

ExoPAG: ASTRA Update

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2026/09/01
Ad ASTRA Workshop

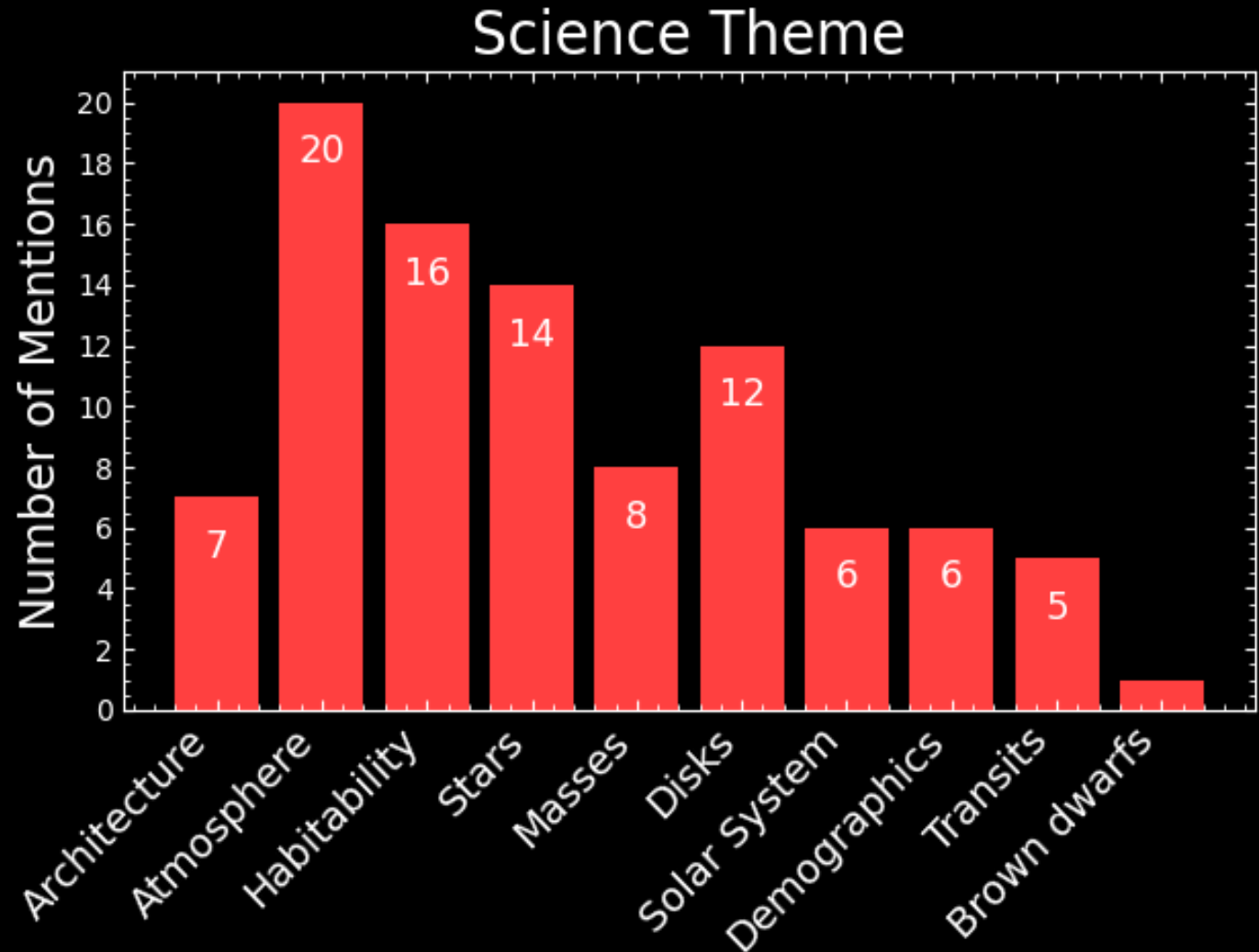
ASTRA Mission Concepts

- The ExoPAG EC categorized Mission Concept submissions based on:

