8$^{th}$ March 2021

**ECFA Physics, Experiments & Detectors (PED) at Higgs and top/EW Factories Study Mandate for Physics Analysis Methods working group**

The ECFA PED working group on Physics Analysis Methods provides a forum for sharing experiences and exploring synergies in a united effort towards a future e+e- Higgs and top/EW Factory project, around focused development of analysis tools and approaches that can benefit all involved.

The group will engage with the wider collider physics community, paying particular attention to linking the various existing e+e- efforts, by sharing technical and scientific expertise, and to making connections to related expertise and people involved in (HL-)LHC. The activities of the group should broaden the active base of people contributing to e+e- studies.

The group will encourage the use of common software (key4hep and edm4hep) in order to build on existing resources and to facilitate exchange of ideas, implementation of code, and comparisons of algorithm and detector performance.

Areas where this group could identify synergies and define specific topics for study include, but are not limited to:

- Monte Carlo generators for e+e- precision EW, Flavour, Higgs, and top physics
- Software framework
- Fast simulation and the limitations of such techniques
- Track and vertex reconstruction algorithms
- Jet algorithms / jet reconstruction
- Constrained kinematic fits
- Particle-flow reconstruction and global event description
- Requirements on particle identification
- Flavour tagging algorithms
- Importance of timing information
- Luminosity measurement

Studies relating to a common approach to systematic uncertainties and the ultimate achievable precision are likely to be undertaken jointly between this group and the Physics Potential working group.

In consultation with the IAC, the group conveners will define a work programme, and identify lead people to take forward each activity. The conveners will facilitate regular working group meetings towards preparation of general ECFA workshops.