



SOFIA Cycle 6 Schedule

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Science Mission Operations Director

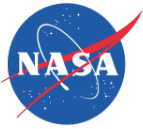
16 November 2017



SUG12 – 16 November 2017

Yorke: Cycle 6 Selection



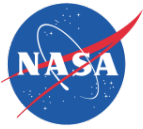


CfP Changes from Cycle 5 to Cycle 6



- A set of new Acceptance Categories was implemented in the proposal selection for Cycle 6: “Priority 1”, “Priority 2”, and “Priority 3”.
 - For proposals accepted in the “Priority 1” category, funding will be released at the time of selection and observations will be automatically carried over into the next cycle if incomplete.
- A new proposal category, “Thesis Enabling Programs”, was introduced in Cycle 6 to enable and support (up to \$100k per year for 2 years) PhD theses based in a substantial part on SOFIA data.
- GREAT: HFA/LFA and HFA/4G (bands 3 & 4) offered in dual cryocooler mode; commissioned in June/July
- HIPO and FLITECAM were not offered in this call





Cycle 6 Response: Summary



	US Queue	German Queue	Total
Hours Offered	500	75	575
Proposals Received	198	27 ¹	225
Joint US/DE Impact Proposals			1
Hours Requested	2038	133	2171
Oversubscription Rate	4.1	1.8	3.78

¹Joint impact proposal counted only once in US queue



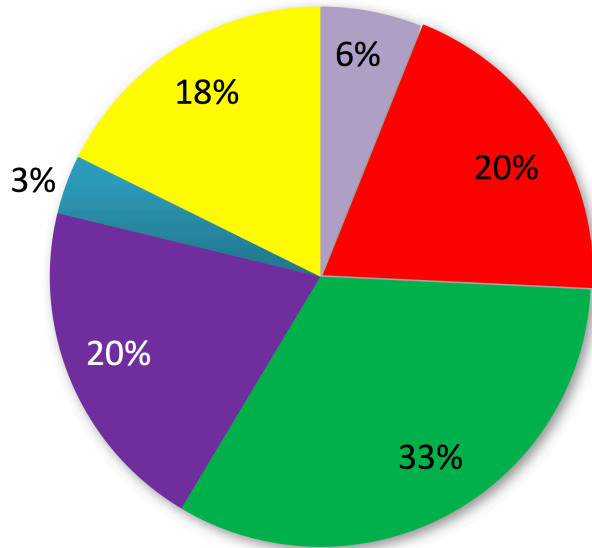


Cycle 6 Response: Proposal requests



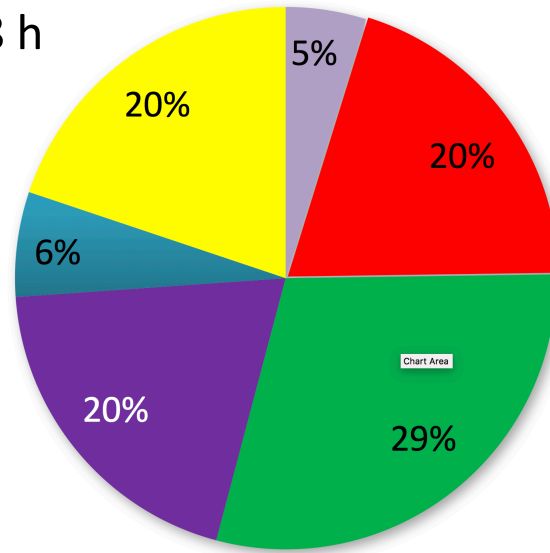
of Proposals by science – US queue

198



Requested Time by science – US queue

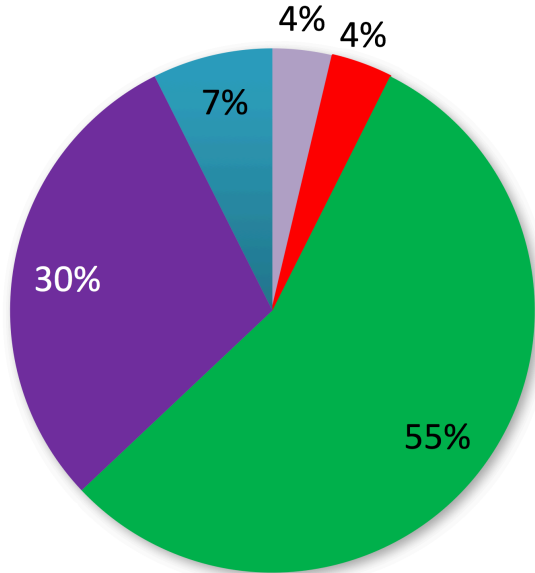
2038 h



- Solar System
- Stars and CSM
- ISM
- Star Formation
- Galactic Center
- Extra Galactic

