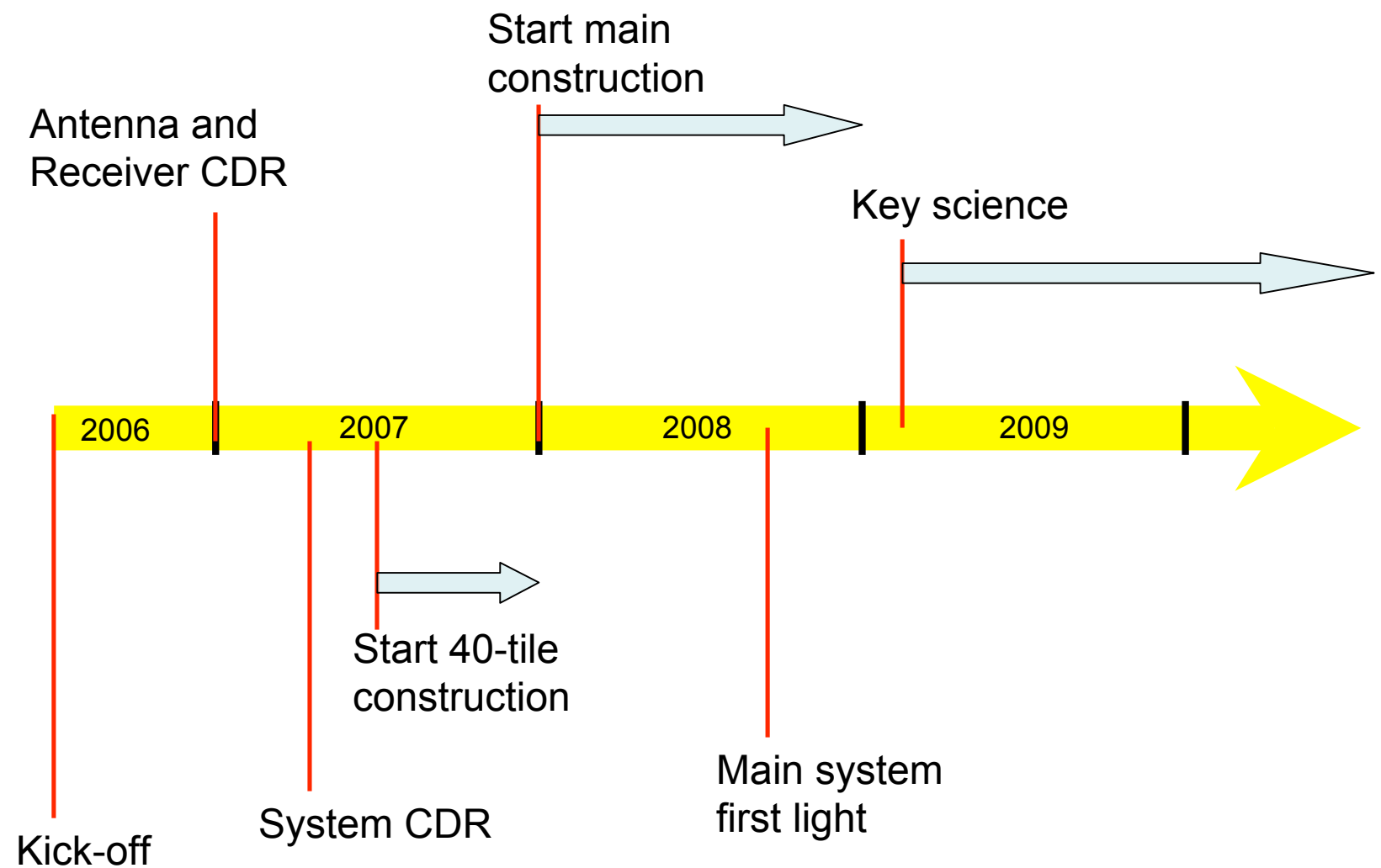


