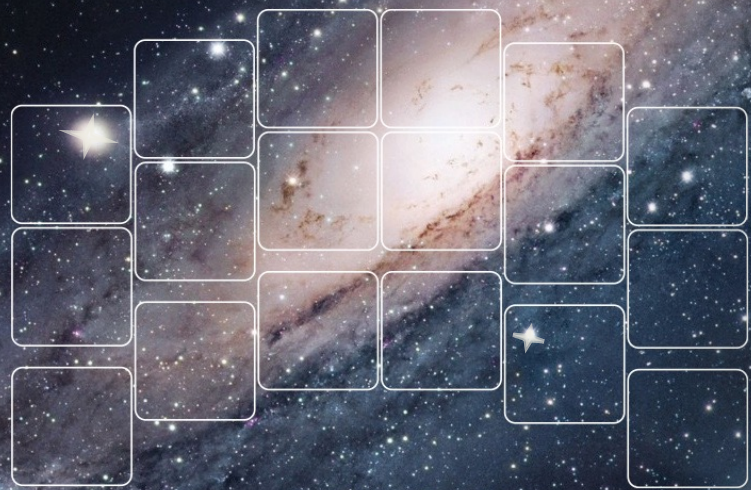


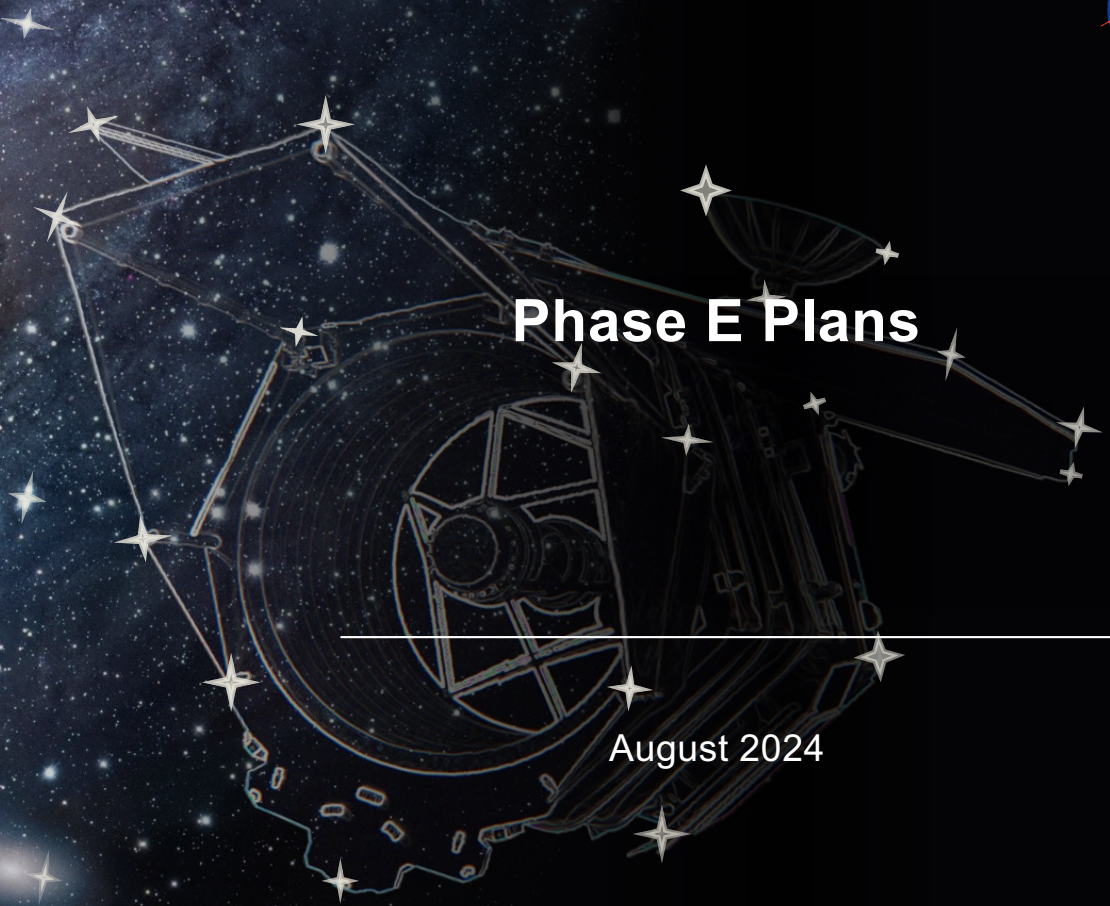
