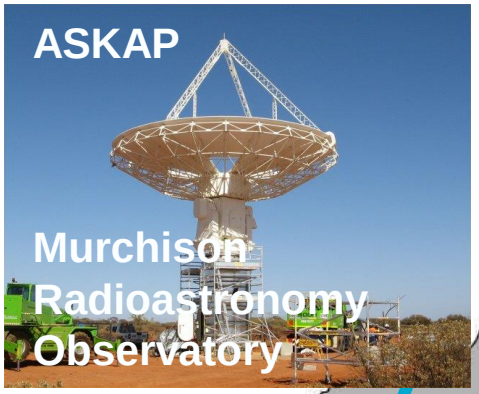
ATUC June 2016 - ATNF Operations

John Reynolds

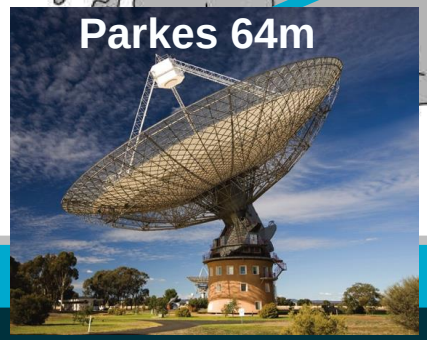
The ATNF

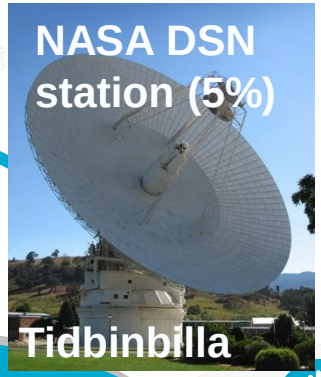

ASKAP
Murchison Radioastronomy Observatory


Mopra


Australia Telescope Compact Array (6x22m)
Narrabri

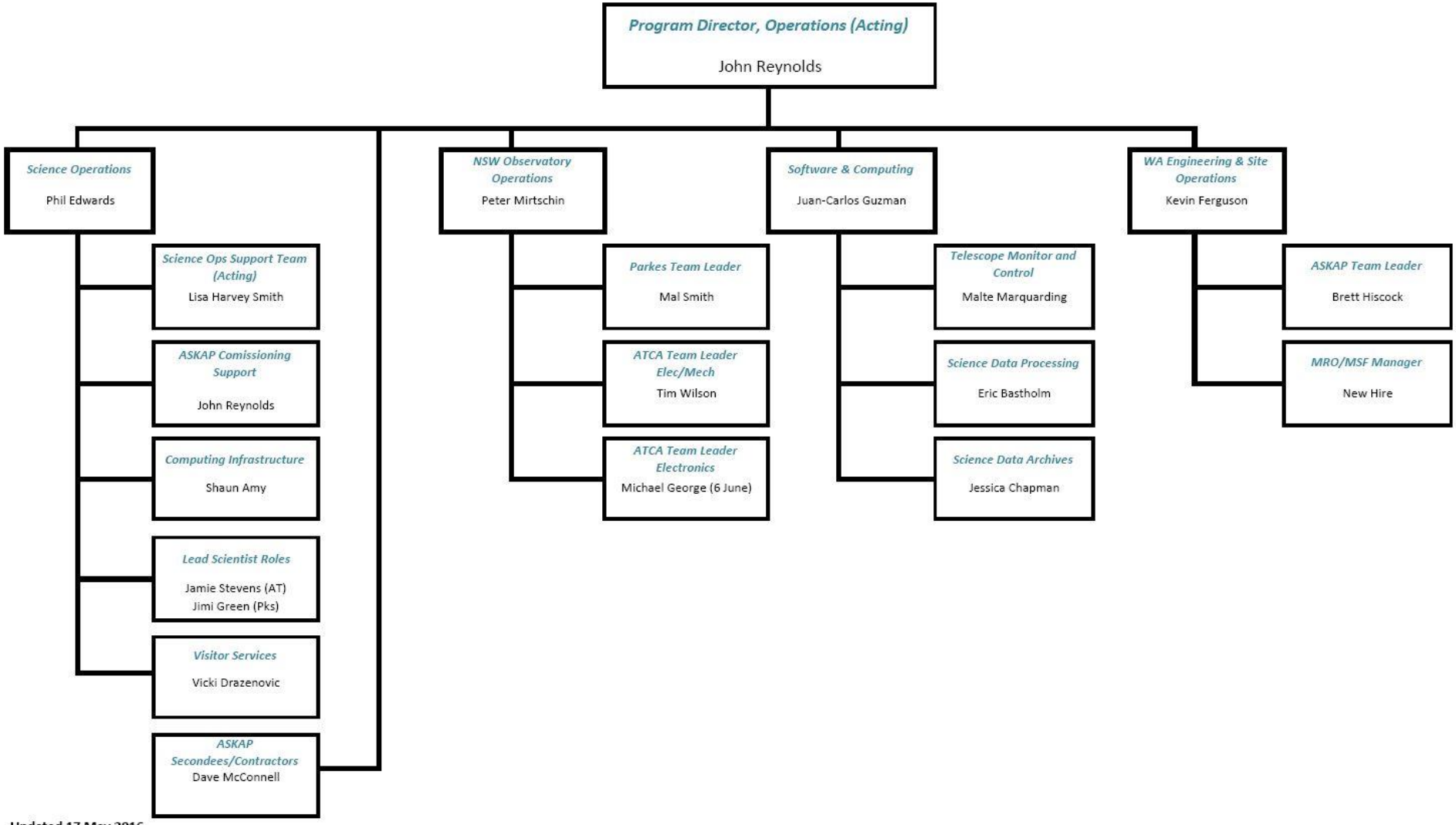

Geraldton


Parkes 64m


NASA DSN station (5%)
Tidbinbilla

WESTERN AUSTRALIA
BOOLARDY STATION
GERALDTON
PERTH
NEW SOUTH WALES
NARRABRI
MOPRA
PARKES
SYDNEY
Radiophysics Laboratory
Pawsey HPC Centre

ATNF Operations - organization



Staff changes

Welcome

Hayley Bignall (Per)
Kevin Ferguson (Per)
Eric Bastholm (Per)

Jimi Green (Syd)
Steve Ord (Syd)
Edward Guntek (Syd)

Steve Hathway (Get)

Farewell & Thanks

Kate Brooks (Per)

Christoph Brem (Get)

Jessica Chapman (Syd)

