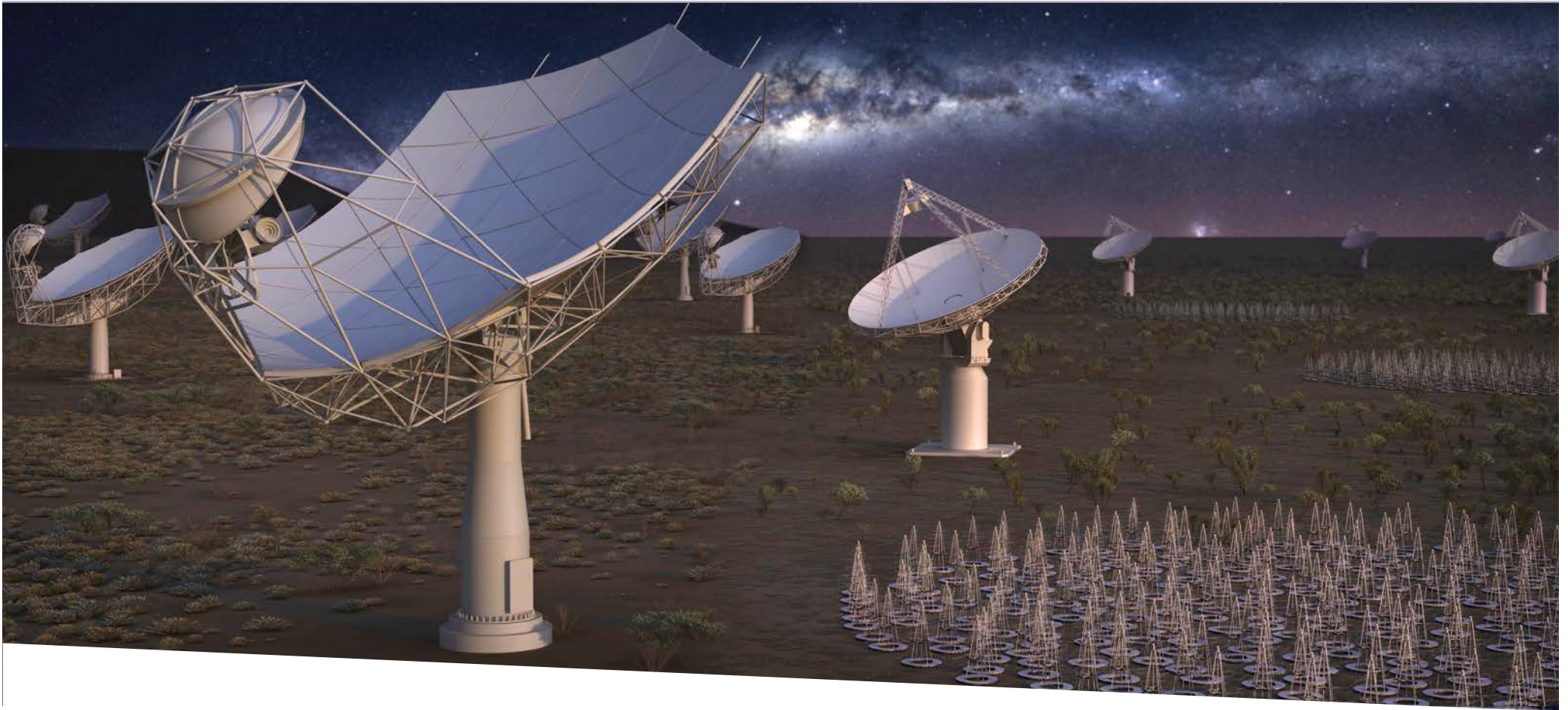


# SWG Science Update



**SQUARE KILOMETRE ARRAY**

Exploring the Universe with the world's largest radio telescope

**Robert Braun, Science Director**

15 June 2021

# Science Activity Updates

- SKAO Members and updated SEAC
- Report on HI/Exgal Continuum joint workshop (Mark, Natasha, Barbara, Paolo)
- Report on Intensity Mapping foregrounds challenge (Laura)
- Discussion on diversity within the SWGs (Valentina, George, Tyler)
- AOB

