



Project Update

M. G. D. Gilchriese (LBNL)
Interim Deputy Project Director
March 8, 2021

Who Am I

- Senior scientist at LBNL
- Involved in scientific management and project management of DOE, NSF or both DOE/NSF projects for last 35 years
 - Superconducting Supercollider
 - ATLAS@LHC
 - DUSEL
 - LUX dark matter project
 - LZ dark matter project

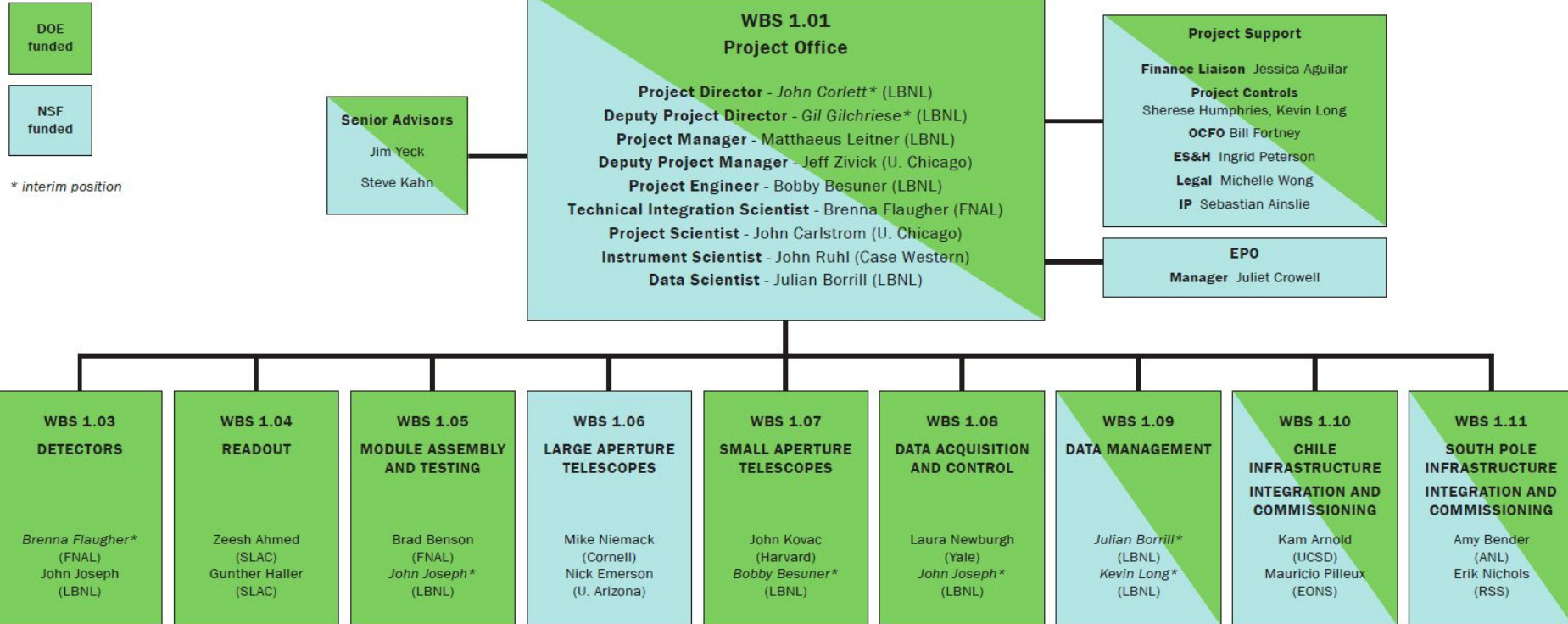
Outline

- Key Project Goals Over the Next Year
- Project Organization
- Design Review Plans
- Configuration Control Plans
- Cost & Schedule Update Plans
- Risk Update Plans
- MOUs/MOAs/SOWs
- Reporting
- Project Documentation
- Key Project Technical Issues
- Conclusion

