



SKA Organisation Monthly Bulletin

14th Issue, September-October 2015

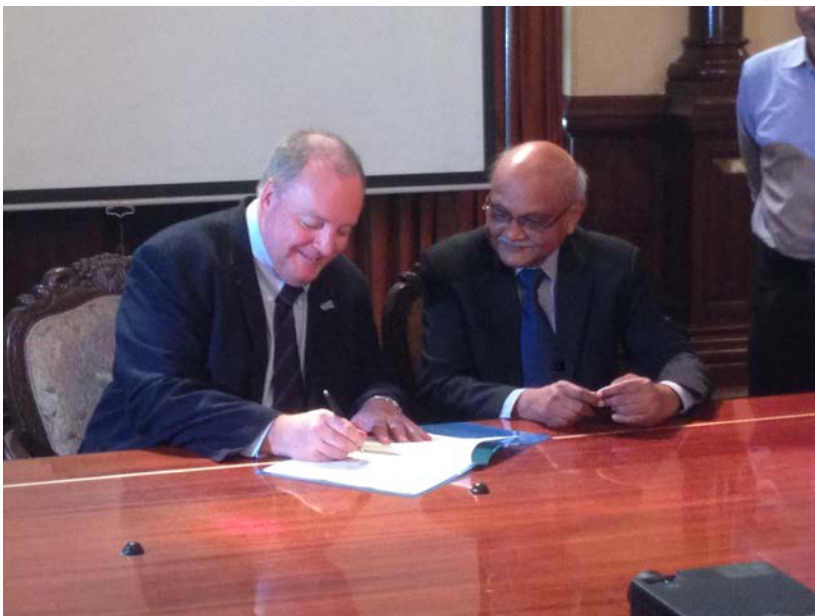
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From the Desk of the Director-General

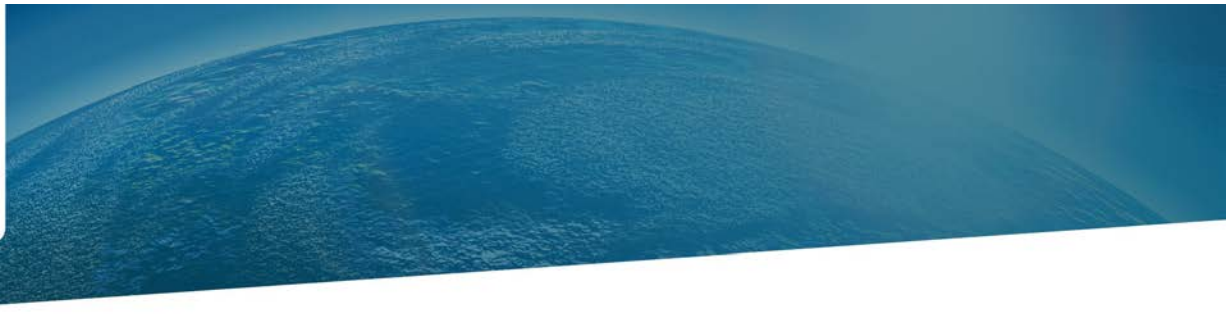
I write these paragraphs from Penticton, late as William Garnier reminds me! We are in the middle of the second day of the SKA Engineering Meeting in Penticton, Canada. The meeting has, so far, been excellent with stimulating talks, many cross- and inter-consortia interactions, a very pleasant evening reception at a local winery and with much more to come. I remain pleased, impressed and excited about the progress in the design activities revealed by the talks from the consortia representatives, by the status of the Preliminary Design Reviews and by the planning for the System Review. SKA is a project on the move.

That is not to say that we don't have our issues. Any project that is developing the design of a mega-science facility with international and distributed design teams will face challenges. Many of ours lie in the area of communications, in all directions: outwards from the SKA Office, inwards from the consortia, between consortia, up to the Board and with the science community. A lot of effort has been expended over recent months to develop processes, tools, meetings etc. to minimise the communication difficulties. SKAO is committed to ensuring that all processes, across the project, are open and transparent. This monthly bulletin is part of the communications arsenal. Vitaly, the engineering meeting is also key and so I am very pleased to be here and engaging with the design teams.