# SKA Global Community

## Member updates



- Previously ratified: Australia, Italy, Netherlands, Portugal, South Africa, UK
- May 28: President Emmanuel Macron announces that France will join the SKA Observatory
- June 3: China ratifies SKAO convention
- June 9: EPFL (CH) signs Cooperation Agreement with SKAO



# Updated Science and Engineering Advisory Committee

## 6. Remit of the SEAC

- 6.1. The SEAC shall provide advice to the Director-General and the Council on the matters including but not limited to:
  - 6.1.1. The status and evolution of the SKA scientific programme;
  - 6.1.2. Construction activities and progress;
  - 6.1.3. Plans for and progress on commissioning and science verification;
  - 6.1.4. Key Engineering Change Proposals, as requested by the SKAO Programme Director;
  - 6.1.5. The implementation of SKA Operations;
  - 6.1.6. Plans for and implementation of the SKA Regional Centre Network;
  - 6.1.7. Plans for and implementation of the SKA Observatory Development Programme; and
  - 6.1.8. Other scientific or technical issues as appropriate.

# Updated Science and Engineering Advisory Committee

## SKAO SEAC Membership June 2021

SEAC (seac@skao.int)			
Members	Affiliation	Representative	Email
	Australia	McClure-Griffiths, Naomi (Chair)	Naomi.McClure-Griffiths@anu.edu.au
	Italy	Ferrara, Andrea	andrea.ferrara@sns.it
	Netherlands	van Cappellen, Wim	cappellen@astron.nl
	Portugal	Melo, Cláudio	claudio.melo@ptspace.pt
	South Africa	Kapp, François	francois@ska.ac.za
	UK	Mundell, Carole	C.G.Mundell@bath.ac.uk
Observers	Affiliation	Representative	Email
	Canada	Spekkens, Kristine	kristine.spekkens@gmail.com
	China	Qian, Zheng	qzheng@shao.ac.cn
	France	Lagache, Guilaine	guilaine.lagache@lam.fr
	India	Shankar, Uday	uday@rri.res.in
	Spain	Alberdi, Antxon	antxon@iaa.es
	Sweden	Mellema, Garrelt	garrelt@astro.su.se
	Switzerland	Csillaghy, Andre	andre.csillaghy@fhnw.ch
At Large	Affiliation	Representative	Email
	NRAO	Glendenning, Brian	bglenden@nrao.edu
	SARAO	Jonas, Justin	J.Jonas@ru.ac.za
	ESO	Kaufer, Andreas	akaufer@eso.org
	ESO	Russell, Adrian	arusell@eso.org
	UKATC	Wright, Gillian	gillian.wright@stfc.ac.uk

## Intensity Mapping (Wolz et al)



Isabella Carucci, Steve Cunnington, Zé Fonseca, Stuart Harper,  
Mel Irfan, Marta Spinelli, Alkistis Pourtsidou, Laura Wolz

