



Future Developments

ATUC

Ron Ekers

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CSIRO SPACE & ASTRONOMY

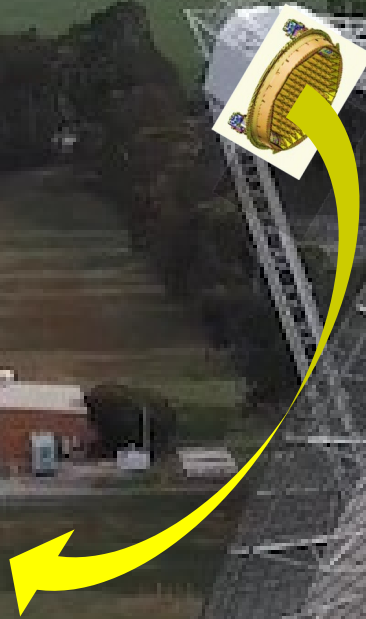
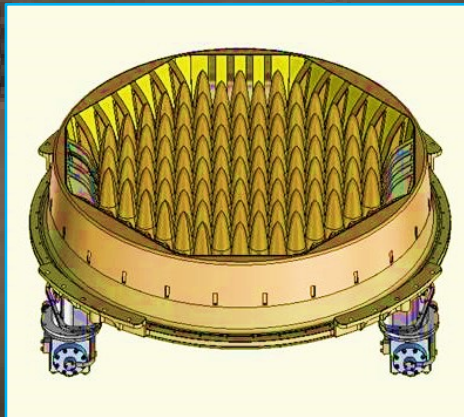
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Summary

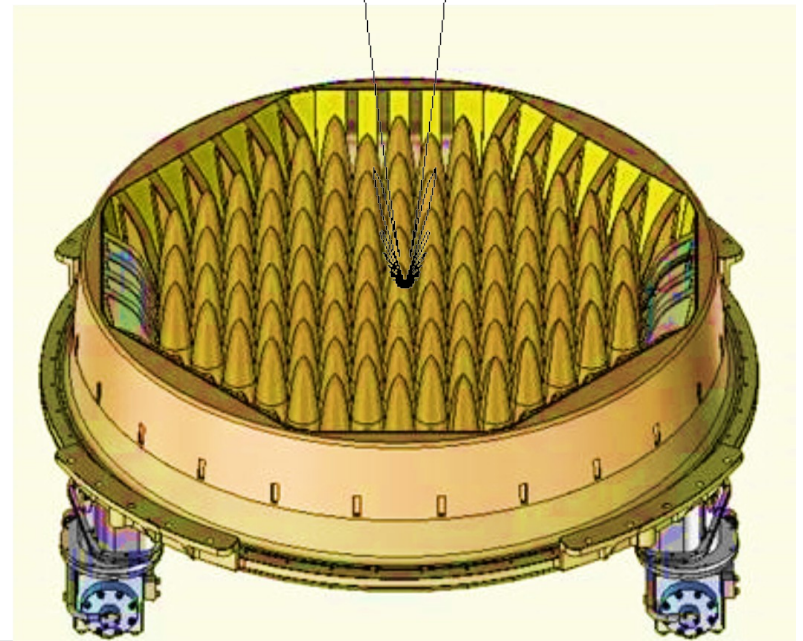
- All sky cryo-PAF
- All sky cryo-PAF interferometer
- ASKAP Tsys (uncooled next gen PAF)
- Other ASKAP upgrades
 - John Bunton
 - ASKAP 12 to 15m dish extension (\$3M) speed x1.56
 - ASKAP PAFs to 72 beams (\$) speed x2.4-3
 - Keith Bannister
 - transparent leg up grade for another 15%
- ASKAP resolution enhancement (for FRB astrometry)

