LSST Science Advisory Committee
Face-to-face meeting
February 21, 2018
Princeton, New Jersey

SAC members attending: Jason Kalirai, Nelson Padilla, Lucianne Walkowicz, Timo Anguita, Niel Brandt, Charles Liu, Michael Strauss (chair), Anze Slosar, Josh Simon, Risa Wechsler, Mansi Kasliwal, Renu Malhotra

Project personnel attending and presenting: Steve Kahn (director), Beth Willman (deputy director), Ranpal Gill, Wil O'Mullane, Eric Bellm, Lynne Jones, Tiago Ribeiro

Summary of recommendations
There are detailed comments and recommendations from the SAC throughout these minutes. Here we summarize some of the key issues.

In communications and public outreach:
 -The LSST should have a presence in as many major
  relevant science conferences as possible, and should resurrect the
  LSST Speaker's Bureau.
 -The community of scientists interested in LSST will be preparing
 white papers for the upcoming decadal survey. It would be good to
 have leadership from the LSST Project to make sure that LSST is
 described appropriately, and to consider uses for the telescope at
 the end of the 10-year survey.
 -The LSST Project should coordinate with members of the Science
 Collaborations who are actively doing public outreach in the LSST
 context.
 -The LSST Project should continue to develop its social media
 presence, taking advantage of high-profile events (such as the
 launch of the Falcon Heavy a few weeks ago).

Data rights and data access policy:
 -There needs to be a definition of what the US scientific
 community with LSST rights is.

 -There needs to be a practical description of what it means for the
 data to become world-public two years after each data release.

 -The nature of data access during commissioning needs to be made explicit.

Survey strategy and event brokers:
 -The SAC is looking forward to reviewing the community call for
 input for survey strategy. The SAC is concerned about the time it
 has taken to get Version 4 of the Operations Simulator completed,

and would like to see a realistic timeline for the implementation of such key features such as rolling cadence. This will need to be clearly explained in the call. While the call will be released in June, it would be appropriate to inform the community now that this call is coming soon.

-The SAC is looking forward to reviewing the community call for proposals for event brokers. We recommend that there be a single such call; it does not make sense to have two rounds of proposals.

Meeting minutes in detail:

This meeting was an opportunity to discuss progress on a series of recommendations the Science Advisory Committee gave in previous meetings, especially the face-to-face meeting in Tucson in August 2017. We heard presentations on a variety of topics, including among others: project communications, data access, event brokers, and survey strategy.   For the latter three of these areas, the Project is preparing draft policy/technical documents that the SAC will be asked to review and comment on. In these meeting minutes, we briefly summarize the presentations we heard, and highlight our principal recommendations and concerns that we can raise at this point.

The slides presented at this meeting are available on the SAC webpage. They are:

Willman_openingslides.pdf: Beth Willman, laying out the goals for the meeting, and describing the status of the submitted proposal for LSST operations.

Kahn_projectstatus.pdf: Steve Kahn, overall LSST project status.

Gill_communications.pdf: Ranpal Gill, communications challenges in the project.

Willman_dataaccess.pdf: Beth Willman and Wil O'Mullane, developing a detailed policy on, and definition of, LSST data access.

Ribeiro_scheduler.pdf: Tiago Ribiero, progress on the scheduler.

Jones_cadence.pdf: Lynne Jones, plans for a call for proposals from the community on the observing strategy.

Bellm_Event_Brokers.pdf: Eric Bellm, plans for a call for proposals from the community on developing event brokers

****Plans for Operations, Current Project Status

The presentations from Beth and Steve are as listed above. A few relevant highlights:

-The proposal to NSF and DOE for LSST operations was submitted last summer. It underwent a formal review in December, which went quite well. There is work ahead to develop a detailed personnel plan for the transition between construction and operations. And the budget needs to be reworked in detail in the context of the

National Center of Optical-Infrared Astronomy (NCOA), the new
framework within which LSST, NOAO and the US component of Gemini
will operate.
-Roughly $100M of equipment will be shipped to Chile in 2018! The
major pieces of the dome, the telescope, and the camera are being
assembled now. In terms of earned value, the construction was 50%
complete on the NSF side, and 74% at DOE, as of November 2017.
The current schedule has construction complete in November 2021,
leaving 11 months of contingency before the official full
operations start date of October 2022. The end of commissioning
will be defined by an operations readiness review.
-The CCDs of the camera will be delivered by two firms, ITL and
e2V. Well over half the CCDs are in hand, and rafts (of 16 CCDs
each) are being constructed. There are some concerns about excess
noise in some of the CCDs; we'll know soon how serious a concern
this is.
-Most of the camera optics are in hand.
-The dome and the installation of the M1/M3 mirror into its cell
are currently on the critical path.
-Commissioning, and integration of the subcomponents, are some of
the principal concerns at the moment.

