



Update from the CBG SPWG

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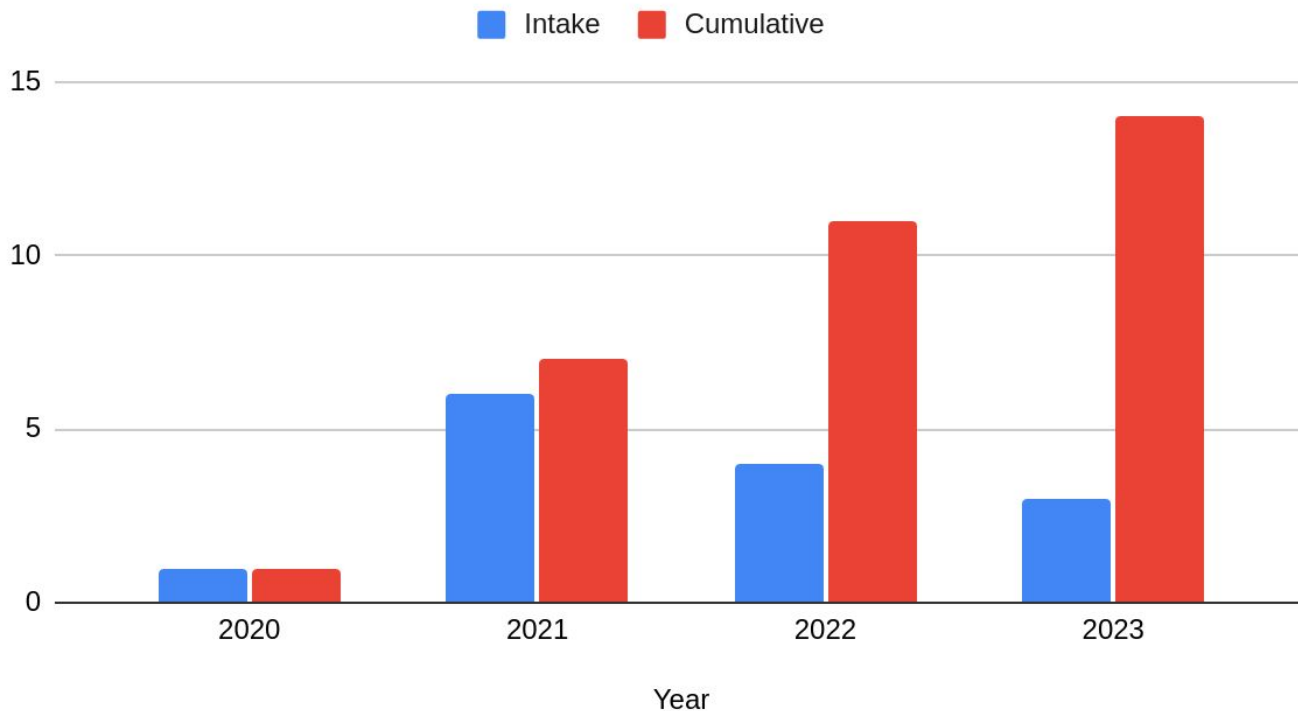
CBG General Meeting, Riga Stradins University, Latvia
12.10.2023

- Recap of the programme:
 - DSP “Particle physics and accelerator technologies” is implemented jointly by RTU and UL;
 - The development, implementation and oversight is done with the support of the CBG partners;
 - The programme has a dedicated study programme council consisting of 8 council members:
 - 2 representing RTU;
 - 2 representing UL;
 - 2 representing the CBG;
 - 2 representing CERN;
 - + 2 programme directors (1 from RTU, 1 from UL);
- Student attestation is performed yearly; for the academic year 2022/23 it is planned for the week of the 12th of June;
- The study direction (physics, materials science and mathematics) containing this DSP was undergoing accreditation during 2022;

