



NANCY GRACE R.OMAN

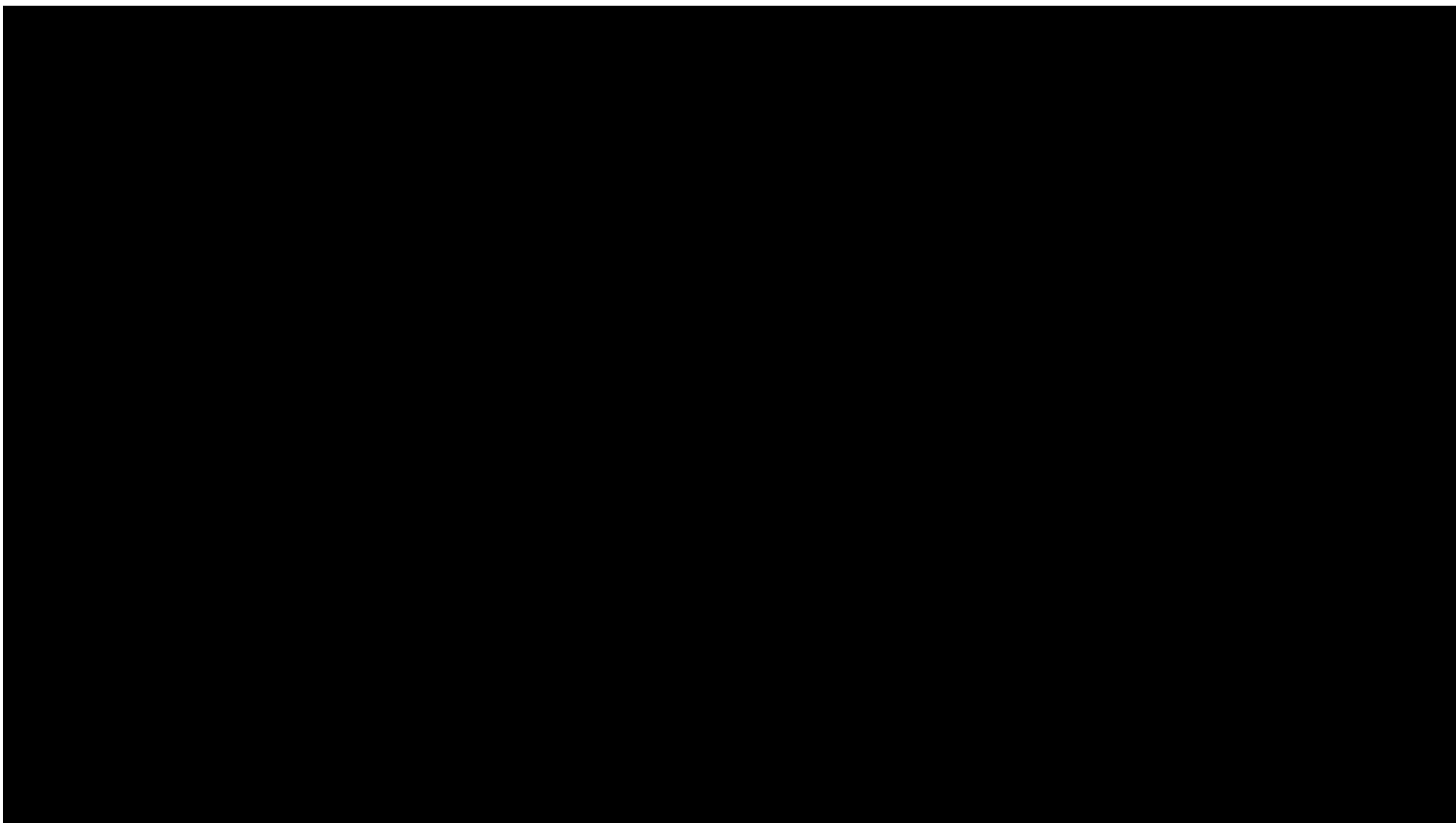


SPACE TELESCOPE



Mission Status

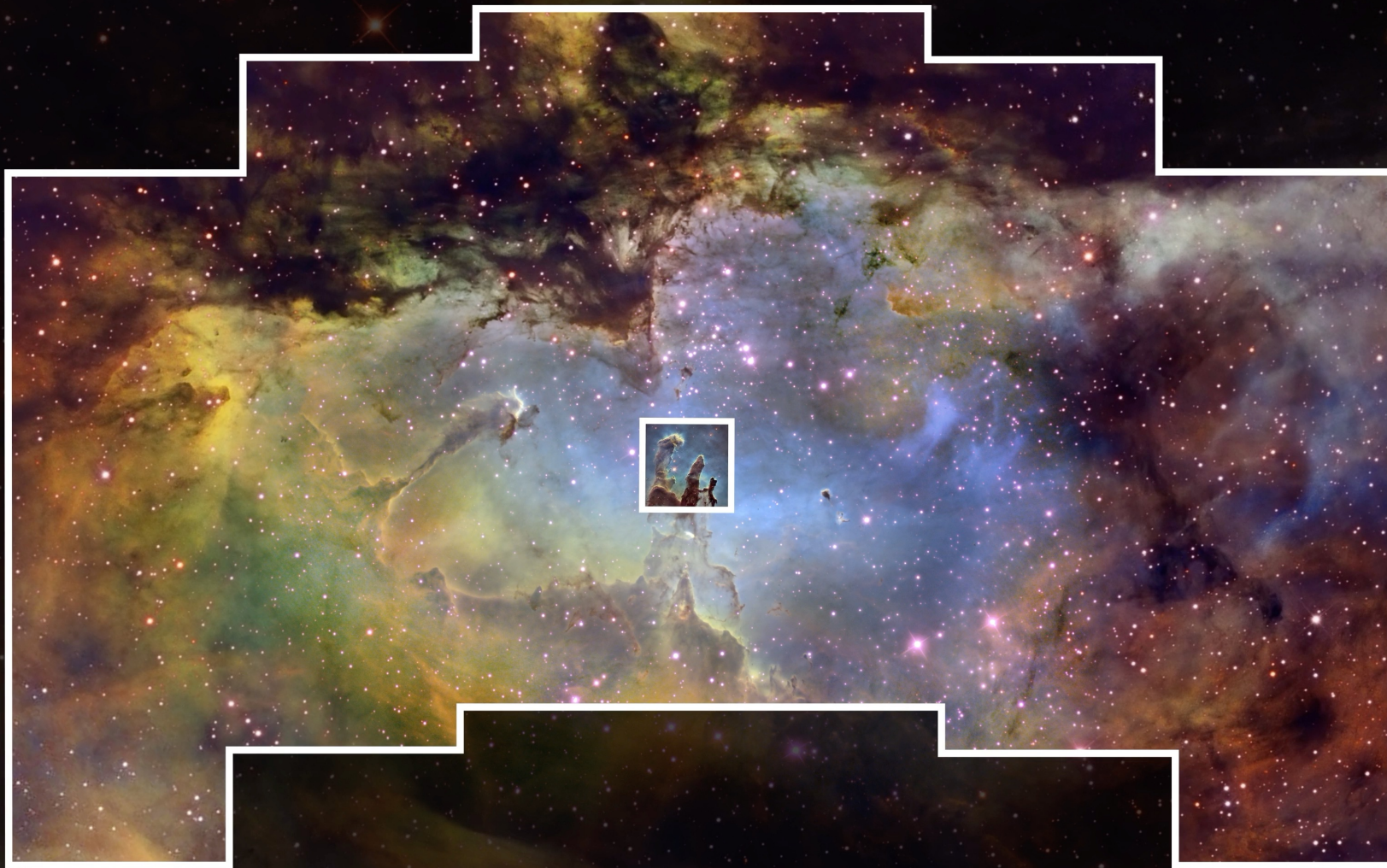
NASA GODDARD SPACE FLIGHT CENTER • JET PROPULSION LABORATORY • L3HARRIS TECHNOLOGIES • BAE SYSTEMS • TELEDYNE • NASA KENNEDY SPACE CENTER • SPACE TELESCOPE SCIENCE INSTITUTE • IPAC
EUROPEAN SPACE AGENCY • JAPAN AEROSPACE EXPLORATION AGENCY • LABORATOIRE D'ASTROPHYSIQUE DE MARSEILLE • CENTRE NATIONAL D'ÉTUDES SPATIALES • MAX PLANCK INSTITUTE FOR ASTRONOMY



