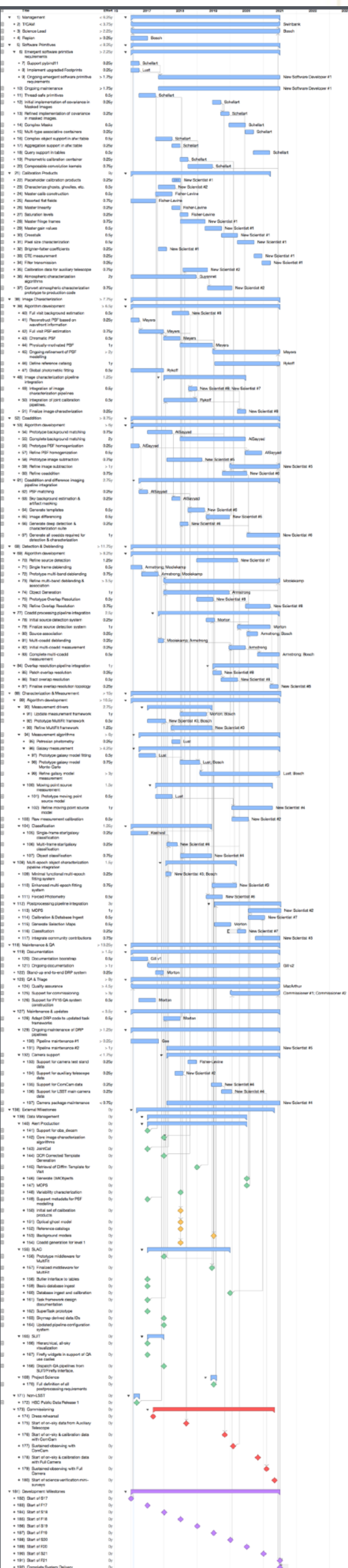


Data Release Production Replan Status

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Large Synoptic Survey Telescope



- Delivers complete LDM-151 §§4 & 5 + **QA**, camera packages.
- Start 2016-12-01(S17), finish 2021-05-31 (S21).
- 137 separate activities.
 - Each traceable to sections of LDM-151 or other documents.
 - Reduced to 52 planning packages.
- 22 L3 milestones required from other teams.
- 5 L3 milestones delivered to other teams.
- 80 FTE years scheduled work.
 - **Top-down estimate based on experience and judgement.**
 - 17.8 FTE continuously from start date.
- \$14,349,910 total cost (based on PP definitions).
 - **\$2,236,030 overrun.**

New Work Breakdown Structure



1.02C.04.00	Management	\$1.2M
1.02C.04.01	Software Primitives	\$1.5M
1.02C.04.02	Calibration Products	\$1.5M
1.02C.04.03	Image Characterization	\$1.4M
1.02C.04.04	Coaddition	\$1.4M
1.02C.04.05	Detection & Deblending	\$2.3M
1.02C.04.06	Object Characterization	\$2.7M
1.02C.04.07	Maintenance and QA	\$2.5M

Major L3 Requirements



- Alert Production

- A series of algorithmic components. Highlights include:

- JointCal (LDM-151 §§8.2, 8.3, 8.23.2, 8.23.3); S17.
- Core image characterization routines (LDM-151 §§8.2, 8.3, 8.23.2, 8.23.3); F17.
- DCR corrected template generation (LDM-151 §8.18); F17.
- Variability characterization (LDM-151 §8.20); S18.
- MOPS (LDM-151 §§8.25–8.29 inclusive); S20.

- DM Project Science

- Detailed postprocessing specification (LDM-151 §5.6); F19.

Major L3 Requirements #2



- DAX

- SuperTask definition & prototype; S17.
- Prototype database ingest in support of QA; S17.
- Prototype MultiFit-style workflows; F17.
- Ingest & calibration at scale; F19.

