

# SOFIA Update

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28 April 2014

# Topics

- What's been happening on the Mission
  - Full Operational Capability
  - FIFI-LS First Light
  - EXES First Light
  - Cycle 2 Observations
- Recent Events
  - President's FY 2015 Budget Proposal
  - Congressional hearings
  - Science Advisory Committees
    - Astrophysics Subcommittee
    - Space Studies Board
- Upcoming Activities
  - SOFIA Working Group
  - Cycle 3 Call for Proposals



# Cycle 2 Detailed Planning Overview

Aircraft & TA Heavy Maintenance																																		
F	S	S	GH	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	H	S	S	M	T	W	T
6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10
June -- 2014															July -- 2014																			

Aircraft & TA Heavy Maintenance																																		
F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T
11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14
July -- 2014															August -- 2014																			

Aircraft & TA Heavy Maintenance																																		
F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	H	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
August -- 2014															September -- 2014																			

Aircraft & TA Heavy Maintenance																								FCF		Ferry		Lufthansa Technik Margin											
F	S	S	M	T	W	T	F	S	S	M	T	W	T	GH	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T					
19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
September -- 2014												October -- 2014																											

			Observatory Functional Check					OC#2-F FORCAST					Observatory Cycle #2-G FLIPO					EXES Commissioning Part 2																	
F	S	S	LO	2 Flts		Install	LO	3 Flts			Remove	Install	LO	2 Flights		Remove	Install	LO	4 flights																
24	25	26	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	H	W	T	F	S	S	S	M	T	W	T	F	S	S	M	T	W	H
October -- 2014										November -- 2014																									

EXES Commissioning Part 2			OC #2-H EXES		Observatory Cycle #2-I GREAT															Maintenance / Phase 3 Integration														
F	S	S	Remove	Install	LO	8 Flights								Remove	M	T	W	T	F	S	S	M	T	W	H									
28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
November -- 2014										December -- 2014																								

△ Observatory

\ RTB Flight

□ Project

✗ Canceled Flight

**Bold Outline: Actual Flight / Line Ops**

**Red Outline: Platform Integration Opportunity**

**H: Holiday SD: Safety Day GH: German Holiday**

observing flights

instrument commissioning

platform flights

aircraft maintenance/observatory upgrade

deployed observing flights

Science hour estimates were calculated based on maximum possible flights at 89% reliability.

