

Dark Energy Survey: Science Committee and Science Working Groups Charters

January 17, 2009

The DES Management Committee (MC) has established a Science Committee (SC) with the primary aim of ensuring that the Dark Energy Survey produces science of the highest quality in a timely manner. Scientific analyses using non-public DES data will be carried out collaboratively by DES *members, participants, and external collaborators* under the auspices of the Science Committee; their access to DES data is defined in the Membership Policy. The rules for the publication and communication of DES results are defined in the DES Publication Policy. The organizing principles laid out here will, in some cases, be further elaborated in the DES Publication Policy.

I. The DES Science Committee and the Working Groups

A. The responsibilities of the Science Committee

The Science Committee will:

1. Define the Key Science Projects of the survey;
2. Provide input to the DES Project Director on the formulation of the Science Requirements and review the Science Requirements for the Project Director;
3. Review the technical specifications and requirements (flowdown) of the DECam, DES Data Management (DES DM), and CTIO Facilities projects for consistency with the Science Requirements for the Project Director and provide input to the DECam, DES Data Management, and CTIO Facilities project leaders on issues of mutual interest such as pipeline integration and simulations;
4. Assist in the development of the DES survey strategy and review observing and commissioning plans for the Project Director;
5. Review whether the DES DM outputs for simulated survey data satisfy the Science Requirements and, once the survey begins commissioning and observations, whether the raw and processed data obtained with DECam and DES DM satisfy the Science Requirements. In addition the Science Committee will have responsibility for defining and implementing an acceptance test of the DES DM system for the DES Collaboration prior to the beginning of the DES Survey (Oct 2011).
6. Ensure that the science analysis tools that are specified by the Science Committee are developed and tested by the Science Working Groups (WGs) before the survey begins;
7. Organize the testing of the interfaces between the science analysis tools developed by the Science Working Groups (WGs) and the data products provided through the DESDM Archive during the data challenges;
8. Ensure that any software tools developed by the WGs that will enhance access to the DESDM Archive are tested before the survey begins;

9. Provide a framework in which science analyses can be carried out in a timely, collegial, and collaborative manner, with open communication lines;
10. Provide a framework for adjudication of disputes that may arise with regard to DES science;
11. Coordinate the publication of DES science results in journals and conference proceedings;
12. Assist in the preparation of funding proposals for the DES and coordinate presentations on science at DES reviews.

The Science Committee may add other responsibilities and augment the aforementioned responsibilities with the approval of the Management Committee.

B. The Science Committee and Working Group Organization

1. Science Committee Co-Chairs

The DES Project Director shall appoint a chair or two co-chairs of the SC, with the approval of the MC. The terms of these appointments shall normally be up to three years, with the possibility of renewal or reappointment. When there are co-chairs, they will divide the responsibilities between them in consultation with the Project Director.

2. Science Working Groups

The SC chairs will propose Science Working Groups (WGs) that support DES science for approval by the MC. The groups will be charged to organize the scientific efforts of the DES, including but not limited to the Key Projects. At a minimum, the WGs will include the four primary dark energy probes of DES: clusters, weak lensing (cosmic shear), large-scale structure (including BAO and ISW), and supernovae, as well as two WGs that cut across several science areas: photometric redshifts and N-body simulations.

3. Study Groups and additional Science Working Groups

The SC Chairs may establish Study Groups (SGs) with the approval of the Management Committee to consider DES research on Dark Energy as well as in other areas not covered by one of the existing WGs. Each SG will be led by up to two co-organizers and they will be charged by the SC Chairs to prepare and submit a White Paper to the SC. After the study group has completed its White Paper the SC will recommend to the MC one of the following options:

- a. the establishment of a new Science Working Group
- b. the formation of a sub-group of an existing WG
- c. the formation of a “satellite working group” acting within the SC but not necessarily participating in SC meetings on a regular basis
- d. leave the development of research in this area to informal collaborations within DES.

The SC may terminate the activity of a Study Group if the White Paper shows that the proposed science is beyond the scope of DES or is not competitive with other surveys.

As of 2008, five Study Groups have been established: theory and combined probes, quasars, galaxy formation and evolution, strong lensing, and Milky Way archeology.

