



CERN Baltic Group Conference 2024

15th - 17th of October 2024
TalTech, Estonia

Assoc. Prof. Brigita Abakevičienė, Kaunas University of Technology, Chair of the CBG

Assoc. Prof. Kārlis Dreimanis, Riga Technical University, Vice-Chair of the CBG

Image credit: Kaupo Kalda

- CERN Baltic Group (CBG) was established on the 28th of May, 2018, with the signature of a [Memorandum of Understanding](#) by eight research institutions in the three Baltic States:
 - Tallinn University of Technology (TTU, now 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);
 - Kaunas University of Technology (KTU);
 - Vilnius University (VU).
- The core principles of the group were declared to be: transparency, honesty, sharing and collaboration.
- The mission of CBG is to facilitate collaboration and communication regarding CERN-related research in the Baltics !
- In short, CBG aims to be a lens through which we hope to focus our efforts to enhance the scientific ecosystem in our region !



- Since 2018, CBG has grown considerably, and now comprises 14 leading research institutions in the Baltic states:



**CERN
Baltic Group**



**UNIVERSITY
OF LATVIA**



**RĪGA STRADIŅŠ
UNIVERSITY**



**Vilnius
University**



**LITHUANIAN
ENERGY
INSTITUTE**



**LITHUANIAN UNIVERSITY
OF HEALTH SCIENCES**



- Besides the *day-to-day* activities of collaboration and communication, CBG has created three Working Groups:
 - Study Programme Working Group.
 - Scientific and Technology Working Group.
 - Advanced Particle Therapy center for the Baltic States Working Group.
- Some ideas and tasks have worked great, some less so, but collaborative spirit is alive and well !
- Under the umbrella and with the support of the CBG, Latvia has developed a joint doctoral study programme “Particle Physics and Accelerator Technologies” between Riga Technical University and the University of Latvia.
- Via the CBG, the feasibility study for the development of a large-scale scientific infrastructure project, the Advanced Particle therapy Centre, has been nearly completed, and we are readying to take the next steps !
- Through CBG, we are hopeful of establishing an European Master’s programme, jointly in the three Baltic states ! ... the pilot-project is complete and the next steps need to be taken !



- The Baltic School of High-Energy Physics and Accelerator Technologies !



BALTIC SCHOOL OF HIGH-ENERGY PHYSICS AND ACCELERATOR TECHNOLOGIES 2021

Kļapkalnciems, Latvia
August 2 - August 6, 2021

Lecturers:
Dr. Maurizio Vesterini
Prof. Dr. Jonathan Ellis
Prof. Dr. Yuri Dokshitzer
Prof. Dr. Matteo Cacciari

Scientific Program:

- Quantum Field Theory
- Quantum Electrodynamics
- Quantum Chromodynamics
- Standard Model
- Higgs Mechanism

Beyond the Standard Model
Collider physics
Precision physics at the LHC
Particle accelerator technologies
Particle accelerator applications

Local Organizing Committee:
Dr. Inga Kārkliņa (ITP, LV)
Dr. Kārlis Dreimanis (RTU, LV)
Prof. Dr. Jānis Ekmans (RTU, LV)
Ms. Elīna Grāze (RTU, LV)
Ms. Riga Kāle (RTU, LV)
Andrius Povilaitis (RTU, LV)

Scientific Committee:
Dr. Hans-Joachim Heusler (DE)
Prof. Dr. Maria Antonelli (SI, IT)
Dr. Kārlis Dreimanis (RTU, LV)
Prof. Dr. Jozsef Bernabetti (IT, HU)
Ms. Elina Grāze (RTU, LV)
Dr. Mihai Zeciu (UT, EE)
Dr. Thomas Gaisler (DE)
Dr. Marjatta Huuskonen (CERN)
Prof. Dr. Leonidas Stenisevicius (LT)
Dr. Jevgenijs Proskins (RSU, LV)
Dr. Aleksis Muceniecevics (CERN)

Further information:
<https://www.cta.taltech.ee/infocentrs/balticsummer-school>
email: bsp@tal.lv

Registration deadline: June 23rd



TAL TECH TALLINN UNIVERSITY OF TECHNOLOGY

BALTIC SCHOOL OF HIGH-ENERGY PHYSICS AND ACCELERATOR TECHNOLOGIES 2022

Saaremaa, ESTONIA
August 8-12, 2022

LECTURERS:
Prof. Jonathan Ellis
Prof. Yuri Dokshitzer
Prof. Ilsema Quakenbush
Prof. Leonid Reicher
Dr. Maurizio Vesterini
Dr. Axel Hocker
Dr. Jevgenijs Proskins (RSU)

SCIENTIFIC COMMITTEE:
Prof. Paolo Soriano (TUM, DE)
Prof. Veronika Zuber (IT, IT)
Prof. Tommi Tuomi (FTU, FI)
Prof. Kirill Babitskiy (KTPU, RU)
Prof. Maria Antonelli (SI, IT)
Dr. Thomas Gaisler (DE)
Dr. Kirgen Kemick (NCCRP, DE)
Dr. Thomas Spänhoff (DE)
Dr. Jevgenijs Proskins (RSU, LV)

