SKA SWG Update 19th Apr 2022

Attending co-chairs: Samaya Nissanke, Andrei Mesinger, Marta Spinelli, Phil Edwards, Mark Sargent, Adriano Ingallinera, Divya Oberoi, Eduard Kontar, Fernando Camilo, Patrick Woudt, Valentina Vacca, Tessa Vernstrom, Jason Hessels

SKAO: Robert Braun, Anna Bonaldi (Notes), Philippa Hartley (Notes), Jeff Wagg, Tyler Bourke

Apologies: Aris Karastergiou, Natasha Hurley-Walker, Sebastien Muller, Laurent Lamy, Paolo Serra, George Heald, Barbara Catinella, Francoise Combes

Welcome to new SWG co-chairs

John Ilee for Cradle of life; Tessa Vernstrom for Magnetism. Thanks to Josep Girart and George Heald for their hard work!

Update on SDC3

We are now working on the third science data challenge. This will be a Cosmic Dawn / Epoch of Reionization challenge. Thank you to members of the CD/EoR working group. Two parts to the challenge:
1) A foreground subtraction exercise. The data will be in the form of a cube, and participants will need to remove point and diffuse components. Figure of merits may include the quality of subtraction as well as possibly number counts. Slides 5+6 illustrate the components of the data cube and its construction. The datacube will be approx. 1 TB in size (similar to SDC2).
2) EoR parameter estimation exercise, starting with a power spectrum that contains contaminations. Figure of merit will be based on ionisation fractions of several redshift epochs.
The subtraction exercise will be the first challenge, followed by the EoR signal inference. The two parts of the challenge will be independent; we will regenerate the data. This will give us the chance to propagate some of the errors from foreground subtraction into the inference task. Part 1 will be released in Autumn 2022; part 2 in early 2023. We again plan to deliver some computational resources to challenge teams. Thanks again to the EoR group who are helping us to deliver this very exciting exercise!
Adriano: can we have more information on the Galactic simulation? Can we use it as a by-product of the challenge?
Robert: we are making use of MHD simulation from V. Jelic plus compilation of low-resolution foregrounds from GSM2016
Adriano: it will be interesting to find out the average galactic foreground from this study.

Robert: List of upcoming meetings is shown in this slide. Are there other ones to add?
Patrick: The Timing and imaging of compact sources meeting now moved to June 2023 due to covid-related issues.

Updates from SWG chairs:

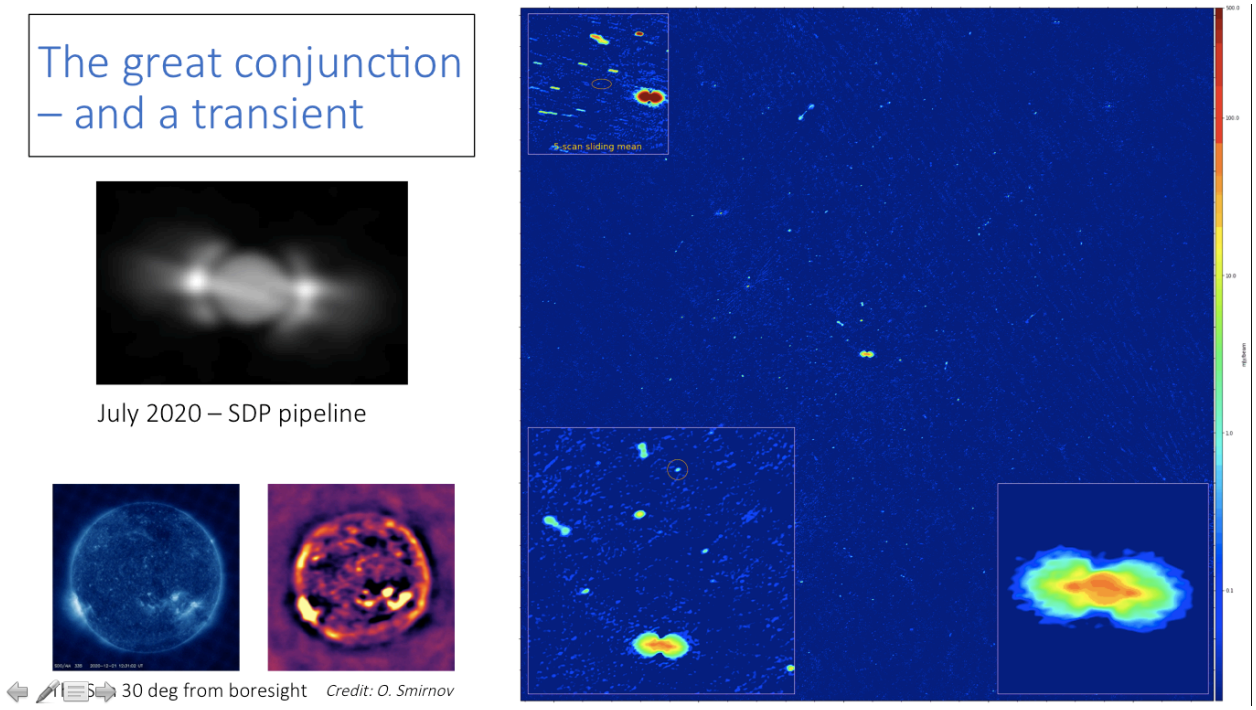
Transients: Patrick: one of our PhD students in Oxford has worked on a Zooniverse transient search algorithm for MeerKAT. So far we looked at the commensal ThunderKAT data and confirmed transients.

