Recent results from CABB:
the Compact Array Broad-Band system

Bärbel Koribalski (ATNF)

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ATCA - the Australia Telescope Compact Array

- 6 x 22-m dishes (ie. 15 baselines, from 30 m to 6 km)
- frequency coverage: ≈ 1 - 100 GHz (3mm to 20cm)
- dual-frequency & dual-polarisation operation
- high time resolution
- dedicated expert staff & international user community (incl. a large number of students)
- max. bandwidth was 2 x 128 MHz

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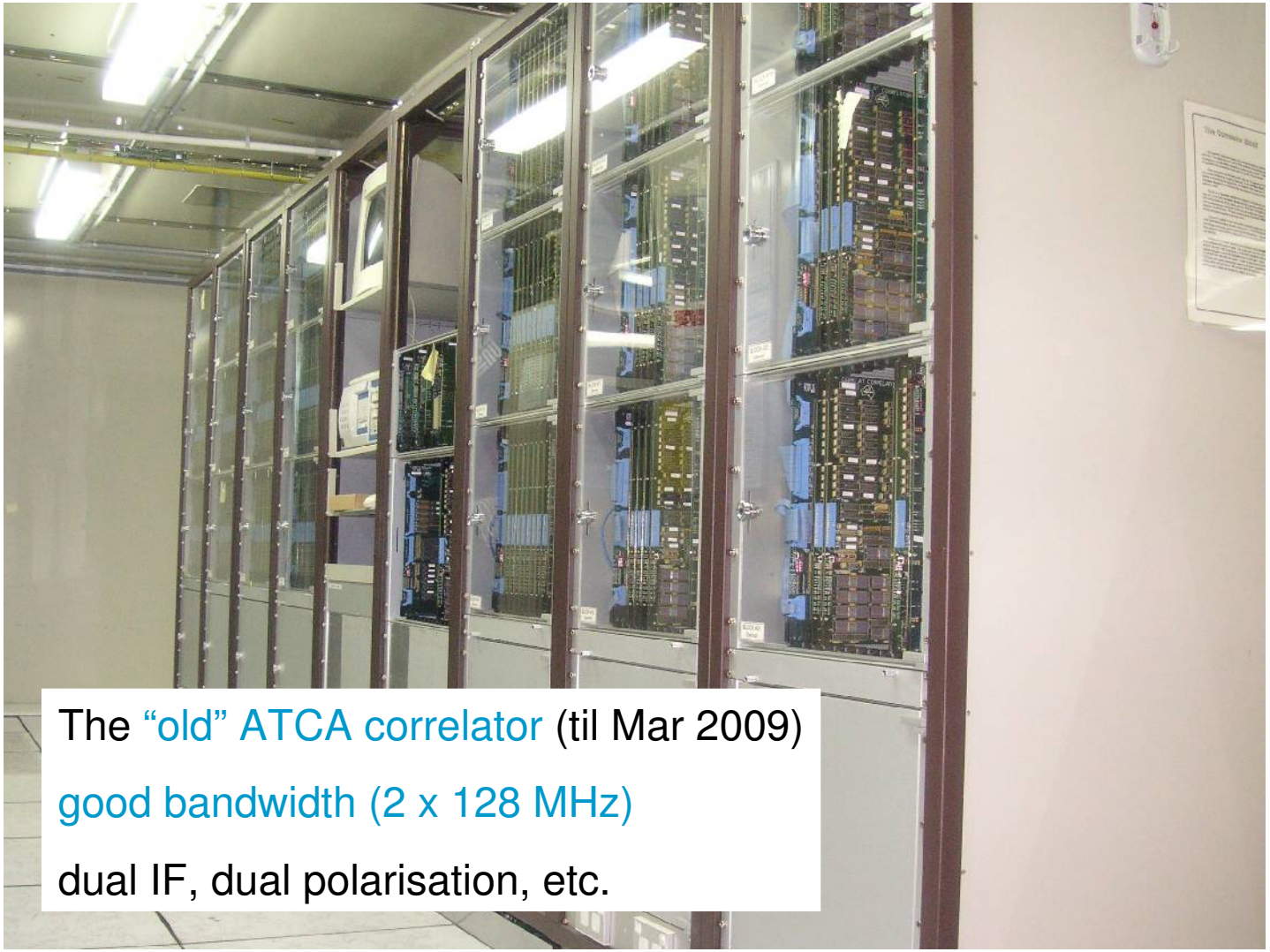
- high time resolution
- dedicated expert staff & international user community (incl. a large number of students)
- NOW: bandwidth is 2 x 2000 MHz (+ 16 zoom modes)

ATCA - the Australia Telescope Compact Array

CABB advantages:

- highly increased continuum & polarisation sensitivity
- highly increased *uv*-coverage ⇒better images
- large velocity coverage, high velocity resolution
- multi-line observations, esp. in the millimetre bands
- combined line + continuum observations
- spectro-polarimetry, etc.

ATCA - the Australia Telescope Compact Array



The "old" ATCA correlator (til Mar 2009)

good bandwidth (2 x 128 MHz)

dual IF, dual polarisation, etc.