Roman Status

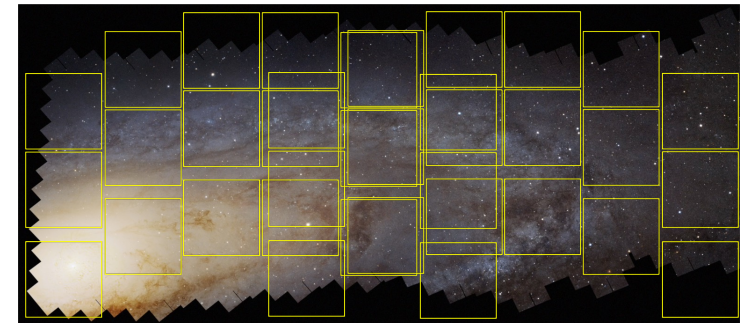
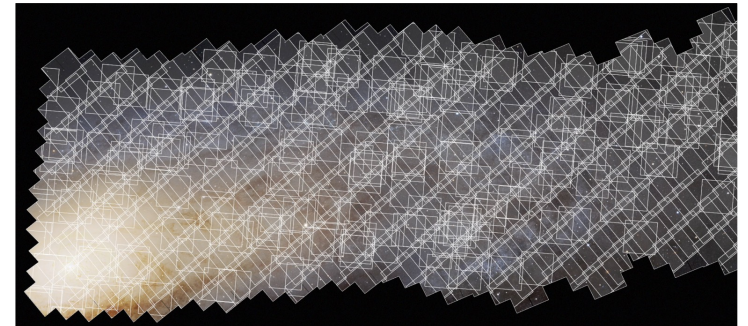
- **Roman Observatory is complete!**
 - Meets or exceeds all science requirements!
 - e.g. pixel operability is >99% (c.f. requirement of >95%), wave front stability much better than requirements and more
- **Flight Operations Review/Operations Readiness Review last week**
 - Final lifecycle review (not the final review!)
 - KDP-E mid-Aug
- **Launch Readiness date: Aug 30**
 - 9 months ahead of schedule!
- **Next Steps:**
 - Launch





Roman as a Precise Survey Facility

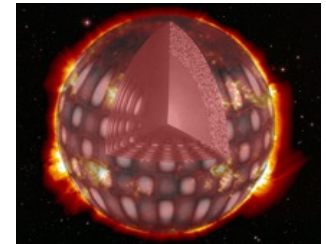
- The power of Roman is not *just* that it has a large field of view:
 - Very efficient observations
 - Rapid slew & settle
 - no Earth occultations
 - no South Atlantic Anomaly
 - Well understood and stable PSF
 - Jitter and wave front error requirements around factor of 100 tighter than JWST
 - Stable thermal environment (L2 orbit, thermal control of all parts of the optical system)
 - Rigid optical structure with vibration isolation from the spacecraft
 - Stable attitude control
 - State of the art detectors with low persistence and low noise, stable readout electronics
 - Excellent flux calibration
 - Relative calibration system



Roman's Core Community Surveys

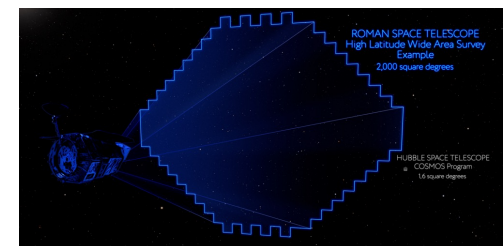
Three ambitious surveys of unprecedented scale to address key questions in Cosmology, Exoplanets and Astrophysics