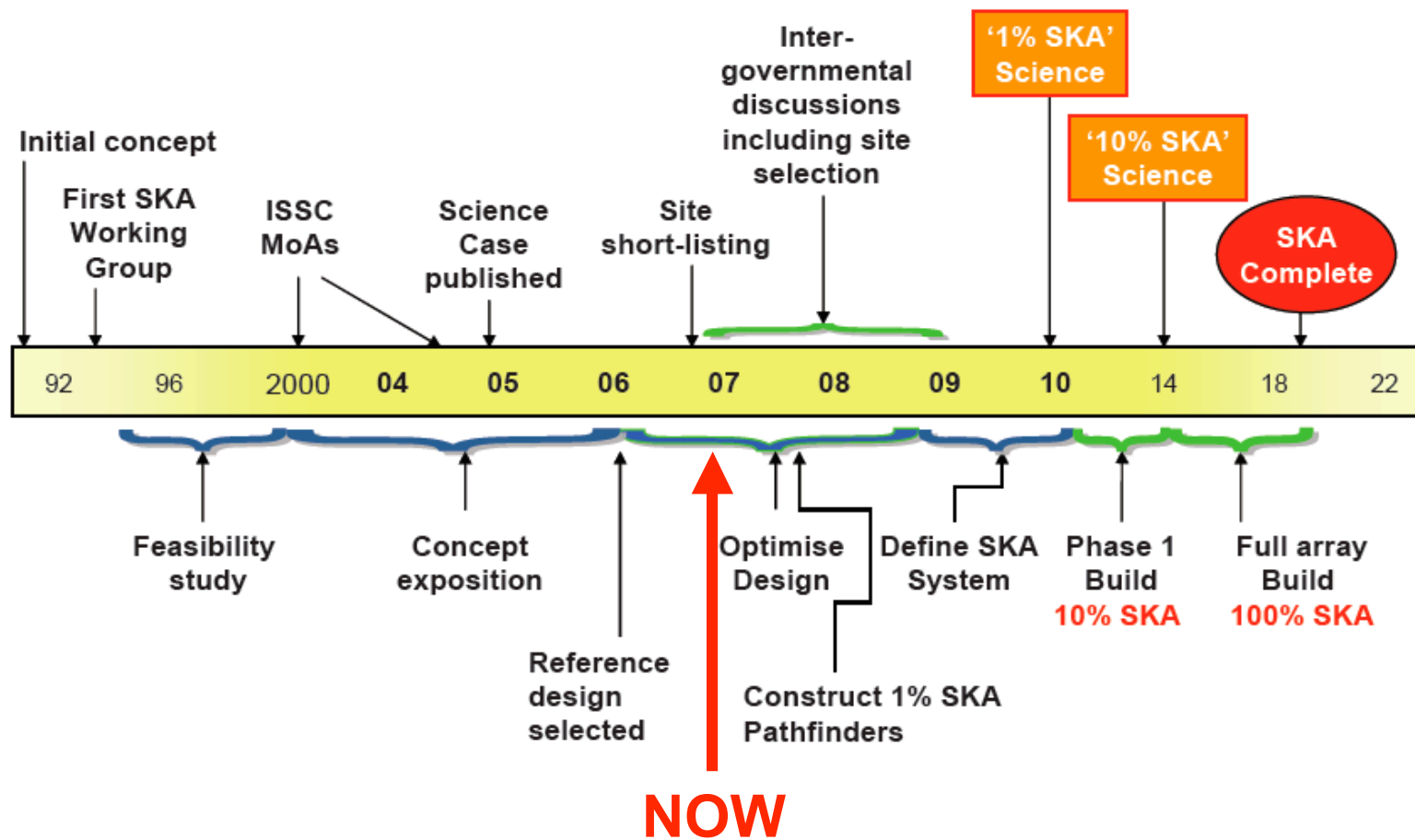
parameters for future EoR telescopes ...