Parkes Cryo-PAF



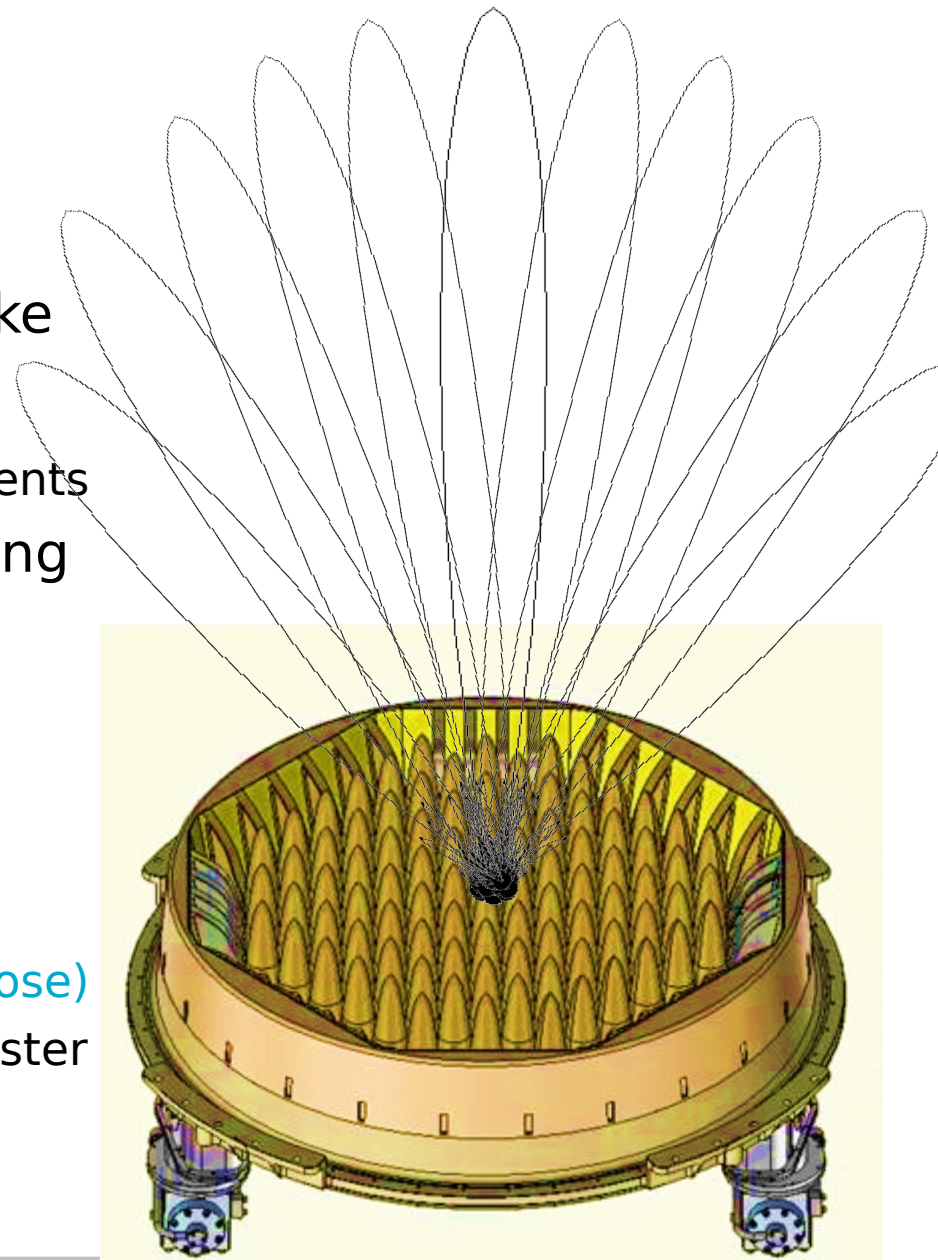
PAF all-sky dishless monitor

- Combine all 98 elements to make each beam
 - Total collecting area sum of all elements



PAF all-sky dishless monitor

- Combine all 98 elements to make each beam
 - Total collecting area sum of all elements
- Form 72 separate beams covering whole hemisphere
 - FoV 30x larger than CHIME!
- 72 FRB processing channels
- FRB detection rate 1-10/week
 - Rare FRBs (very energetic or very close)
 - Galactic magnetar, M81 globular cluster

