

Updates from AS SKA-LOFAR



Cherry Ng-Guihéneuf (LPC2E)

SF2A 2026 @Grenoble



SKA design baseline

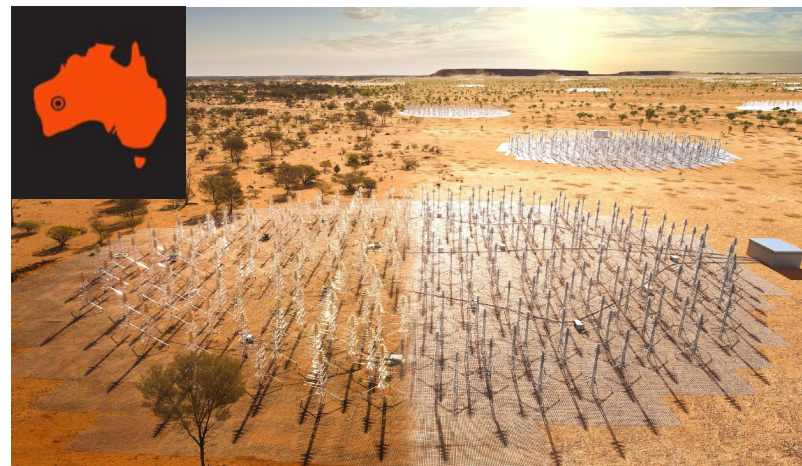
SKA-Mid

- 197 steerable dishes
- (133 x SKA + 64 x MeerKAT dishes)
- 0.35 – 15.4 GHz
- 150 km baselines
(0.22" @1.7 GHz; 0.034" @15 GHz)
- Karoo, **South Africa**



SKA-Low

- 131,072 log-periodic antennas
- (512 stations each with 256 dipoles)
- 50 – 350 MHz
- 74 km baselines (9.5" @ 110 MHz)
- Murchison, **Western Australia**



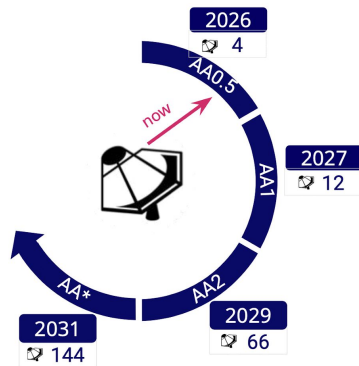
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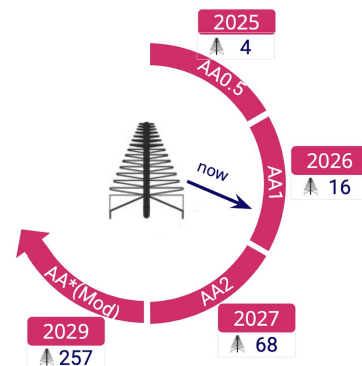


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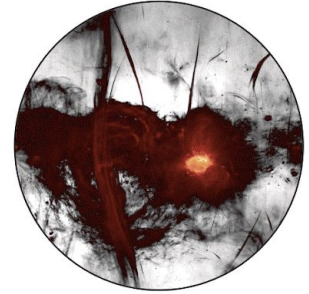
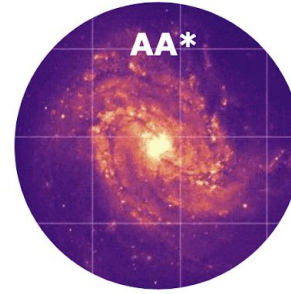
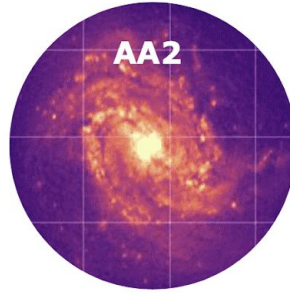
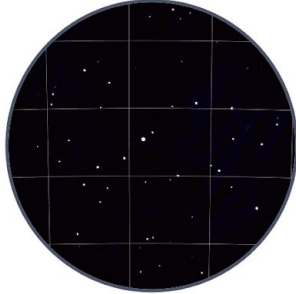
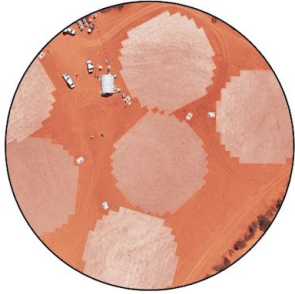
SKA-Low



The SKA Timeline to Science

Community involvement

Full Science



Construction

Commissioning

Science Verification

Cycle 0

Now

Now

Mid-2027

First-half 2029

2030

Now

Now

First-half 2029

First-half 2031

2032

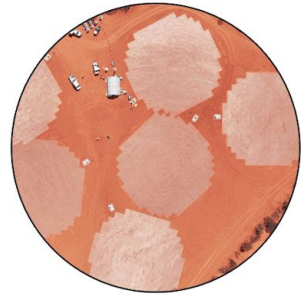
Credit: I. Heywood, SARAO



The SKA Timeline to Science

Community involvement

Full Science



SKA-LOW SV : First public access to SKA data **in a year** from now!

PI-led proposals in **a few years!**
KSP (not yet allocated) comes after.

