



Outline

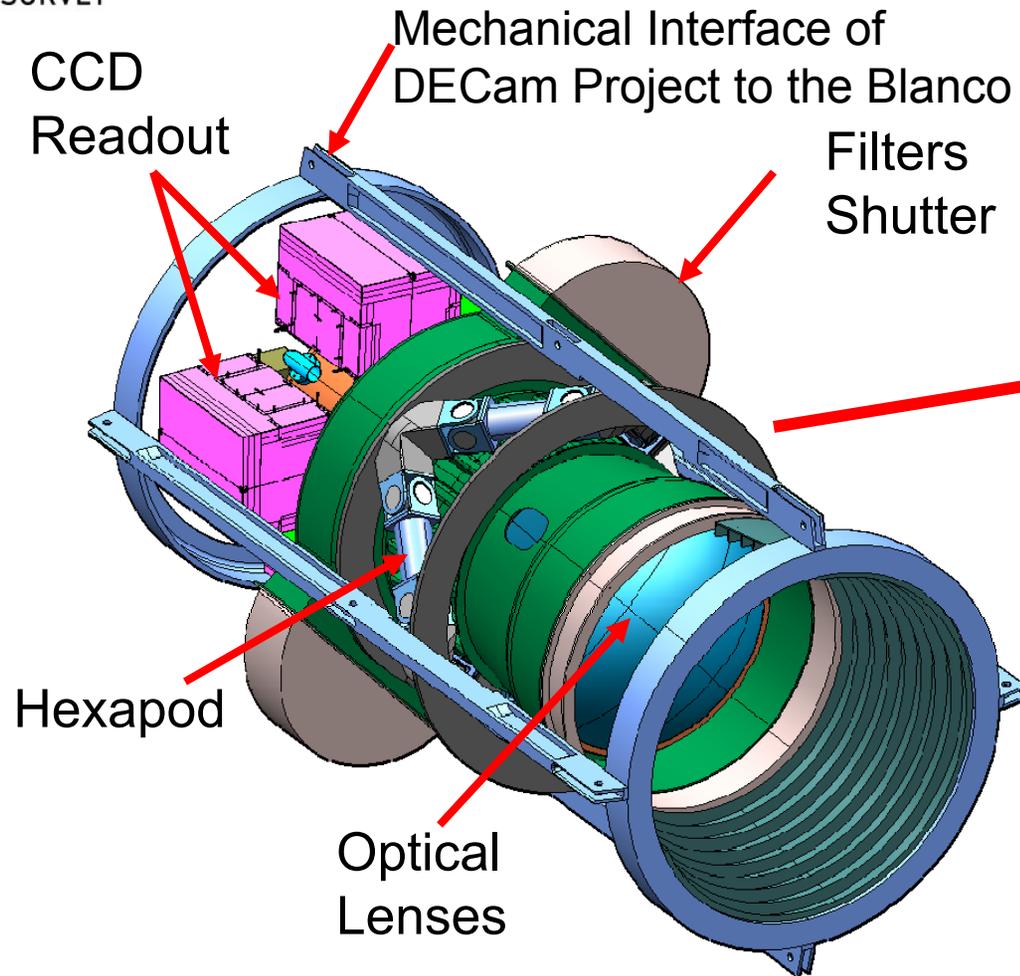
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- This talk will describe progress on DECam since the joint NSF/DOE CD-1 review in May 2007 and preparations for the Joint NSF/DOE review of DES Jan. 2008 which will serve as the CD2/3a review of the DECam Project for DOE.
- Introduction
- DECam Project Structure
 - 1.1 Management
 - 1.2 Focal Plane Detectors
 - 1.3 Front End Electronics
 - 1.4 Optics
 - 1.5 Opto-Mechanics
 - 1.6 Survey Image Processing System (SISPI)
 - 1.7 Survey Planning
- Preparations for CD-2
- Conclusions



DES Instrument: DECam replaces the Prime Focus Cage of the Blanco

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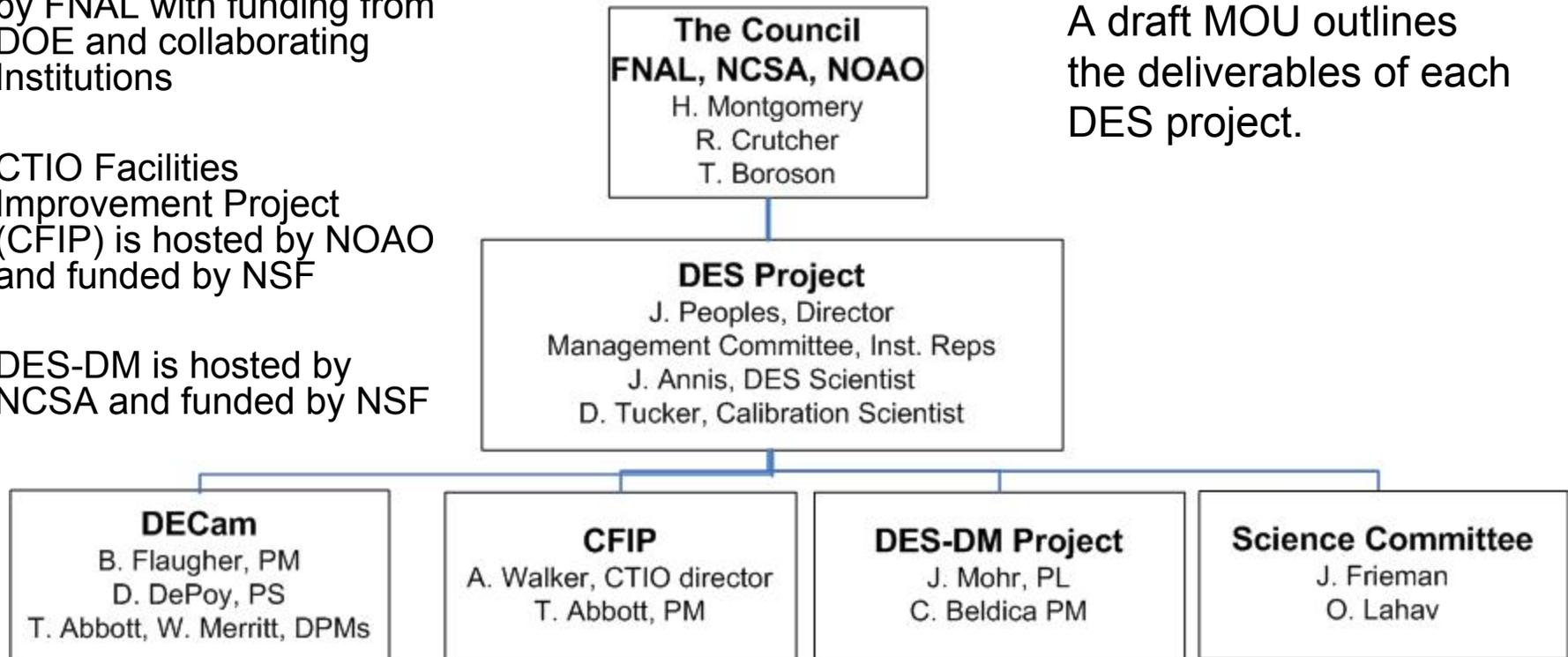
DES Organization