The past month has been a busy one for me. It began, as Simon Berry mentions below, with he, Jeff Wagg from the SKA Science Team and me, visiting Mumbai for a signing ceremony with Mr R.K.Sinha, the Secretary of the Indian Department of Atomic Energy (DAE) as DAE took over the Indian membership of SKA, thereby providing a seat within SKAO for the Indian government. This is an extremely positive development. Following the ceremony in the Boardroom of the Royal Bombay Yacht Club, now DAE offices, we spent the rest of the day briefing Indian officials and scientists on the current status of the SKA. Yashwant Gupta of NCRA was the key player in making this happen and I wish to pass him my personal thanks.



Phil Diamond and Mr. R.K.Sinha, the Secretary of the Indian Department of Atomic Energy (DAE), during the signing ceremony



The week after Mumbai I participated in the first meeting undertaking the formal negotiations to establish the SKA as an Inter-Governmental Organisation (IGO) governed by a convention. This took place in Rome under the presidency of Minister Enrico Vicenti from the Italian Ministry of Foreign Affairs. Simon Berry reports on this meeting below; I will say that it was a very positive meeting with the negotiations proceeding well and the establishment of 4 working groups to take forward the detailed work required. The next meeting is scheduled for the end of January.

The following week I attended the OECD Ministerial Science Meeting in Daejeon, Korea as one of three keynote speakers. I had the honour of addressing the plenary meeting (senior delegations from ~50 countries, many led by Science Ministers) on the subject of 'Science Policy for the 21st Century: Open Science and Big Data'. I was asked to use SKA as a real-world exemplar for this subject. The talk seemed to go well; I was very pleased that I could inform such a high-level audience of the SKA. Following the plenary session I attended a discussion on the same topic, which delved into more detail. It was an interesting meeting.

The excitement didn't end there, On 23rd October, during the State Visit of President Xi of China to the UK, I was invited to a civic luncheon at Manchester Town Hall in honour of President Xi's visit. David Cameron, Prime Minister of the UK was also present. Nice though it was for me to be well fed, it was more important that SKA was represented at such a high-profile event.

Lest you think that I am over-worked I also found time to spend a weekend in Stratford-upon-Avon with my wife and two friends, at which the ladies did the cultural thing (Shakespeare's Henry V) and the gents drove racing cars at Silverstone – see the photograph below: great for stress relief.

Philip Diamond
SKAO Director-General





Project

By Alistair McPherson, Head of Project

The past month has been focused on preparations for the delta-architecture review and the initiation of the Telescope Teams. The Telescope Teams have both started well with volunteers filling the roles within the teams and all consortia being represented. The TT-Low team managed to meet together at ASTRON and this was extremely useful to kick-off the work face to face. The TT-Mid team have met by video, but have already constituted their initial Resolution Teams for their priority tasks. Both teams have a day together at the Engineering Meeting so that we can spend some time looking across both telescopes to identify any issues that may be masked by the element approach.

The planning is complete for the Engineering Meeting and the programme now looks extremely full. There have been many requests for meetings and this has resulted in a programme which will be demanding for many. Unfortunately some meetings will clash, but sensible decisions on priorities should resolve this. We are also very pleased with the invitation to visit the observatory and I hope everyone who wants to visit will be able to.

This month we will have had the down-select for the Dish Main Structure. This review is occurring as I write, so we should have a result soon after the Engineering Meeting, once approved by the DISH Consortium Board. This process has been lengthy with many competing pressures on the consortia. I believe their drive to produce a clear down-select criteria and process has helped them formulate a decision. Probably a good lesson for those consortia that will be carrying out down-selects in the future months.

The delays to the Dish, SDP and the CSP-Low PDRs are putting the Systems Review under pressure as evidence from these reviews to demonstrate a baselined solution is required. We are monitoring progress to see how this can be resolved. That said, with the Dish down-select nearly complete, their PDR should not be further delayed.

I am looking forward to seeing everyone at the Engineering Meeting. It should be a great opportunity for people to get together, to discuss issues and to progress the project. I would encourage you to choose meetings wisely, so that you can maximise your contributions in an effective manner and also look for opportunities to unblock any issues that you are aware of. Sadly, as a distributed project, we don't have too many face to face opportunities, so we must maximise the time.