Construction

Commissioning

Science Verification

Now

Now

Mid-2027

First-half 2029

2030

Now

Now

First-half 2029

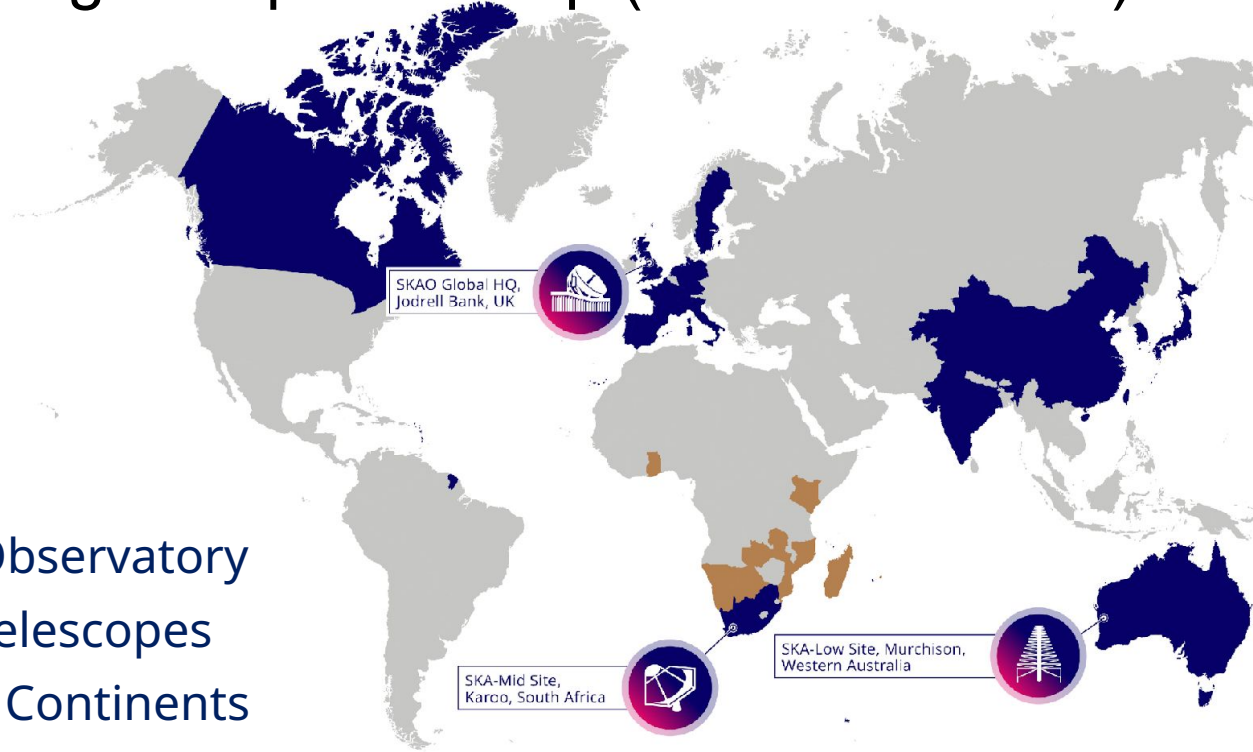
First-half 2031

2032

SKAO global partnership (IGO since 2021)



One Observatory
Two Telescopes
Three Continents



14 Ratified Members:

- *Australia*
- *China*
- *Italy*
- *The Netherlands*
- *Portugal*
- *South Africa*
- *Spain*
- *Switzerland*
- *United Kingdom*
- *Germany*
- *Canada*
- *Sweden*
- *India*
- *France*

SKAO Partnership - includes SKAO Member States* and SKAO Observers



African Partner Countries



SKA France timeline



- 2016: SKA-France officially launched by the CNRS
- 2021: France announces intent to seek full treaty-level membership.
- 2026 (June 4): France officially becomes the 14th full Member State of the SKAO

What does that mean for us?

- ♥ Guaranteed "Time Share"
- ♥ Sovereign Data Access via the French Science Regional Centre (SRC)

French SKA Precursors

LOFAR

- Over 50k antennas in Europe
- 10–270 MHz

NenuFAR

- 2k antennas
- Standalone beamformer & imager + part of LOFAR 2.0 (≥ 2027)
- 10–85 MHz
- Core 400m diameter + 8 remote up to 5 km (not shown) $\Rightarrow$ angular resolution up to $\sim 5'$

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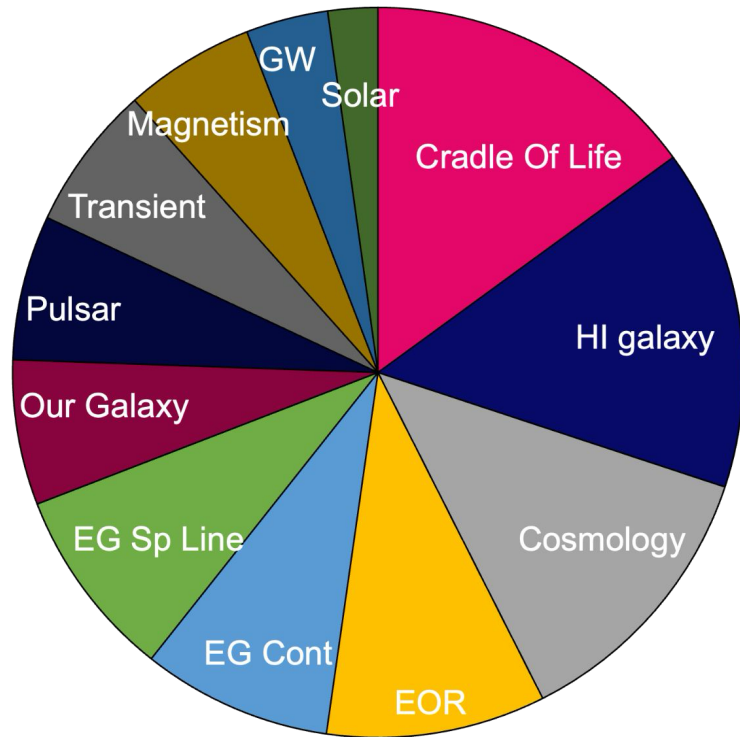


NenuFAR core
completion (Feb 2026)

NenuFAR

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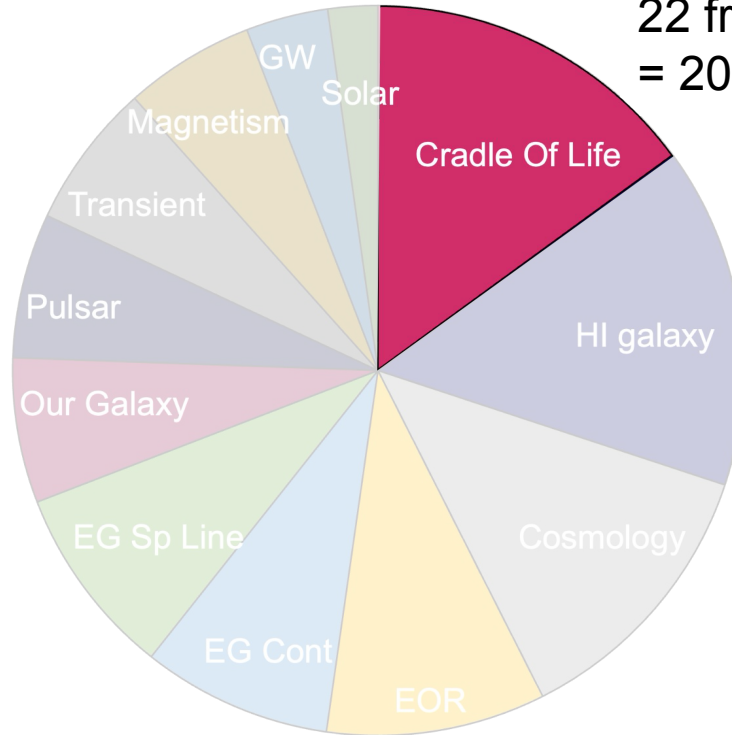
SKA SWG French contribution



% of memberships in each SWG among 108 unique French-affiliated astronomers

P.S. Remember to sign up to SWGs and update your affiliations if you have moved!

