



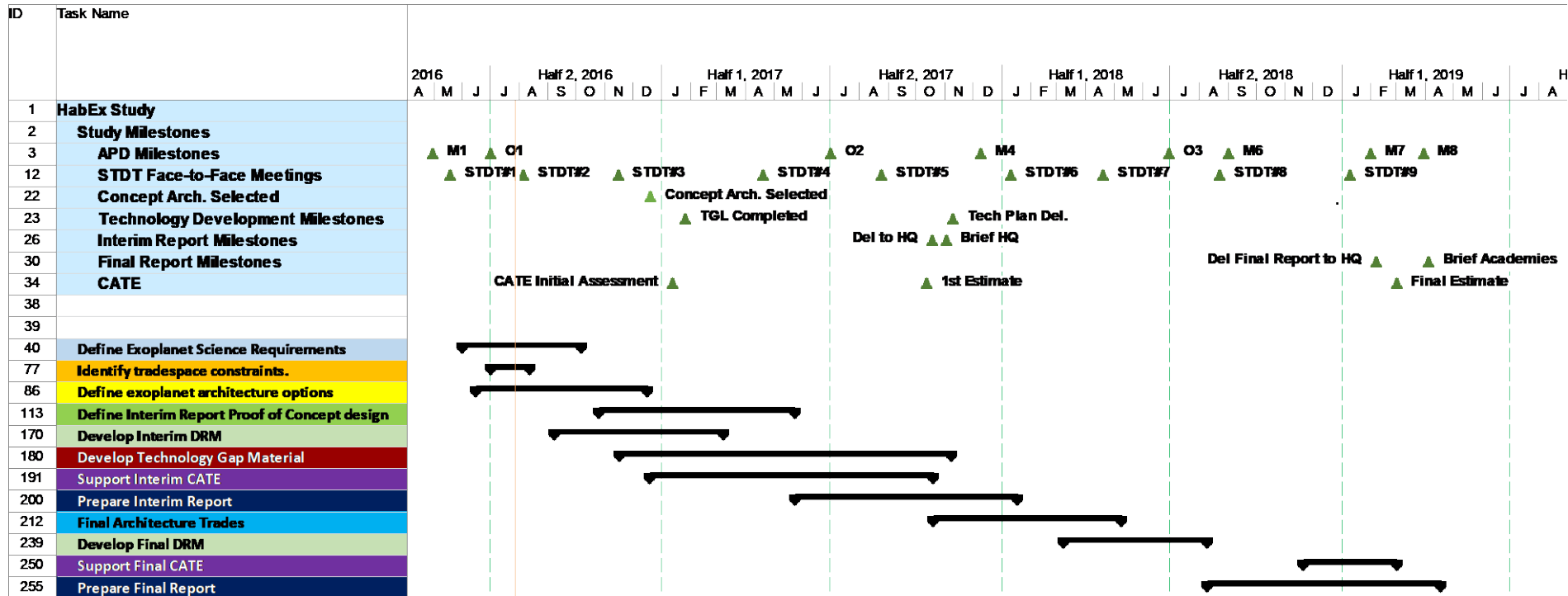
# HabEx Concept Study Schedule and Scope

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# HabEx Overall Schedule



- DSMT dropped M2 and M3, and made M5 optional
  - CML audits are no longer required
- FY17 will require the most work
  - Interim Report drives the work

# Near Term Schedule



ID	Task Name	2016														
		A	M	J	J	A	S	O	N	D	J	Half 2, 2016				
20	<b>APD Milestones</b>	▲	M1	▲	O1											
29	<b>STDT Face-to-Face Meetings</b>		▲	STDT#1	▲	STDT#2			▲	STDT#3						
39	<b>Concept Arch. Selected</b>												▲	Cor		
40																
41	<b>Define Exoplanet Science Requirements</b>															
42	<b>Define science goals and objectives</b>															
49	<b>Determine observational factors for identifying habitability</b>															
52	<b>Determine exoplanet observational approaches</b>															
56	<b>Map goals/objectives to observations</b>															
60	<b>Define exoplanet HZ spectral requirements</b>															
64	<b>Define other exoplanet observational requirements</b>															
68	<b>Define other observational requirements</b>															
72	<b>Establish key parameter definitions</b>															
78	<b>Identify tradespace constraints.</b>															
87	<b>Define exoplanet architecture options</b>															
88	<b>Agree on the trade methodology</b>															
92	<b>Develop trade tools (cost, mass, performance)</b>															
95	Brainstorm on different architectures to explore															
96	Describe each candidate option (aperture diameter, on/off axis, segmented/non-segmented, # of starshades, # and type of instruments, foreign															
97	List possible technology developments needed for candidate architectures (Coronagraph, starshade, telescope, pointing control, UV coatings etc.)															
98	<b>Trade Coronagraph/telescope architectures</b>															
105	<b>Define general astrophysics instrument options</b>															
112	<b>Final trade selection -- agree on the Interim Report baseline architecture</b>															
113	Margin															

# Key Points About Schedule



- Our near term goal
  - Narrow the tradespace down to an acceptable architecture for the interim report by year end.
  - This will give us about 7 months to design the interim concept and about 5 months to write the report
- Our very near term goals
  - Would like to define the direct imaging architecture tradespace and take a first cut at constraining by end of this meeting
  - Would also like to define the general astrophysics tradespace and take a pass at constraining by the end of the meeting
  - Will work to finalize and merge both architecture choices at the same time after the meeting.
- We have margin in the schedule

# Scope of Study Support



- Study Team
  - JPL engineering support includes flight systems and instrument systems engineering, optical design, thermal and mechanical engineering, mechanical design
  - Access to telescope, coronagraph and starshade expertise
- Other NASA Center Support
  - Have telescope systems, thermal and mechanical engineering support from MSFC
- Concurrent Design Work
  - 3 instrument designs for possible general astrophysics payloads are budgeted
  - 1 mission study budgeted
- Outside Science Support
  - Funding for ground RV work is included
- Industry
  - Will be enlisting NGAS for starshade support shortly
  - Have funds for one or possibly two additional industry participants if a clear need appears

# Scope of Study Support (cont'd)



- Cost Estimating and CATE
  - An initial design critique and a CATE-like estimate of the interim design are included
- Documentation Support
  - Editors and graphic artists for the Interim and Final Reports are included
- Travel
  - Have travel funding for all F2F meetings and closeout briefings
    - Working an issue getting funds to STDT and Design Team members at NASA Centers
  - Have some additional funding for a few community presentations
    - Chairs will decide which meetings will be covered by which STDT members
- Study Budget
  - The current budget utilizes all of APD's allocation. JPL also investing resources for complimentary work. Growth above the current plan is not likely. We must be careful about how we approach the study...spend the money where it will yield the most useful products.

# Key Trades



- Architecture
  - Direct Imaging Method
  - # of Starshades
  - # of Launches
  - L/V types
  - Orbit?
- Telescope
  - Aperture Size
    - Segmented or Monolith
  - Frequency Range
    - Mirror Coatings
    - Operating Temperature
      - Mirror Material
  - Stabilization method
  - On/Off Axis
- Coronagraph
  - Type
  - DM Size
  - Frequency Range
  - # of Bands
- Starshade
  - Type
  - Diameter and Petal Size
  - Bandpass Size
  - SEP or Bi-prop
- General Astrophysics Payload
  - Instrument Type
  - Frequency Range