# SKA Intensity Mapping Focus Group: Blind Foreground Removal Challenge

DR LAURA WOLZ - 15. JUNE 2021



# SKA HI Intensity Mapping

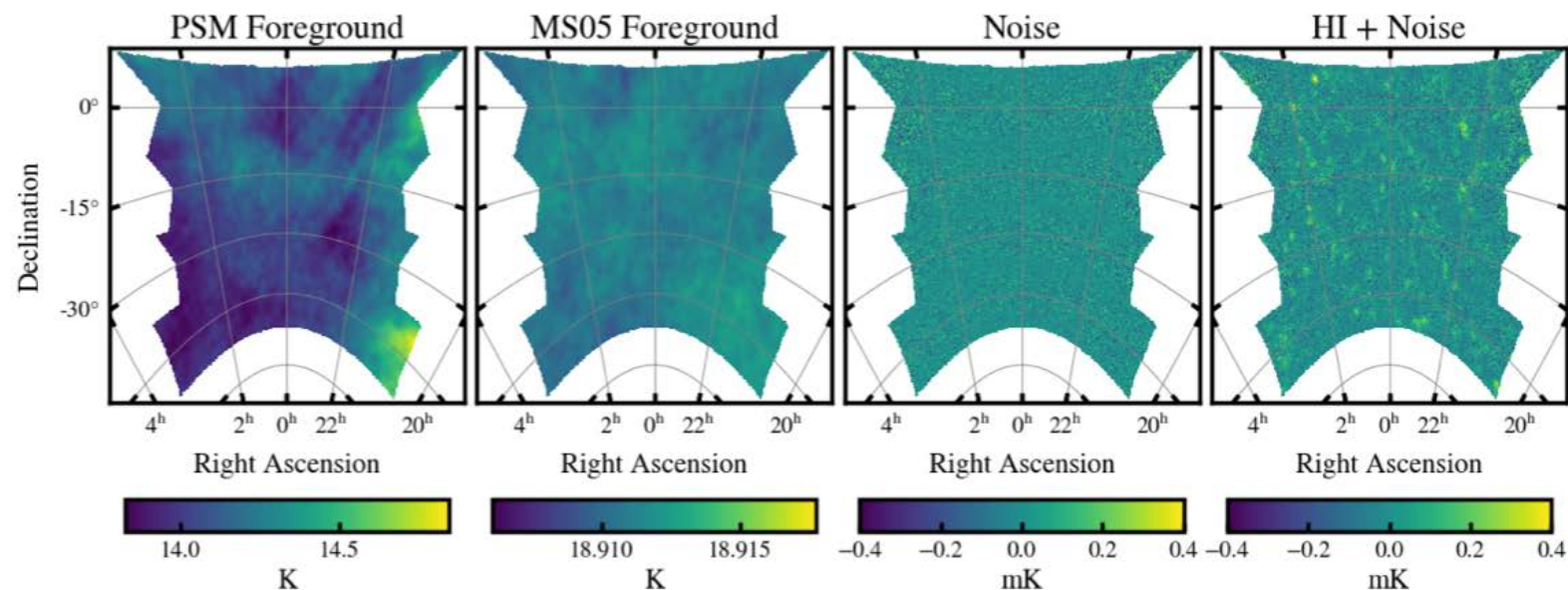
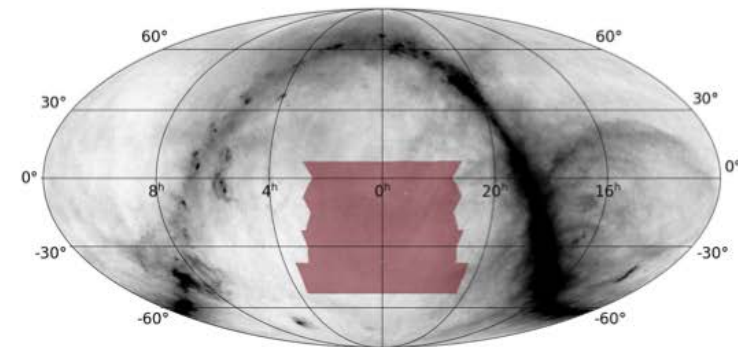
**BAND 2 (950<F<1400MHZ)**