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- DECam project is hosted by FNAL with funding from DOE and collaborating Institutions
- CTIO Facilities Improvement Project (CFIP) is hosted by NOAO and funded by NSF
- DES-DM is hosted by NCSA and funded by NSF

Dark Energy Survey Projects

A draft MOU outlines the deliverables of each DES project.



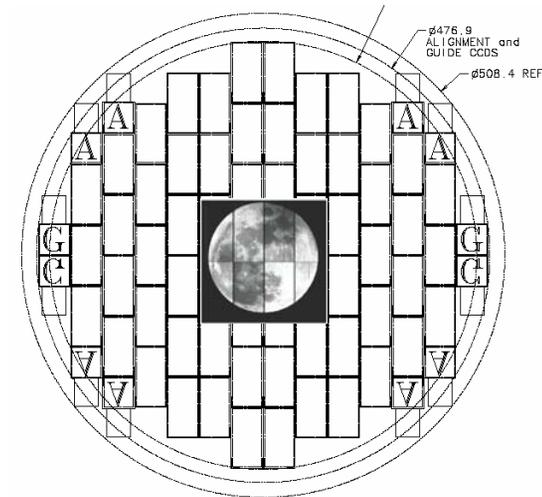


DECam Introduction

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- To meet the DES science requirements, within the allocated time period DECam must have:
 - 3 sq. deg. field of view
 - excellent image quality
 - red sensitive CCDs
 - g,r,i,Z,Y filters
- Our R&D program has addressed the most technically challenging aspects of DECam, and has led to a well understood cost and schedule

DECam Focal Plane



62 2kx4k Image CCDs: 520 MPix
8 2kx2k focus, alignment CCDs
4 2kx2k guide CCDs



DOE Expectations for Critical Decision 2 (CD-2)

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A successful review requires the following elements (413.3A):

- Technical Design Report
- Performance Baseline (Project schedule and cost)
- Up-to-Date Risk analysis
- Required Documentation (DOE Order 413.3A):
 - Updated Project Execution Plan
 - Updated Hazard Analysis Report
 - Approved Acquisition Strategy
 - NEPA documentation
- Other Documentation
 - Updated Project Management Plan (PMP) to supplement the PEP.
- **The DECam project has all of the elements required and will be ready for CD-2/3a approval by Jan. 29th 2008**



DECam Project Management Roles

(WBS1.1)