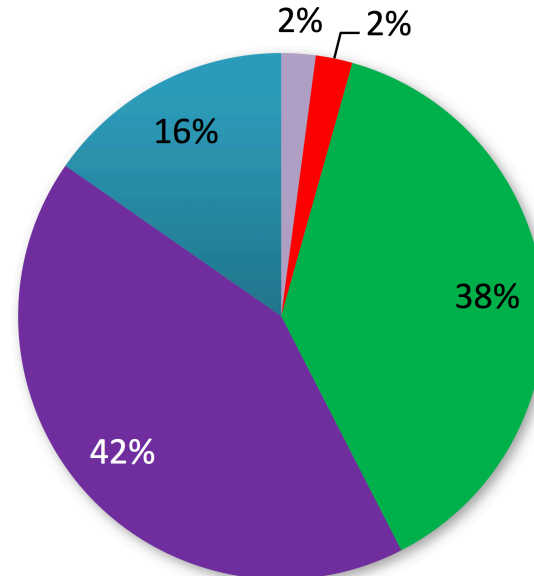
of Proposals by science – DE queue

27



Requested Time by science – DE queue

133

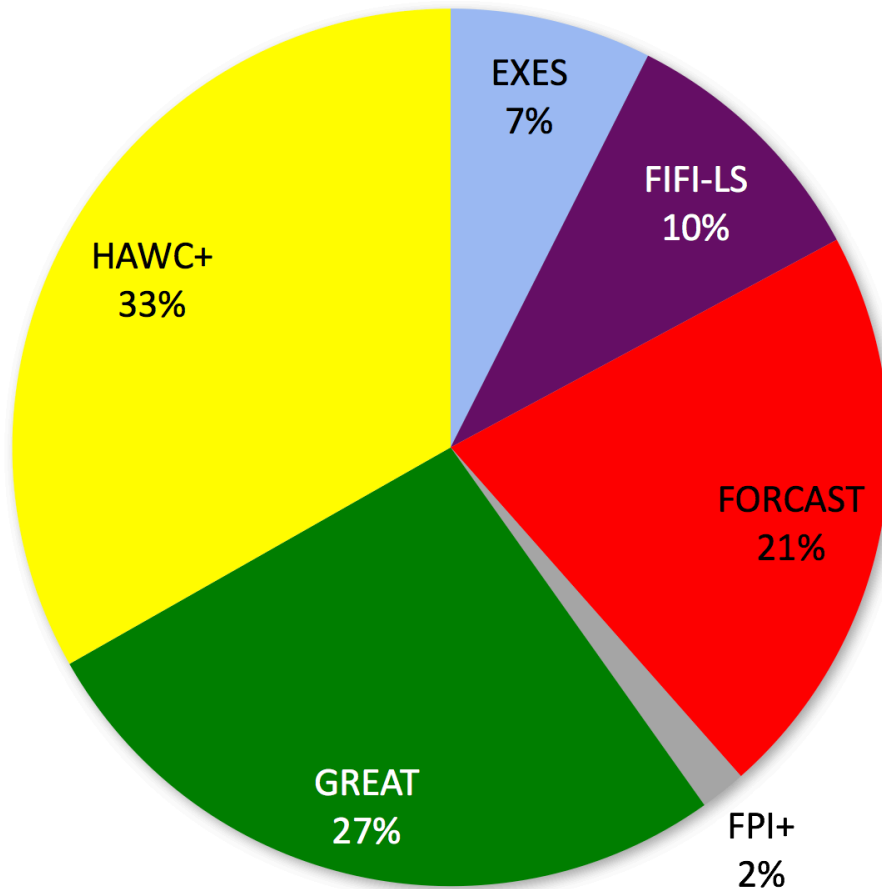




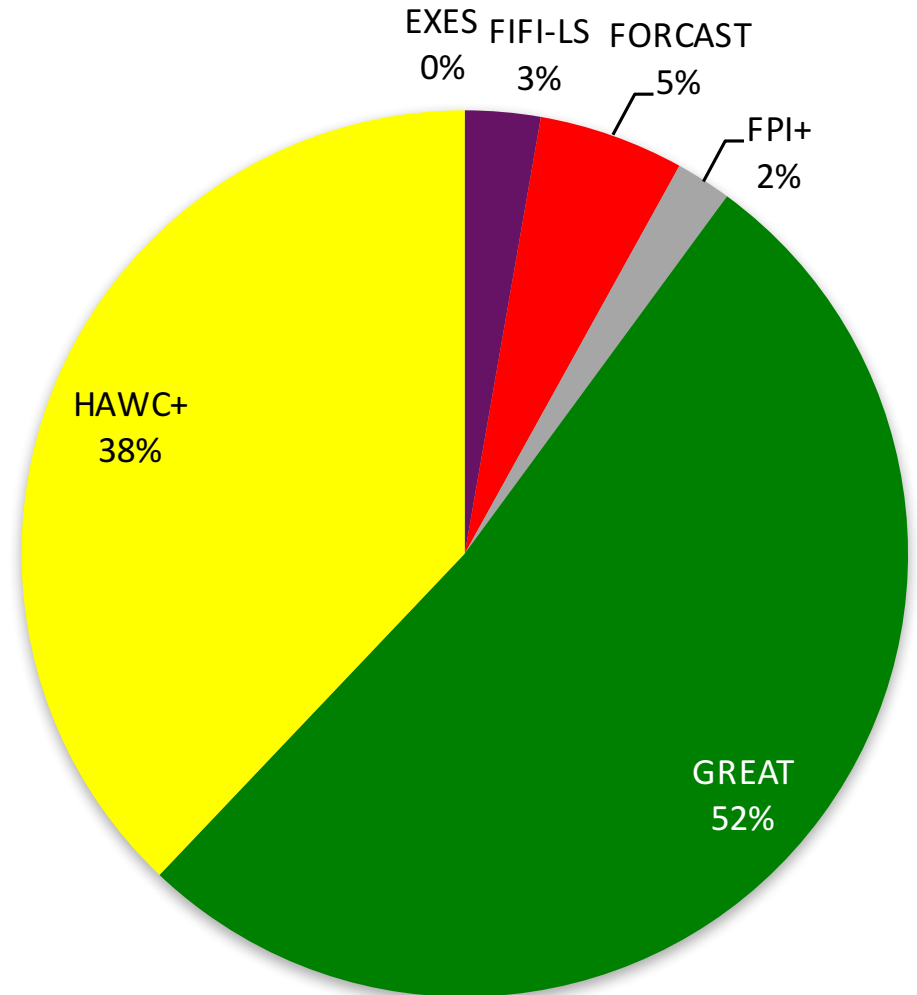
Cycle 6 Response: Proposal time requests



