025
01-May-2025	TMA Pointing Models Complete	16-Apr-2025
29-May-2025	TMA AOS Ready	14-May-2025
04-Jul-2025	Rubin First Light	19-Jun-2025
15-Aug-2025	Rubin SV1 Start	13-Aug-2025
15-Aug-2025	Rubin SV2 Start	13-Aug-2025
11-Sep-2025	Rubin Eng Prep for OPS Start	09-Sep-2025
18-Sep-2025	Rubin Operations Readiness Review	16-Sep-2025

ComCam Image Press Release

- https://rubinobservatory.org/news/rubin-completes-comcam-tests

Testing, Testing! NSF–DOE Vera C. Rubin Observatory Completes Comprehensive System Tests With Flying Colors

January 14, 2025

NSF–DOE Vera C. Rubin Observatory has just successfully completed a series of full-system tests using an engineering test camera.

ComCam Image Press Release

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Testing, Tes
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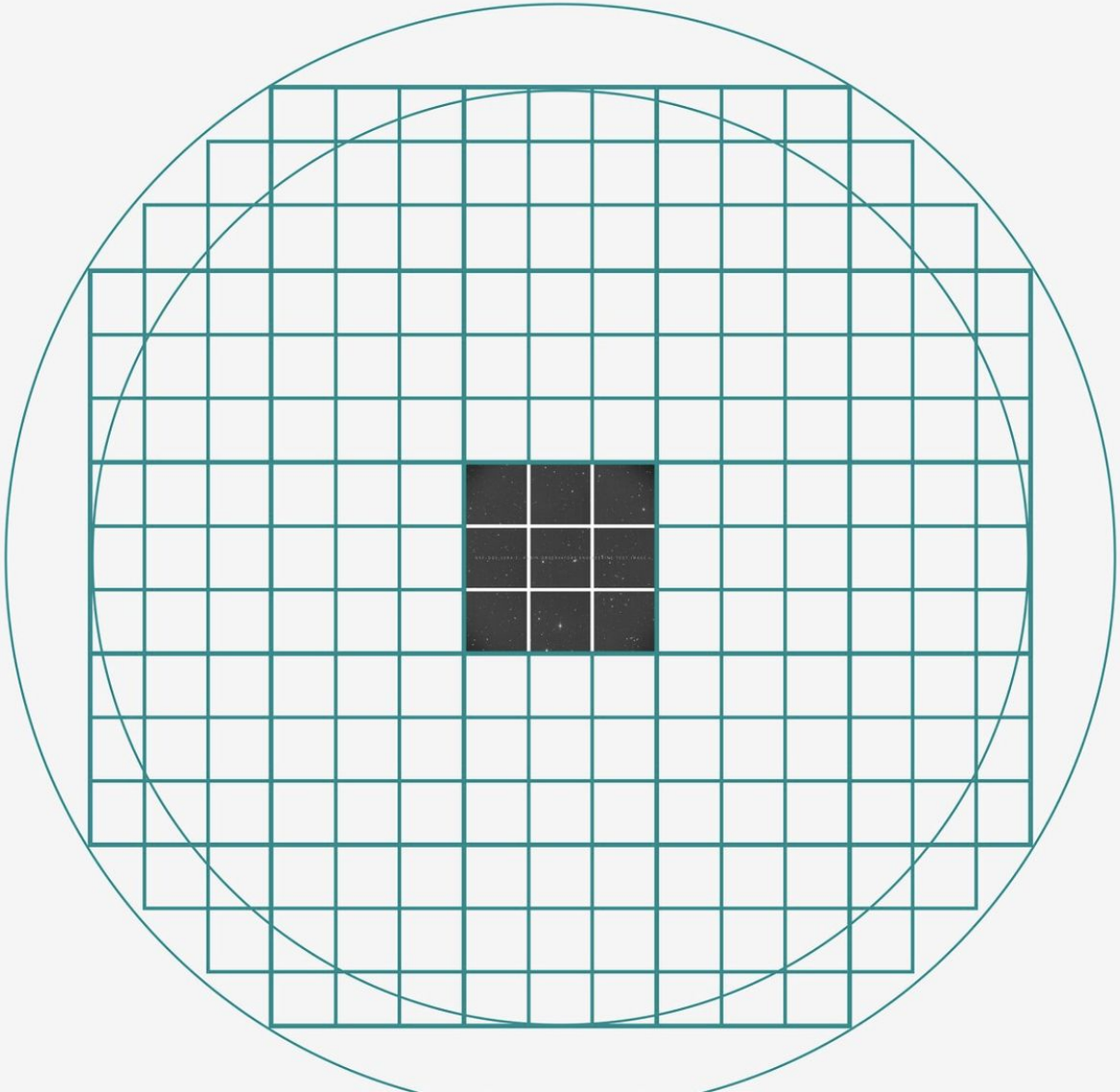
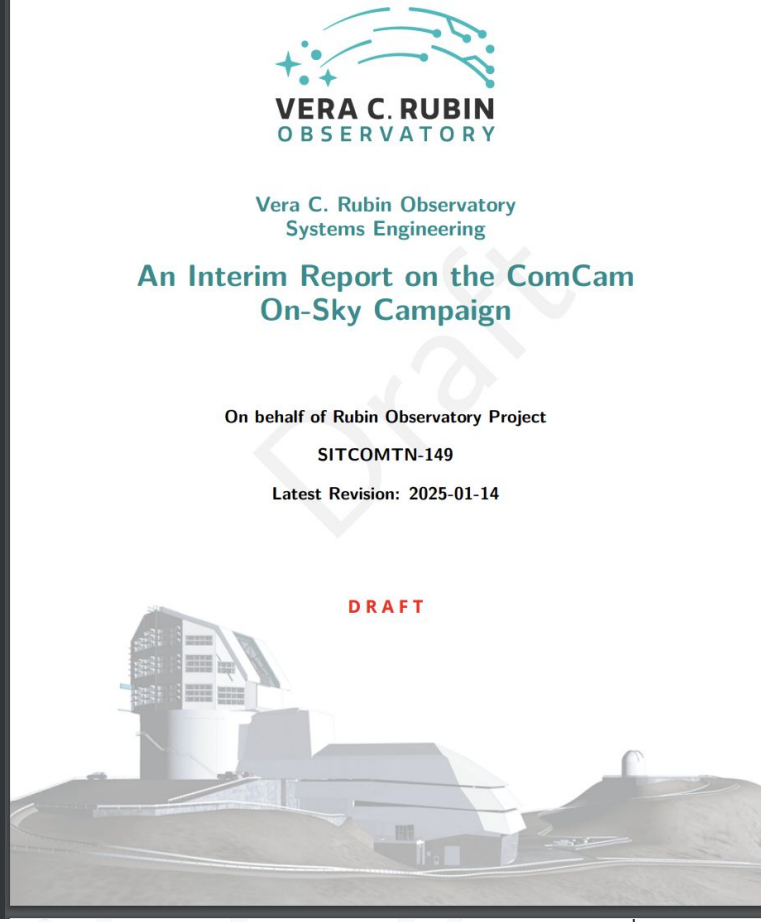