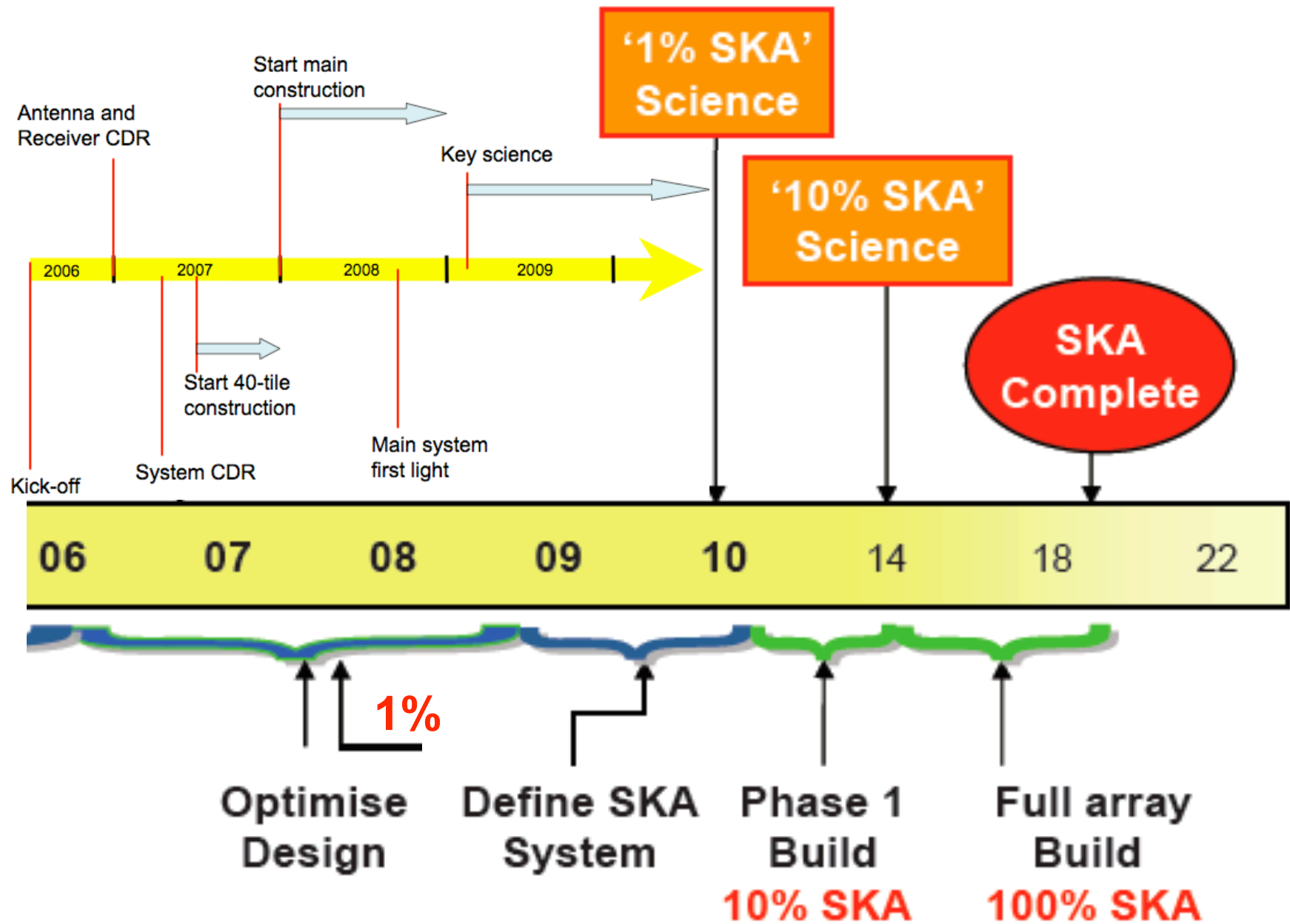
- ... present experiments ...
- SKA timeline
 - EoR is one of five Key Science Projects
 - EoR is one of three KSPs for “Phase I”
 - Science Working Group,
includes Colin, Lincoln, Frank, Bryan,
JohnD, ChrisC, ...

