

- LIGO SCIENTIFIC COLLABORATION -

<b>Document Type</b>	<b>LIGO-M050172-v20</b>	May 26, 2020
<b>Bylaws of the LIGO Scientific Collaboration</b>		
Bylaws approved April 2020.		

WWW: <http://www.ligo.org/>

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# 1 Membership

## 1.1 Basic Structure

- 1.1.1. The LIGO Scientific Collaboration (LSC) is comprised of LSC Groups.
  - 1.1.2. An LSC Group is comprised of individuals, known as LSC Members. There are two Group types: a single-institution Group and a consortium Group. All Members of a single-institution Group must have a professional association with the institution at which the Group is based. All Members of a consortium Group must have a professional association with one of the institutions whose cooperative research agreement defines the consortium.
  - 1.1.3. A Group Member is any person who will contribute substantially to the Group's scientific commitments to the LSC. An individual may be a Member of more than one LSC Group, but their level of effort (i.e., their Member Work Contribution; see §1.2.3) as reported by each Group should not duplicate effort reported by another Group.
  - 1.1.4. Each LSC Group shall designate one or more Senior Members to be Principal Investigator (LSC-PI) for the Group. These Senior Members determine a Group's overall research plan and direction. The LSC-PI is the formal point of contact for all official LSC business with the Group.
  - 1.1.5. The LSC is responsible for coordinating the scientific research performed with and in support of the LIGO detectors and for ensuring equal scientific opportunity among its member groups and individuals. The development and implementation of future detector systems is part of the LSC mission.
  - 1.1.6. The LSC is governed by the LSC Council (§2.1) and is led by the LSC Spokesperson (§2.2) and the LSC Management Team (§2.4). The LSC Program is prepared by the Program Committee (§2.5).
  - 1.1.7. The continual operation of the Collaboration is performed by its Working Groups (§2.6) and Committees (§2.7), organized in Divisions (§2.8).
    - 1.1.7.1. All Working Groups, Committees, and Divisions must maintain their section of the Policies and Procedures document, LIGO-M1900139, describing their operations. Each section of the Policies and Procedures document will contain a subsection on Policies and another on Procedures. Policies should be generally known by the Members of the Collaboration and the Members are bound by these policies. Changes in the policies must be presented to and approved by the Council. Procedures delineate the practices of a given Working Group, Committee, or Division and they may be modified by each Working Group, Committee, or Division at their discretion.
  - 1.1.8. The LSC reports to the LIGO Directorate, consisting of the LIGO Laboratory Director, the LIGO Scientific Collaboration Spokesperson, the LIGO Scientific Collaboration Deputy Spokesperson, and the LIGO Laboratory Deputy Director.
- ## 1.2 Memoranda of Understanding
- 1.2.1. Each LSC Group in good standing will have a Memorandum of Understanding (MoU) signed by the LIGO Directorate and the LSC-PI of the Group. The MoU will define the Group's institutional structure and any special conditions required for the Group to be part of the LSC. Attachments to the MoU will be updated annually.
  - 1.2.2. The Group's LSC roster lists all Group Members, their position, their planned level of effort, and their institutional affiliation.

1.2.3. The roster includes the following quantities:

- 1.2.3.1. Universal Work Week (UWW) is defined as a person's effort, measured in hours, of a full week of work. The LSC defines  $UWW = 35$  hours.
- 1.2.3.2. Research Hours (RES) is the total number of hours per week, averaged over a year, that an individual devotes to research. An individual's RES value must be  $\leq UWW$ .
- 1.2.3.3. LIGO Research Fraction (LRF) is the fraction an individual's RES devoted to LIGO research for a given LSC group. The sum of an individual's LRF values, across all groups of which they are a Member, must be  $\leq 1$ .
- 1.2.3.4. Member Work Contribution (MWC) represents the fraction of a UWW that an individual works on LIGO research for a given LSC group.  $MWC = RES \times LRF / UWW$ .
- 1.2.3.5. An individual's Total Work Contribution (TWC) is the sum of their MWC over all groups of which they are a Member.  $TWC = \sum MWC$ . For an individual who is a Member of a single group,  $TWC = MWC$ .
- 1.2.3.6. Group Work Contribution (GWC) is the sum of the MWC over all Members of a Group.

1.2.4. Any student listed in a Group's LSC roster must be enrolled in or have a professional association with (one of) the Institution(s) covered by the MoU unless explicitly authorized by the Spokesperson.

1.2.5. Each Group will describe its planned LIGO research in Attachments to their MoU.

1.2.6. For multi-institutional Groups, the Spokesperson, consulting with the MoU Review Panel, will determine if a set of Attachments is required from the Group or from each institution in the Group.

1.2.7. Each year an LSC Group will submit a report detailing the progress made against the commitments described in the Attachments of previous year's MoU. The report, which is submitted with the MoU Attachments, is reviewed by the MoU Review Panel (See §7.8).

1.2.8. If the MoU review process ends with a recommendation to sign, the MoU will be signed by the LIGO Directorate and the LSC-PI for the Group and the Group will maintain their LSC membership.

### **1.3 LSC Group Admission**

1.3.1. New Groups are admitted to the LSC through a vote of the LSC Council. They remain members of the LSC until they withdraw (§1.8.2), have their membership expire (§1.8.3), or are expelled (§1.8.4).

1.3.2. Groups interested in joining the LSC will contact the LSC Spokesperson. They will develop a plan together with the Spokesperson and other Members of the LSC for how the Group will contribute to the LSC. This plan will be described in Attachments to the Group's draft MoU with LIGO (§1.2).

1.3.3. When the candidate Group's plan is complete, the Spokesperson will transmit the draft MOU and Attachments to the Collaboration Council as a motion to admit the Group to membership. The candidate Group will present its proposed collaborative program to the Collaboration Council at a regularly scheduled meeting. A vote by Council on the Group's application will be held following the presentation. Approval requires a 2/3 majority of those voting, excluding abstentions.

## **1.4 LSC Principal Investigators**

- 1.4.1. The admission of a new LSC Group represents approval of its proposed contributions and LSC Principal Investigator (LSC-PI) by the LSC Council.
- 1.4.2. An LSC Group may change or add an additional LSC-PI. The LSC Group will inform the LSC Spokesperson in writing of the change. The Spokesperson will inform the LSC Council.
- 1.4.3. For an LSC Group with more than one LSC-PI, all LSC-PI's shall take full responsibility for their Group.
- 1.4.4. The LSC-PI is responsible for ensuring that all individuals in their Group understand and comply with the rules of the LSC, including those in the LSC Code of Conduct (§1.9).
- 1.4.5. The LSC-PI takes ultimate responsibility for the Group's performance against the commitments delineated in the Group's MoU and its Attachments.

