LSST:UK Newsletter 26 (September 2022)

Introduction

A major construction milestone was reached at the end of August, with the successful installation of ComCam, the commissioning camera, in the Telescope Mount Assembly (TMA) in the dome (see right). The Rubin team have also released a video of the installation process, which had been practiced many times over the past few months, using a camera mass surrogate in place of ComCam itself. ComCam will now be subjected to a battery of tests to check that its behaviour in the TMA matches that recorded in the lab prior to this installation.

Credit: Rubin Obs/NSF/AURA

Following a discussion at the Project and Community Workshop in August, Rubin have released a revised statement on the impact of satellite constellations on LSST science, which makes for very sobering reading. The good news is that SpaceX continue to engage constructively with the astronomical community to try and mitigate the impact of their own satellites, but it remains to be seen how successful these strategies will be, particularly as regards residual systematics in images after streak removal. The bad news is that further companies are proposing additional constellations with little consideration of their impact on astronomy, and it seems inevitable that a large population of satellites in low-earth orbit will yield a large number of spurious alerts (from “glints” as they rotate) and severely hinder the detectability of asteroids, given their prominence in the twilight sky.

On a happier note, congratulations to Stephen Smartt on his appointment as the second holder of the Philip Wetton Chair of Astrophysics at Oxford. Stephen will be starting in Oxford in early October, but his LSST:UK roles will continue as they are.

As mentioned in the August Newsletter, an updated Rubin schedule was presented during the Project and Community Workshop. That has been followed by release of an updated version of the *Release Scenarios for Rubin LSST Commissioning and Survey Data* document (RDO-011) which sets out a timeline for the LSST data releases. This revision of RDO-011 is working with an assumed survey start date of 1 October 2024, meaning that Data Release 1, based on the first six months of observations, would be due to be released in November 2025. Commissioning data will be available (from ComCam) in Data Preview 1 (due Mar-Jul 2024) by that schedule and (from LSSTCam) in DP2 (Jan-Mar 2025), but those planning grant applications or PhD projects should not count on the availability of data release products before November 2025.

We will opening another PI/JA selection round later in the autumn. Details of that will be announced in due course, but please note that several of the Science Collaborations allow some sort of temporary membership to those not yet holding, but expecting to obtain, data rights. These arrangements vary between the different Science Collaborations, so anyone seeking SC membership before the results of the forthcoming PI/JA round have been implemented by the Rubin Observatory should look into what the particular SC of interest offers. Links to all the SC websites can be found here.

Those with ideas for future newsletter items should contact the LSST:UK Project Managers (@ George Beckett and @ Terry Sloan lusc_pm @mlist.is.ed.ac.uk), while everyone is encouraged to subscribe to the Rubin Observatory Digest for more general news from the US observatory team.

@ Bob Mann

News from Rubin commissioning

The LSST:UK contingent in Rubin’s System Integration Test and Commissioning (SITCom) team have been assigned to their relevant topical teams (e.g. wave front sensing sub-system, astrometry, difference image analysis). These teams are in the process of being stood up. We receive regular updates on progress from the construction project via monthly “SITCom General Assembly” zoom calls. Recent updates of note include that the construction project passed a major milestone this summer, when ComCam was successfully mounted on the Telescope

Mount Assembly (TMA). The next major activity is start commissioning the TMA on-sky, using small telescopes co-aligned with the optical axis of the main telescope. The current official view on future milestones is publicly available here: https://dmtn-232.lsst.io, one headline from which is that the Operations Readiness Review is currently slated for mid July 2024. The next major review of the timeline is planned to take place in November.

@ **Graham Smith**

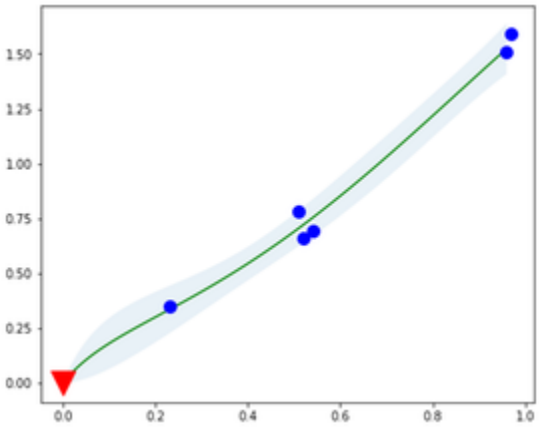
News from the SAC

A reminder that all minutes from the Rubin Observatory Scientific Advisory Committee (SAC) are available publicly on https://project.lsst.org/groups/sac/meetings . The last meeting was at the Project and Community Workshop on 7th August 2022 and the minutes are available. The major recommendations from the SAC :

- For the Project to implement improved structure and content links for the community webpages, including a functioning search capability
- More clarity on the decision making process for Survey Cadence Optimisation Committee (SCOC) and a clear set of tasks and goals for 2023
- The Project should explore ways to generate alerts during early science operations, even if the templates are not perfect.
- DPO has been successful in allowing users to gain experience of the Rubin Science Platform. But a method of releasing simulated solar system data products should be considered for inclusion in DP0
- The project is considering how to implement pre-defined alert filters such that users can get a small number fraction of the alerts directly from the alert stream (as opposed to the full stream which is restricted to community brokers). A possibility is to partner with ANTARES to do this, and the SAC requested a more complete description of how this would work.
- There was some discussion on the international contributions and community contributions to commissioning, and more details are available in the link above.

