

# Mandate for the convener of the FCC/TLEP-WG11 “Detector Designs”

## 1. Physics Objectives

- a. Propose hardware solutions for potential TLEP (sub-) detectors, to match the performance requirements from the studies from the other physics working groups (“Electroweak Physics at the Z pole”, “Di-boson Physics and W mass measurement”, “H(126) properties”, “Top quark physics”, “Experimental signatures of new physics”, “QCD and  $\gamma\gamma$  physics”, and “Flavour physics”).
- b. Understand the limitations and constraints from the machine and interaction point layout (keeping close contacts with the groups “Machine-Detector interface” and “Experimental Environment”), as well as from the Online aspects (studied in the group “Online Software and Computing”) and contribute to proposing solutions in case of conflicting requirements.
- c. Seek synergies with linear collider studies whenever appropriate. Explore also all other avenues (LHC-like detectors, LEP-like detectors, common Lepton/Hadron-collider detectors, etc.), with the goal of having material for up to four interaction points.

## 2. Managerial objectives

- a. Define and start the activities of the group with a global vision, seeking for international collaboration. Synergies with linear collider teams, in particular, will have to be exploited whenever deemed relevant and useful.
- b. Attract people for the studies relevant to the group. The list of TLEP subscribers with a declared interest in detector designs is compiled in the mailing list [TLEP-DetectorDesigns@cern.ch](mailto:TLEP-DetectorDesigns@cern.ch). One of the roles of the convener is to extend this list as much as possible (and ask new interested people to subscribe to the study through <http://tlep.web.cern.ch>).
- c. Maintain a high level of contacts with the other groups of the studies, especially those mentioned in paragraph 1.a. It is highly advisable to have group members participate to the activities of the other groups, especially if relevant to achieve the scientific objectives of the group.
- d. Create adequate sub-groups to match the group scientific objectives, and suggest appropriate sub-conveners, possibly starting with a high-profile convener for each of the sub-groups.

- e. Find, within about a year, one (or two) associate(s) to work as co-conveners, and able to take over the convener task after two years or thereabout (although of prolongation of the mandate of the first convener until the end of the study is not excluded, of course).
- f. Appoint editors towards the production of intermediate reviews and a final yellow report. (See “Timescale and deliverables below.”)
- g. Report progress to the physics coordination of the study and at regular TLEP physics meetings (held monthly for the time being).

### **3. Timescale and deliverables**

The Working Group “Detector Designs” is part of the physics coordination of the TLEP design study, itself part of the FCC (Future Circular Collider Design Study at CERN). The FCC study consists of three phases:

- a first phase, called “Exploration” until March 2015 or thereabout, which will serve exploring all possible options and potential studies, and identifying requirements and constraints;
- a second phase, called “Analysis” until September 2016 or thereabout, where the identified baselines are conceptually studied in detail and in an integrated fashion, and where the relative merits and costs are assessed;
- a third and last phase, called “Elaboration”, expected to last until the end of 2017, which delivers all information in terms of technical concepts and costs, required for the final Conceptual Design Report (CDR) of the study.

Each phase will conclude with a workshop and a review milestone that will layout the directions of the next phase. It would therefore be instrumental to foresee an interim written reports of the work of the group after each the first two phases. A final yellow report, which will be part of the FCC CDR, is to be delivered at the beginning of 2018, and will document the scientific achievements of the group, expected to match or exceed the objectives set in the first section.

The “Phase 0” for TLEP physics studies, called “Preparation” is happening now. It should be concluded within a few weeks by the delivery, from the group convener to the physics coordinator, of a document describing in some details the “scope” for the group, with work areas and timeline.