

# SKA-France

Monthly bulletin

August / September 2019

## SKA-France

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## News from Maison SKA-France

### The Netherlands ratify their participation in the SKA construction

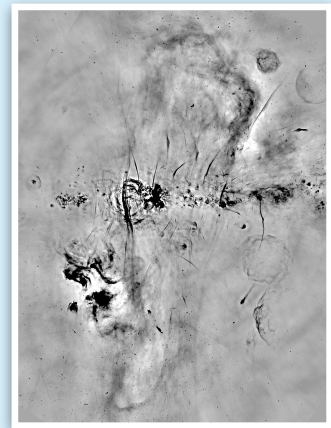
A very good news has been announced on August 19, 2019: the Netherlands are the first country to ratify the SKA Observatory Convention.

This treaty establishes the SKA as an intergovernmental organisation and was signed last March in Rome by representatives of seven countries. Important to recall that, after the signature, the Convention has to be ratified by the parliaments of member countries. Ratification processes are currently under way in the other six countries that signed the Convention (Australia, China, Italy, Portugal, South Africa, and the United Kingdom), whose entry into force will happen when at least five signatories, which have to include the three SKA host-countries (Australia, South Africa and United Kingdom), will have ratified its text.

The Dutch government managed to finalise this important step prior to the summer break, allowing the confirmation, on August 19, 2019, that the acts of ratification have been accepted by the UK Foreign and Commonwealth Office, the depository of the Convention. The Ministry of Education, Culture and Science will represent the Netherlands in the new SKA Observatory. The Minister Ingrid Van Engelshoven said: "We are investing 30 million Euros in the project, and that investment will generate employment, activity for industry and knowledge for our society, for example in the fields of IT and sustainable energy. The Netherlands will also strengthen its leading position in science worldwide".

More information are available at the [SKA Organisation](#) and [ASTRON](#) websites.

This relevant news certifies the important and rapid steps forward of the preparatory work towards the future Observatory, which includes on-going finalisation of the system CDR, of the construction and procurement plans, as well as of the whole set of regulations.



### MeerKAT detects "radio bubbles" in our Galaxy

The SKA precursor MeerKAT has recently allowed the discovery of a pair of edge-brightened bubbles, spanning more than 1400 light years across the Galactic plane. Their origin is most likely associated to the formation of a young star cluster in the central region of our Galaxy, which happened about 6 millions years ago and was strongly influenced by the massive black hole at the centre of the Milky Way. Congratulations to the South African Radio Astronomy Observatory and the international team behind this discovery!

Image courtesy: [Heywood et al., 2019, Nature 573, 235](#)

## Activities

### French participation to the program Increment Meeting #4

The fourth edition of the "Program Increment Meeting" (PI#4) of the software engineering activity coordinated by the SKA Organisation during the Bridging Phase was held from September 2 to 9, 2019. PI#4 was followed by a two-day SAFe methodology training course (September 9 and 10, 2019) offered by SKAO to interested participants. PI and SAFe training sessions were held at SKAO Headquarters, in Jodrell Bank (UK).



*Participants in the PI#4 meeting (above) and the French team (right)*

*Image courtesy: SKAO and S. Roux (Thales Services)*

The PI meetings constitute an opportunity both to welcome new participants, introducing them to the principles of PI operation, and to make a general point on on-going progresses of the various teams. PI#4 was the first to officially host a significant representation of possible French contributors. Besides M. Caillat, who provided a support function from the Maison SKA-France (MSF) coordination team, several colleagues from two private partners of MSF attended the meeting, namely ATOS-Bull and Thales Services. French participants, who at this stage were welcomed as observers, could identify possible collaborators, in particular in the fields of benchmarking, hardware-software co-design, TANGO control system and Science Data Processor (SDP) orchestration. Discussions are currently on-going for preparing the French participation to PI#5, which will be held in December 2019.

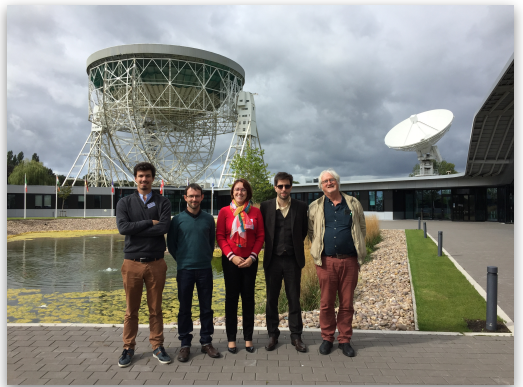
**French participants and MSF are very grateful to SKAO and to colleagues of the PI teams for the hospitality and the willingness to cooperate!**

### French study of innovative options for SKA1-MID energy system: first progress meeting

The project "Sustainable Energy Supply for SKA Telescope", lead by Bertin Energie Environnement and supported by The French Private Sector Research and Assistance Fund (FASEP-Etudes), is developing a global optimisation study of energy for SKA1-MID (see [May 2019 issue of the SKA-France bulletin](#)). The objective is to define a selection of technologies that are best suited for the South African context, safe, environmentally friendly and with a long-term perspective.

Bertin is studying the various resources available in the area into consideration. The experts also analyse the impact of production and storage technologies on the environment by integrating product life cycle analysis. They identified and sized several solutions to better meet the needs of the SKA project.