ASKAP Operations

ASKAP operations - headline items

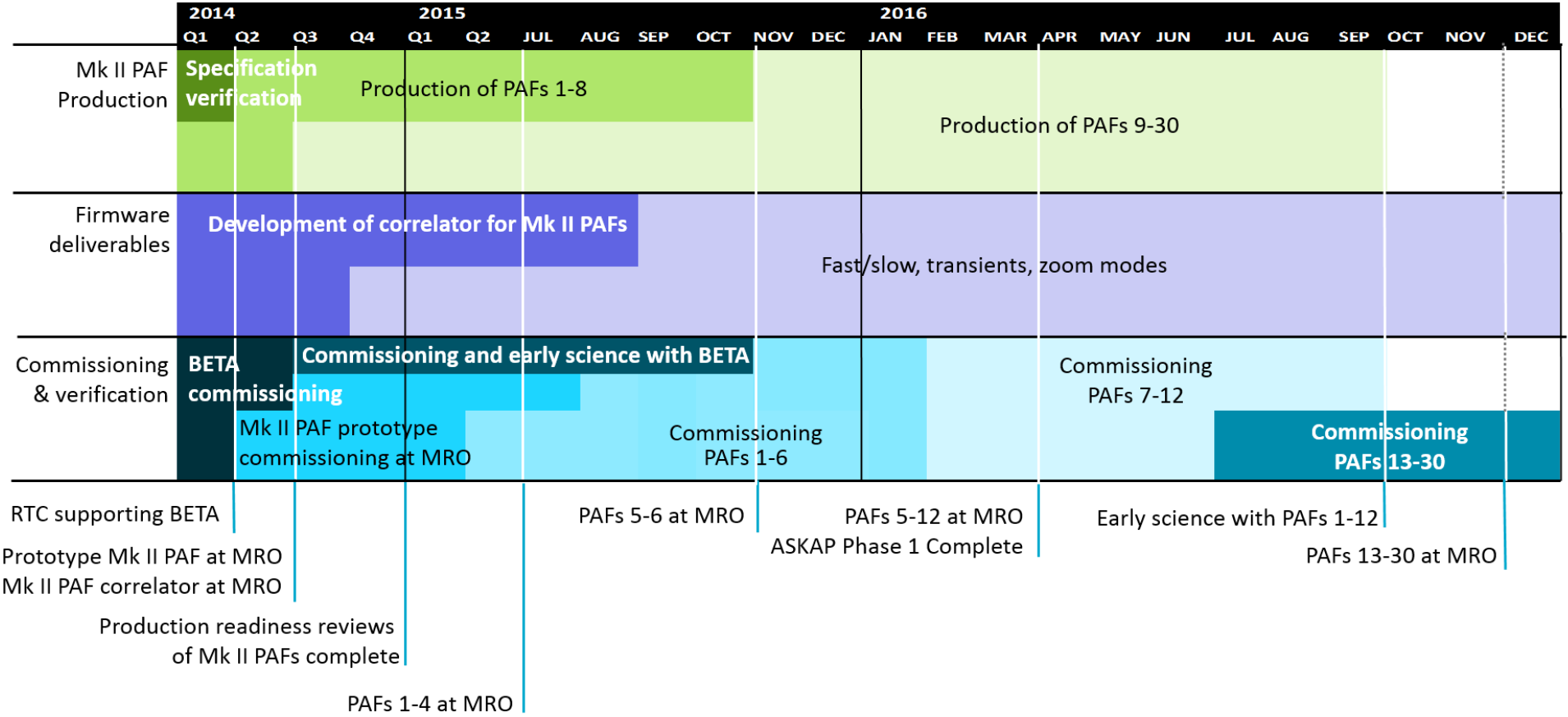
- Recent ACES results covered by Dave McConnell
- ATNF Operations Plan with ASKAP released
- BETA operations ceased in Feb 2016
- Geraldton staffing close to steady-state levels
- Cut-over to new power station, July 2016
- “FIFO” model for site access working well
- Early Science commencement ~Sep 2016

- Tied-array mode now a new project – covered in Tasso’s talk

CSIRO's Stage 2 renewable expansion

ASKAP delivery

Integrated schedule



The Early Science Program

- **A wide area continuum survey**
  (1 MHz and 18.5 kHz resolution, full Stokes, 700-1800 MHz, 6-12 hours per field)

- **A few 30 square degree fields studied in neutral hydrogen**
  (18.5 kHz resolution, 1130-1430 MHz, 120 hours integration time per field (TBC).

- **A single deep HI field**
  (18.5 kHz resolution, 1000-1300 MHz)

- **A science program at high spectral resolution** (details TBC)

- **A science program to probe the variable and transient radio sky (details TBC)**

Other ideas requiring very small observing times (e.g. MWA EoR field) may be observed on an “opportunistic” basis as part of commissioning.

Estimated time available for early science

Program duration: 12-14 months ≈ 9400 hours

Fraction for early science 25% ≈ 2300 hours

Minus ~20% overheads (beamforming, calibration etc.)