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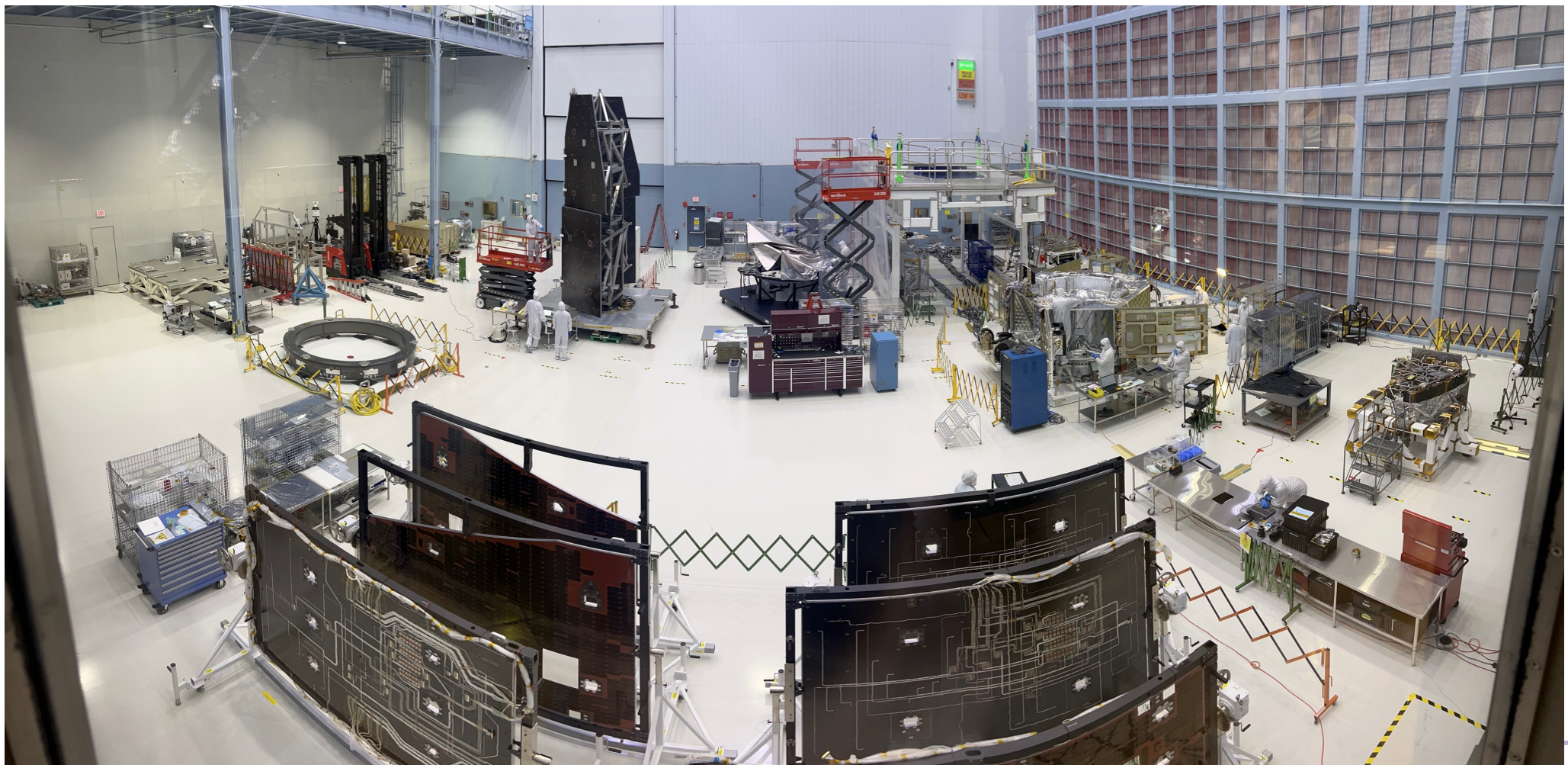
SPACE TELESCOPE