@ Stephen Smartt

Lasair Meeting on Tiny Lightcurves



The Lasair broker relies on 'features' for lightcurves so that astronomers can build filters separating what is wanted from what is not. The LSST project will provide a large number of such features, mainly focused on periodic and stochastic variability. However, there is not much in the LSST alert packet concerning new sources, the possible explosive transients like supernovae, kilonovae, tidal disruption events, GRB afterglows etc. In this case, there may or may not be a galaxy association, and the distance of that galaxy may or may not be known. The LSST observations will utilise six light filters, *ugrizy*, and there may be just a handful of flux measurements spread over these. We call these 'tiny lightcurves'.

One objective for a community broker is to add values to the LSST alert stream, and the Lasair project has decided to add value by building useful features from tiny lightcurves. Therefore there was a brainstorming workshop Sept 12-13 at Edinburgh. Several algorithms were considered: fitting a straight line in magnitude -- i.e. power law in flux -- or fitting other simple curves, or the Bazin 5-parameter model. We also considered the non-parametric Gaussian Process to fit the lightcurve. In addition to working with detections of the new transient, we will take account of previous non-detection (upper limit measurements) to refine our understanding of the new transient.

We also asked how to make a *useful* feature; for example the parameters of a quadratic fit are features, but perhaps not useful to an astronomer building a query. The most relevant features for astrophysical explosions (as opposed to variables) with tiny lightcurves are the peak magnitude (combined with absolute magnitude if distance known) and the rate of increase and decrease of magnitude. Absolute magnitudes can be made only with a strong association with a galaxy plus knowledge of the distance of that galaxy. The rate of increase, we decided, would be done with a combination of methods, depending on the sparsity of the lightcurve. Work is beginning on formulating, coding, and testing suitable algorithms. Further details of the workshop can be found /wiki/spaces/LUSC/pages/2990505985.

@ Roy Williams

Planning the next LSST:UK All-Hands Meeting

Whilst our last (virtual) LSST:UK All-Hands Meeting, in May 2021, was very successful, many people have expressed that it would be good to get the LSST:UK community together again, so the Exec Group has started planning our next AHM. Given that LSST@Europe4 is taking place in late October, and the UK's Data Rights Agreement is unlikely to be signed before the New Year, there seems little motivation for

holding the meeting before the end of 2022. Teaching commitments then necessitate avoiding the first few months of 2023, so we are thinking that the meeting should be held in late April or May 2023, probably over two full days.

We would like your input to help the Exec plan the event, so we have set up a brief questionnaire to solicit your preferences for the timing and format of the event. The form should take no more than 10 mins to complete. It just asks you to note good/bad weeks for the event, plus whether you are more likely to attend in person or remotely, and seeks your comments on what is required to support meaningful remote participation and what balance of types of session - plenary v parallel, project status v science - you would like to see. The deadline for completing the questionnaire is **28 October 2022**, and we expect to be sending out a “save the date” email for the conference in January.

We would also be very interested to hear from people who might be interested in hosting the meeting. The venue would ideally be able to hold ~125-150 people for the plenary sessions and, ideally, have to support two parallel sessions of up to ~80 people, although we can discuss capping the in-person attendance, if necessary. LSST:UK should be able to contribute significantly to the cost of catering, etc, but may not be able to cover all the local expenses incurred. The details remain subject to discussion, but anyone potentially interested in hosting the AHM should email @ Bob Mann (rgm@roe.ac.uk), as should anyone interested in serving on the SOC for the event.

@ Bob Mann

Forthcoming meetings of interest

Meetings of potential interest for the coming months include:

- 27th February – 3rd March – DESC Collaboration Meeting (virtual). Details to be published on DESC members website (login required).
- 24–28 October 2022 – **Rubin Observatory LSST@Europe4**, at Accademia dei Lincei, Rome, Italy. The will be a hybrid meeting with a limited number of in-person spaces. Registration for (virtual or in-person) participation has now closed.
- 17–22 October 2022 – **DESC Sprint Week**, at University of Michigen, Ann Arbor. Details to be published on DESC members website (login required).

Members of the Consortium (not in receipt of travel funding through one of the Science Centre grants) may apply for travel support for meetings of this kind via the the LSST:UK Pool Travel Fund. Details are available at Forthcoming LSST-related Meetings .

Note that the current list of forthcoming meeting is always available on the Relevant Meetings page. You may also wish to check information held on the LSST organisation website LSST-organised events and the LSST Corporation website.

@ George Beckett

Announcements

If you have significant announcements that are directly relevant to LSST:UK and would like to share the announcement in a future newsletter, please contact the LSST:UK project managers.