Total available on sky ≈ 1800 hours*

Estimated commencement of Early Science operations: September 2016

Contact for further information: Lisa Harvey-smith

Status & Impact

Media impacts

- Traditional media releases
- Social media campaigns (#CSIROspace)
- ATNF website news
- Events/meetings

The media landscape continues to evolve!

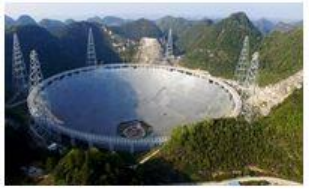
- *Sunrise Breakfast:* live cross (Jul 2015)
- *How Ridiculous:*145,753 *YouTube* hits + Sunrise promo
- *Eureka* Prize finalist in science communications (Lisa Harvey-Smith, mentioned in Hansard)

In planning/negotiations;

- *Stargazing Live 2017* (3xBBC, 3xABC, host: Brian Cox)
- *Apollo 11* 50th anniversary doco (Fairtrade Films)
- *The Bachelor* (!?)

Impacts;

- Trigger significant traffic to CSIRO media and home pages (6,000+ views for ASKAP HI discovery)
- Strong social media support of space and ATNF's observatories result in significant media pick-up both domestic and internationally



05 MAY 2016

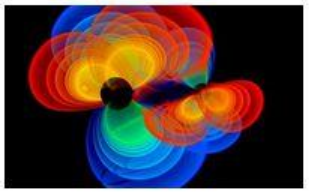
Australian technology behind the world's largest telescope >

Technology developed by CSIRO will sit at the heart of one of the world's biggest ever science projects, following an agreement with China's leading astronomical research organisation.

25 FEBRUARY 2016

Solved! First distance to a 'fast radio burst' >

For the first time a team of scientists has tracked down the location of a fast radio burst (FRB), confirming that these short but spectacular flashes of radio waves originate in the distant universe.



12 FEBRUARY 2016

Aussie innovation helps hunt down gravitational waves >

For the first time in history, astronomers have observed elusive gravitational waves – ripples in space time caused by a violent cosmic event taking place in the distant Universe.

22 JANUARY 2016

Dark 'noodles' may lurk in the Milky Way >

Invisible structures shaped like noodles, lasagne sheets or hazelnuts could be floating around in our Galaxy radically challenging our understanding of gas conditions in the Milky Way.

25 SEPTEMBER 2015

Eleven year cosmic search leads to black hole rethink >

One hundred years since Einstein proposed gravitational waves as part of his general theory of relativity, an 11-year search has failed to detect them, casting doubt on our understanding of galaxies and black holes.

