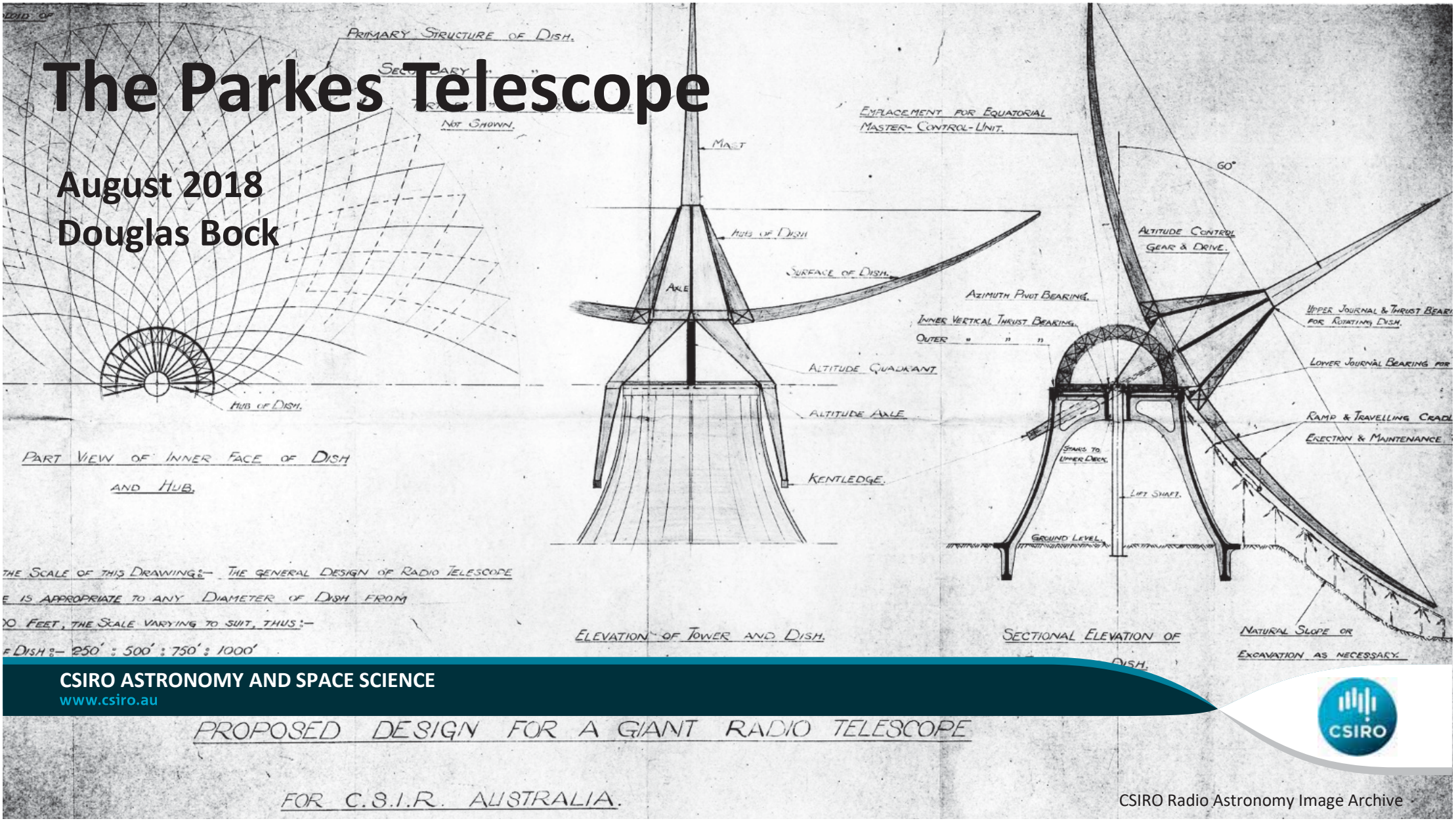
The Parkes Telescope

August 2018

Douglas Bock



1952	Funding request
1954	$250 (Carnegie Foundat)
1959	Bids closed (Freeman Fox, MAN)
1960	Construction
1961	First light (Fornax A): 14 Dec
1962	Mostly observing by April

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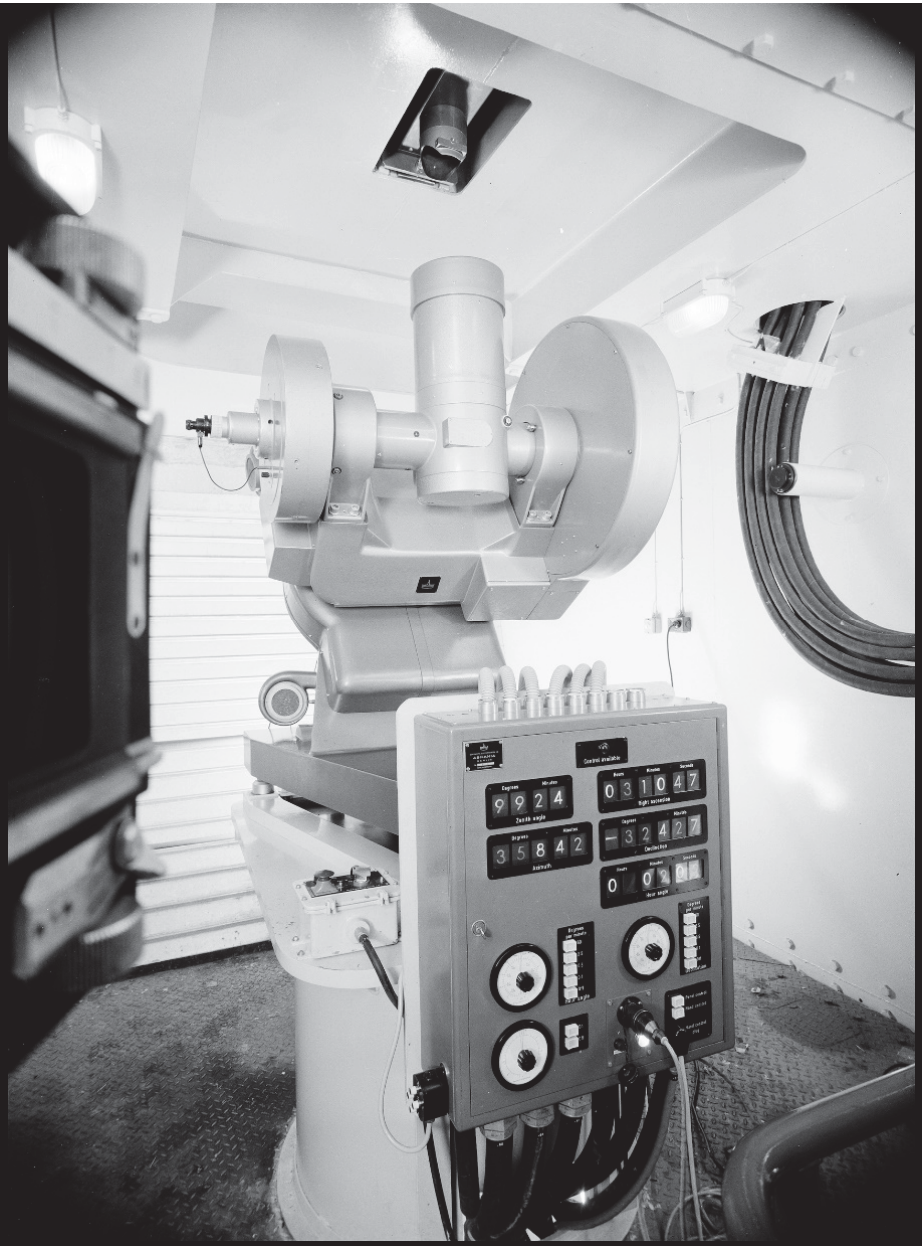
Master equatorial



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IAU Symp 20
in 1963

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Site (1965)

