



Institute of Particle Physics and
Accelerator Technologies

4th Baltic School of High-Energy Physics and Accelerator Technologies 2024

Kuldīga, Latvia, 5th-9th of August, 2024

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Riga Technical University

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Overview



- Location: Kuldīga, Latvia;
- Dates: 5th-9th of August;
- Proposed programme:
 - 17 lecture slots across the week;
 - Single lecture slot of 90 mins (or 2x40mins);
 - 1 “keynote” talk (Wednesday);
 - 1 school dinner (Wednesday);
 - 1 outreach event (Sunday or Thursday)
 - 1 excursion [Irbene radio telescope] (Tuesday);

Time	Sunday (04.08.)	Monday (05.08.)	Tuesday (06.08.)	Wednesday (07.08.)	Thursday (08.08.)	Friday (09.08.)	
07:00-07:15	Arrival	Shuttle	Breakfast	Breakfast	Breakfast	Breakfast	
07:15-07:30							LB V
07:30-07:45			Arrival & registration	Coffee	Coffee	Coffee	
07:45-08:00							Welcome
08:00-08:15			LB I	LB VI	LB IX	LB XIII	
08:15-08:30							Lunch
08:30-08:45			LB II	LB VII	Lunch	Lunch	
08:45-09:00							Coffee
09:00-09:15			LB III	Excursion to Irbene	Coffee	Coffee	
09:15-09:30							Coffee
09:30-09:45			LB IV	Excursion to Irbene	Coffee	LB XV	
09:45-10:00							Shuttle
10:00-10:15			Arrival &	Free time,	Free time	Free time,	
10:15-10:30							Free
10:30-10:45			Free	Free time,	Free time	Free time,	
10:45-11:00							Free
11:00-11:15			Free	Free time,	Free time	Free time,	
11:15-11:30	Free	Free time,					Free time
11:30-11:45			Free	Free time,	Free time	Free time,	
11:45-12:00	Free	Free time,					Free time
12:00-12:15			Free	Free time,	Free time	Free time,	
12:15-12:30	Free	Free time,					Free time
12:30-12:45			Free	Free time,	Free time	Free time,	
12:45-13:00	Free	Free time,					Free time
13:00-13:15			Free	Free time,	Free time	Free time,	
13:15-13:30	Free	Free time,					Free time
13:30-13:45			Free	Free time,	Free time	Free time,	
13:45-14:00	Free	Free time,					Free time
14:00-14:15			Free	Free time,	Free time	Free time,	
14:15-14:30	Free	Free time,					Free time
14:30-14:45			Free	Free time,	Free time	Free time,	
14:45-15:00	Free	Free time,					Free time
15:00-15:15			Free	Free time,	Free time	Free time,	
15:15-15:30	Free	Free time,					Free time
15:30-15:45			Free	Free time,	Free time	Free time,	
15:45-16:00	Free	Free time,					Free time
16:00-16:15			Free	Free time,	Free time	Free time,	
16:15-16:30	Free	Free time,					Free time
16:30-16:45			Free	Free time,	Free time	Free time,	
16:45-17:00	Free	Free time,					Free time
17:00-17:15			Free	Free time,	Free time	Free time,	
17:15-17:30	Free	Free time,					Free time
17:30-17:45			Free	Free time,	Free time	Free time,	
17:45-18:00	Free	Free time,					Free time
18:00-18:15			Free	Free time,	Free time	Free time,	
18:15-18:30	Free	Free time,					Free time
18:30-18:45			Free	Free time,	Free time	Free time,	
18:45-19:00	Free	Free time,					Free time
19:00-19:15			Free	Free time,	Free time	Free time,	
19:15-19:30	Free	Free time,					Free time
19:30-19:45			Free	Free time,	Free time	Free time,	
19:45-20:00	Free	Free time,					Free time
20:00-20:15			Free	Free time,	Free time	Free time,	
20:15-20:30	Free	Free time,					Free time
20:30-20:45			Free	Free time,	Free time	Free time,	
20:45-21:00	Free	Free time,					Free time
21:00-21:15			Free	Free time,	Free time	Free time,	
21:15-21:30	Free	Free time,					Free time
21:30-21:45			Free	Free time,	Free time	Free time,	
21:45-22:00	Free	Free time,					Free time
22:00-22:15			Free	Free time,	Free time	Free time,	
22:15-22:30	Free	Free time,					Free time
22:30-22:45			Free	Free time,	Free time	Free time,	
22:45-23:00	Free	Free time,					Free time

- Many direct flights on Sunday and Friday/Saturday to & from Riga:
 - Amsterdam;
 - Frankfurt;
 - Munich;
 - Rome;
 - Warsaw;
 - Oslo;
 - Copenhagen;
 - London;
 - Vienna;
 - Prague;
 - Oslo;
 - Vilnius;
 - Tallinn;
- Riga can be reached on Sunday from almost anywhere Europe via AMS, FRA, MUC, WAW.
- We would organise 2-3 bus shuttles to & from Kuldīga:
 - Kuldīga - Rīga: Sunday [1700-1930];
 - Kuldīga - Rīga: Monday [0700-0930];
 - Rīga - Kuldīga: Friday [1330-1600].
- Riga international airport is on the travel route and can be added as a stop if needed.
- Participants will be asked for their arrival and departure times.
- To optimize the number of shuttles and the times.