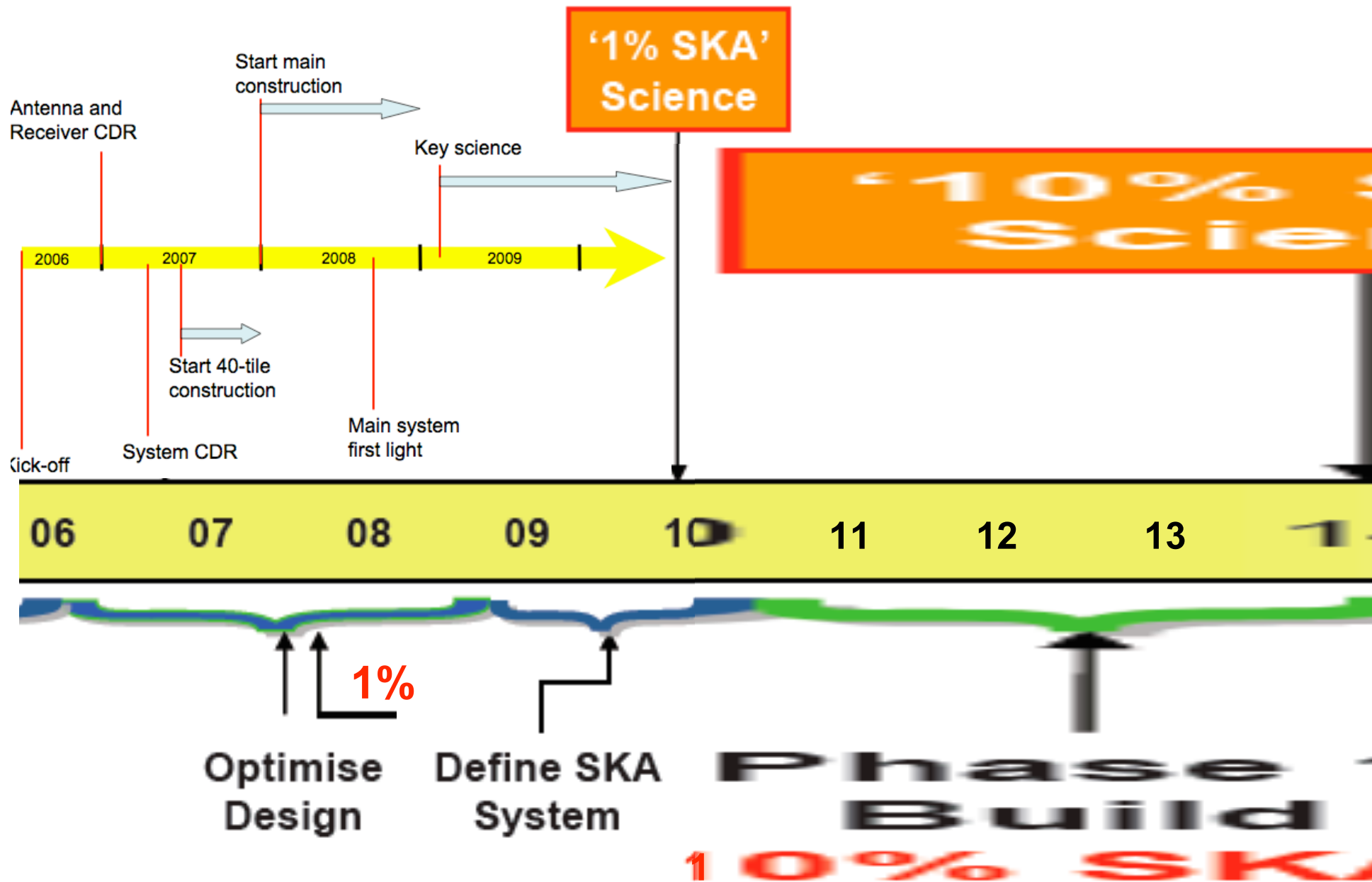
LFD Schedule Outline (Colin, June Kickoff)



SKA Timeline







SKA “Key Science Project” on EoR...

... three components...