## **1.5 Responsibilities of Groups**

- 1.5.1. Each LSC Group makes an on-going commitment to the LSC Program. The Collaboration contributions are overseen by the Working Groups and Committees defined in Sections §3–§7 of these Bylaws.
- 1.5.2. Each LSC Group has responsibilities, including contributions to membership fees, assessed by the Management Team (§2.4) and paid annually.
- 1.5.3. Each LSC Group must contribute at least a minimum amount of its GWC (§1.2.3) commensurate to its membership as defined in LIGO-M1900139 to the operations and infrastructure tasks which are listed in the LSC Program.
- 1.5.4. Each LSC Group has the responsibility and obligation to share openly with the Collaboration all their research efforts, which includes data, software, analysis results, hardware designs, and any other results or products within the LSC scope of research as defined within the LSC Program. All Members of LSC Groups share these responsibilities and obligations.
- 1.5.5. Each LSC Group has the responsibility of ensuring that their Members adhere to the Code of Conduct, §1.9.

## **1.6 Senior Members**

- 1.6.1. A Senior Member is any Group Member who independently manages their own research line. The LSC-PI will designate all Senior Members in their Group.
- 1.6.2. To add a new Senior Member to an existing LSC Group, the LSC-PI shall contact the LSC Spokesperson, who may review the situation with the Management Team. The proposed new Senior Member will make a presentation to the Collaboration Council at its next meeting.
- 1.6.3. Adding a new Senior Member who is not a current LSC Member to an LSC Group requires approval by a 2/3 vote of the ballots cast by the LSC Council.

## 1.7 Rights of Members

- 1.7.1. All Members of the Collaboration will have free and equal access to any detector data taken by the Collaboration, provided that they abide by Collaboration rules for the use, distribution, and publication of results from the detector data. Members who intend to analyze data to extract observational results or study the detectors will do so by joining, participating in, and coordinating with the appropriate Working Group.
- 1.7.2. LSC Members who have made substantial contributions to the LSC Program earn the right to authorship on all LSC-wide publications.
- 1.7.3. Other LSC Members may petition for authorship on a specific paper; petitions must be approved by the Management Team.
- 1.7.4. The author list is revised in February and in August every year according to the following rules:
  - 1.7.4.1. An author's TWC must be 0.2 or larger. See §1.2.3 for the definition of this quantity.  
If a Member has made substantial contributions to the LSC Program, but their TWC has fallen below 0.2 due to extenuating circumstances such as medical or parental leave, the Member may request from the Spokesperson an exemption from this requirement.
  - 1.7.4.2. The February list will contain the names of current LSC Members who joined the LSC prior to June 15 of the previous year and who have devoted at least 50% of their research effort toward LIGO since that date. It will also contain the names of past LSC Members who had earned authorship but have left the Collaboration (or whose research effort fell below the 50% level) after February 15 of the previous year.
  - 1.7.4.3. The August list will contain the names of current LSC Members who joined the LSC prior to December 15 of the previous year and who have devoted at least 50% of their research effort toward LIGO since that date. It will also contain the names of past LSC Members who had earned authorship but have left the Collaboration (or whose research effort fell below the 50% level) after August 15 of the previous year.
  - 1.7.4.4. An author who leaves the Collaboration in good standing and then rejoins with an effort level that meets these requirements will be added back to the author list without the waiting period.
- 1.7.5. An individual who either voluntarily withdraws from the Collaboration or is a member of a Group that voluntarily withdraws from the Collaboration will retain rights to co-authorship on LSC-wide publications as specified in §1.7.4. Individuals may waive this right by notifying the Spokesperson or the chair of the Editorial board. After the authorship period expires, the individual may still petition to the Spokesperson to be added to the author list if a significant contribution by the departing individual will first appear in that paper.
- 1.7.6. Undergraduate students represent a special case, because they frequently have a shorter time horizon for LSC membership and benefit more from near-term rewards than longer term ones.
  - 1.7.6.1. Undergraduates who perform at the level of a typical graduate student and have a longer anticipated association with the LSC may be included as Long-Term Undergraduate Student in the Group's LSC roster and the Group will accrue all the normal rights and responsibilities of their full LSC membership. This decision is the responsibility of the LSC-PI and is verified annually by the MOU Review Panel.

- 1.7.6.2. Undergraduates with a shorter anticipated association with the LSC may be listed in a separate category (Short-Term Undergraduate Student) in the Group's LSC roster. Such students do not increase a Group's Council representation or other Group Responsibilities to the Collaboration. They may be included as coauthors on LSC papers by special petition, and LSC-PI's are encouraged to propose undergraduate authors through this mechanism to reward their contributions in a timely way.
- 1.7.7. LSC Members who choose to participate in activities of other GW or GW-related astrophysics Collaborations may only do so under the provisions of the LSC Policy on membership in other GW-related Collaborations, LIGO-M1200043.
  - 1.7.7.1. An unpublished idea learned from discussions with other LSC Members must not be shared with those not in the LSC, or designated as a collaborator organization for that domain of research, without explicit permission from the LSC Member (or Members) who conceived the idea.
  - 1.7.7.2. When composing talks, papers and workshop presentations, LSC Members should explicitly attribute technical contributions, significant ideas, calculations, measurements, and plans to those groups and people from which they originate. This is standard practice in the scientific community. Members with multiple citizenship should be especially careful to avoid making presentations with unattributed content.
- 1.7.8. Any LSC Member who has been an author-eligible Member of the LSC for more than 10 years, who retires, and who no longer contributes to the LSC Program, may within one year apply to receive emeritus LSC Member status. The request will be presented as a motion by an LSC-PI and will be voted on by the Council.
  - 1.7.8.1. Persons who already are retired may apply for emeritus status within a year after the approval of these bylaws.
  - 1.7.8.2. Emeritus Members remain in an LSC Group, but do not add to that Group's required contributions to LSC operations or fees.
  - 1.7.8.3. Emeritus Members maintain access to the DCC and to other LIGO and LSC resources such as their ligo.org email account.
  - 1.7.8.4. Emeritus Members are not automatically authors, but their names may be added by petition to papers to which they have contributed.

## **1.8 Termination of Membership**

- 1.8.1. The LSC-PI shall remove the name of any individual from the Group's LSC roster, when that individual ceases to be a Member of the Collaboration from that Group for any reason. The individual will normally retain all rights as a former Collaboration Member under §1.7.
- 1.8.2. A Group may end their membership in the Collaboration by notifying the Spokesperson in writing of their intent to withdraw. The Spokesperson shall record the change in the Collaboration membership.
- 1.8.3. A Group whose MOU remains unsigned due to non-performance for two consecutive MOU cycles will have their membership expire and members of the Group will immediately lose their authorship rights. The Spokesperson will notify the Council regarding all Groups whose membership has expired. Groups whose membership has expired are eligible to reapply to join the LSC using the standard application process.



- 1.8.4. An individual or Group may be expelled from the Collaboration for willful and/or egregious violations of Collaboration rules, including the Code of Conduct LIGO-M1900037. The Standards and Conduct Committee (§7.9) sets procedures for this process. If the recommendation is approved by a 2/3 majority vote, excluding abstentions, of the ballots cast by the Council, the Group or individual is expelled from the Collaboration, and they will not retain any further authorship rights under §1.7.5.
- 1.8.5. After leaving the Collaboration, former Members may not use any LSC proprietary knowledge, information, data, or research products that are not publicly available and to which they gained access through their Collaboration membership.
- 1.8.6. Groups leaving the Collaboration have the obligation to leave all products (code, analysis intermediate or final results, documents) developed or in development for LSC-scope research available to the Collaboration.