4. Leadership of the Working Groups

Each WG will have a coordinator or two co-coordinators and each SG will have a coordinator or two co-organizers. The SC chairs will recommend the WG and SG coordinators to the MC, which will make the appointments. These selections will be based on scientific qualifications, the ability and desire to lead the group, and the goal of balancing WG and SG leadership across the participating institutions. The duration of the WG coordinator term shall normally be up to three years, with the possibility of reappointment. In the case of co-coordinators, in consultation with the SC chairs, they will divide the responsibilities between them.

If progress in a particular WG or SG is not satisfactory, then the SC chairs may recommend to the MC that a WG or SG coordinator be replaced before the end of his or her term, with approval required by the MC.

5. Science Committee Membership

The SC co-chairs, along with the coordinators of the original six WGs, will constitute the initial Science Committee. The SC will meet regularly to review progress on the various science projects, to discuss science issues common to the WGs, and to discuss issues requiring coordination among the different groups. All coordinators of the original WGs will be invited to participate in the SC meetings, but in the case of votes by the SC, each Group will have one designated voting member. The Study Group coordinators may be invited to participate in SC meetings on an ad hoc basis. If an SG is transformed into a WG, the SC co-chairs, in consultation with the SC, will recommend to the MC whether the new WG should have representation on the SC. (We have decided not to make this step automatic due to concerns about the size of the SC as well as maintaining focus on the dark energy goals of the project.)

In addition, the SC or SC chairs will meet periodically with the leads of the DECam, Data Management, and CTIO Facilities Improvement projects to ensure that interface issues are being handled smoothly.

II. Science Working Group Membership and Responsibilities

A. Working Group participation

Participation in any Working or Study Group is open to any DES member or participant; there are no formal procedures for joining a group. DES members may propose the creation of new WGs or SGs to the SC; in general, if a critical mass of interested DES members wishes it, and if the SC collectively believes it is in the best

interest of the project, then the SC chairs shall propose it to the MC. This process will also govern the possible subdivision or merging of existing WGs.

B. Science Working Group Responsibilities

1. WG coordinators will organize regular WG meetings to discuss plans and review progress. If there are projects on which progress is not satisfactory or on which there are disputes, the WG coordinators will work with the members of the WG, in consultation with the SC chairs, to restructure the effort.
2. WG coordinators, along with the WG members and in consultation with the SC, will define the suite of analysis projects that should be carried out in each WG during the course of the DES, so that it can achieve its overall science goals. The WG coordinators also have primary responsibility for ensuring that the associated analysis pipelines are developed and tested before the survey begins, working with the DES simulation, Data Management, astrometric, and photometric calibration teams.
3. The WG coordinators will maintain protected websites for each WG, where information on on-going analyses and other development work can be shared (see below). Access to these websites will be open to all DES members, participants, and approved external collaborators. The WG coordinators will also work to promote strong communication across the collaboration within each WG through use of the WG email archives.

III. Science Communication & Collaboration

A. Initiation of Science Projects

1. Whenever one or more DES members or participants wish to start a science analysis project with DES data, including images or catalogs, that have not been released to the public *by the time the project starts*, they shall announce the project to the collaboration and to the appropriate Science WG, in accordance with the procedures described in the Publication Policy, and shall invite other DES collaborators to participate. A list of such project announcements shall be maintained by the DES Publication Board in a central repository. This notification/announcement must be made in the *earliest stages* of the science analysis, *well before* results are ready for publication.
2. If a proposed science analysis project does not fall under the purview of one of the existing WGs, then the proposer(s) shall first consult with the Science Committee chairs, followed by announcement of the project to the DES collaboration, again with invitation for others to collaborate.

B. Communication and Collegiality

1. The WG coordinators are expected to develop a collaborative atmosphere within each WG by setting up regular venues for communication within the group; those working on projects are expected to provide regular updates to their DES colleagues on progress, through emails to the WG archives and oral reports in WG meetings. They are also expected to document their analyses through internal technical notes that shall be posted to the WG archives or website.
2. While collaboration on DES science projects is strongly encouraged, and the WG structure is meant to promote that, multiple papers on the same science topic are not expressly forbidden. The WG coordinators, in consultation with the SC chairs, will work to ensure that such instances are worked out amicably and fairly, as described in the Publication Policy. Their role is especially important in ensuring coordination of publication of Key Science Project results.
3. More generally, the WG coordinators are the first line of defence in adjudicating disputes among WG members, again as described in the Publication Policy. If the relevant WGs are unable to resolve a dispute within the relevant WGs, the issue should be brought to the SC co-chairs for resolution.