SKA SWG French contribution

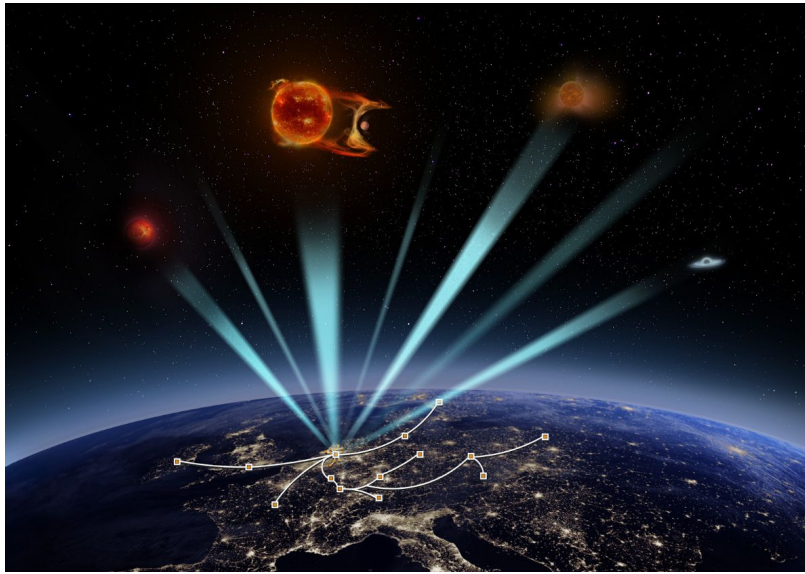


Cradle of Life

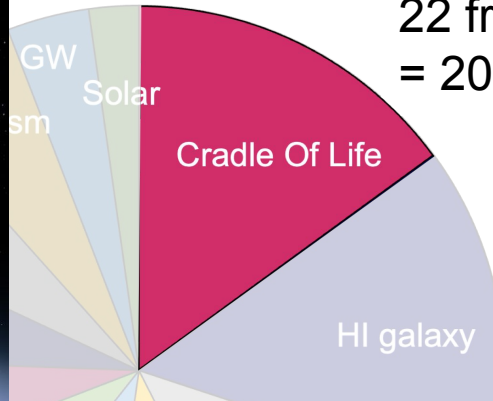
22 french astronomers

= 20 % among all french

SKA SWG French contribution



RIMS (Radio Interferometric Multiplexed Spectroscopy): dynamic spectra in parallel in multiple directions of the field of view

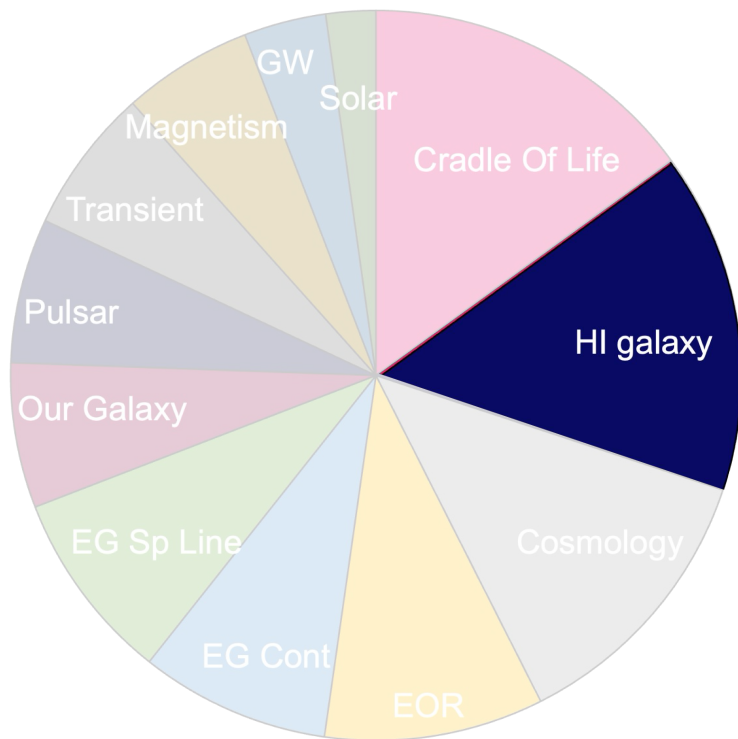


Cradle of Life

22 french astronomers
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- LOFAR: 27 Circularly polarized radio bursts, 1 candidate star-planet interaction (GJ687)
Tasse et al. 2026, incl Zarka, Loh, Girard, Griessmeier, Lamy, Louis, Maudit, Zhang
- NenuFAR: 12 circularly polarized burst, 1 from exoplanet system HD 189733
Zhang et al. 2025, and 13 other french