Proposals by Instrument – US queue



Proposals by Instrument – DE queue

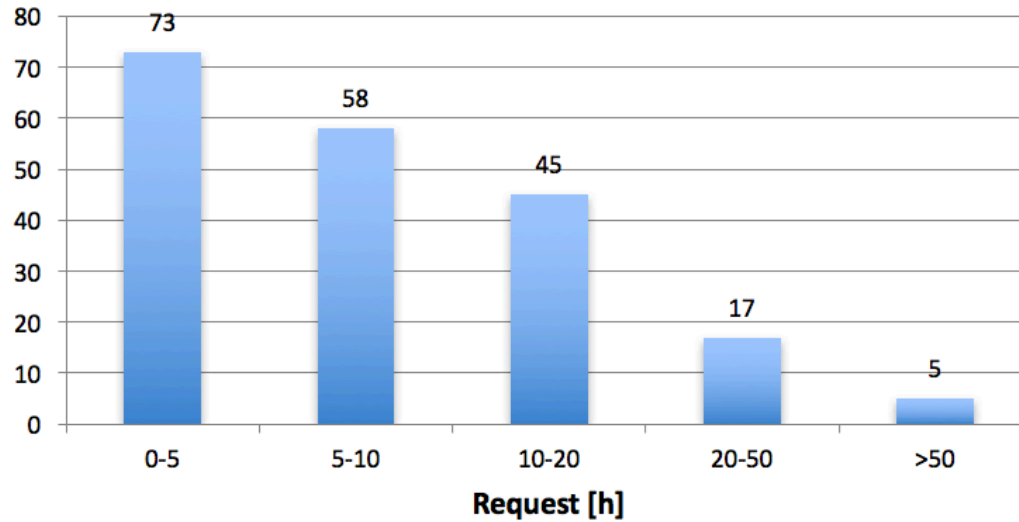




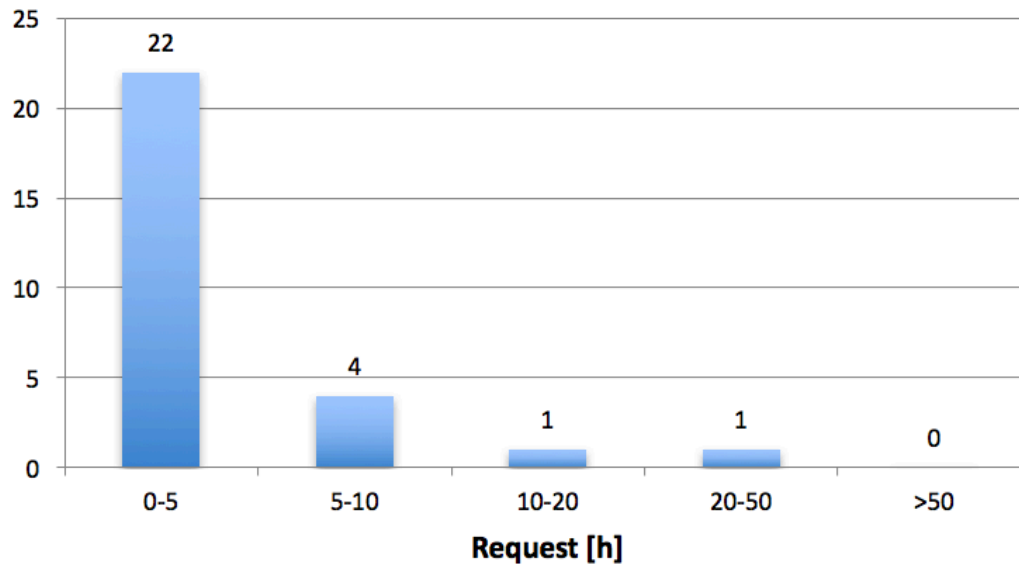
Cycle 6 Response: Proposal requests



Proposal # by total request - US queue



Proposal # by total request - DE queue





Selection Process 1: Evaluations



- Technical review of feasibility & compliance with CfP conducted by SMO
- Science review of proposals by Time Allocation Committees
 - US TAC met in San Jose August 14-16, 2017
 - German TAC met in Stuttgart September 11-12, 2017 and approved by the GSSWG on September 13, 2017
- Recommendations from both TACs were combined in discussion with Hans Zinnecker (former SMO Deputy Director who presided over German TAC) and Holger Jakob (current acting SMO Deputy Director)
 - Some adjustments of numerical ratings were necessary to normalize results between 5 separate US TAC panels and the single German TAC panel
- Prioritized list of programs was produced: Priority 1 [Will do], Priority 2 [Should do], Priority 3 [Do if Time] and “Don’t Do”
 - No determination was made at this point whether all “Priority 1” rated programs could actually be scheduled (some were mutually exclusive)





Selection Process 2: Calendar

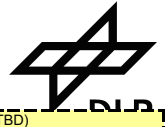


- General layout was guided by Cycle Scheduler runs
 - Only included Priority 1 & 2 observations for ~470h
 - Multiple runs: Priority 1 targets strongly drove the schedule
- SOFIA Program constructed Cy6 Draft lego October 19, 2017
 - Cycle starts Feb 3, 2018 and ends Feb 7, 2019
 - 109 Science Flights, 27 contingency flights
 - GREAT and HAWC+ deployed to Southern Hemisphere
 - 3 maintenance/upgrade periods; Standard template for instrument swaps
 - Use 75% of 579.5 h (= 434.6h = 385.2h[US] + 49.4h[DE]) for Priority 1 & 2 proposals
- Short Term Scheduler (STS)
 - Once general layout was determined, individual STS runs were used to schedule the campaigns
 - If highly rated proposals could not be scheduled by STS, they were not selected (i.e. wrong instrument on deployment) – two Priority 1 programs were eliminated at this point.





Cycle 6 Daily Overview – Page 1 of 2 - DRAFT



Cycle 6 Start												ARC (TBD)																
OC#6 A FORCAST						OC#6 B HAWC+						OC#6 C GREAT LFA/HFA																
2 Flights		SI Rem	SI Install			SI Install	5 Flights				SI Rem	SI Install		5 Flights LFA/HFA														
S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	H	T	W	T	F	S							
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	1	2	3
February -- 2018																								March -- 2018				

LA County Airshow (TBD)

OC#6 C GREAT LFA/HFA						OC#6 D FIFI-LS						Maintenance / Upgrades #16						AFRC Safety Day		Chk Fit		SI Install												
		SI Rem	SI Install			SI Install	3 Flights					Eng LO							Eng LO			Chk Fit	SI Install											
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							
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	2	3	4	5	6	7
March -- 2018																								April -- 2018										

