Recommendations of the 99th Physics Research Committee

At its **99th meeting on 7-9 April 2025**, the PRC reviewed all groups, projects and activities of particle physics at DESY. During this meeting, the **PRC also met with the Astroparticle Physics Committee (APC)** in order to explore commonalities and to exchange information, particularly addressing the areas of detector development and software. The conclusions from the joint discussions will be published in a separate document.

The PRC recognises that, overall, **all activities are going well**. Particularly pleasing are the good performance of the LHC and its experiments – the HL-LHC upgrades have made important progress over the last 6 months, and several exciting new results were shown – and the successful start-up of the ALPS II experiment with first results presented. The testbeam facility has again performed well in 2024. With the ELBEX EU grant for an extraction beamline from the European XFEL, the LUXE experiment is making long strides towards its realisation. The experiment is aiming for CD2 as a next step, which is important for the collaborators to secure construction funding. The Theory group conducts outstanding research, offers direct support and conceptual framing for DESY experiments, and attracts world-leading researchers to Germany.
The FH platforms for detector R&D and for scientific computing are operational and facilitate communication, coordination, and planning. The platforms are important in view of the European strategy for particle physics update (ESPPU), the PoF V strategy evaluation process, and also the engagement in the new DRD collaborations.

Recent FH milestones include

- the very successful PoF review in February 2025: specific recommendations received on the FH activities in the MU and MT programs comprise to maintain the ability to react to external pressure (e.g. concerning HL-LHC components / schedule), the on-site lab programme, the position of DESY in the field of AI, and the sharpening of the detector R&D profile. The latter two points will specifically be addressed in the forthcoming PoF strategy evaluation process, with central planning roles for the aforementioned platforms.
- DESY scientists had numerous leading roles (e.g. for Higgs factories, non-collider experiments, muon and plasma-based colliders, R&D activities, European networks) in preparing inputs to the update process for the European strategy for particle physics (ESPPU).

Concerning the last point, the PRC takes note of the **strong support to establish a DESY "axion platform"** expressed by the German particle and astroparticle communities in their respective ESPPU inputs. Such a platform and infrastructure would complement the DESY collider activities with a strong and leading non-collider program on axions and ALPS. The PRC also notes that the ultimate sensitivity of the DESY axion platform will not only explore a wide region of the ALP parameter space but, most remarkably, include a sizeable stretch of the ``QCD axion band''. This has the potential to ultimately solve the strong CP problem and explain all dark matter in the universe. Not least in view of this scientific promise and the high expectations towards DESY, the PRC suggests that a particular urgency is to define a construction model for the BabyIAXO magnet and to make progress on its funding within such a model. The PRC strongly encourages DESY management to support the funding process and to establish a realisation model with CERN and industry.

With the **expansion of the on-site experimental program,** relatively large collaborations will use DESY as a host lab for an extended length of time (5-10 year). This has consequences to which the PRC wants to direct the attention:

- There is a growing pressure on availability of essential services and infrastructure. These include the cryo-platform and general cryogenic support, magnet services and expertise, the ELBEX beamline, site adaptations, optics expertise, software and operational support, and related topics.
- There is a need to re-discuss and better define the roles of DESY as the host lab and of institutes collaborating in the on-site experiments, for the various phases of the experiments (construction, installation, commissioning, operation). Rules, guidelines and procedures for setting up, approving, and running such international experiment at DESY need to be clarified.

The PRC is voicing a **number of additional concerns**:

- Care must be taken to fit all essential activities in the available – decreasing – resources, a constraint that currently affects all FH groups. This requires, in particular, a careful planning in preparations of the PoF strategic evaluation.
- These reductions come at a time where it remains a priority to ensure that sufficient technical personnel for the imminent construction projects are maintained or built up – e.g. for the LHC experiments and for the on-site experimental activities, and key cross-cutting services that are important for a wide international and national community – such as support for future collider project studies, scientific software developments, and testbeam operations, need to be preserved.
- Hiring restrictions are mostly felt in the reduced numbers of Ph.D. students and postdocs and, correspondingly, in the scientific output. In some cases, the retirements of people with long-standing key expertise bring the danger that this expertise is lost completely.
- The future of the testbeam facility in the PETRA IV era should be secured, given its importance for DESY's own R&D activities and also for the European and wider international landscape.

The next meeting of the PRC (11/12 November 2025) will be the 100th meeting of the committee, and a special session to celebrate this is being planned.