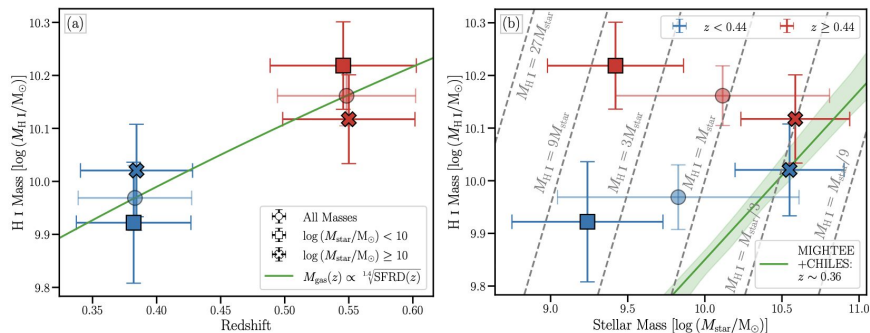
SKA SWG French contribution



HI Galaxy

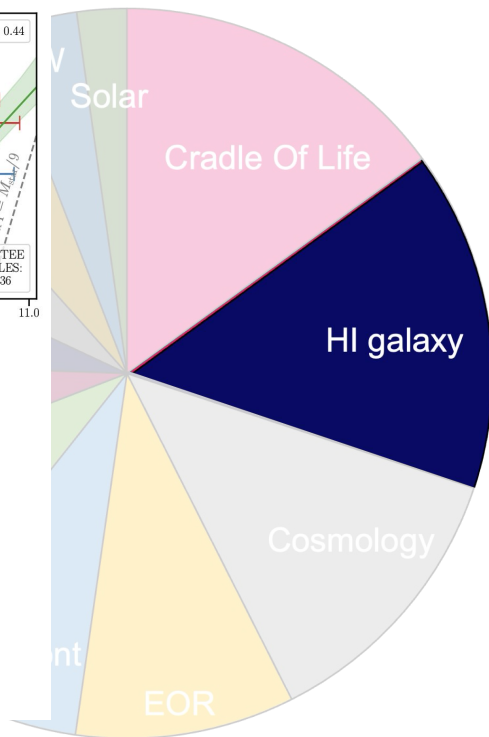
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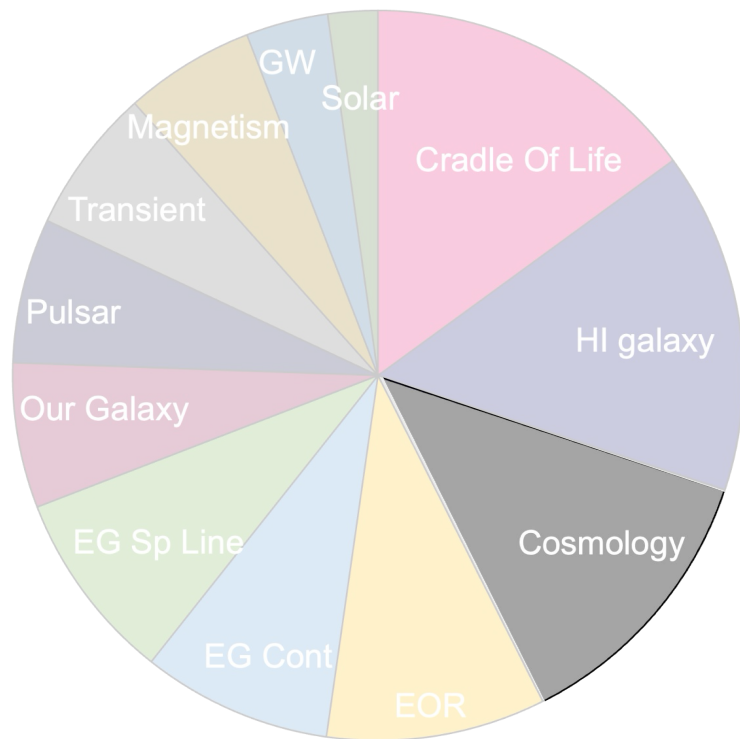
HI properties of Field Galaxies at $z \approx 0.2-0.6$: Insights into Declining Cosmic Star Formation

DePalma et al., 2025, incl. Combes, Noterdaeme, Petitjean, Krogager



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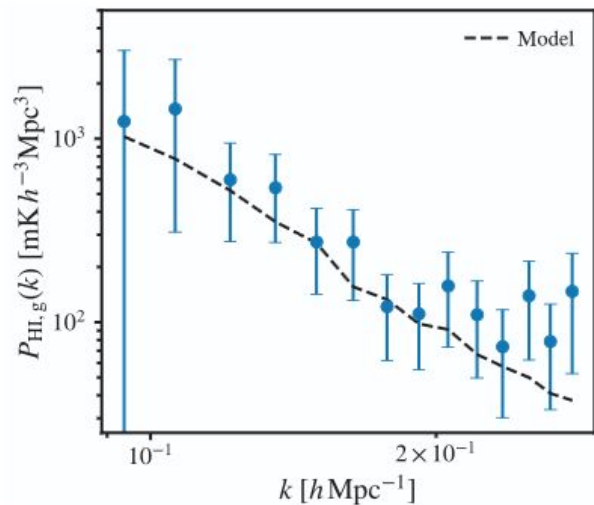


Cosmology

18 astronomers = 17%

** With a French SWG
co-chair (Marta Spinelli)*

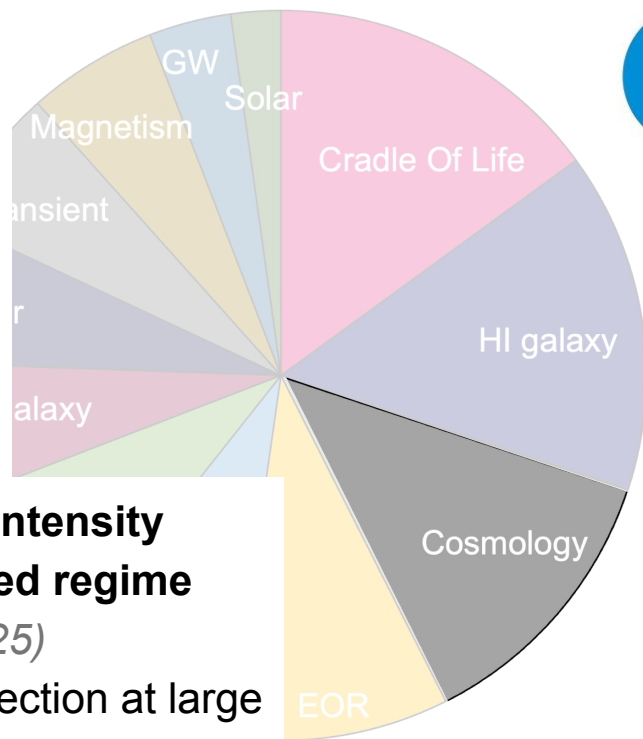
SKA SWG French contribution



MeerKLASS L-band deep-field intensity maps: entering the H I dominated regime

MeerKLASS Collab. MNRAS (2025)

+ first H I autopower spectrum detection at large cosmo scales (arxiv and under review)



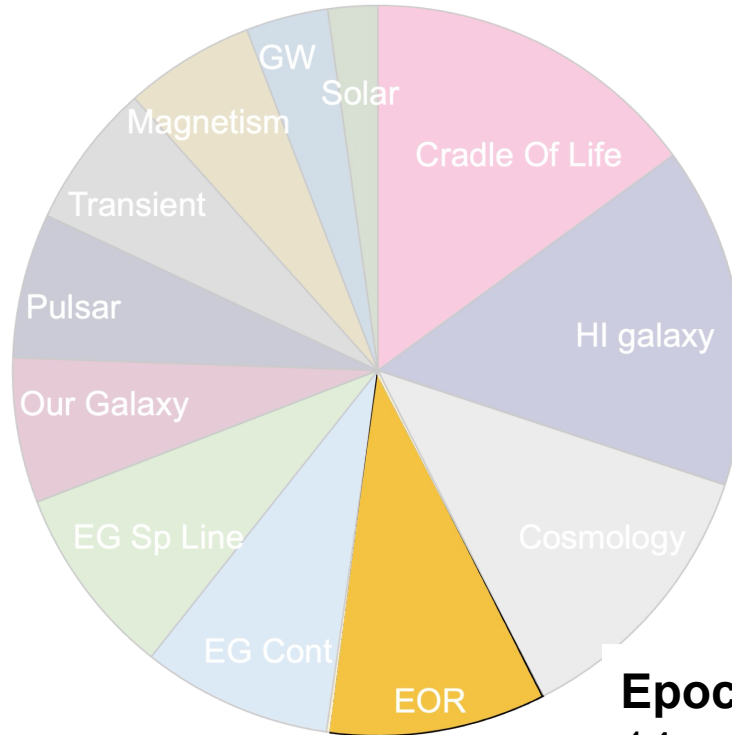
See also talks at
Parallel session S14
Astrophysical
foregrounds for
precision cosmology