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Högbom
Galactic Plane
1965

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Resurfacing
1970

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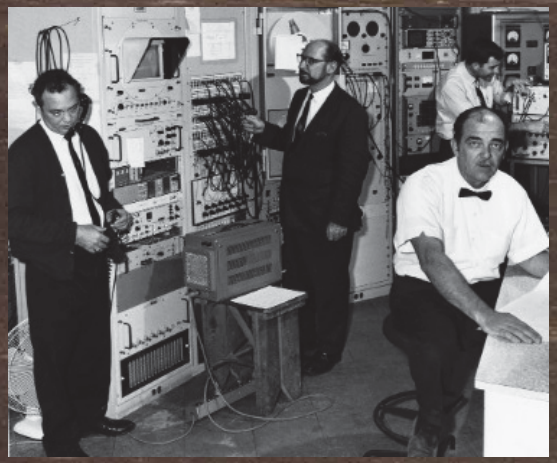
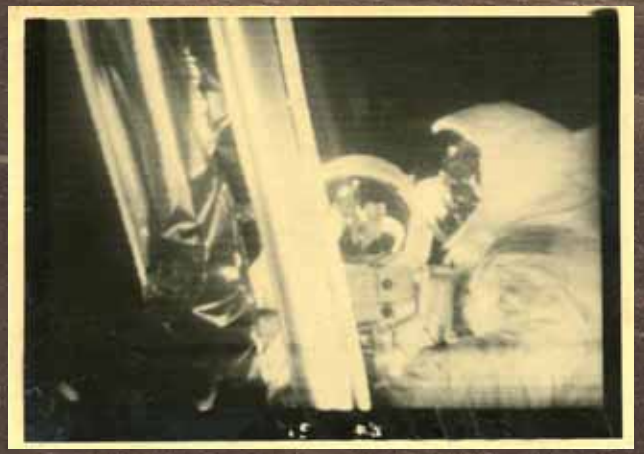
20 July 1969





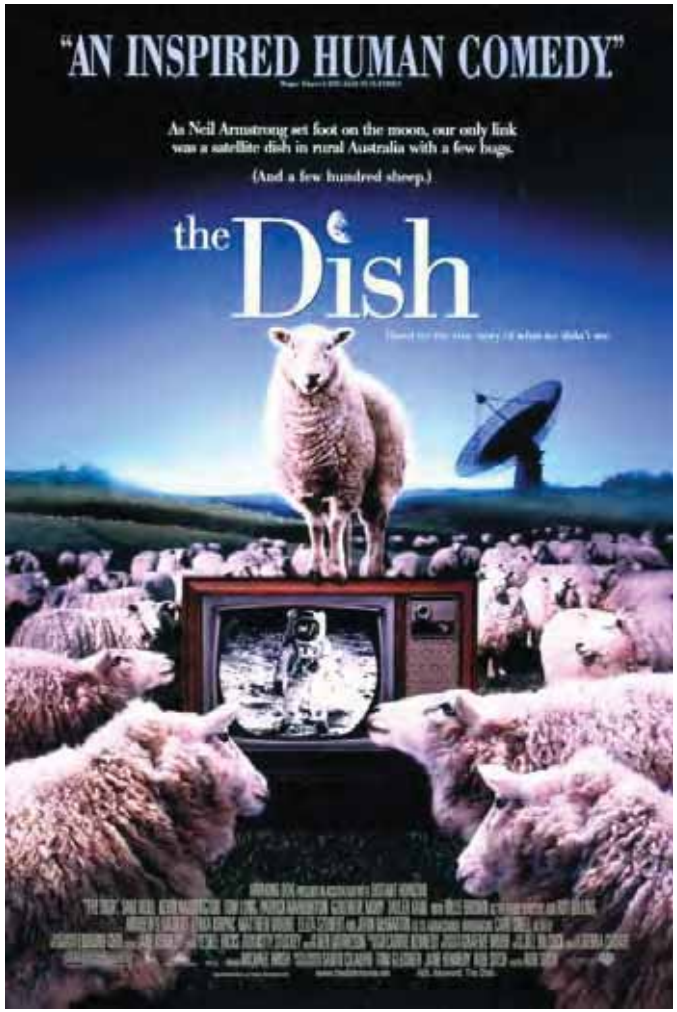
Background and right inset: NASA
Left inset: CSIRO Radio Astronomy Image Archive


CSIRO Radio Astronomy Image Archive

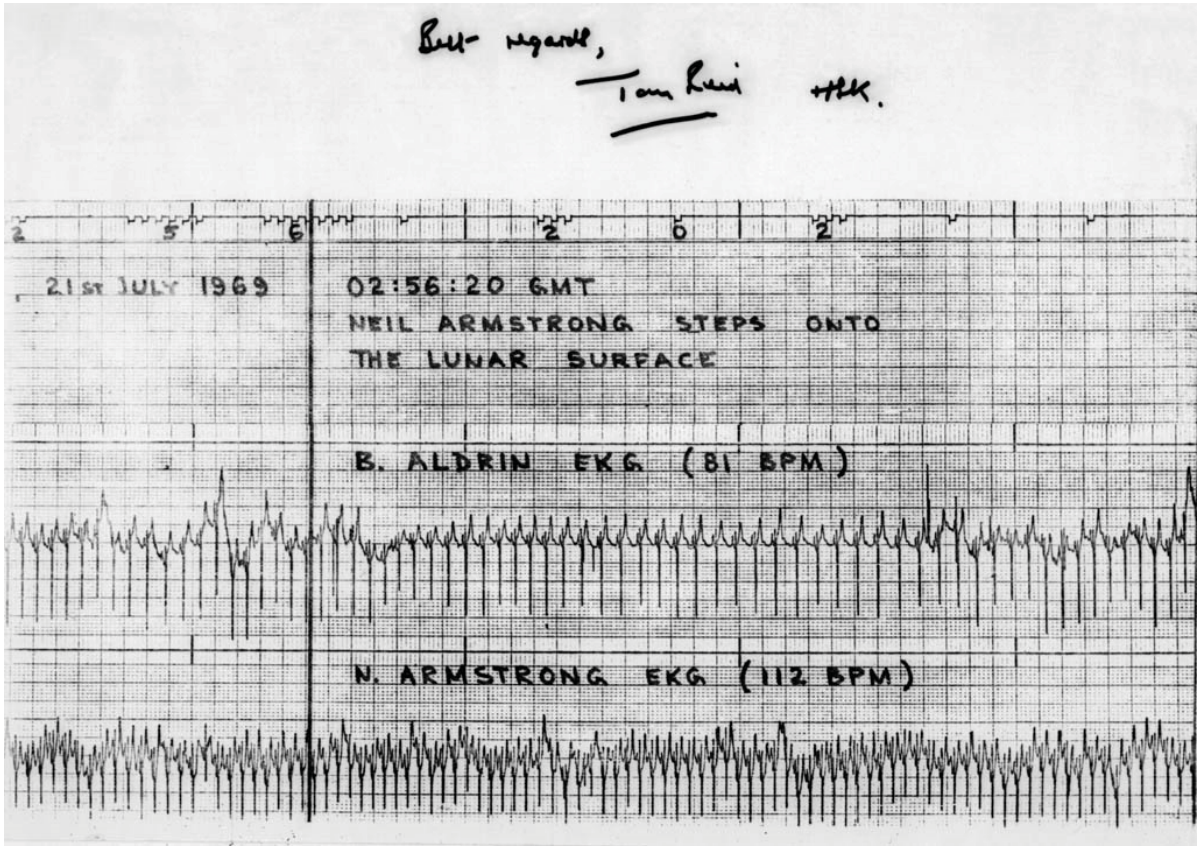
“The Dish”

“The Dish is a 2000 Australian film that tells a somewhat fictionalised story of the Parkes Observatory’s role in relaying live television of man's first steps on the Moon during the *Apollo 11* mission in 1969. It was the top grossing film in Australia in 2000.” --
Wikipedia

Visitor numbers to the Parkes Visitors Centre increased dramatically as a result!