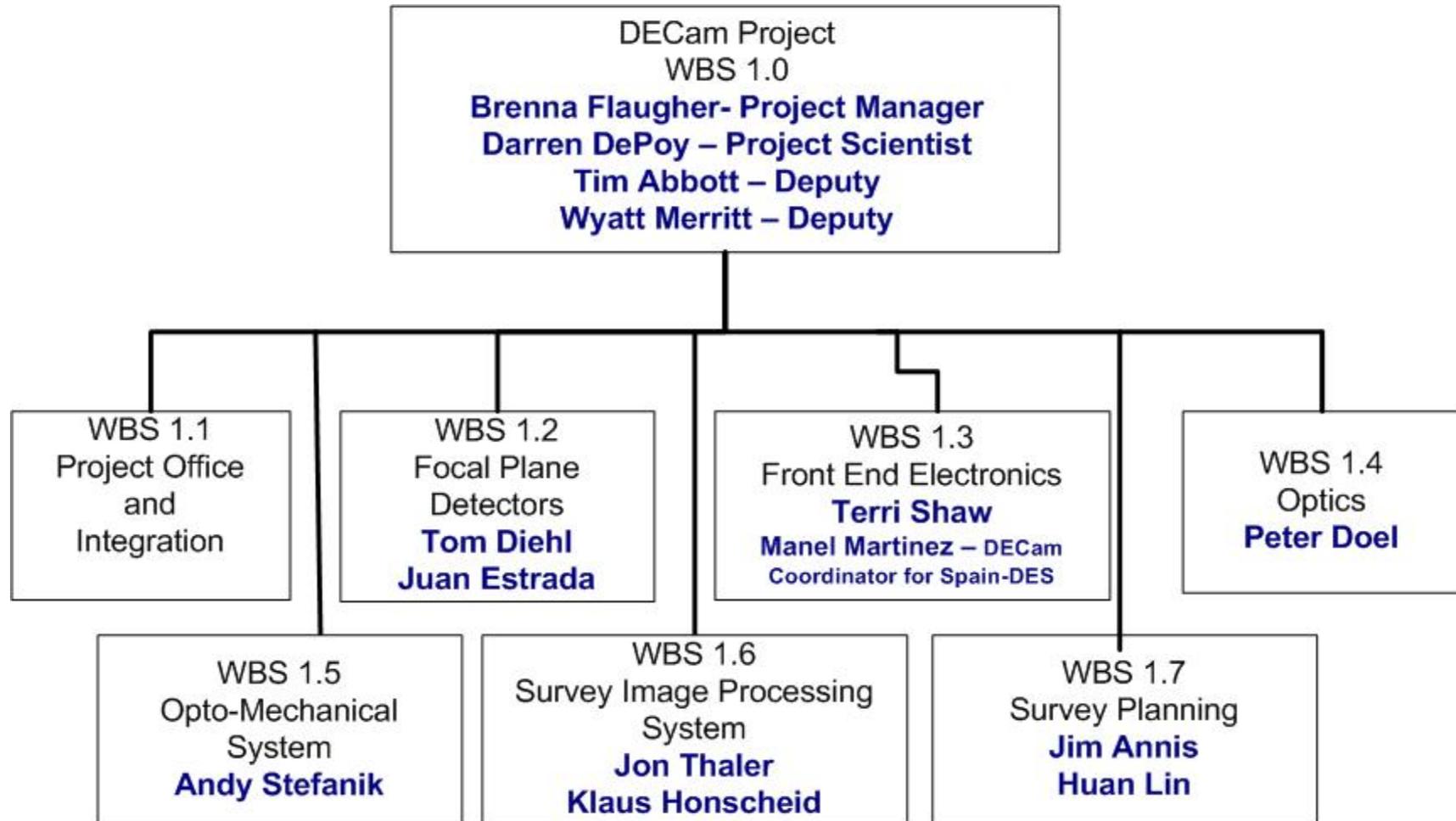
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- DECam Project Scientist: Darren DePoy (OSU)
- Two Deputy Project Managers
 - Both help with many aspects of the project management
 - **Fermilab DPM: Wyatt Merritt**
 - DOE Documents, Risk Management, ES&H
 - Signature and decision authority in absence of PM
 - **CTIO DPM: Tim Abbott**
 - Primary point of contact with CTIO
 - Authors documents on Integration and Acceptance of DECAM at CTIO
- Safety (ES&H) Coordinator: Wyatt Merritt
- Mechanical Project Engineer: Andy Stefanik
- Electrical Project Engineer: Terri Shaw
- Software Integration Coordinator: Jon Thaler
- Documentation Coordinator: Liz Buckley-Geer
- Budget Officer: Dale Knapp
- Scheduler: T.J. Sarlina



DECam Project Organization

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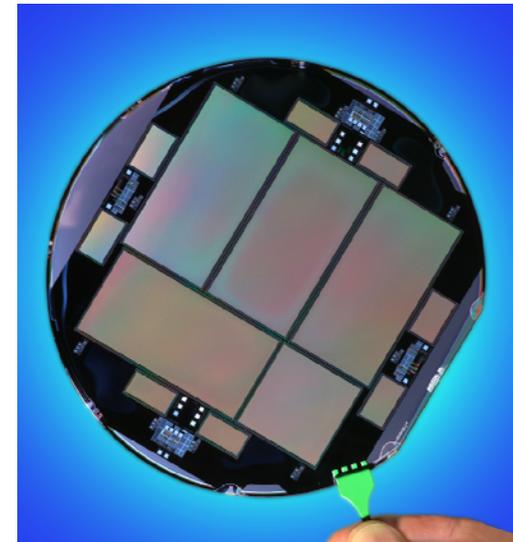
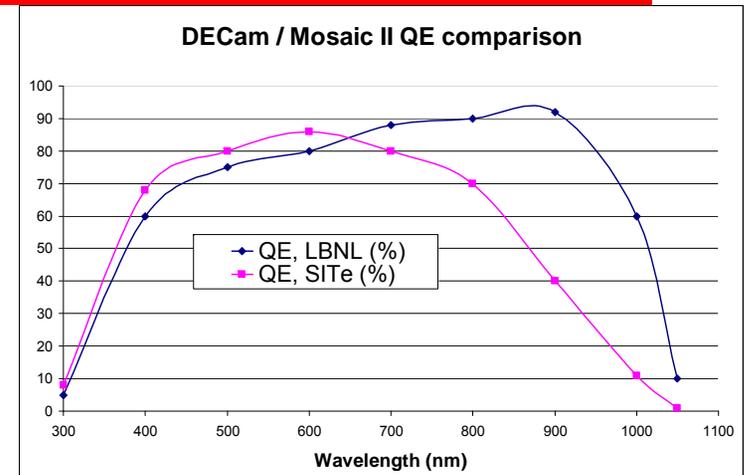


DECam CCDs (WBS 1.2)

LBNL, FNAL, ANL

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- Red Sensitive CCDs developed by LBNL:
 - QE > 50% at 1000 nm
 - 250 microns thick
 - readout 250 kpix/sec
 - 2 RO channels/device
 - readout time ~17sec
- The LBNL CCDs meet the DECcam requirements
- Our current estimate of the yield is 19.7% + 5.6% - 6.8%
- This translates to 83 + 23 – 29 good devices
- We need 72 good devices: 62 + 10 spares
- The project cost and schedule cover a yield as low as 15%.
- By the Dec. Review we will have more information on the low side uncertainty. We will add contingency, if needed, to cover the low side.