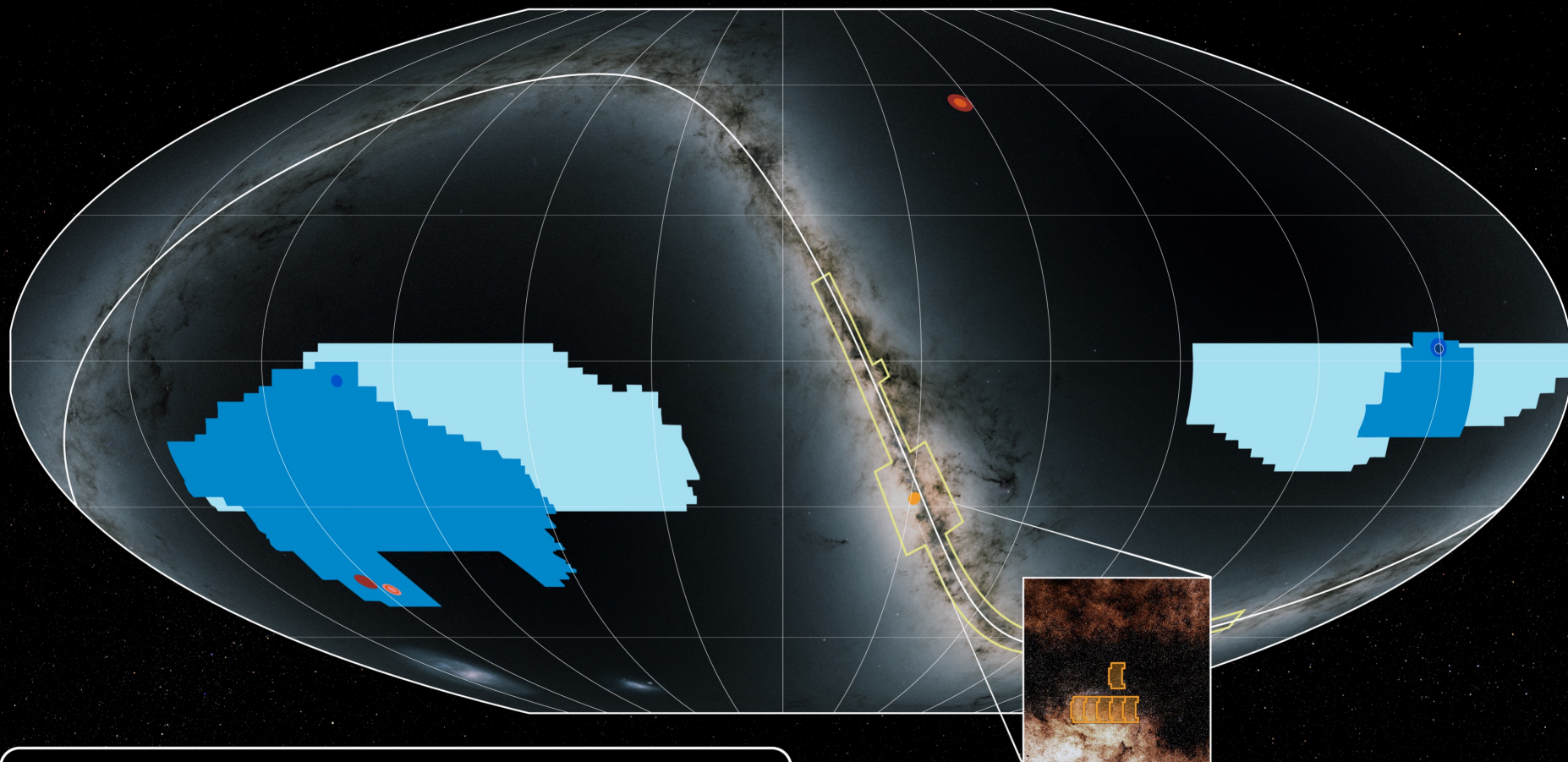
Galactic Bulge Time Domain Survey: Observe ~ 2 sq deg towards Galactic bulge every 12.5 mins. Monitor >200 million stars to discover exoplanets via the microlensing technique. Exoplanet discovery machine ($\sim 100,000$), black hole finder, groundbreaking stellar studies and more



High Latitude Time Domain Survey: Observe ~ 20 sq deg every ~ 5 days. Monitor $>100,000$ galaxies to detect supernovae (and use these to map expansion history of universe). Will also find tidal disruption events, merging neutron stars, gamma-ray burst afterglows, outbursts from active galaxies and much more

High Latitude Wide Area Survey: ~ 5000 sq deg to measure shape of >100 million galaxies in multiple colors. Precise (spectroscopic) redshifts of >10 million galaxies. Use these to study expansion history and growth of structure in the Universe. Also study everything else in that region of sky.