System Engineering

by Tim Stevenson, SKA Chief System Engineer

Recent weeks have seen the revision of the documentation that describes the architecture of the SKA Telescopes, with critical contributions from Thomas Kusel and Hermine Schnetler of SKA-SA and UK ATC respectively. These contributions place the Project on a firm footing regarding the relationship between the functions required to conduct SKA1 radio astronomy and the functions provided by the designs being developed by the Consortia. These analyses are intended to show where the architecture/design is weak or inappropriately partitioned. That being said, the picture is healthy – bearing in mind the Preliminary Design status and the scope that exists for changes.

Another necessary artefact for a system level PDR is the Product Breakdown Structure (PBS). All unique large-scale projects experience difficulty with agreeing this, and the SKA is no different. In reality, there are several PBSs necessary over the lifecycle of the Project, and some may co-exist. It is absolutely key that

the terms used for the same thing across the various co-existing PBSs are the same and that every PBS is complete for the phase of relevance. The good news is that the Project is converging on an agreed PBS for this phase and is developing the Work Breakdown Structure (WBS) for construction in which the (differently structured) Construction PBS is embedded. The Construction WBS is the basis for the Cost Book – the representation of the investments necessary to build SKA1, to be used in negotiations with the Member Governments. The speed and efficiency (and success!) of these negotiations is critical to keeping the SKA1 schedule, and the structure of the Cost Book is key to this.

Architecture

by Peter Dewdney, SKA Architect

A significant new development is the establishment of 'Telescope Teams', one for each of SKA1-mid and SKA1-low. Led by Domain Specialists (Gie Han Tan and Mark Waterson, respectively) from the SKAO, and supported by project managers and systems engineers, there are also representatives from the Consortia.

The principal goals of the TTs are to identify, define and supervise the resolution of major technical issues that will naturally crop up during the design, installation and commissioning phases of SKA1-mid and SKA1-low. The TTs take on primarily technical issues that inevitably crop up during the normal engineering work, not to do normal design and system engineering work. They refine the description of the issue, and ensure that they are sufficiently well described, not so large that they cannot be resolved in a month or so. Then the issues are passed on to Resolution Teams, which consist of acknowledged experts, appointed by the Executive of the TT. In principle, members of the RTs can be drawn from anywhere.

If the TT-model works well for these contexts, it may be expanded for other aspects of the project.

A revised version of Level 1 requirements has now been issued. It now contains cross-references to Level 0 requirements (SKA Phase 1 System Requirements Specification, Rev 6C).

The Office is preparing for a delta-Architecture Review. This a joint effort by the Architecture group and the System Engineering group, and managed by the Project Manager. A particularly important part is the technical component of System Budget Definitions. These are usually error budgets, whose components cross sub-system or work-package boundaries (e.g. complex gain errors, which have contributions from the Dish, Timing, and Signal Processing). The actual allocations will be made later, and even the Definitions will potentially be subject to refinements and revisions.

An initial version of the Baseline Design (v2.0) document has been written recently. This 'light' version, which does not contain detailed quantitative information, provides a 'glimpse' of the structure and content of a more complete version that will be written for the Systems Review.

Operations Planning

by Gary Davis, Director of Operations Planning

I am pleased to announce the recruitment of a new staff member: Dr Antonio Chrysostomou, who has commenced work as Head of Science Operations Planning on 21st September. Antonio came to us from the University of Hertfordshire (UK) and has vast experience in observatory operations, having worked for a period at the United Kingdom Infrared Telescope and later as Associate Director of the James Clerk Maxwell Telescope. His arrival has galvanised the Operations Planning group.

Bolstered by this additional effort, work to define the operational requirements is moving forward apace. We plan to issue an Operations Concept Document to the Consortia for review in November/December, leading

to final issue by Christmas and a review in early 2016. Until these requirements are issued, we are maintaining a regular dialogue with TM and SDP: these meetings have been fruitful in highlighting issues where clarity is needed. Two other draft documents are about to be issued on the engineering operations side: the Support Concept and the RAM Allocations. All of these documents are being issued for review and discussion within the wider project, and we welcome responses from the Consortia.

In my previous reports I have highlighted the organisational structure of the SKA (in its 50-year operational phase) as a fundamental prerequisite for its ultimate success. The working group set up by the Board has completed its work and a proposed structure will be presented to the Board for approval in November. An announcement to the project will follow.