- Redshifted HI ... $z > 6$ $f < 200 \text{ MHz}$
- Redshifted CO ... $z > 6$ $f < 16 \text{ GHz}$
- continuum emission from earliest Star Forming Galaxies

SKA Reference Design Specs

	SKA Science Specifications (Memo 45)	Reference Design for full SKA (see below and section 3)	Phase I (see below)
Frequency Range (GHz)	0.1-25	0.1-25	0.3-10
A_{eff}/T_{sys}			
0.1-0.3 GHz	5000 m ² K ⁻¹	5000 m ² K ⁻¹	Not applicable
0.3-1	20000	20000	2000 m ² K ⁻¹
1-3	20000	20000	2000
3-10	20000	20000	2000
10-25	10000	10000	Not applicable
Field of View			
0.1-0.3 GHz	Not defined	200 deg ²	Not applicable
0.3-1	200 deg ² (0.7/f) ²	50 deg ²	50 deg ²
1-3	1 deg ² (1.4/f) ²	1-10 deg ²	1-10 deg ²
3-10	1 deg ² (1.4/f) ²	0.33 deg ² (3/f) ²	1 deg ² (1.4/f) ²
10-25	1 deg ² (1.4/f) ²	0.33 deg ² (3/f) ²	Not applicable
No. of Fields of View	1 at full sensitivity; goal of 4 FoVs; 10 sub-arrays	Not defined	Not defined
Baseline length (km)	>3000 km	>3000 km	50 km

HI

???

CO

SKA Reference Design Specs

	SKA Science Specifications (Memo 45)	Reference Design for full SKA (see below and section 3)	Phase I (see below)
Frequency Range (GHz)	0.1-25	0.1-25	0.1-25
Aeff/Tsys			
0.1-0.3 GHz	5000 m ² K ⁻¹	5000 m ² K ⁻¹	1000?
0.3-1	20000	20000	2000 m ² K ⁻¹
1-3	20000	20000	2000
3-10	20000	20000	2000
10-25	10000	10000	1000?
Field of View			
0.1-0.3 GHz	Not defined	200 deg ²	Not applicable
0.3-1	200 deg ² (0.7/f) ²	50 deg ²	50 deg ²
1-3	1 deg ² (1.4/f) ²	1-10 deg ²	1-10 deg ²
3-10	1 deg ² (1.4/f) ²	0.33 deg ² (3/f) ²	1 deg ² (1.4/f) ²
10-25	1 deg ² (1.4/f) ²	0.33 deg ² (3/f) ²	Not applicable
No. of Fields of View	1 at full sensitivity; goal of 4 FoVs; 10 sub-arrays	Not defined	Not defined
Baseline length (km)	>3000 km	>3000 km	50 km

HI

???

CO

9. Summary of Paris workshop (Bryan Gaensler, Joe Lazio)

* The reference design is too expensive by a factor of three. This concept needs to be descoped to make it affordable. The SWG needs to decide which descoping options we can accept. Correspondingly, we decided we were willing to give up the high frequencies for now, but only provided they remain part of future plans.

* We were asked if we could give up a factor of two in collecting area. The pulsar science cannot accept a factor of two drop in effective area. HI surveys can accept this drop, provided more collecting area is moved into the core

* We decided we did not want to give up on having long baselines. However, we are willing to reduce the fraction of the collecting area on long baselines, since the main experiments on these baselines only need sensitivity, not image quality.

* A proposal arising from all of this, which met with no strong objections in Paris, is a potential three-stage phasing for the SKA:

- phase I: 10% of the area, concentrated in the core, baselines out to 50 km, covers < 10 GHz only

- phase II: 50% of the area, concentrated in core, baselines out to >3000 km, covers < 10 GHz only (this is equivalent to the EWG's "strawman design" that was circulated to the SWG a few months ago)

- phase III: increase area on long baselines, add high frequencies

Table 1: Comparison between SKA-Phase1 and low frequency EoR pathfinders

Array	A_{eff} km ²	Frequency MHz	Diameter km	FOV @ 150 MHz	Start
LOFAR ¹	0.050	115 – 240	2 – 5	4 – 60 ²	2008
MWA	0.008	80 – 300	1.5	400	2008
21CMA	0.01	70 – 200	2	30	2006
SKA-Phase1	0.4 ³	70 – 300	5	?	2013

Notes:

¹ LOFAR entries refer to core (32 stations).

² LOFAR will start with 1-beam and form 10 – 20 beams ~ 0.5 years later

³ Assuming $A_{\text{eff}} / T_{\text{sys}} = 1000 \text{ m}^2 / \text{K}$