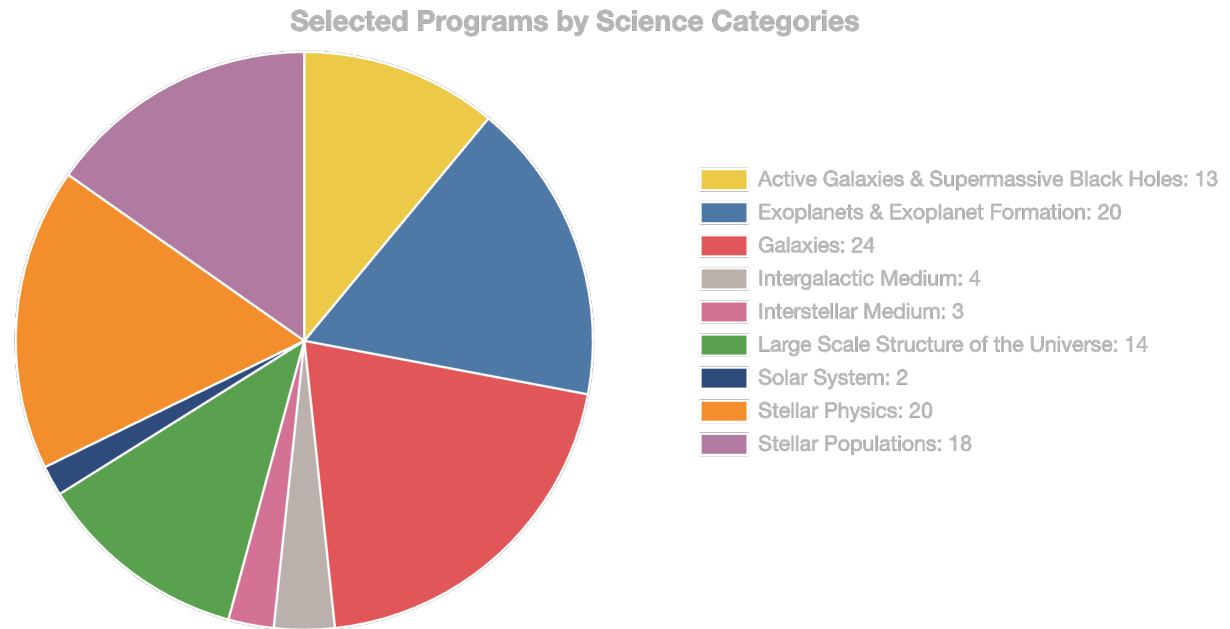


- | | |
|--|---|
|  High-Latitude Wide-Area Survey |  Galactic Bulge Time-Domain Survey |
|  High-Latitude Time-Domain Survey |  Galactic Plane Survey |

Cycle 1 General Investigator Program

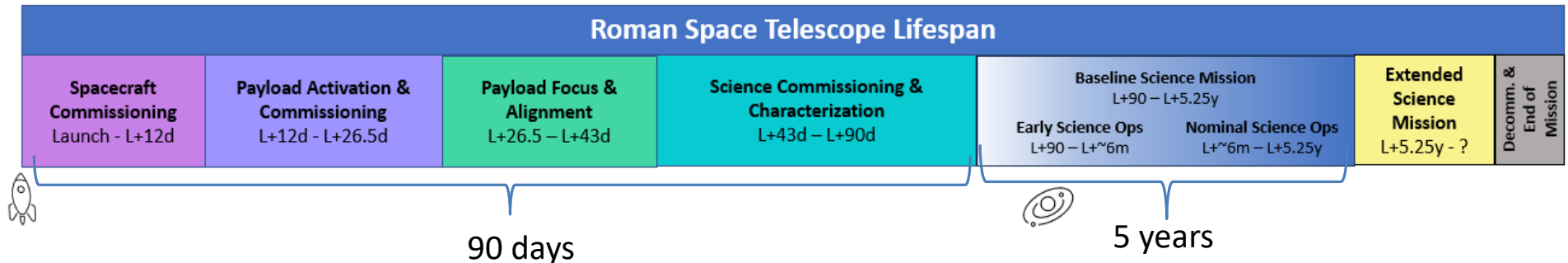
- 61 Small
- 45 Medium
- 12 large

**Includes 5 new General
Astrophysics Surveys**



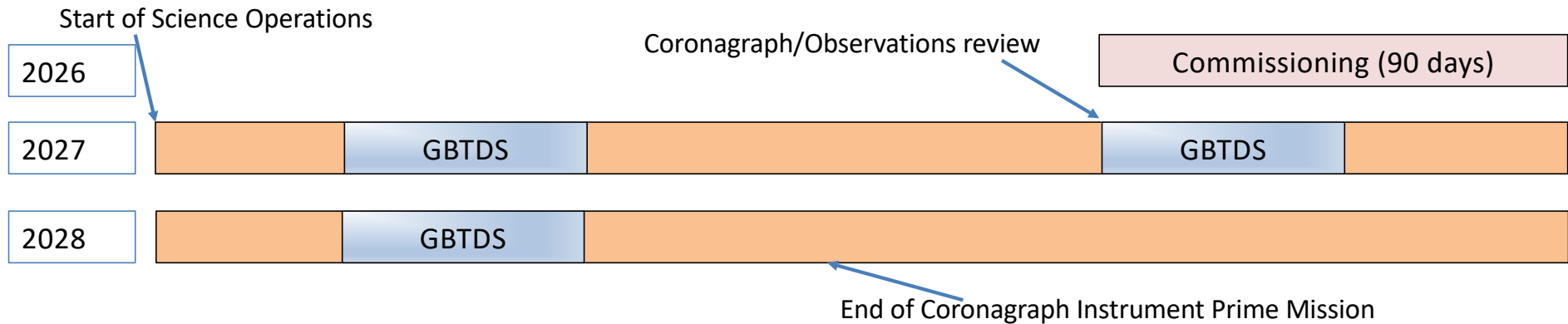
Cycle 2 call released in Nov/Dec 2026, with deadline in Feb/Mar 2027

What happens after Launch?



