

# SKA update

Sarah Pearce  
24 November 2015

•CSIRO Astronomy and Space Science  
[www.csiro.au](http://www.csiro.au)



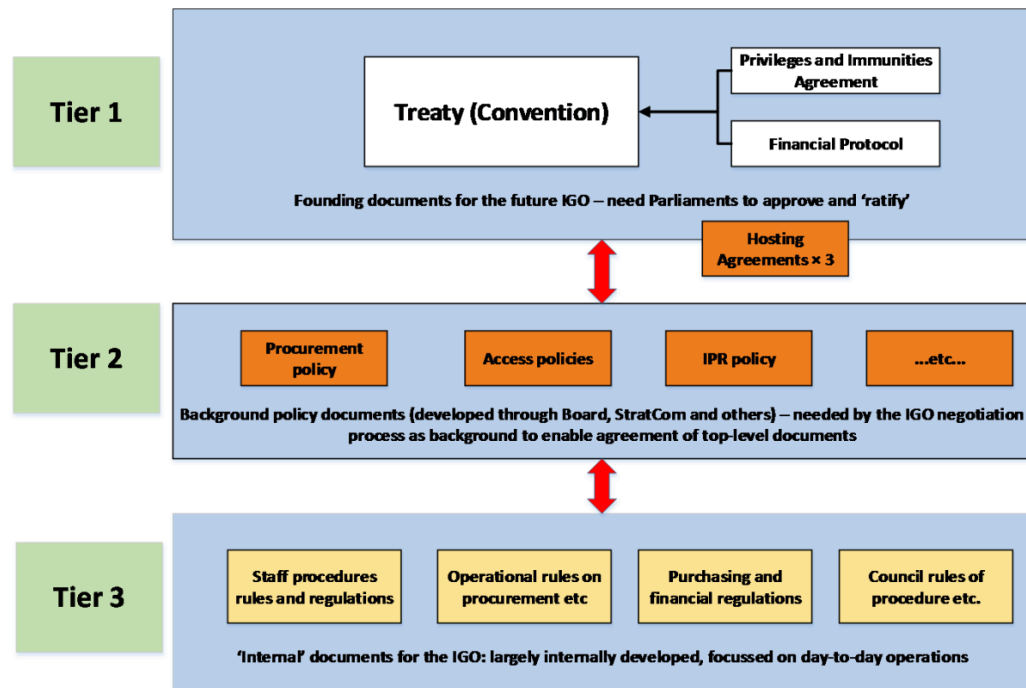
# SKA Convention negotiation

- Aim to establish treaty organisation before tendering for construction
  - Commits money, flexible tender rules
- First round of formal negotiations in October