NSF-DOE VERA C. RUBIN OBSERVATORY ENGINEERING TEST IMAGE

Report on ComCam Campaign

- Interim Report on ComCam On-Sky Campaign
- https://sitcomtn-149.lsst.io/

- Introduction
- Executive Summary
- Observations
- System Performance Analysis
- Active Optics System and Image Quality
- Image Inspection
- Calibration Data and ISR
- Astrometry
- Static-Sky Photometry
- Low Surface Brightness Sources and Scattered Light
- The Variable Sky
- Survey Performance
- References
- Acronyms



ComCam Science Targets

- Extended Chandra Deep Field South (ECDFS)
  (ra, dec) = (53.13, -28.10)
- Euclid Deep Field South (EDFS)
  (ra, dec) = (59.10, -48.73)
- Low Ecliptic Latitude Field (Rubin SV 38 7)
  (ra, dec) = (37.86, 6.98)
- Low Galactic Latitude Field (Rubin SV 95 -25)
  (ra, dec) = (95.00, -25.00)
- 47 Tuc Globular Cluster (47 Tuc)
  (ra, dec) = (6.02, -72.08)
- Fornax Dwarf Spheroidal Galaxy (Fornax dSph)
  (ra, dec) = (40.00, -34.45)

- Data will be released as part of DP1 around July 2025

ComCam Data Release

Rubin Data Policy (RDO-013):

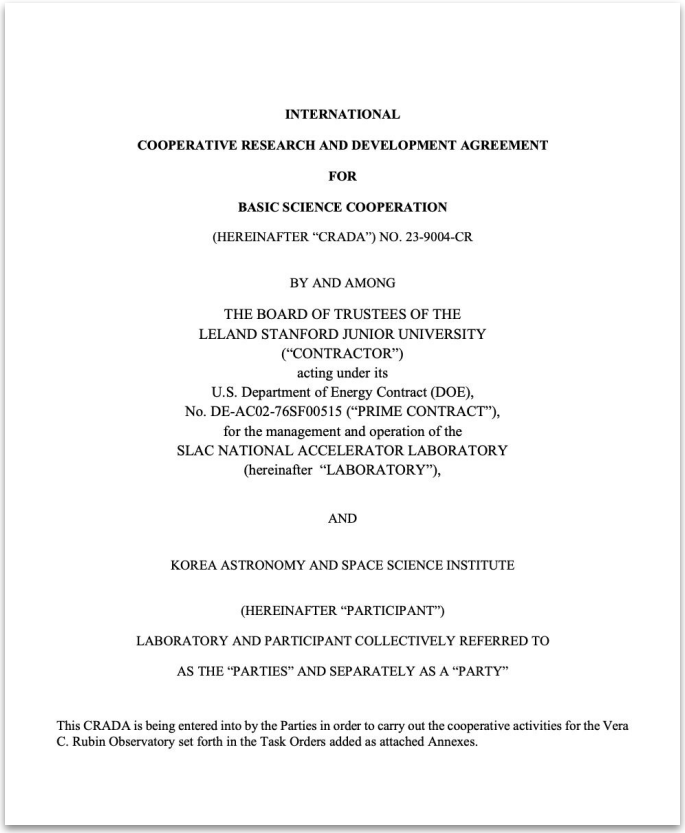
DPOL-516 Science Data from Commissioning: Scientific analysis of the commissioning data will be an integral and necessary part of the science verification process. All commissioning data used for science will be released to all LSST Users prior to any publication by anyone. Members of the Project team may not submit science papers to a journal and/or the arXiv based on commissioning data prior to the release of those data to LSST Users, but they may undergo the Rubin Observatory Publication Board process (this board is part of the construction project, not operations) in advance of the release of those data.

In current Early Science Program planning (RTN-011), a subset of ComCam **commissioning data would be released as Data Preview 1**. SITCOMTN-076 includes discussion of policies and guidelines for developing peer-reviewed journal publications, including the case of science papers with Project team members as authors.

DRH Agreement Status

Data Right Agreements (DRA) Signed!

- DRA between SLAC/DOE and KASI: signed on Nov. 4, 2024
- DRA between AURA/NSF and KASI: signed on Dec. 18, 2024



INTERNATIONAL

COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT

FOR

BASIC SCIENCE COOPERATION

(HEREINAFTER "CRADA") NO. 23-9004-CR

BY AND AMONG

THE BOARD OF TRUSTEES OF THE
LELAND STANFORD JUNIOR UNIVERSITY
("CONTRACTOR")
acting under its
U.S. Department of Energy Contract (DOE),
No. DE-AC02-76SF00515 ("PRIME CONTRACT"),
for the management and operation of the
SLAC NATIONAL ACCELERATOR LABORATORY
(hereinafter "LABORATORY"),