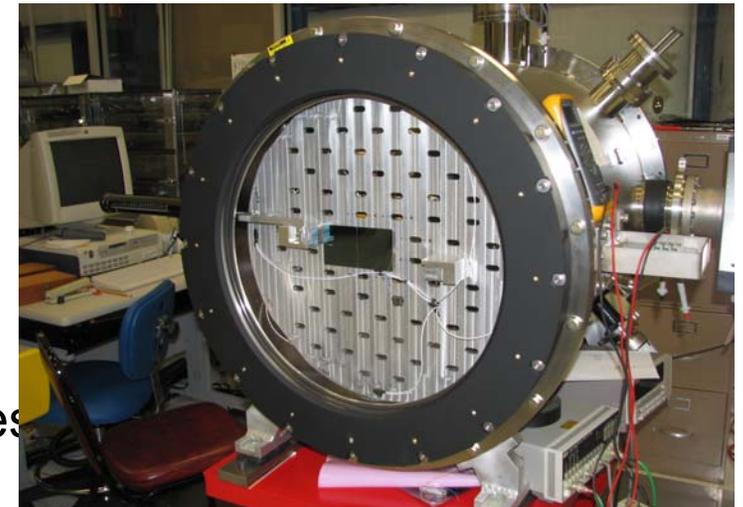


Front End Electronics (WBS 1.3)

FNAL, Spain, UIUC

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- We chose the Monsoon CCD readout system developed by NOAO as the starting point for the DECam readout
 - We have achieved the technical requirement of noise <10 e at 250 kpix/sec in the MultiCCD test Vessel (four CCDs readout in parallel)
- Prototype high density boards from Fermilab and Spain meet the readout specifications!
- Preproduction board design in progress
- Spain will provide the production boards.
- UIUC is developing thermally controlled crates
- Compact power supplies work with low noise and fit within the thermally controlled crates



Imager Prototype/Multi-CCD Test Vessel
FNAL and UChicago

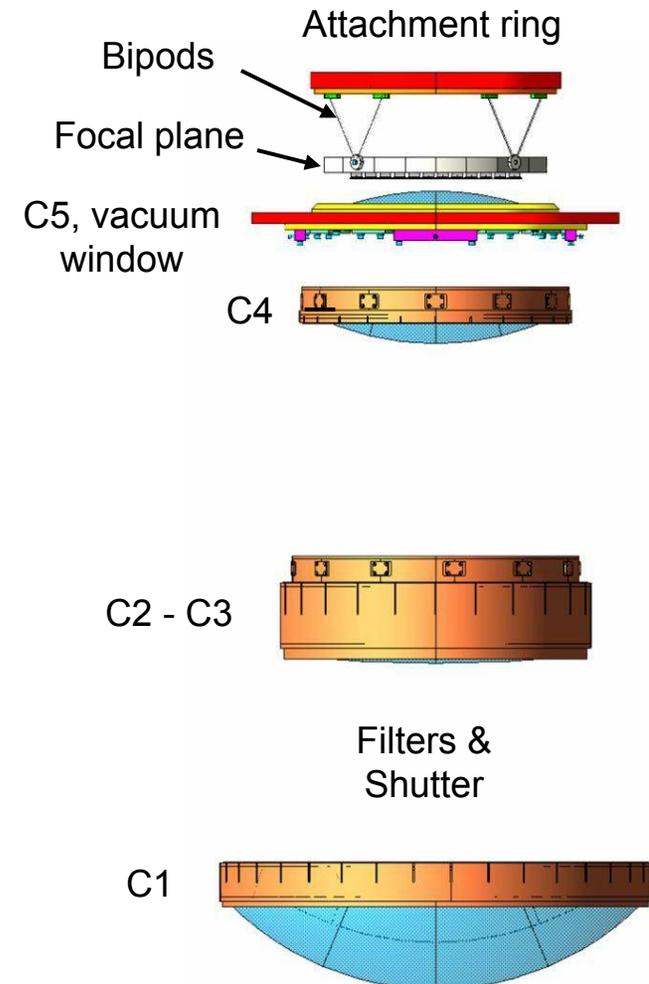


Optics (WBS 1.4)

UK, Michigan, FNAL

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- **Optical design was finalized in March '07**
- Blanks were ordered in Sept. 07. Delivery anticipated in Feb. 2008
- Funding for lens blanks (~ \$1M) is through in-kind contributions from Universities.
- Lens polishing, lens cells, corrector assembly and alignment are funded through a grant from STFC (PPARC), led by members of the University College London Optical Science Lab.
- Bids for polishing received last week, vendor and technical evaluation is in progress.
- Polishing of the optical elements is very long lead time (~1.5 years) and is on the critical path



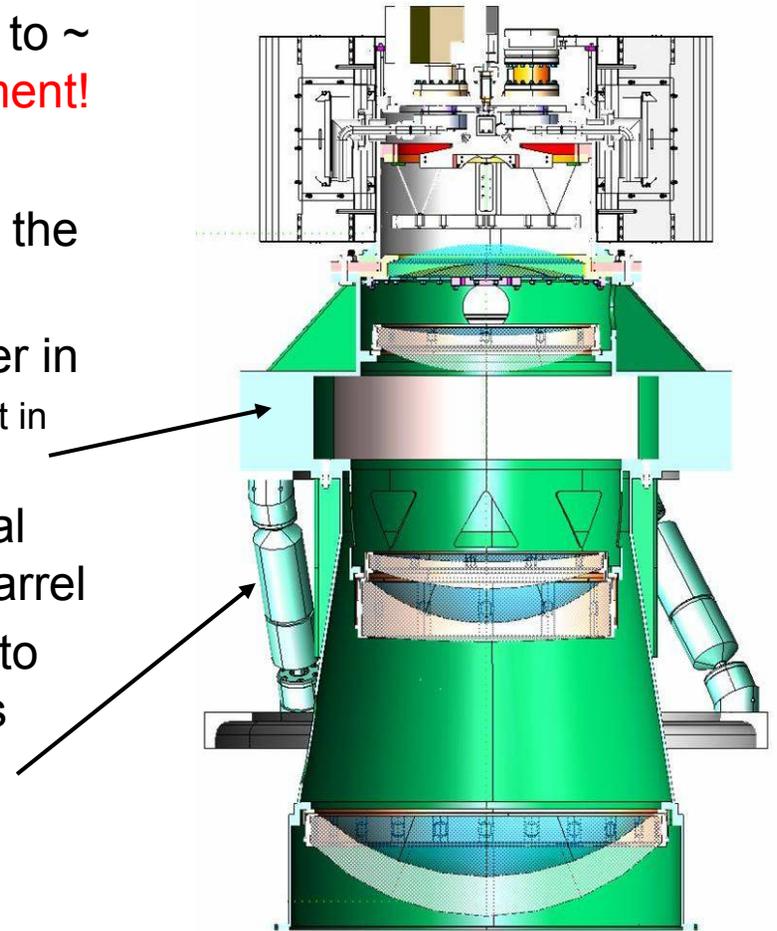


Opto-Mechanical Systems (WBS 1.5)