OC#6 E EXES												OC#6 F HAWC+																						
SI Install		8 Flights								SI Rem	SI Install			SI Install	8 Flights																			
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							
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	11	12
April -- 2018												May -- 2018																						

OC#6 F HAWC+						OC#6 G GREAT LFA/HFA						OC#6 H (NZ) GREAT																						
		SI Rem	SI Install		3 Flights LFA/HFA			Aircraft Prep		Ferry CHC - 2 flts Time		Media	Orient		8 Flights LFA/HFA		Soft cont.	Post	Down	Prep														
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							
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	15	16
May -- 2018												June -- 2018																						

Soft cont												Code O Safety Day												COSPAR Pasadena, CA (TBD)										
OC#6 H (NZ) GREAT								SI Install				SI Install		8 Flights								SI Install				SI Install		Ferry PMD						
Soft cont.	Swap	Down	Prep	8 Flights 4G/HFA			Soft cont.	Post	Down	Prep	Soft cont.		SI Rem.	Down	SI Install	8 Flights		Soft cont.	Post	Down	Prep	Soft cont.		Prep			Ferry PMD							
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							
17	18	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
June -- 2018												July -- 2018																						

EAA AirVenture Oshkosh, Wisconsin (TBD)						Maintenance / Upgrades #17												OC#6 J FORCAST																
OC#6 I			Crew Rest		SI Rem.	MD Inst.		Eng LO		CR				Eng LO		Chk Fit	MD Rem	SI Install			SI Install	10 Flights												
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							
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	19	20	21	22	23	24	25
July -- 2018												August -- 2018																						

Key Observing Cycle: 6 Baseline Science Flights: TBD Baseline RHs: TBD Planned Science Flights*: 109 Estimated RHs*: 872 (*Year to date + Estimate)																																
S	7	F	F	H	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Weekend day (black text with no fill)	Work day (black text w/ day box grey fill)	AFRC Regular Day Off (day and date shown in red)	US or German Holiday (day of week box H or GH w/ red fill)	Line Operations (bold border)	Possible Maint/Up. Check Fit (day and date box filled with lt. green)	Instr. Commissioning Flight (bold white text, purple fill, bold border)	Contingency Instr. Comm. Flight (day box with purple fill)	Deployment Observing Flights (bold white text, light blue fill, bold border)	Short Flight (colored fill only lower half, bold bdr.)	Observing Flight (bold white text, blue fill, bold border)	Contingency Obser. Flight (day box with blue fill)	Ferry/Maint./Non-Sci Flight (bold white text, green fill, bold border)	Contingency Ferry/Maint./Non-Sci Fit (day box with green fill)	Half Sci. & Half Ferry/Maint./Non-Sci (two colored fill)	Educator on Flight (white star on day of week)	Media/VIP on Flight (yellow star on date)	Key Projects (orange fill on day of week)	Return to Base (RTB) Flight (single slash through day and date)	Canceled Flight (x through day and date)	Deployment Key Projects (light orange fill on day of week)												





Determination of hours offered



		Computation of CFP (using intermediate calculations)			
			NASA	DLR	
		80/20 baseline after DDT:	648.8	162.2	
		GTO (to be subtracted):	30.0	81.1	
		Calibration,, Deadlegs, Other Overhead (to be subtracted)	89.2	11.2	
		GO Hours carried from prior cycle	16.0	4.0	P1+P2 (75%)
		CfP hours:	513.6	65.9	579.5 434.6
<i>Priority 1 Allocation</i>	25%	<i>Priority 1</i>	128.4	16.5	144.9
<i>Priority 2 Allocation</i>	50%	<i>Priority 2</i>	256.8	33.0	289.8
Total Not to Exceed 75%					
		Total DDT	61.0		
		DDT Calibration	8.4		
		Allocable DDT	52.6		



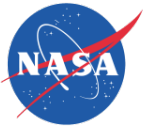


“Thesis enabling” Proposals



- Consideration of “Thesis enabling” (TE) programs
 - A TE program provides two years of funding for a graduate student (capped at \$100k per year), if a highly ranked proposal provides critical and significant data for the student’s thesis
 - A TE program is automatically carried over into the next observing cycle if not completed within Cycle 6
 - 10 proposals were submitted as “thesis enabling” (6 US and 4 non-US); none were initially in the Priority 1 category
 - 2 proposals selected as “thesis enabling” (1 Survey + 1 Priority 2); letters of congratulations were sent





Summary of Cycle 6 Selections



	US + INT hours	German hours	Total hours	US + INT numbers	German numbers	Total numbers
P1	130	18	148	24	4	28
P2	248	31	279	43	12	55
P1+P2	378	49	427	67	16	83
P3	275	21	296	44	7	51
Survey	90	0	90	3	0	3
Thesis-enabling	50	0	50	1 "Survey" + 1 "P2"	0	2

