HECTOR SCIENCE MEETING

WEDNESDAY 9 NOVEMBER 2022, 3.00 – 4.00PM

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

Attendees: Julia Bryant (Chair), Sree Oh, Matt Owers, Stefania Barsanti, Scott Croom, Gabriella Quattropani, Mina Pak, Joon Hyeop Lee, Hyunjin Jeong, Jong Chul Lee, Amelia Fraser-McKelvie, Henry Zovaro, Marie Partridge, Sam Vaughan, Jiwon Chung, Madusha Gunawardhana, Kyuseok Oh, Tom Rutherford, Luca Cortese, Oguzhan Cakir, Pablo Corcho Caballero

Apologies:, Matthew Colless, Sarah Sweet, Jesse van de Sande, Angel Lopez-Sanchez

---

Item	
1	**Action Items from the previous meeting (9 August 2022)** Action items below which did not relate to Busy week organisation were covered at the Busy week • Brent will send an email regarding the cubing method files and put the information on the Wiki • Sree will upload the logs to the cloud and advise the group once available. • Contact Sree regarding DR tasks and observing. • Send any updates to the DR procedures to Sree or Madusha. • Julia and Sree to contact Simon O'Toole to discuss the ongoing issues with Data Central access Hector data. • All members to contact Simon directly regarding any issues that arise with accessing the Hector Wiki or cloud.
2	**Observing wrap up for 2022 and plans for 2023** • The observation schedule for 2023 will likely be announced in December, however the first run is likely to be the end of Feb as this is the first dark time. • Once the schedule is released Stefania will contact the group asking for observers.
3	**Update/advertisement for Hector Expert observer position.** • The position will ideally be based at Siding Springs Observatory and would suit a PhD or Masters student who does not want to pursue an academic career, as there is no research component to the role. They will also undertake other observing tasks. The individual needs to have a long-term commitment to the role. • They will lead the majority of Hector observing however, labour rules only allow 70 hours work in 2 weeks, so they would not be able to finish a long run. This would mean that for the same number of nights as secured in 2022 there would be a requirement for an additional 20 trained observers leading 2 x 6 nights each. • Due to the recruitment timelines it is unlikely that this role will be finalised before the February observing run. **Action Items:** • All members to consider potential PhD or masters students for the Hector Expert Observer role
4	**Data Reduction (DR) Update – Sree** • There are a core group of people attending the DR meetings. • The DR group prepared the test data cubes which were tested during busy week and some issues were identified. The names and folder size required for the data cubes was also discussed. If Jesse and/or Brent are able to join one of the DR meetings, the size and format can be decided. • Sree has been working on artificial features in the data cubes and revisiting the tests for the flats. • Madusha is using the secondary flux calibrations, the test cube used the primary stars however now the secondary standard stars need to be used, which are more accurate. • There will be 3 more DR WG meetings this year including 1st and 13th December. • The goal before the end of 2023 is to generate the next version of the data cube without artificial features, with the appropriate name and size, using the secondary star calibration. • People are able to test their own pipelines currently, but are advised to wait one month for the updated version of the test cube before starting any science. **Action Items:** • All members are encouraged to visit the DR webpage, review the tasks, get involved and join the DR meetings.
5	**Updates from ongoing tasks from the Busy week (if there has been progress):** Henry - fibre swaps • Henry has established that some fibres might be swapped and has been running a pipeline to identify which ones. • Plot 1 shows star observations in the hexabundles, where the black points indicate where there is more light and the white, less light. The star was dithered around the hexabundle with the aim to illuminate as many fibres as possible, in order to detect (using his pipeline) the fibres which may have been swapped. The pipeline highlighted bundle J as it revealed more flux in one fibre that you would expect – indicating that it has probably been swapped. There may be others in the parts of the hexabundles which haven't been illuminated yet. • Plot 2 added all observations. Red fibres are those which have been illuminated well at a number of different dither

