

# Taming the accuracy of event generators

Silvia Ferrario Ravasio, Pier Monni, Stefan Prestel, Emanuele Re, Peter Richardson

June 29 - July 3 2020

# Welcome to the workshop

- ▶ **The goal of the workshop is to encourage a synergistic interaction between participants to define clearly and rigorously the main problems and challenges in the field of event generators**
  - ▶ **Experimental needs**
  - ▶ **Computing performance**
  - ▶ **Perturbative accuracy**
  - ▶ **Modelling of NP dynamics**
  - ▶ **...**
  
- ▶ **Such discussions are motivated by the current status of the field and the urgent experimental need for higher theoretical precision in event simulations at colliders**

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- ▶ ...

**Your interactions and discussions are crucial !**

▶ Such discussions are motivated by the current status of the field and the urgent experimental need for higher theoretical precision in event simulations at colliders

# Some logistics

- ▶ This virtual session will be hosted entirely in Zoom. It will feature
  - ▶ An open session in the afternoon (starting at 1.30pm), with 2 / 3 talks followed by discussions
  - ▶ The discussions will be resumed in the morning sessions (starting at 10.30am)
  - ▶ We encourage the participants to use the Slack channel created for this workshop to communicate (if you haven't yet registered please email us). It is possible to use Zoom within Slack to open rooms for spontaneous discussions at any time (ask us for instructions, or to open a room for you!)
  - ▶ We will open one Zoom room / session, but do not hesitate to ask for more rooms (or open them yourselves through Slack). Also please feel free to initiate further discussions

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  - ▶ We will open one Zoom room / session, but do not hesitate to ask for more rooms (or open them yourselves through Slack). Also please feel free to initiate further discussions
- ▶ A second session (tentatively scheduled for January 2021) will be hosted at CERN, unfortunately with a limited number of participants (due to office space limitations). We will keep Zoom and Slack channels open for those who cannot attend in person.



# Programme and Schedule Changes

## ► Monday (& Tuesday morning): Exp. point of view & log accuracy of PS

**10:30** → 12:30 **Goal of the workshop & experimental needs**

Zoom: <https://cern.zoom.us/j/94792242433?pwd=UndUcjEvVW5xVW1Dd3FMN1F5TGZUQT09>

Password: 403625

**Speakers:** Christian Gutschow (UCL (UK)), Pier Francesco Monni (CERN)

Introduction and goal of the workshop

**Speakers:** Emanuele Re, Peter Richardson, Pier Francesco Monni, Silvia Ferrario Ravasio, Stefan Prestel

Future experimental needs in event simulation

**Speaker:** Christian Gutschow (UCL (UK))

**13:30** → 17:00 **Accuracy of parton showers**

Zoom: <https://cern.zoom.us/j/94792242433?pwd=UndUcjEvVW5xVW1Dd3FMN1F5TGZUQT09>

Password: 403625

**Speakers:** Frederic Alexandre Dreyer (Oxford), Jack Holguin (The University of Manchester), silvia ferrario ravasio

Parton showers beyond leading logarithmic accuracy

**Speaker:** Dr Frederic Alexandre Dreyer (Oxford)

Recoil schemes in angular ordered parton showers

**Speaker:** silvia ferrario ravasio

Building a consistent parton shower

**Speaker:** Jack Holguin (The University of Manchester)

**This afternoon's session will end at 3.30pm to allow people to attend the public update on the CERN Council Week Discussions will resume at 4.30pm**

# Programme and Schedule Changes

## ▶ Tuesday (& Wednesday morning): higher order kernels

10:30 → 12:30 Discussion ¶

13:30 → 17:30 ~~Higher order kernels in parton showers~~ **16:00**

Zoom: <https://cern.zoom.us/j/94792242433?pwd=UndUcjEvVW5xVW1Dd3FMN1F5TGZUQT09>

Password: 403625

**Speakers:** Peter Skands (Monash University (AU)), Stefan Hoche (Fermi National Accelerator Lab. (US))

Higher order kernels in Antenna Showers: Vincia

**Speaker:** Peter Skands (Monash University (AU))

Higher order kernels in Dipole Showers: Dire

**Speaker:** Stefan Hoche (Fermi National Accelerator Lab. (US))

**Tuesday's session will end at 4pm to allow people to attend the Snowmass meeting**

# Programme and Schedule Changes

## ► Wednesday (& Thursday morning): matching of NNLO and Parton Showers

**10:30** → 12:30 **Discussion**

**13:30** → 17:30 **Matching of NNLO QCD to parton showers**

Zoom: <https://cern.zoom.us/j/94792242433?pwd=UndUcjEvVW5xVW1Dd3FMN1F5TGZUQT09>

Password: 403625

**Speakers:** Emanuele Re (Unite Reseaux du CNRS (FR)), Simone Alioli (Universita & INFN, Milano-Bicocca (IT)), Stefan Prestel (University of Lund)

Geneva

**Speaker:** Simone Alioli (Universita & INFN, Milano-Bicocca (IT))

MiNNLOPS

**Speaker:** Emanuele Re (Unite Reseaux du CNRS (FR))

UN2LOPS

**Speaker:** Stefan Prestel (University of Lund)



# Programme and Schedule Changes

## ► Thursday (& Friday morning): subleading colour, NG and SL logarithms

**10:30** → 12:30 **Discussion**

**13:30** → 17:30 **Subleading colour corrections, non global and super leading logarithms**

Zoom: <https://cern.zoom.us/j/94792242433?pwd=UndUcjEvVW5xVW1Dd3F5TGZUQT09>

Password: 403625

**Speakers:** Simon Platzer (University of Vienna (AT)), Thomas Becher (University of Bern), Zoltan Nagy

**Non global and super leading logarithms**

**Speaker:** Thomas Becher (University of Bern)

**Amplitude level evolution**

**Speaker:** Simon Platzer (University of Vienna (AT))

**Subleading colour corrections in parton showers**

**Speaker:** Zoltan Nagy

# Programme and Schedule Changes

## ► Friday: Computational aspects & Outlook

**10:30** → 12:30 **Discussion**

**13:30** → 17:30 **Computational aspects & Outlook**

Zoom: <https://cern.zoom.us/j/94792242433?pwd=UndUcjEvVW5xVW1Dd3FmN1F5TGZUQT09>

Password: 403625

**Speakers:** Gregory Soyez (IPhT, CEA Saclay), Paolo Torrielli (Universita e INFN Torino (IT)), Rob Verheyen

**On the reduction of negative weights in MC@NLO-type matching procedures**

**Speaker:** Paolo Torrielli (Universita e INFN Torino (IT))

**Veto algorithms**

**Speaker:** Rob Verheyen

**Computational aspects of PanScales dipole showers**

**Speaker:** Gregory Soyez (IPhT, CEA Saclay)

**Thank you and enjoy the workshop !**