ATCA - the Australia Telescope Compact Array

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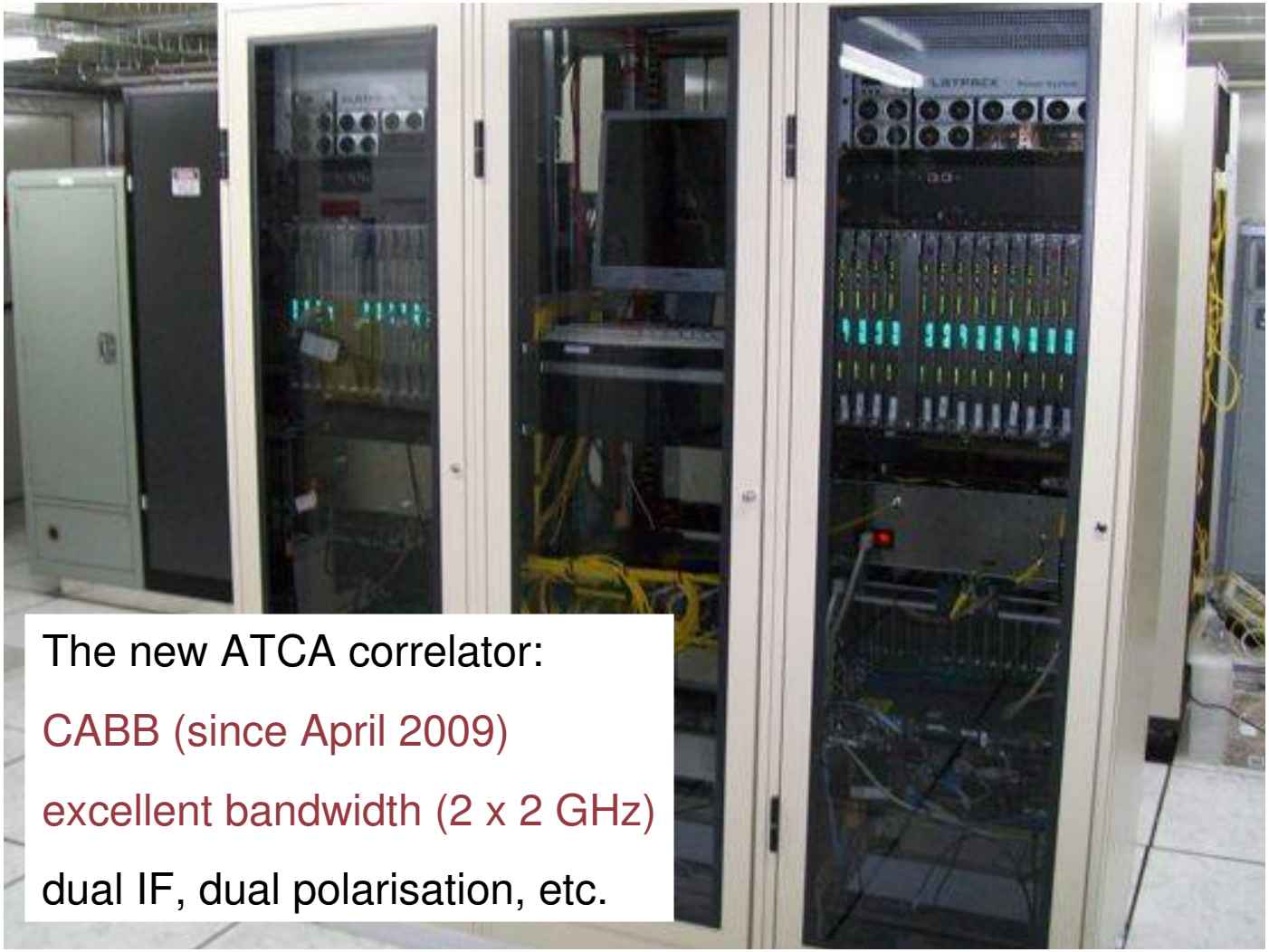

The new ATCA correlator:

CABB (since April 2009)

excellent bandwidth (2 x 2 GHz)

dual IF, dual polarisation, etc.

