

Matter and the Universe

Ties Behnke

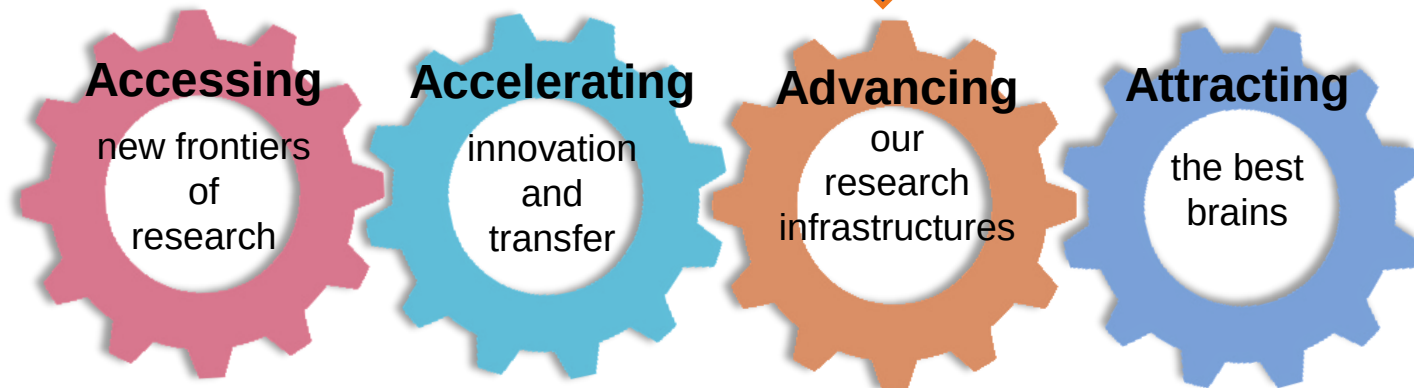
19.6.2025

Our A⁴ strategy supports our mission

Matter A⁴ strategy

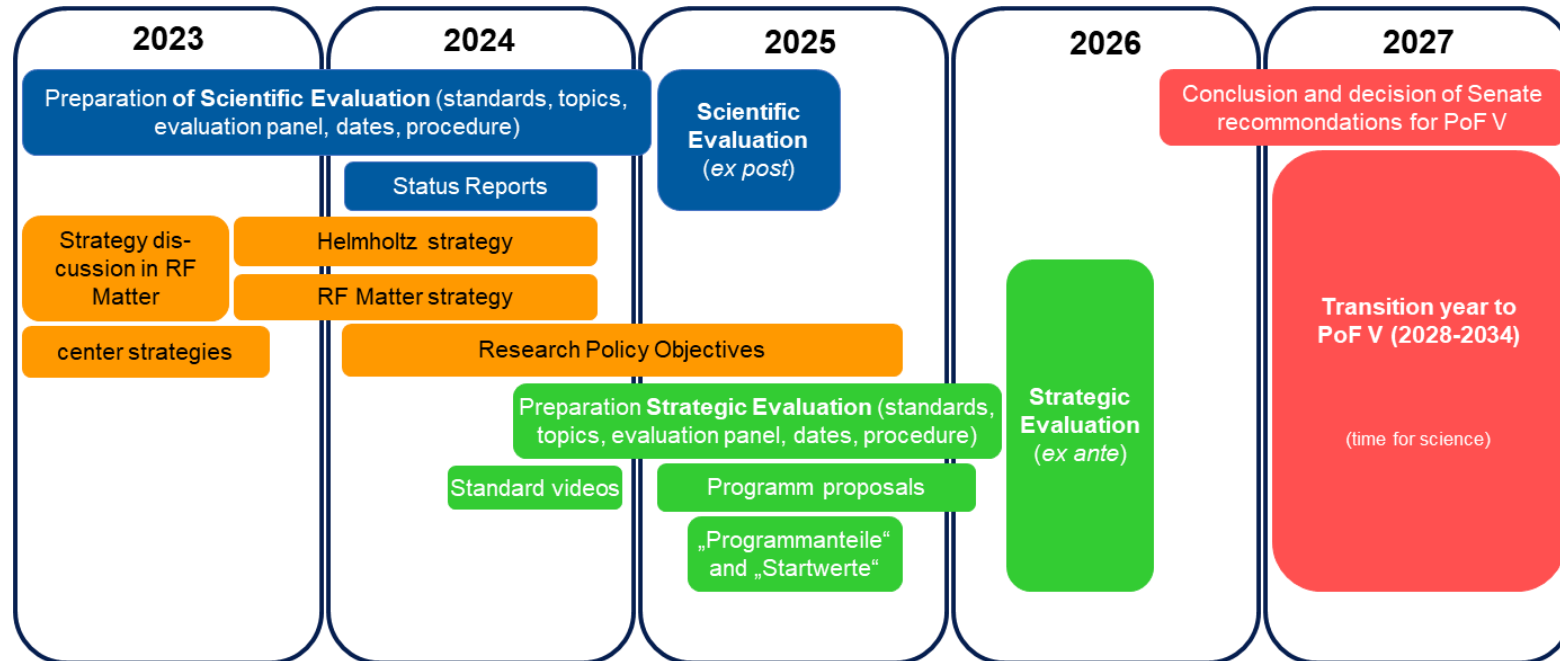


Matter Roadmap 2023-2030 Upgrade Photon Science Facilities !



