STScI | SPACE TELESCOPE SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

# Community Definition of Roman's Core Community Surveys


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# Roman Observational Program: Wide-Field Infrared Surveys of the Universe

Large Core Community Surveys *majority of observing time*

**Dark Energy**

**High-latitude wide area survey**
Enables Weak Lensing, Baryon Acoustic Oscillation cosmology investigations

**High-latitude time-domain survey**
Enables Supernovae Ia cosmology investigations

**Exoplanets**

**Galactic Bulge time-domain survey**
Enables exoplanet microlensing investigations

**Astrophysics with Wide Field IR Surveys**

Smaller Astrophysics Surveys *nominally 25% of observing time*

- Selection via a peer-review process

Archival Investigations

- All data will be public immediately
- Anticipated to be main component of community involvement

# Top Level Goal for Defining the Core Community Surveys

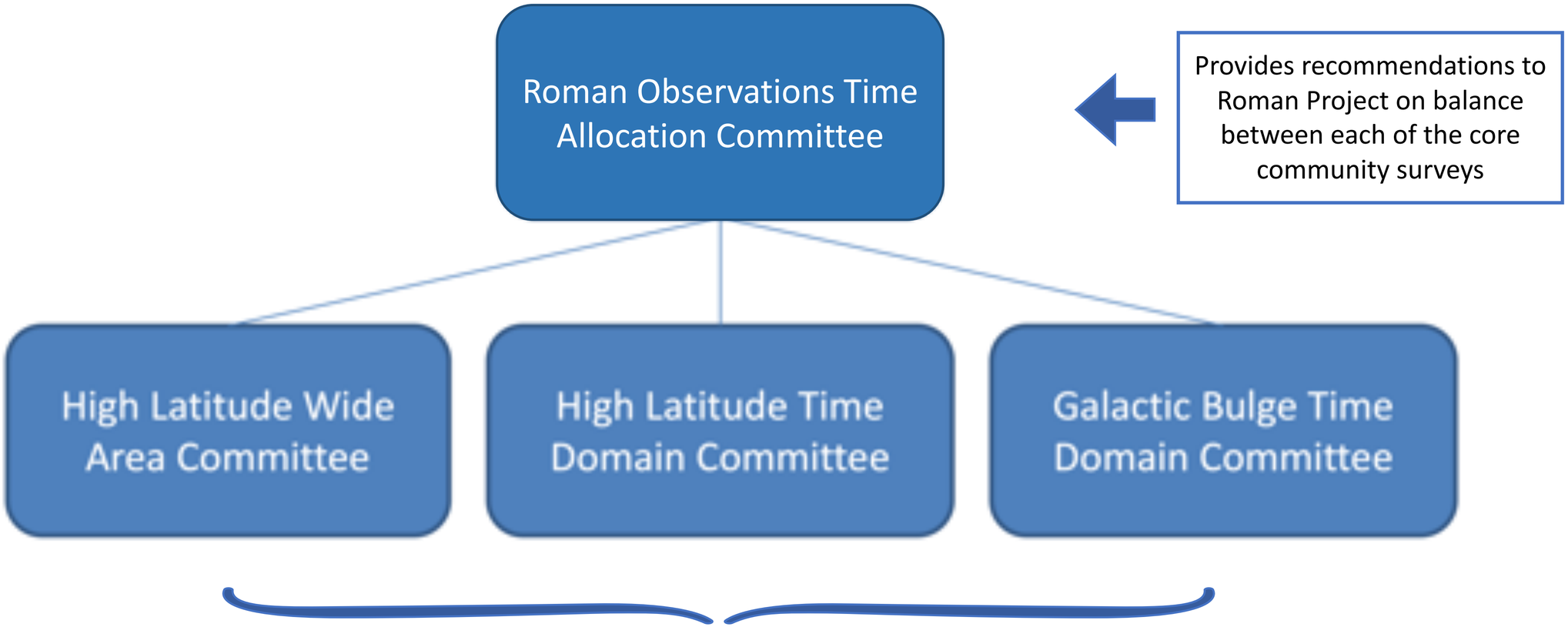
*Maximize the overall science return of Roman's wide field infrared surveys*

*While meeting Mission requirements focused on cosmology and exoplanets*

The existing survey strategies served their primary function in showing the mission can meet its requirements.

