LSST:UK Newsletter 39 (November 2023)

Introduction

As mentioned in the October Newsletter, the LSST@Europe5 meeting included the informal announcement (followed by a Community post) of Rubin construction schedule delays caused by a problem with the dome crane and the discovery of a vacuum leak in the LSSTCam cryostat. The crane is now fixed and, while we await confirmation of the duration of the delay induced by fixing the vacuum leak, the Observatory has published a major update to the schedule for the end of construction and for early science, as detailed by @Stephen Smartt below.

Video (Credit: RubinObs/NSF/AURA)

As part of building momentum within the wider community as the start of the survey approaches, Rubin are publishing a series of press releases summarising the scientific motivations for the LSST. The latest of these explains how LSST data will be used to shed light on dark matter and dark energy. The Observatory is also releasing a series of animated videos, describing aspects of the project to a general audience. Another recently-released video (link to right), shows a timelapse of progress with construction on Cerro Pachon, from an explosion blowing the top off the peak in 2011 to the present day.

Rubin have also recently announced that next year's Project and Community Workshop will be run in hybrid mode, rather than wholly online, as previously indicated.

Finally, the International Data Rights Holder List has been updated to reflect the outcome of our recent data rights round, which is also summarised on the LSST:UK wiki: we currently

have 111 PIs and 137 Junior Associates.

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.

<div align="right">@Bob Mann</div>

Updated Rubin Schedule

A significant update to the Rubin schedule and timing plans for early science has been released. A summary, which is updated on roughly a monthly basis is always available on the LSST:UK wiki home page (see LSST:UK - Getting started with Rubin and LSST data). The important document Rubin Observatory Plans for an Early Science Program (Leanne Guy et al. RTN-11) was updated and released on 31st October 2023.

Due to a delay of several months in the delivery of LSSTCam to Chile (due to a vacuum leak), and a failure of the summit dome crane, it is now likely that some on-sky observations and commissioning tasks **will now** happen with ComCam. This is a change since the last official version of the commissioning plan and path to first light was summarised on this page. Guy et al. RTN-11 notes "The updated plan calls for on-sky data to be taken with ComCam for approximately two months, around July-August 2024 to support Telescope commissioning, primarily the Active Optics System. This is approximately four months earlier than could be done with LSSTCam."

System first light, which is LSSTCam and the full mirror assembly is now due January 2024. There is a large uncertainty in the start of the science survey of 4-10 months from this point. Almost certainly it will be **no earlier than June 2025 (which is currently the earliest date for operational readiness review).** Further revisions to this are expected and the Rubin operations schedule is updated monthly on : 🖅 Monthly Updates .

Guy et al. RTN-11 gives a table of updated timings for the data previews DP1 (ComCam data), DP2 (LSST Science Validation data) and DR1 (first data release based on the first 6 months of survey data). This is also summarised on the wiki page we keep up to date. The DP2 release, with LSSTCam data is expected to be available between November 2025 and May 2026 with DR1 release date targeted at May 2026 - January 2027.

<div align="right">@Stephen Smartt</div>

Lasair Notebook Marshall

The purpose of a transient survey is to find the needle in the haystack: the scientifically interesting alert among millions of others. Lasair users can do this in two parts: first an automated filter that runs as the alerts are ingested, then a human looking at the results, with an application known as a "marshall". The scientist looks at a batch, flagging some as "favourites", and some as "don't show me this object again". Then the next batch, until all have been seen. The next night there will be a fresh batch to be checked.

The Lasair project has released its "notebook marshall", built as a Jupyter notebook. For example, the screenshot results from a filter authored by @Ken Smith -- the Zooniverse

[pre-query]. The pictured alert is a supernova in the centre of the Science image – near the centre of the lovely spiral NGC 1086 at 55 Mpc.

At the top are the attributes selected by the filter, then lightcurves, the ZTF reference and latest image, and the colour image from Pan-STARRS. The SN II is already registered in TNS, and has a link. There are two checkboxes, and a place for a comment. Ticking "veto" means the object will not be seen again (like the object at the bottom of the image), and ticking "fave" means it will be emphasised next time. If the notebook is run again, a new set of results is shown, until all have been seen. Using the notebook for eyeballing is much easier than having Lasair send email notification. The filter must be streaming kafka, and you will need a Lasair login and API token. Code and instructions are here, and there is a video demonstration here.

@Roy Williams

Introduction to the RSP Sessions: Where, when, what?

We've had a fantastic response to our request for expressions of interest for the Introduction to the Rubin Science Platform sessions that we'll be running in early 2024. In total, over 150 UK-based researchers responded, with representation from almost all of the UK's astronomy groups. Thanks to all of your who raised awareness within your groups, and to those who have completed the form. It's great to see such high levels of interest among the UK community for LSST data products!

Locations and Dates

In response to the expressions of interest, I have identified a number of institutes around the country that are well-located to host a session. There is roughly one location per region, and I've tried to select the intitutes in such a way that the minimise *total* travel time for *all* of those that expressed an interest. Further, I've tried to ensure that most people who have expressed an interest are within roughly one hour's train journey from at least one session.