Although the Board established a cap for the capital construction cost of SKA1, it did not establish a cap for operations costs (although, naturally, the Members have expectations about the level of operation they are able to support). I have therefore initiated a process to develop a bottom-up estimate of the operational cost, beginning with the estimates provided by the Consortia for their PDRs. The overall PDR-level estimate will be presented to the Board in April 2016, and updates will be provided to each Board meeting thereafter. This process will culminate in the presentation of an Operating Plan to the Board for approval along with the Construction Proposal (in January 2018 on current planning) so that the Board can at that time approve the entire package. The support of the Consortia for this budget development process will be essential.

The Data Flow Advisory Panel has commenced its work. The Panel has 16 members, covering every SKA partner country and some independent members. It will submit its report to the Board for its April 2016 meeting.

I look forward to meeting many readers of this bulletin in Penticton.

Science

by Robert Braun, SKA Science Director

1) Bologna meeting

A meeting to discuss radio continuum (and other synergistic) surveys with SKA pathfinders leading up to SKA took place at INAF in Bologna from 20 – 23 October. About 130 participants took part in the conference with a wide-ranging programme of presentations and discussion sessions.

<http://www.ira.inaf.it/meetings/survey2015/>

2) Stockholm KSP Workshop Outcomes

Good progress was made at this workshop in the further development of Key Science Project concepts and this is documented in the Science Working Group presentations and summaries that are now posted on the Workshop web site at (<https://indico.skatelescope.org/event/342/page/4>).

One of the unanticipated outcomes of the workshop was the emergence of a concept of “generic” surveys that would – by design – allow a wide range of scientific objectives to be realised from the same basic data stream. It is clear that such an approach is not suited to all project types, but there is a significant fraction of projects that might be addressed effectively in this way. There is an on going effort to distil a short list of perhaps four such surveys that might enable the largest possible range of science objectives to be realised. It is conceivable that the basic parameters of such surveys (sky area, frequency range and depth) might be established well before the actual Call for KSP Proposals, since this would permit survey team organisation and ancillary data acquisition to begin. KSP proposals targeting such pre-defined surveys would still need to compete in the normal process to receive the “limited data rights” to undertake their science programme.

The assessment of such proposals would (as for all KSP proposals) consider the additional resources committed by the KSP teams as well as the proposed public data release schedule for value-added products. A preliminary concept for several such “generic” surveys is now being circulated within the Science Working Groups for discussion.

A second unanticipated outcome of the workshop was substantial discussion around the question of observing band definitions. The discussion during the meeting was followed up with preparation of a document that captures these considerations for future reference. That document is now available on the SKA website. What is clear from this tabulation is that the technical requirements of the various science areas are quite diverse. Overall, they strongly reinforce the planned SKA1 deployment programme that has been approved by the SKA Board, including the band definitions put forward in the original Baseline Design.

3) The configuration and station definition of SKA1-low

Significant progress has been made in clarifying the various constraints that apply to both the stations and their configuration for deployment in SKA1-low. This is summarised in a draft discussion document that is available on the web site.

Policy Development

by Simon Berry, SKA Director of Policy Development

Since the last report, the policy team has been busy with a range of meetings and events. As reported elsewhere, it was an honour to attend a signing ceremony in Mumbai to mark the Department of Atomic Energy taking on the membership of the SKA Organisation for India. In addition to a well-attended and high-profile signing event, the Director-General and I were able to brief government officials on progress within the project and discuss a number of policy development matters. The event marks the culmination of much hard work and effort from a number of people on both the project and Indian sides.

The following week the focus moved to Rome. The early part of the week was taken up with a meeting of the StratCom sub-group developing a procurement policy document. The remainder was spent with the first formal negotiation meeting towards the creation of the future SKA Observatory as an Intergovernmental Organisation. In the beautiful surroundings of the Villa Farnesina, delegations and observers from all the current SKA Members and respective governments made excellent progress examining the core texts that will be needed to ultimately establish the new organisation. The task ahead over the coming months will be challenging to maintain the pace, but the evidence of the first meeting suggests that there is a will to work hard towards the goal. Several working groups are being established to continue the detailed discussions and work between now and the next plenary discussion session set for late January 2016. Part of this work requires the Office to consider how it will operate and some of the administrative processes will develop. In turn, some of these questions rely on the parallel work we are undertaking to negotiate a draft Headquarters Hosting Agreement with the UK, and finalise the Hosting Agreements with Australia and South Africa. Some good progress made, but plenty more to do!