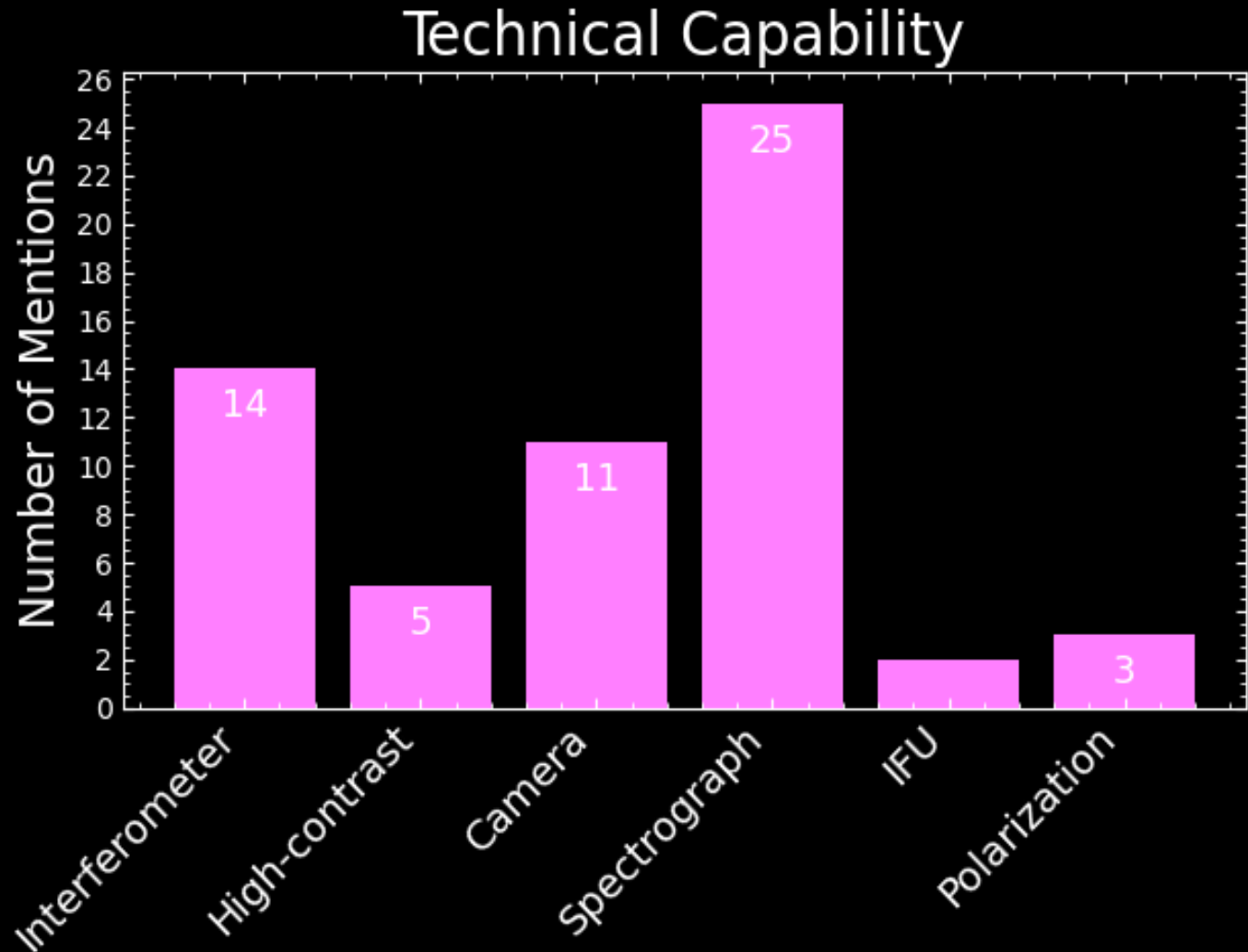
- Science themes
- Wavelengths
- Capabilities/instruments
- Size/scale
- Architecture
- Possible orbit/location