LOCAL ORGANIZING COMMITTEE:
Prof. Pieter Sarason (TalTech, EE)
Prof. Veronika Zuber (UT, EE)
Dr. Eni Kärber (TalTech, EE)

SCIENTIFIC PROGRAMME:
Quantum Field Theory
Standard Model and Beyond
Physics of Colliders
Early Cosmology

Dark Matter
Gravitational Waves and New Physics
Accelerator Technologies
Accelerator Applications

Further information and fees: indico.cern.ch/e/CBG2022
Preliminary registration deadline: June 1st



ktu KAUNAS UNIVERSITY OF TECHNOLOGY

BALTIC SCHOOL OF HIGH-ENERGY PHYSICS AND ACCELERATOR TECHNOLOGIES 2023

August 7 – 11
Patungas, Lithuania

TOPICS:
Quantum field theory
Quantum chromodynamics and electrodynamics
Standard model physics and beyond
Collider physics and precision physics at the LHC
Accelerator technologies and applications
Application of accelerators in medicine / Interface between machine and patient

LECTURERS:
Dr. Maurizio Vesterini (CERN)
Prof. Jonathan Ellis (UK)
Prof. Yuri Dokshitzer (LV)
Prof. Leonid Reicher (CH)
Prof. Kirill Babitskiy (DE)
Dr. Aleksis Muceniecevics (DE)
Prof. Yuval Grossman (USA)
Prof. João Inácio (DE)
Prof. Tommi Tuomi (LV)
Prof. Tatiana Campos (PT, USA)

SCIENTIFIC COMMITTEE:
Dr. Maurizio Vesterini (CERN)
Prof. Jonathan Ellis (UK)
Prof. Maria Antonelli (SI, IT)
Prof. Veronika Zuber (UT, EE)
Dr. Kirgen Kemick (NCCRP, DE)
Dr. Jevgenijs Proskins (RSU, LV)
Dr. Anshu Sharma (INDIA, IN)
Dr. Jozsef Bernabetti (IT, HU)
Prof. Veronika Zuber (UT, EE)
Dr. Kirgen Kemick (NCCRP, DE)
Dr. Jevgenijs Proskins (RSU, LV)
Dr. Kirill Babitskiy (TUM, DE)

LOCAL ORGANIZING COMMITTEE:
Dr. Brigita Abakavičienė (KTU, LT)
Dr. Asta Gudobienė (KTU, LT)
Dr. Ernesta Borskaitė (KTU, LT)
Dr. Rasa Zastauskienė (KTU, LT)
Prof. Mikalojus Štikonas (KTU, LT)

Registration deadline: June 30, 2023



BALTIC SCHOOL OF HIGH-ENERGY PHYSICS AND ACCELERATOR TECHNOLOGIES 2024

August 5-9
Kuldīga, Latvia

Scientific Programme

Quantum Field Theory & Standard Model
Beyond the Standard Model physics
Effective Field Theory
Higgs physics at the LHC
Topics in Machine Learning
Accelerator Physics
Accelerator Applications
Future Accelerators

Lecturers

Leonid Rykin (EPFL, CH)
Maurizio Vesterini (CERN)
Jocqueline Kienzle (CERN)
Klaus Desch (University of Bonn)
Rasmus Winterhager (CERN)
John Ellis (CERN & Imperial College London, UK)
Timothy Cohen (EPFL, Univ. of Oregon & DESY)
Mark Thomson (University of Cambridge & DESY)

Scientific Committee

Levy Breda (University of Ferrara, Italy)
Giuseppe Penaranda (University of Valencia, Spain)
Giovanna Broo (University of Padua, Italy)
Giovanna Broo (University of Padua, Italy)
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Local organizers

Kristiņa Podiņa
Gundega Salga Putra
Saul Vītols
Kristiņa Podiņa

Registration deadline
14th of June

For more information:
<https://indico.cern.ch/event/1390267>
bsp@ktu.lv

- CERN Baltic Conference (CBC):
 - First one organised in Tartu, albeit, remotely due to "the circumstances !
 - Second organised in Vilnius.
 - Third in Riga

... and we have made a full circle and returned to Estonia for the 4th annual CERN Baltic Conference - CBC 2024 !

- We have 2.5 days packed with policy, industry and, of course, scientific sessions to show to each other, what we have and what we are still to achieve!
- The programme is packed, so let's move right into it !
- Thanks to the local organisers and I hope you all enjoy the event !