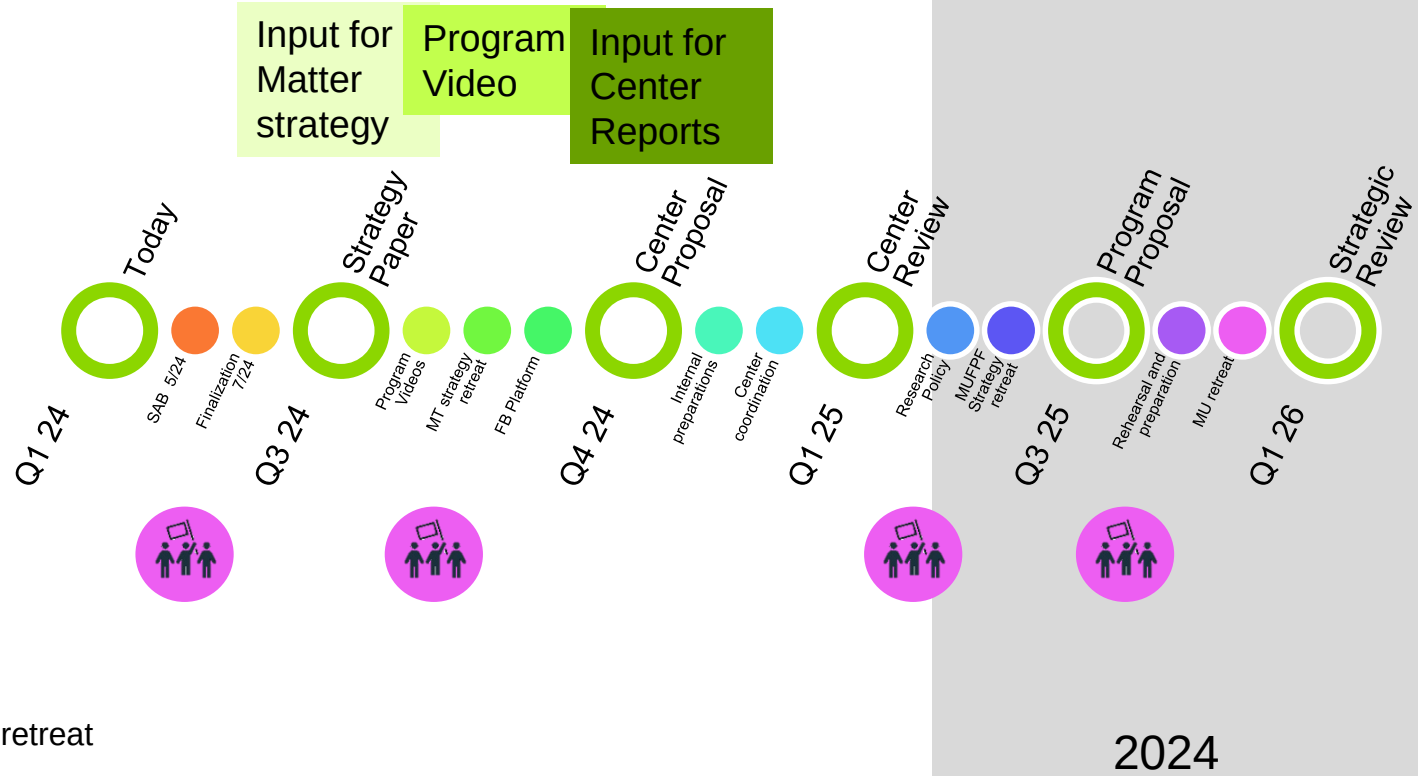
The Planning for PoFV

Preparations for PoF V in full swing



PoF V: 2028-2035

Schedule PoFV Review



- The scientific quality and the innovative potential of the theoretical research activities in the field of particle physics are at the highest level, putting the theory group at the top tier of the international community. The group has expertise in collider phenomenology, Higgs physics, BSM, Quantum Chromodynamics (QCD), flavour physics, lattice, and mathematical physics. The strength of the group is twofold: on one hand, it makes seminal contributions to the corresponding experimental program at DESY (and elsewhere). On the other hand, it is a complete theory group in its breadth and excellence, making it very attractive for PhD students and postdocs. A few examples from recent years of its scientific achievements and impactful research include the interpretation of LHC measurements for extended scalar sectors, the study of Higgs physics in future colliders, QCD and parton distribution functions, and high-order corrections relevant to collider phenomenology.

FPF report

- A group of this size and power is expected to take on the most impactful topics, which are often the most challenging. The DESY groups on CMS, ATLAS, and BELLE II have done this and have positioned themselves to make key discoveries as the volume of data grows. In many cases, they are leading the international community on these efforts.
- All the groups participating in particle physics at DESY interact very well and take advantage of the DESY infrastructure and share ideas, experiences, and equipment. The interaction and cooperation with the theory community is excellent. The shared interest in Dark Matter and axions will certainly encourage even more interaction in the future.
- The DESY groups are taking leadership positions in the analyses in both LHC experiments, with both experiments having their physics coordinator and many other subgroup coordinators from DESY.
- Using the impressive facilities provided by DESY, both experiments are producing major parts of the endcap charged particle tracking systems, and CMS is also producing components of the High Granularity EndCap Calorimeter. On BELLE II, the pixel vertex detector, PXD, assembled and commissioned at DESY, has performed well.

Major upcoming steps

- Finalization of the research policy guidelines
- Starting value discussions
- Writing of the proposal