AND

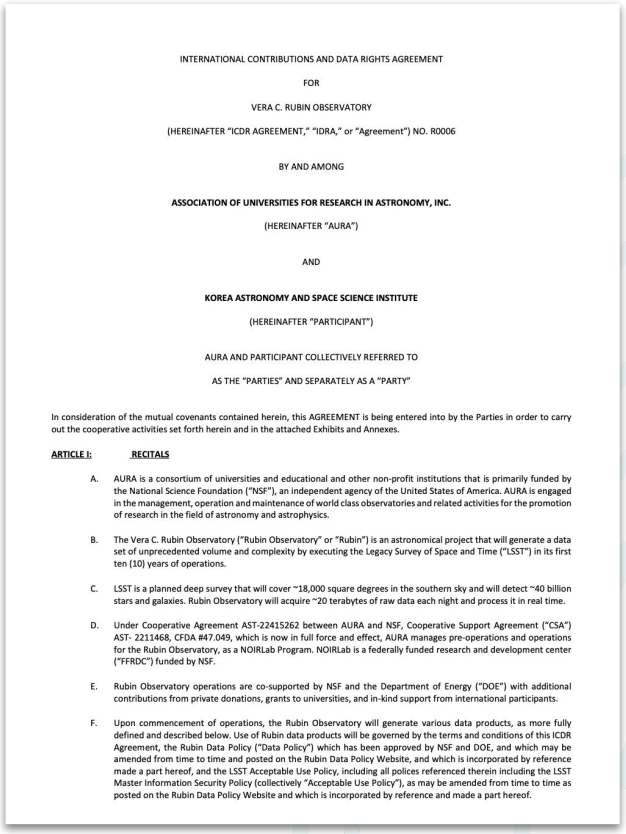
KOREA ASTRONOMY AND SPACE SCIENCE INSTITUTE

(HEREINAFTER "PARTICIPANT")

LABORATORY AND PARTICIPANT COLLECTIVELY REFERRED TO

AS THE "PARTIES" AND SEPARATELY AS A "PARTY"

This CRADA is being entered into by the Parties in order to carry out the cooperative activities for the Vera C. Rubin Observatory set forth in the Task Orders added as attached Annexes.



INTERNATIONAL CONTRIBUTIONS AND DATA RIGHTS AGREEMENT

FOR

VERA C. RUBIN OBSERVATORY

(HEREINAFTER "ICDR AGREEMENT," "IDRA," or "Agreement") NO. R0006

BY AND AMONG

ASSOCIATION OF UNIVERSITIES FOR RESEARCH IN ASTRONOMY, INC.

(HEREINAFTER "AURA")

AND

KOREA ASTRONOMY AND SPACE SCIENCE INSTITUTE

(HEREINAFTER "PARTICIPANT")

AURA AND PARTICIPANT COLLECTIVELY REFERRED TO

AS THE "PARTIES" AND SEPARATELY AS A "PARTY"

In consideration of the mutual covenants contained herein, this AGREEMENT is being entered into by the Parties in order to carry out the cooperative activities set forth herein and in the attached Exhibits and Annexes.

ARTICLE I: RECITALS

A. AURA is a consortium of universities and educational and other non-profit institutions that is primarily funded by the National Science Foundation ("NSF"), an independent agency of the United States of America. AURA is engaged in the management, operation and maintenance of world class observatories and related activities for the promotion of research in the field of astronomy and astrophysics.

B. The Vera C. Rubin Observatory ("Rubin Observatory" or "Rubin") is an astronomical project that will generate a data set of unprecedented volume and complexity by executing the Legacy Survey of Space and Time ("LSST") in its first ten (10) years of operations.

C. LSST is a planned deep survey that will cover ~18,000 square degrees in the southern sky and will detect ~40 billion stars and galaxies. Rubin Observatory will acquire ~20 terabytes of raw data each night and process it in real time.

D. Under Cooperative Agreement AST-22415262 between AURA and NSF, Cooperative Support Agreement ("CSA") AST- 2211468, CFDA #47.049, which is now in full force and effect, AURA manages pre-operations and operations for the Rubin Observatory, as a NOIRLab Program. NOIRLab is a federally funded research and development center ("FFRDC") funded by NSF.

E. Rubin Observatory operations are co-supported by NSF and the Department of Energy ("DOE") with additional contributions from private donations, grants to universities, and in-kind support from international participants.

F. Upon commencement of operations, the Rubin Observatory will generate various data products, as more fully defined and described below. Use of Rubin data products will be governed by the terms and conditions of this ICDR Agreement, the Rubin Data Policy ("Data Policy") which has been approved by NSF and DOE, and which may be amended from time to time and posted on the Rubin Data Policy Website, and which is incorporated by reference made a part hereof, and the LSST Acceptable Use Policy, including all polices referenced therein including the LSST Master Information Security Policy (collectively "Acceptable Use Policy"), as may be amended from time to time as posted on the Rubin Data Policy Website and which is incorporated by reference and made a part hereof.

