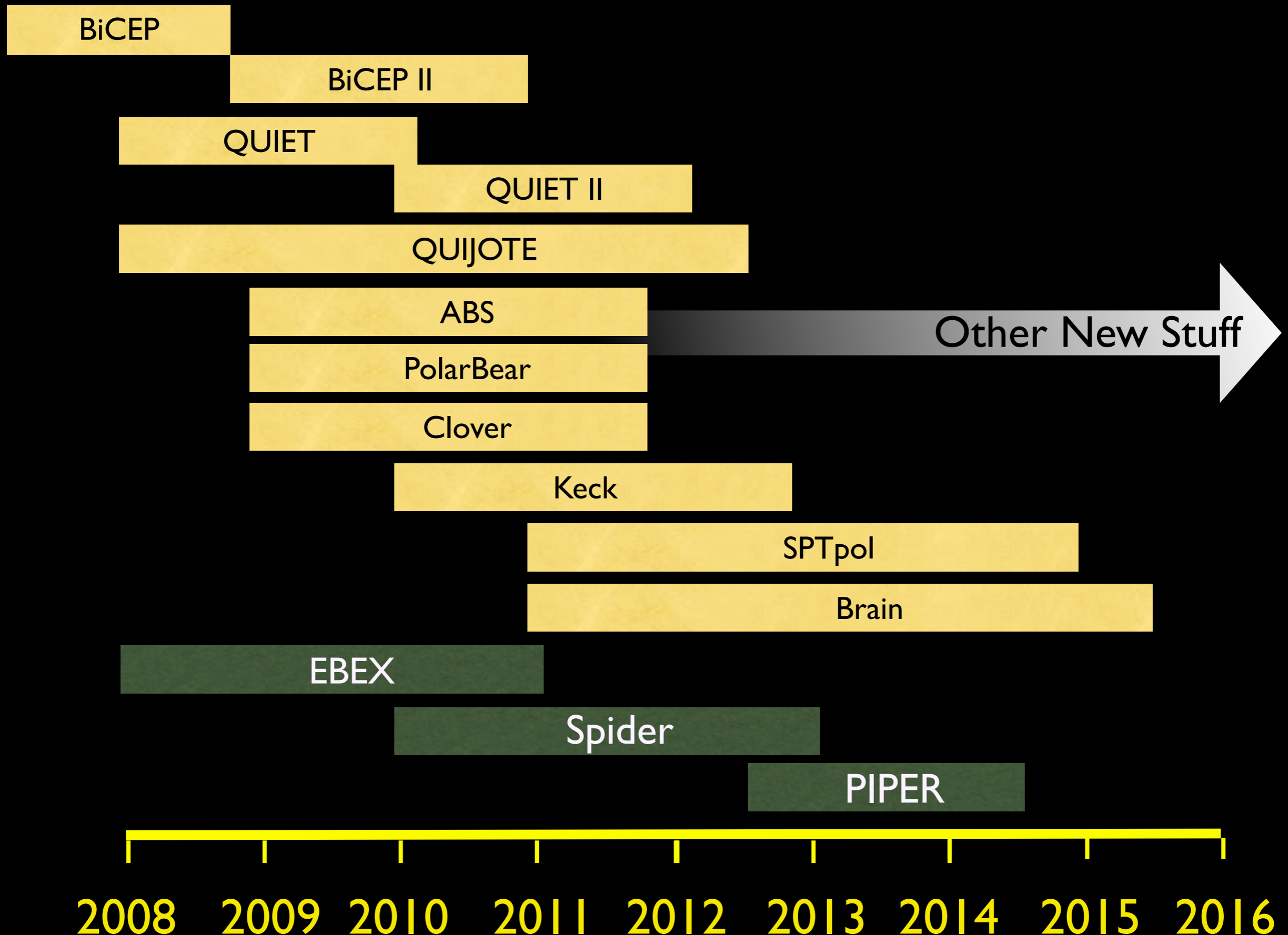


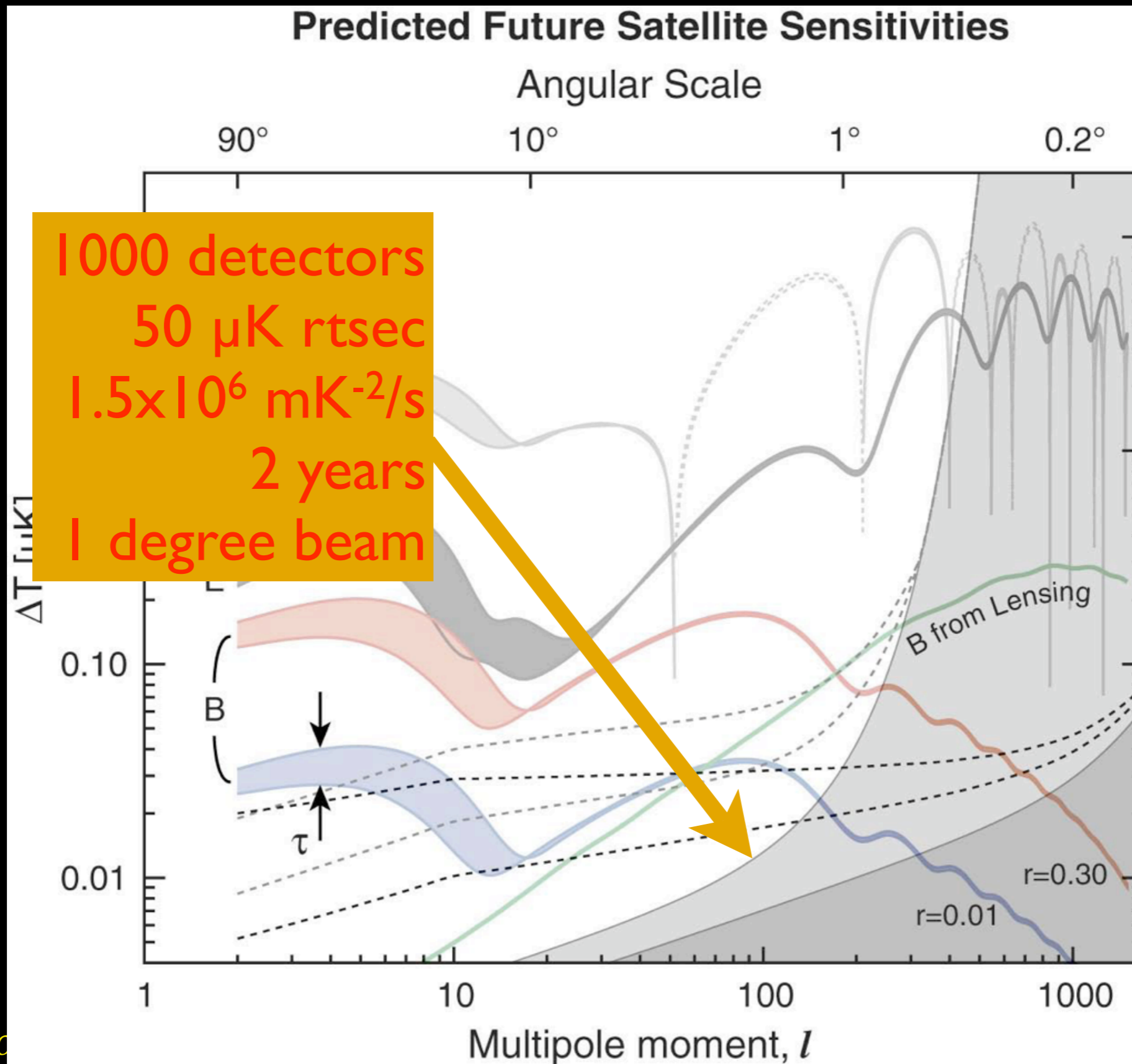
# CMBpol Suborbital Experiments

Stephan Meyer  
CMBpol Technology Meeting  
NIST  
25 August, 2008

# SubOrbital Timeline



# TFCR Fiducial mission



Weiss Report

# Future Balloon

	Year	Freq/pixels GHz/N	Beam arcmin	Total Weight/s mK <sup>-2</sup> /s	f <sub>sky</sub>	W/sky /s	MOD	r
EBEX	2008	150/556, 250/278, 410/139	8	30000, ?, ?	0.01	3×10 <sup>6</sup>	HWP/ Scan	0.02
SPIDER	2010	96/288, 145/512, 220/512	604,025	28000, 51000, 13000	0.6	1.5×10 <sup>5</sup>	Scan/ HWP	0.15
PIPER	2012	200/5120	21	4×10 <sup>5</sup>	0.5	8×10 <sup>5</sup>	VPM	0.01
	2012	270/5120	15	4×10 <sup>5</sup>		8×10 <sup>5</sup>		
	2013	350/5120	14	17000		34000		
	2013	600/5120	14	59		120		

TFCR model:  $W/s = 5 \times 10^5 \text{ mK}^{-2}/s$  for 2 years

Exclude Foreground Experiments: COFE

# Future Ground-based

	Year	Freq/pixels GHz/N	Beam arcmin	Total Weight/s mK <sup>-2</sup> /s	f <sub>sky</sub>	W/sky /s	MOD	r
BICEP	2005	100/25, 150/24	60, 40	217, 272	0.02	1.5x10 <sup>4</sup>	Scan	
	2009	150/256	40	4500			Scan/HWP	
Quiet	2008	40/19, 90/91	28, 12	200, 300	0.04	1.3x10 <sup>4</sup>	CORR	0.15
	?	40/91, 90/397	28, 12	1000, 1300			CORR	
QUIJOTE	2008	10 - 30/34	60	170	0.1	1700	HWP	0.05