ATCA - the Australia Telescope Compact Array

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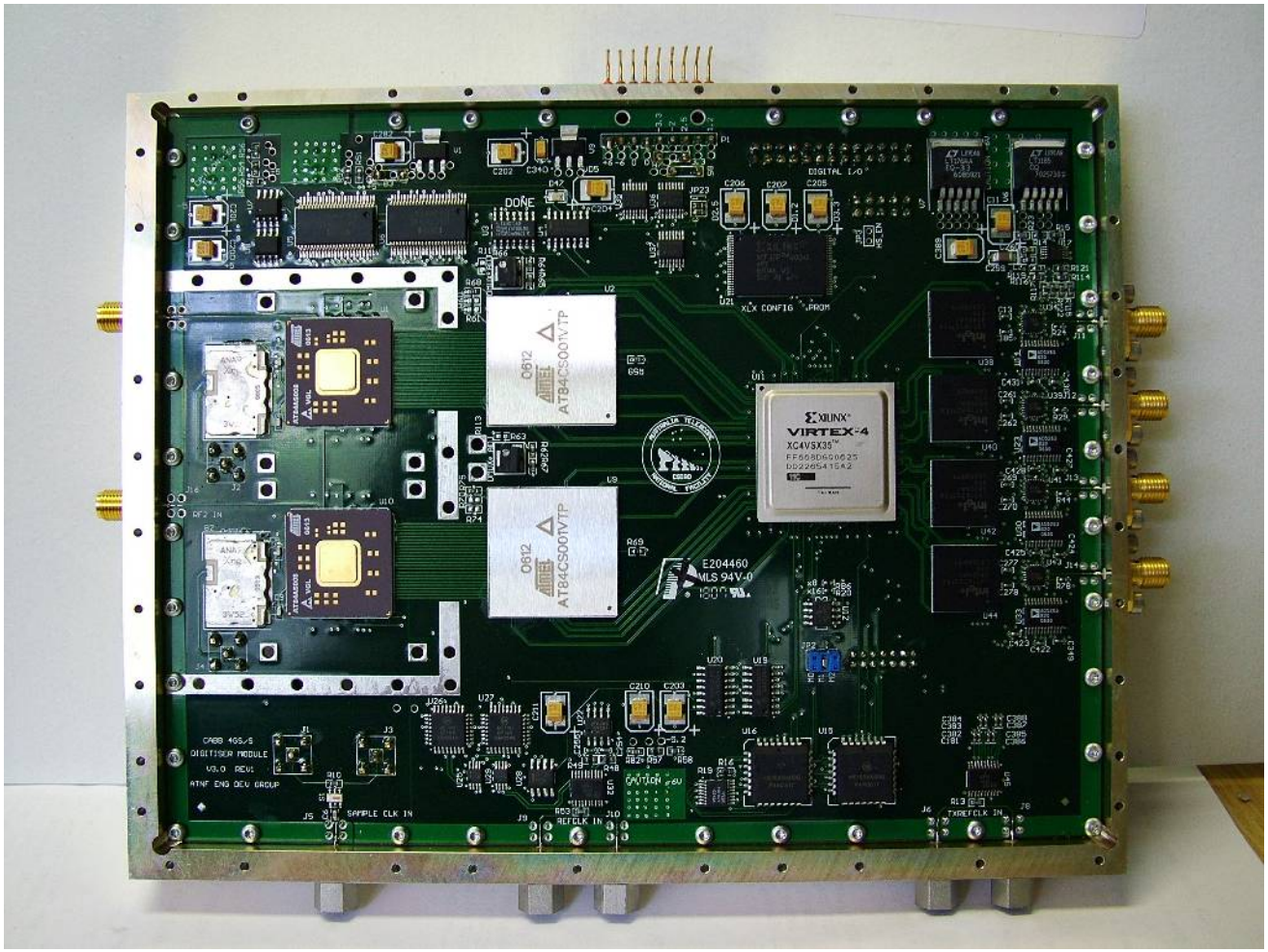
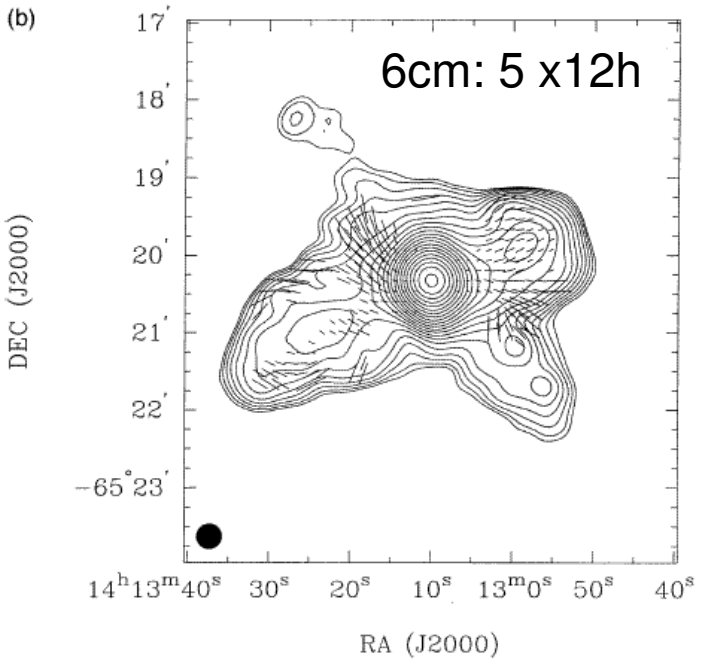


9-bit 4Gsps ADC Module

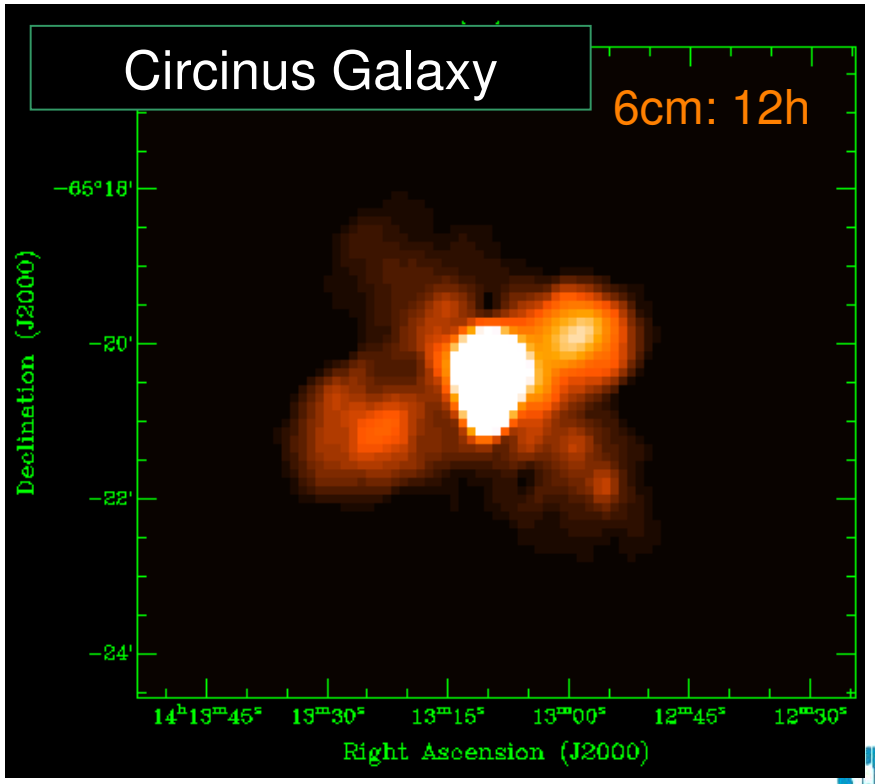
ATCA - the Australia Telescope Compact Array



⇐with the old ATCA correlator (Elmouttie et al. 1998)