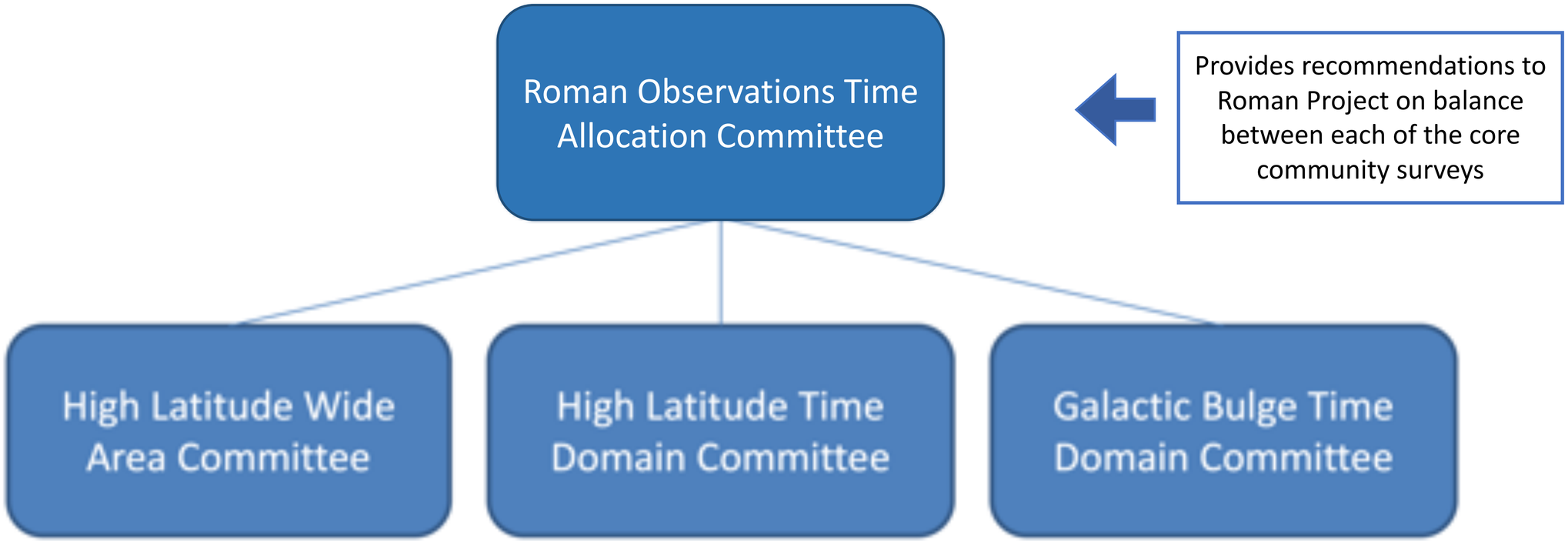
***The actual surveys to be implemented will be defined by the astronomical community.***

# Strategy for Defining the Core Community Surveys




Evaluate initial community input; solicit additional, more targeted community input through a variety of channels; evaluate survey options against science metrics; produce recommendations for survey implementations with options for enhancements/descopes