	2011	30/38	40	930			CORR	0.01
ABS	2009	145/200	30	2000	0.01	2.0x10 <sup>4</sup>	HWP	?
PolarBear	2009	150/1288, 220/?	4, 2.7	10000, ?	0.01	1.0x10 <sup>6</sup>	HWP	0.025
Clover	2009	97/150, 150/504, 225/504	8	4300, ?, ?	0.02		HWP	0.01
KECK	2010	100/144, 150/256, 220/256	60, 40, 30	35,004, 500, 810	0.02	2x10 <sup>5</sup>	Scan/HWP	
Poincare	?	40 - 150	120	?	1		VPM	0.01
SPT-pol	2011	90, 150, 220	1.6, 1, 0.8	5100	0.01	5.1x10 <sup>5</sup>	Scan/HWP	0.01
ACT-pol	?						?	
Brain/MBI	2011	90/432, 150/432, 220/432	30?	?			Interf	0.01

All figures derived from presentations or web or personal communication

Excluded foreground experiments: C-Bass

# Technologies demonstrated by 2015

- 12 Ground-based experiments
  - Bolometer arrays
    - Phased Array
    - Horn fed OMT
    - lens fed OMT
  - Amplifier arrays
  - Optics
  - Modulators, HWP, AHWP, VPM
  - Readouts in operation
- 2 Balloon-Borne instruments (Higher TRL)
  - fMUX, tMUX
  - 2 types of planar bolometer arrays
  - HWP
  - Low power electronics for large arrays

# Technologies demonstrated by 2015

- Data Analysis
- Construction of large focal planes
- Evaluation of systematics

# Not demonstrated by 2015

- Launch survivability
- Spacecraft thermal design
- Observing strategy