Publications

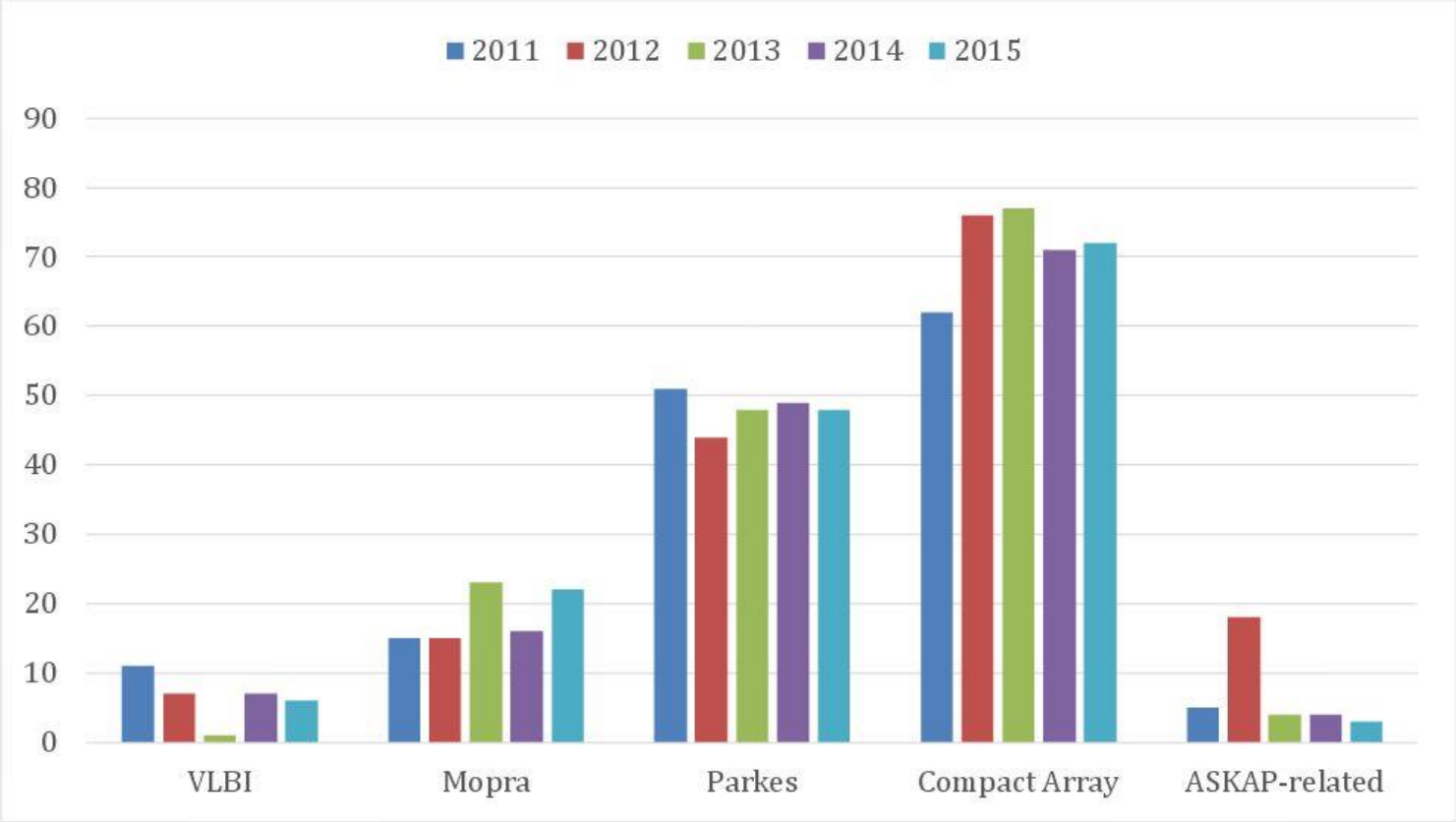


Figure 10: Publications that include data from, or are related to, the Compact Array, Mopra, Parkes, VLBI and ASKAP, grouped by facility for 2011–2015. A small number of papers with data from more than one facility are counted more than once.

Papers and impact for 2014

	No. of papers	No. of citations	Citations/paper
VLA/JVLA	200	1885	9.4
ATCA	70	662	9.5
Parkes	49	588	12.0
LBA	7	76	11.0
Mopra	17	104	6.1
ASKAP	4	26	6.5
Other	72	1075	14.3

Results for ATCA and Parkes (based on ATNF publications lists) examining impact for papers published in 2014, based on citations as given by ADS in the following years.

“Other” – CASS affiliated author(s) using non-CASS facilities

Funding

“Breakthrough Listen” Project

- 25% of Parkes time for 5 years for SETI
- Full cost of operating Parkes for 25% of time (current model)
- No impact on high-ranked proposals
- Uniform LST coverage, time-critical overrides still OK
- Observations commence in October 2016

Science benefits:

- Potential commonalities in new software/hardware
- Includes new versatile backend that will support SETI + other sci.
- Potential for future collaboration / support of new receivers
- Open data and commensal observing