Wavelengths	Science Theme	Capabilities
UV vis (400-1000 nm) NIR (1-5 um)	Atmospheres Habitability Architectures Demographi	Camera Spectrograph
NIR (1-5 um) MIR (5-25 um)	Habitability Architectures Masses	Interferometer Spectrograph
MIR (5-25 um) NIR (1-5 um)	Atmospheres Habitability	Spectrograph
vis (400-1000 nm) NIR (1-5 um)	Atmospheres Disks Habitability	High-contrast
vis (400-1000 nm)	Masses Architectures Demographics Solar System	Camera
MIR (5-25 um)	Habitability Atmospheres Disks	Spectrograph
NIR (1-5 um) vis (400-1000 nm)	Transits Stars Demographics	Camera
vis (400-1000 nm) NIR (1-5 um) UV	Habitability Atmospheres	High-contrast Spectrograph Camera
MIR (5-25 um)	Atmospheres Disks Habitability Solar System	Spectrograph
Xray	Stars Atmospheres	Interferometer
Xray	Atmospheres	Interferometer
NIR (1-5 um) MIR (5-25 um)	Disks Atmospheres	Spectrograph
UV vis (400-1000 nm)	Stars	Interferometer
MIR (5-25 um) FIR (>25 um)	Atmospheres Disks Transits Demographics Archi	High-contrast Spectrograph
vis (400-1000 nm)	Habitability Architectures Disks Masses	High-contrast Camera
FIR (>25 um) MIR (5-25 um)	Disks	Spectrograph
UV vis (400-1000 nm) NIR (1-5 um)	Atmospheres Habitability Demographics Architectu	High-contrast IFU/IFS
Xray UV vis (400-1000 nm) NIR (1-5 um)	Disks Stars	Spectrograph
NIR (1-5 um) UV Xray	Stars Transits	Camera Spectrograph IFU/IFS P
vis (400-1000 nm) NIR (1-5 um)	Atmospheres Habitability	Spectrograph Polarization
MIR (5-25 um)	Atmospheres Habitability Masses	Interferometer Spectrograph Came
radio/submm	Habitability	Interferometer
vis (400-1000 nm) NIR (1-5 um)	Atmospheres Habitability Stars Transits	Camera Spectrograph
NIR (1-5 um)	Atmospheres Stars	Spectrograph
Xray	Stars	Spectrograph Interferometer
FIR (>25 um) MIR (5-25 um) radio/submm	Disks	Interferometer Spectrograph
UV vis (400-1000 nm) NIR (1-5 um)	Solar System Masses Demographics Stars	Camera Spectrograph
NIR (1-5 um) vis (400-1000 nm) UV	Masses Atmospheres Solar System Brown dwarfs	Camera Spectrograph
Xray	Atmospheres	Spectrograph
Xray UV vis (400-1000 nm) NIR (1-5 um)	Atmospheres Transits Stars	Spectrograph Camera
vis (400-1000 nm) UV	Disks Stars	Interferometer
Xray	Habitability Solar System	Spectrograph Polarization
FIR (>25 um) radio/submm	Disks	Interferometer Spectrograph
radio/submm	Stars Solar System	Interferometer Spectrograph
MIR (5-25 um) NIR (1-5 um)	Atmospheres Habitability	Spectrograph
vis (400-1000 nm) NIR (1-5 um)	Architectures Stars Masses	Interferometer
NIR (1-5 um) vis (400-1000 nm) UV	Masses Atmospheres Habitability Stars Disks	Interferometer

