



Big(-ish) Data in MAST

Pan-STARRS, TESS, WFIRST
IVOA Interop, Paris, May 2019

Tom Donaldson



Pan-STARRS

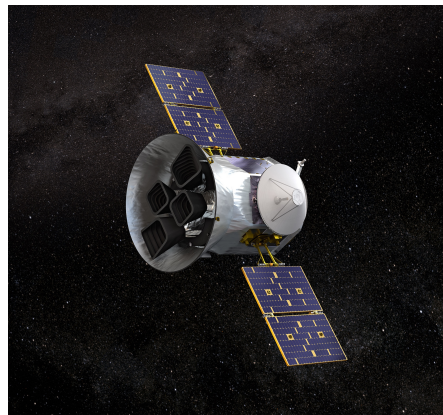
- 1.8 meter telescope with wide-field imaging on Haleakala in Hawaii
- Sky coverage north of -30 degrees.
- 5 bands (g, r, i, z, y)
- Supported at MAST by the Moore foundation



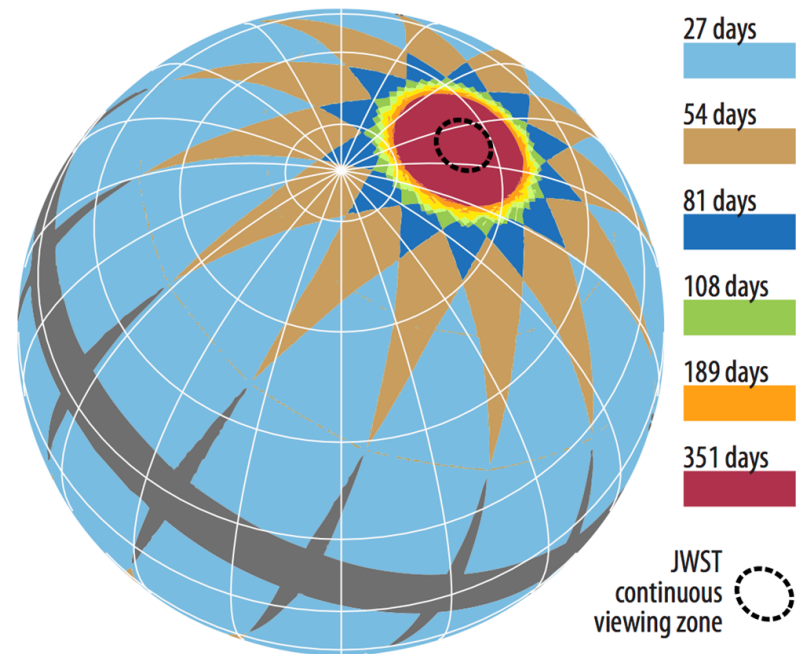


TESS

- Launched on April 18, 2018
- (Nearly) All-sky survey
- Planet hunter
- Full-frame image reads out every 30 min.
- Postage stamp target pixel files read out every 2 min. for high-prec. photometry.



