

Mechanics of decadal review process and timeline

... and other factors that impact
CMB-S4 timing

timing

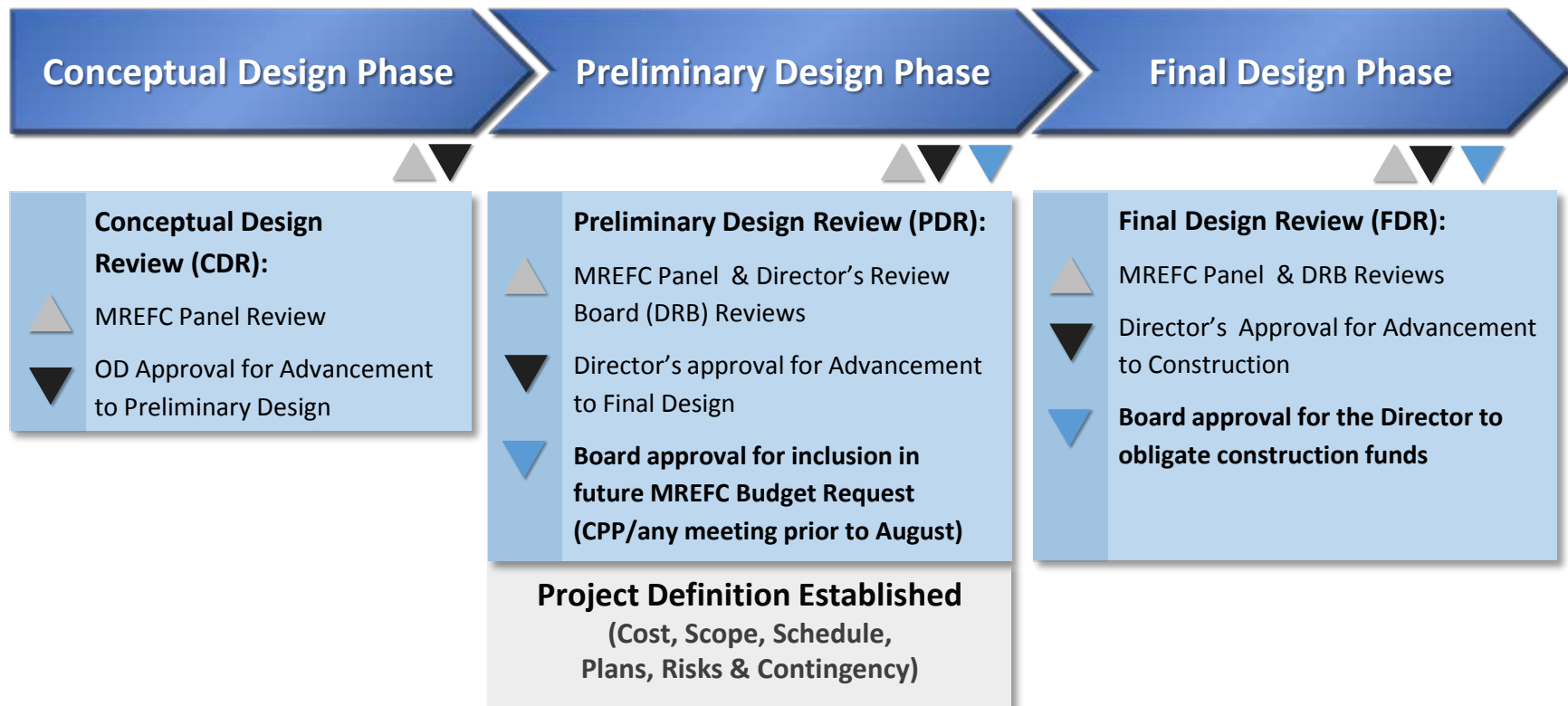
- 2017 October: CDT report submitted to AAAC for approval
 - should be big boost to our momentum and give DOE what they need for CD0
- 2017 March: Establish (or greatly advance) CMB-S4 Collaboration at next workshop
 - another big boost
- 2019? DOE CD0 (DOE's determines when)
 - another big boost
- 2020 Fall Astro2020 Decadal Survey complete
 - Hopefully a very big boost!
- 2020 Enter NSF MREFC queue ***if and only if***
 - NSF's construction cost exceeds \$70M ***and***
 - Astro2020 ranks CMB-S4 as high(est) priority in its class ***and***
 - NSF deems operations are affordable