### **1.9 Code of Conduct**

- 1.9.1. The LSC strives for inclusive workplaces free from discrimination and harassment. It is the policy of the Collaboration that all Members will conduct themselves in a professional manner that is welcoming to all participants and free from any form of discrimination, harassment, or retaliation. Members will treat each other with respect and consideration to create a collegial, inclusive, and professional environment. Creating a supportive environment to enable scientific discourse is the responsibility of all Members.
- 1.9.2. The LSC makes every effort to maintain the highest ethical standards. Fabrication, falsification, or plagiarism in proposing or performing research shall not be tolerated. All who made substantial contributions to a work are included as authors. The LSC gives credit to those who originated ideas used in its research. Scientific work is reviewed fairly and objectively, maintaining the confidentiality of the work reviewed.
- 1.9.3. LSC Members shall maintain confidentiality of results, plans, and designs not publicly available within the Collaboration.
- 1.9.4. Document LIGO-M1900037 defines the Code of Conduct for the LSC.

## **2 Governance**

### **2.1 The Collaboration Council**

- 2.1.1. The Collaboration is governed by the Collaboration (or LSC) Council. The Council has the responsibility to discuss scientific and procedural matters arising in the Collaboration, is informed of all significant activities of committees of the LSC, and votes on Collaboration policies and directions. All votes are by simple majority, excluding abstentions, unless otherwise indicated. Specifically, the Council:
  - 2.1.1.1. Elects the Spokesperson;
  - 2.1.1.2. Votes on new Group memberships;
  - 2.1.1.3. Approves and revises the LSC Charter and Bylaws (as specified in the Charter);
  - 2.1.1.4. Ratifies appointments made by the Spokesperson for a Deputy Spokesperson (§2.2.7), for Division Chairs (§2.8), for members of the Program Committee (§2.5) and for members of the MoU Review Panel (§7.8);
  - 2.1.1.5. Carries out other responsibilities as indicated in the LSC Charter and Bylaws.
- 2.1.2. Every LSC Group is allowed representation on the LSC Council, based on its GWC (defined in §1.2.3). The number of representatives is defined as  $GWC/5$ , rounding up. Thus an LSC group with  $GWC \leq 5$  has 1 representative, while an LSC group with  $5 < GWC \leq 10$  has 2 representatives. Each LSC group is responsible for declaring via the LSC roster which of their members are council representatives, updating at least once every 6 months.
- 2.1.3. Collaboration Council members represent their Group and have the responsibility to discuss Council issues with those they represent. Each Council member is expected to actively participate to the governance process of the Council; if this is not possible, a different delegate should be designated.
- 2.1.4. **The Council Chair**
  - 2.1.4.1. The Collaboration, through the Council, elects a Council Chair. The LSC Council Chair has the responsibility and authority to facilitate the governance process of the Council. The Chair's responsibilities include all aspects of planning and conducting Council meetings in consultation with the Spokesperson and documenting the Council decisions.
  - 2.1.4.2. The Council Chair motivates and supports Council members in participating in the discussion and in bringing forward motions to Council.
  - 2.1.4.3. The Council Chair may delegate certain responsibilities to other LSC members in case of need or conflict. The choice of substitute should be discussed with the Spokesperson (who could take on the role if appropriate for the meeting in question).
  - 2.1.4.4. The position will be for 2 years, and will be phased to alternate with Spokesperson elections in March of appropriate years. The Council may remove the sitting Chair with a 2/3 majority vote, excluding abstentions.

### **2.2 Spokesperson for the Collaboration**

- 2.2.1. The Spokesperson leads the LSC, and is empowered to represent the LSC to the public and to the broader scientific community.

- 2.2.2. The Spokesperson is a member of the LIGO Directorate. The Spokesperson shares in developing strategies and resolving challenges faced by LIGO, and uses the forum of the Directorate to address LSC issues at the interface to the Laboratory.
- 2.2.3. The Spokesperson is responsible for the proper functioning of the LSC, and is responsible and empowered to resolve differences and deadlocks in any issues arising in the LSC. In particular, the Spokesperson has the responsibility to ensure that final approval for publications and release of scientific result is brought to completion, in agreement with the Council policies.
- 2.2.4. In the event that any elected or appointed position is vacated temporarily or indefinitely (including but not limited to reasons of leave, illness, suspension, etc.) the Spokesperson is empowered to appoint an interim replacement until the leave ends or the position can be filled through normal procedures. In exceptional cases, the Spokesperson may (with the consent of the LSC Management Team) remove an elected leader of an LSC Working Group.
- 2.2.5. In addition, the Spokesperson:
  - 2.2.5.1. Chairs the Management Team.
  - 2.2.5.2. Organizes a minimum of two full meetings of the Collaboration each year.
  - 2.2.5.3. Identifies key issues and opportunities and brings them to the attention of the Collaboration.
  - 2.2.5.4. Provides leadership regarding additions to the membership, for evolution and innovation in Collaboration activities, and for advances in external collaborative relationships.
  - 2.2.5.5. Provides a receptive ear for any member of the Collaboration who wishes to raise any issue of concern; resolves otherwise unsolved differences between individuals or committees in Collaboration issues.
  - 2.2.5.6. Represents the Collaboration to the LIGO Oversight Committee and in formal presentations to the funding agencies.
  - 2.2.5.7. Participates (as a member of the LIGO Directorate) in setting the charge for the Program Advisory Committee and receives advice from the PAC on behalf of the Collaboration.
- 2.2.6. The Spokesperson is elected by the Collaboration Council to a two-year term, with re-election possible. Spokesperson elections will be by secret ballot, following the procedures in LIGO-M1900139. The Spokesperson may be removed by a two-thirds majority vote, excluding abstentions, of the Collaboration Council.
- 2.2.7. The Spokesperson may appoint a Deputy Spokesperson. The term of the Deputy Spokesperson ends at the conclusion of the term of the Spokesperson. The appointment shall be confirmed by a majority vote, excluding abstentions, of the Collaboration Council. The Deputy Spokesperson may be removed at the discretion of the Spokesperson, in which case the Spokesperson will inform the Council of the decision.
- 2.2.8. The Spokesperson may delegate some responsibilities to the Deputy Spokesperson, but ultimate authority always remains with the Spokesperson.
- 2.2.9. The LSC Spokesperson is responsible for maintaining the Collaboration organization chart, LIGO-M1200248, which should include the current Divisions, Committees, Working Groups, and all appointed positions.

### **2.3 LSC Ombuds Office**

- 2.3.1. The LSC Ombuds Office provides confidential, informal, independent, and neutral dispute resolution advisory services for all members of the LIGO Scientific Collaboration. The role of the Ombuds Office is described in LIGO Document M1300006. The policy of the LSC for formally addressing interpersonal concerns or problems is described in LIGO Document M1300005.