*****Communications

See the presentation from Ranpal Gill, LSST Communications Manager.
There is a push to improve the "For Scientists" area of the LSST
website, led by a committee including, among others, representatives
of the science collaborations.   This committee is aiming to finish
their work in June, with a maintenance plan in place to keep things
up-to-date.

A questionnaire to the LSST science community shows that the topics
people are most hungry for information about are:
 -Algorithms used in the data pipelines (note that the Data
 Management team has recently assigned liaisons to each of the science
 collaborations to help exchange of information on this front);
 -General updates on the status of the project;
 -Plans for survey strategy;
 -What data access and data rights mean.
The latter three of these are all major topics of discussion at this
SAC meeting!

The communications effort in LSST needs to coordinate (and
eventually integrate) with that of NCOA, and the efforts of the
planned LSST Community Science Center within NOAO.

The "Large Synoptic Survey Telescope" name does not really describe

what the project is about, and discussion has started about renaming
both the telescope itself and the survey it will carry out. There
will be a challenge in convincing the community to adopt the new
name(s), but this has been done before (think AXAF-->Chandra, or
NGST-->JWST).

The SAC had several comments, questions and recommendations on the
general subject of communications:
  -The project should consider advertising the next survey more
  broadly, perhaps via a notice in the AAS electronic newsletter.
  This year, those in the science collaborations and those who had
  signed up for the LSST science mailing list received notice about
  the survey, but the community who might be interested may be
  broader than that.

  -The JWST has developed a comprehensive set of wikipedia-like web
  pages for scientists, which are worth looking at for guidance as
  the LSST pages are developed further. See https://jwst-docs.stsci.edu

  -The LSST should attempt to have a presence in as many major
  relevant science conferences as possible. In this regard, it
  would be appropriate to resurrect the LSST Speaker's Bureau. More
  ambitiously, there could be an effort to give LSST science talks
  at major research institutions across the country.

  -The LSST Project should consider writing white paper(s) for the
  upcoming decadal survey, or find a way to engage with those folks
  who are writing such white papers to make sure that they describe
  LSST appropriately. They can similarly consider planning a
  coordinated and coherent response to the question, 'What should be
  done with the LSST telescope after the 10-year survey is over?'.

  -The presentation that Ranpal gave us was focused on improvements
  in communications to the science community, an effort that Ranpal
  is leading. Ranpal and the the communications office is also
  responsible for communications to the general public.

****Education and Public Outreach
  In previous meetings, the SAC had asked for ways for members of the
  LSST science collaborations to get involved with EPO efforts now.
  The problem is that the LSST EPO effort is in construction phase,
  and is not allowed to use its funds to carry out EPO activities
  until operations are well underway in 2022. But the EPO office,
  under Amanda Bauer, has been in communication with a number of
  individuals from the science collaborations.

The SAC recommends:
-If the EPO office is willing to talk to science collaboration
members about their efforts, this opportunity should be
communicated to the science collaborations, respecting the fact
that the EPO personnel have limited time for such interactions.

-The Project office should look into whether some early
operations money (e.g., in 2019) can be used for EPO efforts,
again perhaps in coordination with and leveraged by the efforts
of the science collaborations.

-The LSST should continue to develop its social media presence.
There are important opportunities to put LSST into the
conversation about high-profile astronomically-themed events
(such as the launch of the Falcon Heavy). One model that has
worked with other consortia is to ask for social-media-savvy
members of the LSST science community to volunteer as "LSST
tweeter for the week"; their tweets would be vetted by the LSST
communications office before they went out.

JWST/STScI has a good track record on the use of social media in
their outreach, but we recognize that they have a larger
number of staff dedicated to this. In this regard, we recognize
that the LSST communications team is understaffed. If it is
politically feasible, the SAC would be happy to work with the
Project Office to help make the case to the funding agencies for
more resources for communications, perhaps by sharing
individuals who are also working in the EPO team.

