Context for ELTs in 2020:

SPHERE/GPI surveys complete.

Many years of VLTI operation.

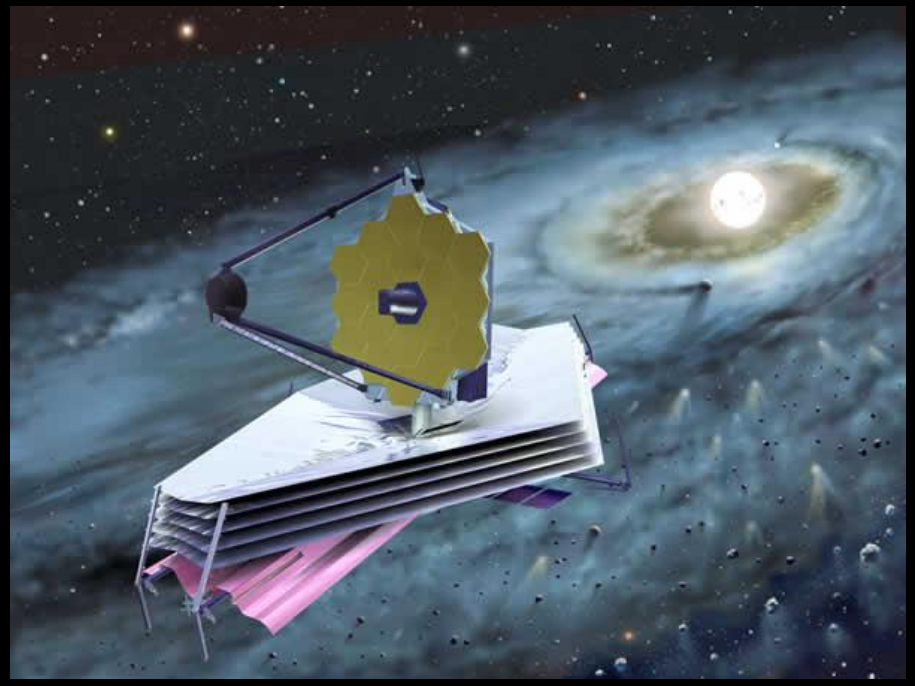
GAIA Mission Complete.

SOFIA/ALMA normal operations.

LSST Surveys Underway.

JWST operations underway.

CHEOPS/TESS underway.



Design Requirements: Critical Scales

Physical Resolution:	30 AU (typical binary sep)
	5 AU (gas giants like our own)
	1 AU (rocky planets)
Spectral Resolution :	R = 100 (molecular features)
	R = 1000 (atomic features)
	R = 10,000 (30 km/ sec)
	R = 100,000 (3 km/ sec)
Field of View:	2’ (star clusters within 1 kpc)
	1.5” (circumstellar disk at 150 pc)

Design Requirements: Critical Scales

Physical Resolution:		15 pc	50 pc	150 pc	450 pc
JWST	1.65 μm	1 AU	3 AU	10 AU	30 AU
	10 μm	7 AU	20 AU	60 AU	180 AU
ELT	1.65 μm	.2 AU	.5 AU	1.5 AU	5 AU
	10 μm	1 AU	3 AU	10 AU	30 AU

Spectral Resolution :	
R = 100 (molecular features)	JWST
R = 1000 (atomic features)	JWST
R = 10,000 (30 km/ sec)	ELT
R = 100,000 (3 km/ sec)	ELT

Field of View:	
2’ (star clusters within 1 kpc)	JWST
1.5” (circumstellar disk at 150 pc)	ELT

QUESTIONS POSED IN ADVANCE:

What are the synergies between E-ELT, ALMA, and JWST in studying circumstellar disks and planet formation?

What will VLTI do in terms of science at the highest resolution (though much lower sensitivity) in these areas?