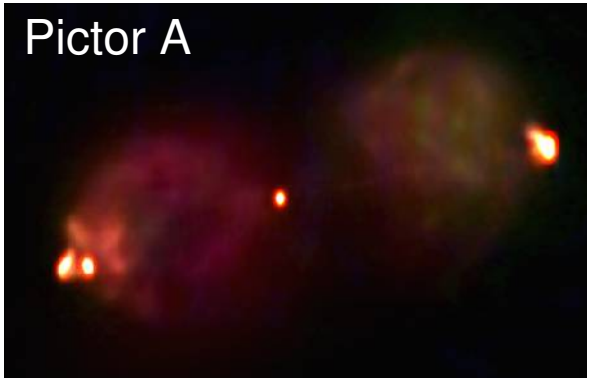
with CABB

⇓



Credits: Jamie Stevens, Bjorn Emonts, Maxim Voronkov, Emil Lenc, …

ATCA - the Australia Telescope Compact Array

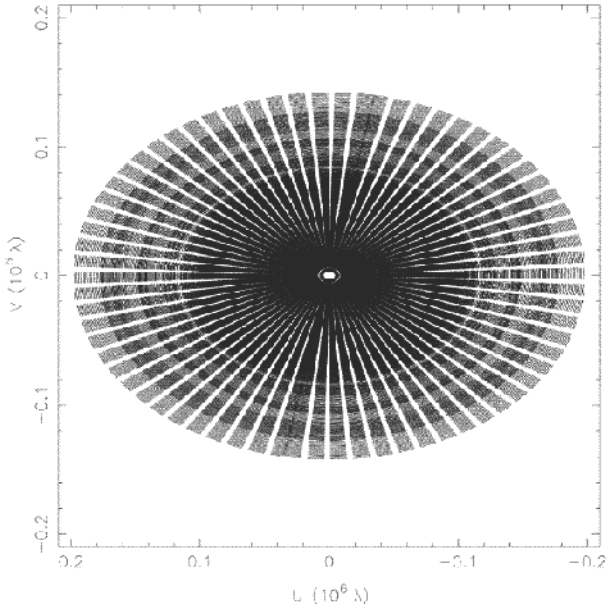


⇐with the old ATCA correlator

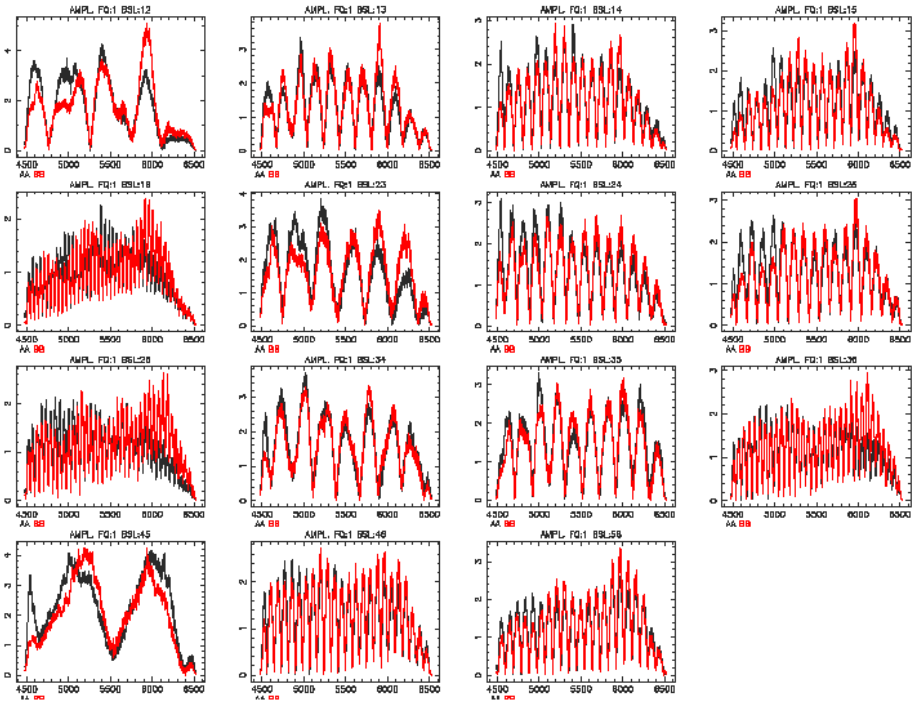
(kindly provided by Emil Lenc)

⇓with CABB

(u,v) coverage for a single 12 hr observation of Pictor A using ATCA-CABB at 6 cm and 3 cm in the 6A configuration.