# Strategy for Defining the Core Community Surveys

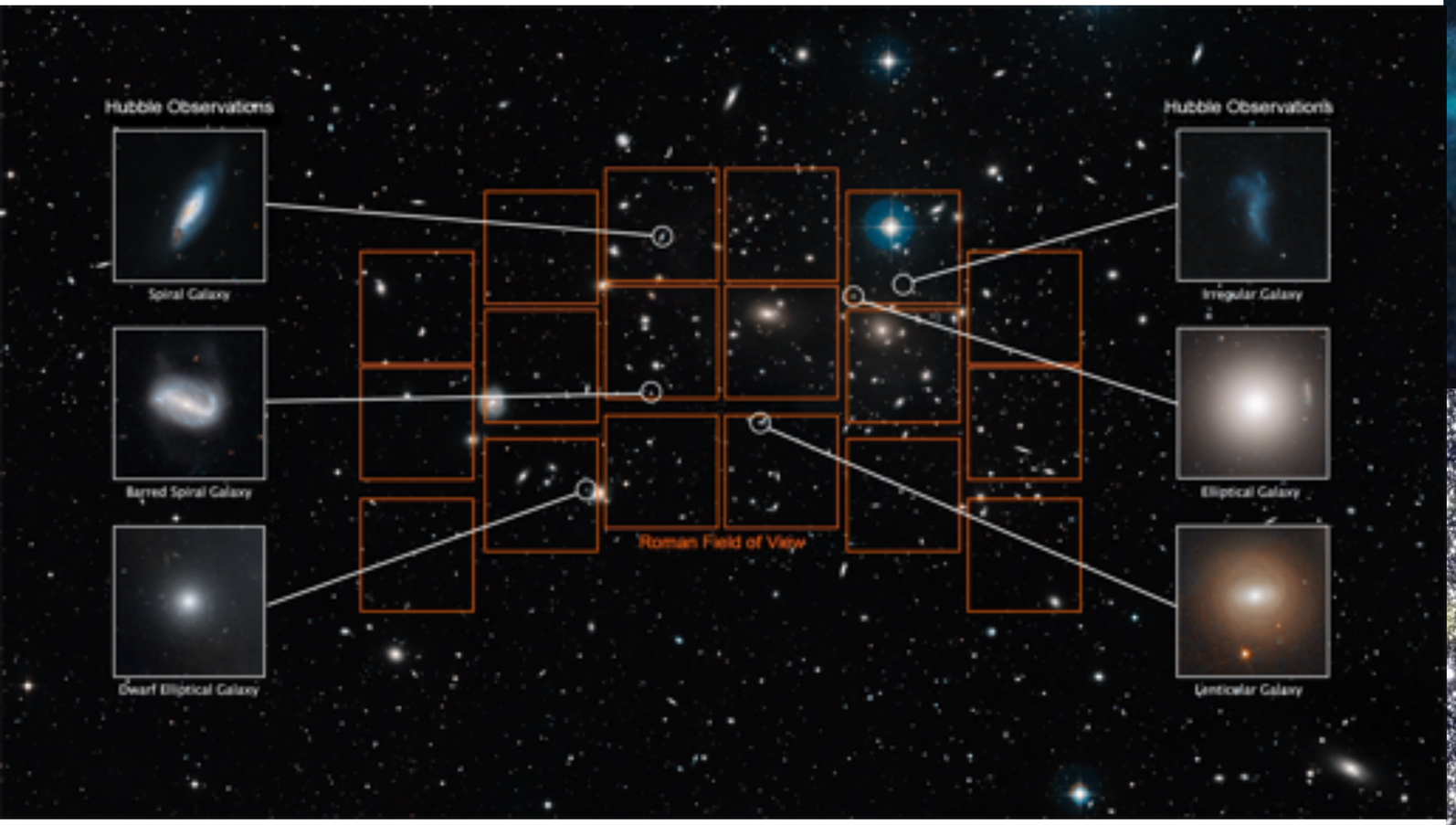



These committees will be *your* committees, and will be charged with understanding and representing the full breadth of the astronomy community's interests in Roman's Core Community Surveys.

*There will be no "survey teams" selected to define or implement the surveys.*

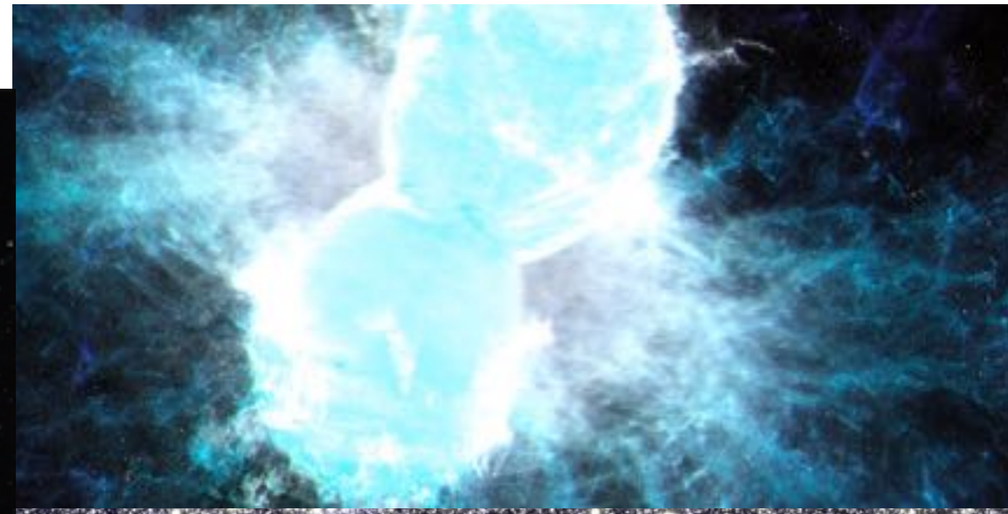
# Should *you* provide input to defining the Core Community Surveys?