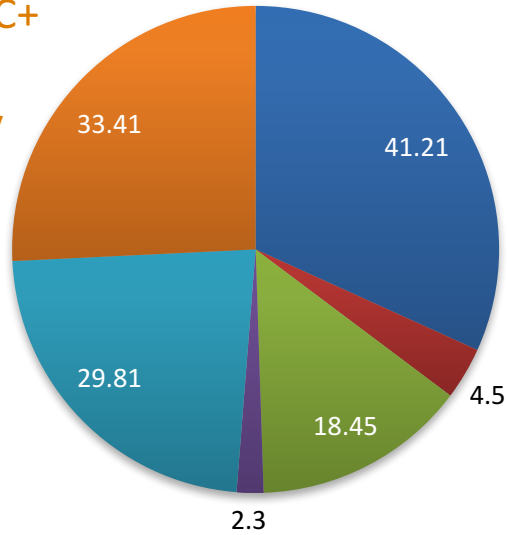


Summary of Cycle 6 Selections

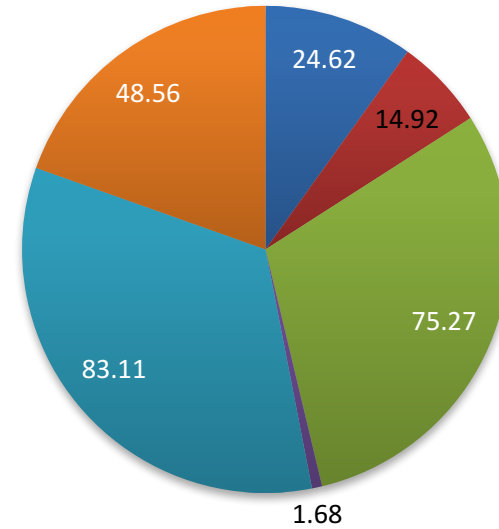


US Priority 1: 129.7h

Note: HAWC+ overheads significantly reduced!

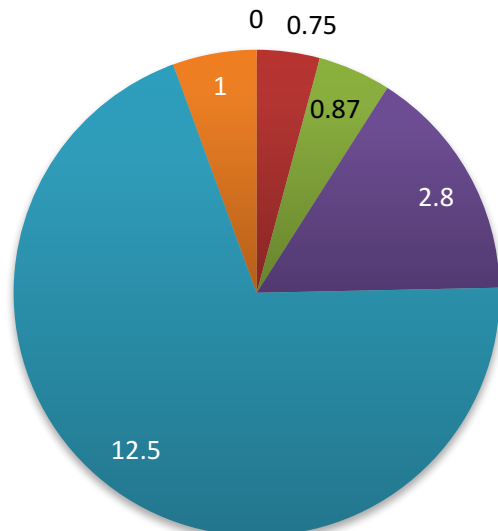


US Priority 2: 248.2h

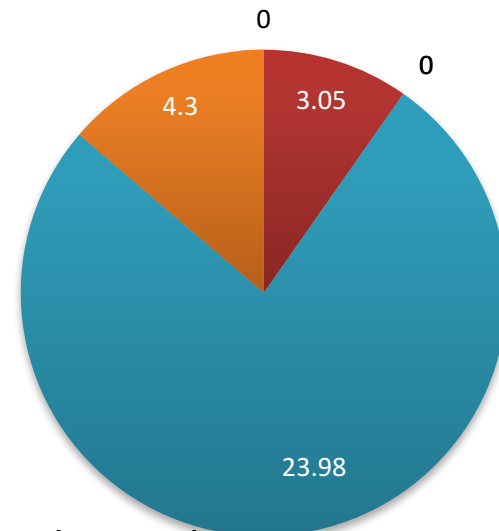


- EXES
- FIFi-LS
- FORCAST
- FPI+
- GREAT
- HAWC+

DE Priority 1: 17.9h



DE Priority 2: 31.3h



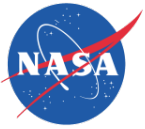
- EXES
- FIFi-LS
- FORCAST
- FPI+
- GREAT
- HAWC+