Key Project Goals

- Obtain Funding
 - DOE
 - Have \$5M(FY21) + carry-forward from FY20. Distributing.
 - Made FY22 request. Overall DOE->SC->OHEP->CMB-S4 funding not known. Stimulus?
 - NSF
 - MSIP & MSRI-1 support ongoing work through FY21
 - Proposals to support FY22 and beyond to be submitted before FY21 ends
- Complete Status and Gate Reviews
 - NSF-led MRSI-1 status review by about mid-May. Received charge, working on agenda. Tentative dates May 11-12
 - DOE-led status review? Not decided but probable in summer.
 - NSF Preliminary Design Review - CRITICAL milestone. End of CY21? Plan on this now.
 - DOE Critical Decision 1(CD-1) Review - CRITICAL milestone. End of CY21? Challenging.
 - Director's Reviews will precede(by 6 weeks or so) DOE status, PDR and CD-1 reviews
- Make Technical Progress
 - Principal subject of this collaboration meeting

CMB-S4 Integrated Project Office



Date: 02 / 23 / 2021

Approved: Corlett, John N

L2 under change control, approved by PD
L3 well advanced, expect approval this month

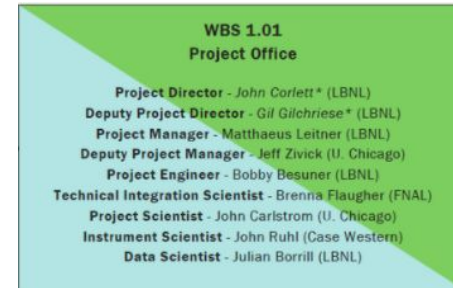
Upcoming Conceptual Design Reviews (CDRs)

L2	Review Scope	Date	(days)
Detectors	Detectors Design & Fab	6/22/21	2.5
Readout	Readout Design & Fab (Cryo)	6/16/21	2.5 total
	Readout Design & Fab (Cold/Warm)		
Module Ass'y & Test	Module hardware design	6/15/21	
	Module I&T plan		
LAT	SPLAT	5/6/21	1.5
	CHLAT		
	LATR	6/10/21	1.5
SAT	Mount	5/20/21	1.5
	Cryostat		
	Optics		
DAQ	DAQ	5/25/21	2.5 total
DM	DM	5/26/21	
Chile Infrastructure/I&C	Site infrastructure	5/13/21	1.5
	Instrument I&C		
South Pole Infrastructure/I&C	Site infrastructure		
	Instrument I&C		

- Design Review Policy/Procedure at [cmbs4-doc-673](#)
 - Describes planning/execution/closeout
 - Describes Review Manager role
 - Includes timeline before and after review
 - References [review report template](#)
 - Includes suggested charge and content of review materials
- More description at recent Technical Meetings
- Questions? Ask R. Besuner

Configuration Control

- In process of implementing database tool - [JAMA](#) - to capture requirements and point description(Current Best Estimate=CBE) in a controlled way
- JAMA training initiated
- Change Control Board(CCB) defined
- Begin monthly CCB meetings April 7
 - Start with top-level science requirements
 - Work “downward”
 - Ultimately capture CBE
 - Establish baseline and initiate Baseline Change Process
- Goals
 - Establish and exercise system prior to NSF-led status review
 - Preliminary baseline prior to NSF PDR and DOE CD-1
 - This will be challenging, but necessary this year



Questions? Ask
R. Besuner
J. Zivick
M. Leitner

Proud Leaders in Customer Adoption

It started with an idea – to build an easy-to-use requirements management platform that would address ever-increasing product and software development complexities. Now, 13 years later, Jama Software is an innovative, award-winning industry leader dedicated to helping our customers around the world shape the future by catalyzing their ideas into reality.