### **2.4 Management Team**

- 2.4.1. The Management Team is the group that implements the policies created by the Council and coordinates the activities of the LSC.
- 2.4.2. The Management Team is chaired by the Spokesperson or by the Spokesperson's delegate.
- 2.4.3. The Management Team will meet nominally weekly, and the notes from the meeting will be made available to the LSC.
- 2.4.4. The Management Team consists of:
- 2.4.4.1. The Spokesperson (elected) and Deputy Spokesperson (if one is appointed by LSC Spokesperson).
  - 2.4.4.2. The LIGO Lab Executive Director and Deputy Director.
  - 2.4.4.3. A representative of each LIGO Observatory (appointed by the LIGO Laboratory Executive director).
  - 2.4.4.4. One representative from the LIGO-India Observatory and one from the GEO600 Observatory.
  - 2.4.4.5. Observational Science Committee Chair (appointed by LSC Spokesperson).
  - 2.4.4.6. Instrument Science Committee Chair (appointed by LSC Spokesperson).
  - 2.4.4.7. Operations Committee Chair (appointed by LSC Spokesperson).
  - 2.4.4.8. Communication Committee Chair (appointed by LSC Spokesperson).
  - 2.4.4.9. Internal Resource Committee Chair (appointed by LSC Spokesperson).
  - 2.4.4.10. A Detector Characterization Committee co-Chair (appointed by LSC Spokesperson).
  - 2.4.4.11. A Computing and Software Committee co-Chair (appointed by LSC Spokesperson).
  - 2.4.4.12. An Editorial Board co-Chair (appointed by LSC Spokesperson).
  - 2.4.4.13. The senior (earliest elected) Chair from each Observational Science Working Group.
  - 2.4.4.14. Two members, elected by and from the Council, holding staggered two-year terms.
- 2.4.5. Decisions by the Management Team will be by vote, with the results given in the meeting minutes.
- 2.4.6. The Spokesperson may invite other (non-voting) members from the the Collaboration to specific meetings.

### **2.5 Program Committee**

- 2.5.1. The Program Committee is charged with formulating the Science Program of the LSC. The scientific program will be consistent with and use as references the LSC white papers (§3.1.4.2,4.1.4.2.,5.1.6,6.1.4) and Publication Plan (§3.1.4.3).

- 2.5.2. The LSC Program will be approved by the Council by majority vote, excluding abstentions, and made available as a public document within 2 months of the Spring Collaboration meeting. The Program will be used to guide activities and priorities in the following MoU cycle.
- 2.5.3. The Program Committee will provide the Council and the Working Groups with an annual assessment and critical feedback of the LSC Program, after the annual MoU review process is concluded.
- 2.5.4. The Spokesperson can assign other responsibilities to the Program Committee as deemed necessary.
- 2.5.5. Members of the Program Committee are proposed by the LSC Spokesperson and ratified by the Council. New appointments to the Committee will be made every year within a month following the Fall LVC meeting.
- 2.5.6. The members of the Program Committee are:
  - 2.5.6.1. A Chair, appointed for two years.
  - 2.5.6.2. A Deputy Chair, appointed for two years, who will become Chair at the end of their term.
  - 2.5.6.3. Twelve members drawn from the LSC, consisting of members with high scientific expertise and experience, such as those who have held leadership roles in the collaboration. The members should be broadly distributed across LSC research expertise, GWC, and demographics. Each member will be appointed for three years, with staggered terms so that each year four new representatives are appointed.
  - 2.5.6.4. The LIGO Directorate, as ex officio members.

## **2.6 Working Groups**

- 2.6.1. LSC research is carried out by Working Groups. Each Working Groups is a member of a Division (§2.8).
- 2.6.2. Working Groups are open to the whole Collaboration.
- 2.6.3. Working Groups are created as needed to allow Collaboration members to address specific needs and interests of the Collaboration. New working groups are proposed to, and voted on by, the LSC Council. Once approved, the chair or chairs are either elected or appointed by the Spokesperson, following the practices of the relevant Division (§2.8).
- 2.6.4. Each Working Group will prepare and maintain a section in the LSC Policies and Procedures document describing how the Working Group operates. The chair of the Division will review the document and approve changes. Substantial changes (as identified by the Division chair) will be voted on by the Council.
- 2.6.5. The procedure for choosing elected Working Group Chairs is described in §7.5. Observational Science Working Groups have two co-chairs. Terms are two years.
- 2.6.6. Each Working Group will maintain and regularly update a working mailing list of members.
- 2.6.7. Chairs of the Working Groups are members of the appropriate Divisions, as defined in §2.8.
- 2.6.8. Each Working Group will prepare regular reports of progress and plans, which in general will be made up of contributions to the relevant White Paper and contributions to LSC status reports prepared by the Spokesperson.

2.6.9. Apart from election of their Chair, Working Groups may determine their internal decision-making processes (elections, consensus, etc.) Working Groups may establish subgroups as they see the need for them.

## **2.7 Committees**

2.7.1. A Committee has defined membership with at least one Chair.

2.7.2. Standing Committees are defined in these Bylaws. Each Standing Committee is a member of a Division §2.8.

2.7.3. The Spokesperson may appoint additional, Ad Hoc Committees for specific tasks or objectives.

2.7.4. Each Standing Committee will prepare and maintain a section in the LSC Policies and Procedures document describing how the Committee operates. The chair of the division will review the document and approve changes. Substantial changes (as identified by the division chair) will be voted on by the Council.

## **2.8 Divisions**

2.8.1. Committees and Working Groups respond to one of five Divisions, which are described in the next sections of this document. The Divisions are:

- Observational Science Division (§3);
- Instrument Science Division (§4);
- Operations Division (§5);
- Communication Division (§6);
- Collaboration Standards and Services Division (§7).

2.8.2. The Spokesperson appoints a Chair for each Division; these appointments are ratified by the Council.

2.8.3. Each Division will prepare and maintain a section in the LSC Policies and Procedures document describing how the Division operates. The Spokesperson will review the document and approve changes. Substantial changes (as identified by the Spokesperson) will be voted on by the Council.