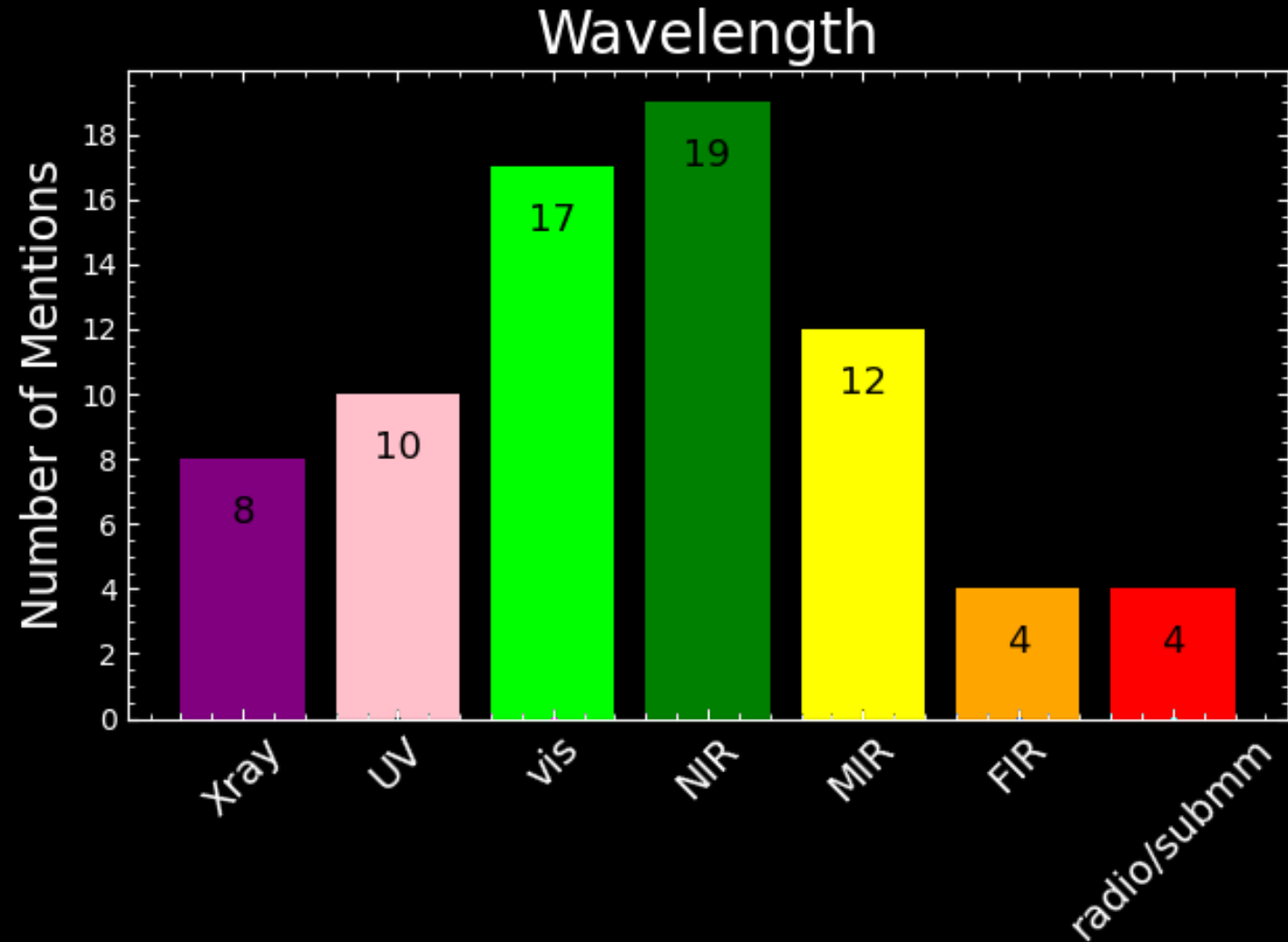
- Submissions focus on many science themes:
- Main themes:
 - Atmospheres
 - Habitability
 - Stars
 - Disks