SKA Board Matters and Administration

by Colin Greenwood, SKA Head of Administration and Legal

SKA Governance

On 14 July, Mr Peter Crabtree was appointed as the New Zealand Government’s Ministry of Business, Innovation and Employment Voting Representative on the SKA Board of Directors and Nominated (Voting)

Member Representative.

As reported previously, at the 18th meeting of the SKA Board of Directors (July 2015), Professor Michael Garrett was re-appointed as Science Representative to the Board's Executive Committee (XC). The XC membership now comprises: Prof. Giovanni Bignami (Chair), Mr YIN Jun (Vice-Chair), Prof. Michael Garrett (Netherlands), Dr Bernard Fanaroff (South Africa), Ms Patricia Kelly (Australia) and Prof. John Womersley (UK). Prof. Phil Diamond (Director-General) and Mr Colin Greenwood (Company Secretary) attend XC meetings in ex-officio capacity.

As from 2 October 2015, Dr Luigina Feretti stepped down as INAF's Science Representative on the SKA Board of Directors. As from 2 November 2015, Dr Feretti also stepped down as INAF's Second Member Representative. Dr Feretti has supported the SKA project over many years on different SKA governance boards and her contributions to the project are gratefully acknowledged and appreciated.

On 5 October 2015, India transferred its full membership of SKA Organisation from the National Centre for Radio Astrophysics to the Indian Government's Department of Atomic Energy. From this date, Mr Arun Srivastava was appointed as India's Voting Representative on the Board of Directors and Nominated (Voting) Member Representative. Prof. Yashwant is now India's Science Representative (Board) and as Second Representative (Member).

As from 3 November 2015, Dr Grazia Umama was appointed as INAF's Science Representative on the SKA Board of Directors and Second Member Representative.

The 19th meeting of the SKA Board of Directors will be held at SKA HQ on 19-20 November 2015. The main topics of discussion at this meeting will be science, engineering, operations and policy updates. The Board's Finance Committee will present the SKA's budget for 2016 and indicative budget for 2017 for approval. In addition, the Chair will provide an update on the current status of negotiations between member governments to establish SKA as an intergovernmental organisation in the near future.

SKA Building Update

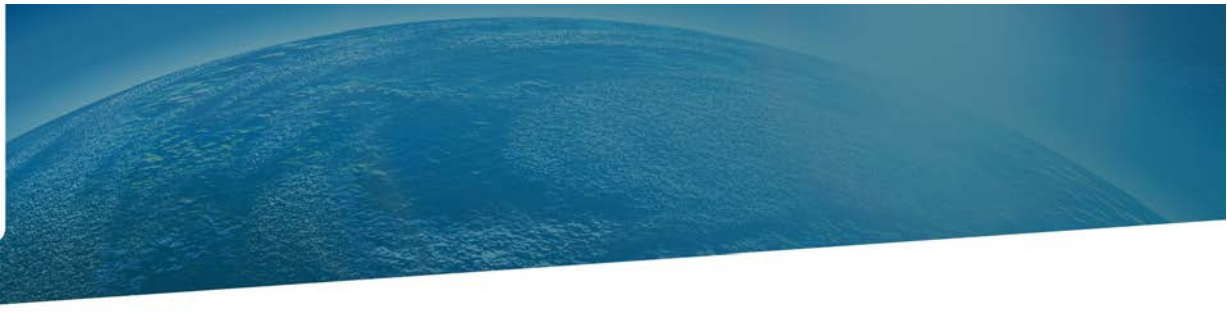
Negotiations between SKA Organisation and the UK Government continue regarding the SKA HQ hosting agreements. The SKA Office also continues to work closely with the University of Manchester to further develop designs for the new Headquarters building. The engineering and construction company Sir Robert McAlpine has been appointed as principal contractor/designer for the pre-construction stage of this project and Hassell, and international architect practice, has been appointed as Project Architect.

The design and build of the SKA HQ building will adhere to good practice guidelines set out by the Royal Institute of British Architects (RIBA). The RIBA Plan of Work 2013 organises the process of briefing, designing, constructing, maintaining, operating and using building projects into a number of key stages. The SKA is working with the University, Sir Robert McAlpine and Hassell to develop a design brief under RIBA Stage 1.