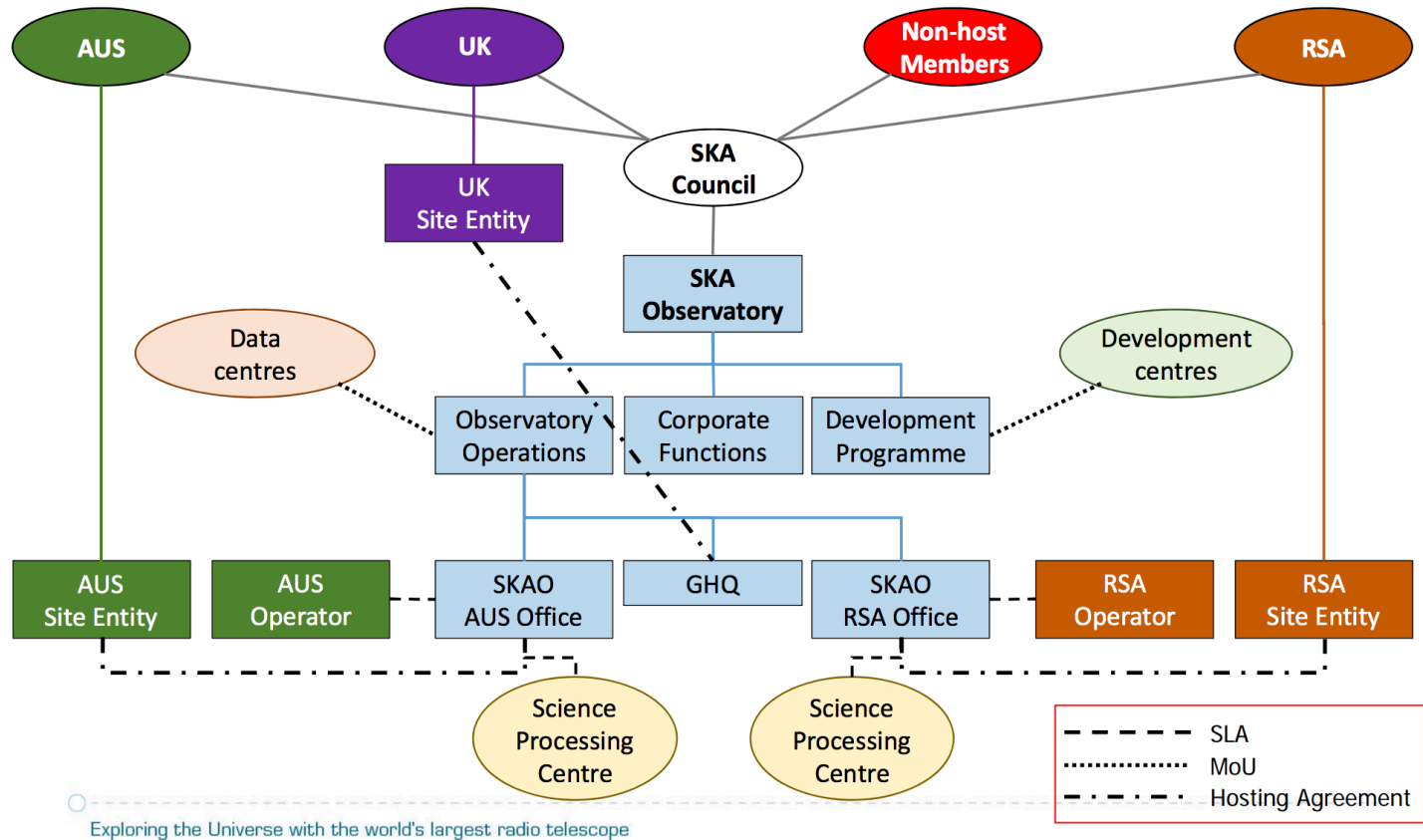
- Australia's negotiating team – Patricia Kelly (DIIS), David Luchetti (DIIS), Lisa Clutterham (DFAT), Sarah Pearce
- Representatives from all Member countries
  - India and Canada observers
- Next negotiation rounds – Jan, April 2016

# Convention negotiation details



- Four working groups established
  - Finance – chaired by SA
  - Privileges and Immunities - chaired by UK
  - Procurement and IP – chaired by China
  - Operations and Access – chaired by Australia