At the beginning of September a first progress meeting took place with representatives from the participating French Ministries and interested parties in France (CNRS and industry). The scope of the study was established in detail involving SARAO and SKAO. If many accurate inputs are still lacking, the first results point towards technological innovations that make it possible to consider an economically and technically credible alternative to fossil resources.



## Radio transient workshop

As announced in the [July 2019 issue of the SKA-France bulletin](#), the [Action Spécifique SKA-LOFAR](#) (AS SKA-LOFAR) and SKA-France organised a one-day workshop (September 24, 2019) focused on the study of the transient sky with SKA and precursors.

After an overview of both the SKA and SKA-France, current progresses of SKA pathfinders and precursors were highlighted, focusing in particular on their search for the different classes of transient sources of the radio sky. Presentations from members of the French community allowed to get an overview of several topics (accreting binaries, ultra-luminous X-ray sources, gamma-ray bursts, active galactic nuclei, electromagnetic counterparts of gravitational waves) of this exciting research field, which is witnessing important discoveries thanks to the impressive progresses in radioastronomical observatories preparing the SKA. In the last part of the meeting, after a focus on transient studies with [NenuFAR](#) (the French SKA pathfinder), synergies with high-energy observatories and multi-messenger projects were discussed. **All presentation are available on-line at the [meeting website](#).**

A summary of the workshop was presented by S. Corbel (Director of the AS SKA-LOFAR) during the third edition of the [Transient Sky 2020 Workshop \(TS2020\)](#), which was held on September 25 and 26, 2019.

## Announcements

### News from the SKA Science Team

After his September teleconference with the chairs of the SKA Science Working Groups (SWG), R. Braun (SKA Science Directors) informed all members of the different SWG that the SKAO Science Team has begun working on the **second Science Data Challenge. Released in 2020**, this new challenge will involve **detecting and analysing the signatures of red-shifted neutral hydrogen as seen in both emission and absorption by representative surveys undertaken with both SKA1-LOW and SKA1-MID.**

As in the previous challenge, the main aim of this activity is to verify that the planned SKA Science Data Products will be fit for purpose and that the analysis pipelines being developed within the community will be effective at extracting and accurately characterising target populations. This is being done with the most realistic simulations possible, in terms of population characteristics as well as deliberate residual data product imperfections. Since the team are still in the early definition phase of this Challenge, suggestions from the interested scientists are still welcome, in particular concerning the most relevant survey characteristics and target attributes, as well as types of imperfections. Suggestions for subsequent Science Data Challenges are always welcome as well.

Slides and meeting notes from all teleconferences between R. Braun and the SKA Science Working Group chairs are [available on-line](#).

### Open position at Paris Observatory: MINERVA project

The LERMA department of Paris Observatory is seeking candidates for a **2-years post-doc position on Machine Learning for Radio-astronomical 2D images and 3D data cubes**. The position is open from January 2020 within the **MINERVA project** ([Machine Learning for Radioastronomy at Observatoire de Paris](#)), federating astrophysicists interested in a variety of astrophysical phenomena.

Radioastronomy is experiencing an explosion of volumes of observational data with the development of giant interferometers (LOFAR, ALMA, NenuFAR, SKA). These instruments produce huge and numerous two and three-dimensional datasets (RA, Dec, frequency). Faced to these daily TByte-scale data (PByte-scale with SKA), the traditional methods of source detection and classification reach their limits. In parallel, machine learning methods have undergone algorithmic developments that bring them to a high level of maturity.

The goal of the present project is to perform pilot implementation of new methods for (i) radio sources classification based on their morphology, (ii) multi-wavelength cross identification and (iii) shape recognition and analysis in radio-astronomical large data-cube. The successful candidate will carry out an inventory of existing methods and design new tools that shall be applied to large 2D-planes/datacubes and to large quantities of such data. MINERVA will make use of datasets from ALMA and LOFAR. The new algorithms will also be tested in the context of the SKA data challenges.

Applicants should have at least an engineer diploma in the field of Machine Learning or a PhD in physics, astronomy, or computer science by the time of the appointment. Experience in Astronomy is not mandatory. We encourage applications from candidates with a strong expertise in either the manipulation or the development of state-of-the-art Machine Learning methods. Experience with manipulating images and data cubes will also be considered. Skills in one or several programming languages (e.g. Python, Fortran, C++) are necessary.

The successful candidate will have access to computing resources dedicated to MINERVA (a dedicated server with GPUs). The LERMA/Observatoire de Paris maintains a lively visitor program and hosts regular workshops and conferences throughout the year. The successful candidate will be immersed in an internationally visible research environment in the Paris Campus, with rich intellectual and computational resources.

The appointment is for 2 years with a salary including French social security benefits. Funding will also be allocated for travel. **Applicants should submit via e-mail a CV (max. 2 pages), a publication list, a short review of previous works (2 pages) and a statement of research interests (2 pages):**

**Contact persons:** [Philippe Salome](#), [Cyril Tasse](#), [Stéphane Aicardi](#)

**Email object:** MINERVA Application

For full consideration materials must be received before **October 31st, 2019**.

*Chiara Ferrari*  
for the **Maison SKA-France**