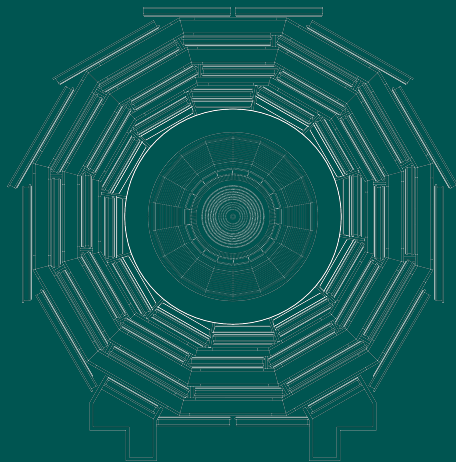
[and more]

- Revisited the proposed programme following the previous discussion [max. 17 x 90 minute lecture slots available]:

90 min (or 2x40 mins)	QFT & Standard Model	Intro + QED
90 min (or 2x40 mins)	QFT & Standard Model	QCD + EW
90 min (or 2x40 mins)	QFT & Standard Model	EWSB + Higgs
90 min (or 2x40 mins)	Beyond the Standard Model	BSM overview
90 min (or 2x40 mins)	Beyond the Standard Model	SUSY & other BSM models
90 min (or 2x40 mins)	SMEFT	Introduction to EFT and SMEFT
90 min (or 2x40 mins)	SMEFT	Motivation; state-of-the-art; observables;
90 min (or 2x40 mins)	HEFT	Motivation; state-of-the-art; observables
90 min (or 2x40 mins)	HEP Experiments	Exp. HEP @ LHC; state-of-the-art results;
90 min (or 2x40 mins)	HEP Experiments	Analysis approaches; triggering; challenges; statistics
90 min (or 2x40 mins)	Machine learning	Machine learning techniques;
90 min (or 2x40 mins)	Machine learning	ML application in HEP & in medical physics
90 min (or 2x40 mins)	Accelerator physics	Introduction, history, overview of accelerators
90 min (or 2x40 mins)	Accelerator physics	State-of-the-art; accelerator types challenges;
90 min (or 2x40 mins)	Future accelerators	FCC, MuCC, ILC, CEPC (in the context of multiboson physics)
90 min (or 2x40 mins)	Accelerator applications	Technologies and applications in industry
90 min (or 2x40 mins)	Accelerator applications	Technologies and applications in medicine

- Currently proposed lecturers:

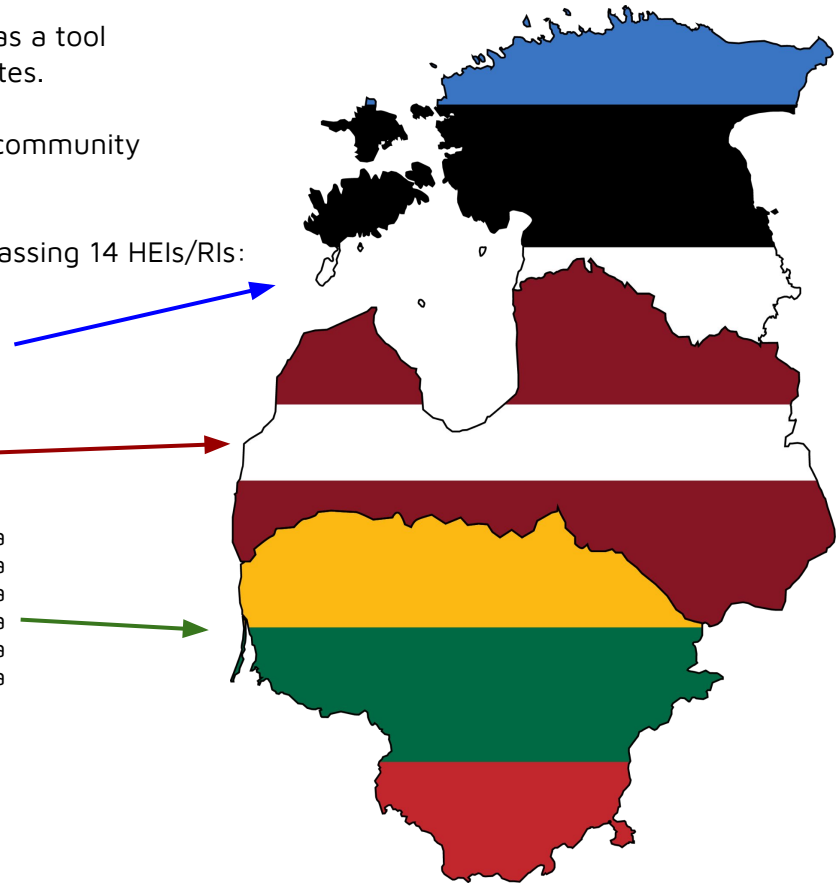
	Option 1	Option 2	Option 3
QFT & Standard Model	Mark Thomson	Giulia Zanderighi	
QFT & Standard Model	Mark Thomson	Giulia Zanderighi	
QFT & Standard Model	Mark Thomson	Giulia Zanderighi	
Beyond the Standard Model	John Ellis	Klaus Desch	
Beyond the Standard Model	John Ellis	Klaus Desch	
SMEFT	Celine Degrande	Giulia Zanderighi	Ilaria Brivio
SMEFT	Celine Degrande	Giulia Zanderighi	Ilaria Brivio
HEFT	Ramona Groeber	Anke Biekoetter	
HEP Experiment	Klaus Desch	Mark Thomson	Lydia Brenner
HEP Experiment	Klaus Desch	Mark Thomson	Lydia Brenner
Machine learning	Lydia Brenner	Mario Pelliccioni	Maeve Madigan
Machine learning	Lydia Brenner	Mario Pelliccioni	Maeve Madigan
Accelerator physics	Maurizio Vretenar	Leonid Rivkin	
Accelerator physics	Maurizio Vretenar	Leonid Rivkin	
Future accelerators	Maurizio Vretenar	Klaus Desch	Leonid Rivkin
Accelerator applications	Leonid Rivkin	Maurizio Vretenar	
Accelerator applications	Maurizio Vretenar	Leonid Rivkin	