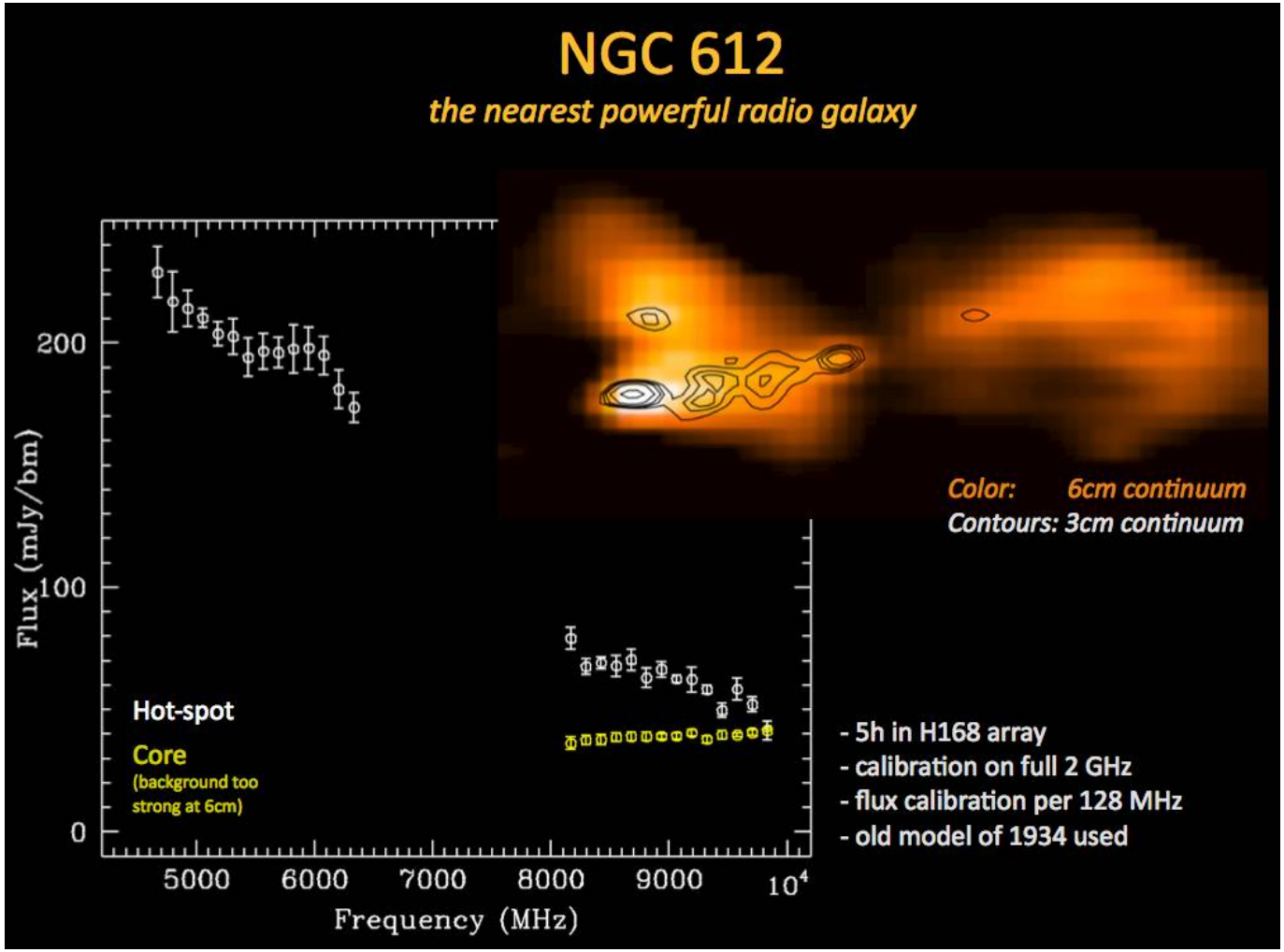


Structure seen across the 2 GHz band in recent 6 cm ATCA-CABB observations of Pictor A.



ATCA - the Australia Telescope Compact Array

with CABB (kindly provided by Bjorn Emonts)



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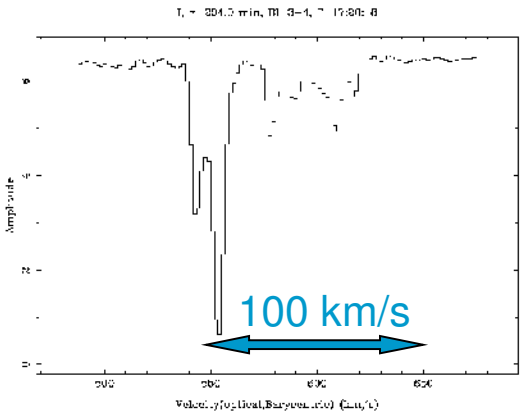
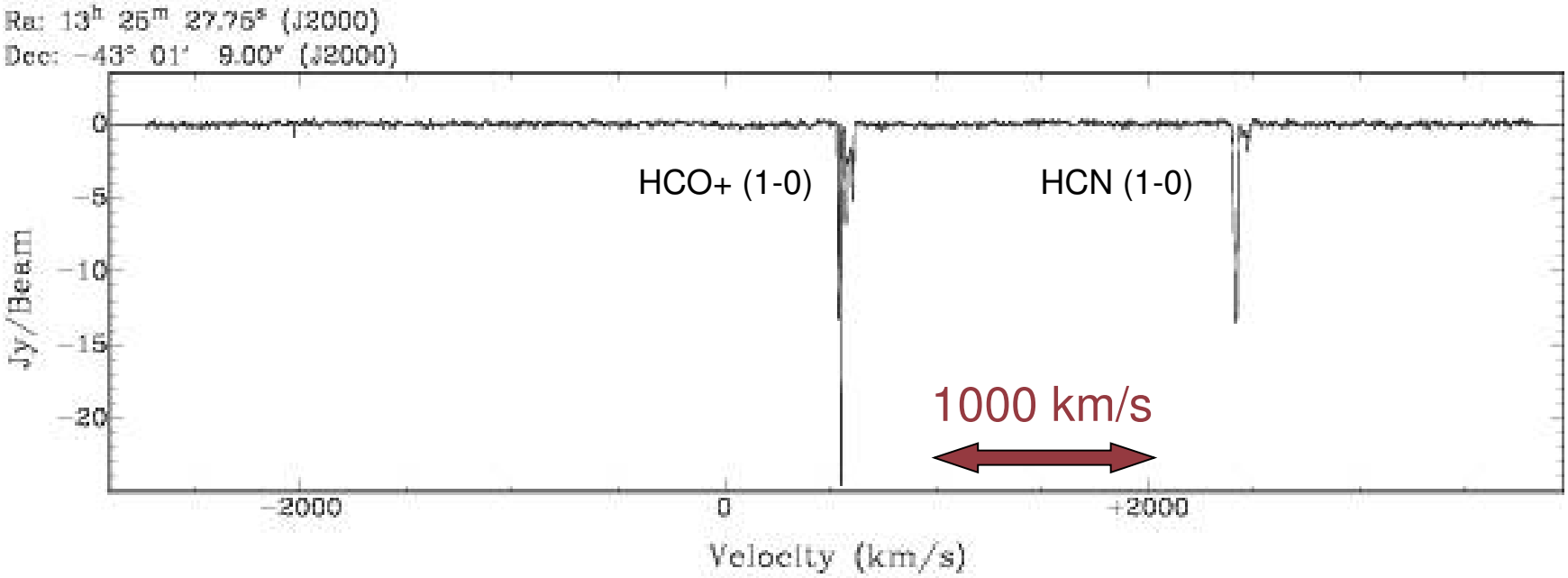