Cosmology

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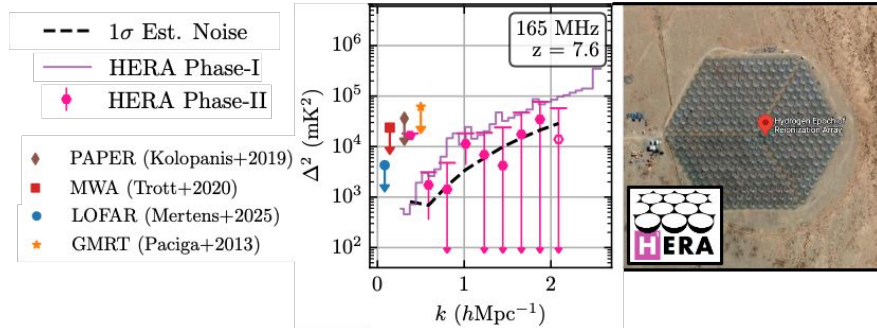
* *With a French SWG
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SKA SWG French contribution



Epoch of Reionization
14 astronomers = 13%

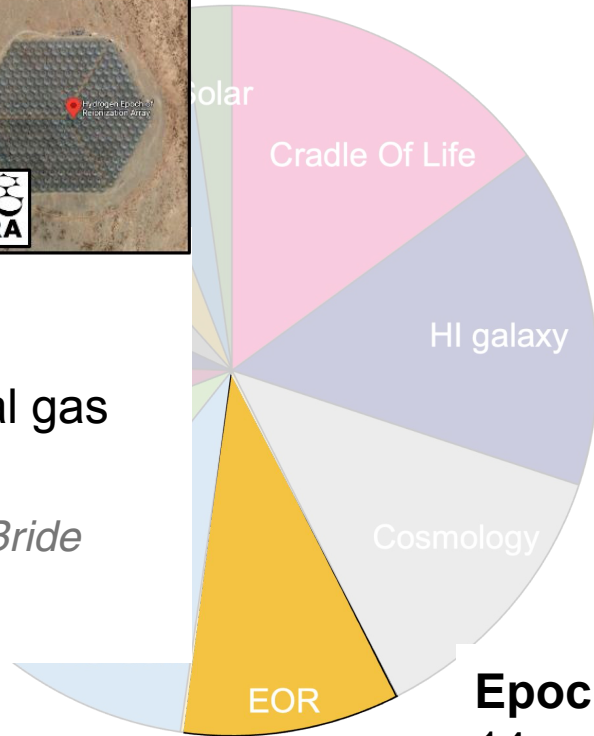
SKA SWG French contribution



HERA Phase II results:

First constraining limits of neutral gas temperature to $z \sim 10$

HERA Collab 2026, incl. Gorce, McBride

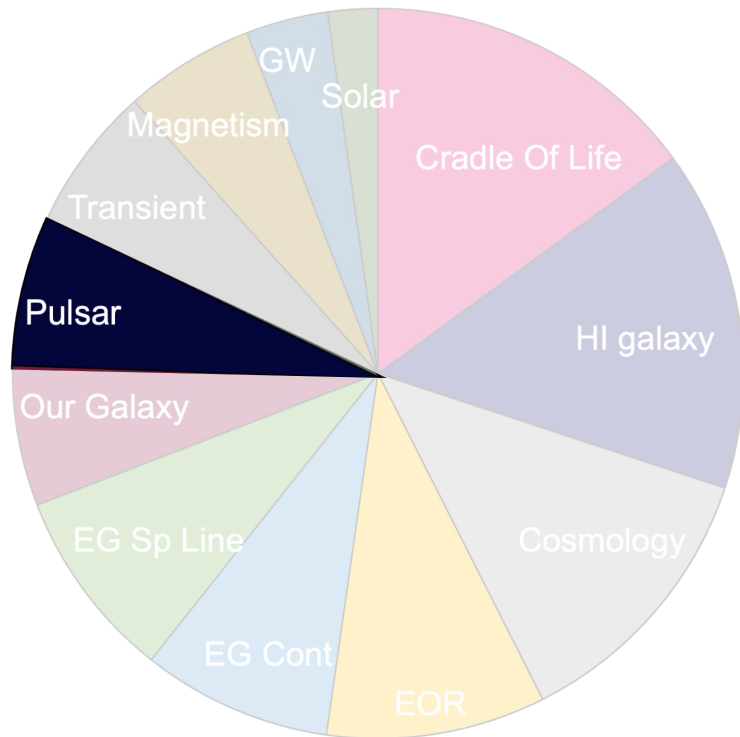


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Pulsar

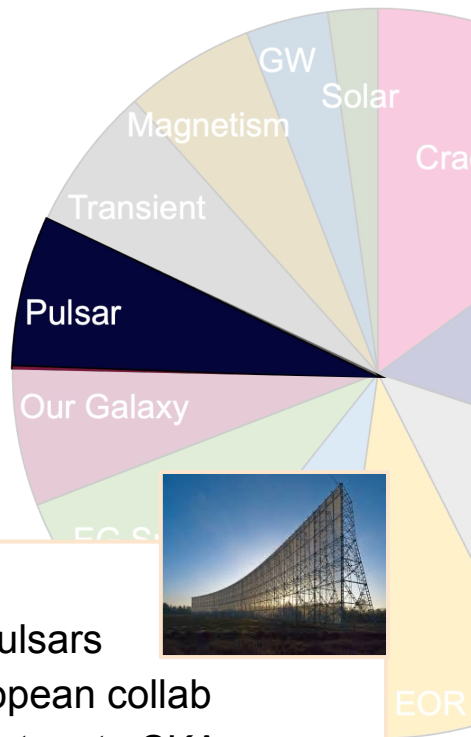
9 astronomers = 9%



SKA SWG French contribution

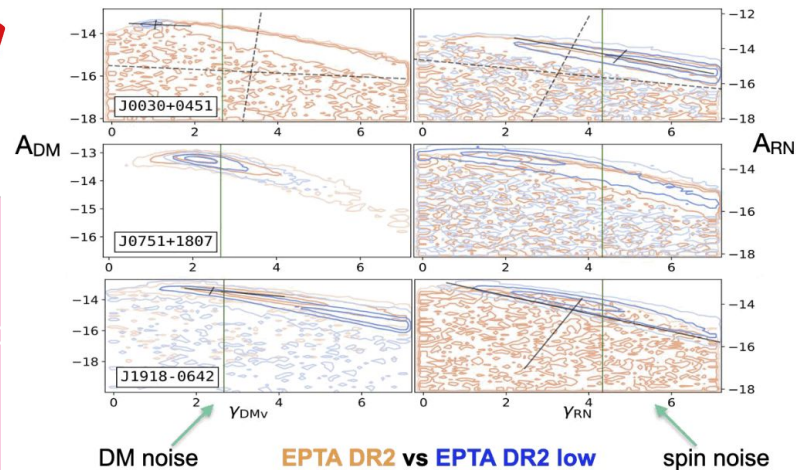
Pulsar

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Critical role of the NRT :

