16.02.2026

Memorandum of Cooperation (MoC)
Between the members of the new FCAL collaboration

Introduction

FCAL-LUMI and FCAL-LUXE are international collaborations of physicists from different Institutes (listed in Annex 1) who join their efforts to build highly compact and granular calorimeters. The two collaborations form the new FCAL collaboration.

The FCAL-LUMI collaboration plans to build a system of such calorimeters for the purpose of luminosity measurement at future colliders, linear or circular.
The FCAL-LUXE is building a calorimeter, based on the technology of FCAL, for measuring the multiplicity and energy distribution of positrons in the future LUXE experiment.

The purpose of this Memorandum of Cooperation (MoC) is to provide a document describing the collaboration among the groups (hereafter called "the Partners"), and the organisational structure of the FCAL-LUMI and FCAL-LUXE collaborations. It replaces an earlier version of the FCAL MoC, as the old FCAL collaboration terminated in February 2025.

Article 1

Scope

1.1 This MoC defines the framework under which the Partners shall cooperate in both collaborations and describes the organisational structure and decision mechanism of FCAL-LUMI and FCAL-LUXE.
1.2 This MoC shall be complemented by Annexes, which shall form an integral part of this MoC.

Article 2

The FCAL-LUMI & FCAL-LUXE Collaborations

The FCAL-LUMI and FCAL-LUXE Collaborations, in coordination with the CERN DRD R&D working groups, aim at:

- Hardware development for detector prototypes, their readout electronics and data acquisition, in part carried out within the DRD R&D working groups.

- Studies of the physics potential and prospects for precision measurements at the future colliders and in the Strong-Field QED (SFQED) domain, including aspects related to luminosity, beam polarisation and studies of the transition between perturbative and non-perturbative QED.

- Detector simulation and optimisation studies including software development for event generation, detector simulation, event reconstruction and analysis.

Article 3

Organisational structure and decision mechanism

The Organisational structure of the FCAL-LUMI and FCAL-LUXE collaborations shall include the following entities:

1. The Institute Board (IB) – the same one for both collaborations.

2. The FCAL-LUMI Spokesperson and the FCAL-LUXE Spokesperson.

3. The Deputy-Spokesperson, one for FCAL-LUMI and one for FCAL-LUXE.

The organisational structure of the FCAL collaborations resembles that of most HEP experiments. The Partners will be represented in the “Institute Board” (IB).

3.1 The Institute Board (IB)

- Comprises one member from each Partner participating in the FCAL collaboration.
- Meets at least twice per year.
- Defines the research direction of the collaboration, taking higher-level constraints and strategies into account.
- Shall elect its Chairperson.
- Shall elect the Spokesperson of the Collaboration.
- Approves the appointment of the Deputy-Spokesperson following the proposal by the Spokesperson.
- Defines the rules applicable in the execution of the collaboration, including the rules for the election and renewal of appointments and the publication rules and internal procedures for public presentations and publications.
- Admits new Partners to the Collaborations,

3.2 The Spokesperson

- Manages the collaboration.
- Launches working groups with specific responsibilities.
- Communicates the results to the scientific community and to the public, encourage their use and monitor their proper citation.
- Encourages analyses and assures that they are completed and lead to high quality presentations and publications.
- Assures the communication within the Collaboration.
- Proposes the Deputy-Spokesperson.

3.3 The Deputy-Spokesperson

– Is proposed by the Spokesperson and approved by the IB.

– Assists in matters agreed between the Spokesperson and the Deputy.

Article 4

Responsibilities of the Partners

4.1 The Partners shall, on a best effort basis, contribute to the FCAL collaboration.

4.2 Any specific agreement on a contribution to FCAL by a Partner may be set out in an Annex to this MoC.

4.3 Signing this MoC does not result in any financial or in-kind obligations for the participating institutes.

Article 5

Intellectual property

5.1 Proprietary information, including any information protected by trademark, patent or copyright, whether pre-existing or developed in the execution of this MoC, contributed to the collaboration by a Partner in the execution of this MoC, shall not create any right in respect of that information for the other Partners, other than a free, irrevocable and non-exclusive license to use such information in so far as required for the execution of this MoC or in the scope of its scientific programme, for non-military purposes.

5.2 The Partners provide no warranties or representations of any kind to each other. They shall have no liability to each other with respect to the subject matter of this Article and each Partner shall be exclusively liable for the consequences of its use of proprietary information contributed to the collaboration.

Article 6

Publications and presentations

Publication rules and internal procedures for public presentations and publications require approval by the IB, and shall be set out in Annex 2 to this MoC.

Article 7

Liability

The Partners shall have no liability to each other in the execution of this MoC.