Staff Update

We are delighted to welcome the following new starters: Ms. Sarah Lamb (Office Manager) on 14 September, Ms. Frances Bell (HR Assistant) on 15 September, Dr. Antonio Chrysostomou (Head of Science Operations Planning) and Mr. John Kerr (Safety and Facilities Manager) on 21 September.

Since the last report, the following staff have left the Company: Ms. Roshene McCool (SaDT Domain Specialist) on 9 October, Takuya Akahori (on secondment from Kagoshima University, Japan) on 15 October, Ms. Greta Collins (Office Manager) on 22 October and Dr. Xiaoxuan Zhu (on secondment from



CETC 54, China) on 30 October. We wish to thank Roshene, Takuya, Greta and Xiaoxuan for their contributions to the SKA project.

Communications and Outreach

by *William Garnier, SKA Director of Communications, Outreach and Education*

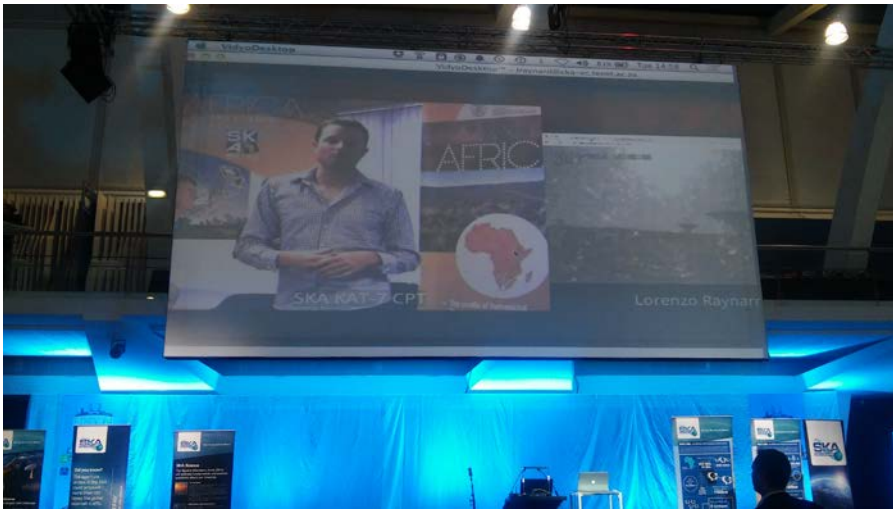
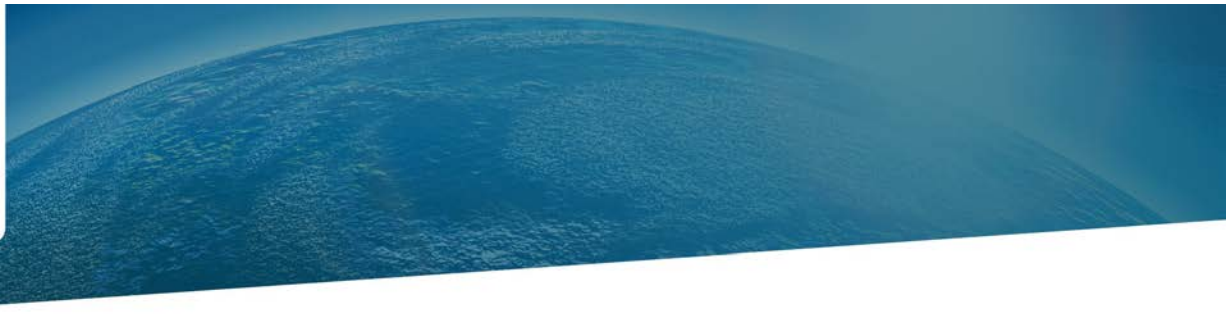
Engineering Meeting

SKAO Comms team has been actively involved in the organisation of the engineering meeting and we certainly hope the meeting will run smoothly and will be fruitful and constructive for all. All members of the Events Organising Committee (EOC) and Local Organising Committee (LOC) are profusely thanked for their effort and dedication in preparing this meeting. I will take the opportunity to address the delegates in a plenary on the first day to remind the importance of working together in properly documenting the activities across the consortia and reporting relevant (from a PR point of view) milestones accordingly, using the multiple channels available in order to maximise the reach and impact, benefitting both the project and its individual partners. I certainly look forward to seeing you all in Penticton.