- **Commissioning**
 - Calibrations, characterize PSF, survey efficiency, etc
- **Baseline science operations**
 - Early science ops (L+~90 – L+~9 months)
 - Commissioning data public
 - Prompt data products now public
 - Image data within 48 hrs, co-adds, single band catalogs within 1 week
 - Nominal Science operations (L+5.25 years)
 - Continue prompt data product release
 - Stable calibrations, pipelines
- **Extended science ops (>5.25 years)**

Roman's First Two Years



• Observing programs that will happen in first two years

- Three Galactic Bulge Time Domain Seasons
- 90 days of Coronagraph Instrument observations (focus on first 6 months)
- 30 days of Galactic Plane Survey (some may be scheduled later than 18 months)
- High Latitude Time Domain Pilot Survey
 - Euclid Deep Field South
 - ELAIS-N1
- High Latitude Wide Area Survey deep/ultradeep tiers
 - Cosmos
 - XMM-LSS
- Some parts of medium tier of HLWAS
- Selected General Astrophysics surveys

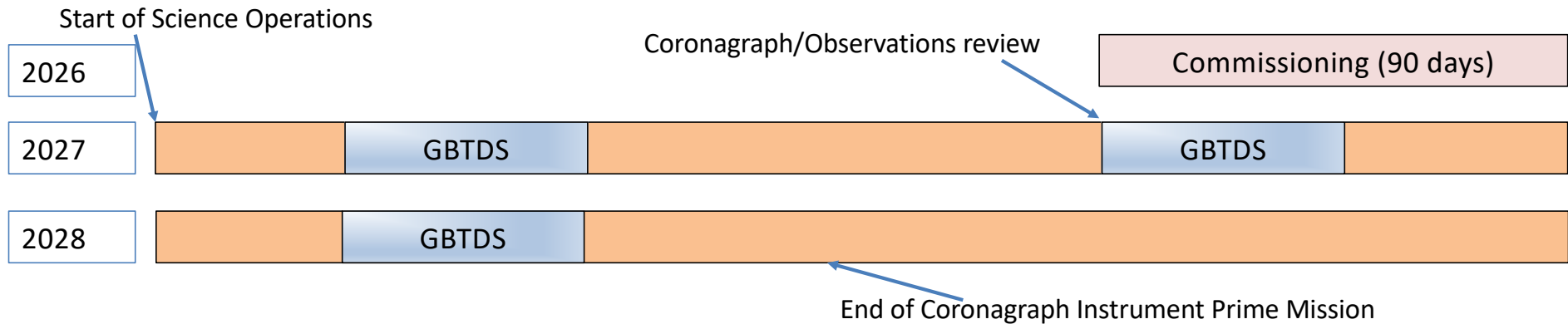
Science Operations in Early Mission

- **Commissioning will have readied the observatory, instrument and ground system and established a calibration and performance baseline**
- **If all is nominal, within first 6 months:**
 - SOC will be producing L1->L4 prompt products from day 1 of science ops
 - But may not yet meet performance requirements due to ongoing calibration work
 - Image data within 48 hrs, co-adds, single band catalogs within 1 week
 - First MSOS delivery from SSC is ~4 months into science operations
 - First spectroscopic delivery from SSC is ~6 months into science operations
 - Transient Alerts (from RAPID PIT) start 4-6 months into science operations
 - Relatively rapid improvements in calibrations, pipeline optimization and nexus environment
- **If we are not nominal, the minimum needed at the start of science ops:**
 - Survey observations, scientifically useful L2 data, MAST archiving of L2 data and working Nexus/Roman science cloud environments
- **Even in the nominal case, we expect significant evolution in the quality and breadth of available Roman data in the first ~6 months**
 - To convey to the science community an expectation of rapid evolution in the first few months of the mission, we are calling this "early science operations", and committing to more frequent community updates than during "nominal science operations"

Are we ready? – yes!

- **Observations defined**
 - Community process for Coronagraph instrument and bulk of WFI observations
 - Cycle 1 selections of additional WFI surveys to be announced soon
- **Calibration plan completed**
 - Reviewed by calibration working group (open to all!)
- **Observations and calibrations implemented into mission plan**
 - Planning and scheduling implementation tested in mission readiness tests
- **Pipelines implemented and tested**
 - Launch code freeze last month
 - Pipeline details discussed/reviewed in calibration and software groups
- **Analysis environment (Roman Research Nexus)**
 - Released and publicly available (along with synthetic data)

Roman's post processing data quality



- **Commissioning will demonstrate that the observatory is working correctly and provide an initial set of flight calibrations**
 - Roman was designed to rely on flight calibration where possible
 - So, think of initial performance as a floor, that will improve with calibrations enabled by larger data volumes, and updates to pipelines and processing
- **Roman will have a sequence of planned reprocessing runs**
 - So Roman performance will improve in leaps and bounds, rather than continuously