- The accreditation performed at RTU and UL separately:
 - Commission accrediting the UL study direction evaluated the programme as excellent (highest award);
 - Commission accrediting the RTU study direction evaluated the programme as good (second highest award);
 - Overall, the study directions were accredited as excellent at both universities;
- Main recommendations:
 - Improvement of the study course descriptions (on-going; will include some more substantial course changes as well);
 - Include *newer* literature (on-going, but we still note that some literature is from the 70s by design);
 - Ensure equal lecturer *vetting* for the guest lecturers (appropriate mechanisms will be developed);
 - Develop and implement a corresponding master's programme (on-going);

- 3 new PhD students have been added for the academic year of 2023/24:
 - Ojārs Mārtiņš Ebrerliņš [LV] (HEP, RTU) Jet substructure and hadronization studies;
 - Robert Pleše [HR] (HEP, RTU) Final-state radiation photon studies using the S resonance;
 - Vincenzo Sansipersico [IT] (AT, RTU) Optimization and Integration of a $^4\text{He}^{2+}$ Synchrotron for Cancer Therapy;
- Existing students (HEP & atomic physics):
 - Andris Potrebko (Y3, RTU) Measurement of the top/anti-top mass difference at CMS;
 - Antra Gaile (Y2, RTU) Measurement of anomalous Higgs couplings in $H \rightarrow ZZ \rightarrow 4l$ channel at CMS;
 - Valts Krūmiņš (Y2, UL) Optical interferometry system for anti-beam positron measurements at AEGLIS;
 - Normunds Ralfs Strautnieks (Y2, UL) Study of lepton universality in top decays at CMS;
 - Conrado Munoz Diaz (Y1, RTU) Measurement of the boosted top quark mass at CMS;
 - Dimitrios Sidiropoulos Kontos (Y1, RTU) Study of the boosted top substructure at CMS;
 - Dace Osīte (Y1, RTU) Search for the dead-cone effect in b-decays from top quarks at CMS;
- Existing students (accelerator technologies & medical physics):
 - Lazar Nikitovic (Y2, RTU) Design of a high-frequency linear accelerator for injection into a therapy synchrotron;
 - Kristaps Paļskis (Y2, RTU) Optimization of ion beam parameters for very high dose rate (FLASH) radiotherapy;
 - Luca Piacentini (Y2, RTU) Integration of Systems, of a Carbon Ion Rotating Gantry for Medical Treatments;
 - Tobia Romano (Y1, RTU+Polimi) Study of sintering behaviour of pure copper processed via binder jetting AM;

PhD Student Statistics



- **Recap: Erasmus Mundus Design Measures (EMDM):**
 - Successful bid for EMDM funding in 2022;
 - 55 kEur (15 months until 31st of December 2023);
 - Deliverable: developed joint mechanisms for a new master's study programme;
- **Aims of the EMDM project:**
 - to develop joint mechanisms for admissions, evaluation, award of the degree, dissemination;
 - to develop the above mechanisms to be fully in line with the requirements for the [Erasmus Mundus Joint Masters \(EMJM\)](#) calls;
 - to develop a curriculum that would be highly competitive & desirable internationally (incl. to Western European students);
- **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;

Development of the master's programme



- 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 (as of October 12th, 2023):
 - 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:
[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";*

