



# Update from the CBG SPWG

**Kārlis Dreimanis**

14<sup>th</sup> CBG General Meeting, CERN  
18.10.2024

- Existing students (HEP & atomic physics):

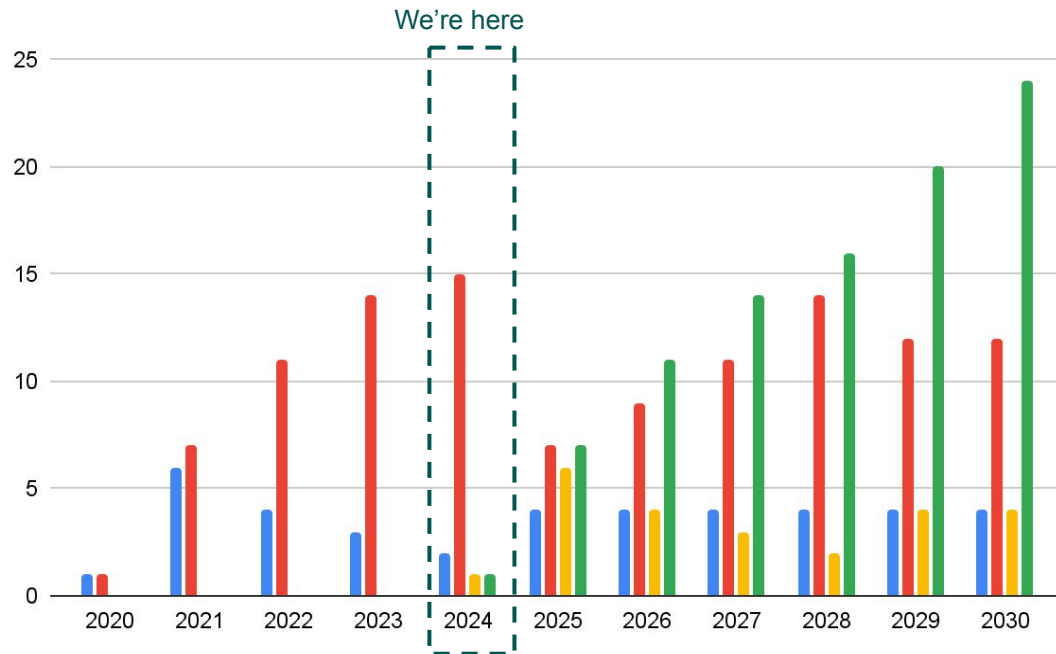
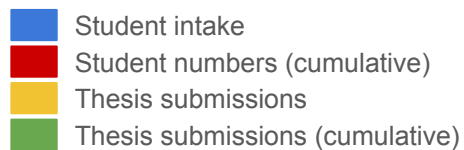
○ Antra Gaile	(Y4)	Study of di-Higgs production in the WWZZ channel.	[CMS, RTU]
○ Valts Krūmiņš	(Y4)	Optical interferometry system for anti-beam positron measurements.	[AEGIS, UL]
○ Normunds Ralfs Strautnieks	(Y4)	Study of lepton universality in top decays.	[CMS, UL]
○ Conrado Munoz Diaz	(Y3)	Measurement of the boosted top quark mass.	[CMS, RTU]
○ Dimitrios Sidiropoulos Kontos	(Y3)	Study of the boosted top substructure.	[CMS, RTU]
○ Dace Osīte	(Y3)	Search for the dead-cone effect in b-decays from top quarks.	[CMS, RTU]
○ Ojārs Mārtiņš Ebrerliņš	(Y2)	Jet substructure and hadronization studies.	[CMS, RTU]
○ Robert Pleše	(Y2)	Final-state radiation photon studies in low pile-up events.	[CMS, RTU]
○ Mārtiņš Klevs	(Y1)	Study of hard QCD radiation in top quark decays.	[CMS, RTU]

- Existing students (accelerator technologies & medical physics):

○ Lazar Nikitovic	(Y4)	Design of a high-frequency linear accelerator for injection into a therapy synchrotron.	[HITRIplus, RTU]
○ Kristaps Paļskis	(Y4)	Optimization of ion beam parameters for very high dose rate (FLASH) radiotherapy.	[NIMMS, RTU]
○ Luca Piacentini	(Y4)	Integration of Systems, of a Carbon Ion Rotating Gantry for Medical Treatments.	[HITRIplus, RTU]
○ Tobia Romano	(Y3)	Study of sintering behaviour of pure copper processed via binder jetting AM.	[I.FAST, RTU+Polimi]
○ Vincenzo Sansipersico	(Y2)	Optimization and Integration of a $^4\text{He}^{2+}$ Synchrotron for Cancer Therapy.	[NIMMS, RTU]
○ Patrīcija Kalniņa	(Y1)	RIBs production for medical applications: from release study to mass separation.	[MEDICIS, UL]

- Andris Potrebko [CMS, RTU] has now become a “student in a pre-stage to PhD-ship”; plan to submit Oct./Nov., defence Feb.Mar.