Article 8

New Partners

The FCAL Collaboration intends to welcome new Partners. The admission of any new Partner is subject to the formal approval by the IB.

Article 9

Entry into force and duration

9.1 This MoC enters into force upon signature by at least 4 Partners. It can be terminated by a common decision of all Partners.

9.2 Any Partner may withdraw from this MoC, upon a six-months-in-advance written notice to the IB.

Article 10

Dispute resolution

The Partners shall settle any difference concerning this MoC through a consensus. Where this is not possible, the CB shall appeal to an external scientific expert to help in reaching an agreement. Notwithstanding reference of the dispute, the Partners shall continue to perform their obligations under this MoC.

Annex 1: The Partners

(Status: 16 February 2026)

1. AGH University of Krakow, Faculty of Physics and Appl. Comp. Science, 30-059 Krakow, Poland

2. Deutsches Elektronen Synchrotron (DESY), Platanenallee 6, 15738 Zeuthen, Germany

3. Agencia Estatal Consejo Superior de Investigaciones Científicas, C/Serrano 117, 28006 Madrid, Spain, through its Instituto de Física Corpuscular (IFIC-CSIC)

4. Institute of Space Science – INFLPR Subsidiary, 409 Atomistilor Street, 077125 Magurele, Ilfov, Romania

5. School of Physics and Astronomy, Tel Aviv University, 69978 Tel Aviv, Israel

6. University of Warsaw, Faculty of Physics, Pasteura 5, 02-093 Warszawa, Poland

7. Niels Bohr Institute, Copenhagen University, Jagtvej 155, 2200 Copenhagen N, Denmark

8. Department of Physics and Astronomy, Aarhus University, Ny Munkegade 120, DK-8000 Aarhus C, Denmark

List of all Partners. To be updated each time a new Partner has joined.

Annex 2: Organisational Structure – Internal Procedures

This Annex contains more detailed descriptions of the organisational structure and internal procedures, beyond those described in the text of the MoC.

A. Procedure to elect the chairperson of the Institute Board

• **Election procedure:**The chairperson of the Institute Board (IB) is elected by the IB members (one vote per partner, i.e. per MoC signed). For the election, the IB first has to select a polling officer: a simple majority of cast votes is sufficient for the election of the polling officer. The polling officer:

o Solicits nominations from the IB members.

o Discusses with the nominees to form a list of candidates.

o Organizes the election in the IB, which normally will take place via email.

In the election, each partner has **one vote**. The chairperson of the IB is elected by **absolute majority of all partners** (i.e. not simply the absolute majority of the cast votes). If no candidate reaches an absolute majority, the polling officer discusses with the candidates with the aim of obtaining a reduced field of candidates for a second round of voting. In this second round, the IB chairperson is also elected by **absolute majority of all partners**. Should this not result in the election of a candidate, a third round is conducted with the two highest-ranked candidates of the previous round. In this final round, the IB chairperson is elected by **simple majority (50% of all cast votes)**.

• **IB chairperson term of office:** The term of office of the IB chairperson is **2 years**, after which a new election will take place.

B. Institute Board Meetings: Agenda and Minutes

The agenda of the IB meetings needs to be announced to the IB members well in advance. The agenda is initially protected and will be made public once the meeting has been closed. Minutes of the IB meetings will be written and distributed to the IB members within two weeks for comments. After their approval (electronically) by the IB members they will be made public.

C. Procedure to elect the Spokesperson

• **Election procedure:**The spokesperson is elected by the Institute Board. For the election, the chair of the IB acts as a “polling officer”. The polling officer:

o Solicits nominations from the IB members.

o Discusses with the nominees to form a list of candidates.

o Organizes the election in the IB, which normally will take place via email.

In the election, each partner has **one vote (**i.e. one vote per MoC signed). The spokesperson is elected by **absolute majority** of all partners. If no candidate reaches an absolute majority, the polling officer discusses with the candidates with the aim of obtaining a reduced field of candidates for a second round of voting. In this second round, the spokesperson is elected by **absolute majority** of all partners. Should this not result in the election of a candidate, a third round is conducted with the two highest-ranked candidates of the previous round, where the spokesperson is elected by **simple majority (50% of all cast votes)**.

• **Spokesperson term of office:**The term of office of the spokesperson is **2 years**, after which a new election will take place.

D. Time of elections

The election of IB chair and of Spokespersons should be held one year apart.

Annex 3: Procedures for conferences and publications

Publication and Speakers Committee

- The Publication and Speakers Committee (PS) is responsible for implementing policy with regards to all types of publication from the FCAL collaboration and for organizing conference presentations from members of the Collaborations:

- The PS consists of a Chair and three other members. The PS chair is proposed by the Spokesperson and approved by the IB.