Phase E Plans

August 2024



Coronagraph Instrument at Goddard



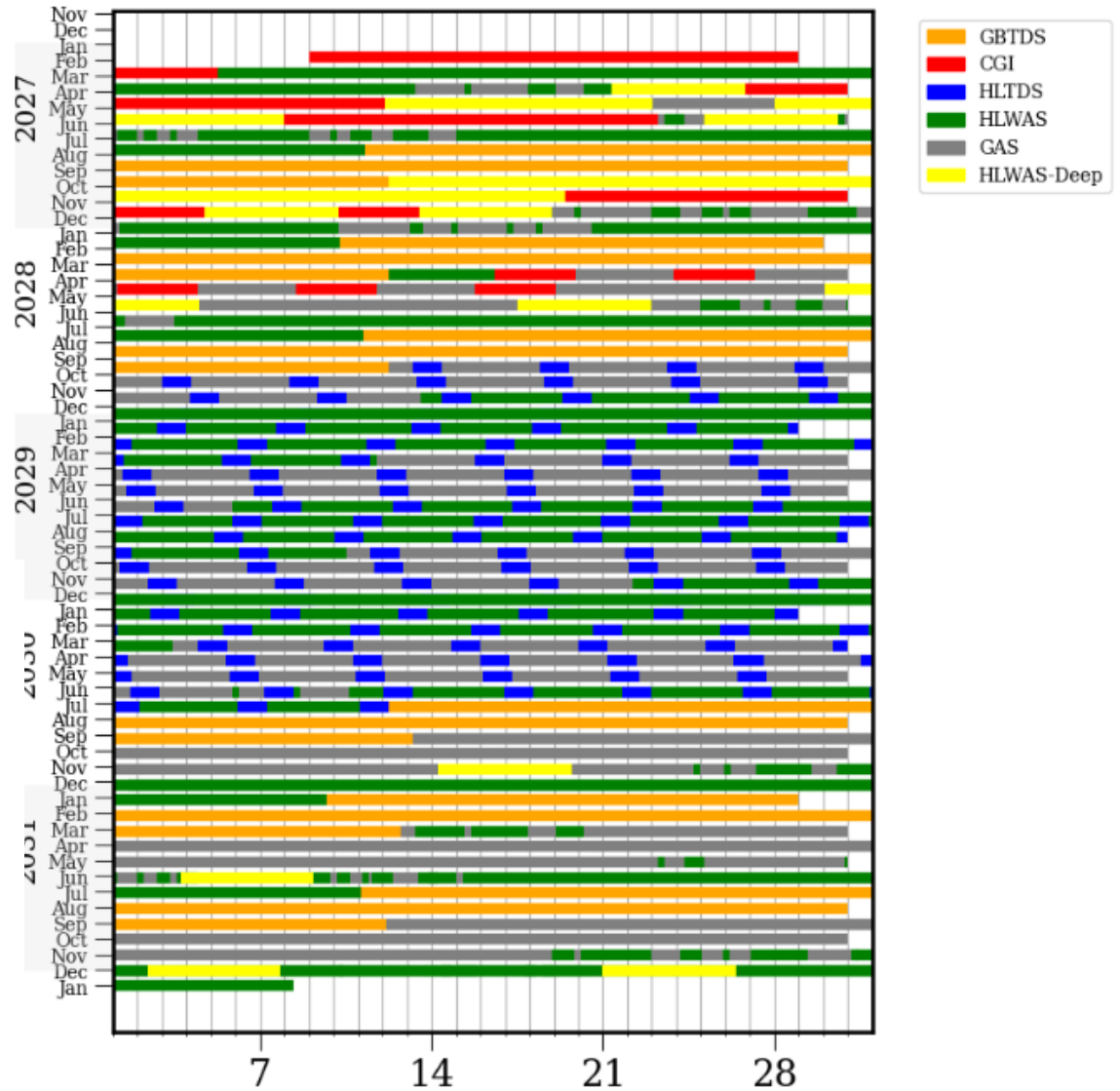
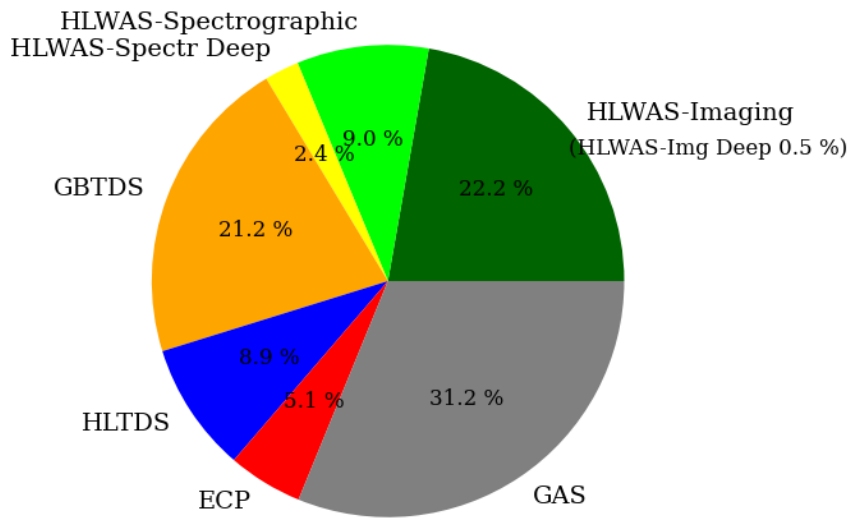
Roman Observations