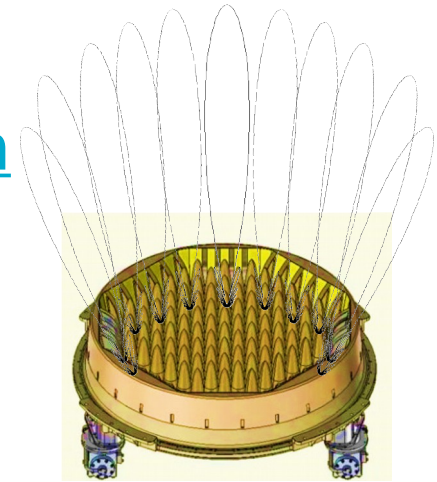
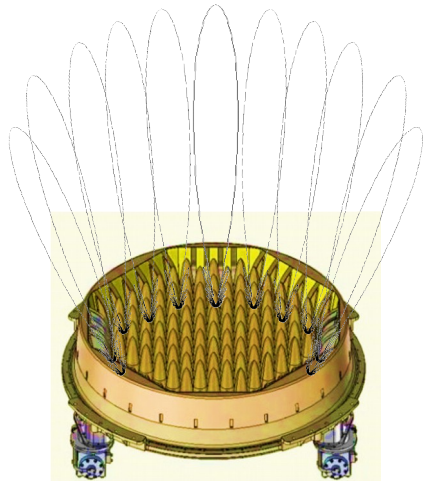
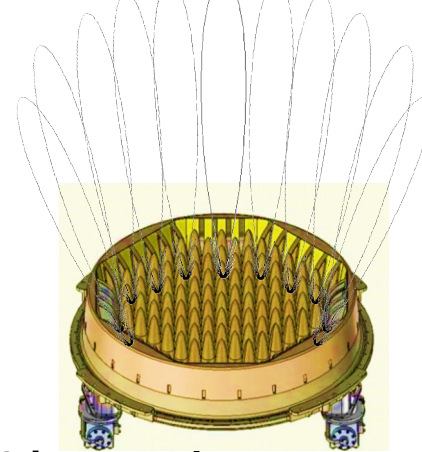


Parkes Cryo-PAF specifications

System	Specification	Notes
Frequency	0.7 - 2.0 GHz	
Elements	98	
Polarizations	2	
Bandwidth	1250 MHz	processor limited
Tsys	15K	19K on dish
Efficiency	80%	60% on dish
Effective area	0.7 sqm	Reduced by projection
Number of beams	72	
FoV	10,368 sqd	25% of sky

PAF all-sky VLBI for astrometry

- Need 3 PAFs
- Separated by 100km gives positions to 0.1"
 - Just need buffers and trigger for voltage dump of one beam on the ancillary systems
- Ultimate SETI transient detection and [confirmation](#) system



ASKAP upgrades - why wait till 2030?

- Sys with uncooled PAF <30K (current 60-80K)
 - Survey speed > x4 for all ASKAP projects
 - Loose 1 year now and gain 7-8 years in survey speed
 - \$30M full project costs(Tasso)
 - No impact on data rate, backend or system design
- Even more improvements possible
 - Transparent leg project 15% (Keith Bannister)
 - Dish diameter increase to 15m
 - x1.6 survey speed (John Bunton)
 - Hardware cost \$3M (John Bunton)
- Comparable (x0.6) with SKA mid in survey mode at 1GHz!
 - Offload the oversubscribed SKA mid (for only \$30M!)
 - Re-establish the case for SKA survey
 - Better polarization performance

ASKAP backend upgrades

- Corellator and beamformer
 - Bandwidth to 1.2GHz
 - Number of beams to 72
 - A factor of 8 in survey speed !
 - Big hit in data rate and system redesign
 - \$3.5M hardware ciosts
- Becomes comparable (x0.6) with SKA mid in survey mode at 1GHz
 - Offload the oversubscribed SKA mid (for only \$30M!)
 - Re-establish the case for SKA survey