3/06/2014

**Pre-decisional. For Internal Program Use Only. Do not distribute.**

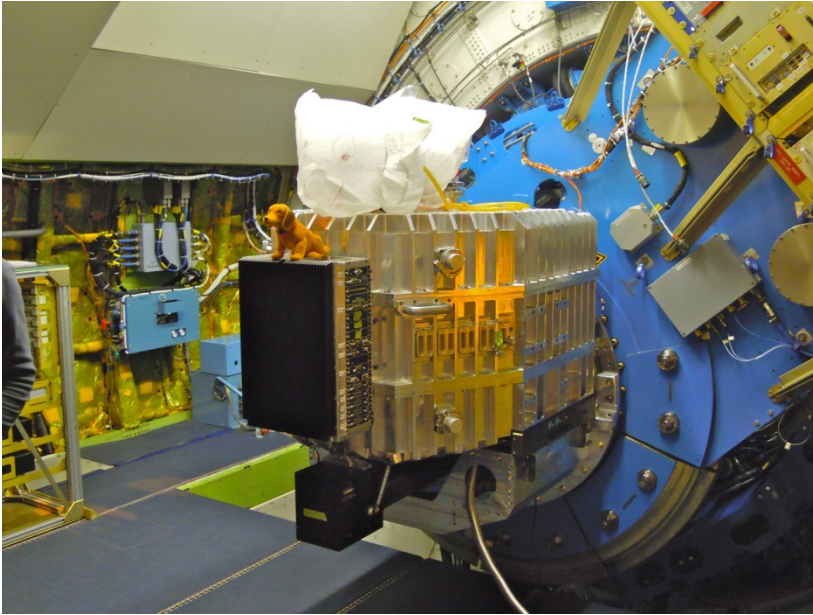
Rev. B

# SOFIA Reaches Full Operational Capability



- Full Operational Capability (FOC) is a milestone set by NASA HQ to demonstrate readiness to conduct regular science by satisfying key Level 1 requirements
  - 2.5-m Telescope with specified wavelength coverage, elevation range, and image quality
  - 6 hours of operation at 41,000 ft
  - Global Operations
  - Capable of changing instruments between flights
  - Capable of 20 years of operations
  - Capable of supporting 40 investigator teams per year
  - 4 instruments commissioned
  - Promote educational activities and public outreach
- All the FOC criteria were satisfied with the commissioning of FLITECAM in February