Three science case examples of many …



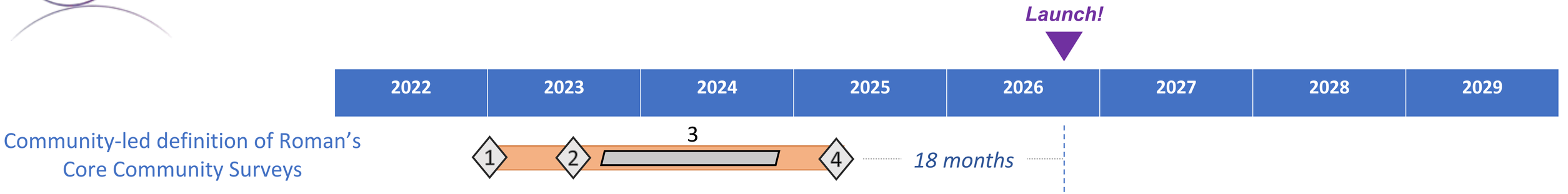

*Galaxy properties as a function of redshift*

*Illustration of a kilonova*



*Simulation of Galactic Bulge: 1/140$^{th}$ Roman's FOV*

# Timeline for Defining the Core Community Surveys




(1) Initial Request for Community Input

(2) Formation of CCS Definition Committees

(3) Committee-driven investigations, deliberations, and gathering of additional community input, including community workshops

(4) Final report detailing CCS observations due to Project

# Guiding Principles for the First Step in Defining the CCSs

A successful call for community input will:

- get all the science ideas on the table for both the drivers of the science requirements, and other astrophysics that can be done with the CCSs
  - ensure the CCS committee members represent the breadth of science investigations that the community wants enabled by each CCS
- Provide the CCS committees with initial input on what requirements on survey strategy are set by various science investigations
  - obtain actionable observational strategy descriptions and tradeoffs, and where possible, quantitative metrics or figures of merit, for general astrophysics investigations as well as core science for the CCSs — enough to kickstart the work of the CCS committees
- expand the Roman community
- begin an extended, community-wide discussion

# Guiding Principles for the First Step in Defining the CCSs

The committees will use the responses as a foundation to begin their work. This might include:

- identifying the most promising synergies between the drivers of the science requirements for each CCS and other astrophysics investigations
- identifying areas where additional investigative work is needed (e.g., to define appropriate metrics for a science case)
- identifying areas where community consensus-building is needed (e.g., where there are significant discrepancies in strategy for the same/similar science case)
- targeting additional requests for community input
  - e.g., informing the programs and agendas for later follow-up community workshops on the CCS survey definition

# First Step in Defining the Core Community Surveys

Two avenues to respond to the initial request for community input into the CCS definitions:

(1) A “Science Pitch” plus questionnaire requested by **February 17**

- science pitch: 1-2 paragraphs “pitching” a science investigation that could be done with an appropriately configured CCS

- an associated questionnaire to collect ***high level*** input on important survey characteristics for a given science pitch (e.g., survey area, depth, filters, cadence, etc.)

(2) A traditional white paper

- with adequate time post-ROSES deadline; anticipate a late spring deadline

Community members can respond to one or the other or both.

All input will be given to the CCS definition committees and made available for interested members of the astronomy community.

# Avenue 1: Science Pitches

(1) A “Science Pitch” plus questionnaire requested by **February 17**

- science pitch: 1-2 paragraphs “pitching” a science investigation that could be done with an appropriately configured CCS

- an associated questionnaire to collect ***high level*** input on important survey characteristics for a given science pitch (e.g., survey area, depth, filters, cadence, etc.)

Science Pitches should briefly:

- describe the science investigation
- motivate its importance in addressing open questions in its field
- describe how the capabilities of a Roman CCS will uniquely enable the investigation

Incentives:

- the opportunity to influence the breadth of expertise of the selected members of the CCS committees and their initial deliberations *with minimal time investment*
- a small number of entries from junior researchers will be chosen for invitations to present their ideas at an upcoming community workshop

# Avenue 2: White Papers

(2) A traditional white paper

- with adequate time post-ROSES deadline; anticipate a late spring deadline

White papers should:

- motivate the importance of the science investigation and how a Roman CCS will uniquely enable it
- include quantitative discussions of what observational strategies will minimally enable, and optimize, a given science investigation
- include figures of merit or other quantitative metrics by which a given observational strategy's impact on the science investigation can be judged

Resources and support for the writing of white papers:

- an extensive list of technical resources is available (see *Resources* links in call)
- an analysis of the results of the questionnaire associated with the science pitch submission will be released in late March
- authors of related science pitches will be welcomed and encouraged to collaborate on white papers

Incentives:

- quantitatively and materially inform the work of the CCS definition committees
- provide the CCS definition committees with ability to judge if a given observational strategy will enable your science

# The Community Process for Defining the CCSs Has Begun

## The Call has been released

- Roman Core Community Survey Science Pitches due February 17
- Roman Core Community Survey White Papers anticipated to be due in late spring
  - due date and details of the content requested in the white papers anticipated to be announced in early spring
- Did you miss the announcement? Join the Roman Project mailing list: email roman-news-join@lists.nasa.gov

Call for Initial Community Input