

*[initial version ratified by Full Members of the LSST DESC July 2014]*

*[Amended July 2015 to change “Executive Board” to “Advisory Board”, remove names from Organizational Chart in Figure 1, and change tense in references to Collaboration Council and Membership Policy.]*

*[Amended February 2016 to include Operations items: Plan, Manager, and Committee, and also Liaisons to Synergistic projects.]*

*[Amended March 2016 to include the duties, composition and evolution of the Membership Committee.]*

# Governance and Organization of the Large Synoptic Survey Telescope Dark Energy Science Collaboration

## Background

The Large Synoptic Survey Telescope (LSST) Dark Energy Science Collaboration (DESC) was established at a meeting in June 2012. An interim governance model was presented and adopted at that meeting. The positions needed for the management team in this interim period were filled by individuals who were ready and able to carry out the tasks for the first year.

In November 2012, the DESC made public a White Paper [[arXiv:1211.0310](https://arxiv.org/abs/1211.0310)] that described the need for the DESC and identified high priority tasks to be carried out in the first three years of the collaboration. The goal of the DESC is to develop and execute a high-level plan for the study of dark energy and associated fundamental physics of the Universe with LSST data. As described in the White Paper, this will include the development and optimization of a complete set of cosmological analyses that will be performed with the data, the detailed study of systematic issues that may compromise those analyses, the clarification of the sensitivity of those analyses to various technical aspects of the LSST system design, the identification and assembly of observational resources necessary to carry out the analyses, the generation and refinement of simulations and other tools required to validate the analyses, and the identification and assembly of the computational resources to support such investigations both before and after the onset of data taking.

In the White Paper, a minimal governance structure was outlined with the intent that a Governance Working Group would be established to propose a longer term, more complete governance model that builds on the one-year initial phase. In July 2013, the five members of the Advisory Board were charged with drafting a governance plan with broad input from the DESC. This document is the product of that effort and was ratified by the Collaboration in July 2014. A separate Membership Policy was reviewed and ratified in May 2015 after the Collaboration Council was established.

## Governance and Organization

The governance plan consists of a management team, an Advisory Board, a Collaboration Council, and a Membership Committee. The management team consists of a single Spokesperson, a Deputy Spokesperson, an Analysis Coordinator, a Computing and Simulation Coordinator, a Technical Coordinator, and an Operations Manager. The Advisory Board advises the Spokesperson on scientific, financial, and organizational matters pertaining to the Collaboration.

The DESC has both informal and formal connections to the LSST Project. Since a number of the members are working directly on the Project, the DESC has direct access to technical information regarding the detailed performance characteristics of the various subsystems. However, when it becomes necessary for the DESC to communicate specific concerns about the LSST system design that might compromise its effectiveness for dark energy investigations, the collaboration, through its spokesperson, will do so officially through the LSST Chief Scientist, which is the formal channel that the Project has established for interactions with the community.

The organizational structure is shown in Figure 1. The roles are described in more detail below.

The Spokesperson and members of the Advisory Board and the Collaboration Council will be selected for terms of two years through the processes described below. The governance plan does not define fixed terms for the Coordinators, the Operations Manager, or for Conveners of working groups; these are specified in the Management and Operations plans. However, turnover in leadership can be beneficial because it increases engagement of a larger number of people, recognizes the contributions and abilities of individuals, and provides opportunities for leadership development. In cases where term limits are not imposed, the management team should nonetheless revisit leadership positions regularly.