### **3 Observational Science Division**

#### **3.1 Basic Structure**

- 3.1.1. The Observational Science Division is responsible for coordinating, overseeing, and reviewing observational science work.
- 3.1.2. A Chair of the Observational Science Division is appointed by the LSC Spokesperson for a two year term.
- 3.1.3. The members of the Observational Science Division Steering Committee are the Observational Science Division Chair, the two co-chairs of each Observational Science Working Group, and the review chair of each Observational Science Working Group.
- 3.1.4. The Observational Science Division will:
  - 3.1.4.1. establish Review Committees for observational science groups and is responsible to see that a thorough review of analyses is performed.
  - 3.1.4.2. prepare and maintain a White Paper relevant to the Collaboration's plans and activities for future observational science updated annually. The annual update of the White Paper will be completed and made available one month before the due date for the annual MoU review.
  - 3.1.4.3. maintain a Publication Plan (currently described in section 2.6 of LIGO-M060322, the LIGO-Virgo MoU, Attachment A).
  - 3.1.4.4. Coordinate with other Collaborations with whom the LSC has an established and approved MoU.
- 3.1.5. Regular Observational Science Division meetings are open to all LSC members and any LSC member can participate in the deliberations.
- 3.1.6. LSC matters relating to the responsibilities laid out in §3.1.4 may be decided by consensus or, at the discretion of the Division Chair, by a vote of the LSC Observational Science Division Steering Committee.
- 3.1.7. The Chair of the Observational Science Division may call meetings limited to the Division's Steering Committee.
- 3.1.8. New Observational Science Working Groups are proposed to, and voted on by, the LSC Council, in an action that modifies the LSC Bylaws, as specified in the LSC Charter.
- 3.1.9. The chair or co-chairs of Observational Science Working Groups are elected.
- 3.1.10. Observational Science Working Groups organize and oversee the work of any sub-groups that may be created according to §2.6.9. Only Observational Science Working Groups may bring an analysis (and publication) forward for review.
- 3.1.11. Any sub-group jointly created by two or more Observational Science Working Groups should designate and report through a primary Observational Science Working Group. The primary Observational Science Working Group may be different for different target sources.
- 3.1.12. Working groups shall maintain a list of all on-going analysis activities, which will include a description of the activity and the individual who serves as the point of contact for the activity.
- 3.1.13. Collaboration papers originate in the Observational Science Working Groups, consistent with the Collaboration paper planning process.

### **3.2 Burst Working Group**

- 3.2.1. The Burst Working Group is devoted to searching for transient gravitational wave signals without relying on accurate knowledge of the waveforms. Because of the wide variety of potential signals, Burst Group members employ a range of detection strategies, from focused searches for reasonably well-modeled astrophysical objects to search methods which are designed to detect signals with completely arbitrary waveforms.
- 3.2.2. The Burst Working Group has two co-chairs serving two-year terms. The co-chairs are elected in alternate years.

### **3.3 Compact Binary Coalescence Working Group**

- 3.3.1. The Compact Binary Coalescence (CBC) Working Group searches and characterizes modelled gravitational wave signals from compact binary mergers.
- 3.3.2. The Compact Binary Coalescence Working Group has two co-chairs serving two-year terms. The co-chairs are elected in alternate years.

### **3.4 Continuous Waves Working Group**

- 3.4.1. The Continuous Waves Working Group is tasked with searching for the signatures of continuous gravitational waves. The Continuous Waves Working Group carries out searches for continuous gravitational waves targeted at known astronomical objects, interesting sky directions, and all-sky searches for as-yet unknown sources.
- 3.4.2. The Continuous Waves Working Group has two co-chairs serving two-year terms. The co-chairs are elected in alternate years.

### **3.5 Stochastic Background Working Group**

- 3.5.1. The Stochastic Working Group focuses on searches for the stochastic background of gravitational waves. The stochastic background is expected to arise from a superposition of many incoherent astrophysical sources of gravitational waves, from different directions in the sky, and with different polarizations. It is also expected to be generated by a variety of cosmological processes, in which case it would carry unique information about the earliest moments of the evolution of the Universe.
- 3.5.2. The Stochastic Working Group has two co-chairs serving two-year terms. The co-chairs are elected in alternate years.



## **4 Instrument Science Division**

### **4.1 Basic Structure**

- 4.1.1. The Instrument Science Division is responsible for organizing and documenting the Collaboration's instrument science research for the current detector, planned detector upgrades, and future detectors.
- 4.1.2. The Chair of the Instrument Science Division is appointed by the LSC Spokesperson for a term of two years.
- 4.1.3. The members of the Instrument Science Division Steering Committee are the Chair of the Division and the Chairs of the instrument Science Working Groups.
- 4.1.4. The Instrument Science Division will:
  - 4.1.4.1. Review and consider any LSC support for detector upgrade projects, and for major changes to LSC technology R&D in support of these, in advance of such support.
  - 4.1.4.2. Prepare and maintain a White Paper describing the Collaboration's research activities for the current detector, planned detector upgrades, and future detectors. The annual update of the White Paper will be completed and made available one month before the due date for the annual MoU review.
- 4.1.5. Regular Instrument Science Division meetings are open to all LSC members and any LSC member can participate in the deliberations.
- 4.1.6. Actions relating to the responsibilities laid out in §4.1.4 are decided by a vote of the Instrument Science Division's Steering Committee.
- 4.1.7. The Chair of the Division may call meetings limited to the Instrument Science Division's Steering Committee.
- 4.1.8. New Instrument Science working groups are proposed to, and voted into existence by the LSC Council, in an action that modifies the LSC Bylaws, as specified in the LSC Charter.
- 4.1.9. The chair or co-chairs of Instrument Science Working Groups are elected.
- 4.1.10. Instrument Science Working Groups organize and oversee the work of any sub-groups that may be created according to §2.6.9. Only Instrument Science Working Groups may bring a full authorship publication forward for review.
- 4.1.11. Any sub-groups jointly created by two or more top-level groups should designate and report through a primary instrument science group.

### **4.2 Advanced Interferometer Configuration Working Group**

- 4.2.1. The Advanced Interferometer Configuration Working Group carries out theoretical and experimental research towards upgrades of the LIGO detectors as well as for future gravitational wave detectors. The AIC scope covers optical topologies, top-level detector design, Newtonian noise suppression, aspects of relevant science cases as well as overall integration issues and the control of the lengths, alignments, and wavefronts in the interferometer.
- 4.2.2. The chair of the Advanced Interferometer Configuration Working Group is elected for a two-year term.

### **4.3 Control Systems Working Group**

- 4.3.1. The Control Systems Working Group covers fundamental and applied research in control systems as it relates to gravitational-wave interferometers, including system identification, modeling, analysis, machine learning, optimization, performance assessment, calibration, hardware implementation, and software implementation.
- 4.3.2. The chair of the Control Systems Working Group is elected for a two-year term.

### **4.4 Lasers & Auxiliary Optics Working Group**

- 4.4.1. The Lasers and Auxiliary Optics Working Group addresses all types of classical lasers and other optical auxiliary systems encompassing all technologies which are not part of any of the other working group. The group addresses lasers at a variety of wavelengths and powers, laser stabilization, auxiliary lasers for lock acquisition and for thermal control, photodiodes, modulators, isolators, cryogenics, wavefront control, and beam shaping.
- 4.4.2. The chair of the Lasers & Auxiliary Optics Working Group is elected for a two-year term.

### **4.5 Optics Working Group**

- 4.5.1. The Optics Working Group covers research in all areas of gravitational-wave detector optics, including materials for the test masses of gravitational-wave detectors, thermal noise associated with test masses, fibers, and bonds, charging issues, coatings for test masses, coating thermal noise, coating optical loss, and coating mechanical loss.
- 4.5.2. The chair of the Optics Working Group is elected for a two-year term.

### **4.6 Quantum Noise Working Group**

- 4.6.1. The Quantum Noise Working Group covers research (experiment and theory) involving squeezed light sources, quantum-non-demolition topologies, and research on quantum radiation pressure effects.
- 4.6.2. The chair of the Quantum Noise Working Group is elected for a two-year term.