Tue 15/10	
09:00	Registration
10:00	Tudingmaja, Tallinn University of Technology
11:00	Predictables Tudingmaja, Tallinn University of Technology
	Opening of the Conference and Welcome - Chair of the CERN Baltic Group Tudingmaja, Tallinn University of Technology
	CERN Welcome (online) Tudingmaja, Tallinn University of Technology
	Welcome Address by the Vice Rector of Taltech Tudingmaja, Tallinn University of Technology
	Welcome Address from the Minister of Education and Science (online) Tudingmaja, Tallinn University of Technology
12:00	Welcome Address from the Parliament of Estonia Tudingmaja, Tallinn University of Technology
	Welcome Address from the Baltic Assembly Tudingmaja, Tallinn University of Technology
13:00	Lunch Main restaurant, Tallinn University of Technology
14:00	Baltic ILO Activities Tudingmaja, Tallinn University of Technology
	Tutorika Tudingmaja, Tallinn University of Technology
15:00	OScan Tudingmaja, Tallinn University of Technology
	CBO Workgroup review: Advanced Particle Therapy Center Tudingmaja, Tallinn University of Technology
	CBO Workgroup review: CMS Tier-II Baltic Computing Center Tudingmaja, Tallinn University of Technology
16:00	Lithuanian Student Education on Experimental High-Energy Physics Challenge Tudingmaja, Tallinn University of Technology
	POSTER SESSION Tudingmaja, Tallinn University of Technology
17:00	NETWORKING: Industry Meets Science Tudingmaja, Tallinn University of Technology
18:00	

Wed 16/10	
09:00	Open Problems in Contemporary Particle Physics Matti Raaij Tudingmaja, Tallinn University of Technology 09:00 - 10:00
10:00	Dark Matter Models Kriszta Kamari Tudingmaja, Tallinn University of Technology 10:00 - 10:20
	Cosmology and DESI Implementations Gert Hüb Tudingmaja, Tallinn University of Technology 10:20 - 10:40
	Gravitational Wave Probers of Dark Matter Harri Veermäe Tudingmaja, Tallinn University of Technology 10:40 - 11:00
11:00	Coffee Tudingmaja, Tallinn University of Technology 11:00 - 11:20
	Phase transitions Ville Vuolteen Tudingmaja, Tallinn University of Technology 11:20 - 11:40
	Inflation Antti Paoli Tudingmaja, Tallinn University of Technology 11:40 - 12:00
12:00	Ab-Initio algebraic calculations for the small systems of nucleons Tudingmaja, Tallinn University of Technology
	Nonlocal Quark-Gluon Interactions, A Dyson-Schwinger approach Tudingmaja, Tallinn University of Technology
13:00	Lunch
14:00	Quantum information at colliders Tudingmaja, Tallinn University of Technology
	2d at FCC Tudingmaja, Tallinn University of Technology
	311 models Tudingmaja, Tallinn University of Technology
15:00	Dependence of vacuum arc initiation dynamics on the application of a Tudingmaja, Tallinn University of Technology
	Study of Non-Resonant H⁰ Production in WWZ Decay Mode at CMS Tudingmaja, Tallinn University of Technology
	Coffee Tudingmaja, Tallinn University of Technology
16:00	Di-Higgs Physics at the CMS experiment Tudingmaja, Tallinn University of Technology
	Improving Hadronically Decaying Tau Lepton Identification and Recoil Lauri Teir
	Machine Learning and computing for collider data Tudingmaja, Tallinn University of Technology
17:00	Upgrading the Tau Trigger Algorithm at CMS for the High Luminosity Tudingmaja, Tallinn University of Technology
	The influence of electromagnetic power in vacuum breakdown Tudingmaja, Tallinn University of Technology
	Lepton flavour universality (LFU) violation study in tau decays in pp Aleksandr Raitz Straumats
18:00	

Thu 17/10	
09:00	WW unitarity Kriszta Kamari Tudingmaja, Tallinn University of Technology 09:00 - 09:20
	Inflation model building Christina Diguardi Tudingmaja, Tallinn University of Technology 09:20 - 09:40
	Type II Seesaw mechanism Abdus Kuberan Tudingmaja, Tallinn University of Technology 09:40 - 10:00
10:00	Pulsar Timing Array results Juan Urrutia Tudingmaja, Tallinn University of Technology 10:00 - 10:20
	Probing the Dark Substructure of the Milky Way with Deep Learning Tudingmaja, Tallinn University of Technology 10:20 - 10:40
	Exploring Vector Boson Fusion Di-Higgs Production in the btt$\bar{\nu}$ Final State Norman Seiba Tudingmaja, Tallinn University of Technology 10:40 - 11:00
11:00	Coffee Tudingmaja, Tallinn University of Technology 11:00 - 11:20
	Neutrino Physics Taru Johnny Kankkunen Tudingmaja, Tallinn University of Technology 11:20 - 11:40
	Novel linear accelerator design for injection of helium ions into a particle physics synchrotron and parallel radioisotope... Lauri Teir
12:00	Advancing the knowledge of Physicochemical and Radiobiological Mechanisms of Flash Radiotherapy Dr Jonas Verbe Tudingmaja, Tallinn University of Technology 12:00 - 12:20
	Experimental studies of radiochemical changes at ultra-high dose rates (UHDR) in perspective of FLASH therapy Kriszta Kamari
	Design of a Supporting System for Superconducting Magnets and its application to Rotating Centres for Cancer Therapy Lauri Teir
13:00	
	CLOSING: (?) Tudingmaja, Tallinn University of Technology 13:20 - 14:00
14:00	