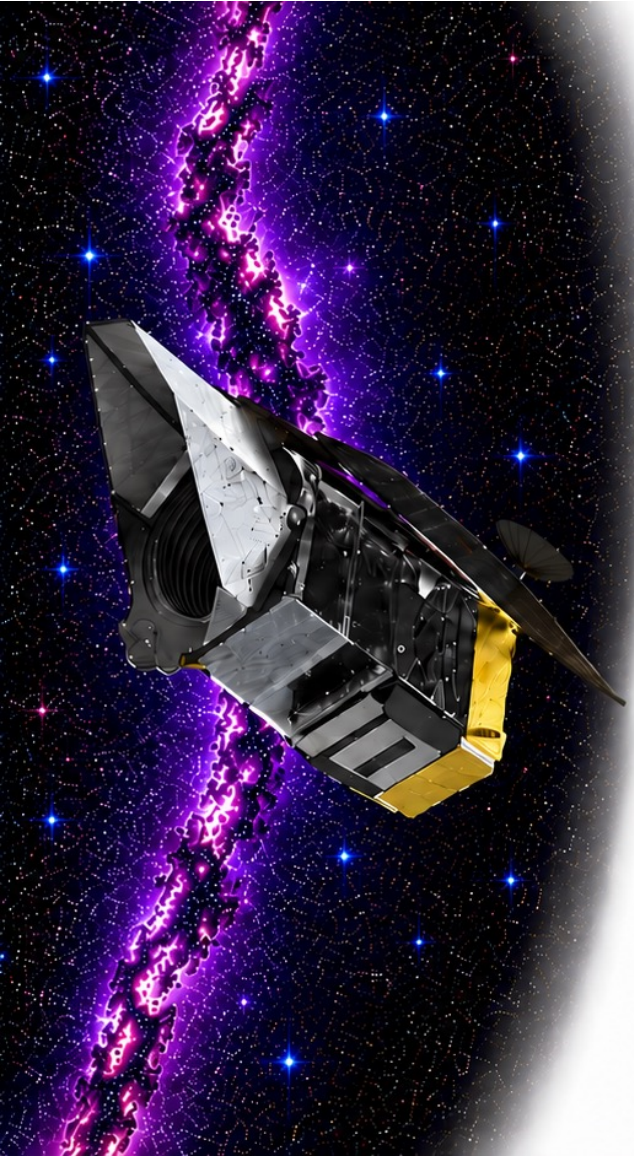
Roman Science Users Panel

Name	Email	Affiliation	Details	Year joined
Casey Papovich	papovich@tamu.edu	Texas A&M	co-chair	2025
Sabrina Stierwalt	sabrina@oxy.edu	Occidental College	co-chair	2025
Tansu Daylan	tansu@wustl.edu	Washington University St. Louis		2025
Kishalay De	kd3038@columbia.edu	Columbia University		2025
Charlie Kilpatrick	ckilpatrick@northwestern.edu	Northwestern University		2025
Adam Kraus	alk@astro.as.utexas.edu	University of Texas		2025
Elisabeth Krause	krausee@arizona.edu	University of Arizona		2025
Karen Masters	klmasters@haverford.edu	Haverford College		2025
Michael Meyer	mrmeyer@umich.edu	University of Michigan		2025
Adrian Price Whelan	adrianmpw@gmail.com	Flatiron Institute		2025
Claudia Scarlata	mscarlat@umn.edu	University of Minnesota		2025
Anne Verbiscer	av4n@virginia.edu	University of Virginia		2025

- The Roman Science User Panel (RSUP) will represent the broader science user community of Roman, providing feedback, suggestions and advice on behalf of users to all elements of the Project

Getting involved with Roman

- **Join the Roman Science Collaboration**
 - <https://outerspace.stsci.edu/spaces/RSCPUB/overview>
- **Write a General Investigator proposal (see Vivian's talk)**
- **Join the Roman news mailing list**
 - sign up to the mailing list by sending an e-mail to Roman-news-join@lists.nasa.gov (no text in the body is required, put Roman in subject)
 - This is where we will provide updates during commissioning and early science operations
- **Join the Roman Science Community (provides access to Roman working groups)**
 - <https://outerspace.stsci.edu/display/RSWGS>
- **Come to the ready, set, Roman training series**
 - <https://outerspace.stsci.edu/spaces/RTS/overview>
- **Got a question?**
 - Roman Helpdesk: <https://stsci.service-now.com/roman>



The Roman Data Philosophy

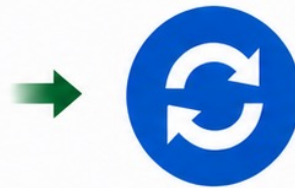
Roman data are available immediately, improve in quality throughout the mission, and are packaged into comprehensive Data Releases along the way.



LAUNCH & EARLY OPS

Day 1 science prompt products available following commissioning.

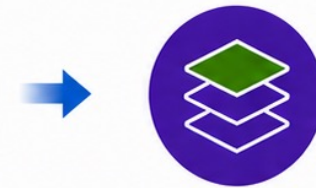
Prompt data products will be available immediately on the MAST archive and Nexus. Pre-launch test products already available.



PROMPT PRODUCTS & UPDATES

Prompt products offer fast, simple data products ideal for early exploration.