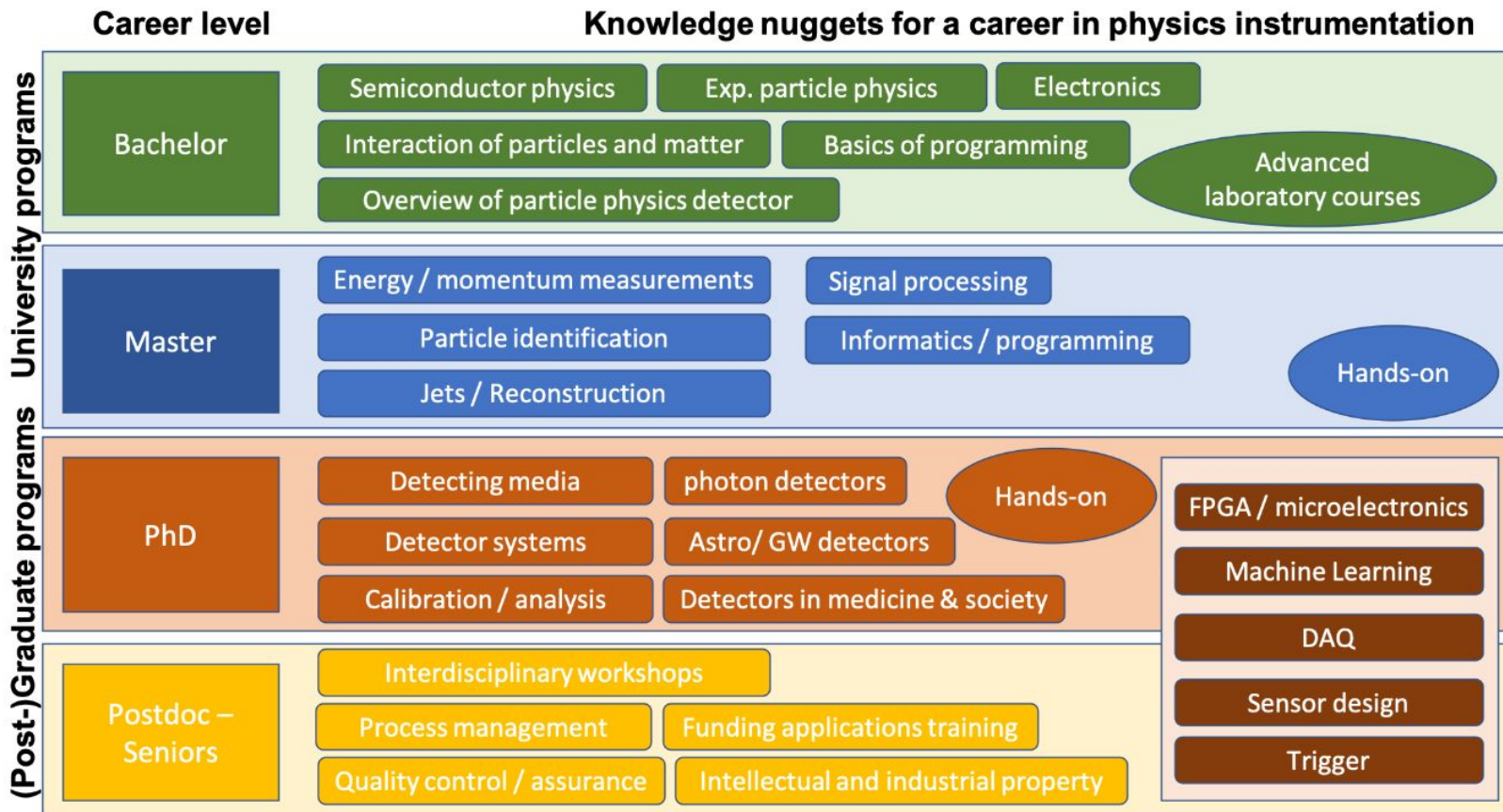
"The role of this coordination panel would primarily be to enhance the synergies between existing training programmes and stimulate the creation of complementary ones where relevant, in particular multidisciplinary schools or academia-industry-joined training programmes. The second equally important 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,

