# CMB Probe Mission Study May 24, 2017

#### Overview

- Admin + agenda check
- Probe PI Telecon review
- Plans for systematics and technology
- Plans for imager
  - and first round with bands

# Highlights from Probe PI Telecon - I

START TIME	TOPIC	<b>PRESENTER</b>
2:00	DECADAL STUDIES PROCESS AND MANAGEMENT - HQ PERSPECTIVE	Rita / Shahid
	<ul> <li>OVERVIEW: Rationale for the Probe Studies; HQ and Decadal Panel Expectations; the Decadal Process</li> <li>FUNDING: Start Date, Duration, End Date; No Cost Extensions; Funding for Studies and Design Labs; Cost Phasing</li> <li>HQ OVERSIGHT: HQ's Oversight Approach and Process; Reporting and Deliverables (Quad Charts); Key Milestones; AAS Presentations</li> <li>INDEPENDENT COST ESTIMATE: Process; Scope of \$1B Cost Limit</li> <li>TECHNOLOGY: General Approach to New Technologies; Expected / Routine Maturation by Study Teams; Costing Impacts</li> </ul>	
2:30	CONCURRENT DESIGN LABS INFORMATION	Kelley / Jennifer
	<ul> <li>TEAM-X PRESENTATION: Process, Products, etc.</li> <li>IDC PRESENTATION: Process, Products, etc.</li> </ul>	
3:00	ENGINEERING INFORMATION	Keith / Gabe
	<ul> <li>DESIGN GUIDELINES: Contingencies and Margins; Rules of Thumb</li> <li>FINAL STUDY PRODUCT: Definition of the Contents; Page Limits</li> </ul>	
3:30	QUESTIONS AND ANSWERS	All Participants
	OPEN DISCUSSION	
4:00	ADJOURN	

# Highlights from Probe PI Telecon - II

- Final report due Dec. 31, 2018
- Grant start (end) date is May 3, 2017 (Nov2, 2018); No-Cost Extension - OK.
- Progress reports due every 3 months (quad chart)
- AAS2018 Special Session
  - includes both Large Scale and Probe Missions
  - 10 min per probe
  - Asking for a Poster Session
- I proposed that NASA will consider an AAS2019 Special Session

# Highlights from Probe PI Telecon - III

- Report is 50 pages
  - TeamX results are part of our 50 pg report
- Teams have the equivalent of 'one round' with TeamX/IDC
- Presentation by Keith Warfield about TeamX/IDC costing rules
  - generally commensurate with Aerospace Corporation which did the independent cost assessment (ICA) for the previous decadal
  - 'Trust our cost estimates'.
  - Are these slides of interest?

# Highlights from Probe PI Telecon - IV

- NASA will submit our report to the Decadal Panel together with an ICA
- ICA by NASA's Science Office of Mission Assessments (SOMA). This topic generated most discussion, least cooked
  - Some teams are doing early design sessions to inform subsequent iterations. If design changes, SOMA doesn't have a basis for the ICA.

#### Plans for Systematics

- How do we integrate systematic effects into our work?
  - Where
    - simulations: leverage the work being done for S4
    - Optics/sidelobes: repeat the 4pi beams of epic-im?
- Anything else obvious?

• Propose: Brendan will present a plan

#### Plans for Technology

- What is the path (+ cost?) for space qualified
  - Multi-chroic TES / KIDs for the imager + MUXed readouts
  - Spectrometer + Multi-moded bolometers for Spectrometer
- Anything else already obvious?

• Propose: Jeff will present a plan

#### Imager / Frequency Bands - I

- Neither LiteBIRD nor CORE studied performance as a function of frequency <u>set</u>
- Current baseline set
  - 30 800 GHz; 19 bands
  - $f_n = f_{n-1} * 1.2$
  - 25% bandwidth
  - (30, 36, 43, 52, 62, 75, 90, 107, 129, 155, 186, 223, 267, 321, 385, 462, 555, 666, 799) GHz

#### Frequency Bands - II

- Comments so far:
  - Jacques: more bands 130 220 GHz; go to 1.2 THz?
  - Charles: go lower than 30 GHz; more emphasis on foreground minimum at 70-80 GHz
  - Al: in simulations, don't assume the model you put in
- Suggested actions:
  - study Remazeilles et al. 1704.04501
  - define nominal focal plane + noise
  - simulate



# Backup Slides