LSST:UK Newsletter 16 (October 2021)

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Introduction

This month's Newsletter includes one announcement - that Chris Lintott has been appointed the LSST:UK Education and Public Outreach Coordinator - and forewarning of two others, that we shall very soon be opening the 2022 call for Affiliate PIs & Junior Associates and also launching the call for "DEV" proposals for inclusion in our Phase C funding bid.

Meanwhile, another major milestone has been reached in the Rubin construction project, as the arrival at SLAC of the last of the six LSSTCam filters marked the completion of the *LSST Camera Major Item of Equipment* (MIE) project, through which the US Department of Energy has funded camera construction work for many years. With all the major components now present at SLAC, the integration and testing of the camera continues in earnest, prior to its shipping to Chile in mid-2022.

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.

Call for Phase C DEV Work Packages

As previewed at the LSST:UK All Hands Meeting in May, we will be issuing a call for bids for development ("DEV") work packages for inclusion in the Phase C proposal, which is due for submission in April 2022. These work packages will form part of the UK's in-kind contribution to Rubin operations, and, so, they must develop/deliver resources (e.g. data sets, analysis software, infrastructure) that enhance the US community's scientific return from LSST data; this will require the work to be endorsed by the relevant Recipient Group (i.e. Science Collaboration or Rubin team), within the work of which it must be embedded. Equally importantly, however, the work packages must also generate sufficient scientific return for the UK to secure funding through PPRP.

We are currently finalising, with the LSST:UK Consortium Board and our Rubin colleagues, the details of the process by which the work packages will be selected, but we will issue the call for proposals shortly, via an announcement on the *lusc-announce* email list. In the meantime, proposers may wish to familiarise themselves with the contents of two Rubin documents - the *Handbook for Proposal Teams* and *M anual for In-kind Contributors and Recipients* - which provide a lot of background information on how to define projects that will be acceptable as in-kind contributions.



2022 Call for Affiliate PIs and Junior Associates

The 2022 selection round for Affiliate PIs and Junior Associates will open very shortly. This round is somewhat different to previous ones, in which three-year terms were awarded, enabling researchers to plan securely for engagement with the LSST Science Collaborations. The reason for the shorter terms this time is that we are still awaiting the decision as to whether the UK's in-kind contribution to Rubin operations will secure data rights for the whole UK community (suitably defined) or a fixed-size list of named researchers, as now. That decision should be made within the next few months, and, since it will determine how we manage UK data rights in the long term, it was decided that this autumn's annual round should just award data rights to the end of 2022, before which time we can put in place a longer-term solution.

Existing Affiliate PIs (APs) and Junior Associates (JAs) whose current terms end on 31/12/21 will automatically be granted a one-year extension to their term if they request it via the selection round application form, which can also be used by new applicants requesting AP or JA status for calendar year 2022.





@ Bob Mann

For LSST:UK Phase B Work Package 3.10 Joe Zuntz and James Perry are supporting the operations of DESC, the Dark Energy Science Collaboration. This is primarily software development, contributing to the pipelines that will run the cosmology analysis of Rubin data, and to the simulation tools that will stress-test the process. Our recent deliverables have covered both these areas.

On the simulation side, James has recently completed <u>contributions</u> to <u>GalSim</u> the galaxy image simulation library that is in wide use in the collaboration, and beyond. Developed as part of the Great 3 cosmic shear challenge, GalSim is one of the few codes with sufficient rendering accuracy for weak lensing analysis. James has added GalSim features to better model pixel boundaries on the telescope focal plane - the Brighter-Fatter effect means that the effective size of pixels are non-uniform in any given image, and these features given the library enough flexibility to model this at LSST accuracy.

On the analysis side, Joe has recently completed a deliverable that brings photometric redshifts into the primary DESC lensing and clustering pipeline. DESC will analyze what has come to be called "3x2pt": the combination of correlation functions in lensing with those in clustering. This analysis needs high quality (and, more importantly, well-characterised) photometric redshifts (PZs), which in DESC are generated via the RAIL package, which wraps a collection of community PZ codes. Joe has added modules to TXPipe, the DESC pipeline code, that link it to RAIL, completing a key step in the pipeline.