NCRIS funding history

2013-14	CRIS + NCRIS 2013	$1.4M	
2014-15	CRIS + NCRIS 2013	$4.5M	
2015-16	NCRIS 2013 + 2015	$4.8M	(BUT only $3.4M new)
2016-17	NCRIS 2016	$3.1M	(BUT only $2.5M new
2017-	Proposed termination		

2016/17 reduction can be managed

- Slow down in rollout of PAF systems 31-36
- Reduce secondments to ASKAP Commissioning & Early Science (ACES)
- Breakthrough Listen funding balances increase in ASKAP energy costs

Zero NCRIS funding from 2017 poses serious problems for current ATNF operations

- CASS is committed to commissioning and operating ASKAP – little scope for savings
- Contraction of science operations – ATCA and/or Parkes – now become serious options
- Parkes bringing in $1.5M/y through, BL, has already been streamlined

ATNF Ops – direct costs by facility

Direct costs of facilities for FY15/16:

- ASKAP $8.3m
- ATCA $3.5m
- Parkes $2.2m
- Common items $1.4m (including LBA)

Have already achieved substantial savings at Parkes, ATCA, Mopra

Recent level of NCRIS funding (~$4m/yr) comprises around 20% of total costs in ATNF Ops, including overheads and depreciation)

ATNF Ops:

Forecast

ATNF Operations forecast for 2016/17 (direct costs):

Forecast	2016/17 ($m)
Revenue	
Internal	11.9
NCRIS	3.1
Breakthrough	1.1
Other External	0.7
Total	***16.8***
Expenses	
ASKAP	9.0
ATCA	3.6
Parkes	2.3
ATNF Common	1.4
Other (not telescopes)	1.4
Total	***17.7***
Operating Result	**(0.9)**

By Telescope (2016-17)

2016-17	Labour	Electricity	Other Operating	Total
ASKAP	4,368	2,550	2,043	8,961
ATCA	2,480	309	833	3,622
Parkes	1,658	221	406	2,285

Can likely save ~$1M through;

- under-spend on ASKAP power
- delayed deployment of ASKAP 31-36 roll-out

To recap

- Recent level of NCRIS funding (~$4m/yr) comprises around 20% of total costs in ATNF Ops, including overheads and depreciation)
- **Zero NCRIS funding from 2017 leaves serious shortfall for current ATNF operations**
- CASS is committed to commissioning and operating ASKAP – little scope for savings
- Contraction of science operations – ATCA and/or Parkes – now become serious options
- Parkes bringing in $1.5M/y through, BL, has already been streamlined
  (remote observing, reduced config changes, infrastructure upgrades)
- Mopra already self-funded (zero cost to CSIRO)

Other leads being pursued/considered

- Continuing dialogue with AAL re: strategy and timescales
- Possible use of Mopra as downlink for (e-Rosetta, WFIRST)
- Recovery of common costs for running MRO
- Pursue opportunities to sell telescope time on all facilities, possibly in competition with national facility users
- Quantify the benefit to Australia of open access to international astronomy facilities

ATCA – time allocation by base

Figure 4: Compact Array time allocation by all investigators, October 2011–September 2015. Time allocated to each proposal has been divided evenly between all authors on the proposal. For each year the time allocation is for 12 months from October to September.

The ATNF User Community – your input

Obtain broad astronomy community input on the implications of ceasing or substantially decreasing funding for ATCA and Parkes, to inform a decision on a timescale of 6 months.

Decision will involve identifying and evaluating several new scenarios for operating our facilites. In the absence of new funding streams these will very likely include scenarios for significant reduction in National Facility science operations at ATCA and/or Parkes.

We acknowledge the Wajarri Yamatji people as the traditional owners of the Murchison Radio-astronomy Observatory site

CSIRO Astronomy and Space Science
John Reynolds
Program Director – ATNF Operations

t +61 2 9372 4165
e john.reynolds@csiro.au
w www.atnf.csiro.au