⇐ with the old ATCA correlator

with CABB

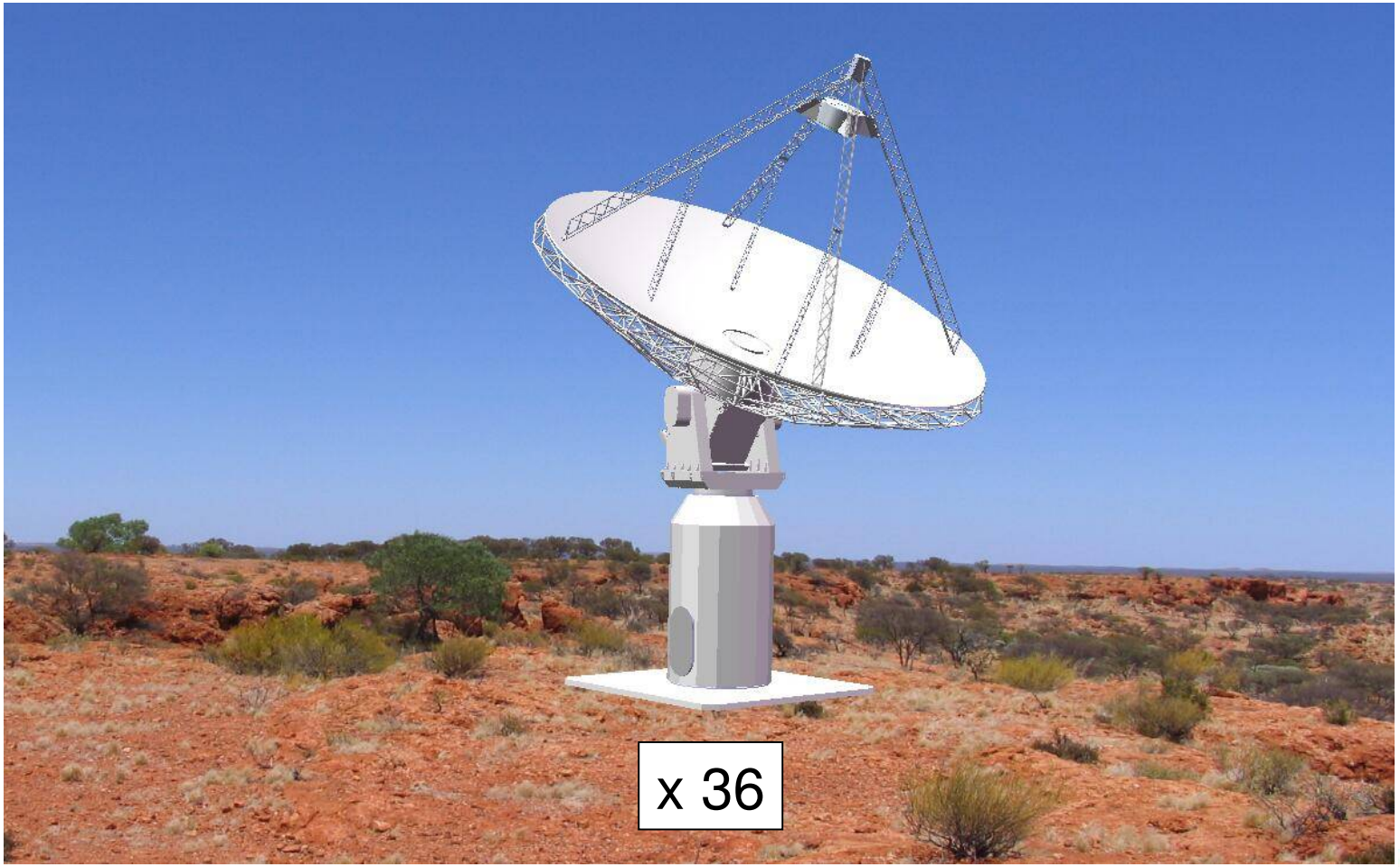
(kindly provided by Jürgen Ott)

⇓



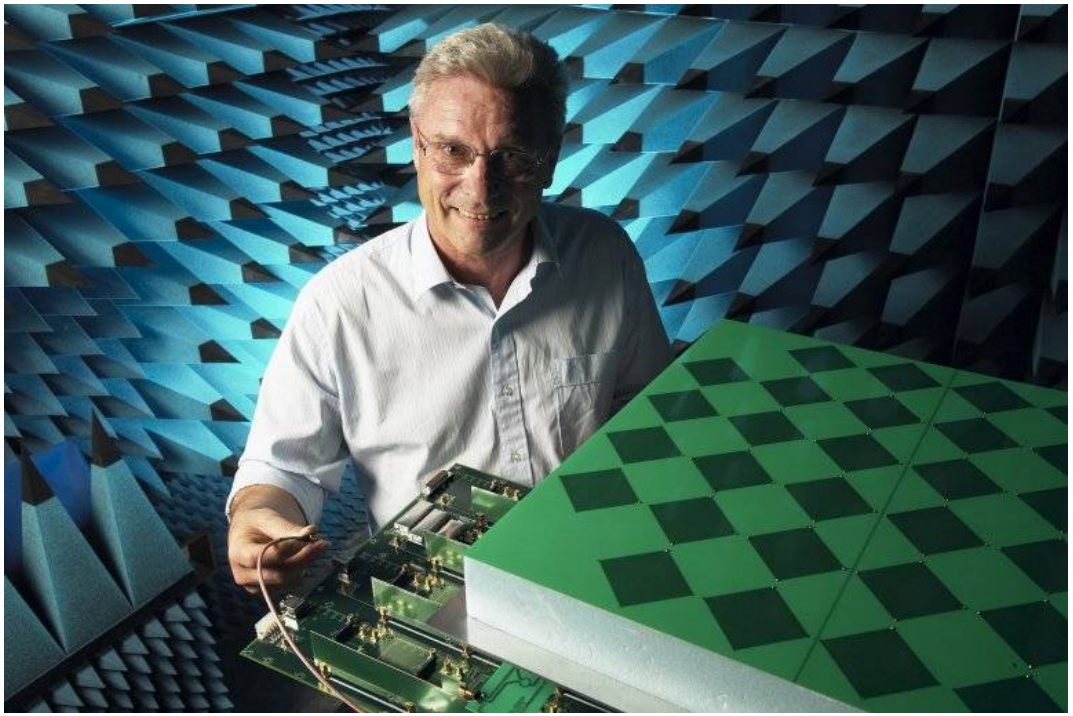
ASKAP - the Australian SKA Pathfinder

- 36 x 12-m antennas (under construction)