Need to Know about DRA

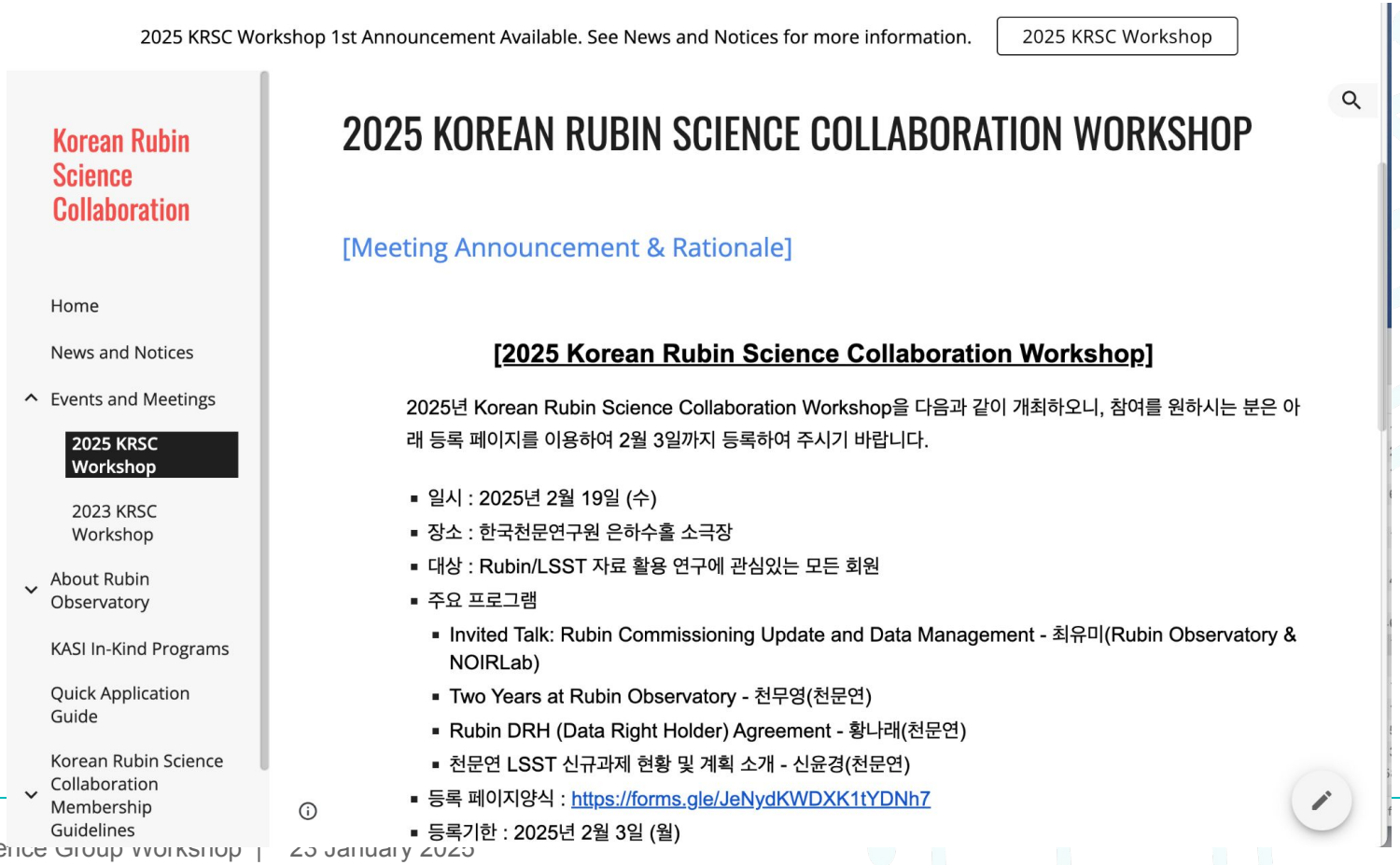
- KRSC community can support up to
  - **14 PI scientists (currently 14)**
  - **56 JA scientists (currently 41)**
-
- Term of Contract
  - **initial 15 years after signing + additional 2 years**
-
- DRH responsibility
  - **DRH scientists shall not share Rubin/LSST data with non-DRH scientists unless the data are made public.**
-