SUG12 – 16 November 2017

Yorke: Cycle 6 Selection

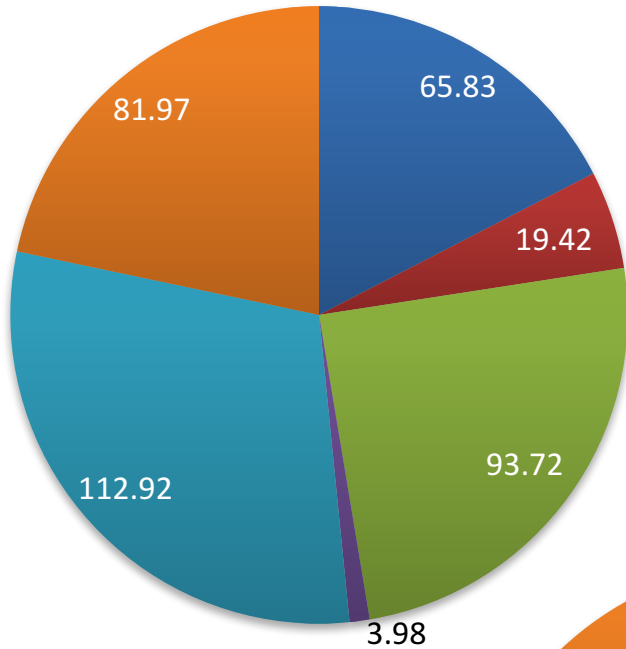




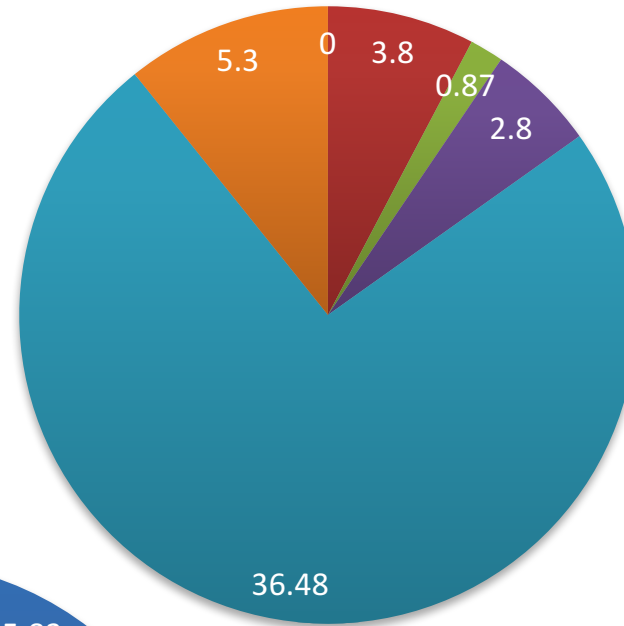
Summary of Cycle 6 Selections



US Priority 1+2: 377.8h

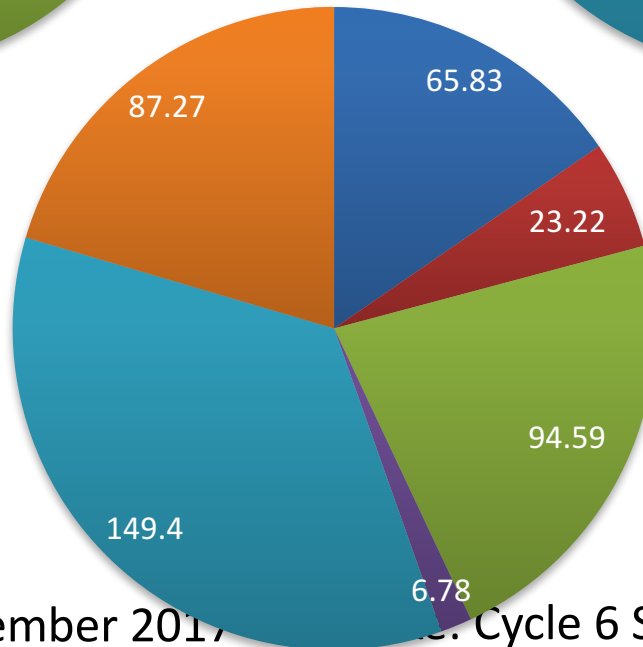


DE Priority 1+2: 49.3h



- EXES
- FIFi-LS
- FORCAST
- FPI+
- GREAT
- HAWC+

Note: HAWC+ overheads significantly reduced!