Appointment of the LSST:UK Education and Public Outreach Coordinator

We are delighted to announce that Chris Lintott has been appointed to be the LSST:UK Education and Public Outreach (EPO) Coordinator.

In addition to co-presenting *The Sky at Night* and being science lead of the *Zooniverse* project, Chris brings experience from a range of education and outreach activities, many conducted by the successful Access and Engagement Team in the Department of Physics at Oxford, which he leads. Chris has also been a member of the Rubin EPO programme's advisory group for many years, so he is well acquainted with the EPO resources being developed by the Observatory in the US.

Chris is keen to solicit input from the many people within the LSST:UK Consortium who already undertake - or would like to undertake - education and outreach activities, as he begins to pull together an EPO plan for LSST:UK. He would particularly like to hear from Early Career Researchers who are keen to include an EPO strand in their career plans over the coming decade of LSST operations. Further details will follow in later Newsletters and separate messages to the lusc-announce list, but interested parties are welcome to contact him directly (chris.lintott@physics.ox.ac.uk).



@ Alastair Edge and @ Bob Mann

Recent LSST:UK outputs

LSST:UK has recently produced the following technical reports.

Title

Author

Description

D3.3.1 LSST/TiDES Metrics Software Chris Frohmaier and Mark Sullivan	The Legacy Survey of Space and Time (LSST) and the 4m multi-object spectroscopic telescope (4MOST) commence survey operations in 2023. The Time-Domain Extragalactic Survey (TiDES) will follow-up LSST discovered transients to obtain spectroscopic measurements for tens-of-thousands of supernovae, galaxies, and active-galactic nuclei (AGN). This additional data will allow the mapping of the astrophysical diversity of cosmic explosions, measure the equation of state parameter for dark energy to unprecedented precision, and perform a comprehensive AGN reverberation mapping experiment. TiDES forms the basis of LSST:UK's work-package WP3.3: Spectroscopic classification of transients.
	The strategies of both the LSST and 4MOST surveys are yet to be finalised and, with each acting independently, there exists the potential for a disjointed operation. TiDES operates downstream from LSST, spectroscopically following-up any transients it discovers. WP3.3 deliverable D3.3.2 (see below) presents the submitted 'Cadence Note' to the LSST Survey Cadence Optimization Committee (SCOC) with recommendations for a strategy suitable for TiDES science goals. This LSST:UK deliverable D3.3.1, presents an overview of the software developed to reach the conclusions presented in D3.3.2. Any future simulations produced by LSST and/or 4MOST can also be evaluated following the prescription presented in this.
D3.3.2 TiDES Cadence Note Chris Frohmaier and Mark Sullivan	The Legacy Survey of Space and Time (LSST) at the Rubin Observatory will revolutionise understanding of the Universe by creating a decade long movie of the time-domain sky. Repeated and cadenced imaging alone, however, does not provide a complete picture of transient phenomena. This is where the 4MOST Time- Domain Extragalactic Legacy Survey (TiDES) adds crucial scientific value to LSST:UK investment in transient science.
	The success of TiDES will be determined, in part, by the survey design choices of LSST. Motivated by this, as part of LSST:UK WP3.3 we have authored a short document in response to an LSST request for a 'Cadence Note' from participating scientific communities. LSST provided us with several survey strategies from which we were able to build a simulation framework compatible with 4MOST's own survey simulations. This TiDES cadence note answers seven key questions presented by the LSST Survey Cadence Optimization Committee (SCOC). In addressing each question, we consider several combinations of the LSST survey simulations and TiDES simulations to find the best performing solution for the TiDES science goals. As a result of this investigation we were able to produce recommendations to the SCOC for their consideration when finalising the LSST survey
	Chris Frohmaier and Mark Sullivan

@ Terry Sloan

Forthcoming meetings of interest

Several meetings of potential interest have been scheduled for the coming months. The Rubin Observatory has announced an LSST Survey Strategy Workshop during 16th–17th November (which will be held online). More details are expected in the coming weeks via the Rubin Observatory Community Forum.

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.