# Observatory operations



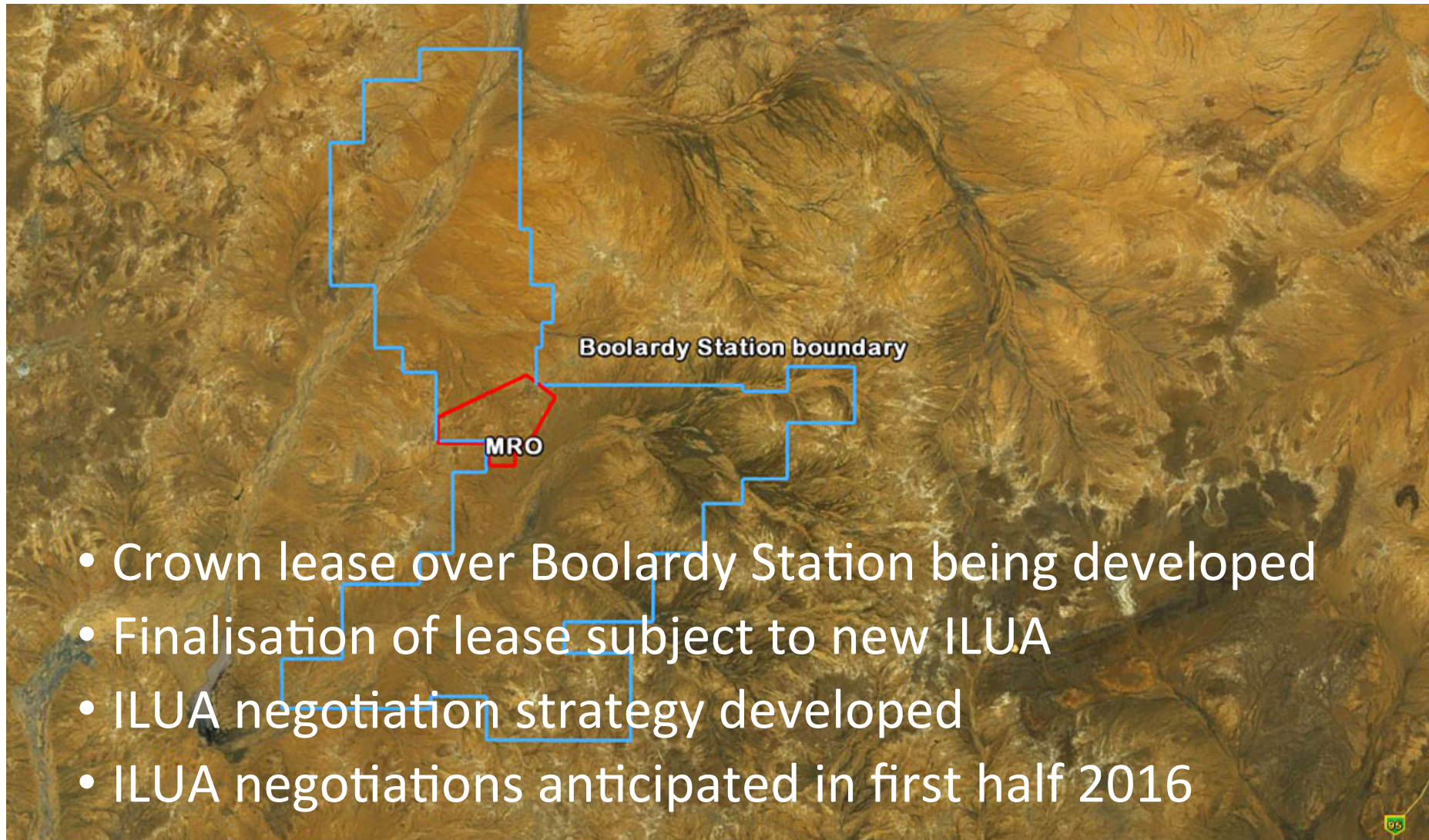
- Data Flow Advisory panel – considering data flow both inside and outside core project (Peter Quinn leading for Australia)
  - Will report to SKA Board in April



# CSIRO roles in SKA operations

- Two roles under negotiation
- **Site entity** – responsible for Australian deliverables (radio quiet, ILUA, shared infrastructure)
  - Negotiating with Commonwealth and WA governments for CSIRO role
- **Telescope operator** – responsible for engineering operations and telescope observations
  - Aim to also have a role in AIV/commissioning during construction

# Site establishment



- Crown lease over Boolardy Station being developed
- Finalisation of lease subject to new ILUA
- ILUA negotiation strategy developed
- ILUA negotiations anticipated in first half 2016

