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Report on the ESO Workshop

Proposal Submission Tools

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The Atacama Large Millimeter/submillimeter Array (ALMA) Observing Tool is a desktop Java application which has been used very successfully since the beginning of science operations to submit requests for time during the annual Call for Proposals, as well as to prepare observing materials such as Scheduling Blocks. An ALMA upgrade study is currently looking at ways in which the OT might be modernised. As part of this study, a workshop was held at ESO Garching in order to bring together groups working on similar systems at observatories around the world.

As is the case for most astronomical observatories, it is necessary for ALMA to provide a way for astronomers to submit their observing proposals. As mundane and obvious as this may sound, proposal submission tools have evolved into complex systems which can carry out a number of tasks. As well as collecting the essential scientific parameters (pointing position, frequency or wavelength coverage, desired sensitivity, etc.), modern submission systems should be easily operable by astronomers working in any band of the electromagnetic spectrum, and incorporate tools and visualisation capabilities, enabling the performance of technical feasibility checks. They must also be capable of dealing with a large volume of traffic due to increased rates of submission close to the deadline. In addition, the software should interface with other software systems in operation at the observatory. Software developers, on the other hand, require code that is easily maintainable and which is not in danger of becoming deprecated or obsolete.

The solution adopted by ALMA is the Observing Tool (OT), a Java desktop application which was released to the ALMA community in time for Cycle 0 of ALMA operations in 2011 (Bridger et al., 2008). The OT has been a great success and was used to submit over 1800 proposals in the most recent deadline in April 2018 (Cycle 6). However, the OT is beginning to show its age. Its development was begun in 2002, and the original technologies have been overtaken by increasingly rapid developments in the available software. In addition, certain toolsets used by the OT have become deprecated, for example, the toolset used to display the OT's main GUI and Java Web Start; the latter will be removed from Java 11 (due to be released later this year). At the same time, desktop installations such as those used by the OT have generally given way to web-based solutions.

With this in mind, an ALMA upgrade study was launched in September 2017, with the goal of investigating alternatives to the current implementation, which could subsequently form the basis of an upgraded OT. It was quickly realised that a huge amount of expertise is in place across various observatories around the world, each of which tends to develop its own proposal submission system independently. In order to allow the ALMA OT team to benefit from the knowledge and experience embedded at each observatory and, perhaps more importantly, to allow all observatories to benefit, a short workshop was organised at ESO with the aim of bringing together staff working on these systems all over the world.

The workshop brought together representatives from 11 observatories. In alphabetical order, these were ALMA, the Netherlands institute for Radio Astronomy (ASTRON), the Cherenkov Telescope Array (CTA), ESO, Gemini, the Giant Metrewave Radio Telescope (GMRT), Institut de Radioastronomie Millimétrique (IRAM, France), the National Astronomical Observatory Japan (NAOJ), the National Optical Astronomical Observatories (NOAO, USA), National Radio Astronomy Observatory (NRAO, USA), and the Square Kilometre Array (SKA). As well as covering the entire electromagnetic spectrum (radio, millimetre, infrared, optical and high energy), these observatories represent different levels of sophistication in how proposals are collected from their community. Two of them, SKA and CTA, are still deciding what their proposal submission systems will look like when they issue their first Call for Proposals. ASTRON is notable as