I've liaised with my point-of-contacts in each of those locations to identify suitable dates, which are outlined in the table below (ordered according to date):

Location	Date	Time (for transport bookings)	Serving[1] (indicative)
U. of Nottingham	17 Jan 2024	**11am-4pm[2]** (Note different start time to other sessions)	Nottingham, Birmingham, Leicester, Warwick, Keele
U. of Oxford	22 Jan 2024	1pm-5pm	Oxford, Hertfordshire, OU
U. of Portsmouth	24 Jan 2024	1pm-5pm	Portsmouth, Southampton, Sussex*
U. of Surrey	25 Jan 2024	1pm-5pm	London universities, Sussex*
U. of Cambridge	*TBC[3]*		Cambridge
U. of Bath	21 Feb 2024	1pm-5pm	Bristol, Bath, Cardiff, Exeter
Queen's Belfast	29 Feb 2024	1pm-5pm	Belfast, Armagh
Durham University	14 March 2024	1pm-5pm	Durham, Newcastle
U. of Edinburgh	15 March 2024	**12pm-5pm[2]** (Note different start time to the other sessions)	Edinburgh, Glasgow, St. Andrews
Lancaster University	20 March 2024	1pm-5pm	Lancaster, Liverpool, Manchester, UCLAN
Online[4]	*TBC*		N/A

Notes:

[1] Booked room sizes are based on our expectation that most people will attend their nearest session (see the "Serving" column), but *small* numbers may attend other sessions. If the latter's the case for you, please contact me to make sure there will be space.

[2] Nottingham's and Edinburgh's sessions include a lunch break (lunch not provided!)

[3] I'm actively liaising with Cambridge to settle on a date.

[4] The online session will happen after all the in-person sessions have taken place. In-person attendance is, however, preferred in order to aide discussion and feeding-back desires for the RSP.

Details on where, precisely, the sessions will take place (i.e., room numbers and how-to-get-there instructions) will be added to the "Introduction to the RSP sessions" confluence page over the coming weeks.

What to expect

Each session will consist of three hour-long lectures, separated by breaks. A small amount of time will be dedicated to giving a brief introduction to the the Vera C. Rubin project, the LSST, and key RSP concepts and terminology. The remainder of the time will be spent giving demonstrations of potential use cases. These will involve going through Python code

– typically in the form of Jupyter Notebooks – which demonstrate possible use cases. The aims of the sessions are to:

- familiarise people with the RSP environment;
- introduce key concepts within the RSP;
- demonstrate how to find out what data is held within the RSP;
- demonstrate what *can* be done within the RSP.

My hope is that people will leave the sessions with at least a sense of how they could achieve X within the RSP (where X is some kind of data retrieval or analysis related to their scientific area of interest).

Topics that will be covered include:

- how to determine what types of data (exposures, coadds, detection tables, etc) is held within the RSP;
- how to determine what data of a given type is present in the RSP (i.e., a coadd covering this patch of sky);
- what the Table Access Protocol and Data Butler are, and how to use them;
- how to retrieve table data and pixel-level data;
- retrieving static and time-series data;

but if there are other topics that you think would be particularly useful for you or your group, then I am open to suggestions; just drop me an email at j.mullaney@sheffield.ac.uk .

Finally, as well as being information delivery sessions, it's also hoped that once people have been introduced to the RSP, then these sessions will also provide a means for the UK community to feed back what they hope to get from the RSP.

@James Mullaney

LUSC Team Meeting in Lancaster

The photos to the right show the (in-person and online) participants of the most recent meeting of the LSST:UK Science Centre (LUSC) Team, which took place at Lancaster University on 24 November. The LUSC Team meets twice a year, currently alternating between online updates from each in-kind contribution team and in-person meetings, with a looser format to take advantage of the greater possibility for discussion presented by having more of the team co-located for the day.

This latest meeting (slides from which are available online) included a preview of one of the RSP intro talks to be delivered by @James Mullaney on this forthcoming tour, as well as a discussion of the use of Slack in LSST and LSST:UK, and a talk by our host, @Roger William Lewis Jones , on progress being made in the UK's contribution to Data Release Processing.
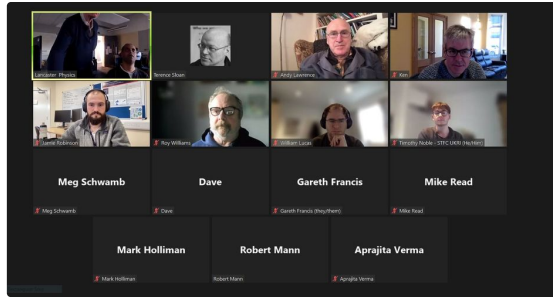
@Terry Sloan and @Bob Mann

Leadership positions held by LSST:UK members

Here is the latest list of significant leadership positions held by members of the LSST:UK consortium in the project and international Science Collaborations. If you are aware of any corrections or additions please contact the LSST:UK Project Managers (@George Beckett and @Terry Sloan : lusc_pm@mlist.is.ed.ac.uk).