FYI – taken directly from MREFC manual

Prerequisites for Candidate MREFC projects include:

- Have received **strong endorsement of the appropriate science and engineering communities**, based upon a thorough external review, including an assessment of (1) scientific and engineering research merit, (2) broader societal impacts, (3) importance and priority within the relevant Science and Engineering communities, (4) technical and engineering feasibility, and (5) management, cost, and schedule issues;
- Be of sufficient importance that the **Originating NSF Organization is prepared to fully fund the costs of pre-construction** planning, design and development, operation and maintenance, and associated programmatic activities (with full awareness that, for a long-lived facility, operations costs may ultimately amount to many times the construction costs); and
- Have been **coordinated with other organizations, agencies and countries** to ensure complementarity and integration of objectives and potential opportunities for collaboration and sharing of costs.

- The [MREFC] design stage is where detailed planning of RI [research infrastructure] which is formally approved by the NSF Director and funded by the sponsoring Directorate or Division [existing work sufficient or AST 2019 MSIP funded?] as a candidate MREFC (or other) project.



- The MREFC Design Stage generally lasts 3-5 years** and costs 10% or more of the estimated construction cost depending on the nature of the infrastructure. It is also the stage where construction funds are identified and (ideally) where partnerships are formalized.

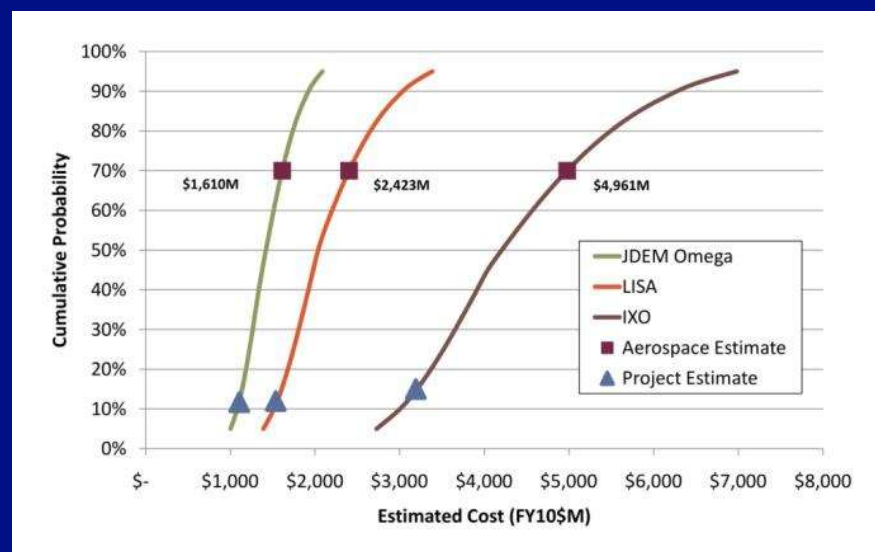
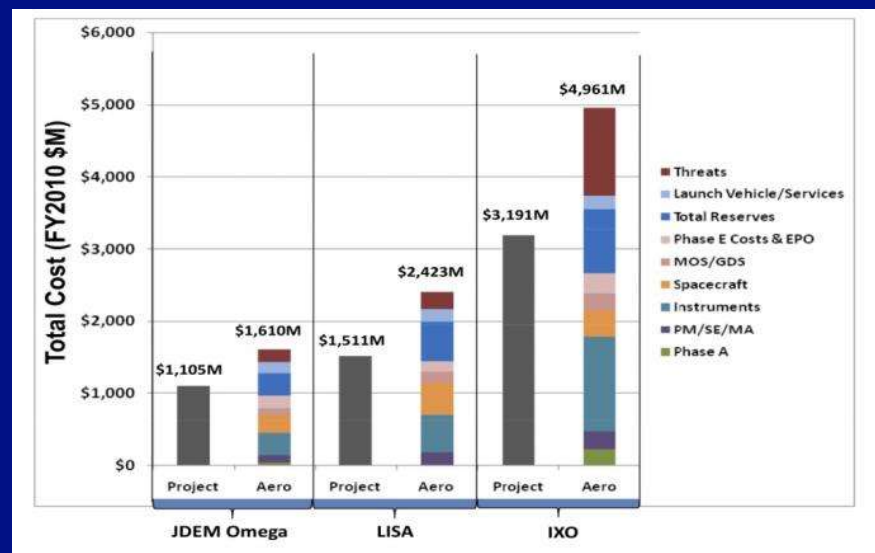
Astro2020 Decadal Survey Timeline

