

SKA-France

Monthly bulletin

May 2020

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32nd SKA Board Meeting

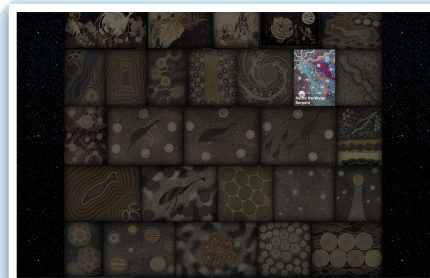
The 32nd meeting of the SKA Board of Directors was held on May 21, 2020, following a two-half-days meeting (May 19 and 20) of the SKA Observatory Council Preparatory Task Force (CPTF).

Due to the COVID-19 related situation, SKA Board and CPTF members and invited guests convened by videoconference. The SKA Headquarters (HQ) is still closed after nine weeks of UK-wide lockdown, preparation being underway for a safe return to the HQ in the following weeks.

This situation has not prevented the successful recruitment of seven new SKAO employees during the lockdown period, and, more generally, excellent progresses in all domains in view of the beginning of SKA1 construction. Some of those important steps forward are summarised below, and we refer to the [Notes from the Chair](#) (C. Cesarsky) for a more complete overview of the meeting.



Members of the SKA Board of Directors at the 32nd Board meeting, which was held by videoconference - Image courtesy: SKAO



Shared Sky on line

We are very thankful to the SKA Organisation for the publication on-line of the virtual gallery of “Shared Sky”, the SKA’s Indigenous Astronomy/Art Exhibition.

We recall here that “Shared Sky stems from a vision by the SKA to bring together under one sky Aboriginal Australian and South African artists in a collaborative exhibition celebrating humanity’s ancient cultural wisdom. This vision embodies the spirit of the international science and engineering collaboration that is the SKA project itself, bringing together many nations around two sites in Australia and South Africa to study the same sky”.

Thanks to this initiative, images and related explanations of Shared Sky artworks are now available on-line at the [SKAO website](#)
Image courtesy: SKAO

Important steps forward have been presented in the **engineering and operations fields**. J. McMullin (SKAO Programme Director and Deputy Director-General) gave an update on **Construction Planning and the preparation of the Construction Proposal**, which will be submitted to the Board for endorsement in September 2020 and then to the SKA Observatory Council for consideration and approval. J. McMullin also reported on the outcome of an external cost review panel, which examined the planned expenditure of the project and made a number of recommendations covering cost, risk, and schedule. It was mentioned that the panel noted the rigour and quality of the work carried out to date by SKAO. L. Ball (SKAO Director of Operations) presented the progress on developing the **10-year Observatory Establishment and Delivery Plan**, covering Observatory Operations, Business Enabling functions and the SKA Observatory Development Programme. An external review of the Observatory Operations aspect of the plan had been completed and the outcome was presented to the Board. An external review of the Business-Enabling functions is scheduled for early-July 2020. The Observatory Establishment and Delivery Plan will be submitted to the Board for endorsement in September 2020 and then to the SKA Observatory Council for consideration and approval.

As stressed in the review of the Observatory Operations, a very important element of the SKA operation plan is the **implementation of the future SKA Regional Centre (SRC)**. To this regard, P. Quinn (Chair of the SRC Steering Committee - SRCSC) presented the SRCSC White Paper and the proposal to establish several SRCSC-lead Working Groups to further develop the details for the implementation of the SRC network. The Board supported the establishment of the proposed Working Groups. The White Paper, which contains proposals for the governance, functionality, participation and cost of the SRC network, was endorsed during the meeting, subject to further work being carried out to agree on the SRC governance model.

The revision of **2020 Budget**, incorporating cost saving measures in the light of COVID-19, was approved by the Board, to whom a draft of the **2021 Business Plan** was also presented for revision. This latter document, which will be submitted for approval at the July Board meeting, takes into account the expected 6-months delay of the project related to the current COVID-19 crisis. The impact of this world-wide emergency on the SKA is constantly monitored by a specific working group that, by reviewing different scenarios, has the aim to establish an operational SKA Observatory and to start construction activities as soon as possible. To this end, P. Kelly (CPTF Chair) and T. Devaney (SKAO Head of Business Development and Change) reported about **progresses in CPTF key priorities** (funding for the SKA Observatory and development of procurement plans in preparation for start of construction) and **transition planning activities**. The Board noted that the currently existing SKAO company is expected to remain a legal and operational entity into 2021, the COVID-19 impact in the ratification process of the Observatory Convention and UK Headquarters Agreement having delayed the timeline for transition from the SKA Organisation to the SKA Observatory.

In view of the preparation of the future exploitation of the SKA Observatory, R. Braun (SKAO Director of Science) and P. Diamond (SKAO DG) informed the Board on one side on plans regarding the **next SKA science meeting** ("The Precursor View of the SKA Sky", originally scheduled to take place in September 2020 but now planned for March 2021), on the other on the work between the Office, external stakeholders and the radio astronomical community to investigate the **potential impact on SKA1 of the various low earth orbit satellite mega-constellations**.