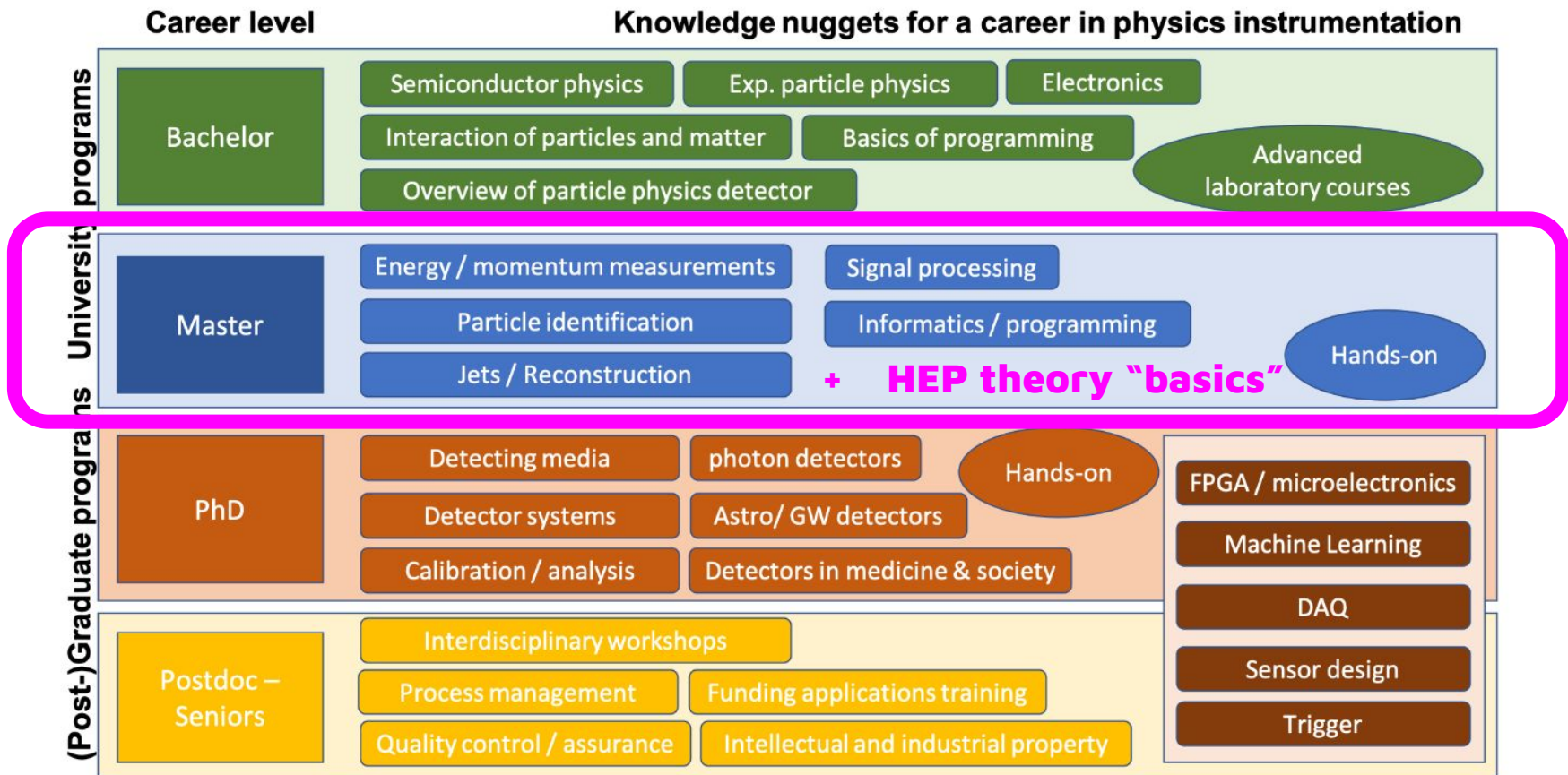
"ECFA recognizes the need for the experimental and theoretical communities involved in physics studies, experiment designs and detector technologies at future Higgs factories to gather."

- There is great interest in our planned activities from CERN and the accelerator-based research facilities!
- With our planned programme we are literally ahead of the curve and ahead of CERN!
- Potentially, we could receive significant aid from CERN and ECFA in our pursuit!

* European Committee for Future Accelerators



HEP & HEP Instrumentation

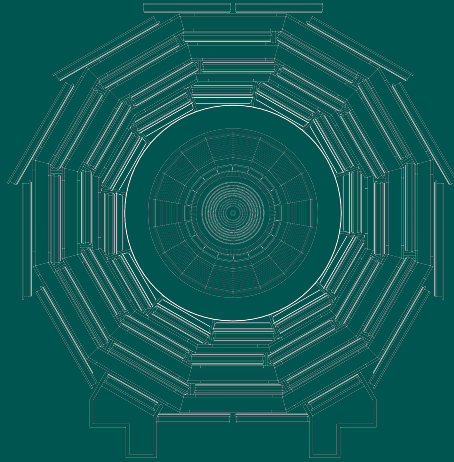




- First project group held a workshop at RTU on the 27th of April;
- Great breakthroughs achieved via face-to-face discussions;
- Second face-to-face workshop planned for next week @ CERN;

- 2023 has been extremely challenging!
- Work EMDM project implementation has been continuously postponed, due to lack of time/resources!
- PL was [justifiably] scolded by the Consortia members in a recent update meeting;
- We are exploring a short extension option for the deliverables of the project!