### **4.7 Seismic Isolation and Suspensions Working Group**

- 4.7.1. The Seismic Isolation and Suspensions Working Group covers research in seismic isolation, suspension design, and suspension thermal noise, including the mechanical design of the suspensions, the thermo-mechanical properties of the suspension materials, suitable techniques for damping suspension resonances, and methods of applying signals for interferometer control.
- 4.7.2. The chair of the Seismic Isolation and Suspensions Working Group is elected for a two-year term.

## **5 Operations Division**

### **5.1 Basic Structure**

- 5.1.1. The Operations Division plans, organizes and manages all LSC activities related to, and necessary for, detector operation, including (but not limited to) the production of calibrated, high-quality strain data as well as the computing infrastructure required to carry out strain data production.
- 5.1.2. While the LIGO Laboratory directs and carries out a large fraction of LIGO operations, the LSC Operations Division focuses on continuing to leverage the expertise and effort of the entire LSC in support of this important work, and to more widely develop human resources in this area.
- 5.1.3. The Operations Division's Chair is appointed by the LSC Spokesperson.
- 5.1.4. The members of the Operations Division Steering Committee are the LIGO Laboratory Chief Detector Scientist, a chair (or one of the co-chairs) from each of the Detector Characterization, Calibration and Low-latency Working Groups; and from each of the Run Planning, Computing and Software, and Support of Observatories Committees.
- 5.1.5. Chairs of the Operations Division Working Groups are appointed by the LSC Spokesperson.
- 5.1.6. The Operations Division will prepare and maintain a white paper covering the LSC's activities related to operations.
- 5.1.7. The Operations Division will meet at regular times.
  - 5.1.7.1. Meetings of the Operations Division are to be open to the entire LSC, and will be used to coordinate and consult among the chairs, to prepare and approve the white paper text, and to handle any other relevant business.
- 5.1.8. Decisions of the Operations Division will be made by majority vote, excluding abstentions, of the Division's Steering Committee.

### **5.2 Detector Characterization Working Group**

- 5.2.1. The Detector Characterization (DetChar) Working Group is responsible for organizing and documenting the Collaboration's efforts in detector characterization and the development of tools for that purpose.
- 5.2.2. Two co-chairs of the DetChar Working Group are appointed by the LSC Spokesperson for a term of two years, with staggered terms.
- 5.2.3. The DetChar Working Group should include members that collectively have expertise in the instrumentation of the LIGO detectors, noise sources and characterization methods, and the astrophysical GW analyses (including long and short duration GW sources as well as searches and parameter estimation methods).
- 5.2.4. The DetChar Working Group will prepare and maintain a list of detector characterization activities relevant to the Collaboration's scientific program, with an up-to-date version to be available one month before the due date for the annual MoU review included in the relevant Collaboration white paper.

5.2.5. This working group will regularly provide data quality products for the GW analyses during an observing run and validation of GW candidates. This group will also characterize the performance of the LIGO detectors and the quality of the noise as is relevant to the astrophysical analyses and liaise with the LIGO commissioning teams and LSC fellows.

### **5.3 Calibration Working Group**

5.3.1. The Calibration Working Group is responsible for organizing, delivering, and documenting the calibration information for the detectors in the Collaboration.

5.3.2. The Calibration Working Group has two co-chairs, who are appointed by the LSC Spokesperson, in consultation with the LIGO Lab Directorate, for a term of two years. Between them, they must have significant experience with calibration issues in instrument science and with observational science.

5.3.3. The Calibration Working Group has the following appointed members: one representative from each of the standing Observational Science Working Groups; one representative from each of the detector sites; together with additional members who have responsibility for calibration hardware, model development and maintenance,  $h(t)$  production, and any other members, expertise in analysis and instrument science as needed. The representatives are appointed by the Spokesperson for two year terms, in consultation with the Calibration Working Group chairs, Observational Science Working Group chairs and the observatory site heads.

5.3.4. Membership in the Calibration Working Group is open to all LSC members.

5.3.5. A Calibration Review Committee is appointed by the Spokesperson to give guidance, support, and independent review of the Calibration Working Group's efforts. Its members and Chair serve for two year terms.

5.3.6. The Calibration Working Group will prepare and maintain documentation of the calibration, and inform the Collaboration of any planned changes in procedure or scope in advance. The Calibration Working Group's work also includes support of calibration hardware (eg, the photon calibrator), a model of the detector response to gravitational waves, measurements to validate the modeled response and measure the model parameters, and precision calibrated strain time-series  $h(t)$  for gravitational wave science, and associated documentation needed for data analysts to make informed use of the calibrated strain.

### **5.4 Low-latency Working Group**

5.4.1. The Low-latency Working Group plans, organizes and oversees analysis activities necessary to provide and disseminate low-latency event information within and outside the LSC.

5.4.2. This Working Group's chair is appointed by the Spokesperson for a term of two years after nomination by the Observational Science Division chair.

5.4.3. This Working Group should include people with expertise and experience in the software and operation of the low-latency pipeline and members from other groups whose activities are required for the low-latency tasks.

5.4.4. This Working Group will liaise with other groups developing and deploying analysis methods required for low-latency tasks.

5.4.5. This Working Group's scope does not include further analysis and communication activities that occur once the rapid-response analysis is complete for each event candidate and the event information is disseminated.

## **5.5 Run Planning Committee**

5.5.1. The Run Planning Committee is charged with the strategic planning of engineering and observing runs and advises the LIGO Laboratory Operations Management Team (OMT) on proposed observing run start dates, run duration, and other relevant activities. It will coordinate activities with other gravitational-wave partners. The run schedules of LIGO detectors are determined by the OMT.

5.5.2. The chair of the Run Planning Committee is appointed by the LIGO Laboratory Directorate.

5.5.3. The members of the Run Planning Committee are the chair, the two LIGO site detection coordinators (appointed by the LIGO Lab.), a representative of LIGO-India, a GEO 600 representative (appointed by GEO), the chair of the Operations Division, and an observational science representative (appointed by the Observational Science chair).

5.5.4. The chair of the Run Planning Committee may appoint additional members to the Run Planning Committee, as needed.

5.5.5. The Run Planning Committee works with other gravitational-wave partners on:

5.5.5.1. Coordination of strategic planning of detector upgrades, engineering runs, maintenance intervals, and observations;

5.5.5.2. Prioritization and coordination of coincident operation and of complementary coverage as appropriate;

5.5.5.3. Coordination of both coincident and individual-detector observing with concurrent external (non-gravitational wave) observations to optimize scientific opportunity;

5.5.5.4. Proactive and timely communication of detector status and plans for consideration by the full Collaborations.

5.5.6. The Run Planning Committee maintains and updates observing run schedule with partners.

## **5.6 Computing and Software Working Group**

5.6.1. The Computing and Software Working Group is responsible for organizing and documenting the Collaboration's computing hardware and software infrastructure and for formulating plans for its evolution.

5.6.2. Two co-chairs of the Computing and Software Committee are appointed by the LSC Spokesperson for a term of two years.

