HECTOR SCIENCE MEETING

TUESDAY 9 NOVEMBER 2021, 3.00 – 4.00PM

Zoom – the meeting was recording for minute taking purposes only.

Attendees: Julia Bryant (Chair), Sree Oh, Marie Partridge, Matt Owers, Stefania Barsanti, Jesse van de Sande, Scott Croom, Nabo Mukty, Mina Pak, Joon Hyeop Lee, Jiwon Chung, Hyunjin Jeong, Jong Chul Lee, Angel Lopez-Sanchez, Sam Vaughan, Amelia Fraser-McKelvie, Richard McDermid, Luca Cortese, Brent Groves, Madusha Gunawardhana, Joss Bland-Hawthorn, Chandra Murugesan

Apologies: Matthew Colless

Item	
1	**Welcome and Overview** • Julia welcomed everyone and introduced Madusha Gunawardhana, a new ASTRO 3D postdoc at USyd who will be working on Hector science and will be involved with observations. • Julia also introduced Chandra Murugesan a postdoc at CSIRO in Perth and the deputy project scientist with WALLABY Survey who provided an update (agenda item 3) on WALLABY and how this fits with early ASKAP science and the key people to liaise with for interdisciplinary projects. It is an important time for both surveys which are commencing at a similar time. • The current meeting is designed to start the process of discussing cross project collaboration. • Scott mentioned that Stu Wyithe has requested a list of cross project collaboration meetings for the A3D Retreat, Hector/Wallaby is a good example. However, many Hector team members will be unable to attend the Retreat in person due to Hector commissioning and the main WALLABY team will be in WA. • Julia also thanked Angel who whilst observing on 2df managed to observe some Hector fields from the 2df observation program for this semester. • Hector ships to site next week. The 1st commissioning run is very long at 12 nights. The aim is to align and calibrate the instrument rather than observe galaxies. It will be a lot of work for those at the telescope (Julia, Scott, Madusha, Sam and Jesse). The instrument team will also be on site. **Action Item:** • Please send Scott and Julia any areas for collaborative meetings required at the Retreat.
2	**Action Items from the previous meeting (14 Sept)** **Data Management/QC Coordinator Role** • There have not been many suggestions for people to fill the QC Coordinator role. Julia encourage the group to consider how they might contribute to Hector and increase their presence, there are a number of different roles to fill. **Hector Wiki** • Sam has posted the tile list and files available for each observing run and the first observing proposal on the Hector website. • Matt asked for the link to the Hector Wiki to be circulated again. **Action Item:** • Stefania will ask Data Central to take down the old Hector Wiki as it still appears in online searches and will recirculate the links to the Wiki to the science group.
3	**WALLABY Overview – Chandra Murugesan** • Please refer to the comprehensive slides Chandra presented which are attached with the minutes. **Questions and Discussion** • The 5044 field contains 500 – 600 detections, about 10 – 20% of the detections are resolved at 30 arc seconds resolution. This may go up with the 10 arc second resolution. • Different weighting options bring out different structures. The full survey will be done at one weighting however, the team have asked that the 6km visibilities will be stored elsewhere so that different weighting options can be applied at a later time and researchers can image them. Running 100 sources in parallel would take 20 – 30 minutes. • Most Hector galaxies are 4 – 5 arc seconds, at 10 arc seconds a large fraction of the Hector galaxies would only be marginally resolved, it would be interesting to see the performance. WALLABY only intends to do this for resolved galaxies to get high resolution data and currently hasn't been tested on marginally resolved galaxies, this could potentially be done if a Hector/WALLABY project was developed. The costs associated would need to be considered as it is not possible to go to 10 arc seconds for every detection. 20 - 30 targets per field could be observed at 10 arc seconds. It was noted that there would be quite a lot of galaxies below the resolution at 30 arc seconds, so if the level was pushed down there would be an increase in the resolved fraction, however this is an unknown quantity as the details are based on the constraints of HIPASS catalogues or some sort of scaling relationship.

	• There is an interest in gas dynamics versus localised stellar dynamics, the 30 arc second resolution is outside of Hector. Reducing to 10 arc seconds even for marginally resolved galaxies, may provide a link between the gas dynamics of the ionised gas which Hector sees in great detail through the HI gas direction rotation over the same field which extends to larger scales. That link could be important in the feed and settling of gases into rotations. Even with partial resolution from ASKAP that link could possibly made. In the future galaxies could be selected for that high resolution. • It would be possible for the WALLABY team to take the Hector sample and provide the high-resolution images for all the Hector galaxies if they have the location of the object and the catalogues. As opposed to having to decide which ones in the WALLABY field deserve high resolution imaging. The ability to do this would depend on the resources allocated and the costs associated with the number of sources which are required to be imaged eg computing costs. • It would be interesting to look at the distribution of the kinematics for example a low resolution kinematic major axis of H+, HI and the stars as a function of environment. The simulations don't track the way that the HI disc form so methodical observations even at low resolution to try and catalogue the difference in orientations would be valuable. • A detailed plan of which areas of sky will be observed and when would help to potentially synchronise the high priority areas of both surveys in the early stages at the appropriate times. There may be other priorities for some of the other ASKAP survey teams, however it was agreed that a discussion about priorities was required. • Targeting the Hector fields would be valuable for WALLABY as they have the deeper high quality optical KIDS imaging processed in Perth for WAVES. It is however unlikely that WALLABY will target a large fraction of Hector galaxies before the end of 2022. Researchers could potentially request specific fields to be targeted once the survey starts . • It was noted that although there were differences seen in the moment zero maps especially at different weightings, there were not huge differences between moment 1 maps. At this stage it wasn't possible to comment on whether structural differences would be seen between the moment 1 and 2 maps as the resolution increased. • It was also agreed that a Hector/WALLABY MoU would be required but this should be drafted after the ASKAP review, and the Hector survey starts. • Julia thanked Chandra for his presentation and the initial discussion it had prompted. She summarised that it was time to start constructing project ideas. A longer science meeting should be scheduled in Feb/March 2022 to discuss further ideas. **Action Item:** • Email Chandra with any further questions. • Send project ideas to Luca in order to connect with the appropriate WALLABY team member.
4	**Hector Observing Proposal** • Julia encouraged everyone aligned to the 5 pilot project areas to assist in order to produce early science papers.
	The next Hector Science meeting is scheduled for Wed 8 Dec 2021, 3 - 4pm **Meetings will continue alternately on the 2nd Tue and Wed of each month at 3-4pm AEST (1 – 2pm AWST).**
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