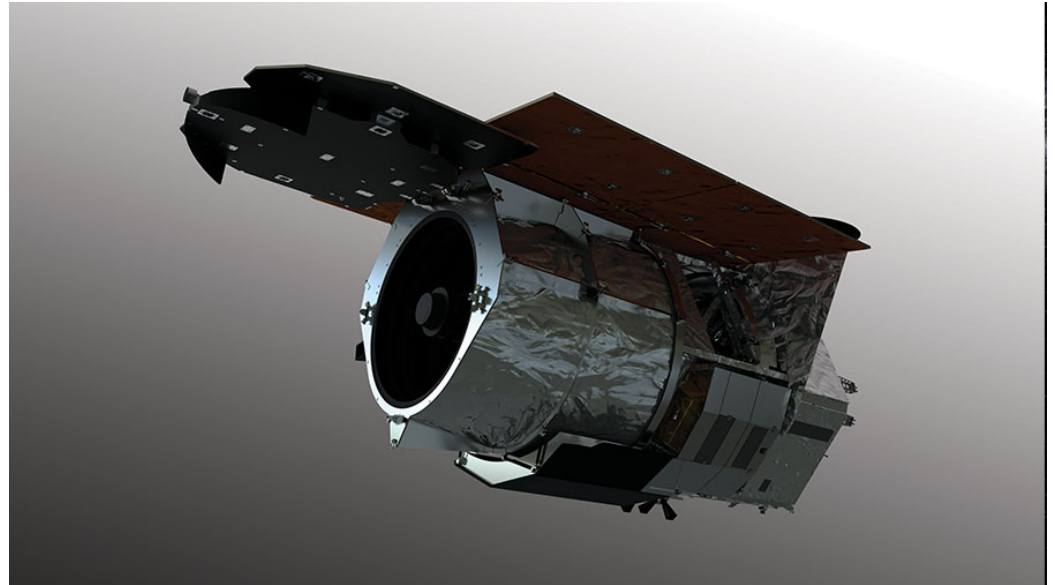
TESS 2-year sky coverage map





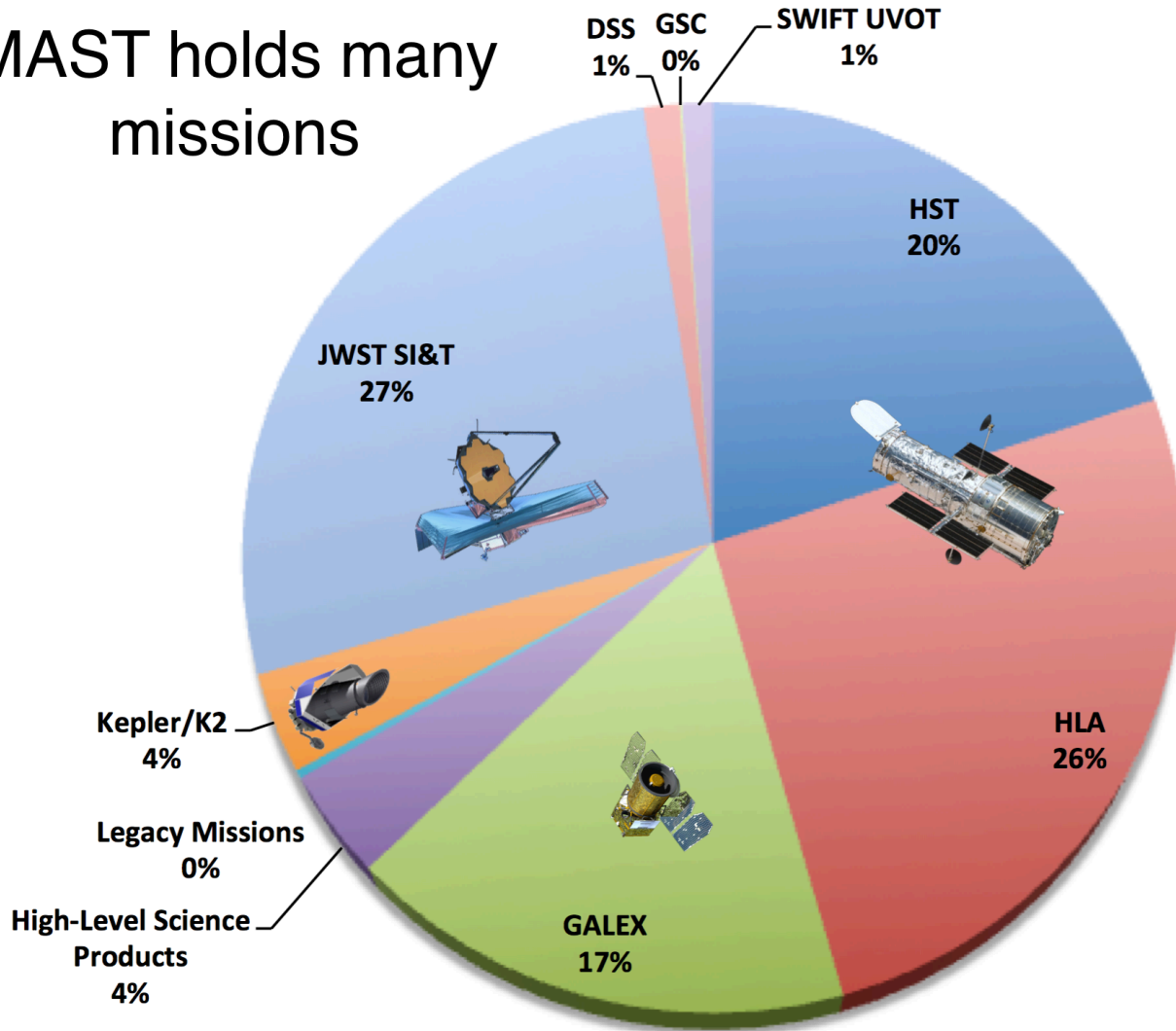
WFIRST

- Wide Field Infrared Survey Telescope
- Launches in mid 2020's to L2
- Hubble-size mirror (2.4m)
- FoV 100 times larger ($>0.28 \text{ deg}^2$)
- 0.11 arcsec/pixel