**5,000 SQDEG AREA**

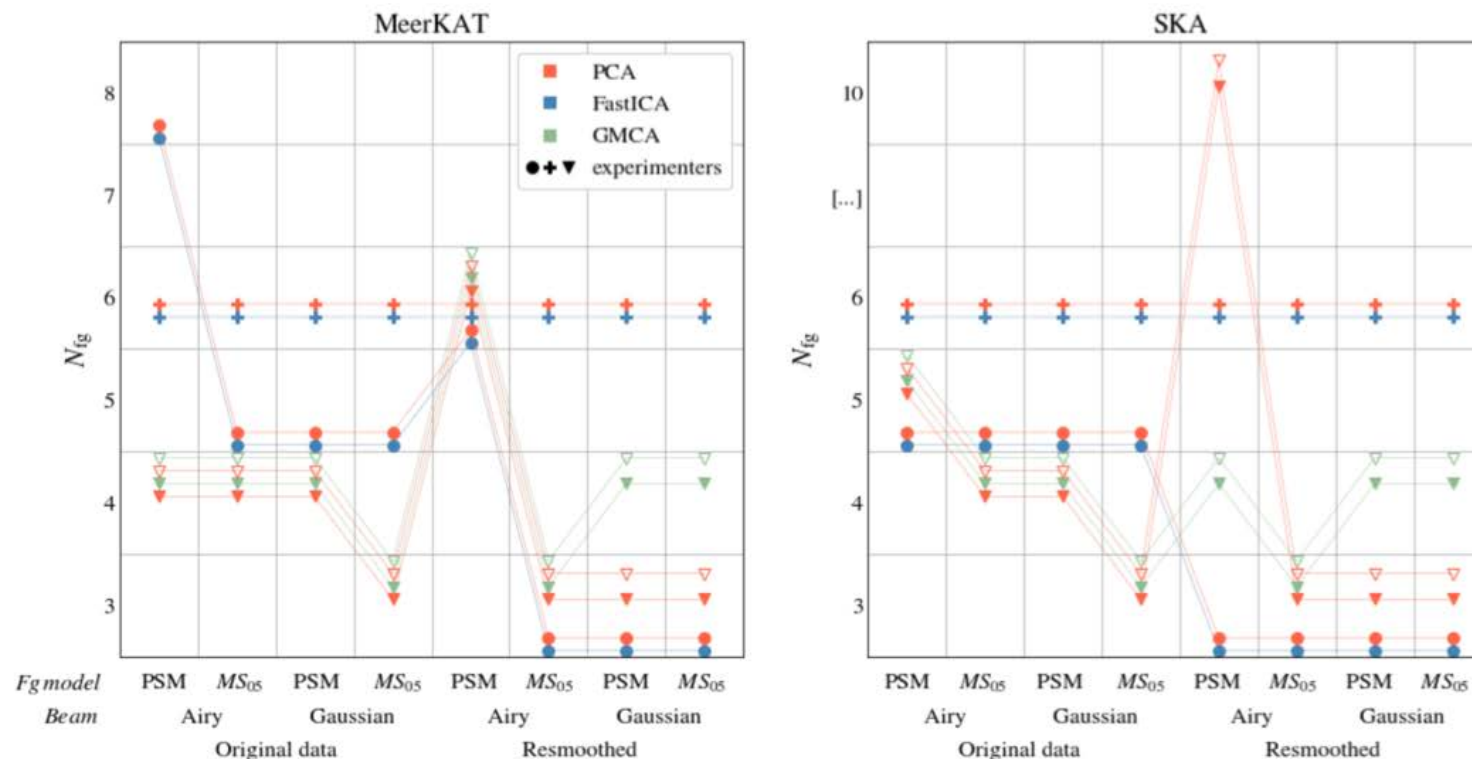
**2 INSTRUMENTS: SKA AND MEERKAT**

**2 BEAM MODELS: GAUSSIAN AND AIRY**

**2 FOREGROUND MODELS**



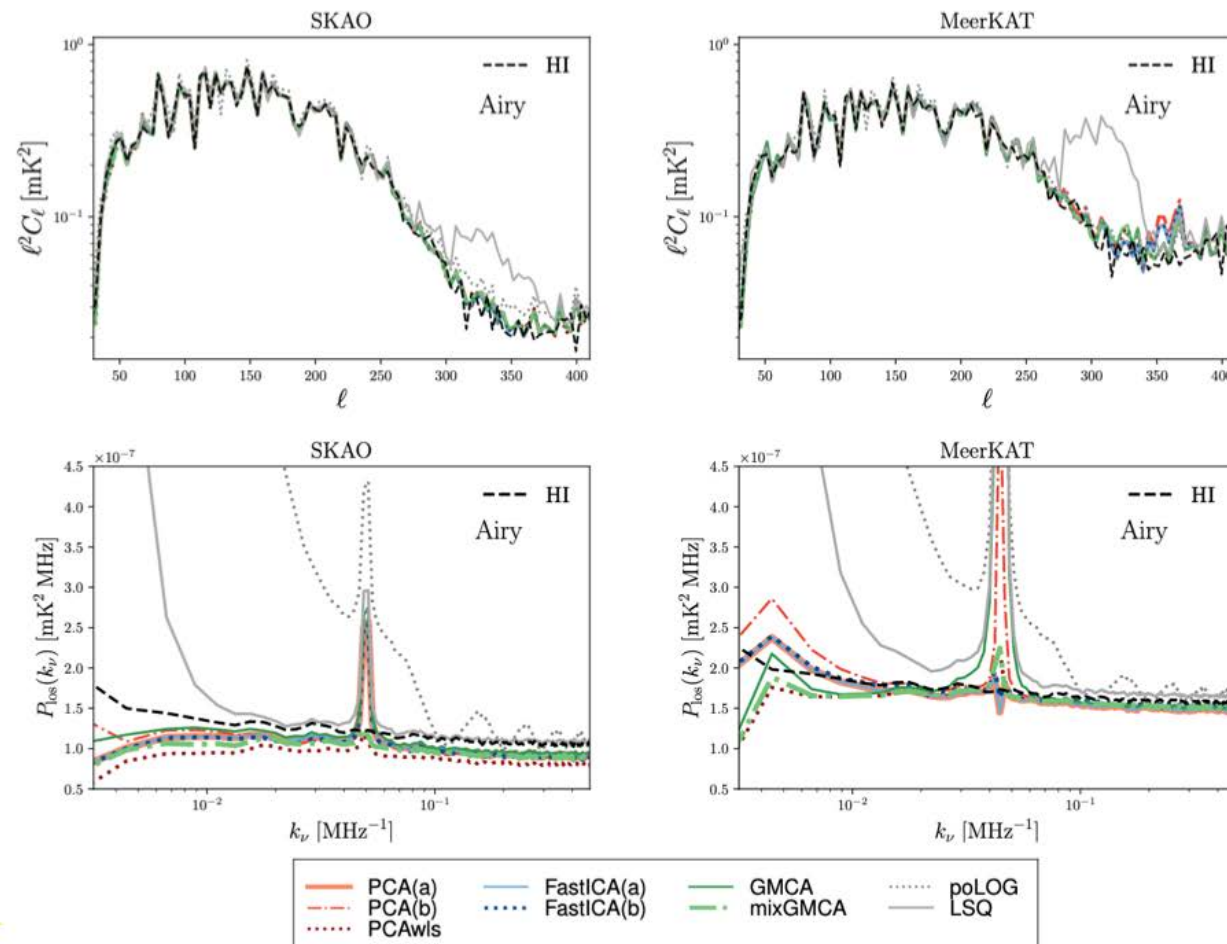
# Blind Foreground Removal



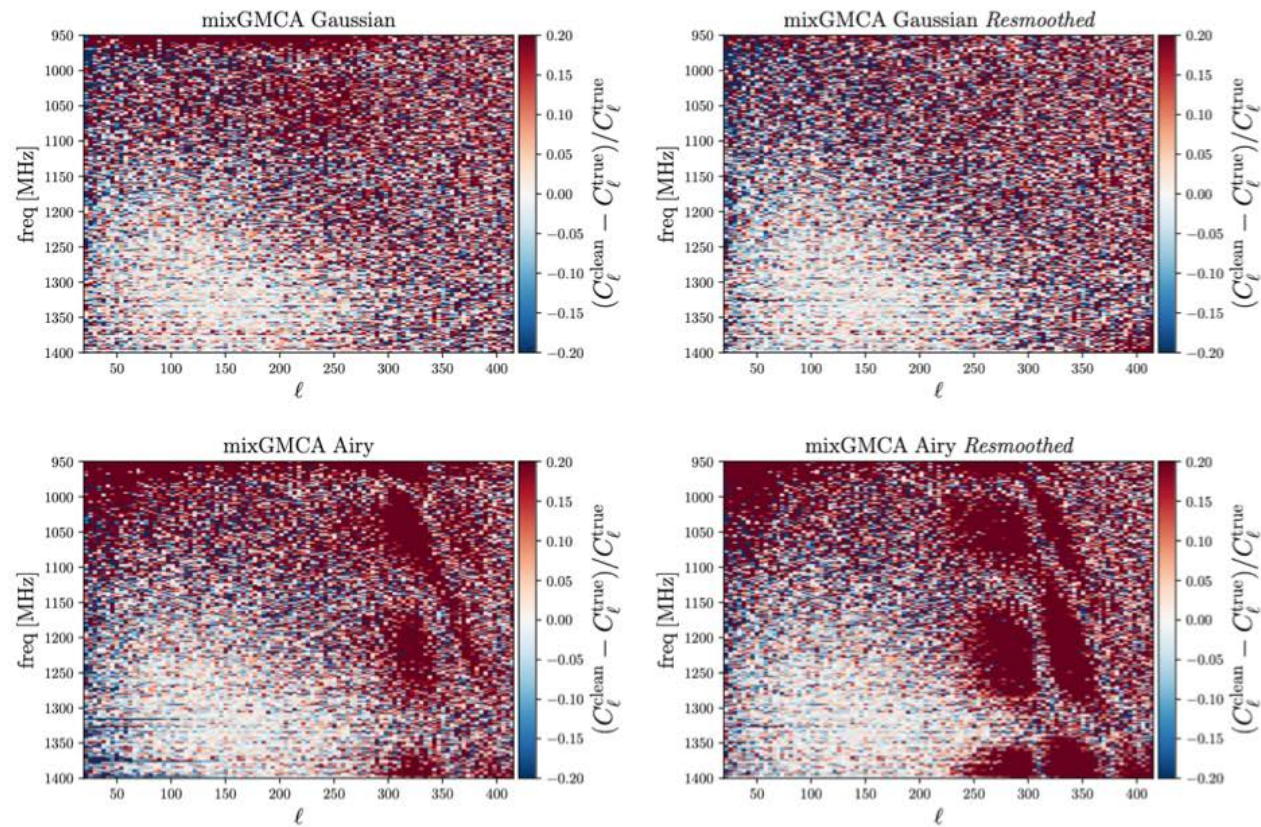
**9 CLEANING METHODS IN TOTAL**  
**3 CLASSES OF METHODS**  
**4 PARTICIPANTS (INCLUDING MULTIPLE METHODS)**



## Comparison



## Comparison



# Preliminary Conclusions

- Number of modes removed is important and changes cleaning outcome