David Alonso	Co-convenor of the DESC External Synergies Working Group; CMB-S4 DESC Liaison; Simons Observatory DESC Liaison; UK representative on DESC Operations Committee; Core Cosmology Library (CCL) Team lead.
David Bacon	Member of DESC Speakers Bureau
Manda Banerji	Member of the Rubin-Euclid DDP Working Group; Galaxies SC member of the Rubin International In-Kind Contribution Evaluation Committee (CEC).
George Beckett	Member of the LSST DESC High-performance computing resources committee; UK representative on Rubin Data Production Leadership Committee; Co-chair of the LSST:UK LSST National Group.
Rebecca. Bowler	Co-chair of the SED fitting and Photometric Redshifts Working Group in the LSST Galaxies Science Collaboration.
Erminia Calabrese	DESC Advisory Board
Thomas Collett	Member of the Rubin-Euclid DDP Working Group
Victor Debattista	Co-lead of the Galactic Bulge WG in the LSST Stars, Milky Way and Local Volume Science Collaboration
Tassia Ferreira	Member of DESC Collaboration Council
Chris Frohmaier	4MOST Extra-Galactic Deputy Project Scientist
Carlos Garcia-Garcia	Co-convenor of the Large Scale Structure (LSS) Working Group
Joachim Harnois-Déraps	DESC Higher Order Statistics (HOS) topical team co-lead
Peter Hatfield	Co-chair of the Galaxy Environment Working Group in the LSST Galaxies Science Collaboration

Sebastian. Hoenig	Co-Chair of the Variability group in the AGN Science Collaboration; In-kind contribution coordinator for the AGN Science Collaboration; AGN SC alternate member of the International In-Kind Contribution Evaluation Committee.
Sugata Kaviraj	Co-chair of the LSST Galaxies Science Collaboration; Co-chair of the Low Surface Brightness Coordination Group.
Ofer Lahav	Member of DESC Publication Board
Boris Leistedt	Co-convenor of the Large Scale Structure (LSS) Working Group
D. Leonard	Co-lead of the DESC Modelling and Combined Probes Analysis Working Group
Chris Lintott	leads the LSST EPO development of Zooniverse as a citizen science platform
George Madden	Member of DESC International Resources Committee
Bob Mann	Co-chair of the LSST:UK LSST National Group
James Mullaney	Chair of the Active Galactic Nuclei WG in the LSST Galaxies Science Collaboration
Qingling Ni	Member of Rubin Users Committee
Cyrielle Opitom	Co-lead Active objects WG in the LSST Solar System Science Collaboration
Subir Sarkar	Lead of DESC Project 52 -- Testing the isotropy of the universe
Meg Schwamb	Co-chair of Solar System Science Collaboration
Stephen Smartt	member of the Survey Cadence and Optimisation Committee; DESC Rubin Observatory Project and Facility Operations liaison for Survey Cadence and Optimisation Committee.
Graham Smith	Co-chair of the Strong Gravitational Lensing Science Collaboration (SLSC); Commissioning Liaison for the SLSC.
Mark Sullivan	Co-lead of the DESC Time Domain Analysis Working Group; Member of the DESC Membership Committee; 4MOST/TiDES DESC Liaison.
Aprajita Verma	In-kind Program Coordination Team Lead; Member of SLSC Advisory Group; SLSC member of the International In-Kind Contribution Evaluation Committee; Chair of the Software Sub-committee and International Program Coordinator in the Rubin Director's Office.
Aaron Watkins	Co-lead of the LSST LSB challenge 1: "How do LSST algorithms do at detecting LSB sources?" ; Co-chair of the low-surface-brightness working group within the LSST Galaxies Science collaboration; Co-chair of the Low Surface Brightness Coordination Group.

Forthcoming meetings of interest

Things are relatively quiet, meeting-wise, as we head towards the Christmas break.

However, there are still several potentially interesting meeting in early 2024 to be aware of:

Dates	Meeting Title/ Event	Meeting Website/ Contact	Venue
12/Mar/24—15/Mar/24	Preparing for the Statistical Age of Strong Gravitational Lens Science with the Rubin Observatory Legacy Survey of Space and Time (LSST)	More information available from @Aprajita Verma .	Oxford, UK

22/Jan/24 - 26/Jan/24	What was that? - planning ESO follow up for transients, variables and solar system objects in the era of LSST	🔲 ESO - LSST	
11/Dec/23—15/Dec/23	Unveiling the Dynamic Universe: Cosmic Streams in the Era of Rubin	🎇 Scientific Rationale	Puerto Varas, Chile

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.

Subir Sarkar has asked us to advertise the workshop Challenging the Standard Cosmological Model, which is due to be held at the Royal Society in London, on 15 and 16 April 2024. Registration is open now.