	star exposures, blue or green fibres have not had much light. Hopefully with the new observations the outer edges of the bigger bundles have been targeted to identify any further potential swaps. • The fibres will also be checked in Dec at the observatory and swapped in the fibre cable if that is the case and then update the fibre table if required. • The analysis also identified bundles T and I exhibited strange linear features, this may have been caused by too much flux in adjacent fibres on the slitlet. Could this be a fibre mapping issue? Sree will look into this. • Some frames were taken in the last run from the outskirts of bundles A and B so more data may be available (in the log under standard stars) During the observing run standard stars will be put in one hexabundle at a time so that data is available and the bundle is identified with the comments column. Some images do have multiple stars. -Oguzhan – allocations • For field H01 there are still some missed allocations. It is quite low mass, one galaxy was 10^8 allocated to larger hexabundle A. Properties of its RE are quite large. Most cases are edge on and faint galaxies so the properties could be overestimated by Profound. Julia confirmed that there were issues with H01 has properties where the stellar mass was not matching the reds shift. • Julia suggested focusing on the fields that were completed in the last run. There were only 2 due to the poor weather. One was done multiple times and another with 7 point dithers the aim was to get a faint dwarf field completed. These observations have the correct values for the galaxies in order to run through the allocation process. Also the cluster fields should be correct. Once more data is available further analysis can be done on optimising the allocations. -Henry - running cubes through LZIFU • This was tested duringthe busy week with no problems -Jesse - cubes and stellar kinematics pipeline • Work on the stellar kinematic pipeline will be continued Jan-2023. -Tania – tramlines – no update -Other busy week tasks • Tom completed tasks during busy week checking that all the cubes were centred on the correct galaxy. One may be centred on the incorrect source, there is a list on the document. • Pablo confirmed that the arc line fits were checked for the best combination. The quality wavelength solution need to be refined to a finer level of detail. Sree will share the file which contains the lower level reduction. • Stefania is working on masks for CCDs. She took more of the focus flats during the last observing run for CCD4. In the reduction it was noticed that the masks from SAMI were used. Madusha re reduced them and they now need to be reproduced. **Action Items:** • Henry to send Sree a list of the bundles which showed anomalies (T&I)
6	. **Discussion of Action items from Busy week** (not done yet but some to be allocated to Hector members, and some for the FYI of those not at the Busy week): 1. Sam to put g and r magnitudes into the catalogues. o As people have been working on the catalogues, they have raised some issues. 2. Test impact of what the colour cuts we use on the clusters have on the groups - is it necessary to apply blue/red sequence cuts to the WAVES groups? o This should be allocated to someone other than Sam. o The colour cuts have yet to be applied to Hector clusters. To what extent should they be applied to the groups within the WAVES fields and what does this do for the sample selection? o There are larger mass halos in the WAVES regions that were in the SAMI GAMA regions. Scott advised caution with this approach as it was done with SAMI because the clusters are special regions and a large fraction of the galaxies are red and passive. With SAMI blue cloud galaxies were also a higher priority. o If this is done for the WAVES region it may be an option to also look at doing similar things that have been done in MANGA . If colour bias selection is done it needs to be implemented very carefully. I may need to be based on the number of red galaxies. 3. Set tiling priorities for clusters with Blue cloud top priority (at any radius) then next highest priority 1-2R200 all galaxies (irrespective of colour), then the rest. o This is similar to SAMI but it was more graduated for the clusters than in the tiling priorities for the field galaxies. o The priority selection could easily be changed prior to tiling the next clusters. 4. Set Hector tiling priorities higher in the overlap regions with WALLABY for things that will be more likely to be HI rich. o Luca confirmed that he can provide the information needed, Please advise who he should contact and what type of WALLABY information is required. o Hector/SAMI and WALLABY maybe a useful cross project collaboration topic to discuss at the A3D Retreat, however non A3D people also need to be included in the discussions. 5. Test setting tiling priorities for MW analogues and edge on wind galaxies below that of the above vs just selecting tiles from the above key cases that happen to have these extra galaxies in them. o The selection could be forced, but would require a simulation to establish the best approach. There could be an emphasis on tiles that have Milky Way analogues and edge on galaxies. Tiles may need to be hand picked if the poor weather continues. o Sam volunteered to take on this task. 6. Change galaxy naming in Hector catalogues to the new scheme: Need WAVES ID format => Character to make it a string S=star, W=WAVES region, C=CLUSTER o Naming in the catalogue needs to be consistent. If the cluster numbers used are the same as the cluster tile

name and cluster number, this will make the names longer than the WAVES numbers. GAMA IDs are available for the GAMA galaxies and these could get written into the fits headers. This may add some complexity as another column would need to be added to the tile file for cross referencing, alternatively an extra DR step could be included.

7. Cubes need to be rotated to correct compass direction
    - Sree and Madusha will discuss this, but it is a lower priority. Sree will add it to the DR task list.
    - More information is required to rotate the cubes. Mapping on to spaxels is the best time to implement the rotation. This should be in the WCS rotation data, however it may not be correct.
8. Implement the expanded RA regions in the H01 and H03 WAVES regions - set boundaries on the new regions that match the size/area but include 2R200 on complete groups as best as possible. - as per Matt's plots from the Busy week.
    - When the H01 and H03 fields are extended to stop the situation where the air mass curves could not be observed in one night and were offset.
    - The selection boundaries may need to be modified. The aim was to get more complete groups. Red shifts will be required so these will need to be observed early in 2023.
    - Once Sam received the boundaries agreed at the busy week a discussion can be had about the practicality of the changes. There were only a few options for changing the H01 and H03 region boundaries.
9. Tile clusters and WAVES regions and see how efficient it would be to be done with Taipan (Tayyaba).
    - Configuring the regions that have yet to be observed, in Taipan rather than using 2dfdr. It was agreed that this would take longer to run in Taipan than 2dfdr, but could it be done practically with Taipan freeing up AT nights to use on Hector as they would not be used for red shifts.

Action Items:

- Julia will email Luca regarding Hector tiling priorities higher in the overlap regions with WALLABY for things that will be more likely to be HI rich.
- Scott will flag a cross collaboration discussion opportunity for Hector/SAMI and WALLABY at the A3D Retreat with Stu.
- Sree and Madusha will discuss cube rotation.
- Julia and Matt will discuss modifying the selection boundaries for the expanded RA regions in the H01 and H03 WAVES regions.
- Matt to share the sample plots he produced for Busy week with Sam.
- Julia will email Tayyaba to discuss freeing up a fewer night to focus on observations and not red shifts.

The next Hector Science meeting is scheduled for Tuesday 13 December 2022, 3 - 4pm AEST

Meetings will continue alternately on the 2nd Tue and Wed of each month at 3 - 4pm AEST (1 – 2pm AWST).