- Decadal monitoring of pulsars
- 70% of the data for European collab
- Northern sky complementary to SKA



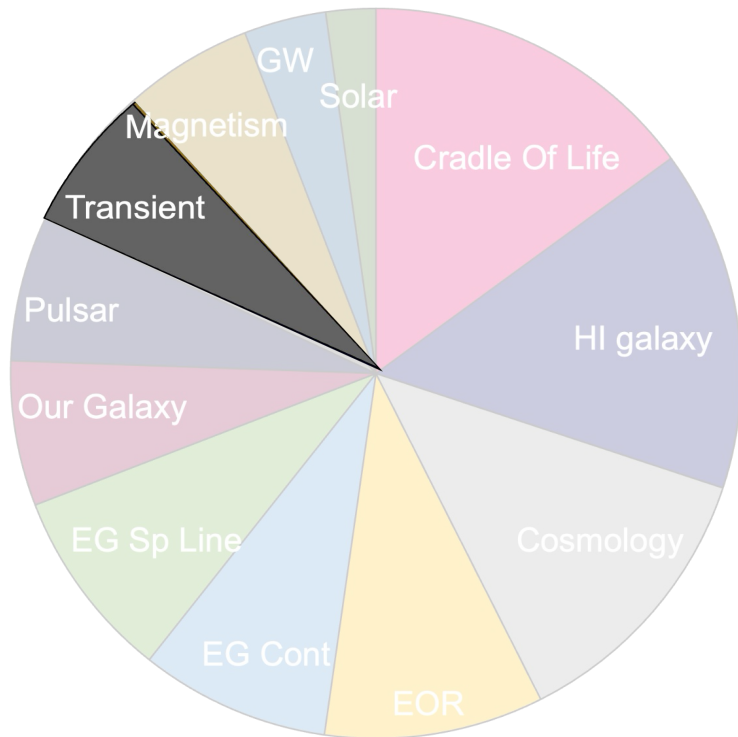
Gravitational signal detection: First time combining EPTA L- and S-band data with low-frequency data NenuFAR and LOFAR

Iraci et al. 2026, incl. Chalumeau, Cognard, Corbel, Girard, Griessmeier, Guillemot, Jankowski, Rana, Theureau, Zarka

SKA SWG French contribution

Transient

9 astronomers = 9%

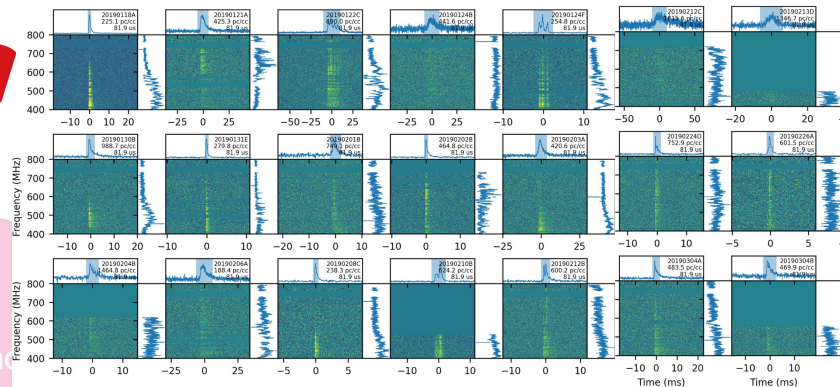
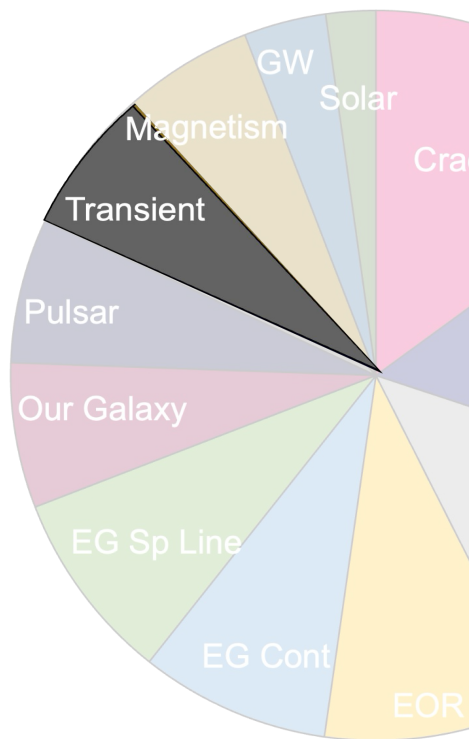