- **Three Core Community Surveys address the 2010 Decadal Survey science goals while providing broad scientific power**
 - **High Latitude Wide Area Survey:** Wide area multiband survey with slitless spectroscopy
 - Enables weak lensing and galaxy redshift cosmology mission objectives
 - *1700 deg² (wide), 20 deg² (deep), 4 filters (Y, J, H, F) for wide and deep fields and grism spectroscopy*
 - **High Latitude Time Domain Survey:** Tiered, time domain observations of 10s deg² at high latitudes
 - Enables Type Ia supernova cosmology mission objectives
 - *19 deg², (wide), 4.2 deg² (deep), 4 filters (R, Z, Y, J – wide) / (Z, Y, J, H – deep), 5 day cadence, and prism spectroscopy over 2 year baseline*
 - **Galactic Time Domain Survey:** ~<15 min cadence observations over few deg² towards galactic bulge
 - Enables exoplanet microlensing mission objectives
 - *2 deg², 15 min cadence with W filter, 12 hour cadence for R or Z and Y or J for 62 day seasons; 6 seasons*
- **Minimum 25% time allocated to General Astrophysics Surveys**
 - Selected via traditional peer review proposal and/or community process
 - Galactic Plane General Astrophysics Survey community definition process just started
- **90 days for Coronagraph technology demonstration within first 18 months of mission**

Example Mission Plan

- Launch 10/31/26
- Layout of observations
 - Day of month on X
 - Month on Y



Coronagraph Instrument



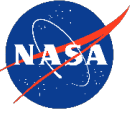
- **Coronagraph has a 3 month observing allocation within the first 18 months post commissioning**
- **Top priority: verify L1 technical requirement (TTR5)**
 - Expect 2-3 weeks needed (15% - 30% of available time)
- **Remaining time available for expanded technology demonstration and to observe challenging targets**
 - Understanding performance limits helps HWO prep
 - Choose scientifically-interesting targets wherever possible
 - Eg: reflected light Jupiter analogs & exozodi at $<10^{-8}$ contrast; complement HST/JWST debris disk studies
- **Observing program developed in a collaborative mode / with community input**
 - Community Participation Program (CPP) facilitates community engagement opportunities