Activities

First ESKAF meeting

May 8, 2020, saw the **first videoconference of the European SKA Forum (ESKAF)**, the coordination structure that, as announced in the [February issue of the SKA-France bulletin](#), has been launched by European countries members of the SKA Organisation and/or signatories of the SKA Observatory Convention (France, Germany, Italy, Portugal, Spain, Sweden, Switzerland, The Netherlands, United Kingdom).

The main aim of the meeting, organised by C. Ferrari (Observatoire de la Côte d'Azur/CNRS, FR) and M. Van Haarlem (ASTRON, NL), ESKAF Chair and Vice-Chair respectively, was to discuss on the status and main objectives of the coordination in order to precisely define the ESKAF Terms of Reference (ToR).

The videoconference also allowed to organise the logistics of ESKAF meetings and related documents. Following C. Ferrari's proposal, L. Fournier (SKA-France Business Manager) has been unanimously named ESKAF Secretary.

The Swiss representative, J.-P. Kneib (École Polytechnique Fédérale de Lausanne) was congratulated by all participants for EPFL having recently become the 14th member of the SKA Organisation.

Further information about ESKAF progresses will be regularly posted.

Announcements

News from SKA precursors and pathfinders

Radio galaxies are giant radio sources characterised by extended jets. Their radio emission is associated to the presence of magnetic fields and acceleration of particles by a supermassive black hole (SMBH) at the centre of the host galaxy. In most of the cases, jets are collinear and thought to be aligned with the spin axis of the SMBH. However, less than 10% of radio galaxies are X-shaped, having a second set of jets or “wings” misaligned with the first. Over the last decades, several possible explanations have been conceived to explain this peculiar shape. Thanks to its exquisite capability of imaging the radio sky, the South African SKA precursor MeerKAT has allowed astrophysicists to shed light on this open question.

On May 7, 2020, a [press release of the South Africa Radio Astronomy Observatory \(SARAO\)](#) has announced the [publication of a detailed study](#) of one X-shaped radio galaxy (XRG), known as PKS 2014-55.

Radio emission detected from the galaxy PKS 2014-55 by MeerKAT (in blue), overlaid on the visible image of the same sky region.

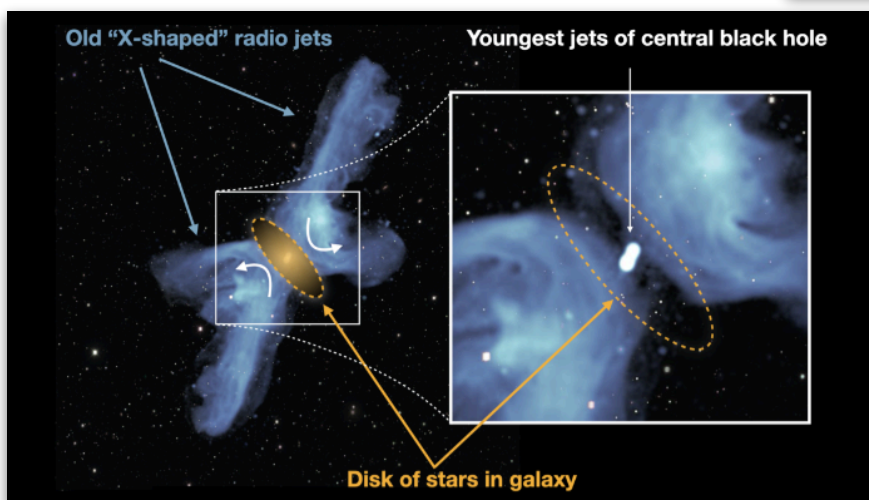
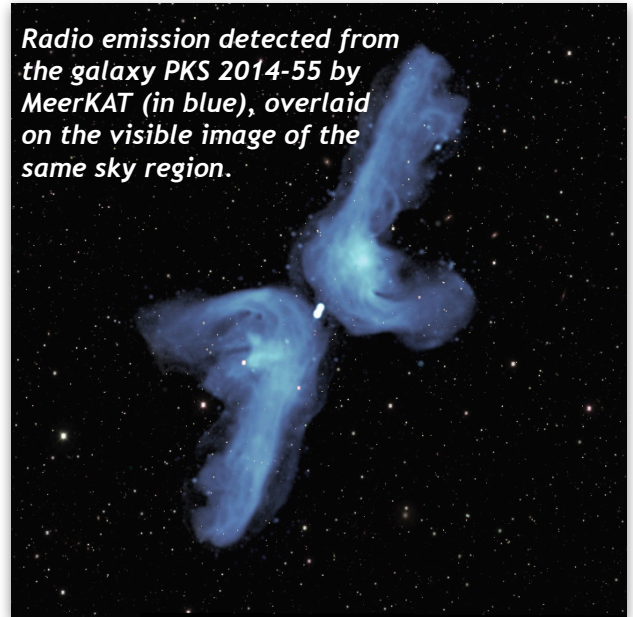


Image courtesy:

UP; NRAO/AUI/NSF; SARAO; DES

This analysis points out that, although the radio source may resemble a true XRG in low-resolution images, its actual shape is more like a “double boomerang”. The thoughtful physical analysis of PKS 2014-55 indicates that the two bent jets are “turned back” by the pressure of the tenuous intergalactic gas surrounding the disk of stars of the galaxy hosting the SMBH.