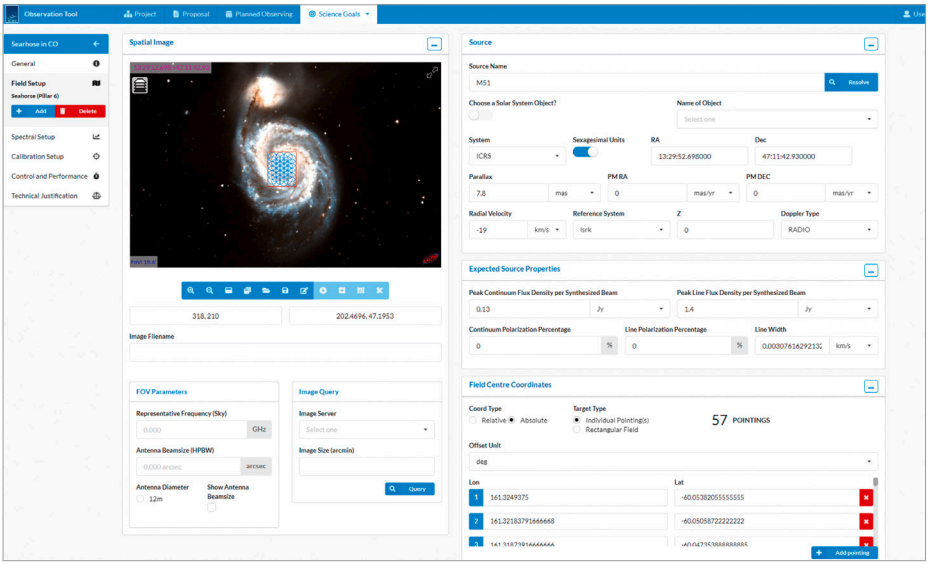

Figure 1. A screenshot from a prototype of the ALMA Observing Tool showing the spatial visual editor.

Figure 2. Workshop photo.

their Northstar system has been used by multiple observatories, both radio and optical, and they are experts in building common-user software.

The first part of the meeting was devoted to short presentations from each observatory giving an overview of their current proposal submission system, including their specific challenges and plans for the future. All talks given at the workshop have been published on Zenodo and are accessible from the workshop web pages[1]. The talks were followed by a demonstration of new tools and functionality by four of the observatories, ALMA (see Figure 1), ESO, Gemini and GMRT. The ESO proposal submission system is currently undergoing a major overhaul, and it was very interesting to see the new system in action. The discussions then began in earnest, covering a large array of topics and including two parallel sessions devoted to technical and policy issues, respectively.

One area that was given special attention during the workshop was that of Authentication, Authorisation and Accounting (AAA). All observatories currently maintain their own user databases and thus each astronomer must create a separate account with their own username and password. Federated Identities, whereby users can log onto multiple internet sites using their user credentials for another, have become familiar to us all through, for example, Facebook and Google, and the question now arises as to whether such an approach could also be used within astronomy. To familiarise the workshop participants with what is a relatively new field, we invited Davide Vaghetti, an expert from Consortium GARR[2] — the Italian national network for universities and research — to give a general talk introducing this area. ESO's Maurizio Chavan gave an introduction from a purely astronomical perspective.

At the conclusion of the meeting, it became clear that all participants were very interested in staying in touch and building on the discussions and the contacts that had been made during these three days. In order to facilitate this, a Slack workspace called "Astro Observatories Collaboration" has been set up to allow observatories to easily communicate with each other. Another decision was made to set up a working group to investigate what progress can be made in the area of AAA/Federated Identities. Given the success of the meeting, there was also agreement that having a similar meeting in a few years would be beneficial.

Demographics

The workshop was relatively small — with too many participants it would have been difficult to efficiently manage the discussion sessions that formed the bulk of the proceedings. Attendance was by invitation only and individual observatories were contacted by the Scientific Organising Committee and asked to nominate the members of staff that they would like to attend.

In total, we had 34 participants from observatories in Australia, Chile, Europe, India, Japan, South Africa and the US (Figure 2). The gender balance was unfortunately poor, with only four female attendees. With hindsight, the SOC should have encouraged observatories to think about gender balance in their invitations to participate. However, given the small numbers of people working on these systems, it is unclear if this would have brought about a more positive gender balance.

Acknowledgements

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References

Bridger, A. et al. 2008, Proc. SPIE, 7019, 0R

Links

[1] Workshop programme: https://www.eso.org/sci/meetings/2018/proposal-tools-workshop/program.html
[2] Consortium GARR: https://www.garr.it/en