- Most methods perform well on Gaussian beam
- Airy beam model in combination with more complex foreground model makes cleaning very difficult
- Beam model needs to be known for good cleaning
- Improved methods needed for up-coming data!

**DR LAURA WOLZ ON BEHALF OF HI INTENSITY MAPPING FOCUS GROUP**



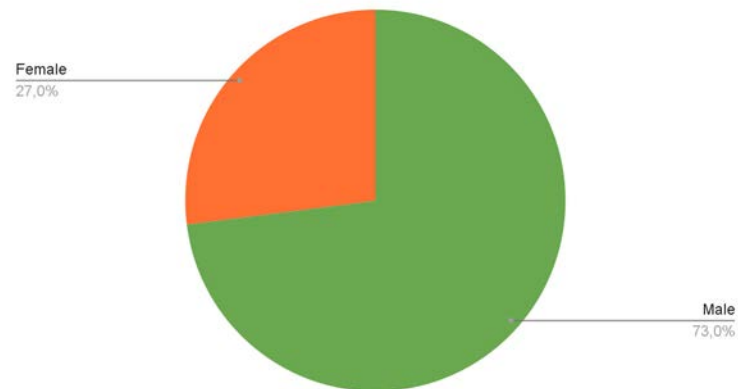
## DIVERSITY IN SWGS (Vacca, Heald, Bourke)

- SKAO has put attention to balance amongst the SWG chairs gender/institute/country
- Our approach to general membership has been quite passive and any balance in the broad membership has arisen without active attention
- Diversity is not only gender, for example Early career researchers
- Can we identify and take some proactive steps to address diversity imbalances?
- Can(/should) this be enacted more generally than for individual SWGs?

