HECTOR SCIENCE MEETING

WEDNESDAY 11 MAY 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, Jesse van de Sande, Scott Croom, Mina Pak, Joon Hyeop Lee, Jiwon Chung, Hyunjin Jeong, Jong Chul Lee, Amelia Fraser-McKelvie, Richard McDermid, Madusha Gunawardhana, Di Wang, Emily Wisnioski, Gabriella Quattropani, Marie Partridge, Brent Groves, Tom Rutherford, Yifan Mai.

Apologies: Celine Boehm, Matthew Colless, Sarah Sweet, Sam Vaughan, Luca Cortese

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Item	
1	**Action Items from the previous meeting (12 April 2022)** **New Cubing Methods** • New cubing methods will be discussed as an agenda item below. **Observer Numbers** • Observers are locked in for the next 3 observing runs, however more observers are still required. Only 10 people have responded to the call for observers. Of those people present at the meeting 10 plan to observe for 5 nights during the next Semester. • Team members, please contact the relevant Science Working Group (SWG) lead to discuss contributions outside of observing, more people are still required to sign up to tasks and contribute to the survey. **First Data and 5 Initial Science Cases** • The additional ancillary work which will be required to streamline the process of getting early papers finalised will be discussed as an agenda item below.
2	**Data Reduction (DR) Meetings - Sree** • Sree and Madusha have been very organised in compiling tasks. • Many DR tasks do not need any previous experience, Julia encouraged junior researchers particularly to volunteer for tasks as this would gain them credit and also enable them to familiarise themselves with the data. • Many of the task have people signed up to them, however new tasks are continually being added. • A recent task is: Assessing tramline position accuracy by comparing the number and position of each tramline produced by the 3 different types of flats (dome, flap and twilight). • The next DR meeting is tomorrow (12 May) everyone was encouraged to attend.

3	**Cubing Methods – Brent (please refer to the attached file for the images)**
	• Brent has been exploring 3 different methods to reduce the data into cubes (the drizzle method, used with SAMI data, Gaussian process and the Covariance Regularised Reconstruction (CCR) method).
	• Several cubes have been reduced using the different method and then been run through lazy ID.
	• Slide 1 – each row shows one of the different processes. The Left column shows Hα the Right column the correction factor.
	  ○ 1st row - The drizzle method has a cleansing effect especially on emission lines Hα and Hβ at the end of the spectra.
	  ○ 2nd row - Gaussian process, Hα map appears smoother, some features are lost but there is no speckled pattern and Hα and Hβ say the same thing.
	  ○ 3rd row – CCR Process produces results between the other 2 methods
	• Brent confirmed that that the DAR correction was applied to each frame in the cubing process. The issue is caused by the fibre sampling and the shift in point spread function (PSF) between each frame due to different DARs and the dithering (see Appendix A in SAMI DR2 paper, Green (2018).
	• Smoothing loses spatial information. Hα and Hβ in principle should measure the same thing. There is a need to determine the best way to correct as Hβ doesn't appear exactly the same as Hα due to the reduction process.
	• Emission lines have more point source emissions.
	• The Gaussian process over smooths the data. The impact on stellar populations shouldn't be an issue.
	• Brent will try and find unresolved point like regions and stars and determine the resulting PSF for each cubing process.
	• Sree noted that the Gaussian cubing process has a very long run time and that getting volunteers to test the cubes will then decide the best process.
	• The impact on PSFs will be discussed at the next meeting including how much resolution is acceptable to lose to get more cohesion across the wavelengths.
	
	Action Items:
	• Brent will move the cubing details on to the build site and email Hector members regarding how to locate the information.

4	**The 4 Initial Observing Proposal Objectives** Plans to engage in the 4 initial objectives from the observing proposals: 1. *Stellar dynamics of low-mass dwarfs - testing outliers from scaling relations.* 2. *Inflows and outflows at higher Re - radial decline and ionization structure of outflows in larger bundles with edge-on galaxies.* 3. *Fate of ram-pressure affected cluster galaxies - are they completely quenched at first pass or maintain some star formation. Focus on galaxies at 1-2R_{200}.* 4. *Kinematic properties of Milky-Way Analogues* • Julia asked people to sign up via the Hector Wiki to propose a paper or sign up to paper aligned with the 4 objectives above. • Paper proposals will be reviewed by the Science Committee which will be led by Scott, but needs to be formed. There will be a focus on conflict of interest. • The May data is available, and the June and July runs will provide more science data. • Objective 2 also focuses on metallicity and Objective 3 aims to focus on the clusters already observed by SAMI, however due to the observation date schedule there will also be non-SAMI clusters observed. • At present when projects are submitted via the form on the wiki they are not automatically posted, Stefania reviews them and then posts them manually. The project page is currently not set up to allow people to add their names to it if they are interested in that area of research. • It was recommended that if an individual plans to propose a project that is similar to one already submitted, they should talk to the project lead so that the initial proposal can either be revised or a joint proposal submitted if the science changes substantially. • Those working in similar areas are encouraged to discuss potential proposal with one another before submitting a project. • The goal is to gather strong science proposals to use the initial data for science papers aimed for release in mid-2023. This will then lead to feedback to improve the data in the future. • The approximate number of galaxies that will be available is conservatively, 180 in July and 1000 by the end of 2022 (subject to weather conditions). • Should there be more interest in one of the initial 4 science goals compared to another the tiling can be targeted to reflect that. • When submitting a proposal abstract, please indicate if there is additional data required for the project. • Sam would be able to provide information as to what regions will be observed in the next observing runs as he is organising the tiling. • It was noted that for new PhD students releasing a paper in a short period of time may be an issue. • It was suggested that the SWG leads should refer to the original proposal which outlines which observations will be coming up in the next Semester and then engage with other based on that information. • The WG leads could present the case they will work on at the Busy Week in September. • The September Busy Week date can be finalised once the next Semester's observing schedule is published. • It was proposed that the Busy Week should be a joint SAMI/Hector event. **Action Items:** • Email Stefania with any questions regarding the Wiki • Stefania will review the project page of the wiki to potentially include comments or allow people to add their names to projects. • Julia will email the entire group to encourage people to sign up through the Wiki. • The SWG leads to email their teams about areas of interest. It was noted that there is a conference scheduled for the 1st week of September and that mid semester break is 26 – 30 Sept but coincides with the new moon. • Scott and Julia will discuss the Busy Week program. • Volunteers to assist with the organisation of the Busy Week should contact Julia. • SWG leads to contact Stefania to set up a page for their group on the Wiki.
5	**Other Business** • There were no other items of business raised.
	The next Hector Science meeting is scheduled for Tue 14 June 2022, 3 - 4pm AEDT **Meetings will continue alternately on the 2nd Tue and Wed of each month at 3 - 4pm AEST (12 – 1pm AWST).**