FNAL, ANL, Michigan

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- Barrel and lens cells must hold lens alignment to $\sim 25 \mu\text{m}$. **Preliminary design meets this requirement!**
- Imager is supported by the barrel.
- CCD readout electronic crates are mounted to the outside of the Imager and are actively cooled.
- LN2 pumped from the floor to a heat exchanger in the imager provides cooling. (External review report in Doc-db 1014)
- Filter changer and shutter form one mechanical unit, and are installed through opening in the barrel
- Barrel is purged and kept at positive pressure to eliminate condensation and to keep the lenses and filters clean.
- Hexapod (or alternative) provides focus and lateral alignment capability for the corrector-imager system.





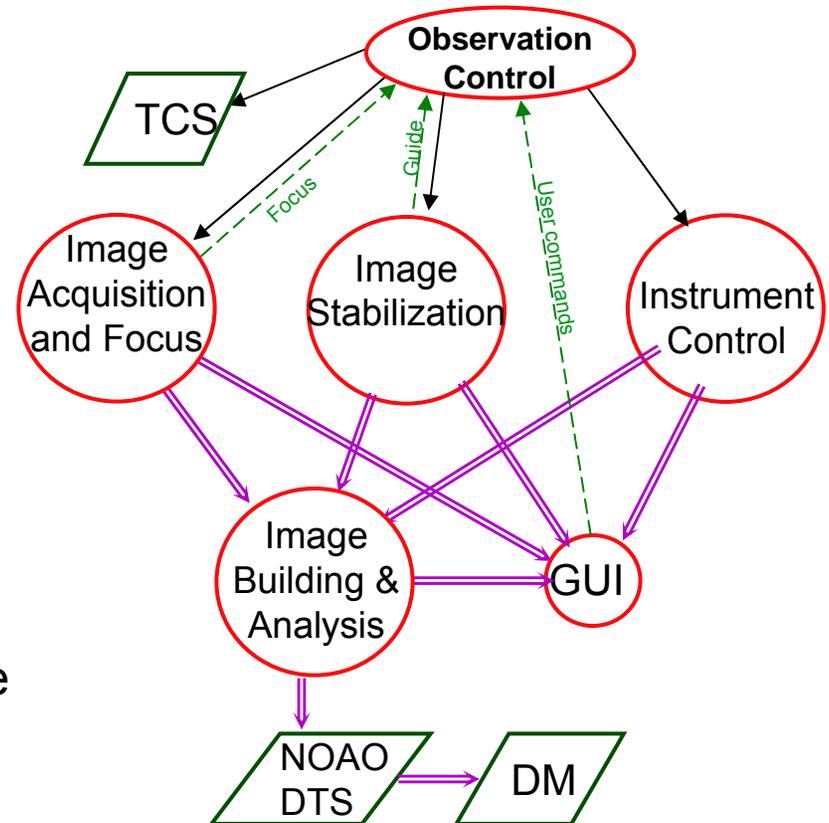
Survey Image System Process Integration (SISPI)

WBS 1.6

UIUC, OSU, FNAL, CTIO, ANL, Spain, Chicago

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- SISPI Controls the acquisition of images and has interfaces to
 - The NOAO Data Transport System which delivers the data to the DES Data Management system at NCSA
 - The Telescope Control System
 - The Observers
- UIUC and OSU are leading SISPI development.
- CTIO requested a LabView platform for compatibility with SOAR Telescope and existing expertise.
- UIUC, OSU and FNAL have LabView and are starting to use it!
- MCCDTV cooling is controlled by a National Instruments Compact Field Point controller and LabView – test bed for the final system.





CD3a Request

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- We will request CD3-a Approval for the following tasks:

	Request for CD3a	Start	Labor (k\$)	M&S (k\$)
WBS 1.2	CCD processing at LBNL	4/1/2008	0	639
WBS 1.2+1.3	CCD Packaging	4/21/08	553	526
WBS 1.5	Procure Hexapod	8/11/08	22	866
	Total Request (inc. OH)		575	2,032

These are all long lead time procurements.

Meeting with Kathy, Mike and Paul this afternoon to discuss the CD3a plans and plans for using MIE funds for final engineering and design



Funding Need Profile CD-1 Review May 07

(burdened and escalated to then yr \$)

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	FY07-Q4	FY08	FY09	FY10	FY11	Total
R&D	0.99	2.97	1.20	0.00	0.00	5.17
MIE-base	0.00	2.69	6.15	4.47	0.75	14.05
MIE-Cont.	0	0.91	1.35	2.2	1.3	5.76
MIE-Total	0.00	3.60	7.50	6.67	2.05	19.81
Total (R&D+MIE)	0.99	6.57	8.70	6.67	2.05	24.98

- Contingency on the MIE is heavily distributed in FY10 and FY11 because this is when extra CCD lots would be processed, packaged and tested.
- DES Collaborators are contributing in-kind labor, cash and equipment with a total value of ~ \$8M. These commitments include contingency.
- Base Schedule: delivery to CTIO in July 2010, testing complete Oct. 2010
 - No explicit schedule contingency included
 - These dates are used to coordinate with the other DES projects.
- DECam project complete milestone is Oct. 2011. This includes 12 months schedule contingency (~ 31%).