Conferences

ICT: I attended the ICT conference in Lisbon, Portugal, mid-October, where I organised a session from the central stage in the main hall, consisting of a 25' general presentation about the SKA, followed by a live link with South Africa, where Simon Ratcliffe provided an update on the project in South Africa. This conference is held every two years and is the European Commission's flagship ICT conference, attracting a number of EC Senior Officials and industry from the ICT sector.





Live session organised during ICT conference in Lisbon

WRC: A few months ago, SKA was granted the status of Sector Member by the International Telecommunication Union (ITU) and, as I am writing these lines, we are represented at the ITU's World Radiocommunication Conference (WRC) currently running in Geneva, Switzerland, by Harry Smith, SKAO's Spectrum Policy Manager. Mathieu Isidro is also manning the SKA stand, where a specially made brochure is being distributed to delegates. The WRC is an extremely important event in the field, and we are pleased to be able to attend as we seek to increase the visibility of SKA within the global spectrum community. Harry will provide a more complete report in the next issue of this bulletin.



Harry Smith at the opening ceremony of the World Radiocommunication Conference (WRC) in Geneva, Switzerland.

ESOF: as reported in this bulletin in previous issues, we submitted 4 sessions for the next Euroscience Open Forum (ESOF), to be held in Manchester in July 2016. ESOF is a high-level science policy conference, bringing together policy-makers, senior officials, governments, media and scientists, being held every 2 years in a European city. It is the European equivalent to AAAS meeting. Due to ESOF being held in Manchester next year, we actively engaged with the organisers to make sure SKA will be highly visible and we received very encouraging signs from our contacts. Stay tuned. In the meantime, the organising committee made their selection and I'm pleased to report that all of our 4 proposals were accepted. This is an excellent outcome considering that there was an oversubscription of a factor of 4. In summary, our proposals consider ~30 speakers, including a Nobel Prize winner, 2 Science Ministers, the DG of the Directorate General for Research and Innovation at EC, the vice-Chair of the CERN Council, the CERN DG (still to be confirmed), the ESO DG, the ALMA Director, the JWST Project Scientist, etc. We certainly look forward to that conference and we hope to see many of you there next year.

ASTRON Open House Day

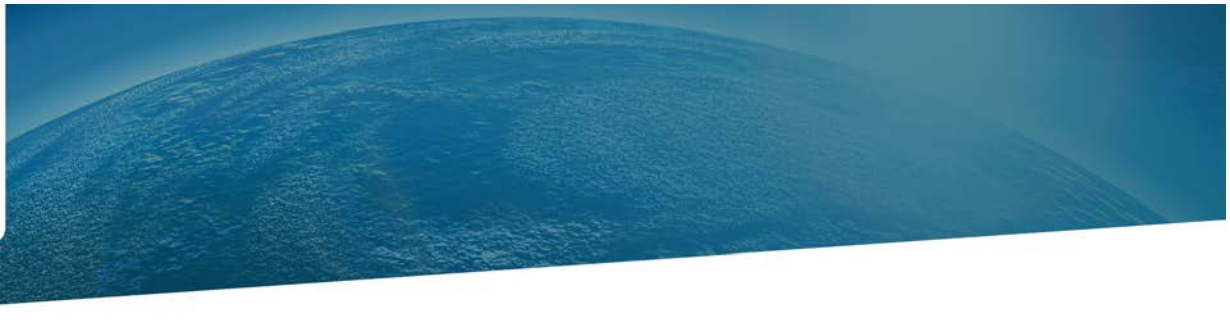
We took part in the ASTRON Open House Day in Dwingeloo on October 4 with an SKA booth. The event saw thousands of visitors keen to learn about ASTRON's work and guided by a small army of ASTRON staff volunteers. Congratulations to them on a very successful outreach day!

Universe Awareness Education Workshop

We also took part in the Universe Awareness international Education Workshop organised in Leiden the following week, where we updated the education community on our outreach initiatives. There is a real desire to see the SKA do more in terms of education and outreach and we're pleased to say we've had encouraging informal discussions on the way forward towards a comprehensive education strategy. More in upcoming bulletins.