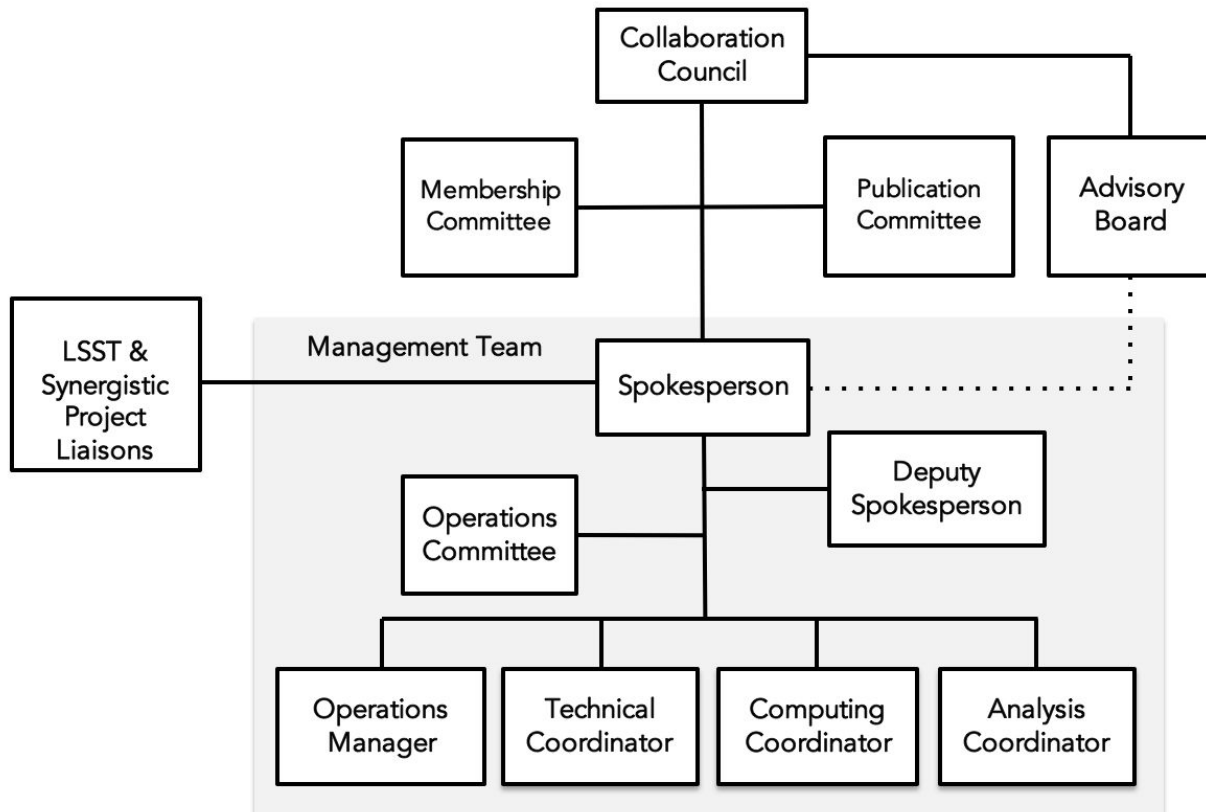


Figure 1: LSST Dark Energy Science Collaboration organizational chart.

## The Management Team

### The Spokesperson

The DESC will be led by a single Spokesperson who has overall responsibility for all scientific, technical, organizational, and financial aspects of the Collaboration. The Spokesperson is the contact person for the DOE Office of High Energy Physics and other funding agencies.

The Spokesperson serves for a two-year term. The Spokesperson will also serve as Spokesperson-elect for up to six months before the two-year term begins and as past-Spokesperson for six months after the two-year term ends, to allow an overlap period between the incoming and outgoing spokesperson to facilitate the transfer of responsibilities.

### Spokesperson selection process

The Spokesperson selection process will begin at least six months before the expiration of the current spokesperson's term. The next spokesperson serves for up to six months as spokesperson-elect to allow time for the spokesperson-elect to manage other responsibilities so

that he/she will have time to fulfill the DESC spokesperson responsibilities when the term commences.

A nominating committee appointed by the Collaboration Council will gather nominations from the collaboration and seek input on potential candidates and on key issues facing the collaboration. The nominating committee will consult broadly -- for example, with members of the collaboration, key people in the funding agencies, and LSST project leaders. The nominating committee will then recommend a slate of two or more candidates to be considered in an election. A new nominating committee is appointed for each election, possibly with some overlap with earlier nominating committees. The electing body for the spokesperson is the set of all Full Members.<sup>1</sup>

## **Deputy Spokesperson**

The Deputy Spokesperson will be responsible for overseeing many of the ongoing operations of the Collaboration.

The Deputy Spokesperson is designated by the Spokesperson and confirmed by the Collaboration Council.

## **Coordinators**

### Analysis Coordinator

The Analysis Coordinator is responsible for coordinating the analysis tasks needed in preparation for achieving the science goals of the DESC. For the first three years, the Analysis Coordinator is responsible for managing and achieving the list of analysis tasks identified as high priority in the November 2013 LSST DESC White Paper, both in specific science areas and in cross-cutting areas.

### Computing and Simulation Coordinator

The Computing and Simulation Coordinator is responsible for planning for and coordinating computational resources, and the development of associated software and simulations necessary to carry out the work of the DESC.

### Technical Coordinator

The role of the Technical Coordinator is to coordinate the interactions between those with technical knowledge of the components of the LSST system and those on the analysis teams who are improving the understanding of the impacts that particular technical issues might have on the science analyses.

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<sup>1</sup> Categories of membership are described in a separate document -- the Membership Policy.

## Operations Manager

The role of the Operations Manager is to coordinate and oversee activities involved in the implementation of the DESC operations plan, and the interactions between the operations activities and those they support in the analysis, computing and technical working groups to achieve the collaboration science goals.

The Analysis Coordinator, Computing and Simulation Coordinator, Technical Coordinator, and Operations Manager positions all require specialized expertise and a significant time commitment. The Coordinator positions will be filled by recommendation of the spokesperson, after appropriate consultation with constituents in the DESC, and confirmed by the Collaboration Council. The Operations Manager position will be filled by recommendation of the spokesperson in consultation with the DOE Host Lab (SLAC) as well as other DESC constituents, and confirmed by the Collaboration Council. The Operations Manager will have a line management role in SLAC for the duration of the appointment, though they need not have held one previously.

## **The Management Plan**

Certain elements of the management structure are not defined in the governance plan but are expected to be part of a Management Plan that is proposed by the Spokesperson in consultation with the Advisory Board, and ratified by the Collaboration Council. We give several examples here.