5.6.3. The Computing and Software Working Group will prepare and maintain White Papers relevant to the Collaboration's plans and activities for computing and software, with an up-to-date version to be available one month before the due date for the annual MoU review.

5.6.4. The Computing and Software Working Group will coordinate with gravitational-wave partners as described agreements with those partners.

## **5.7 Support of Observatories Committee**

- 5.7.1. This committee is responsible for coordinating contributions by LSC members in direct support of Observatory activities. This includes LSC Fellows and other LSC members who make long-term visits to the sites (LIGO-M1400310).
- 5.7.2. Two co-chairs are appointed by the LSC Spokesperson, in consultation with the LIGO Laboratory Directorate.
- 5.7.3. Members are appointed by the LSC Spokesperson and are expected to be broadly experienced in work carried out at the observatories.
- 5.7.4. This committee will operate in close coordination with LIGO Laboratory operations and with relevant LSC Operations committees and working groups.

## **5.8 Open Data Working Group**

- 5.8.1. The Open Data Working Group is responsible for the release of instrumental data and associated documentation to the public. It will coordinate activities with other gravitational-wave partners, whose data are included in releases.
- 5.8.2. The latency and data to be released are as described in the LIGO Data Management Plan (LIGO-M1000066).
- 5.8.3. A chair of the Open Data Working Group is appointed by the LIGO Spokesperson, in consultation with the LIGO Directorate, for a term of two years.
- 5.8.4. The Open Data Working Group will:
  - 5.8.4.1. develop and maintain the Gravitational Wave Open Science Center web server, services and products;
  - 5.8.4.2. prepare, document, and release LIGO instrumental data, as described in the Data Management Plan;
  - 5.8.4.3. coordinate with other LSC working groups to document publicly available products from data analysis, including electronic catalogs and parameter estimation results;
  - 5.8.4.4. provide support for the community of people working with open data
- 5.8.5. An Open Data Review Committee is appointed by the Spokesperson to give guidance, support, and independent review of the public release of data. Its members and Chair serve for two year terms.

## **6 Communications and Education Division**

### **6.1 Basic Structure**

- 6.1.1. The Communications and Education Division is responsible for overseeing and documenting the Collaboration's activities in education and public outreach. The Communications and Education Division is also responsible for formulating the Collaboration's strategic plans to harness the excitement and enthusiasm generated by gravitational wave research in order to inspire and educate students and the general public in astronomy and fundamental science.
- 6.1.2. The Communications and Education Division has a Chair appointed by the LSC Spokesperson for a term of two years.
- 6.1.3. The members of the Communications and Education Division Steering Committee are the Division Chair and one representative of each of the committees listed in §6.2–6.7. Additional members of the Communications and Education Division Steering Committee are appointed by the Communications and Education Division Chair for two year terms in consultation with the LSC Spokesperson. The Communications and Education Division Steering Committee includes a representative from each of the observatories, and covers a spread of interests and expertise in formal and informal education, media relations, and public and professional outreach.
- 6.1.4. The Communications and Education Division is responsible for preparing and maintaining a White Paper relevant to the Collaboration's plans and activities for education and public outreach, with an up-to-date version to be available before the beginning of the annual LSC MoU review cycle.
- 6.1.5. The Communications and Education Division develops press releases on behalf of the Collaboration and coordinates LSC press conference events. The LIGO Directorate will give final approval of these press releases and events.
- 6.1.6. The Communications and Education Division coordinates the projects and wider outreach efforts undertaken across the LSC through its standing committees.

### **6.2 Formal Educational Committee**

- 6.2.1. The Formal Educational Committee coordinates educational activities taken on by LSC entities.

### **6.3 Informal Education and Public Outreach Committee**

- 6.3.1. The Informal Education and Public Outreach Committee supervises the collaboration's informal education and public outreach activities.

### **6.4 Professional Outreach Committee**

- 6.4.1. The Professional Outreach Committee manages the collaboration's interaction with the scientific community, such as at conferences and meetings.

### **6.5 LSC Web Committee**

- 6.5.1. The LSC Web Committee maintains and hosts internal LSC web pages (ligo.org) as well as the LSC public pages.

## **6.6 Media Relations Committee**

- 6.6.1. The Media Relations Committee is the LSC forum for coordinating media activities, particularly those associated with formal announcements of scientific results. It coordinates as needed with partner collaborations.

## **6.7 LIGO Magazine Committee**

- 6.7.1. The LIGO Magazine Committee publishes twice a year the LIGO Magazine, which details the latest research, news and personalities across the diverse group of LSC members.



## **7 Collaboration Standards and Services Division**

### **7.1 Basic Structure**

- 7.1.1. The Collaboration Standards and Services Division addresses tasks and topics related to the climate within the LSC, equitable share of visibility, Collaboration organization issues, and Collaboration administrative functions.
- 7.1.2. The Chair of the Collaboration Standards and Services Division is appointed by the LSC Spokesperson for a two years term.
- 7.1.3. The members of the Collaboration Standards and Services Division Steering Committee are the Division Chair and one representative of each of the committees listed in §7.2–§7.9.
- 7.1.4. The Collaboration Standards and Services Division will periodically meet.

### **7.2 Diversity, Equity, and Inclusion Committee**

- 7.2.1. The Diversity, Equity, and Inclusion Committee oversees and documents the Collaboration’s activities relevant to LSC members’ diversity, equity, and inclusion.
- 7.2.2. The Committee Chair is appointed by the LSC Spokesperson for a term of two years.
- 7.2.3. Members of the committee are appointed by the Committee Chair, with approval of the LSC Spokesperson, for terms of two years. Terms are staggered for continuity.
- 7.2.4. Diversity in this context includes different genders, race and ethnic backgrounds, socioeconomic backgrounds, countries of origin, and self-identified membership in groups that are underrepresented in scientific and technical fields.
- 7.2.5. To ensure that these issues are properly addressed, a member of the Diversity, Equity, and Inclusion Committee shall also be a member of the Speakers and Awards Committee §7.6. In addition, the Diversity, Equity, and Inclusion Committee shall appoint a liaison to the LAAC.
- 7.2.6. Some of these issues, as they affect people *outside* of our Collaboration, may be properly addressed by the Communications and Education Division.
- 7.2.7. The Committee prepares and maintains a public document that contains quantitative goals of the Collaboration, and a Best Practices guide for the Collaboration. Both documents should be updated as needed, at least annually.
- 7.2.8. The Committee prepares and maintains a White Paper (action plan) relevant to the Collaboration’s plans and activities towards the goals, with an up-to-date version to be available before the beginning of the annual LSC MoU review cycle
- 7.2.9. The Committee coordinates the projects and wider efforts undertaken by the LSC diversity working group, membership of which is open to the entire LSC.

### **7.3 LSC Academic Advisory Committee**

- 7.3.1. The LSC Academic Advisory Committee (LAAC) is responsible for overseeing and documenting the Collaboration's activities in representing and protecting the interests of students and postdocs. The LAAC is also responsible for providing education and training activities for new students and postdocs in the Collaboration. Its policies and procedures are described in LIGO-M1900139.
- 7.3.2. The elected members of LAAC are the two co-chairs, two senior LSC members, two postdoctoral members, and two graduate student members. These members of the LAAC will be elected following elections procedures in LIGO-M1900139. The term of membership will be two years, and members may run for reelection.
- 7.3.3. The LAAC co-chairs will appoint an LSC member to the committee in the position of Beginner's Guide Maintainer. This person is responsible to update and maintain the Beginners Guide to LIGO. The term of the Beginner's Guide Maintainer is one year and reappointment is possible.