NASA



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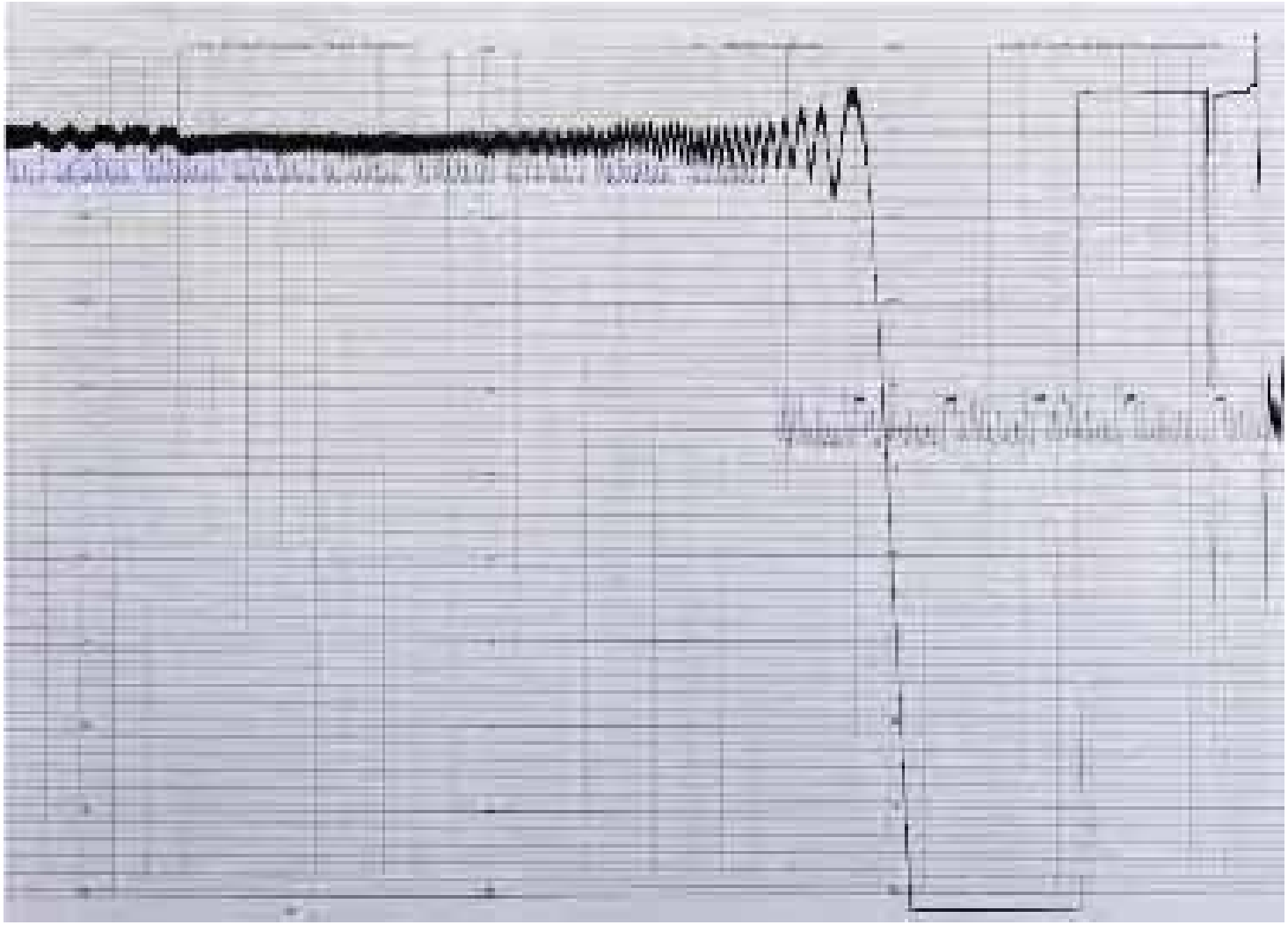
We really went there …



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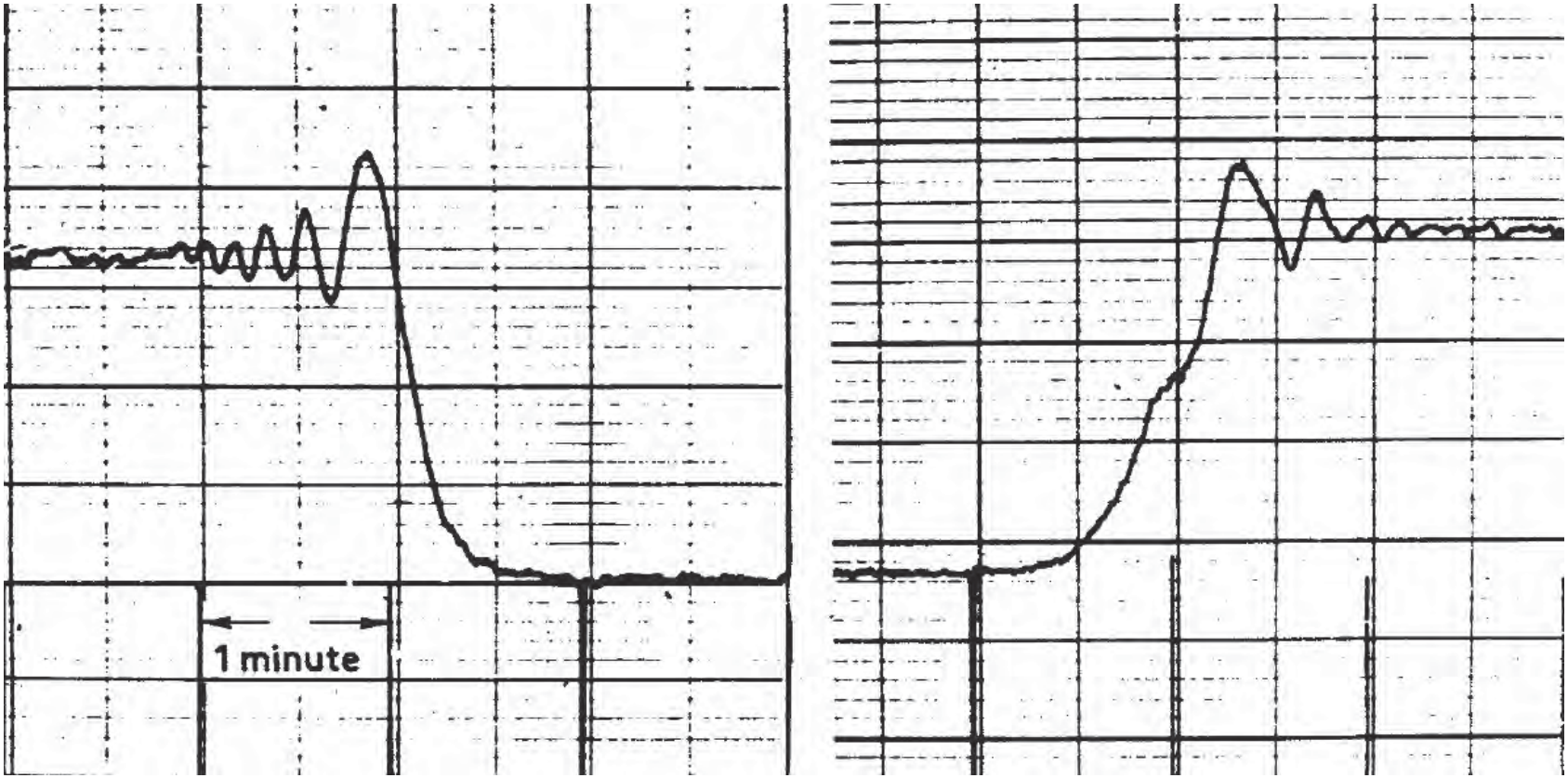
Major contributions of Parkes

- Localisation of 3C273 (via lunar occultations) leading to identification of quasars
- Discovery of Faraday Rotation in Cen A
- First observation of OH satellite lines (1612 and 1720 MHz)
- Contribution to 408 MHz all-sky survey (Haslam et al. 1982)
- Discovery of most distant objects known (z=2.2 in 1967, z=3.78 in 1982)
- PKSCAT (2.7 GHz) and PMN (4.8 GHz) catalogs
- Discovery of over half the known ~2600 pulsars
- Studies of our Galaxy, LMC and SMC, and local universe
- Support of space missions, esp. Apollo 11 and Apollo 13

