Welcome to the 1st ECFA WG2 SIMULATION topical workshop

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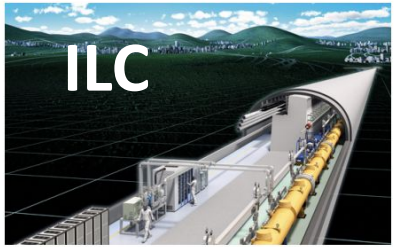
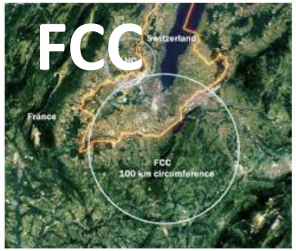
ECFA statement July 2020

- *ECFA recognizes the need for the experimental and theoretical communities involved in physics studies, experiment designs and detector technologies at future Higgs factories to gather.* ***ECFA supports a series of workshops*** *with the aim to* ***share challenges and expertise, to explore synergies in their efforts*** *and to respond coherently to this priority in the European Strategy for Particle Physics (ESPP).*

Goal: bring the entire e^+e^- Higgs factory effort together, foster cooperation across various projects; collaborative research programmes are to emerge





CEPC

Recommendations from the IAC

SOFTWARE ECOSYSTEM
Frank Gaede (Desy) ILC
Gerardo Ganis (CERN) FCC
André Sailer (CERN) CLIC

- Extension to include **electroweak** and **top** factory
- **Extend the physics studies** (w.r.t studies of European Strategy update (EPPSU)), where relevant (not all completed at time of EPPSU), however, focus on e^+e^- potential
  → no discussion of pros and cons of various machines or alternatives to e^+e^- Higgs factories
- Understand better the **interplay between (HL-)LHC and an e^+e^- Higgs/EW/Top factory**
- Development of **common tools** important (software, simulation, fast simulation, ...)
- Development of **common analysis methods** of high interest
- **Exploit synergies, discuss challenges**, do not restrict to common items
- Need for **theoretical accuracy** and **MC generator improvements** ...
- ...

WG1 Physics Potential

WG2 Physics Analysis Methods

What is WG2?

GENERATORS

SIMULATION

RECONSTRUCTION

ALGORITHMS & TOOLS

SOFTWARE ECOSYSTEM

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

Goals of the workshop

- Very unfortunate we cannot have this meeting in person. We'll try again.
- Modified the Agenda and timing to **allow as much as possible that participant remain connected** and active during the whole time.
- The main goal is to share experiences, also from the LHC, to **optimize the process of moving toward the new software ecosystem (Key4Hep)** for all the projects.
- Focus on fast event simulation and also on specific detector full simulation and challenges
- Plenty of time for discussion.
- We'll plan on **follow ups on specific issues** that might come up, or just to follow the progress.
- Please subscribe to: ECFA-Workshop-Higgs-factory@cern.ch (through the CERN egroup system)to be informed on the ECFA Higgs factory workshop activities