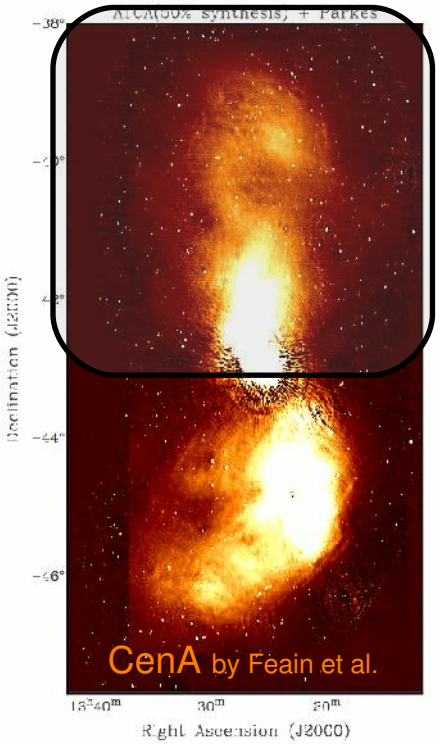


ASKAP - the Australian SKA Pathfinder

- 36 x 12-m antennas (under construction)
- novel focal-plane-arrays (designed & tested at ATNF) providing 30 degr^2 field-of-view



5.5° x 5.5°



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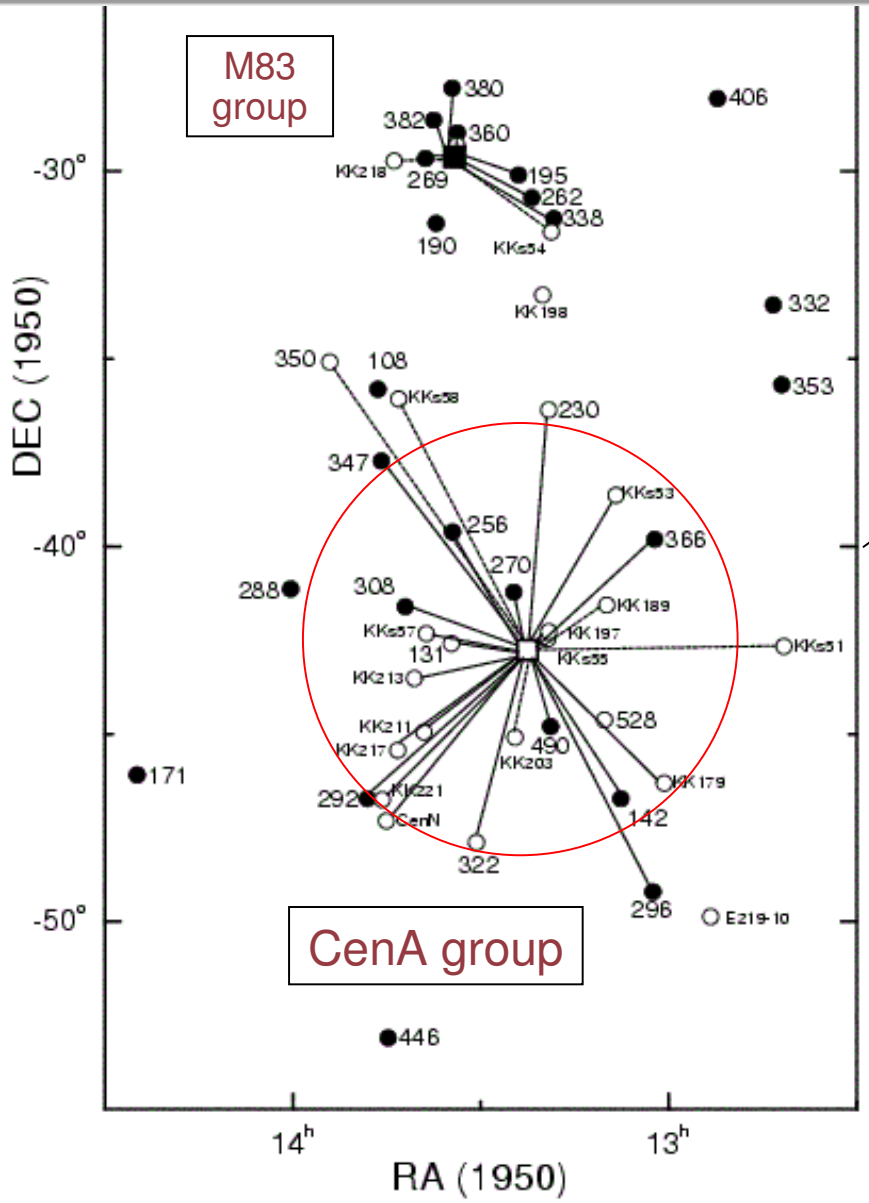

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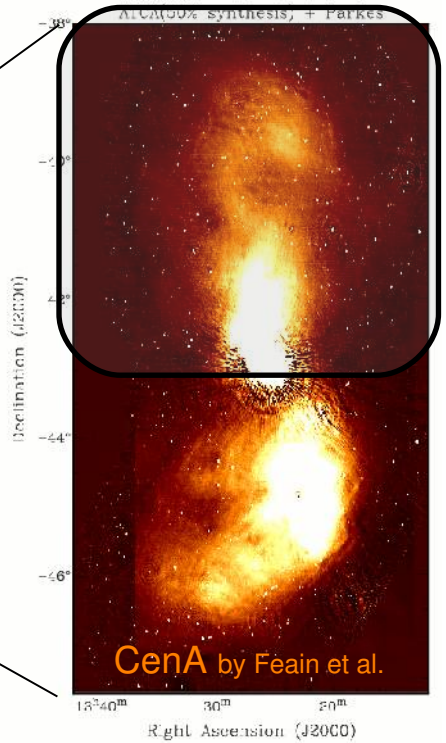