(See Phil Edwards' "Fifty years in fifteen minutes" for a chronological review https://arxiv.org/abs/1210.2138)

Discovery of quasars

3C273
5 Aug 1962



Hazard, Mackey & Shimmins, 1963

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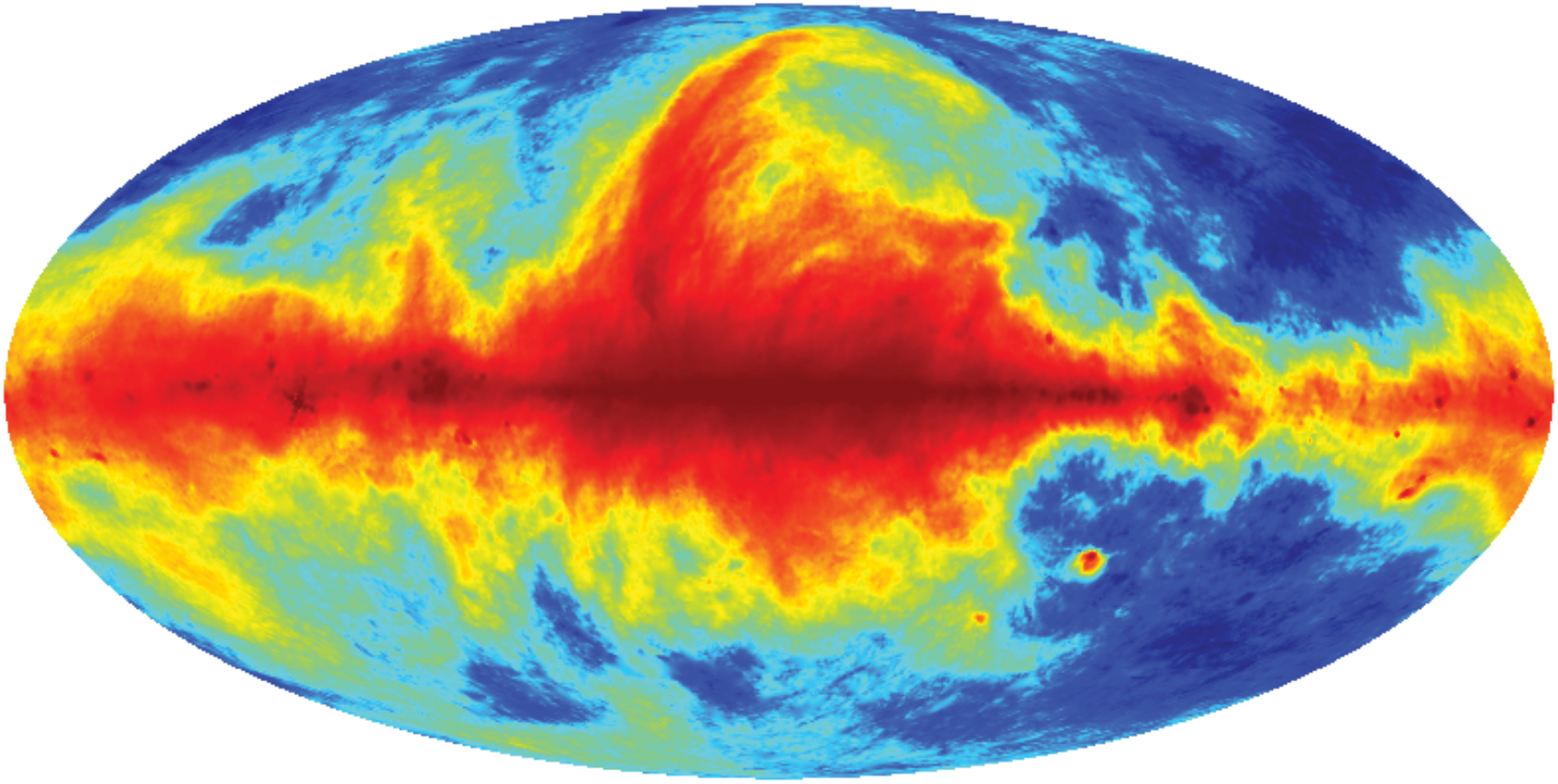
Haslam 408 MHz revisited



The 2014 source-subtracted and de-striped Haslam map (Remazeilles et al 2015)