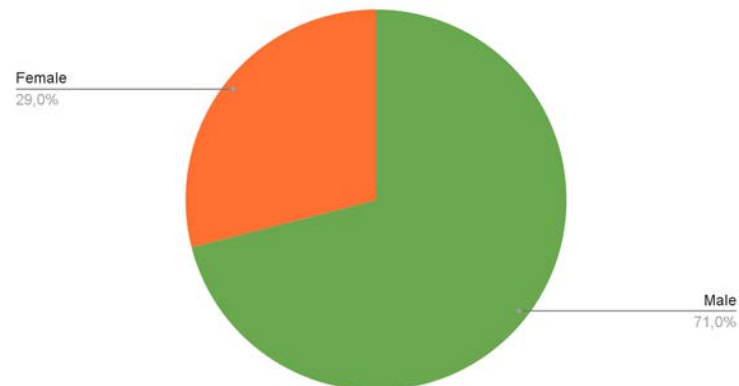
## DIVERSITY IN SWGS (Vacca, Heald, Bourke)

Some examples...

All co-chairs



Current co-chairs

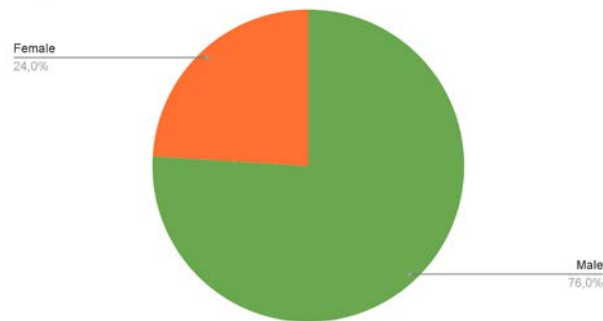


This information is approximate, because we have not collected gender information (based on names), let alone carried out a survey, and we have not allowed for non-binary gender identifications.

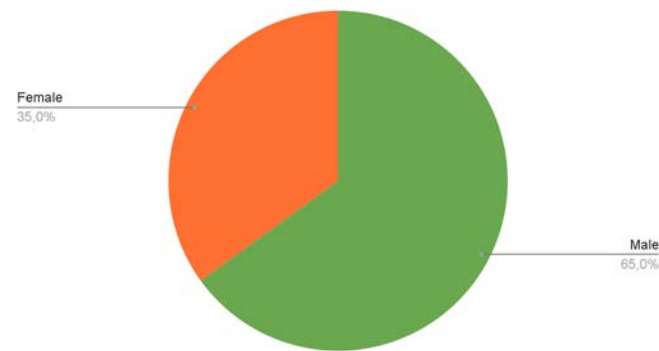
## DIVERSITY IN SWGS (Vacca, Heald, Bourke)

Some examples...

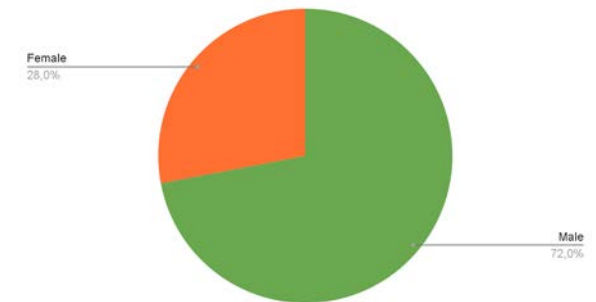
Magnetism



Cradle of Life



Transients



*Core:* 42% female, 58% male

*Associate:* 17% female, 83% male

*Core:* 28% female, 72% male

*Associate:* 37% female, 63% male

This information is approximate, because we have not collected gender information (based on names), let alone carried out a survey, and we have not allowed for non-binary gender identifications.



## DIVERSITY IN SWGS (Vacca, Heald, Bourke)

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# AOB



- ???



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