Roman Space Telescope

The Mission
- NASA Mission in development for mid-2020s launch
- Top large space priority of ASTRO2010 Decadal Survey
- STScI will be the Science Operations Center for Roman, with science support activities shared by GSFC, STScI, and IPAC

Science
- Dark Energy: Distinct equation-of-state measures
- Exoplanets: Microlensing discovery down to sub-Earth masses; Coronagraphic imaging and spectroscopy
- Astrophysics: Funding opportunities for new observations and archival research programs

Telescope
- Existing Hubble-size 2.4-m primary, 3-mirror anastigmat

Wide Field Instrument (WFI)
- 0.5–2.3 microns, 0.28 degrees² (100× Hubble’s FOV)
- Eight broad-band filters + slitless spectroscopy

Coronagraphic Instrument
- 0.4–1.0 microns, 10⁻⁹ contrast goal

WebbPSF
A customizable multi-mission interface to perform point-spread function (PSF) simulations and calculations
- Simulated PSFs are critical to predict the performance of the observatory and to simulate scenes
- WebbPSF accounts for pupil shapes, source spectral energy distributions, filter bandpasses, and field-dependent aberrations
- WebbPSF contains flexible Python tools for analysis or export of PSFs

Pandeia
A multi-mission data cube simulator and signal-to-noise ratio/exposure time calculator (ETC)
- Accounts for the effects of wavelength-dependent PSFs and pixel-to-pixel correlations inherent to modern IR detectors
- Detailed scene creation for broad science cases (extra-galactic, galactic, etc.)
- Support for a wide range of instrument modes

STIPS
A tool designed to produce full-scene pipeline-processed simulated data
- Generate complex astronomical scenes through user-specified inputs (e.g., star cluster structural and population characteristics)
- Possibility to include post-pipeline data reduction residuals

Field of View Overlay
Quickly and simply display the FOV outline of the Roman instruments over sky images
- Supports overlays on DSS, SDSS, or GALEX images
- Object catalogs can be extracted and shown in a separate window
- Uses functionalities of the Mikulski Archive for Space Telescopes (MAST)
- As MAST Portal functionality expands, tool features will improve

Links to tools created by STScI and Roman Space Telescope Partners are available at https://www.stsci.edu/roman/science-planning-toolbox.

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