# SKA pre-construction

- Dish consortium
  - New Dish consortium leader – Roger Franzen
  - Downselect for dish structure made at Penticton meeting. Delta PDR in December
- Australian Infrastructure
  - Passed PDR in early 2015
  - SKA1-Low configuration critical - holding pattern for environmental and heritage surveys
- Central Signal Processing
  - CSIRO/ASTRON/AUT collaboration for correlator/beamformer
  - Working towards delta PDR
- Plans for Phased Array Feed advanced instrumentation program
  - In collaboration with ASTRON, NRC and possibly others
  - Will then move to SKA Observatory Development Program

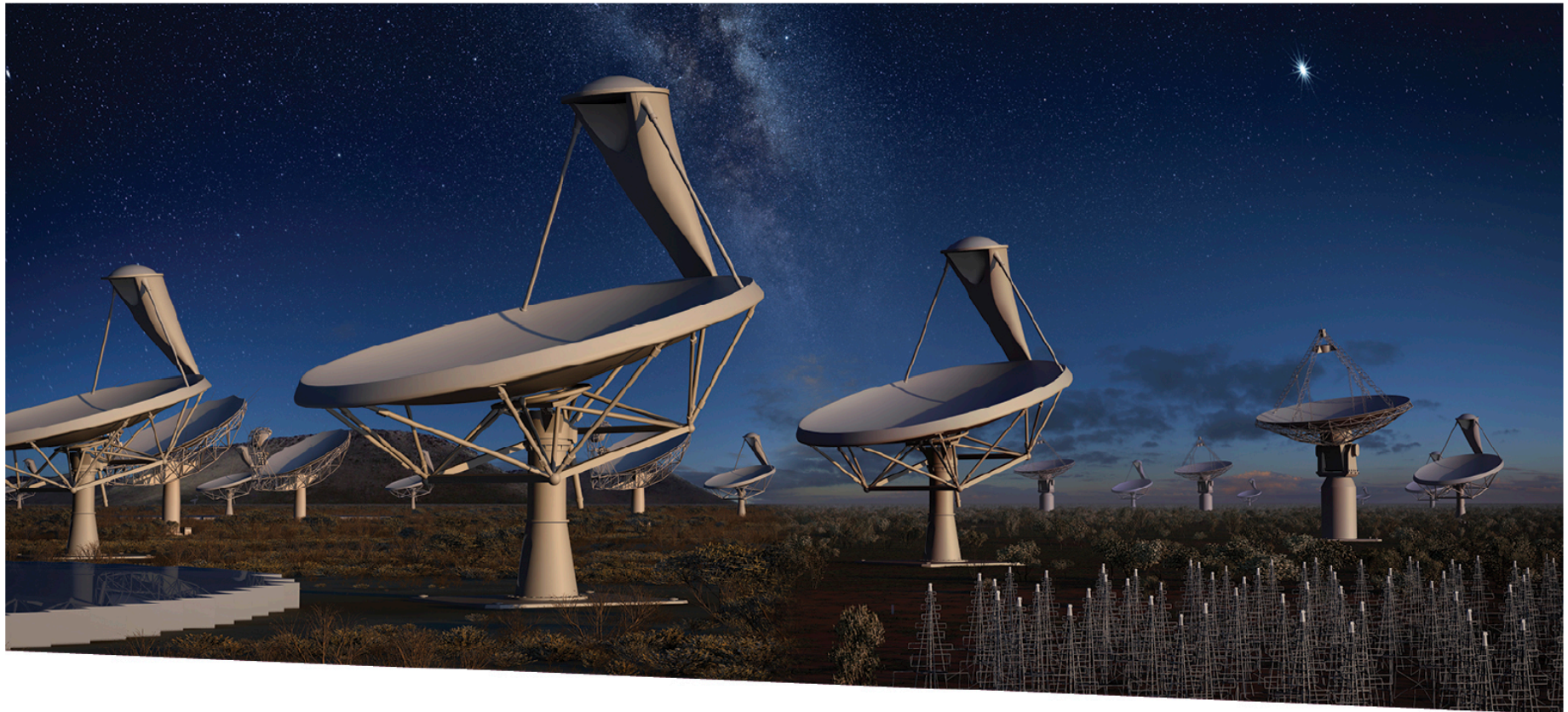


# SKA Engineering Meeting 2015

## Penticton, Canada

- ~250 (mainly) engineers involved in pre-construction consortia
- Excellent lessons learned presentation from ALMA and complex international programs
- Many ICD discussions, consortium meetings, telescope teams, consortium Board meetings