# DSP: Update on numbers



- Funding limits have imposed a reduced number of students in the last couple of years.
- We hope to recover to 2+2 (physics+technologies) soon (but impossible under current funding conditions).

# Development of the master's programme



- **Recap: Erasmus Mundus Design Measures (EMDM):**
  - Successfully completed an EMDM project on 31st of May, 2024.
  - Total funding awarded was 55 kEur.
  - Developed a skeleton of a proposed programme syllabus.
  - Developed the proposal for joint mechanisms for programme management.
  - Prepared an MoU signed by the vice-rector or rector of all five universities involved:
    - RTU;
    - UL;
    - UT;
    - KTU;
    - VU.
- **Aims of the planned master's programme:**
  - to develop the scientific capacity in modern fundamental physics and related technologies in the Baltic region;
  - to train and develop human resources with the skills and competencies desired by the local industry;
  - to increase the internationalisation of the higher education ecosystem in the Baltic region.
- **Crucial necessity: we must attain a single joint diploma !**

It is agreed by all partners of the consortium that without a joint diploma this programme will not be tenable !

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- **Crucial necessity: we must attain a single joint diploma !**

- Two-year academic master's comprising **120 ECTS**, focused on HEP & HEP instrumentation relatable to:
  - Particle physics HEP;
  - Particle reconstruction techniques HEP & HEP instrumentation;
  - Detector technologies HEP instrumentation;
  - Accelerator physics HEP instrumentation;
  - Accelerator technologies HEP instrumentation;
  
- Programme to be implemented by a **consortium of Universities** from the three Baltic states:
  - Riga Technical University (RTU, lead), Latvia (LV);
  - University of Latvia (UL), Latvia (LV);
  - University of Tartu (UT), Estonia (EE);
  - Vilnius University (VU), Lithuania (LT);
  - Kaunas University of Technology (KTU), Lithuania (LT);

- Encouraging (for us) discussion in the ECFA\* report at the CERN Council last year: [the Taskforce] *"calls for the creation of a dedicated panel in this area under the auspices of ECFA, in consultation with organisations or communities representing neighbouring disciplines and ICFA";*

*"The role of this coordination panel would primarily be to enhance the synergies between existing training programmes and stimulate the creation of complementary ones where relevant, in particular multidisciplinary schools or academia-industry-joined training programmes. The second equally important DCT sets out as a goal the creation of a European master's degree programme in HEP instrumentation [read: accelerator & detector physics & technologies], to also be a potential responsibility of this proposed panel to help coordinate."* [from the R&D roadmap document: <https://cds.cern.ch/record/2784893>];