- The other members of the publication committee are selected by the Spokesperson in consultation with the chair of the PS.

- Members of the PS normally serve for a period of two years.

- The PS is responsible for both the review procedure for papers/notes and for making sure that the internal documentation/webpages are maintained. Publications/Notes based on studies performed as part of one of the broader detector R&D and detector concept collaborations will be reviewed and published by those collaborations.

- For plenary talks, the PS in consultation with the Spokesperson, proposes the name of the speaker, considering the nature of the meeting.

- The PS is responsible for maintaining a list of talks from the members of the Collaborations.

- For major workshops/conferences the PS should propose a list of possible contributions to optimise the visibility of the Collaborations.

- Normally, slides should be made available for comments two days before the talk will be given.

- The PS is responsible for ensuring that the collaboration is aware of significant conferences where results from the FCAL Collaboration could be presented. The Chair, together with the Spokesperson, is responsible for lobbying for talks at major meetings.

- For major HEP conferences, it is the responsibility of the PS to submit abstracts on behalf of the Collaborations.

- In the case where a specific person has been asked to speak at a conference, they should inform the Chair of the PS. Normally, no further action is required.

Publication Rules

Four types of publication are covered, each with specific rules:

Collaboration-wide papers, journal papers such as reviews summarizing broad areas of physics, detector R&D or the design of detectors.

Single/multiple author papers, journal papers based on a specific study, for example a paper summarizing the performance of particular components of a detector.

Notes which are not submitted to a journal but are publicly available.

Conference proceedings.

Publications will be encouraged to be submitted to the arXiv.

Theses (PhD and Master) that have been submitted and defended at the home university / institute of the student. These are not reviewed by the collaboration.

Journal Publications

In all cases it is the responsibility of the PS to organize the review of the publication and for the formal sign-off. The publication procedure is as follows:

For all journal publications, there will be an open review process using the Collaboration webpage.

Collaboration-wide publications will use the Collaboration author list.

The author list for other journal publications will be determined by the authors, but requires approval by the PS chair. In some cases the PS chair may recommend that additional contributions should be recognized or that the paper should use the full collaboration author list. Such papers should acknowledge *the Collaboration.* They should have a footnote on the front page with the following: *"This study was performed within the framework of the FCAL-LUMI or FCAL-LUXE collaboration".*

Once the draft paper is placed on the Collaboration webpage, it will be announced to the collaboration with a two-week deadline for comments.

The PS will assign two reviewers for publications. The reviewers will place comments on the Collaboration webpage within the review period.

After the two-week review period the authors will produce a final draft paper based on the comments received.

Where there are unresolved issues or disagreement, the PS chair will adjudicate.

It is the responsibility of the PS to ensure that the comments have been addressed and to formally approve the paper for submission to the journal.

Once approved, it is the responsibility of the authors to submit the paper to the journal and place it in the arXiv.

Conference Proceedings

The rules for conference proceedings are as follows:

Conference proceedings will be submitted under the name of the presenter and will include the words “on behalf of the *FCAL-LUMI or FCAL-LUXE Collaboration”*. In some circumstances the presenter might wish to add one (or more) additional names as authors for a conference note.

It is the responsibility of the PS to post the draft on the Collaboration webpage and to initiate a one-week review period.

At the end of the one-week review period, the author(s) should prepare the final document – no further iteration is necessary.

Notes

The rules for publicly visible notes are as follows:

Notes appear under the names of the author(s). There should be a footnote on the front page with the following: *“This study was performed within the framework of the FCAL (FCAL-LUXE) Collaboration*”;

It is the responsibility of the PS to post the draft in Collaboration webpage and to initiate a two-week review period.

At the end of the two-week review period, the author(s) should prepare the final document.

Collaboration Author List

The PS will maintain the official collaboration author list and ensure that it is updated every six months.

On collaboration wide publications, authors will be listed alphabetically.

It is the responsibility of the IB representatives to provide a list of authors from their institute to the PS. Authors should have made some contribution to the *FCAL Collaboration* over the course of the preceding year.

It is the responsibility of the PS to ensure that the list is reasonable and to iterate with the IB representatives.

Intellectual Property

The PS shall ensure that, where publication ma affect any intellectual property of the Partners, appropriate measures are taken to protect such intellectual property prior to publication.

Annex 4: Signature form template

THE PARTNER ……

Declares that he agrees with the content in the Memorandum of Cooperation of the FCAL Collaboration

Done in PLACE, Date

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For the PARTNER

.....
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NAME
……...

FUNCTION
……...