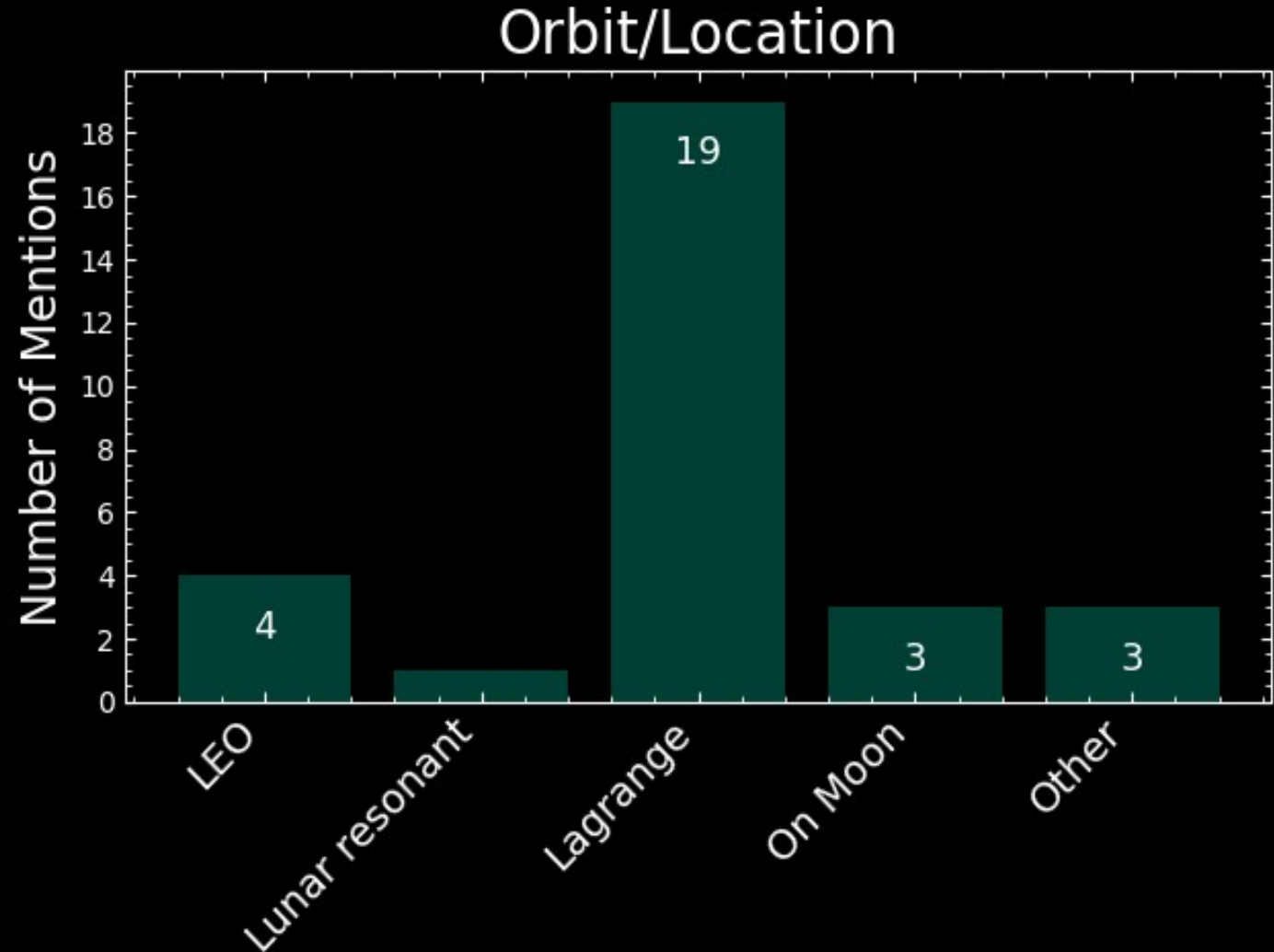
- Necessary technical capabilities prioritize:
 - Spectroscopy
 - Interferometry



- Broad range of desired wavelength coverage.
- Main focus:
 - NIR (1-5 μm)
 - Vis (0.3-1 μm)
 - MIR (5-25 μm)