- 1,250**
review sessions daily
- 480 Million**
items managed by our clients
- 12.5 Million**
active users

Training Project of CMB-S4

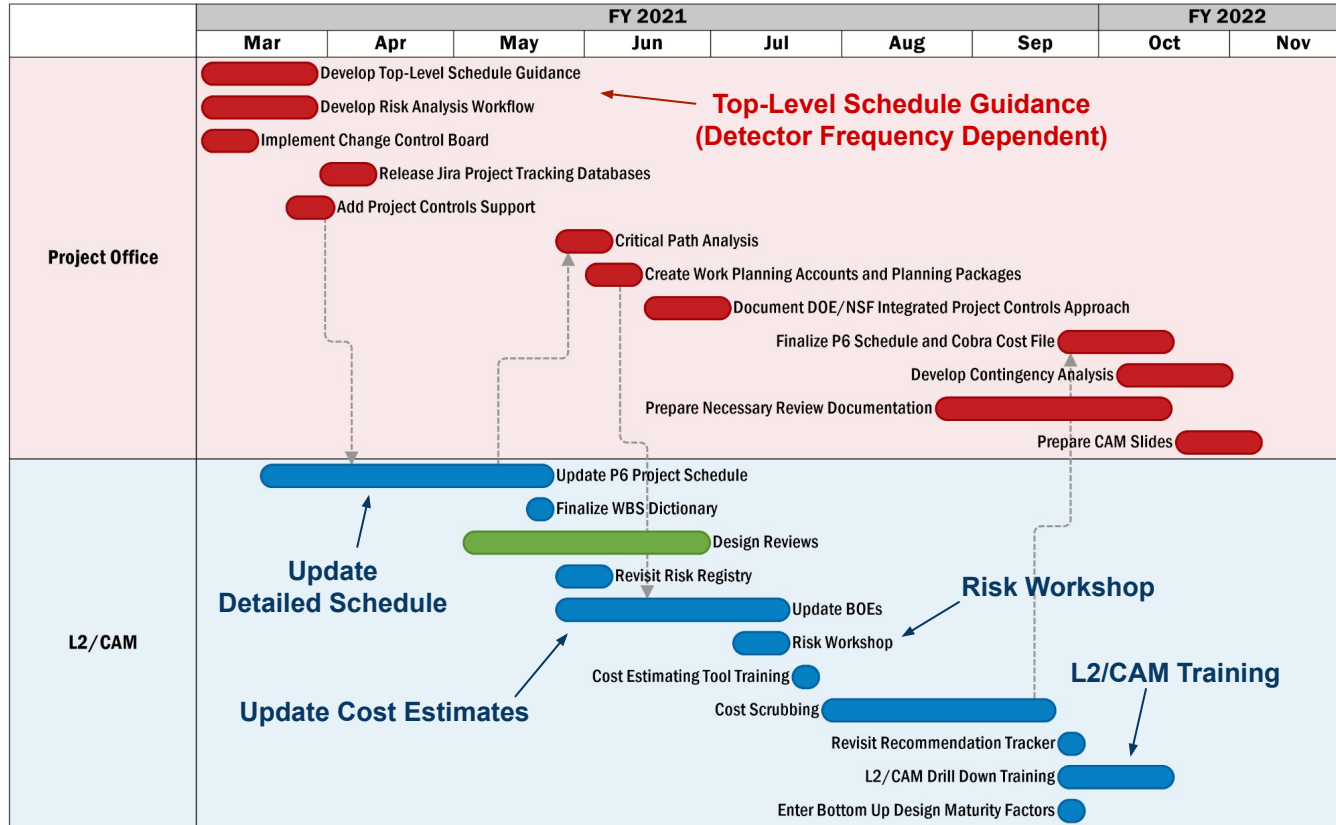
Project | Change project

Explorer

Add

- Training Project of CMB-S4
 - Level 1
 - 1.03 Detector Assembly
 - 1.04 Readout Assembly
 - 1.05 Module Assembly
 - 1.06 LAT
 - 1.07 SAT
 - 1.08 DAQ
 - 1.09 DM
 - 1.10 CH Site/I&C
 - 1.11 SP Site/I&C

Spring/Summer: Update Cost and Schedule Documents To Prepare For Potential Reviews By End of CY2021



- **May:** NSF Progress Review
 - Top-Level Schedule Defined
 - Risk Analysis Software Implemented
 - Schedule Logic Improved
- **April/May:** L2/CAMs Update Project Detail Schedule
- **May/June:** L2/CAMs Update Cost Estimates
- **July:** Risk Workshop
- **Aug/Sept:** Cost Validation