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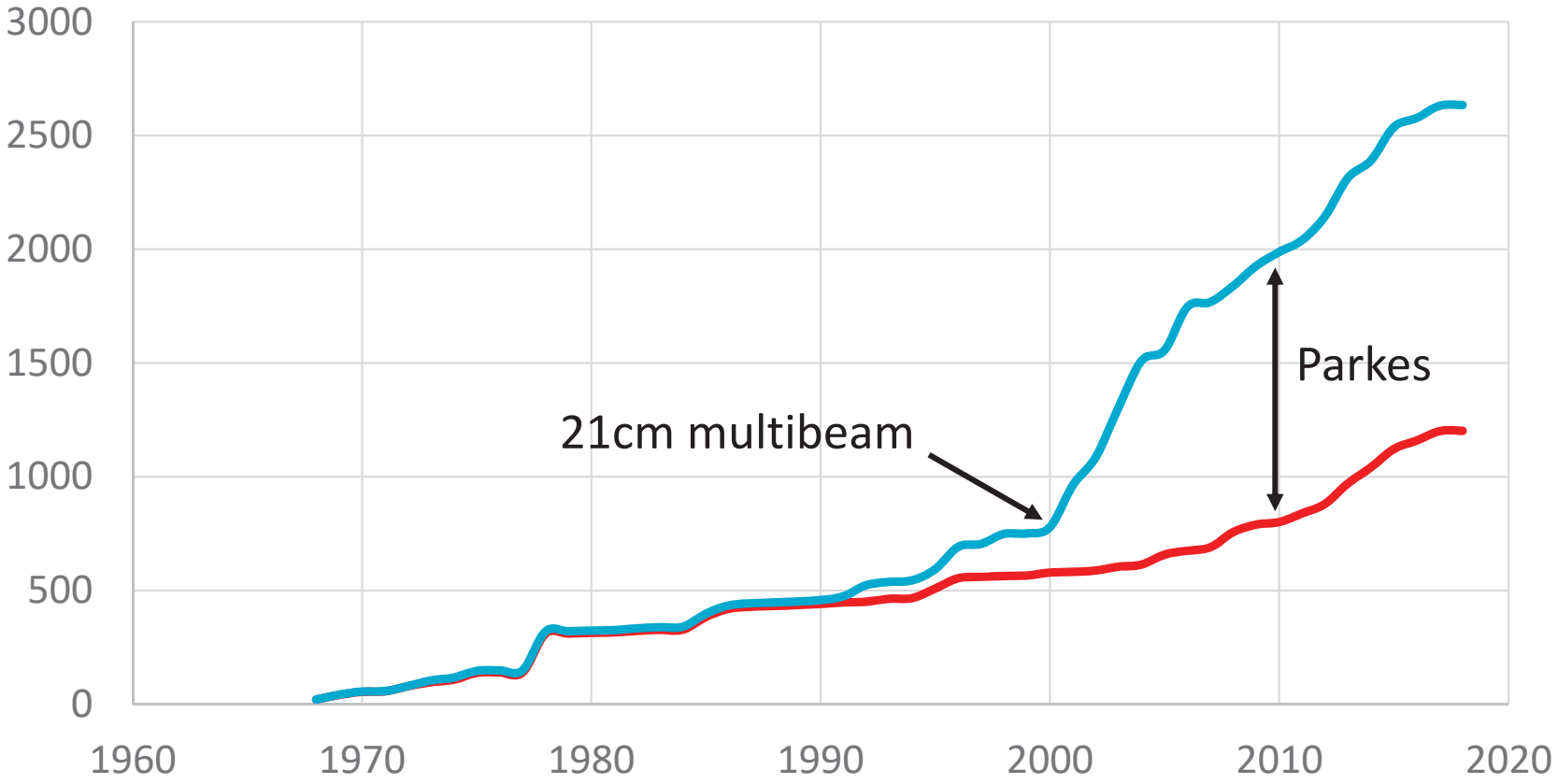
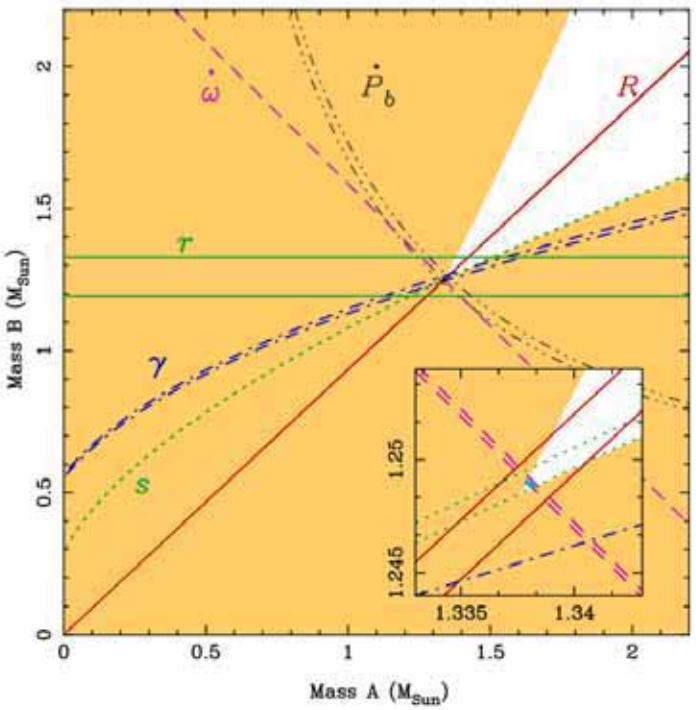
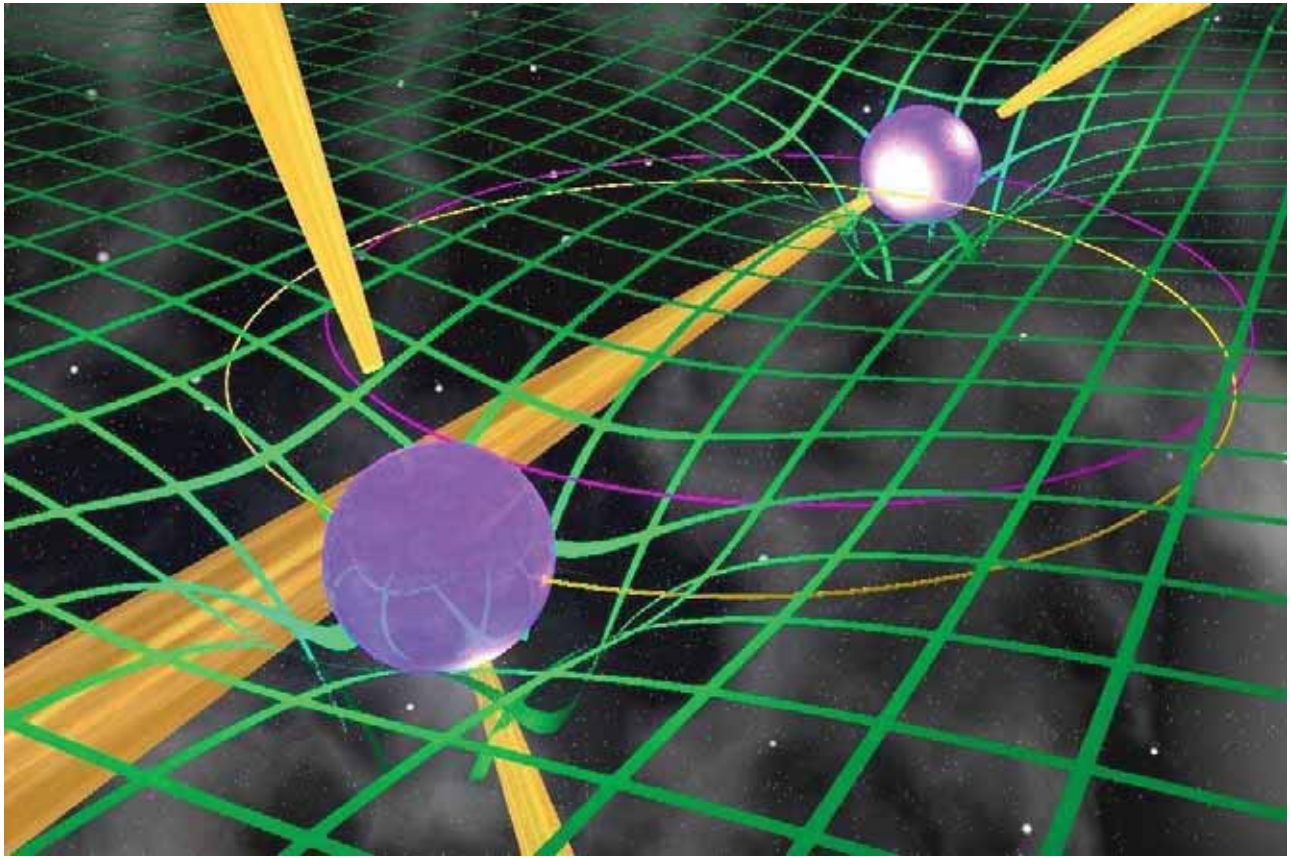
Known pulsars by year