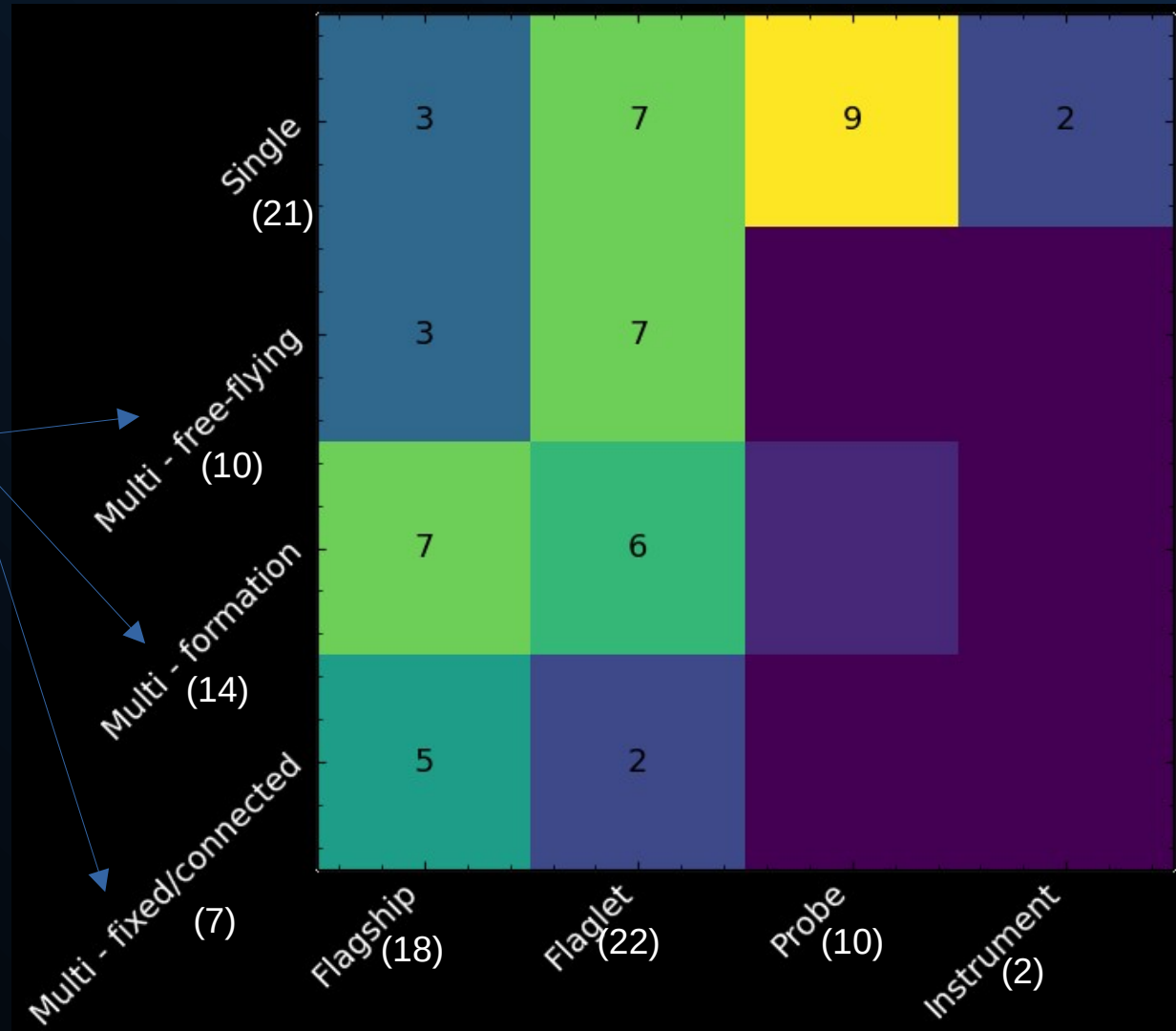


- Overwhelming desire to locate missions at Lagrange Points:



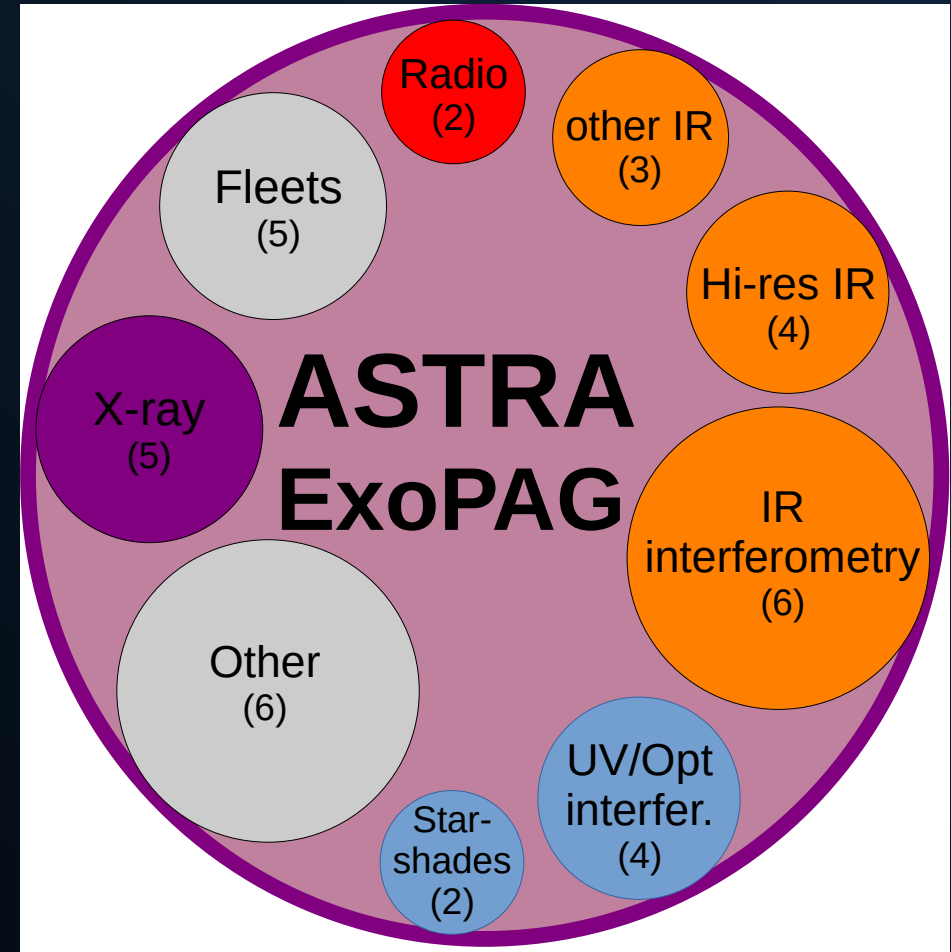
Scale & Architecture:

- Preference for:
 - Multi-aperture facilities
 - Large-scale missions (Flagship / Flaglet)



