LSST:UK Newsletter 2 (July 2020)

Introduction

Covid-19 continues to have its impact on Rubin Observatory preparations, as it does on all aspects of our lives. At this time of year, the Rubin community would be starting to focus on the annual Project and Community Workshop, but, as explained in this newsletter, that is taking place online this year, so you can participate from the comfort of your own home, rather than in sweltering Arizona. The Covid-induced "*rebase lining*" of the final stages of Rubin construction and of the pre-operations preparations continues, and @ Graham Smith , the LSST:UK Commissioning Coordinator explains in a newsletter item, and linked briefing paper, the current state of play and forewarns us that a call for expressions of interest from UK researchers to participate in Commissioning will be issued during August. In a pair of newsletter items, @ Stephen Smartt explains how scientific guidance is injected into LSST planning - at the Observatory level, though the Science Advisory Committee, and at UK level, through the LSST:UK Science Working Group - and summarises some of the issues currently being discussed by the two groups. Our featured recent output from the STFC-funded LSST:UK Science Centre (LUSC) programme is a report by @ James Perry on running the current pipeline stack, while our final newsletter item congratulates @ Alastair Edge , who no sooner stood down from the LSST:UK Executive Group than decided to stand as LSST:UK Consortium Board Deputy Chair, a position to which he has since been elected unopposed.

@ Bob Mann

UK participation in Rubin Observatory Commissioning

The commissioning plan is in the process of being redrawn, as the worst effects of covid-19 are hopefully passing, and the in-kind contribution negotiations are reaching an advanced stage. The UK is well placed to make valuable contributions to commissioning, and has funding in place to support extended visits to Rubin locations in the UK and Chile. It is also clear that the Rubin Project Team are keen for international partners to contribute to some aspects of commissioning, and will be ready to start defining these contributions in the coming months. We therefore plan to publish a call for expressions of interest from people wishing to be considered for a role in Rubin commissioning; this will be emailed to the *lusc-announce* email list during August. Further details on commissioning are available in this briefing paper. Colleagues interested in commissioning and early science are also encouraged to join the relevant sessions (8-9pm UK time August 11 and 12) at the upcoming online Project and Community Workshop.Please email any questions about commissioning to Graham Smith at gps@star.sr.bham.ac.uk.

@ Graham Smith

Rubin Observatory Science Advisory Committee

The Science Advisory Committee provides advice to the Rubin Observatory project on policy and technical matters. It is compromised of community scientists who are broadly representative of the major science topics that LSST will address. The members do not represent Science Collaborations, nor are they appointed or nominated by the collaborations and the committee is meant to provide independent advice and thoughts to the project, while being knowledgeable about LSST data science. Meg Schwamb and Stephen Smartt sit on the SAC. Some important recent business for the SAC has been

- Submission and review of the cadence white papers which advocated different Survey Strategies, and advised the LSST Simulations teams on which survey simulations and strategies to run. You can follow the releases here on LSST Community. A Survey Cadence Optimisation Committee has been formed by the SAC. This important committee will review the new sets of simulations, the metrics and make recommendations through the SAC to the Project for final decisions on the survey cadence. The Charge to the S-C-O-C committee and the membership can be found here.
- The LSST Data Policy - this important document was developed by Bob Blum, with advice and input from the SAC. It is essential reading to describe how data rights holders will work with LSST data and we recommend all UK scientists interested in using LSST data to read it. It is linked on the Rubin Observatory's Key Project Document Page.

- The SAC has also advised on Rubin Observatory - Euclid discussions, informing the selection of the Rubin Observatory's working group to lead on high level discussions on what Derived Data Products would be produced and shared amongst the two projects.
- The SAC is working on the "Science Collaboration Federation Charter" which will provide a more formal remit and framework for the science collaborations. An important point, for all LSST scientists, (related to the Charter and the Data Policy) is that Science Collaborations do not hold any proprietary right over any science from LSST. Data will be available to all and while membership of SCs is advisable, it is not mandatory. Each SC will develop its own policies regarding use of software and derived data products as might be expected in any type of astronomical data collaboration.
- Finally, two important other areas that the SAC will have input on this year are the Operations and Survey Strategy in Year 1 (and commissioning) and evaluation of the Community Event Broker proposals in 2021.