CD-1 Total Project Cost Range: \$24.1M – \$26.7M

Schedule Range: April 2011-April 2012



Dark Energy R&D Proposal

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- In Feb. FY07 DECam submitted a proposal to DOE in response to a solicitation for proposal for Dark Energy R&D.
- Funding for M&S and for postdocs and technical support of the University collaborators
- **In June 07 DECam was awarded \$900k out of a total of \$3M awarded!**
- Funds arrived in August 2007
 - \$117k for the University groups
 - \$683k for M&S for R&D
 - \$100k overhead
 - **This nearly covers the remainder of the R&D procurements**

R&D proposal for DECam, the Dark Energy Survey Instrument

SC Program announcement title: **Discovering the Nature of Dark Energy**
Name of laboratory : **Fermi National Accelerator Laboratory**
Name of principal investigator (PI) : **Brenna Flaugher**
Position title of PI : **Scientist II, Fermilab, DECam Project Manager**
Mailing address of PI : **M.S. 310, PO Box 500, Fermilab, Batavia, IL 60510**
Telephone of PI : **630-840-2934**
Fax number of PI : **630-840-8274**

Electronic mail address of PI : **brenna@fnal.gov**
Name of official signing for laboratory* : **Pier Oddone**
Title of official : **Director of Fermilab**
Fax number of official: **630-840-2900**
Telephone of official : **630-840-3211**

Electronic mail address of official: **pjoddone@fnal.gov**
Requested funding for each year; total request : **One year of funds are requested totaling \$2.3M**

Use of human subjects in proposed project: **No**
Use of vertebrate animals in proposed project: **No**

Signature of PI, date of signature

Brenna Flaugher 2/21/07

Signature of official, date of signature*

Pier Oddone 2/21/07

*The signature certifies that personnel and facilities are available as stated in the proposal, if the project is funded.



Funding

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- In August 2007 Kathy Turner sent the following proposed funding profile.
- FY07 includes the \$0.9M award (these funds arrived in August)
- The mix of MIE and R&D is not fixed and the total is not capped, although the MIE in FY08 will not go up.
- Currently we are working with Fermilab to determine what Fermilab can support in FY08

Kathy Aug. 30 07	FY07	FY08	FY09	FY10	FY11	Total
R&D	1.40	2.58	1.20			5.18
MIE		3.60	7.50	6.70	2.00	19.80
Total	1.40	6.18	8.70	6.70	2.00	24.98

Carry-over from Award in FY07 = \$0.83M (loaded)
Total available with this profile plus carryover is 7.01M



DECam Funding Need Profile Oct. 2007

(burdened and escalated to then yr \$)

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	Estimated Total Base w/Ind. & Esc.					
	FY07	FY08	FY09	FY10	FY11	Total
R&D	0.53	3.72	1.10	0.00	0.00	5.35
MIE	0.00	3.60	6.91	4.38	0.37	15.26
MIE-Cont	0.00	0.00	1.06	2.30	2.40	5.76
Total	0.53	7.33	9.07	6.68	2.77	26.37

- Once the funding guidance is finalized, the obligations profile will be adjusted to match the profile and to generate MIE contingency in FY08.
- Delivery to CTIO and project complete milestone may change due to the constraints on the funding profile in FY08 (depends on what they are)

Major cost increases in the MIE since the CD-1 review:

- Hexapod responses to RFI were higher than we had estimated
- Cost of CCD processing at LBNL went up ~ \$0.20k
- Current total cost includes 33% contingency



DECam Schedule Summary

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Task Name	Start	2007		2008				2009				2010				2011					
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
DECam Project	8/1/07																				
Management (WBS 1.1)	8/1/07																				
<i>Start of Project</i>	<i>8/1/07</i>																				
<i>CD-1 approval</i>	<i>10/15/07</i>																				
<i>CD2/3a approval</i>	<i>4/1/08</i>																				
<i>CD 3b approval</i>	<i>1/1/09</i>																				
<i>CD-4</i>	<i>10/11/11</i>																				
Focal Plane Detectors (WBS 1.2)	8/1/07																				
CCD R&D	8/1/07																				
Procure Package and test Lot 2 CCDs	4/2/08																				
Procure Package and test Lot 3A CCDs	11/18/09																				
Readout Electronics (WBS 1.3)	8/1/07																				
Prototype and testing	8/1/07																				
Production of RO electronics	7/16/08																				
Optics (WBS 1.4)	9/26/07																				
<i>Procure polished coated lenses</i>	<i>9/26/07</i>																				
<i>Put Lenses in cells and barrel and ship to CTIO</i>	<i>4/29/09</i>																				
Opto-Mechanics (WBS 1.5)	8/1/07																				
Test prototype imager and cooling system	8/1/07																				
<i>Design, build and test Prime Focus Imager, Cooling, controls</i>	<i>4/1/08</i>																				
Design, build and test prototype Barrel	1/7/08																				
Design, build, test and ship final barrel to UCL	11/17/08																				
Design, Build Test Cage, Telescope simulator, Hexapod	11/17/08																				
<i>Tests of all equipment on Telescope Simulator, Ship to CTIO</i>	<i>11/24/09</i>																				
Survey Image System Process Integration (WBS 1.6)	8/1/07																				
Prototype and Final SISPI software and hardware	8/1/07																				
Survey Planning (WBS 1.7)	8/1/07																				
Simulations and Observing Plan	8/1/07																				
CTIO integration (WBS 1.8)	11/16/09																				
Finalize Integration, installation and operations plans	11/16/09																				
<i>Reassemble and test DECcam</i>	<i>7/7/10</i>																				
<i>Acceptance Testing Complete</i>	<i>10/12/10</i>																				



Milestones

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Formal change control procedures will track technical, schedule, and cost changes in the project. Each change requires the preparation of a Project Change Request (PCR) form and approval depending on the size.