# FIFI-LS and EXES First Light



FIFI-LS on the telescope  
First Light Flight 150

Details in Randolph Klein's presentation

EXES Team after installation  
First Light Flight 158

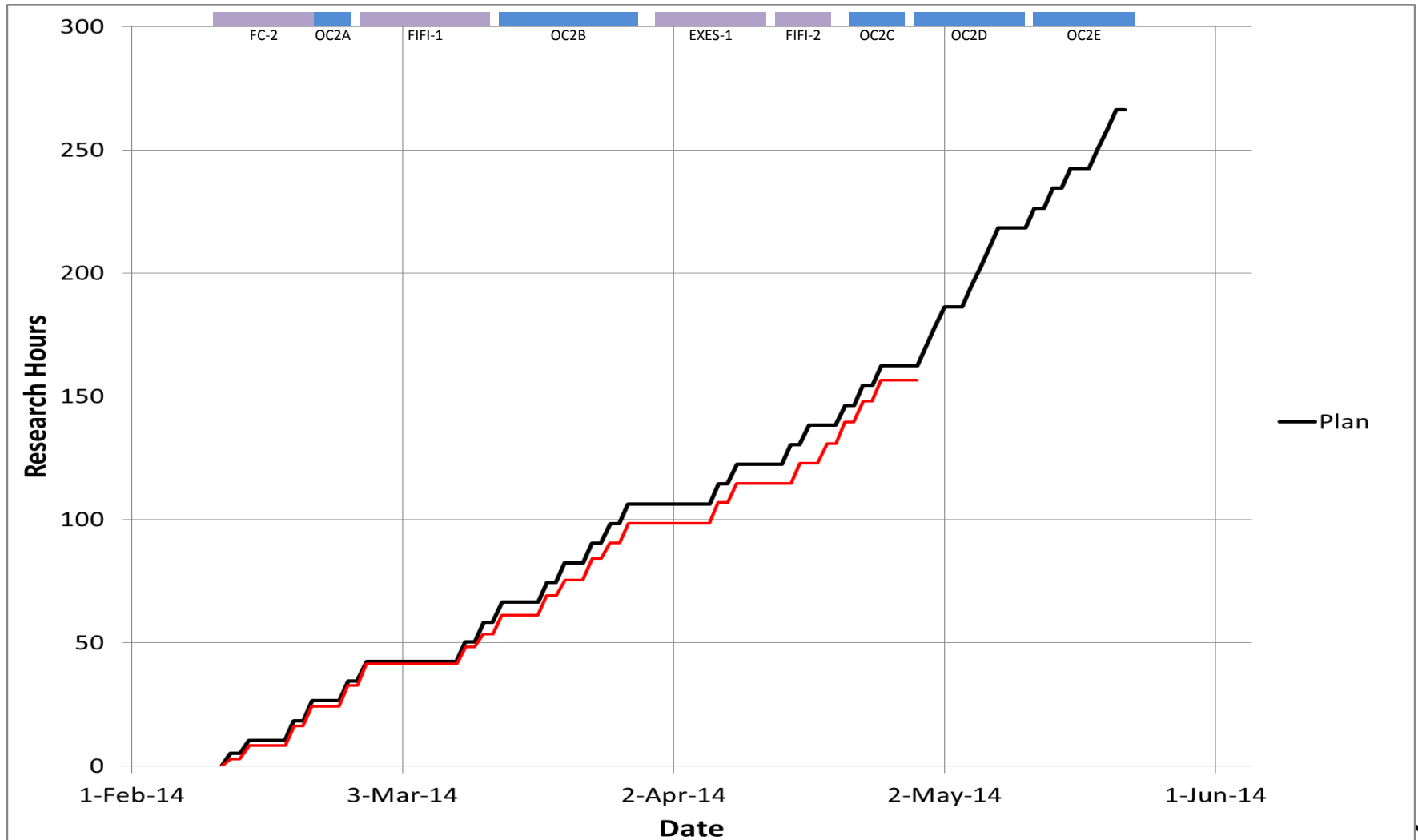
Details in Matt Richter's presentation



# Cycle 2

- The team has been doing an amazing job of executing the mission of SOFIA
  - FLITECAM commissioned
  - FIFI-LS and EXES saw first light
  - Successful FORCAST flight series
  - New systems or new versions brought on line
    - TA Sim, DCS, Pipeline, Short Term Scheduler, Vacuum Pump System
  - Preparations for upcoming flights
  - Only a net of 6 lost hours since the start of Cycle 2

# Cycle 2 Cumulative Research Hours





# Guest Investigator Time

As of 25 April 2014

	Cycle 1			Cycle 2		
	US (hours)	German (hours)	Total (hours)	US (hours)	German (hours)	Total (hours)
FORCAST	25.8	2.0	27.8	26.1	0.0	26.1
GREAT	39.3	35.6	74.9	1.6	1.0	2.6
FLITECAM	0.0	0.0	0.0	4.5	0.0	4.5
FLIPO	2.9	0.0	2.9	1.8	1.8	3.6
FIFI-LS	0.0	0.0	0.0	2.2	4.7	6.8
<b>Total</b>	<b>68.0</b>	<b>37.6</b>	<b>105.6</b>	<b>36.2</b>	<b>7.5</b>	<b>43.7</b>

Note: FIFI-LS includes flight scheduled 4/25/2014

# US Guaranteed Time Usage

As of 24 April 2014

Instrument	Original Allocation (hrs)*	Observing Time Used (hrs)	Remaining Guaranteed Time (hrs)
FORCAST	50	12.3	37.7
FLITECAM	25	1.9	23.1
HIPO	15	5.5	9.5
FLITECAM+HIPO	25	0.0	25.0

\* Science Utilization Policies, SOF-DF-PLA-1087 v. 2.4 (2008)

# Budget Situation

# Federal Budget Process

- The President's Budget Request
  - FY 2015 Request was released on March 4, 2014
- The Congressional Budget Resolution
- House Authorization
- Senate Authorization
- House Appropriation
- Senate Appropriation
- Conference Committee
- Signing by President

# NASA FY2015 Budget Proposal



	FY2013 Plan	FY2014 Enacted	FY2015	FY15-FY14	delta
<b>Science</b>	<b>4,781.60</b>	<b>5,151.20</b>	<b>4,972.00</b>	<b>-179.20</b>	<b>-3.5%</b>
Earth Science	1,659.20	1,826.00	1,770.30	-55.70	-3.1%
Planetary Science	1,274.60	1,345.00	1,280.30	-64.70	-4.8%
Astrophysics	617	668	607.3	-60.70	-9.1%
JWST	627.6	658.2	645.4	-12.80	-1.9%
Heliophysics	603.2	654	668.9	14.90	2.3%



# SOFIA Impacts of FY15 Proposal



- SOFIA was put on a path to termination in the FY 2015 budget request

	FY 2014	FY 2015	FY 2016	FY 2017
FY 2014 Budget	87.4 M	87.3 M	85.2 M	85.1 M
FY 2015 Budget	87.4 M	12.3 M	0.0	0.0

- Unless partners were found to support the U.S. portion of SOFIA costs, NASA would place the aircraft into storage by FY 2015.