- SUIT

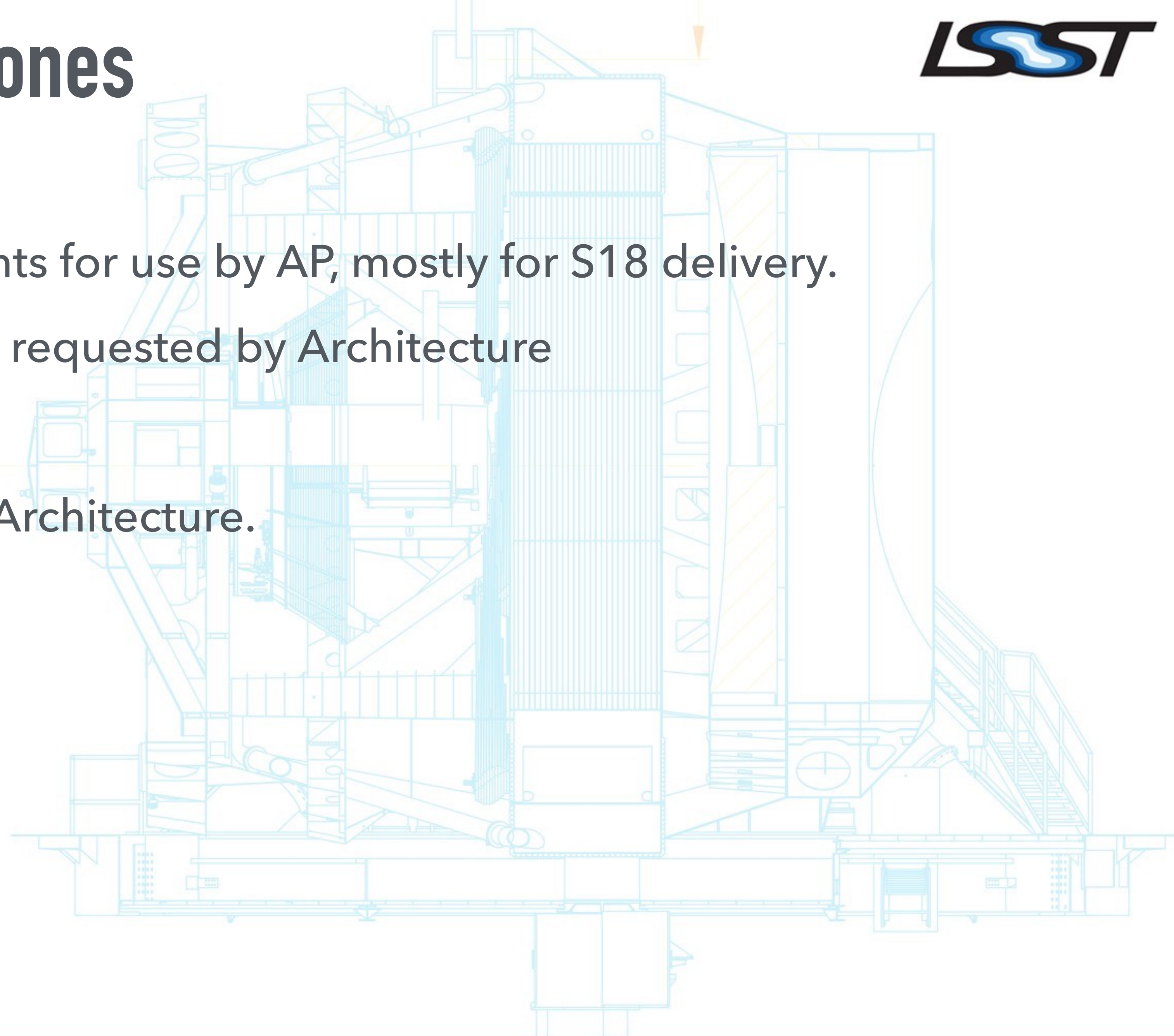
- Visualizations in support of QA: to be driven by QA plan.
- HEALPix visualization in S17.

- SQuaRE


- SQuaSH over arbitrary datasets; scheduling still TBC.

Major Deliverable Milestones

- Assorted algorithmic components for use by AP, mostly for S18 delivery.
- Algorithmic component update requested by Architecture
 - Requires further definition.
- Integration tasks as defined by Architecture.



Major Functionality Milestones



S17	Replan complete
S17	PSF homogenization
F17	Multi-band deblending
S18	MultiFit
S18	Background matching
F18	Galaxy model Monte Carlo
S19	Atmospheric characterization
S19	Image characterization
S20	Object generation
S21	MOPS integration

Major Uncertainties

- Still to demonstrate that Calibration Products Production outputs are perfectly aligned with AP/DRP inputs.
- Plan for auxiliary telescope processing needs more work.
- Plans for ghosts/glints unclear.
- Long term QA / QC plan is still not well defined.
 - Current plan allocates a bucket in DRP without proper motivation.
 - Full set of milestones required from other teams cannot be established.
- Still soliciting feedback/suggestions/approval from science leadership.