Thank you

- [CERN Baltic Group](#) was officially established on the 28th of May, 2018, as a tool to enhance the scientific collaboration between CERN and the Baltic states.
- In particular, the aim of CBG is to grow and to strengthen the scientific community of HEP and accelerator physics and technologies in the region.
- Originally, started by a couple of HEIs/RIs from the region, now encompassing 14 HEIs/RIs:
 - Tallinn University of Technology (TTU, TalTech),
 - National Institute of Chemical Physics and Biophysics (NICPB),
 - University of Tartu (UT),
 - Riga Technical University (RTU),
 - University of Latvia (UL),
 - Riga Stradins University (RSU),
 - Ventspils University of Applied Sciences (VU),
 - Daugavpils University (DU),
 - Vilnius University (VU),
 - Kaunas University of Technology (KTU),
 - Vytautas Magnus University (VMU),
 - Lithuanian Energy Institute (LEI),
 - Lithuanian University of Health Sciences (LUHS),
 - National Cancer Institute (NCI),

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- Since 2021, CBG have organised two annual events to promote HEP and accelerator research in the region, rotating each of the events through the three countries:
 - CERN Baltic Conference (CBC):
 - [1st CBC](#), Tartu, Estonia [remote only];
 - [2nd CBC](#), Vilnius, Lithuania;
 - [3rd CBC](#), Riga, Latvia.
 - Baltic School of High-Energy Physics and Accelerator Technologies (BSHEPAT):
 - [1st BSHEPAT](#), Klapkalnciems, Latvia;
 - [2nd BSHEPAT](#), Kuressaare, Estonia;
 - [3rd BSHEPAT](#), Palanga, Lithuania;
 - 4th BSHEPAT, Kuldīga, Latvia.



- COST Action 22130: COverprehensive Multi-boson Experiment-Theory Action (COMETA) is a *new* CA, which was initiated on 18/09/2023 and is currently scheduled to run until 17/09/2027.
- There are 23 participating countries, including Latvia (Kārlis Dreimanis, RTU) and Estonia (Torben Lange, NICPB); Lithuania is not represented at the moment (but we hope to change this in due course).
- COMETA has five working groups, covering **three** interlinked scientific directions:
 - **WG1**: Theoretical framework, precision calculations and simulation (Giovanni Pelliccioli; Ramona Groeber);
 - **WG2**: Technological innovation in data analysis (Alessandra Cappati; Riccardo Finotello; Claudius Krause);
 - **WG3**: Experimental measurements (Valentina Maria Martina Cairo; Matteo Presilla);
 - **WG4**: Management and event organization (Arnaud Ferrari; Pietro Govoni);
 - **WG5**: Inclusiveness and Outreach (Flavia de Almeida Dias; Kārlis Dreimanis);
 - **Action chair**: Ilaria Brivio; **action vice-chair**: Karolos Potamianos.
- Events co-organised by COMETA, obviously, must have at least strong partial focus on the scientific directions of the action !