SKA Chinese Media Day

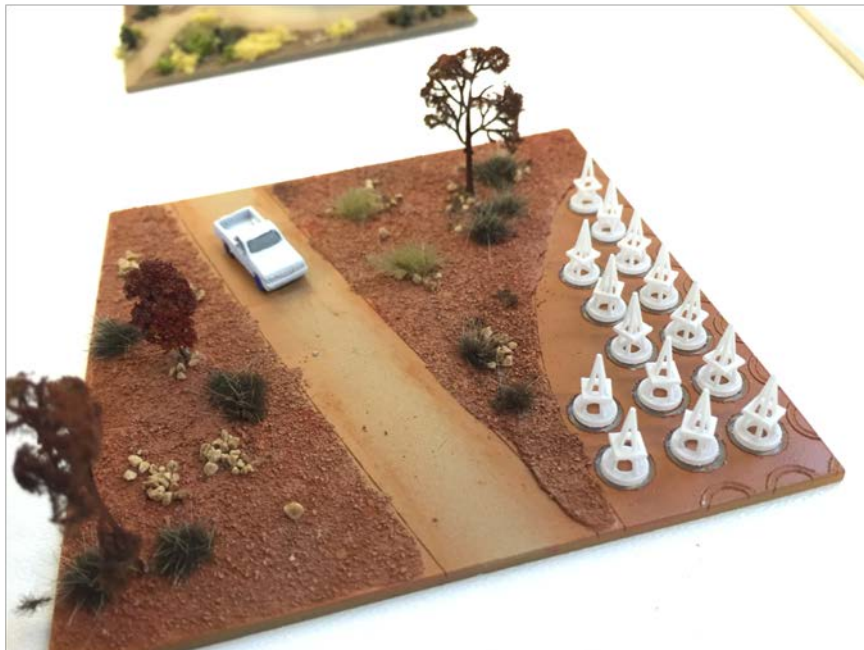
In September, taking the opportunity of the signature of the Letter of Intent (LoI) by China, we organised a Chinese media day in the office. The national Broadcast CCTV, the main Chinese Press Agency Xinhua and the Minister of Science and Technology's publication, namely S&T Daily, all accepted our invitation and spent the day in the office meeting and interviewing key staff and were provided updates about the project and about the Chinese involvement. YIN Jun, SKA China Chief Negotiator and Voting Member in the SKA Board, joined us by video to explain the relevance of the signature of the LoI for China. JIANG Sunan, Science and Technology Attaché at the Chinese Embassy in the UK, and the Manchester-based Chinese Deputy Consul General, ZHOU Haicheng, also attended the event (the former on the phone) and highlighted the excellent relationship between SKAO and Chinese authorities in the UK. Several pieces were published and aired in Chinese media following this successful initiative, including [this piece on CCTV](#).

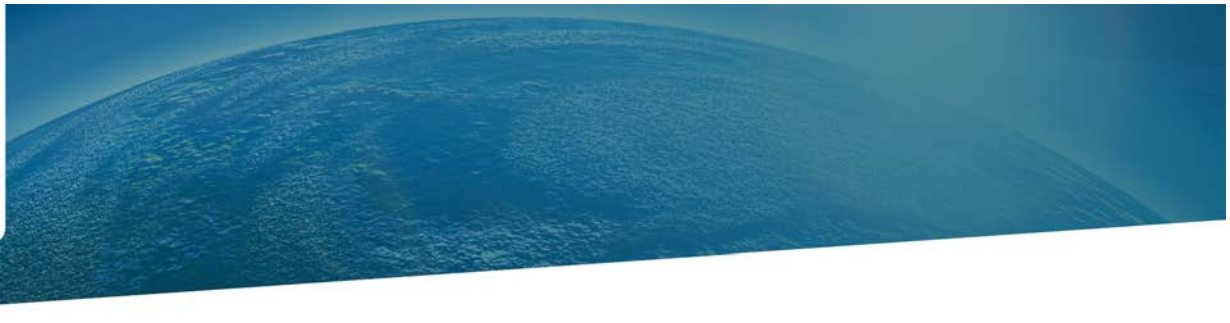


Phil Diamond being interviewed by CCTV during the SKA Chinese Media Day

SKA model

We have teamed up with a young model maker to produce an interactive model of the SKA, featuring both MID and LOW and the data transport. This should hopefully be ready by Christmas and in the meantime, here are some images of the progress so far.





Connect with us

For any enquiries, requests or feedback please write to ska-outreach@skatelescope.org

You can also find the SKA Organisation on [Facebook](#), [Twitter](#), [Google+](#) and [YouTube](#).