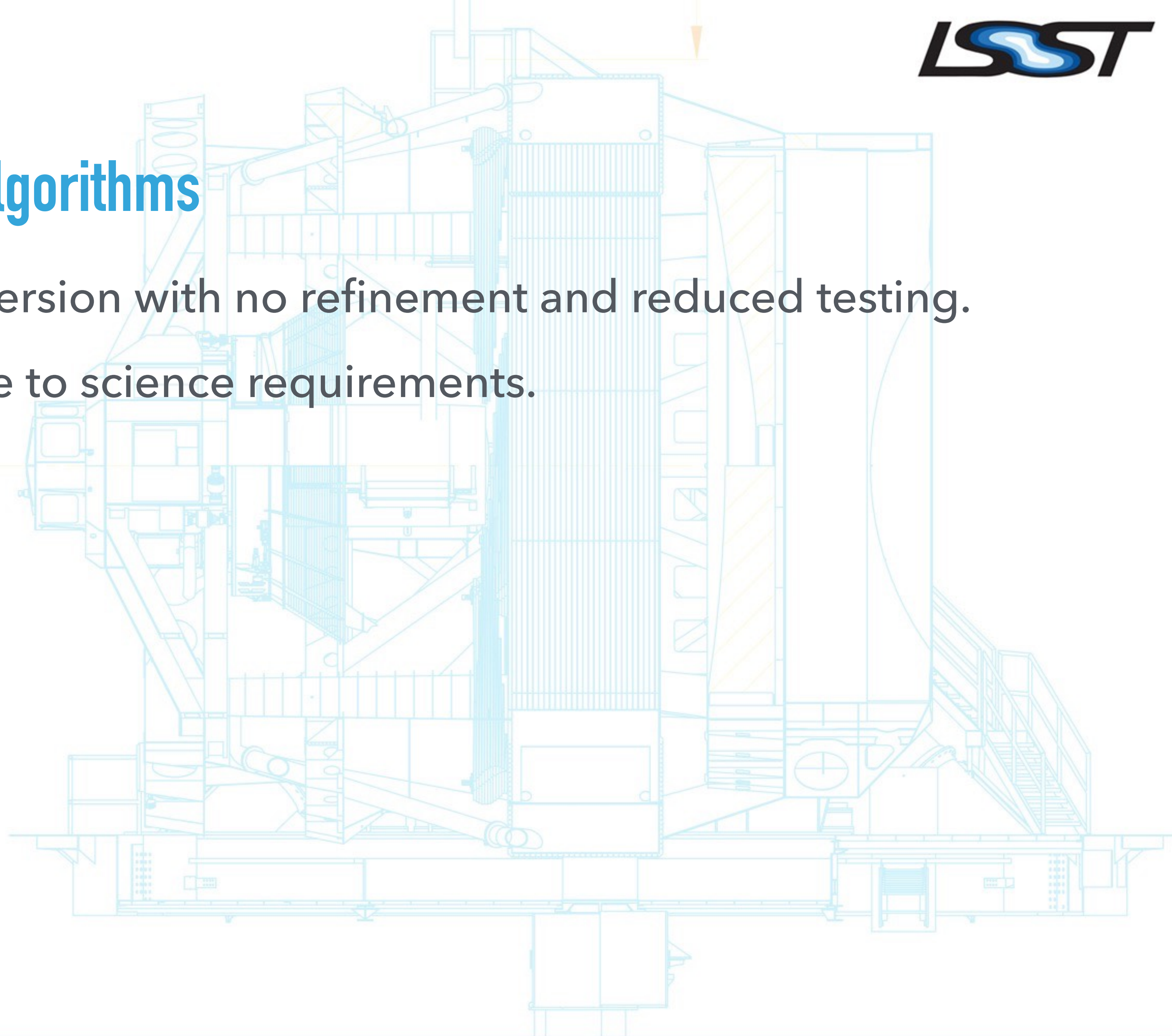
Back Of Envelope Descope Costing

- Limited by staffing, not budget:
 - $\$14.5\text{M} / 80 \text{ FTE years} \rightarrow \sim \$180\text{k}/\text{FTE}/\text{year}.$
 - $13.5 \text{ FTE} \times 4.5 \text{ years} \rightarrow \sim 60 \text{ FTE years}.$
 - Underspend after 4.5 years is $(80 - 60) \times \$180\text{k} \rightarrow \sim \$3.6\text{M}.$
 - Total cost is $\sim \$10.9\text{M}.$
 - Completion after 4.5 years is $\sim 75\%.$
- Plausible to imagine recruiting at a level which lands on nominal $\sim \$12\text{M}$ budget but is 10 FTE years from completion.
- Neglects other effects: massive recruiting, chance to “steal” effort from other teams, ...

Potential Descopes

Reduce Time Allocated To Major Algorithms

- Deploy a minimal/serviceable version with no refinement and reduced testing.
- Risk of underperforming relative to science requirements.
- Examples:
 - Deblender: \$650k.
 - PSF modelling: \$350k.
 - Image subtraction: \$200k.
 - Galaxy photometry: \$500k.



Potential Descopes #2

Postpone Multifit Until Operations

- Not required to hit early science goals; postpone to year 2 or 3.
- Requires development during operations.
- \$500k saving on algorithmic costs in DRP.
- Additional saving on middleware costs in DAX, hardware costs until we start processing.
- Rather than postponing MultiFit entirely, Jim suggests dropping certain features (moving star models, Monte Carlo sampling, etc). Less impact on both science outputs and cost.

Potential Descopes #3



Avoid Crowded Fields

- Commitments are vague (DPDD: “primarily designed to operate in non-crowded regions... expected to perform well in areas of crowding”).
- Bosch: “worried about PSF modeling and basic image registration on images where we just can't find enough isolated stars, so if we really wanted to save effort here, we'd want to get an agreement that we just wouldn't process these regions at all”.
- Likely simplifications across much of the codebase (image characterization, deblender, QA). Detailed assessment of impact requires more science input. \$500k?