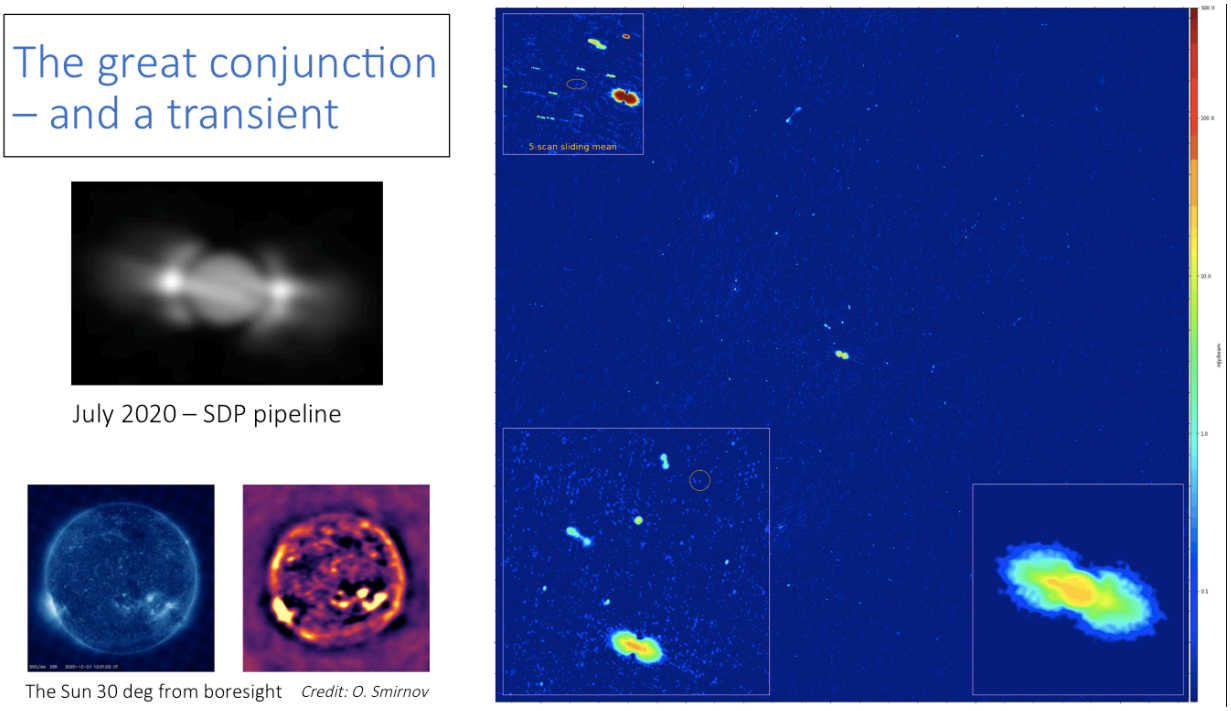
MeerKAT Update: Fernando: Currently open MeerKAT Call for Proposals (deadline May 3): https://skaafrica.atlassian.net/wiki/spaces/ESDKB/pages/1496580202/2022+Call+for+Proposals UHF and L-band receiver available, new modes of the correlator allowing spectral-line mode, a minimum 1500 hours of telescope time. New documentation tools to help with proposal submission.

Divya: We are planning observation of Sun with MeerKAT and would like to offer some support to make this mode of observation available for MeerKAT. Fernando: it needs software changes to add this mode, but we would like to implement solar observing in the next years or so, as well as VLBI and on-the-fly mapping.

Eduard: At the moment it is possible to observe the sun with MeerKAT using only sidelobes.

Fernando: I am showing an image of the sun made with MeerKAT obtained pointing 30 degrees away from it. On the same slide, on the right, there is also a movie of the conjunction of Jupiter and Saturn in July 2020, also including a transient!





Magnetism: Valentina: LOFAR Family Meeting in Cologne on 13-17 June https://www.glowconsortium.de/index.php/en/lofar-family-meeting-2022. Registration open until end of April. Thanks George and welcome Tessa. On April 8 we had a joint HI-Magnetism meeting with 4 talks and good discussion. We are working on promoting some members from associated to core members. Tessa: looking forward to contributing going forward.

Solar: Divya: in India we are putting together a special issue for the Indian effort towards SKA Journal of Astronomy and Astrophysics. We had between 15 and 20 submissions. It is going to be quite comprehensive and substantial special issue. At the moment, most papers are under review.
Eduard: Will there be opportunities for Science Data Challenges of interest to solar people?
Robert: In terms of future challenges we are always open to your suggestions; at the moment we have the SDC3 and the magnetism challenge underway, so in terms of timing it would not be until 2023.

Our Galaxy: Adriano: about 20 members of the working group expressed the will to put in more efforts. we created focus groups on star formation and evolved stars, and we are now collecting some ideas on what the goals could be. We are preparing updated Use Cases for SKA.

Continuum: Mark: we have been updating the Users Stories as part of the SRC architecture design activities. we are now starting organising the HI and continuum joint workshop that we have twice a year.

Cosmology: Marta: we had the annual cosmology SWG meeting in February. Gabriella De Lucia and Natasha Maddox are organising and HI + cosmology meeting soon. Last year we had an internal data challenge for IM in single dish mode, focussing on foreground subtraction. We had very good participation and we are building a new datacube for the next challenge. We will have a hybrid (in person + remote) meeting in Trieste at the end of May to prepare for that.

CD/EoR Andrei: planning SDC3 together with SKAO, also organising a science team meeting for Bologna in October. Some of us are involved on HERA re-analysis of season1 observing data, which currently yields the stronger limits on the EoR signal.

ASKAP update: Phil: we are currently in the process of reviewing of the survey science project after 10 years. We considered whether to add the "split band" observing mode, but the decision was to put that on hold not to delay the other projects. New allocation will start in October. The RACS low-band survey is now available, after the Mid-band.

Samaya: Re-introducing the GW SWG activities after a covid-related absence.