Calibrations and pipeline are continuously improved. We update prompt products when it is of scientific benefit.



DATA RELEASES

Data Releases will be uniformly processed and offer more comprehensive products ideal for thorough analysis.

Official Data Releases ensure consistency. The high cost of large scale data processing precludes independent processing.



CONTINUOUS JOURNEY

Improvements continue throughout the mission.

Each release builds on the last, enabling new discoveries and more powerful science.

The Roman Research Nexus

- A cloud-based science platform designed for Roman users:
 - Bring users and tools to the data (not the other way around)
 - Enable scalable analysis for Roman data volumes
 - Pre-configured Roman environment + custom software support
- Tutorials demonstrating:
 - Data simulation
 - Data Visualization
 - Data Analysis
 - Calibration Pipeline
- Simulations: Including OpenUniverse and Roman I-sim
- Collaboration through team accounts and shared resources
 - Any team can request an account



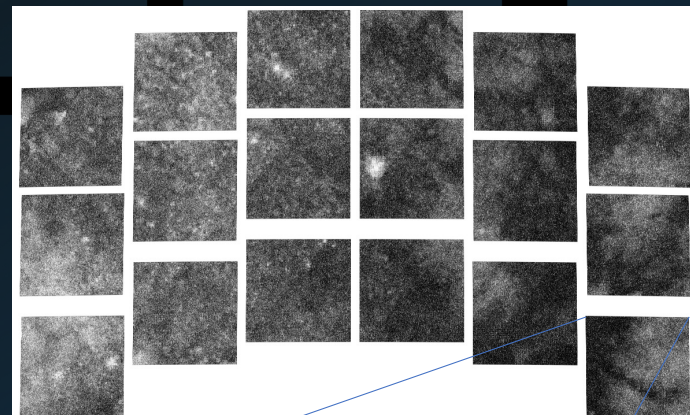
*No installation needed!
Access via your
MyST account at STScI*



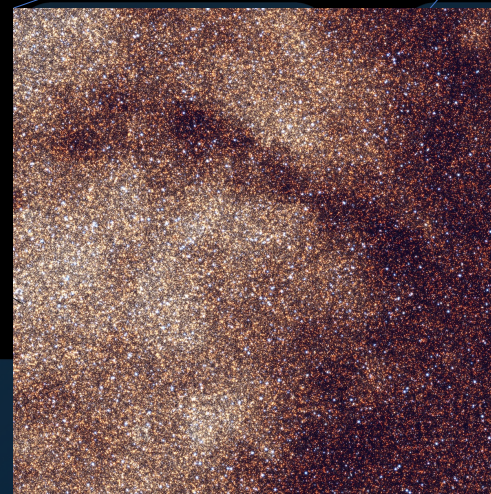
roman.science.stsci.edu

Nexus Continues to Evolve (New Features Coming Soon)

- New science workflows:
 - Time-domain simulation and analysis workflows
 - WFI detector characterization workflows
- Enhanced compute capabilities:
 - GPU-enabled compute for ML and large-scale analysis
 - Larger server configurations (~100 CPUs) for parallel workflows
- Data access, storage, and management
 - S3 buckets for team-based data storage and sharing
 - Bulk upload and download capabilities
- New survey simulations available later this summer
- Tighter MAST archive-analysis integration (see next slide)



GBTDS Simulation created with Roman I-Sim



Get Ready for Roman!

READY, SET, ROMAN!



Training Series



Live webinars with lots of time for discussion and questions, recorded and available on a dedicated youtube channel: <https://www.youtube.com/@NancyRomanSci>

- Webinar 1: Core Community Surveys and Related Roman Tools
- Webinar 2: Simulated Data Sets
- Webinar 3: Astronomer's Proposal Tool (APT)
- Webinar 4: Roman Telescope Proposal Systems (RTPS)
- Webinar 5: Exposure Time Calculator (ETC)
- Webinar 6: The Roman Research Nexus: Data Analysis
- Webinar 7: Preparing for Roman (Mini-Workshop from AAS)
- Webinar 8: Using the Roman Research Nexus
- Webinars 9 & 10: Community Products from the Project Infrastructure Teams
- Webinars 11 & 12: FAQs and Office Hours
- More training coming this year!



The Roman Space Telescope

For the Community, by the Community



Tune In

Sign up for news, listen to webinars, and read documentation.

Interact

Attend conferences, use simulated data and tools, and prepare to submit proposals.

Actively Contribute

Join Wide Field Instrument (WFI) working groups, participate in workshops, and provide feedback to formal committees.



www.stsci.edu/roman/get-involved

Follow us on Roman social media for Scientists

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The social media channel for scientist-focused updates.

Don't miss out on the latest Roman science info!