Milestone Definitions and Change Control thresholds:

- Level 4 Milestones are owned by the Level 2 managers. They define significant points in schedule – no contingency, no change control
- Level 3 Milestones are monitored by the DECam Project manager
Typically contain ~ 4 weeks of contingency.
 - A change of >2 wks triggers preparation of a PCR and requires approval of the DECam PM
 - A change of > 12 wks requires approval of the ADR (Associate Director of Research = Mont)
- Level 2 Milestones are monitored by DECam Federal Project Director. Contingency is ~ 12 weeks. Any change to these requires approval of the FPD.
- Level 1 are the highest level. Any change requires approval of the DOE Acquisition Executive. Contingency is ~ 6 months.



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Schedule Statistics

- 789 tasks (not counting summary tasks)
- 8 Level 1 Milestones
- 57 L2 Milestones (roughly 8 in each WBS Level 2 section)
- 83 L3 Milestones
- 231 L4 Milestones (roughly 35 in each WBS Level 2 section)



Level 3 Milestones in FY08

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WBS	Name	Baseline Start	Forecast Start	Variance	2008					2009	
					Q4	Q1	Q2	Q3	Q4	Q1	
1.7.3.4.4	L3 - Level 3 Test Images Complete	10/13/07	9/13/07	-4.2 wks	★	◇					
1.4.1.3	L3 - Contract Awarded for Production of Blanks	10/19/07	9/19/07	-4.4 wks	★	◇					
1.3.1.4.3	L3 - Clock v1 Card Tests at FNAL Complete	10/24/07	9/24/07	-4.4 wks	★	◇					
1.3.1.6.3	L3 - v1 DES Clock and Transition Card Tests Complete	10/27/07	9/27/07	-4.2 wks	★	◇					
1.1.4.8	L3 - Preliminary CTIO Integration Plans Ready For External Review	11/28/07	10/29/07	-4 wks		◇					
1.2.1.1.9	L3 - Lot 2C, 2D Control Wafers yield known	12/22/07	11/26/07	-3.8 wks		●	◇				
1.3.1.13.4	L3 - CCD readout review - go ahead for V2	1/16/08	12/10/07	-4 wks		●	◇				
1.6.1.1.4	L3 - Conceptual Design of Infrastructure Software Complete	2/1/08	12/28/07	-4 wks		●	◇				
1.4.3.3	L3 - Lens Polishing Contract Awarded	2/7/08	1/8/08	-4.2 wks		●	◇				
1.7.3.4.9	L3 - Image Simulation Level 3 Complete	2/29/08	1/30/08	-4.4 wks		●	◇				
1.2.1.2.11	L3 - Ready To Begin v2.1 Packaging of 10 CCD's	3/8/08	2/7/08	-4.2 wks		●	◇				
1.4.1.12.6	L3 - All Lens Blanks Shipped To Polisher	3/19/08	2/20/08	-4 wks		●	◇				
1.5.1.1.15	L3 - Preliminary Stray Light Analysis Complete	3/28/08	2/27/08	-4.4 wks		●	◇				
1.6.13.3	L3 - SISPI Subsystems Requirements Documents Complete	4/2/08	3/3/08	-4.4 wks		●	◇				
1.2.1.1.14	L3 - Cold probe yield known for Lots 2C, 2D thinned wafers	4/11/08	3/12/08	-4.4 wks		●	◇				
1.3.1.3.9	L3 - Vacuum Interface Boards v3 Ready For Testing	4/11/08	3/12/08	-4.4 wks		●	◇				
1.5.1.1.7	L3 - Detailed Design of Filter Changer Complete	4/26/08	3/27/08	-4.2 wks		●	◇				
1.1.4.17	L3 - CTIO Integration Plans Ready For External Review	5/9/08	4/10/08	-4 wks		●	◇				
1.4.4.8	L3 - Prototype Lens Mounting Complete	5/24/08	4/24/08	-4.2 wks		●	◇				
1.6.4.2.8	L3 - Guider Algorithm Complete	6/15/08	5/16/08	-3.6 wks		●	◇				
1.3.1.4.12	L3 - First Shipment of v2 Clock Cards Sent From Madrid	7/3/08	6/3/08	-4.4 wks		●	◇				
1.4.6.4	L3 - Ready To Evaluate Filters	7/12/08	6/11/08	-4 wks		●	◇				
1.4.3.7	L3 - Initial Review of Polishing Progress	7/20/08	6/20/08	-3.6 wks		●	◇				
1.2.2.9.2	L3 - v2 CCD Processing and Packaging Review Complete	7/26/08	6/26/08	-3.8 wks		●	◇				
1.7.3.2.6	L3 - Level 4 Final Catalogs Complete	8/10/08	7/11/08	-4 wks		●	◇				
1.5.1.6.7	L3 - Design Review of Focal Plate Complete	8/20/08	7/21/08	-4.4 wks		●	◇				
1.4.4.11	L3 - Interface to barrel defined	8/22/08	7/23/08	-4.4 wks		●	◇				
1.2.1.5.10	L3 - Yield Estimate Based on Wafers processing R&D Complete	8/31/08	8/1/08	-4 wks		●	◇				
1.6.13.5	L3 - SISPI Subsystem Prototypes Complete	9/12/08	8/19/08	-3.4 wks		●	◇				
1.3.1.7.10	L3 - v1 Master Control Board testing Complete at Barcelona	9/26/08	8/27/08	-4.2 wks		●	◇				



Started Preparing Monthly reports in August

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- September Cost Performance Report