### **7.4 Meetings Committee**

- 7.4.1. The Meetings Committee is responsible for organizing and coordination the Collaboration's meetings, following the procedures in LIGO-M1900139.
- 7.4.2. The chair of the Meetings Committee is appointed by the LSC Spokesperson for a term of two years.
- 7.4.3. Members of the Meetings Committee are: two appointed by the spokesperson for two-year terms, the Diversity Committee chair (or designee), a LAAC chair (or designee), and two who have been the chairs of the local committees of the two most recent LSC-organized Collaboration meetings
- 7.4.4. Once a meeting host is selected for a future meeting, the chair of its local organizing committee will also serve as a member of the Meetings Committee.
- 7.4.5. One appointed member is assigned by the Spokesperson to be the Scientific Organizing lead.
- 7.4.6. Most meetings will be held in close partnership with other observational collaborations, following agreements formalized in memoranda of understanding. If so, the LSC Meetings Committee will cooperate with their counterparts as specified in the agreements.

### **7.5 Election and Membership Committee**

- 7.5.1. The Election and Membership Committee organizes and oversees all elections processes, including setting dates for elections, soliciting nominations, carrying out the elections, and informing the collaboration of results.
- 7.5.2. The chair of the Election and Membership Committee is appointed by the LSC Spokesperson for a term of two years.
- 7.5.3. Members of the Election and Membership Committee are appointed by the LSC Spokesperson for terms of two years. Terms are staggered.
- 7.5.4. The Election and Membership Committee oversees the elections for Collaboration Spokesperson, for chairs of working groups, for elected chairs and members of committees, and for other elected LSC representatives, following procedures in LIGO-M1900139.
- 7.5.5. The Election and Membership Committee is responsible for maintaining the membership roster of the Collaboration, and the authorship list.

## **7.6 Speakers and Awards Committee**

- 7.6.1. The Speakers and Awards Committee (SAC) is responsible for promoting LSC scientific accomplishments by actively cultivating opportunities for LSC members to present LSC results to the broader scientific community through invited talks at conferences and meetings. Also, the committee is responsible to broaden participation in these meetings among LSC members.
- 7.6.2. The SAC receives requests for speakers, finds speakers to present on behalf of the Collaboration, maintains a list of upcoming conferences, and maintains a database of members speaking at past conferences.
- 7.6.3. The SAC proactively contacts conference organizing committees to seek speaking opportunities for LSC members.
- 7.6.4. Invitations received by an LSC member for talks dealing with LIGO science at a workshop or a conference are regarded as invitations to the Collaboration. Such invitations may not be accepted by members of the LSC without prior approval of the SAC. All talks given “on behalf of the LSC” require SAC preapproval.
- 7.6.5. Invitations received by an LSC member for seminars and colloquia are regarded as invitations to an individual. No prior approval is required.
- 7.6.6. The SAC also has the task of actively seeking opportunities for LSC members to be nominated for scholarly prizes, awards, and fellowships.
- 7.6.7. The SAC shall follow policies and procedures outlined in LIGO-M1900139.
- 7.6.8. The chair of the SAC is appointed by the LSC Spokesperson for a term of three years.
- 7.6.9. The SAC will consist of 6 members appointed by the Spokesperson for two-year terms. The committee will consist of 2 members from each of the three areas: Data analysis, Instrument Science, and Detector Characterization.
- 7.6.10. It is anticipated that at least some members will serve for two or more terms, allowing this committee to establish long-term relationships with meeting organizers and sponsors and to proactively plan LSC representation in meetings in their earliest planning stages.

## **7.7 Editorial Board**

- 7.7.1. The Editorial Board is responsible for maintaining adherence to the Publications and Presentations policy, following the procedures in LIGO-M1900139. In broad strokes, this includes:
  - 7.7.1.1. Shepherding papers about LSC scientific results through the publication process, including circulation to the Collaboration, reviewing by assigned Editorial Board members for appropriate scientific scope and presentation quality, attaching the final author list, and approving submission of the paper to the journal and the archive.
  - 7.7.1.2. Managing the circulation and review of proposed technical publications and listing any required changes.
  - 7.7.1.3. Maintaining a full and complete list of all Collaboration Publications in any medium and making that list accessible to the Collaboration and to the general scientific community.
  - 7.7.1.4. Reviewing proposed presentations and listing any required changes.

- 7.7.2. The Editorial Board will include two co-chairs, who are appointed by the Spokesperson for 2-year terms.
- 7.7.3. The Editorial Board will consist in total of 8 persons appointed by the Spokesperson for 2-year terms. They may call on all members of the LSC to help them in their tasks.

## **7.8 MoU Review Panel**

- 7.8.1. The Spokesperson appoints an MoU Review Panel to make an annual critical review of the accomplishments of the LSC Groups against their past MoU Attachments and their proposed work as described in their new Attachments. The MoU Review Panel evaluates the contribution of each LSC Group to the LSC program and how it applies to details in the relevant white papers.
- 7.8.2. This Panel makes recommendations to sign, to sign after specified changes, or not to sign each Group's MoU Attachments. Outcomes of the MoU Review Panel will be made available to the LSC Council.
- 7.8.3. The chair of the MoU Review Panel is appointed by the LSC Spokesperson for a term of two years.
- 7.8.4. The MoU Review Panel will rotate in membership to the extent possible to guarantee appropriate balance in technical expertise, in interest, and among LSC groups.
- 7.8.5. The procedure of the review is described in LIGO-M1900139.

## **7.9 Standards and Conduct Committee**

- 7.9.1. The Standards and Conduct Committee is responsible for advising the spokesperson, Council, and Collaboration about issues involving the LSC code of conduct.
- 7.9.2. The chair of the Standards and Conduct Committee is appointed by the LSC Spokesperson for a term of two years.
- 7.9.3. Members of the Standards and Conduct Committee are appointed by the LSC Spokesperson for two-year terms. Members are chosen from a broad cross section of the collaboration to minimize conflicts of interest.
- 7.9.4. Matters to be addressed by the Standards and Conduct Committee may be brought to the committee's attention by the Spokesperson or by any member of the Collaboration.
- 7.9.5. The Standards and Conduct Committee will advise the LSC Spokesperson and other members with administrative duties concerning conflicts of interest and ethical standards, following the procedures in LIGO-M1900139.
- 7.9.6. The Committee will make decisions on specific issues when its opinion is requested. The Committee shall investigate such requests and will bring the issue to the Council if it thinks it needs Council action.
- 7.9.7. The Committee will revise, update, or clarify the LSC Code of Conduct, LIGO-M1900037, and the LSC Policy for Formal Complaints and Grievances, LIGO-M1300005, as necessary.