US+DE Priority 1+2: 427.1h

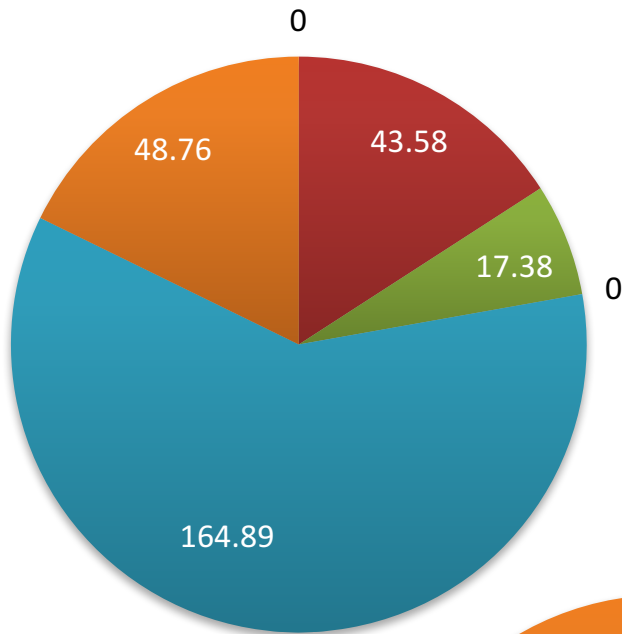




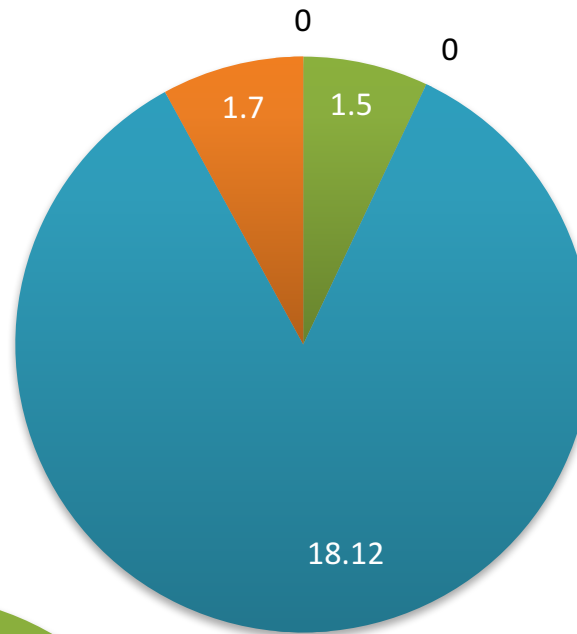
Summary of Cycle 6 Fillers



US Priority 3: 274.6h

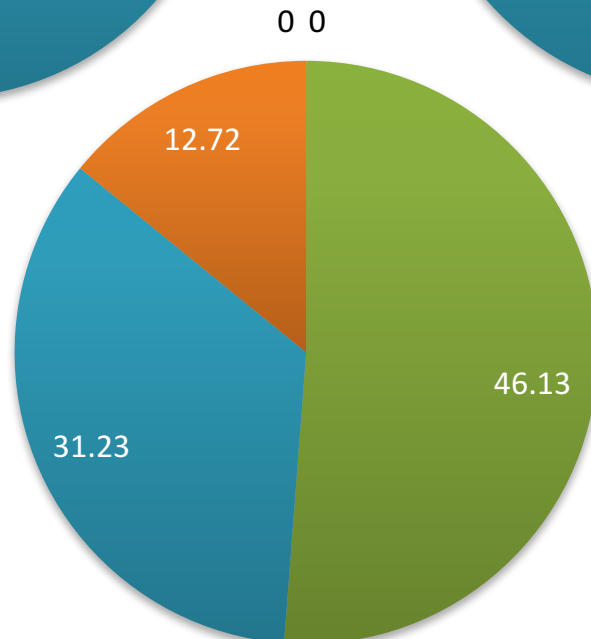


DE Priority 3: 21.3h



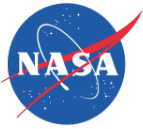
- EXES
- FIFi-LS
- FORCAST
- FPI+
- GREAT
- HAWC+

Note: HAWC+ overheads significantly reduced!



US Survey: 90.1h





Decrease of HAWC+ Overhead



- The original estimate of HAWC+ overheads were based on theoretical considerations + margin
 - Analogous original estimates for FORCAST underestimated the settling time by large margins, leading to incorrect observing times when FORCAST was first used.
- The HAWC+ team did not want to repeat FORCAST's mistake and therefore multiplied the expected settling times by a "fudge factor".
 - Experience on the airplane showed, however, that the theoretical settling times were actually *too long*
 - After the HAWC+ repair (heat switch swap, fixing non-functioning pixels in the detectors, ADR hold time) the sensitivity and stability increased.
 - After adjusting the HAWC+ overhead, all HAWC+ proposed observations were recalculated, leading to significant decreases of necessary HAWC+ observing times with the same sensitivity.