DECam September 07 CPR	CUMULATIVE TO DATE					AT COMPLETION		
	BUDGETED COST		ACTUAL COST	VARIANCE		BAC		
	WORK SCHEDULED	WORK PERFORMED	WORK PERFORMED	SCHEDULE	COST			
							SPI	CPI
<i>EQU Equipment</i>								
1.1 Management	0	0	0	0	0	2,243,871		
1.2 Focal Plane Detectors	0	0	0	0	0	3,849,149		
1.3 Front End Electronics	0	0	0	0	0	1,522,036		
1.4 Optics	0	0	0	0	0	1,269,647		
1.5 Opto-Mechanical System	0	0	0	0	0	6,230,108		
1.6 Survey Image System Process Integration (SISPI)	0	0	0	0	0	518,807		
1.7 Survey Planning	0	0	0	0	0	755,404		
Funding Type-CTotals:	0	0	0	0	0	16,389,023		
<i>RD R&D</i>								
1.1 Management	104,655	104,245	99,147	-410	5,098	424,786	1.00	1.05
1.2 Focal Plane Detectors	119,505	114,383	106,884	-5,122	7,499	1,094,954	0.96	1.07
1.3 Front End Electronics	224,200	228,727	154,130	4,527	74,597	1,974,181	1.02	1.48
1.4 Optics	0	0	0	0	0	0		
1.5 Opto-Mechanical System	197,637	161,819	155,303	-35,818	6,515	1,588,000	0.82	1.04
1.6 Survey Image System Process Integration (SISPI)	0	5,327	0	5,327	5,327	133,876		
1.7 Survey Planning	0	0	0	0	0	63,768		
Funding Type-CTotals:	645,996	614,501	515,465	-31,495	99,036	5,279,564	0.95	1.19

We are falling a little behind, mainly due to ME shortage, but have managed to accumulate \$99k of contingency!



Conclusions

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- The R&D program is on track and will be largely complete in FY08.
 - Award of external funds nearly covers remaining R&D procurements
 - The LBNL CCDs + FNAL packages meet specifications and the yield is consistent with the project cost and schedule
 - The prototype higher density boards readout electronics meet specifications with multiple CCD readout
- Procurement of the lenses has begun (first 2 blanks complete Dec.1)
- The DECam cost and schedule still fall within the CD-1 ranges
 - Cost range of \$24.1M – \$26.7 M
 - Scheduled project completion date from April 2011-April 2012
- DECam received CD-1 approval on Oct. 15th 2007
- DECam is on track for a CD-2/3a review in Jan. 2008:
 - Drafts exist for all documents, will be updated with comments from this review
 - Directors' review of DES in Dec. 2007
 - EVMS review Dec. 2007
 - Joint NSF/DOE Review in Jan. 2008



Cost and Schedule Range: Changes since July 2006

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	Cost Range (Best Est)	Schedule Range (Best Est)	Differences
Director's CD1 Review July 2006	\$20.5M - \$29.8M (\$23.5M)	Jan 2011 – Aug 2011 (Apr 2011)	—
DOE/NSF Proposal Jan 2007	(\$24.6M)	(Apr 2011)	Directors Review recommendations (extra CCD lots), L2 task revision, risk assessment, start of project
CD1 Review May 2007	\$24.1M – \$26.7M (\$25.0M)	Apr 2011 – Apr 2012 (Oct 2011)	Funding guidance



Critical Decisions

- A CD-2 Review is performed to “Approve the Performance Baseline”
- With CD-2 approval, the project is baselined in terms of its technical, management, cost (the TPC) and schedule specifications. The project must be able to show that remaining R&D, design and fabrication are well enough understood so that the baseline does not change.
- CD-3 “approve start of construction”
 - the final design should be complete. If it is not complete the project should be able to show that the remaining design work is well enough understood such that baseline will not change when it is done.
 - The project can spend MIE funds on fabrication of the capital equipment
- CD-3a approval, which is needed for long lead procurements, can be done concurrently with CD-2 approval



DECam Project Management

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- Project Execution Plan contains the charter for the Integrated Project Team
- The DECam Integrated Project Team members:
 - Kathleen R. Turner, DOE OHEP Program Manager
 - Joanna M. Livengood, DOE Fermi Site Office Manager
 - Paul R. Philp, DOE DECam Federal Project Director, IPT Lead and member of the Fermilab Project Management Group
 - Dennis L. Wilson, FSO Business Manager and Contracting Officer
 - Jonathan P. Cooper, FSO ES&H Lead
 - John Peoples, DES Project Director
 - Brenna Flaughner, DECam Project Manager
 - Wyatt Merritt, DECam Deputy Project Manager
 - Joseph P. Collins, Fermilab Procurement
- Fermilab Oversight
 - Hugh Montgomery, Associate Director for Research (ADR)
 - Project Management Group: appointed by the ADR, monitors progress and serves as the change control board



DECam Cost and Schedule

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SURVEY

- Cost and Schedule are captured in a Microsoft Project file (1153 lines).
- This is integrated with the Fermilab general ledger with “Cobra”. Cobra will be used to apply burdens and escalation, monitor project progress and to calculate earned value.
- In August we discovered that COBRA distributes costs linearly across the tasks.
- This is correct for Labor, but not for M&S.
 - An obligations profile (which should match the funding profile) requires placing the M&S at the start of the tasks.
 - A Cost profile (with the M&S at the end of the tasks) should be used for calculating Earned value)
- Microsoft project has a switch: start, prorated or finish.
- Until a fix is found
 - COBRA generates at Prorated profile
 - I compare it to a profile that I generate with an EXCEL spread sheet and the prorated profile from MSP to make sure I have the correct overhead and escalation rates
 - Then I use MSP and EXCELL to generate the obligations and cost profiles
 - For the large M&S tasks we assigned separate cost accounts so that we could use COBRA and correct the earned value on these tasks by hand.



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SURVEY

DECam Project Integration

- DECam Integration Team: chaired by the DECam Project Manager and composed of the individuals charged with insuring the successful integration of all the components of DECam.
 - Mechanical Project Engineer: Andy Stefanik
 - Electrical Project Engineer: Terri Shaw
 - Software Integration: Jon Thaler
 - Integrated Safety Management: Wyatt Merritt + Fermilab ES&H group
 - CTIO integration: Tim Abbott
 - DECam Project Scientist: Darren DePoy