# Recent Events

# Congress

- Hearings
  - 3/26 House Science, Space, & Technology Committee
    - Presidential Science Advisor John Holdren grilled about SOFIA decision by Rep. Palazzo (MS) and Rep. Collins (NY).
  - 3/27 House Space Subcommittee
    - Charlie Bolden questioned about SOFIA.
  - 4/8 House Appropriations Commerce-Justice-Science Committee
    - Rep. Mike Honda (CA) challenged Charlie Bolden about the decision to mothball SOFIA. Bolden said that the President’s budget was “only a proposal.”
  - 4/9 Space Subcommittee
    - Markup of FY 2014 NASA Authorization Bill – Nothing about SOFIA (but none expected since SOFIA was fully funded in FY 2014)
- Letters
  - Letter from Rep. Eshoo (CA) to House Appropriations Committee to restore funding to SOFIA
  - Letter from Rep. Smith (TX) & Palazzo (MS) to Charlie Bolden supportive of SOFIA
  - Letter from Sen. Feinstein & Boxer to Charlie Bolden supportive of SOFIA



# Science Advisory Groups



- Astrophysics Subcommittee
  - Part of the NASA Advisory Committee
    - Strong questioning of Paul Hertz and John Grunsfeld regarding SOFIA decision
  - Letter to full Committee
    - “The decision to greatly reduce funding for the Stratospheric Observatory for Infrared Astronomy (SOFIA) in FY15, and discontinue funding in FY16 and beyond, is of deep concern to the APS...”
- Space Studies Board
  - Chartered by National Academy of Sciences
  - Responsible for the Decadal Reviews
  - Bolden and Hertz questioned about SOFIA decision making process
- American Astronomical Society
  - “We are particularly concerned by the 9 percent cut to the Astrophysics Division and the unanticipated decision to mothball a major mission outside the well-established senior review process.”

# SOFIA Working Group



- NASA and DLR chartered a SOFIA Working Group to work out a path forward for the rest of 2014 and beyond
  - Basic premise is that the FY 2015 budget proposal is valid
  - HVM (Proceed, delay, or drop?)
  - Partners?
- NASA issued a Request for Information for potential partners
  - Held an “Industry Day” at Palmdale to show off SOFIA to potential partners on April 11
- Recommendations will be presented to NASA and DLR on Tuesday April 29.

# Other Activities

- USRA is using company resources to inform Congress about SOFIA
  - Effort to line up support from key members
- We'll be making our case to the scientific community
  - Goddard Far-Infrared Missions meeting
  - AAS
- Many steps to go, but so far so good.

# Cycle 3 Call for Proposals

# Cycle 3 Call for Proposals

- After the March 4 budget was released, the SMO was given direction to put the Cycle 3 CfP “on hold”
- Work continued internally to be prepared to issue the call if the landscape changed
  - Data Cycle System software
  - Draft Call for Proposals
  - Agreements with PI Instrument teams
- Last week we were given the go-ahead to proceed with the CfP
  - Includes language that covers the uncertainties in the current situation
  - CfP will need to be reviewed by NASA HQ
  - Goal is a release date ~ May 9
  - Details will be given in presentation by Ravi Sankrit
- Number of hours is a major uncertainty, but could be as high as 450 hours for the US Call

# Near Term Calendar

- The team has been executing the planned Cycle 2 program excellently
- Longer term schedule is highly fluid because of the budget uncertainties
  - Likely short delay in executing the HMOV to give NASA and Congress additional time to resolve the budget
  - Content of Post-HMOV observing program is not well defined
  - Cycle 3 Call for Proposals will be issued in May 2014