# SKA : science update

- DR JILL RATHBORNE  
[www.csiro.au](http://www.csiro.au)





# Science activities

- Key Science Program (KSP) workshop – Stockholm, August
- Informal de-brief / summary for the community – Sydney, October
- *“Towards the SKA1 in Western Australia”* – Perth, October



# SKA Key Science Workshop #1, Stockholm, Sweden 24-27 August 2015



*There are likely to be 2 or 3 annual KSP workshops before KSP proposals are formally submitted - this is only the first.*

*Attendance of this or any other KSP workshop is not a prerequisite for KSP leadership or participation*

*These workshops will build toward a call for Letters of Intent for KSPs around 2018*





# Australian participants

- Prof. BAILES, Mathew Swinburne University of Technology Pulsars
- Dr. HEYWOOD, Ian CASS
- Dr. HUYNH, Minh Continuum/Cosmology ICRAR/UWA
- Dr. JOHNSTON, Simon CASS Pulsars
- Dr. MACQUART, Jean-Pierre ICRAR/Curtin Transients
- Dr. MEYER, Martin galaxy science ICRAR/UWA HI
- Dr. MORRISON, Ian Swinburne University of Technology Cradle of life
- Dr. MURPHY, Tara University of Sydney Transients
- Dr. POPPING, Attila galaxy science ICRAR / UWA HI
- Dr. RATHBORNE, Jill CASS Our Galaxy / Extragalactic molecular spectroscopy
- Dr. TROTT, Cathryn ICRAR/Curtin University Epoch of reionization / cosmic dawn
- Dr. VAN STRATEN, Willem Swinburne University of Technology Pulsars
- Dr. WAYTH, Randall ICRAR/Curtin University Epoch of reionization / cosmic dawn
- Prof. JACKSON, Carole ICRAR-Curtin University Continuum/Cosmology
- Prof. STAVELEY-SMITH, Lister ICRAR/UWA HI galaxy science

# SKA KSP workshop aims

## 1. Further develop KSP concepts

A notional KSP list has emerged from the SKA1 Science prioritization process, but this is only a representative placeholder, and will be continually reviewed

- *This workshop aims to provide a forum for open discussion of KSP concepts, reviewing the notional list and identifying missing concepts*

## 2. Support development of potential KSP collaborations

There will ultimately be a competitive process of KSP proposal submission, evaluation and allocation. Discussions at this stage are informal and come with no guarantees

- *This workshop aims to provide a forum for the key areas of interest of particular communities to be presented, leadership aspirations to begin to be identified and resourcing strategies to begin development*

## 3. Maximizing commensality

It is likely that the same data stream will serve multiple KSP or PI-led groups, each with limited data rights to address specific scientific objectives

- *This workshop aims to provide a forum for early discussion of support for such commensal programs, including the development of efficient survey strategies intending to maximize the scientific return of the KSP package*

# Day1

09:00	Introductory talk from office [Robert Braun]
10:00	Question & Answer
10:30	Coffee Break
11:00	Continuum [Isabella Prandoni]
11:25	Cosmology [Mario Santos]
11:50	Cradle of life [Melvin Hoare]
12:15	Epoch of reionization/cosmic dawn [Jonathan Pritchard]
12:40	Lunch
13:40	Extragalactic molecular spectroscopy [Mark Sargent]
14:05	HI galaxy science [Martin Meyer]
14:30	High Energy Cosmic Particles [Stijn Buitink]
14:55	Magnetism [Russ Taylor]
15:20	Our Galaxy [Mark Thompson]
15:45	Coffee Break
16:15	Pulsars [Gemma Janssen]
16:40	Solar/Heliospheric physics [Divya Oberoi]
17:05	Transients [J-P. Macquart]
17:30	VLBI [Ivan Agudo & Hiroshi Imai]
17:55	End of Day
18:30	Welcome reception at Albanova Building (10 minutes walk from the Wenner-Gren Centre) - Sponsored by Onsala Space Observatory.