Schedule likely to be tweaked to match actual agency review schedule

Questions? Ask M. Leitner, J. Zivick

A Risk Registry Database Linked To Monte Carlo Analysis Software Will Establish NSF and DOE Contingency Requirements

CMB-S4 Your work Projects Filters Dashboards People Apps

Risk Dashboard

Inherent risk matrix: Risk

Quick Controller

Risk Registry

Quick Filter Results

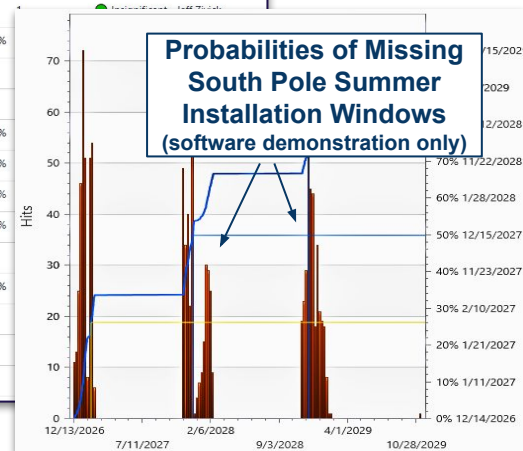
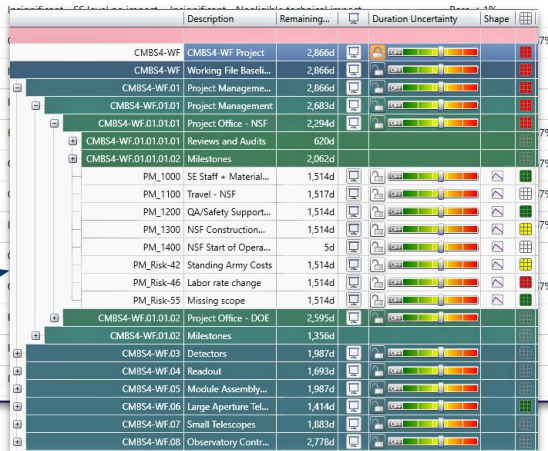
Key	WBS L2	Summary	Activity ID	Cost Impact	Schedule
RISK-69	1.06 - LAT	CHLAT Deployment	CHLAT_3000, CHLAT_3100	High - >= 1M and < 6M	Critical
RISK-71	1.06 - LAT	LATRs parts	LATR_7100, LATR_7000, LATR_7400	Insignificant - <50K	Insigni
RISK-70	1.06 - LAT	LATRs assembly	LATR_7100, LATR_7000, LATR_7400	Insignificant - <50K	Insigni
RISK-67	1.06 - LAT	LATRs assembly/checkout	LATR_7900, LATR_7300, LATR_7500	Insignificant - <50K	Insignificant - SS level no impact
RISK-52	1.01 - PM	FHE incident	PM_1200	Insignificant - <50K	Insignificant - Negligible technical impact
RISK-34	1.01 - PM	Standing Army Costs	PM_Risk-42, PM_Risk-54	High - >= 1M and < 6M	7%
RISK-42	1.01 - PM	Missing scope	PM_Risk-55	Insignificant - <50K	7%
RISK-38	1.01 - PM	Continuing resolution	PM_Risk-A	Moderate - >= 250K and < 1M	7%
RISK-36	1.01 - PM	Funding lack NSF	PM_Risk-A	Critical - >= 6M	7%
RISK-48	1.01 - PM	M&S OH rates	PM_Risk-B	Critical - >= 6M	7%
RISK-46	1.01 - PM	Labor rate change	PM_Risk-B	Critical - >= 6M	7%
RISK-68	1.06 - LAT	SPLAT Deployment	SP4_7700	High - >= 1M and < 6M	7%
RISK-40	1.01 - PM	Procurement delays		Insignificant - <50K	7%
RISK-50	1.01 - PM	Loss of major element during trans		Insignificant - <50K	7%
RISK-92	1.11 - Pole	Updated by a script - Setting User Picker Field		Insignificant - <50K	7%
RISK-91	1.11 - Pole	Pole I&C plans NSF		Insignificant - <50K	7%