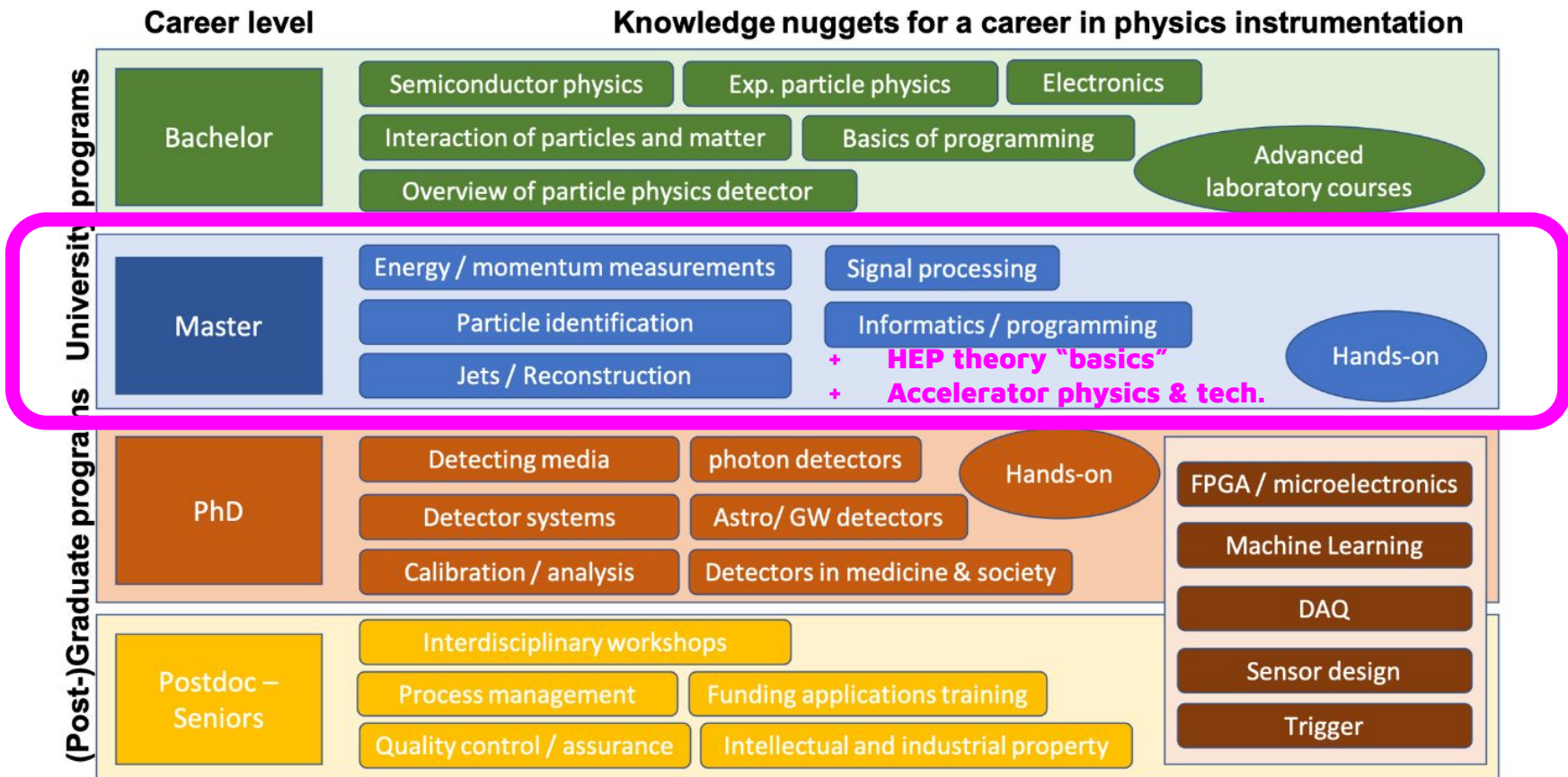
additionally,

*"ECFA recognizes the need for the experimental and theoretical communities involved in physics studies, experiment designs and detector technologies at future Higgs factories to gather."*

- There is great interest in our planned activities from CERN and the accelerator-based research facilities!
- We have contacted ECFA and received an enthusiastic and full endorsement of this activity + a promise of an official letter of support when applying for the EMJM funding !

\* European Committee for Future Accelerators

# HEP & HEP Instrumentation



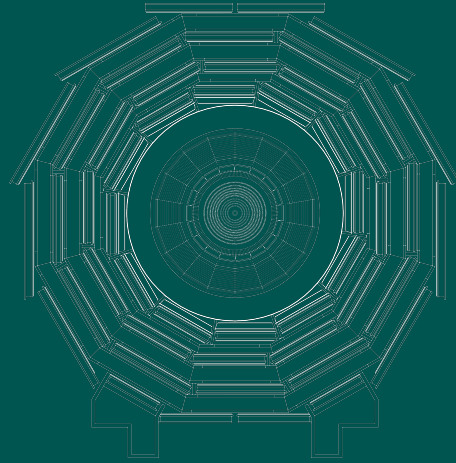


## Doctoral programme:

- DSP going well, but the number of students is reducing due to lack of funding.
- First graduate of the DSP expected shortly

## Master's programme:

- Currently waiting for the EMJM call to be opened.
- Contacted ERASMUS+ NCP for Latvia; advised the call should be opened late October / early November.
- Expected deadline - mid-February.
- Also given some documentation to look through (in progress).
- **Latvian NCP was highly supportive of this initiative**, so expect support from their side.
- If partners are still interested in this initiative, I will start preparing for the project call opening.



Thank you