# Day2

# Day3

# Day4

*Parallel sessions of Science Working Group discussions*

*Daily lunch meetings : Robert Braun and SWG chairs*

18:00 - 20:00 City Hall Tour and Reception, including drink and buffet (hosted by the City of Stockholm) - The reception starts 18:00 prompt, followed by a guided tour of the building.

09:00	VLBI [Zsolt Paragi + TBD]
09:25	Transients [Michael Rupen]
09:50	Solar/Heliospheric physics [Divya Oberoi]
10:15	Pulsars [Andrea Possenti]
10:40	Coffee Break
11:10	Our Galaxy [Grazia Umana]
11:35	Magnetism [Sui Ann Mao]
12:00	High Energy Cosmic Particles [Justin Bray]
12:25	HI galaxy science [Erwin de Blok]
12:50	Lunch
13:50	Extragalactic molecular spectroscopy [John Conway]
14:15	Epoch of reionization/cosmic dawn [Cath Trott]
14:40	Cradle of life [Andrew Siemion]
15:05	Coffee Break
15:30	Cosmology [Xuelei Chen]
15:55	Continuum [Minh Huynh & Rosella Cassano]
16:20	Talk describing the next steps from office [Robert Braun]
17:00	End of Workshop



# SKA KSP workshop outcomes

[illegible]

- Productive meeting; lots of enthusiasm / discussions of commensality
- Intermingling of simulators/observers/theorist; science across SWGs; multi-wavelength
- Clear opportunity for the SWGs to define themselves and their KSPs
- Linkages to the SKAO, join a SWG – through SWG Chairs
- Summary of discussions were compiled by the SWG Chairs, sent to SKAO (Sept 30)
- SKAO to compile the SWG summaries; identify “generic” surveys (Oct 15?)

# Informal debrief for the Australian community - October 9

- Motivation for the SKA KSP workshop - **Jill Rathborne**
- Sparkler presentations (2 slides) summarizing the SWG discussions
  - Cosmology - **Ian Heywood**
  - Continuum - **Ian Heywood**
  - Epoch of reionization / cosmic dawn - **Carole Jackson**
  - Transients - **Carole Jackson**
  - Pulsars - **Simon Johnston**
  - HI galaxy science - **Martin Meyer**
  - Extragalactic molecular spectroscopy - **Jill Rathborne**
  - Our Galaxy - **Jill Rathborne**
  - Cradle of life - **Ian Morrison**
- Overall workshop summary, next steps - **Carole Jackson**
- Group discussion

# ***Towards the SKA1 in Western Australia – October 22***

- 1 day meeting held at the ARRC in Perth (Phil Crosby)
- The meeting was *a WA focused, inter-agency event to showcase and update stakeholders and project partners about activities and planning as we move towards constructing and hosting the SKA1 in Australia*
- Broad participation:
  - CSIRO, ICRAR (UWA, CURTIN UNIVERSITY)
  - PAWSEY CENTRE
  - STATE & FEDERAL GOVERNMENT REPRESENTATIVES
  - POWER INDUSTRY
  - MID WEST INDUSTRY AGENCIES
  - INDIGENOUS GROUP REPRESENTATIVES
  - SKA ORGANISATION

*Productive meeting that clearly demonstrated our leadership in SKA1 activities in Western Australia*

# Thank you

**CSIRO Astronomy and Space Science**

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