HECTOR SCIENCE MEETING

TUESDAY 8 AUGUST 2023, 3.00 – 4.00PM

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

Attendees: Julia Bryant (Chair), Marie Partridge, Madusha Gunawardhana, Oguzhan Cakir, Mina Pak, Joon Hyeop Lee, Pablo Corcho Caballero, Kyuseok Oh, Susie Tunitpong, Jong Chul Lee, Hyunjin Jeong, Angel Lopez-Sanchez, Scott Croom, Gabriella Quattropani, Jesse van de Sande, Sam Vaughan, Amelia Fraser-McKelvie, Stafania Barsanti, Sarah Sweet.

Apologies:, Matt Owers, Sree Oh, Brent Groves, Henry Zovaro

Item	
1	**Action Items from the previous meeting (12 July 2023)** **Hector Observing** • Julia emailed the group requesting that those who need to complete their training sign up for Semester 2023B observing, she encouraged those on the call to encourage others to sign up. • The schedule for Semester 2 is available and observing starts again tomorrow (Wed 9 Aug). **Data Central Requirements** • Sam sent a list to Simon O'Toole, Data Central regarding hosting data requirements. • Simon has drafted a funding proposal to provide software tools including a Hector targeting app, morphology classification tool and an observing log to replace the Google sheet, ideally run at the telescope and Data Central concurrently, however this may take some time as the Hector pipeline needs to be finalised. Having all observing information online so that everyone can track the progress of the survey and also showing catalogue data (reduced automatically) that has been QC approved (rather than manually flagged) would be ideal. • A working prototype of the observing log is available for testing and feedback from Hector and other survey teams. • Please respond to Sam's email asking for people to check galaxies for contaminants. The link to the app is: https://hts.datacentral.org.au/hector. **Testing Wavelength Calibration in the Blue** • Sree, Scott and Pablo discussed this at length during the DR meeting. **Emission Lines Product Code** • Henry confirmed version 1.0 of Spaxelsleuth will be released in a few weeks, he is still looking for volunteers to test.
2	**Team News (Julia)** • The red camera is operational again and both cameras are now observing. • One hexabundle is down as the prism has come unglued. Julia is fast tracking the prism jig in order to rectify this by the end of 2023, however it is a significant (budgeted) cost. • The next Busy Week has been discussed by the Exec Committee for either w/c 20 Nov or w/c 5 or 12 Feb. This allows attendees to focus on the data. **Action Items:** • Julia will email the group about preferred dates for the next Busy week (done).
3	**Morphology Classification Scheme (Mina)** • Mina acknowledged Sam and Amelia's assistance and plans to complete the classification by the end of August and the platform will be built by Data Central or Galaxy Zoo in Sept/Oct. The first classifying sequence will be done between Oct and Dec, the results checked and the 2nd round in early 2024. • The whole sequence will be completed by the end April 2024 with 7073 galaxies between $2R_{200}$. If each galaxy can be classified 5 times by the Science WG members (approx. 30 people) then each person classifies 1300 galaxies. Mina referred to the following slides HECTOR_cluster_morphology.pdf, ***Please note that following discussion during and after the meeting she has updated the slide set and circulated an update via email the updated slides can be found here: One drive: HECTOR_cluster_morphology.pdf* *Google drive: https://drive.google.com/file/d/1Evcp7ycbPT5Amzlna39Jb4stnqWhmqWX/view?usp=sharing *** Discussion points on the slides presented: • The SAMI Classification of 1.5 and 2.5 was a statistical reflection as there was a divide in how some galaxies were classified by individual people and the overall result was an average. This may be mitigated by more examples of galaxies that fall into each category especially for blended or less obvious classification. • Rather than early or late parameters, could other classification be used eg B/T ratio? • Ring galaxies are hard to classify, there was debate as to whether they should be classified in the "other" category or that they have their own category. Many fall into 2 categories. It was agreed to initially classify the galaxy and then decide if was a ring galaxy. • There may be an issue with classifying passive spiral galaxies by morphology as colour is also an important factor.

	• It was recommended to look solely at the image morphology eg Spiral, ring, bar, shell etc to describe the galaxy rather than trying to interpret by structural/science parameters. A grey scale image may assist with classification. • Allowing people to leave a comment regarding the classification may be useful, as was done with SAMI. • The output will be a 6 or 7 digit number for each galaxy classified. It is useful to have as many standard categories as possible to assist with automation. • Merging galaxies could be classified initially as major merging categories and then at the end after classifying the early type/late type add another row to capture the less significant mergers with a merger/non merger option. • The work flows of other galaxy surveys could be referred to for further information eg Galaxy Zoo which uses a workflow which then takes you down a decision tree to move to more detailed questions. Too much complexity may deter people from doing classifications. Could Galaxy Zoo (Northern equatorial strip) be used to cross check the classifications? • It was raised whether machine learning had been considered for this task. Potentially the first 3 questions the algorithms would be good enough. It was noted that machine learning may only be approximately 80% accurate. ADACS or Data Central may have the expertise to comment on this. Kenji Bekki and Brent Grove's student Mitchell completed his thesis on machine learning (but may have left astronomy) distinguishing at least bars and ring structures, so they may have information that could be shared. https://ui.adsabs.harvard.edu/abs/2021MNRAS.506..659C/abstract **Action Items:** • Mina will contact ADACS and also approach Kenji Bekki to discuss if AI may be of assistance for the classification process.
4	**DR Meeting Update (Madusha)** • Julia encouraged people to join the DR meetings. • Sree has been doing a lot of data reduction and making cubes using the observing data from Aug/Sept/Oct 2022 and April/June/July 2023. • If there is no ccd4 data available (June and first half of July 2023) it is not currently being reduced. • If data is required for runs prior to Aug 2022 it can be made available on request with only the primary flux calibration, although the cubes can be made, the quality of the data can't be guaranteed. .
5	**QC Summary (Madusha)** • The QC summary can be run in the manager and then check the quality of the data. • The estimated FWHM is smaller than the value from the guider (which isn't accurate). The reconstructed integrated guider image will be available soon this will assist with the FWHM. • The pipeline doesn't calculate the transmission values, leaving it to be zero for the cluster tiles, as the g-band magnitudes missing from the secondary standard stars. • The transmission estimations need to be examined. **Action Items:** • Email Sree and Madusha if you would like to volunteer for the task to examine the transmission estimations.
6	**Any updates from others from their busy week tasks.** • Susie has written the code to resize the Hector cubes which is now available in the pipeline. She has also checked the header keywords. • Sam and Mina are taking over improving the arc solution from Pablo as previously noted. • Sarah has started checking the telluric accuracy. • The next DR meeting is on 29 August. • The next data release will unofficially be in about 4 weeks time. Will include some CVD corrections.
7	**Other Business** • There was no other business.
	The next Hector Science meeting is scheduled for Wed 13 Sept 2023, 3 - 4pm AEST **Meetings will continue alternately on the 2nd Tue and Wed of each month at 3 - 4pm AEST (1 – 2pm AWST).**