@ Stephen Smartt

LSST:UK Science Working Group

The LSST:UK Executive committee have reconstituted the Science Working Group, with a term of office defined as the duration of the Phase B work. The inital SWG was a large body which was charged with raising the awareness of LSST survey data within the UK community an across other projects with major UK interest. We felt that it had achieved its goal, with the UK's involvement in LSST now widely known and we have become embedded in the LSST Science Collaborations, holding four leadership roles within the LSST Science Collaborations now. The SWG is made up of "Points of Contact" which are related to the Science Collaborations and other UK projects which will jointly exploit LSST data. The roles of the POCs are to actively help review the Phase B work being carried out and commenting if the science requirements are being met or now. They will also provide a link and insight into the ongoing processes within the collaborations. Some have already contributed to early Phase B work reviews and we thank them for their efforts - Revised list of POCs for Phase B (2019 - 2023) We encourage contact with these scientists if you are just starting out in LSST related work.

@ Stephen Smartt

Running the LSST pipeline stack

Over the past few months I have been working to get the LSST software pipeline up and running for processing the images generated by DESC's Data Challenge 2 on UK compute resources. I installed the software on the CSD3 system at Cambridge via the newinstall.sh script and initialised a data repository using calibration data supplied by DESC. I then worked through each stage of the processing pipeline, documenting the process thoroughly in D3.10.5 - Processing DC2 data using the LSST DM Stack on UK Facilities. I was assisted greatly in this by earlier work done by James Mullaney and Darren White.

For ease of installation and use, it is highly desirable to make use of container and workflow technologies. Using container images greatly simplifies the installation of the software and ensures that the correct version of each component is present, while workflow management tools can automate the process of invoking each stage of the pipeline at the right time and on the right data, something which can otherwise be an arduous process when working with large data sets.

A workflow for this purpose is currently under development by Ben Clifford, using the Python-based Parsl workflow management system. This takes care of automatically submitting tasks to a batch system whenever their inputs become available, the software running within a container. Initially this workflow had only been tested on US systems, using Shifter to run container images built by DESC, but I have been working with Ben over the past few weeks to get it running at Cambridge. This necessitated switching to Singularity to run the containers.

The main problem encountered was an MPI error which occurs in many of the pipeline stages on the Cambridge system, believed to be due to an incompatibility between the version of MPI within the container images and the version installed on CSD3. However, the MPI functionality within the LSST stack is not actually required here, since the intention is for all of the parallelism to be handled at a high level by Parsl rather than within the individual jobs. I was able to get the workflow running successfully by replacing the "process pool" module used in the stack with a "fake" version that runs everything serially instead. A better solution, however, is to avoid using the high level "driver scripts" within the stack and instead directly call lower level components that do not use MPI, since this gives a finer granularity of task for Parsl to work with, and this is currently being implemented by Ben Clifford.

@ James Perry

2020 Rubin Observatory Project and Community Workshop

The Covid-19 pandemic has necessitated some changes to arrangements for the up-coming Rubin Observatory Project and Community Workshop. This year's even, which will run during 10th–14th August, will now be run entirely online and this means it is potentially easier for UK-based astronomers to participate in some or all of the sessions.

The Workshop website is now online and includes both the programme for the event and registration instructions. Each day, the programme runs during 5pm--9pm BST. While outside of the usual working day, the timing potentially gives people the option to attend those presentations/ discussions that are particularly interesting to them.

@ George Beckett

Recent Appointments

We are pleased to announce that Alastair Edge (Durham) has been appointed to the position of Deputy Chair for the LSST:UK Board. Alastair commented “I am looking forward to putting my experience on the Executive Committee to good use”.

Full details of Board Membership and other project appointments is always available on the LSST:UK public website.

The 2020 mid-year call for LSST:UK Junior Associates was open during 23rd June–6th July. Applications are currently being assessed by the LSST:UK Selection Committee and we hope to confirm the outcome to applicants before the end of July.

@ George Beckett

Recent LSST:UK outputs

LSST:UK has recently produced the following technical reports.

Title	Author	Description
D3.10.5 Processing DC2 data using the LSST DM Stack on UK Facilities	James Perry	This document describes how to process the images generated by DESC's Data Challenge 2 using the LSST software pipeline. Instructions for installing the software, setting up a data repository and running each stage of the pipeline are provided. Possibilities for using container and workflow technologies to improve the process are also discussed.

@ Terry Sloan