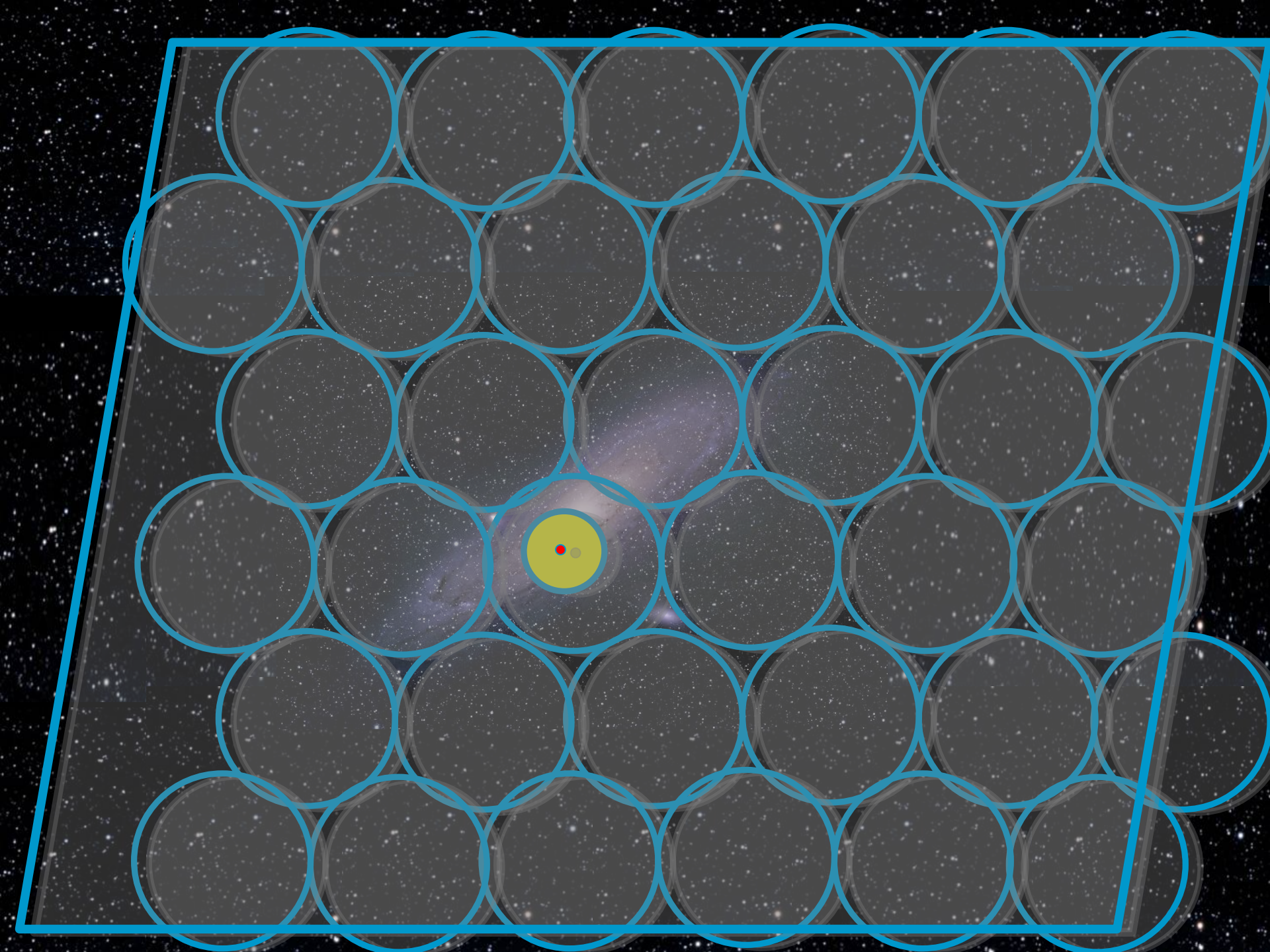

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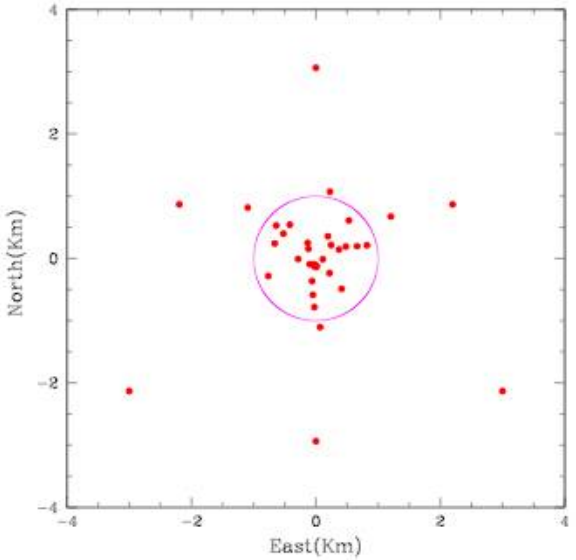

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- 30 antennas within 2 km (30" resolution: HI surveys), another 6 antennas out to 6 km (10" resolution, continuum)
- 300 MHz bandwidth divided into 16384 channels
- frequency coverage: 700 - 1800 MHz ⇒ HI survey machine
- 17 large Science Survey Proposals were submitted by June 15, 2009; awaiting decision in August 2009

ASKAP - the Australian SKA Pathfinder

Parkes Testbed Antenna