Two Opportunities in Upcoming ROSES Solicitation



- **Solicitation text available in NSPIREs for comment**
 - Proposal deadline Feb/March 2025
- **Wide Field Instrument Science**
 - Support to prepare for and enhance the science return of *Roman* that can be addressed with its Wide Field Instrument
- **Coronagraph Community Participation Program**
 - Opportunity to work with the coronagraph instrument team to plan and execute its technology demonstration observations.
 - Provides funding through 18 months past commissioning
 - expect 3-5 additional teams

Coronagraph Community Participation Program



- **Coalition of scientists/technologists to work together to plan and execute Coronagraph technology demonstration observations**
 - Some members of coalition from Coronagraph project & international partners, and the rest is solicited from the community via ROSES opportunity
- **Selecting individuals/small groups to make up CPP Team**
 - Broad opportunity for community engagement
 - Maximize diversity of interests & perspectives
- **Overall, providing long term support to Coronagraph**
 - Detailed planning & precursor work
 - Preparing for assessment, processing, and analysis of observations
 - Making the most of the observations to learn about space coronagraphy

Considerations for observations beyond 18 months

- **Coronagraph instrument is a class D tech demo with minimal redundancy**
 - **possibility of limited instrument lifetime**
 - Execute additional CGI observations early in the mission, soon after the end of the initial 18-month period
 - Make decisions early, don't wait until the end of the 18-month period
 - Maximize efficiency
 - E.g. options to allow CGI parallel ops (e.g. for calibrations) during WFI observations