- Doctoral study programme is doing extremely well (though requires some work to rejig some courses, etc.);
- EMDM project has stalled and a short extension for deliverables is highly-likely (~ 3 month extension);
- The consortium is still alive and we still *can do it!*
- EMJM project proposal submission near 100% will take place in February 2025,
(subsequently, programme implementation should follow in September 2025);



Thank you

- We explicitly aim to develop a program eligible to be submitted to the Erasmus Mundus Joint Masters (EMJM) call;
- EMJM calls typically close in mid-February → aim to have a project proposal ready for February 2024;
- EMJM:
 - Supports the implementation of Joint-Masters programs for up to 74 months (renewable);
 - Allows for the support of up to 4-5 full editions of a 2-year master's cohorts;
 - Financial support:
 - Institutionally: 750 Eur/month per student for up to 100 students;
 - Stipends: 1'400 Eur/month stipend for up to 60 students;
max. 10% of stipends to students of the same nationality;
- At least 1 semester in 2 partner-HEIs other than in the country of residence of the student;
- For our program, at least 1 semester in each of the three Baltic countries;

- We aim to create a highly competitive and unique-in-Europe master's programme aimed at HEP and HEP instrumentation;
- We must strive to create a curriculum and a study experience that is attractive to everyone interested in the field!
- We are small Baltic countries without highly-recognised HE sector in the West; we must seek to change that!
- Mantra:
 - *Where other programmes offer 5 lecture-hours per ECTS, we must offer 6;*
 - *Where other programmes offer 1 tutorial hour per ECTS, we must offer 2;*
 - *Where other programmes are localised on the campuses of their respective Universities, we offer a chance to spend a semester in three different countries!*
- We will also aim to offer, in collaboration with our industrial partners and CERN, internships in the inter-year summer.

Decisions reached at the Workshop



- The degree to be awarded was discussed at length in terms of both the area and the award of the diploma;
 - It was concluded that only the award of a uniform degree is viable for the consortium - master of physics;
 - Naming of a further specialisation of the degree (eg. particle physics, accelerator physics, medical physics) is not planned at this time, but the student's specialisation should be inferred from the diploma supplement;
 - It was concluded that only a joint-diploma is viable long-term (afterwards also emphasised by the rector of Vilnius University);
- The admission of students would proceed as a stepped-process, with them being admitted in Latvia in semester 1, in Estonia in semester 2 and Lithuania in semester 3, followed by graduating with the aforementioned joint-diploma;
- We are still aiming to submit an EMJM project proposal in February 2024:
 - Consortium is in agreement that the implementation in the current form can only proceed with a successful bid;
 - If successful, the first intake of students would be September 2025;
- Joint-diploma requirement might be *a bridge too far* for this project call:
 - Support from the policy makers will be paramount;
 - In case it is not viable to submit the project at the 2024 call, the 2025 call will be utilised;
 - If successful, the first intake of students would be September 2026;

- Reminder, this project was awarded a lump sum grant of 55 kEur;
 - Original plan was to fund travel for meetings using these funds directly from the RTU accounts;
 - Given the current status, plan to split these funds among partners based on a consortium agreement;
 - The consortium agreement for **this** project must be developed **ASAP**;
 - Propose to split of **40 kEur** among the 5 partners to fund the day-to-day work on the programme development in 2023;
 - This results in **8 kEur per partner** for the next 7 months (May-December);

- **15 kEur** to be retained by RTU at this stage for other related near-term activities:
 - Creation of the visual identity and promotional material, including a dedicated web-page;
 - Licensing costs in Latvia and in partner countries, if required;
 - Other miscellaneous costs arising;