The double pulsar

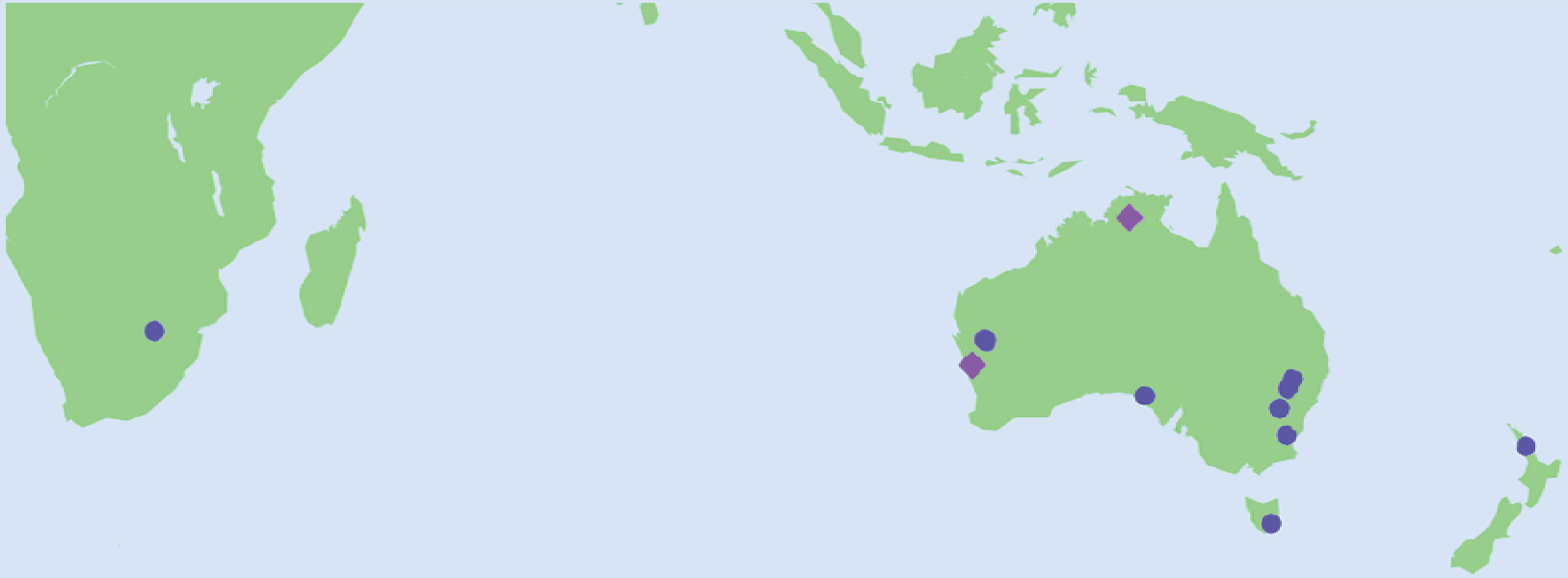


Kramer et al. 2006 & University of Manchester




50
AUSTRALIA
SPECIMEN
SPECIMEN
50

Long Baseline Array

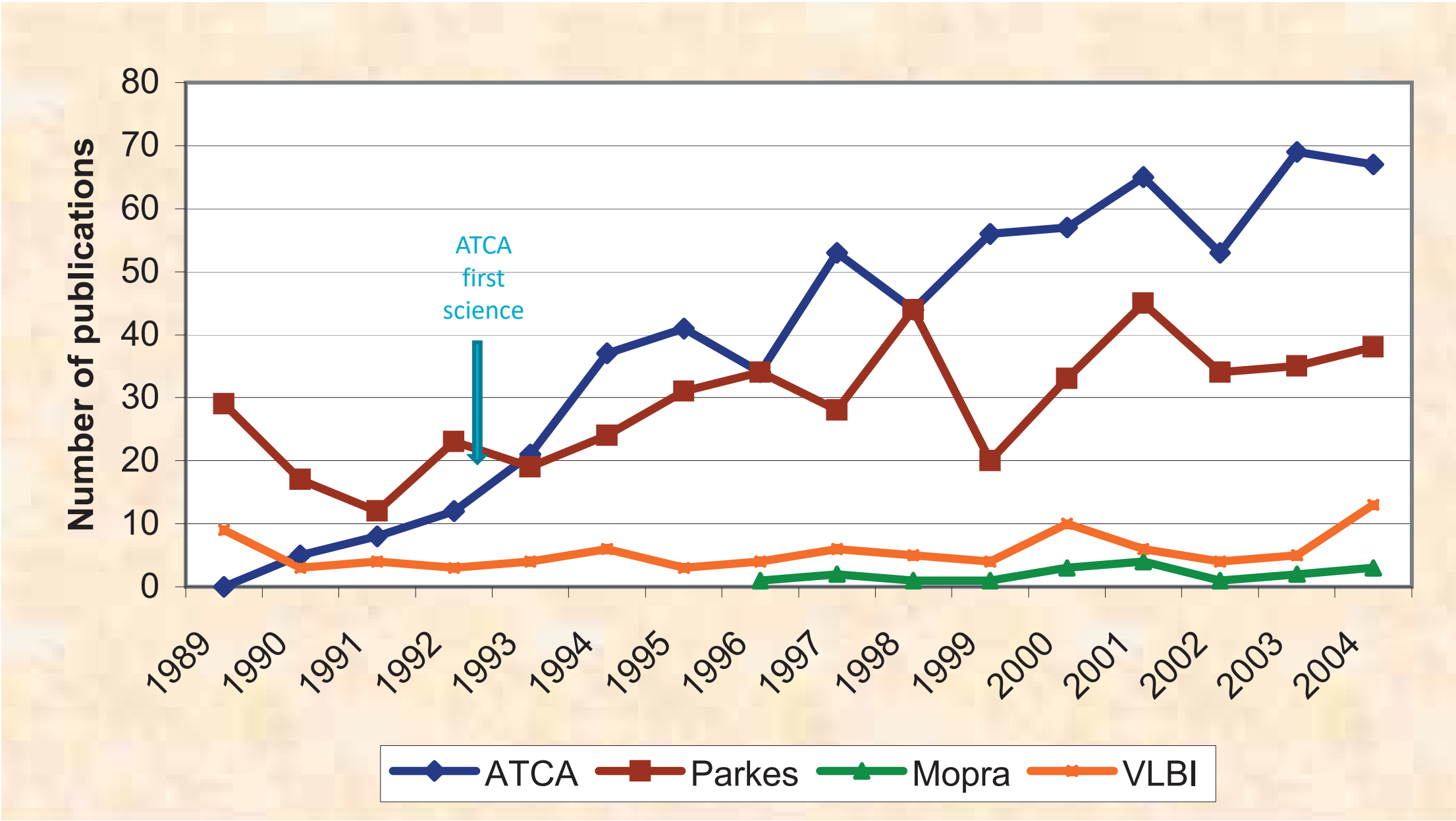


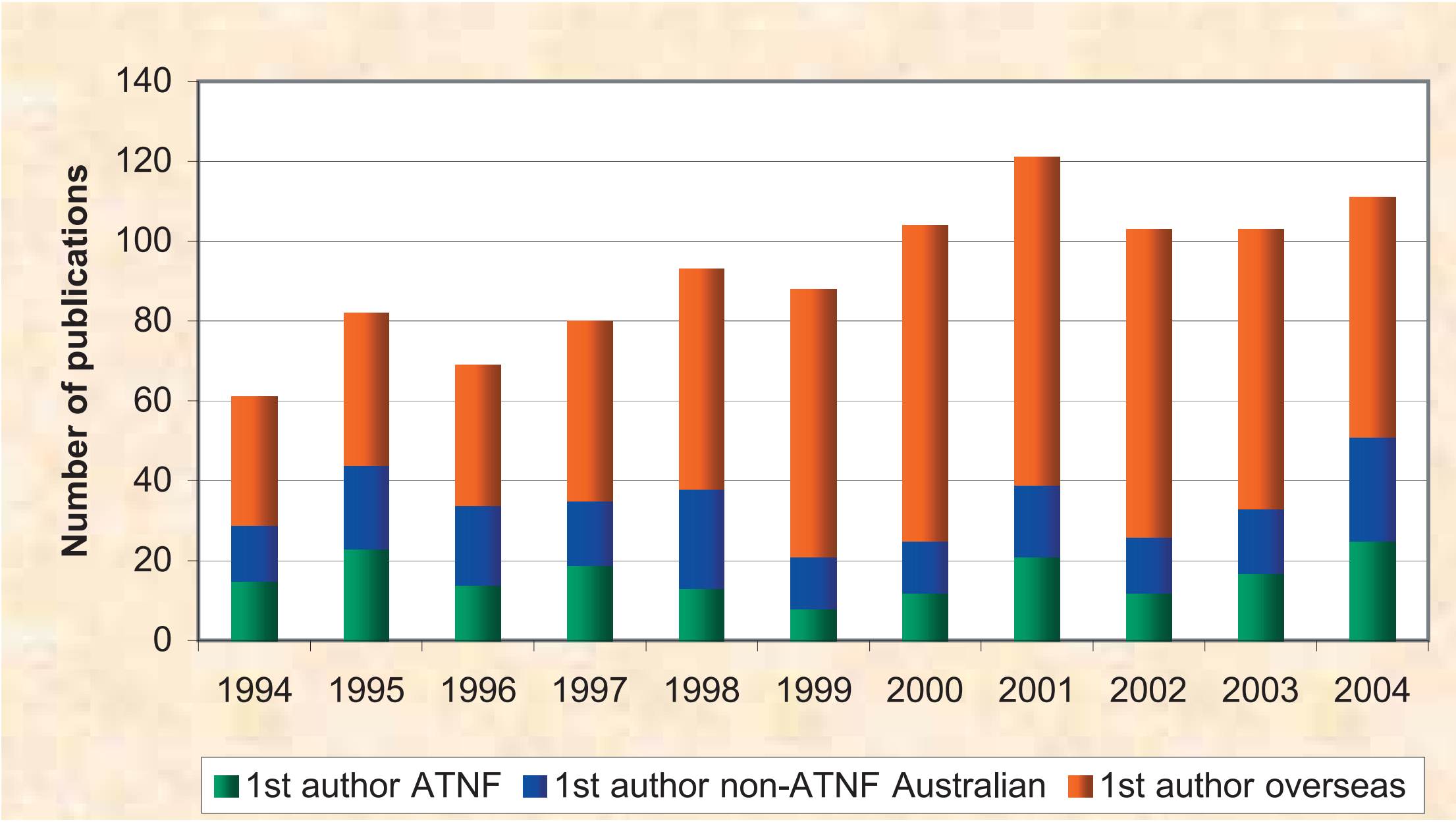
Bistatic radar

Impact

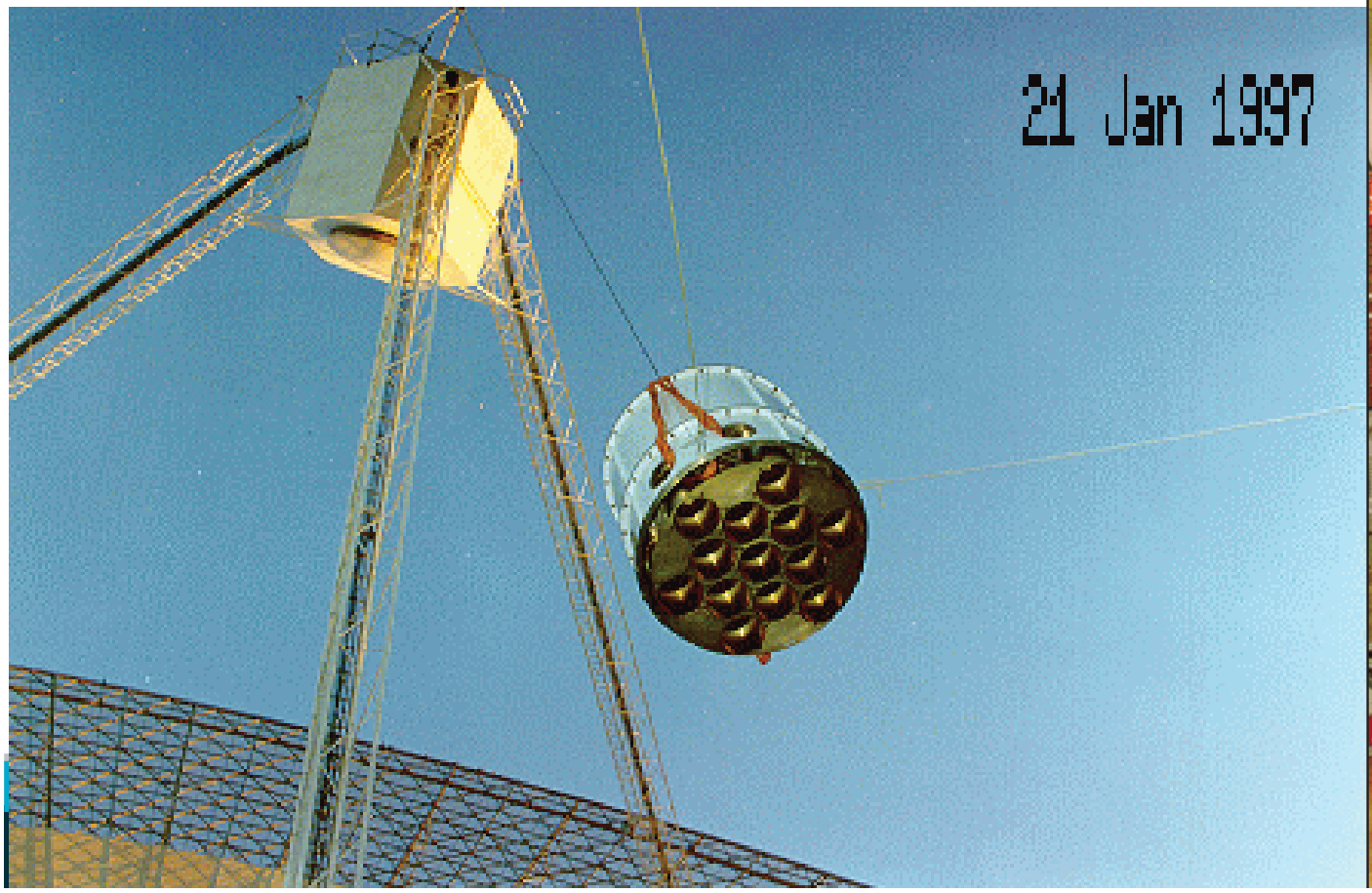
Rank	No. of papers		No. of citations		Citations/paper	
1	VLA	(582.2)	VLA	(8478)	Ryle	(19.9)
2	ATCA	(139.4)	ATCA	(1704)	Parkes	(16.9)
3	VLBA	(105.2)	Parkes	(1669)	VLA	(14.6)
4	Parkes	(98.6)	VLBA	(1161)	Green Bank	(13.1)
5	Arecibo	(84.7)	Arecibo	(969)	ATCA	(12.2)