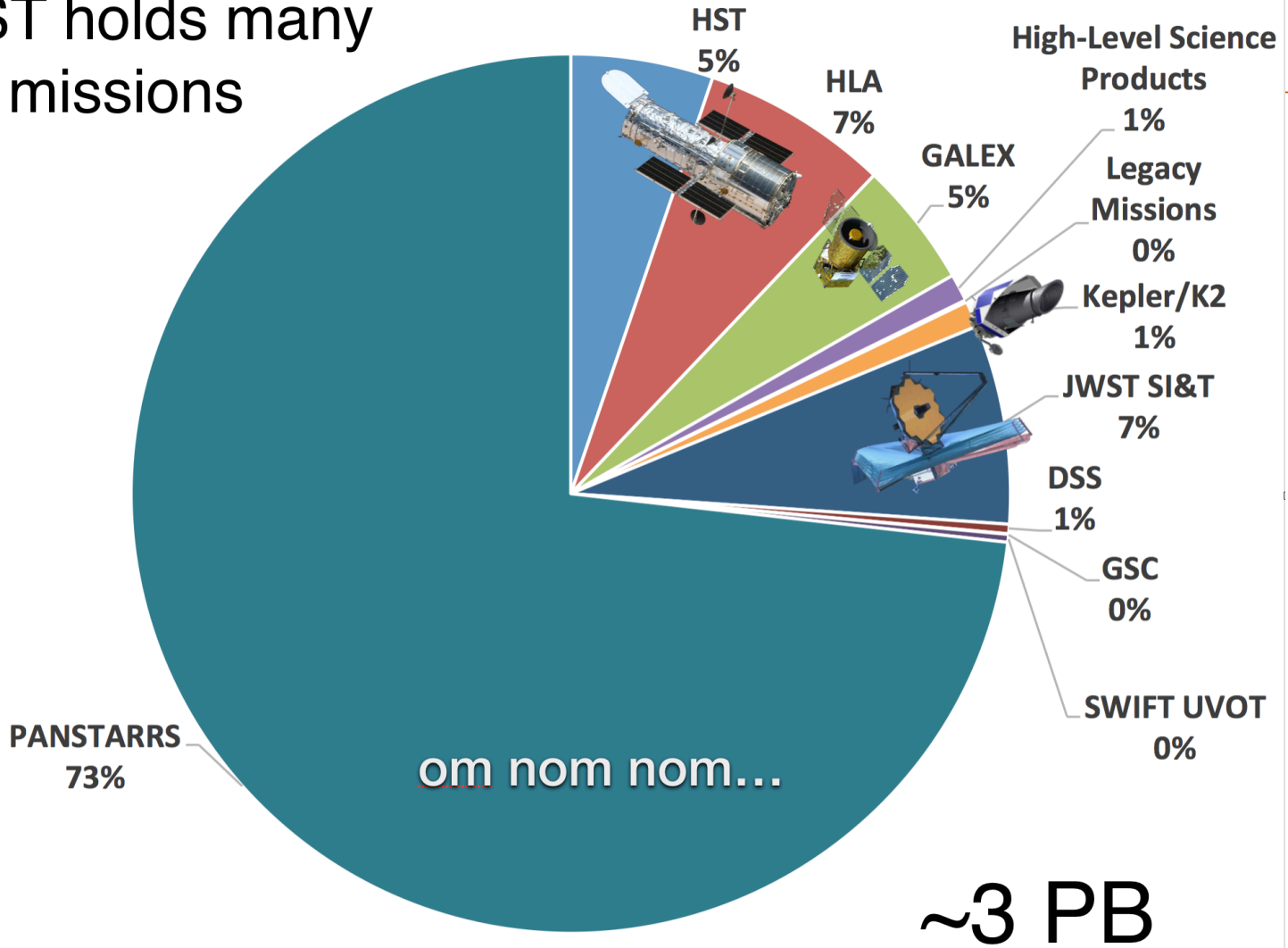


MAST holds many missions





MAST holds many missions



Data Access		Pan-STARRS (PS1)	TESS	WFIRST
Images, Light Curves		DR1: 100 TB (1M images) DR2: 1.4 PB (22M images)	150 TB plus 260TB for HLSPs (~50TB so far)	~20PB
CAOM	VO SIA/SSA	Maybe	Maybe	Maybe
	VO TAP	Current	Current	Planned
	MAST API	Current	Current	Planned
Mission-Specific DB	VO TAP	No	No	Planned
	MAST API	No	No	Planned
VO HiPS		DR1 current (CDS), DR2 ??	Maybe	Maybe
Image/Cube Cutout	SODA	Maybe	Maybe	Maybe
	MAST API	Current	Current	Planned
Catalog Databases		DR1: 15TB (11B objs) DR2: 150TB (11B objs, 73 B dets)	TIC 8: 1.7B rows	??? rows/objects
VO Cone		DR1 Current, DR2 Planned	Current	Planned
VO TAP		Current	Maybe	Maybe
MAST API		Current	Planned	Planned
Casjobs		Current	No	Maybe