****Data rights and data access
Beth and Wil presented the work of a committee which is charged with
developing the implementation and policy details of how data rights
and data access will actually work. The report of this committee
will be ready to share with the SAC by early summer. Some of the
practical issues that the SAC recommends be worked through:
-LSST data are available to the full US and Chilean scientific
community, as well as named individuals who are "International
Contributors" to operations. In Chile, there is a formal definition of the
astronomy community (which they put together for the purpose of
defining who has the right to apply for time on Chilean
telescopes). There is no equivalent definition in the US. Any
operational definition needs:
   -Not to exclude scientists working at other than research universities
      (e.g., smaller liberal arts colleges and community
      colleges, research facilities, and those unaffiliated with an
       institution of higher education).

-To define whether international visitors to US institutions would
   get access.
-To define whether it would be appropriate for overseas scientists
   without formal data rights to work with US scientists on LSST
   papers.
-To give guidelines for how rigid we want to be. Should the system
   be designed to minimize the number of unauthorized individuals
   who gain data access?

-What does it actually mean when we say that all data will be
world-public two years after they are made available to the data
rights community. While we understand the programmatic and
practical arguments against it, the SAC very much likes the SDSS
model, in which everybody would be able to use the data access
tools and science interface (although not the compute power to
analyze data in place) once the data become world-public. Is
there a possibility of enticing philanthropic organizations in
contributing to operations to allow more direct data access to
the world?
-There needs to be a clear policy about long a given data release
can be kept spinning (the SAC has previously argued strongly to not
take old data releases off-line as new ones become available).
-We also need clear policies about how data access and data rights
will work for commissioning data.

The SAC also discussed possible collaboration and data sharing
between LSST and the Euclid project. Progress will require clear
and practical guidelines on data rights.

*****LSST Scheduler and Survey Strategy
We heard presentations from Tiago Ribeiro and Lynne Jones. A major
theme of our August 2017 meeting was the nature of a planned call
for input from the community on ideas for survey strategy,
especially (but not solely) focussed on Deep Drilling Fields. We will
not repeat the various recommendations that we made there, but were
happy to see that they are actively being incorporated in the plans
we heard about. In particular:

-There will be a single call for white papers from the community
with ideas about cadence. That call will go out in June 2018, with
a due date of November 2018. The next LSST SAC meeting will be
devoted to a discussion of the draft call (which should be ready
for our perusal in early April).

-Version 4 of the Operations Simulator is essentially complete, and
there is a test run which is likely to be labeled the new baseline

cadence. This has been quite late, however, and still does not include an implementation of the rolling cadence concept. We understand that that should be fairly straightforward to implement (a few months of work?), given the flexibility of the V4 code, which allows what is called a "feature-based" scheduler.

Our comments and recommendations:
-We are concerned about the time it has taken to get OpSim V4 completed, and given the work that still has to happen before the feature-based scheduler is fully implemented to include such key elements as rolling cadence, we worry about the timeline for finalizing decisions on survey strategy.

-The call for proposals must make available an updated baseline cadence implementation of OpSim, and be explicit about what further realizations will be created on what timescale (for guidance, please see the list of experiments, done with V3, in Chapter 2 of the survey strategy community white paper). Ideally, rolling cadence implementations would be available as well, but we do not want to delay the call further.

-The call should be very clear on what will be considered (new deep drilling fields or mini-surveys, and specific cadences for them), and what will not (Targets of Opportunity? New definitions of the Wide-Fast-Deep Survey?). The call should also make clear how this effort will coordinate with updates for the survey strategy community white paper.

-Given the amount of interest in the community on this topic, and the rumors swirling around, it would be appropriate to include a statement in an LSST news digest soon telling people that a call for white papers will be coming in June.

*******Event Broker policy

Eric Bellm gave us a presentation on this topic, incorporating many of the recommendations we made in our August 2017 meeting. There will be a draft document describing a call for proposals for developing event brokers, which should be ready for comment by the SAC by June, with an aim to share with the LSST community at the Community and Project meeting in August. This document will also describe the requirements for the LSST "mini-broker", which will do basic characterization of alerts.

Note that all event brokers will have to be consistent with the LSST data rights/data access policy, as described above.

We recommend:
-The relationship between the outputs of the event brokers and the
Science Platform that we heard about in our September meeting
should be more clearly defined.

-While it was suggested that there be a two-round proposal system
for development of event brokers, we strongly recommend doing this
in a single round, perhaps after early commissioning data give us
an idea of what our false positive rate will be, and thus how many
event streams we can handle. The received proposals can be ranked
so that we can define a "waiting list" to go to if the event stream
is more manageable than we had feared.

-The call for proposals will have to make reference to the call for
proposals for deep drilling fields and alternative cadences; see
above.