Results for cm-band radio telescopes from Trimble & Ceja (2008), examining impact for papers published in 2001, 2002, and 2003, based on citations in the following three years


Number of publications
80
70
60
50
40
30
20
10
0
ATCA
first
science
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
ATCA
Parkes
Mopra
VLBI


Number of publications
140
120
100
80
60
40
20
0
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
1st author ATNF
1st author non-ATNF Australian
1st author overseas

The Parkes 21cm Multibeam Receiver

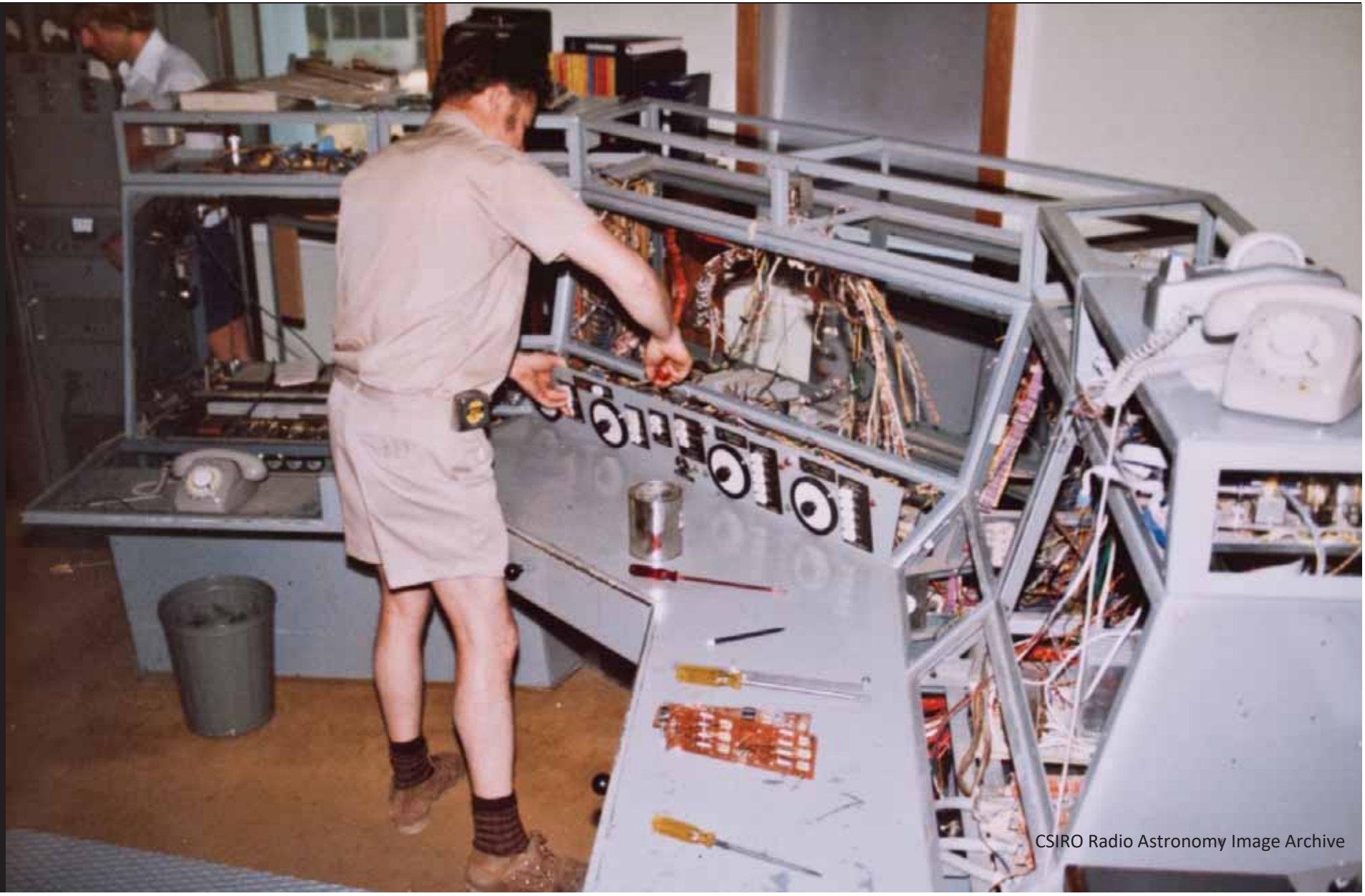


Parkes multi-beam receiver

The multibeam receiver has enabled high impact science, including:

- HIPASS (the HI Parkes All-Sky Survey)
  - blind extragalactic HI 21-cm emission-line survey covering the whole southern sky from declination -90° to +25°
- Parkes multibeam pulsar survey (discovering 832 pulsars)
- Parkes-Swinburne multibeam survey (discovering 109 pulsars)
- Discovery of the double pulsar (J0737-3039A,B) providing some of the strongest tests of GR
- Discovery of RRATs (Rotating Radio Transients)
- Discovery of FRBs (Fast Radio Bursts)
- The Southern Plane Galactic Survey (SGPS) and Galactic All-Sky Survey (GASS)

Remote observing 2011-2015



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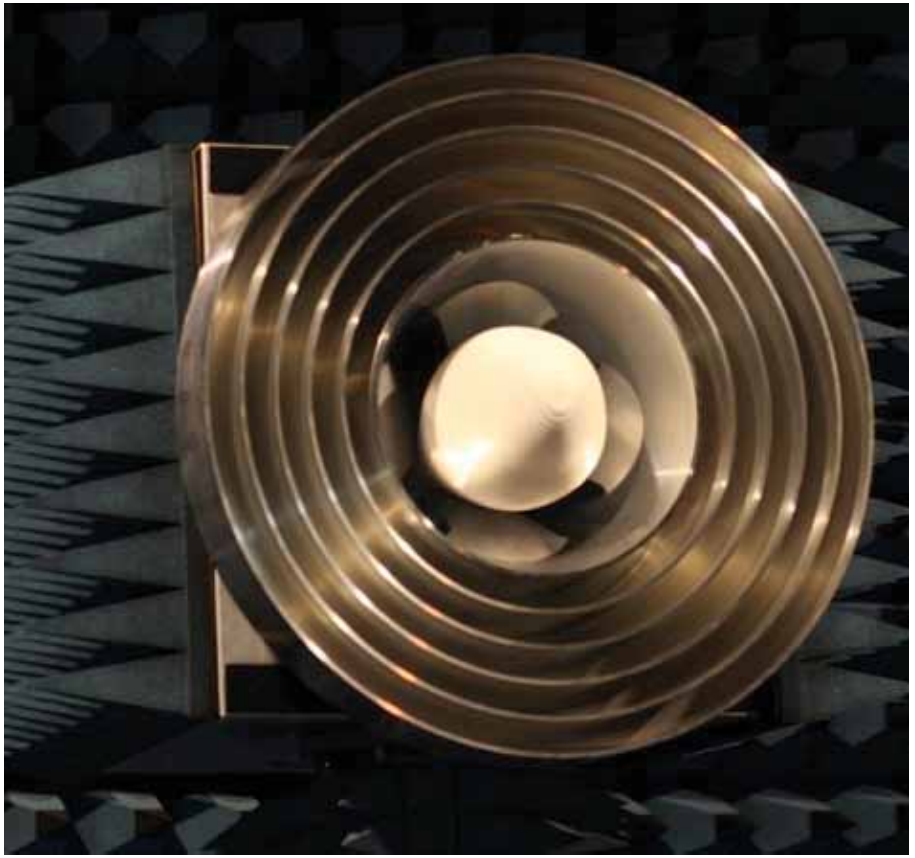
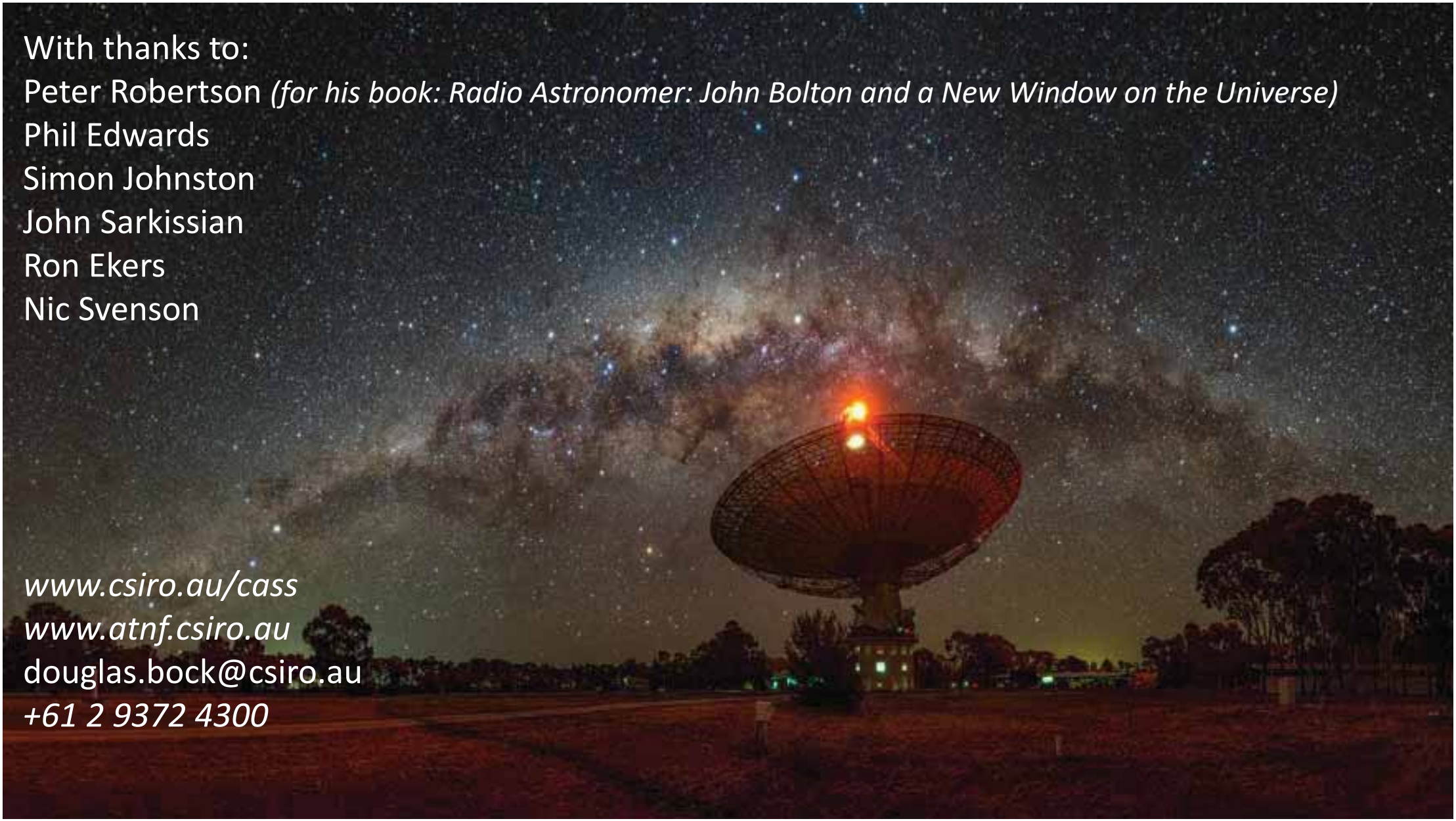
FAST - China



CRYO PAF

Ultra-wide receiver: 0.7 – 4 GHz, < 20K



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Peter Robertson *(for his book: Radio Astronomer: John Bolton and a New Window on the Universe)*
Phil Edwards
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John Sarkissian
Ron Ekers
Nic Svenson

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