Welcome to 1Lund Jet Plane Institute

(CERN, 3rd - 7th July 2023)

indico.cern.ch/e/LundJetPlane2023

Organizing committee (contact **lundjetplane2023-org _at_ cern.ch**):

- Cristian Baldenegro (LLR, co-chair)
- David d'Enterria (CERN, co-chair)
- Raghav Kunnawalkam Elayavalli (Vanderbilt)
- Matt LeBlanc (CERN)
- Simone Marzani (Università di Genova)
- Matt Nguyen (LLR)
- Jennifer Roloff (BNL)
- Alba Soto Ontoso (CERN, co-chair)
- Gregory Soyez (IPhT Saclay, CERN, co-chair)
- Marta Verweij (Utrecht)

General philosophy of this workshop

- Overview, state-of-the-art, future developments of experimental and theoretical Lund plane-based techniques.

- Mostly in-person presentations + zoom connection.

- Afternoon workshop (14h –18h, GVA time): to allow Asia/Americas zoom participation, mornings can be used for discussion on site.

- Time for discussion every day at around 17h30

  We expect to further improve the experimental and theoretical progress of the Lund plane, and hope that new projects and ideas arise.

  (***Hopefully discussion sessions & coffee breaks will help us achieve this!***)

CERN-TH events this week

Lund Jet Plane Institute is part of the TH Institute series

Wednesday July 5th at 14h00: TH Colloquium on The Higgs boson and the top quark
by M. Grazzini

Thursday July 6th: 11h00 Collider X-Talk on the Lund plane by C.Baldenegro, G.Soyez
13h30 BSM forum on Dark Showers by T. Cohen

Coffee breaks at 15h00 – 15h30 at TH coffee room 4/2-011 , part of daily TH coffee

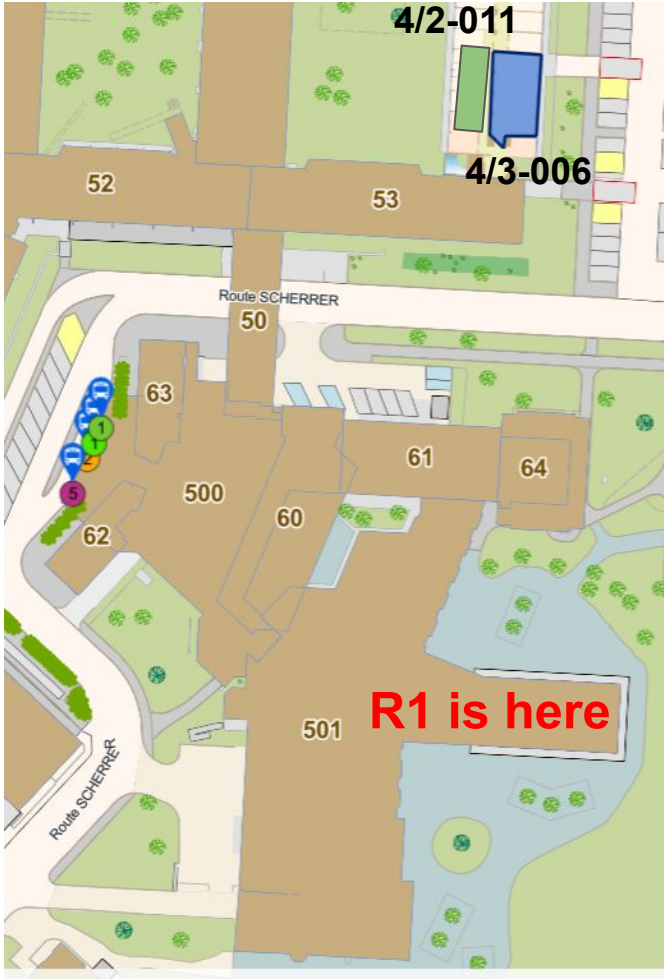
Locations

All talks will take place at TH Conference Room 4/3-006

Coffee breaks at 15h00 – 15h30 at TH coffee room 4/2-011, part of daily TH coffee

Event is broadcasted via Zoom (clickable link)

Indico timetable



Office space

Let us know if you need office space this week

Monday July 3
(Lund diagrams theory & Lund plane related measurements)

Monday, 3 July

14:00 → 14:15 **Introduction**
Speakers: David d'Enterria (CERN), Gregory Soyez (IPhT, CEA Saclay)

14:15 → 15:00 **A history of Lund diagrams and resummations**
Speaker: Prof. Andrea Banfi (University of Sussex)