- i) The areas spanned by the Analysis, Computing and Simulation, and Technical Coordinators are each quite broad. Therefore, the Management Plan may include the definition of a working group structure for efficiently carrying out tasks. The roles and responsibilities of Working Groups, the evolution of the Working Groups, and the process for selecting new Working Group leaders should be defined in the management plan.<sup>2</sup>
- ii) The Management Plan should identify active DESC members who can serve as liaisons with collaborations carrying out precursor or concurrent surveys.<sup>3</sup>

In addition, the specific roles and responsibilities of individual members of the management team will be established in the Management Plan.

## **The Operations Plan**

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<sup>2</sup> The initial Management Plan in the 2012 White Paper defines a layer of Working Groups under each Coordinator, and an initial set of conveners.

<sup>3</sup> The initial Management Plan in the 2012 White Paper identified four liaisons.

An Operations Plan will be produced jointly by the Management Team in consultation with SLAC. This document will provide details of the management structure for DESC operations tasks. The Operations Manager and a new Operations Committee will be key components in this structure. The roles and responsibilities of all relevant parties and the process for selecting Operations Committee members should be defined in the Operations Plan. Once produced, the Operations Plan will require approval of the DESC Collaboration Council for ratification and will remain in place unless amended.

## **Relationship of the LSST Project to the DESC**

The LSST Chief Scientist is part of the LSST Project team and acts as an interface between the LSST Project and the science community. In the case of the DESC, he or she provides the formal communication link between the DESC and the LSST Project. The LSST Project Director may also be invited to join the discussions of the Management Team as needed. The Spokesperson can also appoint additional Project liaisons with roles and responsibilities defined in the Management Plan.

## **Relationship of Other Projects to the DESC**

The Spokesperson can appoint liaisons between DESC and external projects. These liaisons are typically members of DESC. The roles and responsibilities of the liaisons are defined in the Management Plan.

## **The Advisory Board**

The Advisory Board consists of five voting members, who will be chosen to bring broad knowledge of the community, the funding agencies, and the science goals to the collaboration. The members of the Advisory Board provide advice to and work with the management team to help define policy issues as they arise; they do not directly manage the technical and scientific work of the collaboration. The Advisory Board will select its own chair on an annual basis. The Spokesperson chairs joint meetings of the management team and the Advisory Board.

The membership of the Advisory Board should be broadly representative -- e.g., type of institution, funding source, science expertise, etc. The members of the Advisory Board will be selected by the Collaboration Council for two-year terms.

## **The Collaboration Council**

The Collaboration Council represents the full membership of the Collaboration, facilitates discussion of collaboration-wide issues, and has overall responsibility for LSST DESC policies and procedures, including

- Ratifying the LSST DESC organizational structure, by-laws, and policies (including this document).
- Approving proposed modifications or additions to the by-laws and policies. Such modifications or additions may be proposed by the Spokesperson or a Collaboration Council member.
- Appointing the Spokesperson Nominating Committee.
- Selecting the members of the Advisory Board.
- Reviewing and approving policies on membership and appointing a Membership Committee to consider applications for membership.
- Developing a publication policy that is consistent with the template LSST Science Collaboration Publication Policy and appointing a Publication Board to execute that policy.

All motions to ratify or modify the organization or governance of the Collaboration must pass by a two-thirds majority vote.

Upon the recommendation of a majority of the Advisory Board, the Collaboration Council may vote to remove the Spokesperson by a two-thirds majority, and either designate the Spokesperson-Elect as Spokesperson or, if there is no Spokesperson-Elect, designate an interim Spokesperson and begin the nominating process for a new Spokesperson.

The Collaboration Council will select its own chair on an annual basis. The chair will fulfill responsibilities such as forming nominations committees and running elections.

The membership of the Collaboration Council should be diverse on many scales -- e.g., representing both labs and universities, with backgrounds in both particle physics and astronomy, and a focus on both hardware and analysis. The membership should broadly represent the demographics, career stages, and geographic regions of the members of the DESC. The Collaboration Council will begin with at least 20 members but can increase in size as DESC membership grows. Members will serve two-year terms with half the members being replaced each year.

The Collaboration Council will establish a nominating committee each year to solicit nominations for new Council members from the Full Members of the DESC. The nominating committee will work to ensure a slate of nominees that is broadly representative of the DESC. All Full Members of the DESC will be invited to rank the set of nominees. When the set of highest ranked nominees does not maintain the desired broad and diverse representation on the Council, the nominating committee may go deeper in the ranking to appoint up to one-third of the new members to ensure broad representation.

## **Membership Committee**

The Membership Committee receives and reviews applications for new Members and new Full

Members, and makes recommendations to the Collaboration Council to accept or reject these applications. In the initial phase of the DESC, the Membership Committee was tasked with finalizing the membership policy, a process that was completed in 2015.

The Membership Committee has eight members, selected to represent the diversity of DESC Working Groups, geographical regions and collaboration demographics. The committee members serve for two years, with four members rotated every year. New committee members may be nominated by either the Collaboration Council or the Membership Committee, and are selected by the Collaboration Council within three months of the Council election. At least one Membership Committee member must also be a Collaboration Council member.

The Membership Committee decides who will chair the committee; the Committee chair is ratified by the Council.

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