Introduction

Arnaud Ferrari
Uppsala University, Sweden
(on behalf of the conveners)

LHC-HH meeting, 29/01/2020
LHC-HH = HH sub-group of the LHC Higgs Cross-Section Working Group

- **Conveners:** Ramona Gröber, Javier Mazzitelli, Maggie Mühlleitner (theory), Luca Cadamuro (CMS) and Arnaud Ferrari (ATLAS).
- **Twiki page:**
  https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCHXSWGHH
- **ATLAS-CMS-Theory meetings every 3 months:** next one on April 27th!

**General news:**

- HH white-paper: the latest version is on arxiv:1910.00012, as well as LHCHXSWG-2019-005 in CDS, under review by the LHC Higgs XSWG group.
- We are starting to think about a future LHC-HH workshop to review the Run-2 results and prepare for Run-3.
  → When would be a good date? Spring 2021?
1. Two HH-related items in Les Houches proceedings:
   (i) Advanced computations of ggF $HH$ cross-sections towards NNLO FTapprox vs $\kappa_\chi$ (including scale uncertainties).
   (ii) Top-quark mass scheme uncertainties are large and their reduction is still unclear. A task-force on such uncertainties was set-up in Les Houches: https://phystev.cnrs.fr/wiki/2019:groups:higgs:massuncert
Tentative milestones for 2020

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4. Collect inputs for resonant $HH/SH/SS$ benchmarks:
   (i) Call for $X \rightarrow HH$ benchmarks in 2019: one contribution received, to be reviewed today.
   (ii) Once the input format is deemed useful, a call for $X \rightarrow SS/SH$
       benchmarks (i.e. with two mass parameters) will follow.
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A. Ferrari (UU)
Today’s meeting

Morning session (4-S-030):

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Description</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:30</td>
<td>Introduction</td>
<td>Arnaud Ferrari (Uppsala University), Javier Mazzitelli, Luca Cadamuro (University of Florida), Margarete Mühleitner (KIT), Ramona Groeber (Università di Padova and INFN, Sezione di Padova)</td>
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<tr>
<td>09:45</td>
<td>Light Yukawa couplings in HH production (20+10)</td>
<td>Lina Alasfar (HU-Berlin)</td>
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<tr>
<td>10:15</td>
<td>HH in composite Higgs models (20+10)</td>
<td>Prof. Margarete Muehleitner (KIT)</td>
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<tr>
<td>10:45</td>
<td>HH MC update (20+10)</td>
<td>Alexandra Carvalho Antunes De Oliveira (Instituto de Fisica Teorica (IFT)-UNESP - Universidade Estadual)</td>
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<tr>
<td>11:15</td>
<td>Looking back at the HL-LHC HH combination (20+10)</td>
<td>Elisabeth Petit (CPPM-Marseille)</td>
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Afternoon session (160-R-009):

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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</tr>
</thead>
<tbody>
<tr>
<td>14:00</td>
<td>Single Higgs EFT fits and possible implications for di-Higgs (20+10)</td>
<td>Anke Biekoetter (Uni Heidelberg)</td>
<td>160/R-009</td>
<td>30m</td>
</tr>
<tr>
<td>14:30</td>
<td>HH in EFTs at NLO (20+10)</td>
<td>Gudrun Heinrich (Max Planck Institute for Physics)</td>
<td>160/R-009</td>
<td>30m</td>
</tr>
<tr>
<td>15:00</td>
<td>Uncertainties in HH production related to the scheme and scale of the top quark mass (20+10)</td>
<td>Stephen Philip Jones (CERN)</td>
<td>160/R-009</td>
<td>30m</td>
</tr>
<tr>
<td>15:30</td>
<td>Uncertainties at NNLO FTapprox vs lambda (20+10)</td>
<td>Javier Mazzitelli</td>
<td>160/R-009</td>
<td>30m</td>
</tr>
<tr>
<td>16:00</td>
<td>Input for X to HH benchmarks in models with an extra singlet (20+10)</td>
<td>Tania Natalie Robens (Rudjer Boskovic Institute (HR))</td>
<td>160/R-009</td>
<td>30m</td>
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