(approximate and interpreted a bit)

- Dec 2018: Survey Chair selected
- Early Winter 2019: Survey Committee finalized
- Winter 2019: 1st survey meeting; scope and dates set for white papers
- April 2019: white papers due
 - **Need CMB-S4 primarily science case with cost estimate, readiness and schedule**
 - We want to encourage submission of science white papers that support CMB-S4
- May 2019 to Jan 2020: survey makes specific requests to projects for additional input; holds town hall meetings; after which survey is effectively in executive session
 - **Need to have detailed CMB-S4 project ready to submit by \lesssim May 2019**
 - Survey makes first cut on projects and “CATE”s projects still in the running
- August 2020: Survey report results unofficially transmitted to agency to help inform FY22 budget planning

Cost, Risk, and Technical Evaluation

- Early call for Notices of Intent followed by open Request for Information
 - Activities selected by PPPs and committee for a 2nd Request for Information
- (PPPs = Project Priority Panels)
- Subset selected by PPPs and committee for CATE review
 - Independent cost appraisals
 - Evaluations of technical readiness schedule and risk assessment



Optimistic DOE CD schedule

- CD0 – Approved Mission need and preCD1 costing: end of FY19.
 - May want to delay official CD0, as it starts beginning of project accounting.
- CD1 – Approve conceptual design, including alternate selections and cost range: FY20+n
 - *$n > 0$ if forced to wait for Decadal and MREFC synch.*
 - CD1 before next P5, i.e., by 2022
- CD2 – Approve preliminary design, including performance baseline: FY21+n
- CD3 – Start of construction FY22+n
- CD4 – Project end, Operations start FY26+n+m
 - $m > 0$ if construction / commission extends > 5 years

As discussed yesterday, we want to have a CMB-S4 program that allows DOE to start before NSF MREFC

Another reason for DOE to start CMB-S4 earlier: timing of next P5

from Jim Siegrist's presentation at March 13, 2017 HEPAP meeting

- Must baseline major projects of current report before next P5; Avoids “decisional paralysis” of main audience; *[When asked about small projects, he responded that CMB-S4 should start before next P5.]*
- Wait until major reports e.g., A&A Decadal, are done.
- 2020: Begin process to update the 2013 “Snowmass” report.
- 2022: Release new P5 strategy report in time to inform FY 2024 budget
- Funding window for new projects opens in FY 2024

Summary of Decadal Survey action items for CMB-S4 collaboration

- Establish CMB-S4 collaboration
- Build community support for CMB-S4 (new name?), especially reaching out to non-CMB community.
- CMB-S4 white paper (April 2019)
- CMB-S4 supporting science papers (April 2019)
- CATEable design and cost, including readiness (ideally ready with white paper; expect request by ~June 2019)
- Coordination (phasing) with other MREFC AST projects, i.e., Next Generation VLA (NRAO led) and a next generation spectroscopic survey (Billion Object Survey) which are both likely to be later in the decade