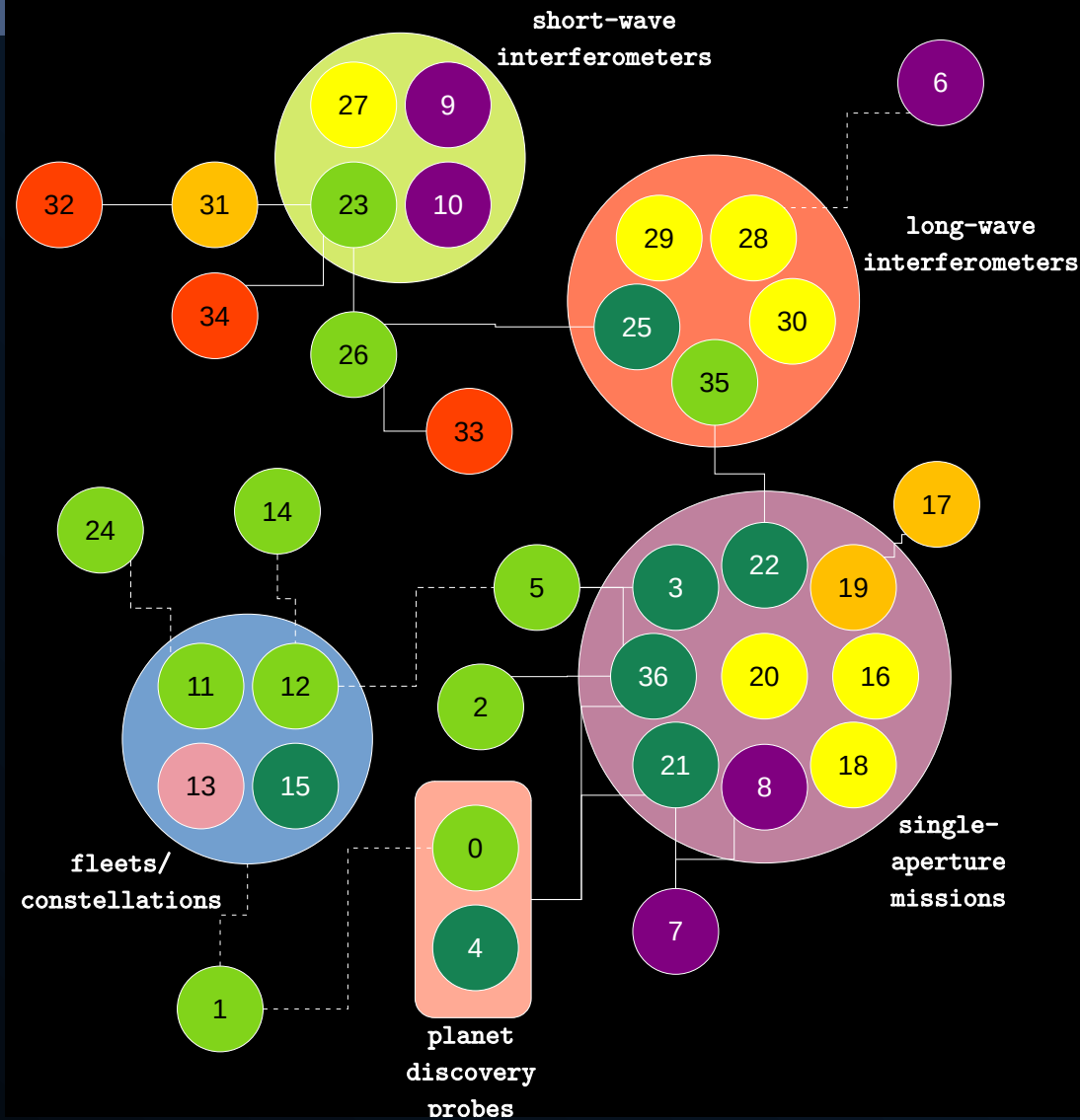
ExoPAG Mission Categories

- Nine mission concept categories:
 - IR interferometry (6)
 - UV/Optical interferometry (4)
 - Fleets/flaglets/constellations (5)
 - X-ray missions (5)
 - High-res IR spectroscopy (4)
 - Other IR spectroscopy (3)
 - Radio/submm (2)
 - Starshades/occulters (2)
 - Other (6)



ExoPAG Mission Categories

- Clustering analysis finds several large groupings:
 - Interferometers)
 - Large, single-aperture missions
 - Fleets/constellations



ASTRA: ExoPAG Community Priorities

- 1) Science: atmospheres, habitability, stars & disks
- 2) Capabilities: spectroscopy & interferometry
- 3) Wavelengths: infrared, visible
- 4) Architecture: multi-aperture
- 5) Size: large (Flagship / Flaglet)

Questions?
Suggestions?
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