Need to Know about DRA

- Participant's responsibility
  - **<u>KASI shall have written agreement with KRSC DRH scientists</u>**
  - "Participant shall be solely responsible and liable for any and all actions taken by any DRH or any individual with Data Rights by or on behalf of or through Participant under this Agreement in accordance with Participant's in-kind contribution as if Participant had taken such action itself"
  - "Participant shall ensure that only those individuals who qualify as DRHs or who otherwise have Data Rights pursuant to the valuation of Participant's in-kind contribution as set forth in and under this Agreement acknowledge have access to Proprietary LSST Data and shall further ensure that such individuals agree in writing that (1) they know of the existence and terms of this Agreement; and (2) are bound by the same obligations as are set forth in this Agreement."
-
- Failure to meet up the the responsibility
  - **Participants: size of DRH pool can be reduced**
  - **each DRH scientist: loss of DRH status**

More to Learn at 2025 KRSC Workshop

Registration is open to Feb 3. Hope to See You All at KASI!
Web:
https://sites.google.com/view/koreanrubinscience/events-and-meetings/2025-krsc-workshop



What to expect in 2025

- KASI-NOIRLab Fellow for Rubin Observing Specialist
  - 2nd Fellow after KASI-KIPAC Fellow
  - plan to start recruit in late 2025

Welcome to Minhee Hyun

Position (*SLAC Postdoc, 80% Observing Specialist / 20% Science*)**:**

- Currently at SLAC for a brief training period
- Relocating to La Serena on December 2nd

Experience and background:

- B.S. & MA-PhD in Astronomy
- Postdoctoral Researcher in the Korea Astronomy and Space Science Institute (2021.9-2024.9)
- Hubble Cycle 31/32 Time Allocation Committee - Extragalactic External panelist
- Various Observational Experiences
  - Gemini S/N, Magellan, JCMT, McDonald Otto Struve 2.1 m Telesc
    Maidanak 1.5 m Telescope, UKIRT
  - MMT, Subaru HSC, CHFT
- Research Interests : Galaxy evolution, Galaxy Cluster, LSSs

What to expect in 2025

- 2025 JA Application To be Announced in July 2025 (TBC)
- Be prepared for full PI/JA Application in 2026

2024 JA Application Announcement

2024/09/02

Dear KRSC Friends,

The Rubin Observatory is expected to start commissioning in 2025, and we expect many early science data and related events that would be only accessible to Rubin DRH scientists in the coming months.
The Korean Rubin Science Collaboration (KRSC) is happy to invite applications for Rubin JA DRH status.
The KRSC has **currently 49 (subject to change) Rubin DRH scientists (14 PI and 35 JA)**, based on the generous support from Korea Astronomy and Space Science Institute (KASI), and expects to be able to accommodate **up to about 20 (TBC) more JA scientists**. The KRSC encourages all early career scientists to apply and get chances to do sciences with Rubin early commissioning data.

KRSC Management Team

What to expect in 2025+

- KASI on-site scientist position will be available for Rubin Operation Participation
  - Science Data handling capability with Jupyter, Python, etc (or RSP)

- Rubin has a plan to host visiting scientists in La Serena, Chile
  - (for example) 3-6 months stay at Recinto
  - Rubin RDH scientist only
  - a limited local support may be available

Rubin/LSST Schedule

- ~~First on-sky photon w/ ComCam – 2024 July~~
- ~~LSSTCam installation on TMA – 2024 Oct~~
- ~~LSSTCam first on-sky photon – 2024 Dec~~
- ~~Rubin system first light w/ LSSTCam – 2025 Jan~~
- LSST start – late 2025
- Data Preview 1 (small example dataset) – early 2025
- Data Preview 2 (science-quality data from commissioning)– late 25/early 26
- Data Release 1 – about 1 year after LSST start (late 26)