SKA SWG French contribution



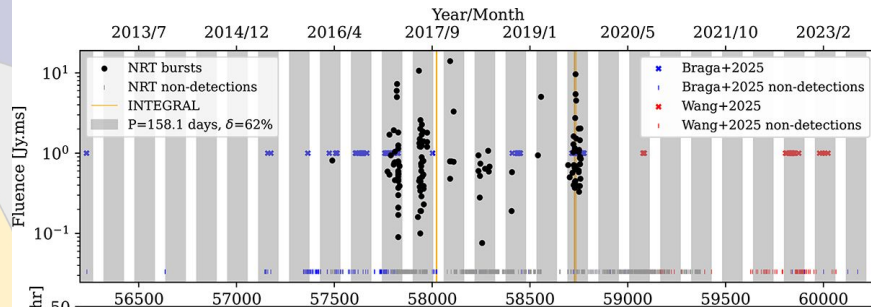
Transient

9 astronomers = 9%



CHIME/FRB Catalog 2: 4500 FRBs

CHIME/FRB collab 2026, incl. Michilli, Ng



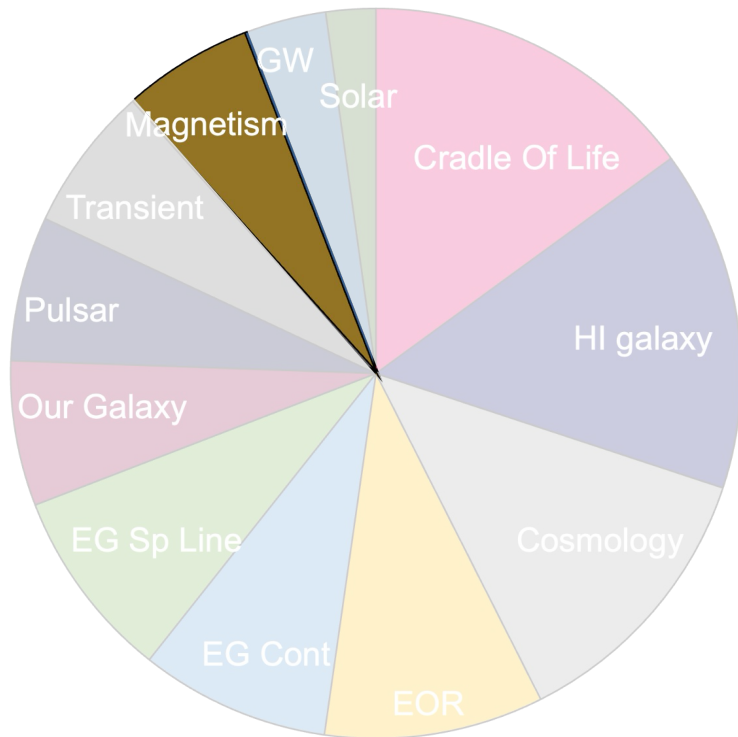
NRT detecting FRB periodic activity

Gouiffès, Ng et al., 2025

SKA SWG French contribution

Magnetism

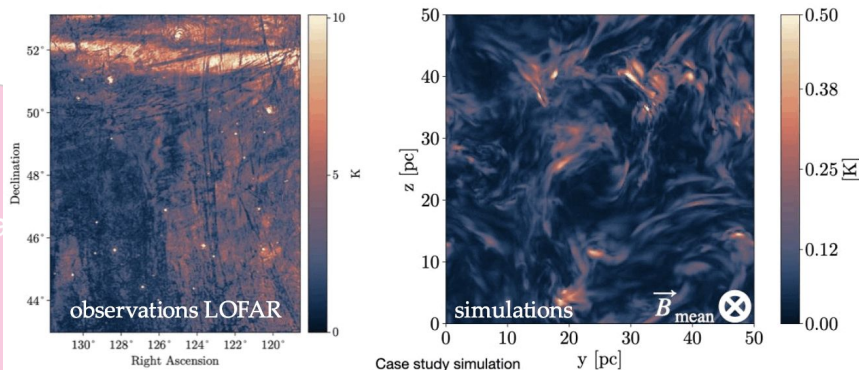
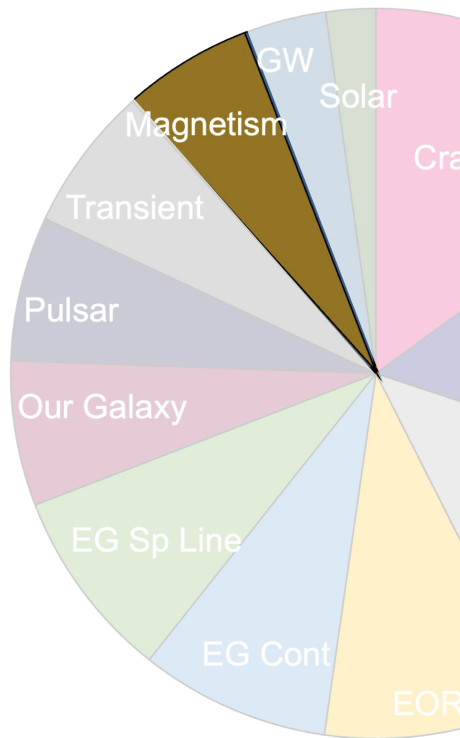
8 french astronomers
= 8 % among all french



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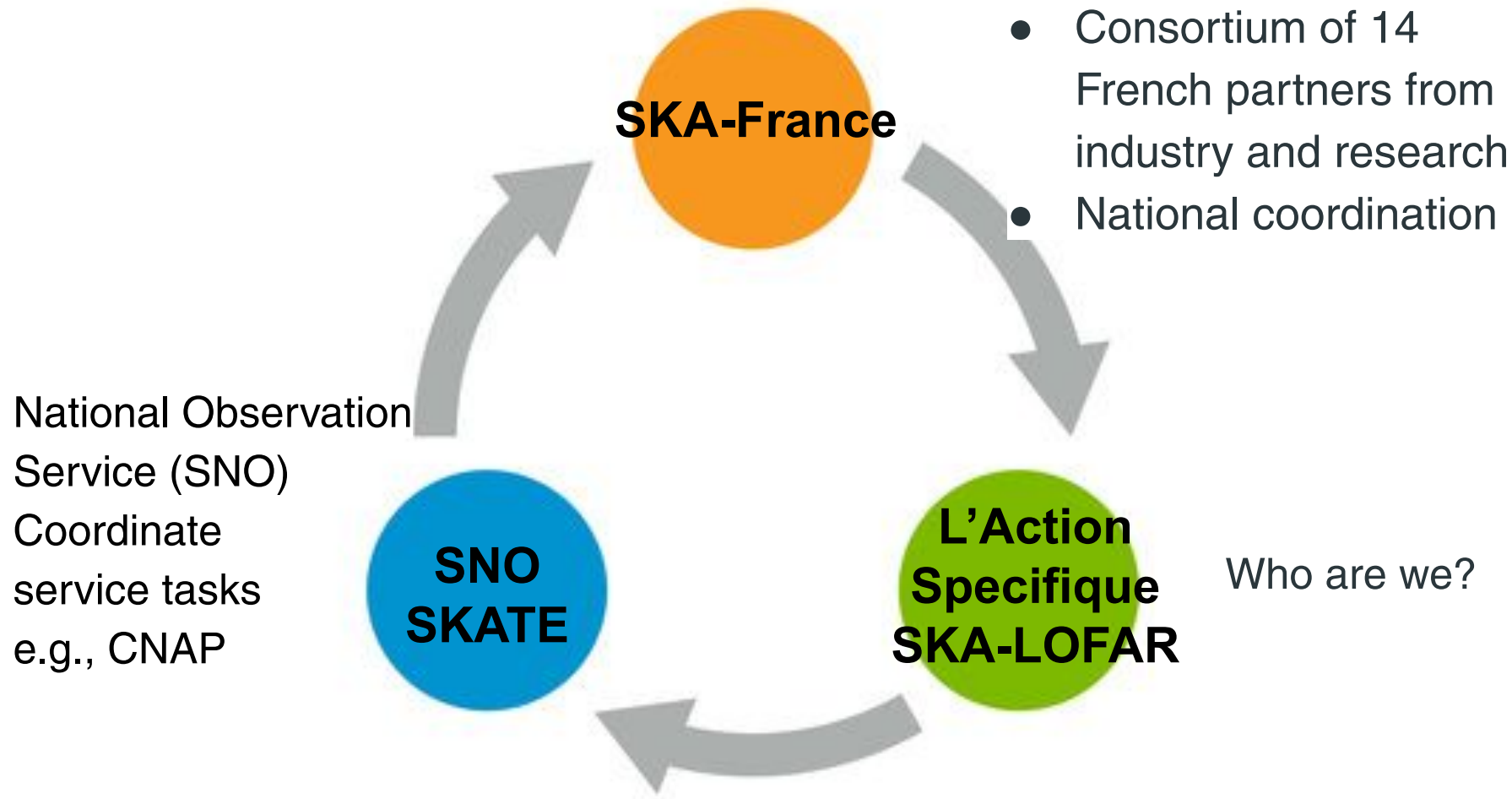
Contribution of neutral gas to Faraday tomographic data at low freq: A first extensive comparison between real and synthetic data