If the giant bent jets, which extend over 2.5 million light years into space, are relics of a SMBH activity that ceased millions of years ago, the MeerKAT image points out that the “monster” at the centre of the galaxy is active again and producing new jets of radio emission on much smaller scales. The fact that the new and old jets are aligned along the same direction rules out the hypothesis that the morphology of PKS 2014-55 is associated to a change in the spin direction of the SMBH, one of the alternative hypothesis proposed to explain XRG.

On the Australian side, on May 28, 2020, a [press release by the Commonwealth Scientific and Industrial Research Organisation \(CSIRO\)](#) announced an extremely relevant [publication on Nature](#) related to observations of the SKA precursor ASKAP. The paper concerns a study of Fast Radio Bursts (FRBs) with known source galaxies that has allowed to obtain a census of the baryonic (i.e. ordinary matter) content of the Universe.

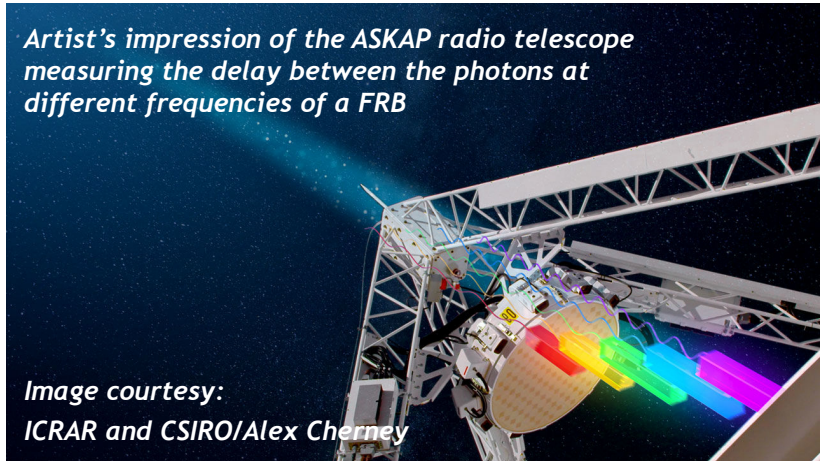
The relevance of this result resides in the fact that not only normal matter contributes less than 5% of the Universe mass (or, equivalently, energy) inventory, but, in addition, more than three quarters of it is in a very diffuse state and thus very difficult to be detected. Why FRBs are so efficient tools to trace that mass? As already explained in several SKA-France bulletins, FRBs are extremely energetic events lasting for just milliseconds. Our radio telescopes, such as ASKAP, are able to collect the emission from FRBs over a range of frequencies; a key feature is that, despite all FRB photons are emitted simultaneously, their arrival time on Earth increases with decreasing frequency, with a delay in time that depends on how many electrons the FRB has traveled through.

The amount of lag of low-frequency photons with respect to high-frequency ones allows us to measure the total amount of matter traversed by the pulse if we also know the distance of the source that emitted the FRB and, thus, if we have identified the galaxy in which this intense and very short radio signal was originated. As explained in the [June 2019 issue of SKA-France bulletin](#), a new technology has been developed by the ASKAP team to precisely localise the spatial origin of the bursts and, subsequently, identify its associated galaxy.

Very importantly the baryonic matter measurements obtained through FRBs are consistent with theoretical predictions and independent observational estimates about how much of baryonic mass the Big Bang should have produced. As pointed out in the conclusions of the Nature paper, a larger sample of FRBs, such as with the future SKA, will not only be able to reveal “that all the baryons are present but will constrain where they lie”.

Artist’s impression of the ASKAP radio telescope measuring the delay between the photons at different frequencies of a FRB

*Image courtesy:
ICRAR and CSIRO/Alex Cherney*



SKA-related open position in Paris Observatory

A permanent research-engineer position is open at the LERMA Department of Paris Observatory, to work half-time on the SKA project and half-time on other research activities. The broad profile for the position is that of a computer scientist with expertise in High Performance Computing and Algorithmic Developments. The detailed profile (in French) can be found at [Paris Observatory website](#).

The position is open to EU citizens. Applications are submitted [online](#) (website in French).

For further information:

- * [Benoit Semelin](#) (details about the position)
- * [Bureau Concours](#) (application process)

Deadline for applications: June 18, 2020

SKAO Current Vacancies

The following SKAO positions are currently open:

- * [Control System Architect](#) - **Contract Type:** Permanent (closing date: June 14, 2020)
- * [Network Architect](#) - **Contract Type:** Permanent (closing date: June 28, 2020)

Interested readers can [register](#) to automatically receive an e-mail as soon as a relevant job is published. More information can be found at the [SKAO webpage](#).

Chiara Ferrari
for the [Maison SKA-France](#)