More at 2025 KRSC Workshop

Registration is open to Feb 3. Hope to See You All at KASI!
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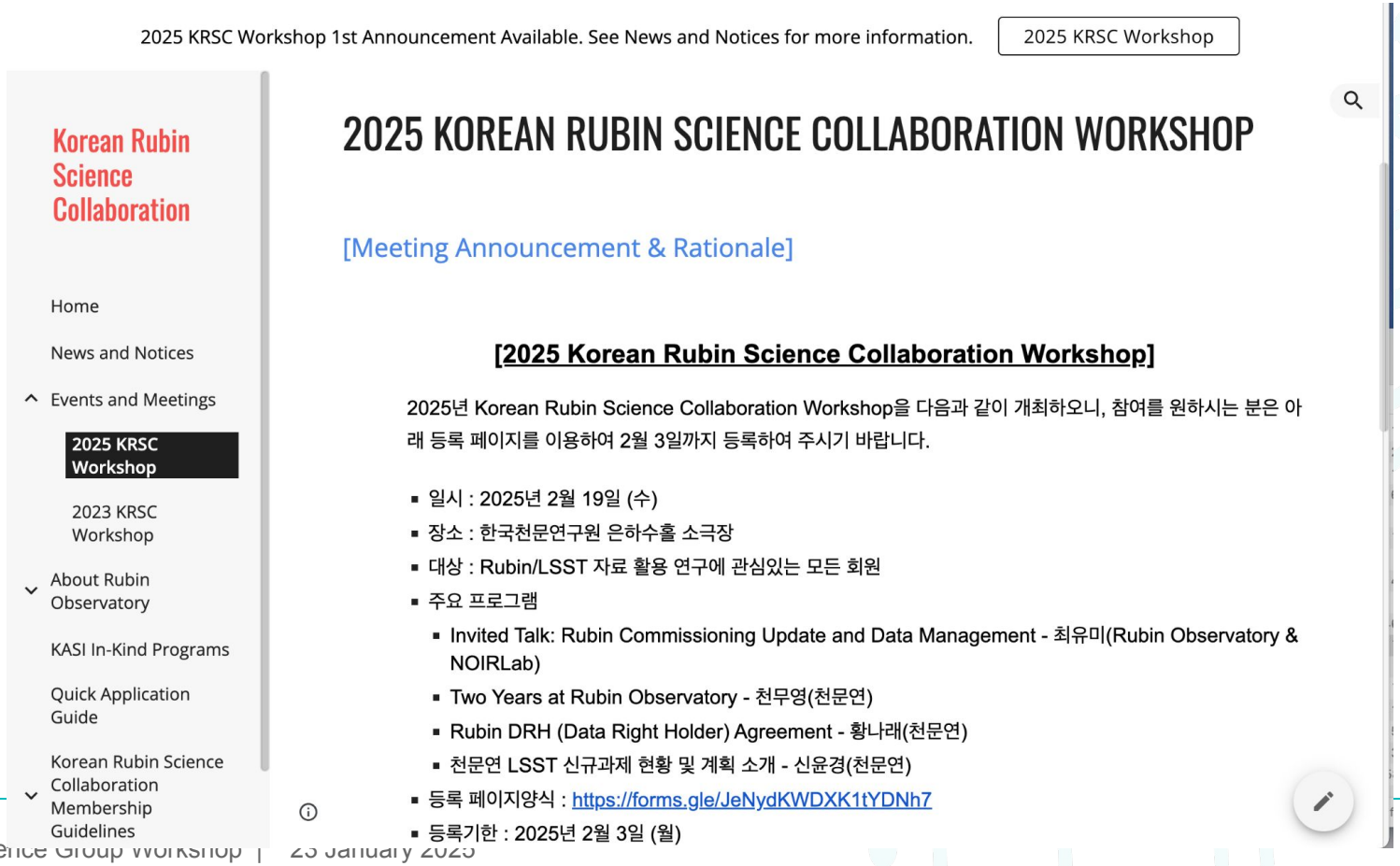
https://sites.google.com/view/koreanrubinscience/events-and-meetings/2025-krsc-workshop



Thank you!