Berat, Miville-Deschênes, Bracco, Hennebelle, Scholtys 2026



Poster at Atelier PCMI, S02

SKA related structure in France



AS SKA-LOFAR

Mandate priority : preparing SKA for operation

Support

Accompagner

Support community
in the scientific
exploitation of
precursors
(LOFAR, NenuFAR,
MeerKAT)

Promote

Valoriser

Encourage
involvement of
researchers in
major **global** SKA
scientific
programs

Focus

Animer

Facilitate
upstream
thinking and
catalyze
technological
R&D in radio

Inform

Informer

Ensure transparent
communication,
share opportunities,
and disseminate
news to the
community

Action Spécifique SKA-LOFAR - Scientific Council

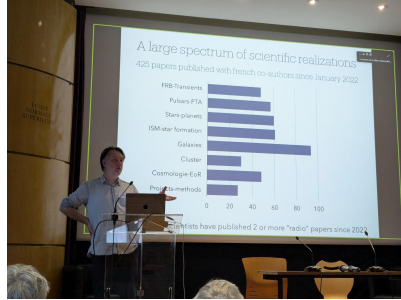
15 members – thematic and geographical coverage

- Cherry Ng-Guiheneuf (LPC2E) ★
- Antoine Gusdorf (LPENS) ★
- Andrea Bracco (LUX)
- Baptiste Cecconi (LIRA)
- Arnaud Collioud (LAB)
- Françoise Combes (LUX)
- Timea Csengeri (LAB)
- Adélie Gorce (IAS)
- Sébastien Guillot (IRAP)
- Daniele Michilli (LAM)
- Ada Nebot (OBAS)
- Marta Spinelli (OCA)
- Gilles Theureau (LPC2E)
- Cédric Dumez-Viou (ORN)
- Philippe Zarka (LIRA)



- Previous directors :
- Michel Tagger (2009–2012)
 - Stéphane Corbel (2012–2021)
 - Marc-Antoine Miville-Deschênes (2021–2025)

Previous activities supported by AS SKA-LOFAR



**SKA France
2024 @ENS**
Over 110
participants



**SKA conference 2025
@Germany**

~500 participants,
Including 27 french



**Science At Low Frequencies
(SALF) 2025 @Orléans/Nançay**
Over 140 participants from
19 countries

SKA Meudon (May 19-21, 2026)



- Close to 200 registrations
- Synergies (ELT, LISA, IRAM, JWST, Euclid...)
- Transient multiwavelength studies / triggers – coordination is critical
- Unique role of the Centre de Données astronomiques de Strasbourg (CDS)
- Industry partners, computing resources and projects

SKA Meudon (May 19-21, 2026)

Be honest: When you think about SKA coming online, what is your main personal worry?

The energy consumption of processing these petabytes will conflict with my ethical/environmental values as a researcher.



Worry	Percentage
The energy consumption of processing these petabytes will conflict with my ethical/environmental values as a researcher.	39%
I won't have the time or the team to learn how to handle this massive exascale data.	32%
My specific science case will get drowned out by the massive, multi-million-euro Key Science Projects.	21%
It will suck up all the national funding and computing resources away from other crucial space and ground missions.	8%

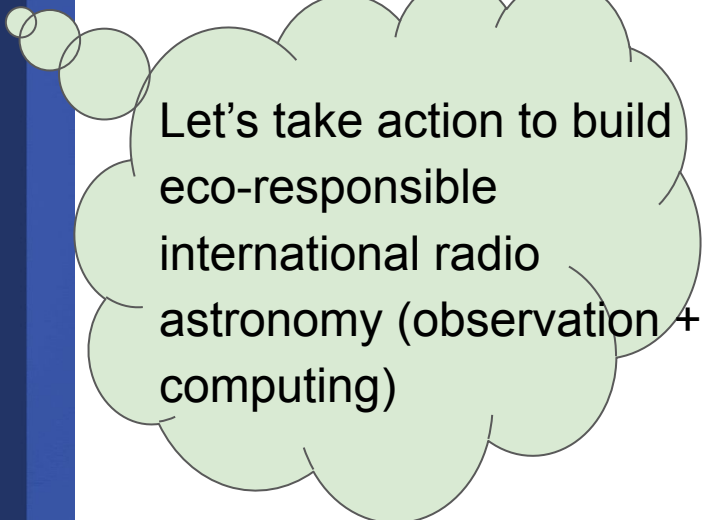
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It will suck up all the national funding and computing resources away from other crucial space and ground missions.



Let's take action to build
eco-responsible
international radio
astronomy (observation +
computing)

Annual Call for Proposals

- Workshop /conference organization
- Individual missions
- Computing needs / data storage



Join our mailing list !

Email **sympa@services.cnrs.fr** with subject:
subscribe as.ska-lofar@services.cnrs.fr FirstName LastName





Upcoming activities

- Organize SKA info sessions
 - proposal writing, observing mode, processing tools, functionalities, sensitivity calculator
 - Help the community to get ready for SV-LOW (summer 2027)
- RAIN Workshops:
 - Radio Acquisition and Instrumentation to Next-generation data
 - 16-18 Dec, 2026 in Paris
 - Talks + Hands-on training for radio data analysis
 - Contact Andrea Bracco (andrea.bracco@obspm.fr)
- SF2A parallel session in future years
 - E.g. explore synergy in broad surveys that serve multiple communities



Back up slides / Extras

Key Science Projects (KSPs)

- Truly transformational & exciting science
- Significant resources and observing time (>1 observing cycle)
- Leadership team restricted to people from member countries
- Co-Is from non-member countries are possible

Principal Investigator (PI) Projects

- Observing projects that require less time and resources than a KSP
- Typically allocated over a single cycle

Director-General's Discretionary Time (DDT)

- Timely projects that could not have been submitted in a standard cycle

50-70%

30-50%

Access to SKA

Observing time will be allocated on the basis of **scientific merit** and **technical feasibility** while maintaining access in proportion to **member shares**

Building to a **small amount of Open Time**

+ Proposal attributes



Long Term Projects



Target of Opportunity



Joint SKA projects



Coordinated Projects

+ **Projects based on archival data**
(that will still require compute resources)



SKA Environmental footprint

- power needs of the telescopes and computing facilities expected to account for 90% of the SKAO's CO2 emissions overall (12 MW of power)
- solar photovoltaic panels at our sites: target to reach 90% renewables-generated power at remote antenna locations
- Pawsey Supercomputing Research Centre in Australia, which uses an innovative geothermal system, with groundwater cooling their machines
- prioritising the efficient and responsible use of water at the computing centres, and ensuring sustainable practices are considered in the tender process, where the SKAO is asking manufacturers bidding for computing contracts to account for the carbon used from mining raw materials through to end products being produced, and to report on factors such as recycling of packaging.
- global headquarters in the UK is provided by the University of Manchester and already comes from 100% renewable sources.

