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)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00</td>
<td>Introduction</td>
<td>David d'Enterria (CERN), Gregory Soyez (IPhT, CEA Saclay)</td>
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<tr>
<td>14:15</td>
<td>A history of Lund diagrams and resumptions</td>
<td>Prof. Andrea Banfi (University of Sussex)</td>
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<tr>
<td>15:00</td>
<td>Coffee break</td>
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<tr>
<td>16:30</td>
<td>Counting jets in the Lund Plane</td>
<td>Alba Soto Ontoso (CERN)</td>
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<tr>
<td>17:00</td>
<td>Jets and Lund plane studies at LHCb</td>
<td>Christine Aidala (University of Michigan (US))</td>
</tr>
<tr>
<td>17:30</td>
<td>Measurements of the Lund jet plane and its properties (ATLAS)</td>
<td>Emily Ann Smith (University of Chicago (US))</td>
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Note: CERN Directorate meetg from 15h00 – 16h30, https://indico.cern.ch/event/1300908/

We will reconvene at 16h30
### Tuesday, 4 July

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker</th>
<th>Institution</th>
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</thead>
<tbody>
<tr>
<td>14:00</td>
<td>The Lund plane as a way to constrain the quark-gluon plasma</td>
<td>Konrad Tywoniuk (University of Bergen (NO))</td>
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<tr>
<td>14:30</td>
<td>Studying jet shower modifications in the quark-gluon plasma using the Lund tree (CMS)</td>
<td>Ms Yi Chen (Massachusetts Inst. of Technology (US))</td>
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<tr>
<td>15:00</td>
<td>Coffee break</td>
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<tr>
<td>15:30</td>
<td>Jet substructure measurements probing the Lund radiation plane in pp and Pb-Pb collisions (ALICE)</td>
<td>Raymond Ehlers (University of California Berkeley (US))</td>
<td></td>
</tr>
<tr>
<td>16:00</td>
<td>Tracing heavy quark trajectories in pp and Pb-Pb collisions, including future challenges and opportunities (ALICE)</td>
<td>Nima Zardoshti (CERN)</td>
<td></td>
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<tr>
<td>16:30</td>
<td>Dead-cone searches in heavy-ion collisions using the jet tree</td>
<td>Leticia Cunqueiro Mendez (Roma Sapienza University)</td>
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<tr>
<td>17:00</td>
<td>Discussion</td>
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Wednesday July 5th
(Simulations with quantum computer, parton shower developments, and more Lund-related measurements)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>14:00</td>
<td>Theory Colloquium</td>
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<td>This is the weekly CERN TH colloquium:</td>
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<td><a href="https://indico.cern.ch/event/1263512/">https://indico.cern.ch/event/1263512/</a></td>
</tr>
<tr>
<td>15:00</td>
<td>Coffee break</td>
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<tr>
<td>15:30</td>
<td>Collider events on a quantum computer</td>
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<tr>
<td></td>
<td>Speaker: Simon Williams (CERN)</td>
</tr>
<tr>
<td>16:00</td>
<td>Jet substructure using the Lund tree in 13 TeV pp collisions (CMS)</td>
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<td></td>
<td>Speaker: Cristian Baldenegro Barrera (Laboratoire Leprince-Ringuet)</td>
</tr>
<tr>
<td>16:30</td>
<td>Exploiting the Lund plane to study jet splitting kinematics at RHIC energies (STAR)</td>
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<td>Speaker: Monika Robotková (Nuclear Physics Institute, Czech Academy of Sciences)</td>
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<tr>
<td>17:00</td>
<td>Lund planes for parton-shower development</td>
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<td></td>
<td>Speaker: Mrinal Dasgupta (Unknown)</td>
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<td>17:30</td>
<td>Discussion</td>
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Thursday July 6th

(BSM dark showers & jet tagging, connections with EIC program)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>11:00</td>
<td>Collider X-Talk: the primary Lund Plane density</td>
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<td></td>
<td>The talk is part of the Collider X-Talk series</td>
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<td></td>
<td>Conveners: Cristian Baldenegro Barrera (Laboratoire Leprince-Ringuet), Gregory Soyez (IPhT, CEA Saclay)</td>
</tr>
<tr>
<td>12:00</td>
<td>Lunch</td>
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<tr>
<td>13:30</td>
<td>BSM Forum: Dark showers and the Lund Plane</td>
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<td></td>
<td>The talk is part of the CERN TH BSM Forum series</td>
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<td></td>
<td>Convenor: Tim Cohen (CERN)</td>
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<tr>
<td>14:30</td>
<td>Jet substructure at RHIC as a roadmap towards the EIC</td>
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<tr>
<td></td>
<td>Speaker: Dr Raghav Kunnawalkam Elayavalli (Vanderbilt University)</td>
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<tr>
<td>15:00</td>
<td>Coffee break</td>
</tr>
<tr>
<td>15:30</td>
<td>Tagging using Lund plane variables</td>
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<td></td>
<td>Speaker: Charanjit Kaur Khosa</td>
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<tr>
<td>16:00</td>
<td>Jet tagging with the Lund jet plane (ATLAS)</td>
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<tr>
<td></td>
<td>Speaker: Jad Mathieu Sardain (University of Arizona (US))</td>
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<tr>
<td>16:30</td>
<td>Discussion</td>
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## Friday, 7 July

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00</td>
<td>Breaking the q/g degeneracy in extractions of the strong coupling from jet substructure</td>
<td>Matt LeBlanc (University of Manchester (GB))</td>
</tr>
<tr>
<td>14:30</td>
<td>Quark/gluon tagging using Lund Plane information</td>
<td>Gregory Soyez (IPhT, CEA Saclay)</td>
</tr>
<tr>
<td>15:00</td>
<td>Coffee break</td>
<td></td>
</tr>
<tr>
<td>15:30</td>
<td>Closing</td>
<td>Alba Soto Ontoso (CERN), Cristian Baldenegro Barrera (Laboratoire Leprince-Ringuet), Gregory Soyez (IPhT, CEA Saclay)</td>
</tr>
</tbody>
</table>
Questions?