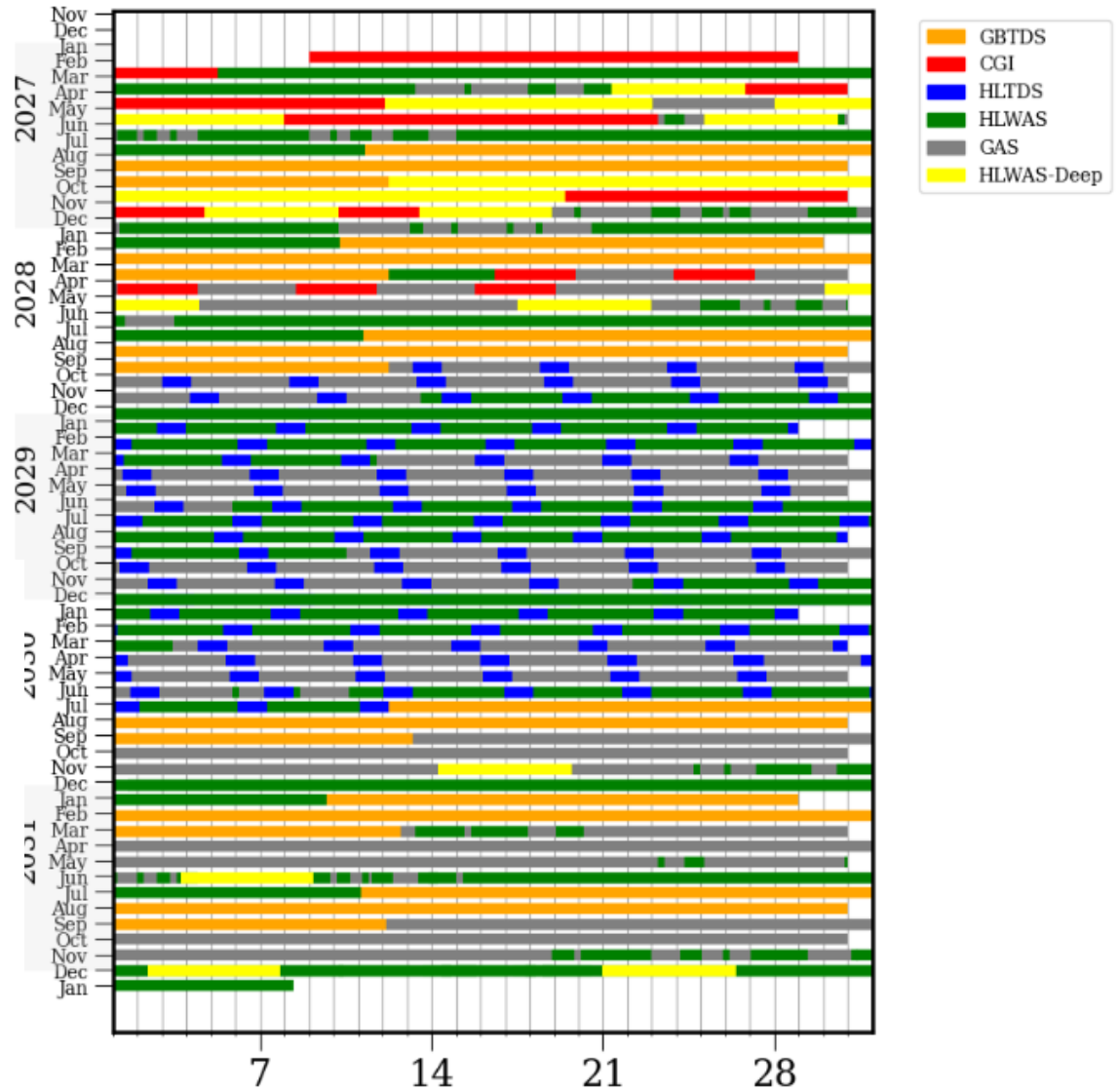
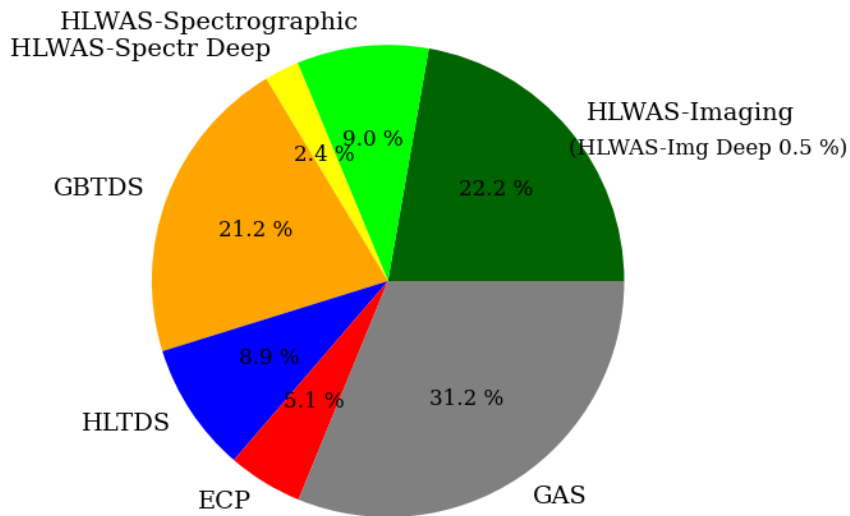
A possible option for continued observations

- **Hold review early in mission (e.g. 6 months into science observations)**
 - Add 3 months of Coronagraph Instrument observations within first 3 years, increase prime mission duration
- **Reschedule some of the Core Community Survey observations to later years to create space for Coronagraph Instrument observations in early mission**
 - This may be complicated, as teams may have planned science investigations that depend on the CCS surveys being executed when originally planned. (can mitigate this by collecting information during GI proposal selection)
- **Continue (or recompute) Community Participation program, and plan the second set of CGI observations in a similar way as the first 3 months**
 - This may be the most efficient way to exploit the pathfinder role for Coronagraph
 - Aim to manage the process in an open transparent way, so that the community has a voice

Note that it is premature to make firm decisions on the best path forward before the science community has had an opportunity to become involved in Coronagraph Instrument. No need to make choices today!

Example Mission Plan

- Launch 10/31/26
- Layout of observations
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The End