15:00 → 16:30 **Coffee break**

16:30 → 17:00 **Counting jets in the Lund Plane**
Speaker: Alba Soto Ontoso (CERN)

17:00 → 17:30 **Jets and Lund plane studies at LHCb**
Speaker: Christine Aidala (University of Michigan (US))
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17:30 → 18:00 **Measurements of the Lund jet plane and its properties (ATLAS)**
Speaker: Emily Ann Smith (University of Chicago (US))

Note: CERN Directorate meetg from 15h00 – 16h30, https://indico.cern.ch/event/1300908/

We will reconvene at 16h30

Tuesday July 4th
(Quark-gluon plasma studies with Lund-tree techniques)

Tuesday, 4 July

14:00 → 14:30 **The Lund plane as a way to constrain the quark-gluon plasma**
Speaker: Konrad Tywoniuk (University of Bergen (NO))

14:30 → 15:00 **Studying jet shower modifications in the quark-gluon plasma using the Lund tree (CMS)**
Speaker: Ms Yi Chen (Massachusetts Inst. of Technology (US))

15:00 → 15:30 **Coffee break**

15:30 → 16:00 **Jet substructure measurements probing the Lund radiation plane in pp and Pb-Pb collisions (ALICE)**
Speaker: Raymond Ehlers (University of California Berkeley (US))

16:00 → 16:30 **Tracing heavy quark trajectories in pp and Pb-Pb collisions, including future challenges and opportunities (ALICE)**
Speaker: Nima Zardoshti (CERN)

16:30 → 17:00 **Dead-cone searches in heavy-ion collisions using the jet tree**
Speaker: Leticia Cunqueiro Mendez (Roma Sapienza University)

17:00 → 18:00 **Discussion**

Wednesday July 5th

(Simulations with quantum computer, parton shower developments, and more Lund-related measurements)

Wednesday, 5 July

14:00 → 15:00 **Theory Colloquium**

This is the weekly CERN TH colloquium:
https://indico.cern.ch/event/1263512/

15:00 → 15:30 **Coffee break**

15:30 → 16:00 **Collider events on a quantum computer**

Speaker: Simon Williams (CERN)

16:00 → 16:30 **Jet substructure using the Lund tree in 13 TeV pp collisions (CMS)**

Speaker: Cristian Baldenegro Barrera (Laboratoire Leprince-Ringuet)

16:30 → 17:00 **Exploiting the Lund plane to study jet splitting kinematics at RHIC energies (STAR)**

Speaker: Monika Robotková (Nuclear Physics Institute, Czech Academy of Sciences)

17:00 → 17:30 **Lund planes for parton-shower development**

Speaker: Mrinal Dasgupta (Unknown)

17:30 → 18:00 **Discussion**

Thursday July 6th
(BSM dark showers & jet tagging, connections with EIC program)

Thursday, 6 July

11:00 → 12:00 **Collider X-Talk: the primary Lund Plane density**

The talk is part of the Collider X-Talk series

Conveners: Cristian Baldenegro Barrera (Laboratoire Leprince-Ringuet), Gregory Soyez (IPhT, CEA Saclay)

12:00 → 13:30 **Lunch**

13:30 → 14:30 **BSM Forum: Dark showers and the Lund Plane**

The talk is part of the CERN TH BSM Forum series

Convener: Tim Cohen (CERN)

14:30 → 15:00 **Jet substructure at RHIC as a roadmap towards the EIC**

Speaker: Dr Raghav Kunnawalkam Elayavalli (Vanderbilt University)

15:00 → 15:30 **Coffee break**

15:30 → 16:00 **Tagging using Lund plane variables**

Speaker: Charanjit Kaur Khosa

16:00 → 16:30 **Jet tagging with the Lund jet plane (ATLAS)**

Speaker: Jad Mathieu Sardain (University of Arizona (US))

16:30 → 17:30 **Discussion**

Friday July 7th
(Quark vs gluon jets)

Friday, 7 July

14:00 → 14:30 **Breaking the q/g degeneracy in extractions of the strong coupling from jet substructure**

Speaker: Matt LeBlanc (University of Manchester (GB))

14:30 → 15:00 **Quark/gluon tagging using Lund Plane information**

Speaker: Gregory Soyez (IPhT, CEA Saclay)

15:00 → 15:30 **Coffee break**

15:30 → 15:40 **Closing**

Speakers: Alba Soto Ontoso (CERN), Cristian Baldenegro Barrera (Laboratoire Leprince-Ringuet), Gregory Soyez (IPhT, CEA Saclay)

Questions?