Risk Entry

Impacted Schedule Activities

Monte Carlo Simulation Software Interface

- **Implemented a Jira-based risk database**
 - Automated risk ranking calculation based on risk impacts
 - Connects to Monte Carlo simulation software
- **Implemented Acumen Risk Monte Carlo simulation software**
- **Next steps**
 - **April:** Prepare project schedule to run a full risk analysis workflow (project office)
 - **April/May:** L2/CAMs update project schedule (L2/CAMs)
 - **May/June:** Revisit and consolidate current risk entries (L2/CAMs and project office)



MOUs/MOAs/SOWs

MOU: Memorandum of Understanding
MOA: Memorandum of Agreement
SOW: Statement of Work

- MOUs(standard format) with LBNL
 - Framework for potential in-kind contributions to CMB-S4
 - Harvard-Smithsonian: signed
 - CCAT Prime Observatory, Inc: in progress
 - Legal framework for work in Chile. U of Chicago: in progress
- MOAs(bespoke format)
 - Detector fab sites + Intellectual Property Management: NIST concluded, rest in progress
 - Institutional MOAs(signed once) + FY Appendix(update each FY): all institutions receiving funds from LBNL. In progress over next few months
- SOWs
 - Key part of contracts between LBNL and DOE funded institutions
 - In progress. Driven by agreeing on technical scope and getting procurement entities engaged at LBNL(new person helping, Jessica Aguilar) and at each institution

Questions? Ask M. Gilchriese(MOUs/MOAs)
M. Leitner(SOWs)

Reporting

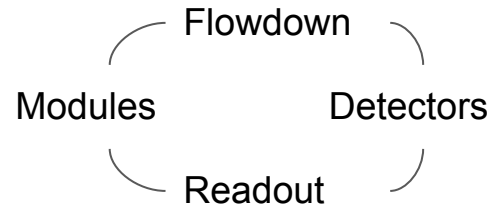
- Regular reporting to the NSF and DOE began months ago
 - [DOE](#)
 - [NSF](#)
- Quality and detail of DOE and NSF reports expected to improve as designs mature, test results come in, etc
- Financial reporting (specifically for the DOE but similar for NSF)
 - Required monthly from all institutions that receive funding
 - Experience suggests will be painful initially but it's essential
 - Down the road will feed into EVMS systems
 - Please respect this reporting need

Project Documentation Update

- Policy and procedures for using CMB-S4's official document repository, [DocDB](#), is posted to [cmbs4-doc-664](#). Accessible using your CMB-S4 credentials.
- Project Configuration Management Plan, defining approval and revision processes for project documentation is posted to [cmbs4-doc-238](#).
- Technical requirements are loaded to management tool, Jama.
 - Still a lot of work required to update and approve requirements and interfaces.
- Project Design Review Policy and Procedures posted to [cmbs4-doc-673](#).
 - L2 Conceptual Design Reviews scheduled for May and June (dates listed [here](#))
 - Review Recommendations tracked in this [google sheet](#)
- Meeting materials and links to relevant information are in [Confluence](#).
- Project CAD Policy and Procedures posted to [cmbs4-doc-661](#).

Key Project Technical Issues

- There are many, many design and technical issues to be addressed at this collaboration meeting
- Keys to moving forward with the Project are given below
- Scope. Is it right and can we, project management, defend it?
- Technical readiness => pass conceptual design reviews(or better)
- Cost containment. Cost growth at this stage of a project is a norm. Must keep costs(including risks) at forefront of technical development
 - Interplay among requirements flowdown, detectors, readout and modules
 - Manufacturability, minimize complexity of detectors/readout...think cheap



Meetings organized by B. Flaugher
Parallel sessions at this collab. mtg.

- Other area of potential concern now: cost of working at the Pole, how accounted by NSF

Conclusions

- Substantial progress in developing the CMB-S4 Project structure since August 2020 when LBNL was designated as lead laboratory
- Project “machinery” now coming together and will be used to prepare for agency status and gate reviews later this year or early 2022
- Formal technical design reviews for all major elements to be completed by this summer
- Cost and schedule to be updated this summer
- Critical to advance Preliminary Baseline Design and related Report in time for upcoming reviews

