RIGA TECHNICAL UNIVERSITY

Centre of High-Energy Physics and Accelerator Technologies

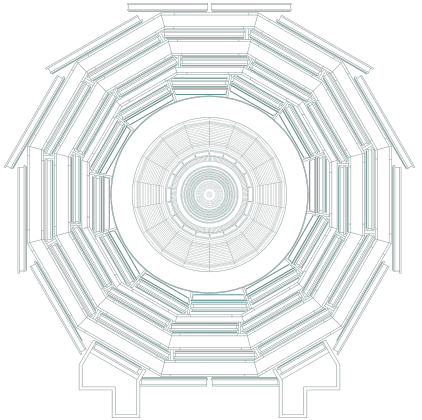
CERN Baltic Group

Erasmus Mundus Design Measures

CBG SPWG meeting

Kārlis Dreimanis

03.02.2022



Our Objectives

- To create a world-class master's programme on CBG-relevant topics:
  - Experimental high-energy physics;
  - Accelerator physics & technologies;
  - more?
- To ensure a steady supply of well-trained students to undertake PhDs in our Universities;
- To alleviate the lack of STEM graduates in our countries in general;
- To boost the higher education ecosystem in the region;

EMDM

- Erasmus Mundus Design Measures (EMDM) is a small project aimed at giving HEI consortia the resources to develop a joint masters study program;
- Project award is 55’000 Eur lump sum to single beneficiary;
- Project duration is 15 months (award in May -> completion August+1Y);
- Expected outcomes:
  - A joint, integrated master’s program ready to be undertaken by the consortium;
  - Joint admission and evaluation rules, joint quality assurance policy;
  - Overall, joint management and administration;
- Submission of an EMJM project is not an expected outcome,
  nor does the award of the EMDM grant give any privileges in the EMJM award process;
- We must be ready to admit the first students in the new master’s program in September 2024 at the latest, with or without further EMJM support!

EMJM

- If we bid for EMDM, we, of course, plan to bid for EMJM in 2023 or 2024;

- EMJM is a large project with significant financial impact:
  - 74 months of financing of the joint programme (covers 4 full study periods, in case of a 120 ECTS master's);
  - Instit. support: 750 eur x DR x NRES (capped at 1.8 million for the entire period);
  - Scholarships: 1400 eur per month (full time only, capped at 60 students);
  - Additional support for students with disabilities;

  - The program is not allowed to collect student application fees (I cannot believe this is still a thing!);
  - The program is not allowed to collect tuition fees from the scholarship holders;

- Our projection:
  - Initially, aim at 20 students per year (80 per grant period);
  - Total institutional grant : 1.44 million (~19.5 kEur per implementation month);
  - Studentship coverage of 75 %;
  - Can we reasonably expect this?

DR	- number of months in the program = 24 for 120 ECTS master's;
NRES	- number of enrolled students (support capped at 100);

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Commitment required **now** (for EMDM)

- We need to decide on the HEIs of the CBG who are happy and willing to commit now to both EMDM and EMJM;

- We must agree on the working group for the EMDM call and implementation and need to fill the following information for each participant in the EMDM:

Name and function	Organisation	Role/tasks	Professional profile and expertise

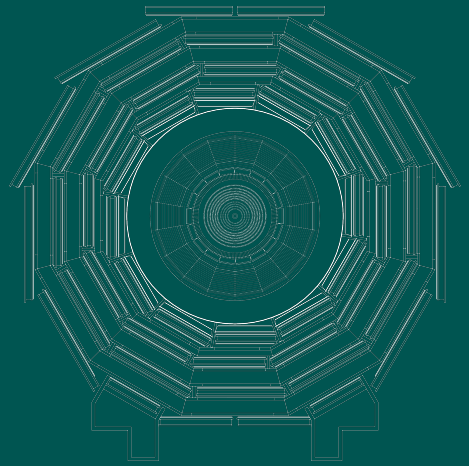
from RTU: *Kārlis Dreimanis, project lead;*
Silva Vītola, main administrator;
others (TBC) WG member/-s (implementation);

- We would ask for an up-to-date CV from all participants involved in the EMDM, as it is unclear if it is mandatory;

- We must provide a list of previous projects for all individual participants involved (past 3 years should do);

- Each participant institution will be required to sign-off on the project in the system (they must be warned to do so as soon as a green-light from the project team is given);

- We will need some volunteers from the project partners to be made available for information-provision, proofreading, fact-checking, etc. for the duration of the next week;



Extremely preliminary programme mock-up

(this is what we would develop during the EMDM)

Laur's [excellent] proposal

- **Semester 1:**
  - Fundamental courses attended by all students in country A;
- **Semester 2:**
  - Specialist courses given in countries B and C;
- **Semester 3:**
  - Students change between B and C for further specialisation;
- **Semester 4:**
  - Thesis writing at their main (home) institution in A, B or C;

- We would encourage participation in the CERN summer student programme and/or seek to cover some internship time at CERN;

Proposed content

- **Semester 1 (A)**:
  - Advanced Mathematics;
  - Special relativity;
  - Advanced electromagnetism;

- Semester 2 (B):
  - Quantum mechanics;
  - Introduction to particle physics;
  - Essential programming;

- Semester 3 (C):
  - Quantum Field Theory;
  - Advanced particle physics;
  - Data analysis techniques;

- Semester 2 (C):
  - Introduction to accelerator physics;
  - Medical particle physics;
  - Advanced materials;

- Semester 3 (B):
  - Advanced accelerator physics & technologies;
  - Advanced manufacturing techniques;
  - Computer-aided design;

- **Semester 4 (A,B,C,O*)**:
  - **Thesis.**

**- other CBG institutes*

Proposed host-institutes and responsibilities

(A) Vilnius (LTU) [all students]:

(Autumn) Advanced Mathematics;
(Autumn) Special relativity;
(Autumn) Advanced electromagnetism;

Fundamental
Introductory (specialist)
Advanced (specialist)

(B) RTU (LVA) [*half* of the students]:

(Spring) Quantum mechanics;
(Spring) Introduction to particle physics;
(Spring) Essential programming;
(Autumn) Advanced accelerator physics & technologies;
(Autumn) Advanced manufacturing techniques;
(Autumn) Computer-aided design;

(C) Tartu (EST) [*half* of the students]:

(Spring) Introduction to accelerator physics;
(Spring) Medical particle physics;
(Spring) Advanced materials;
(Spring) Quantum Field Theory;
(Spring) Advanced particle physics;
(Spring) Data analysis techniques;

- **All interested & applicable CBG members [all students]**:
  (Spring) Thesis supervision.

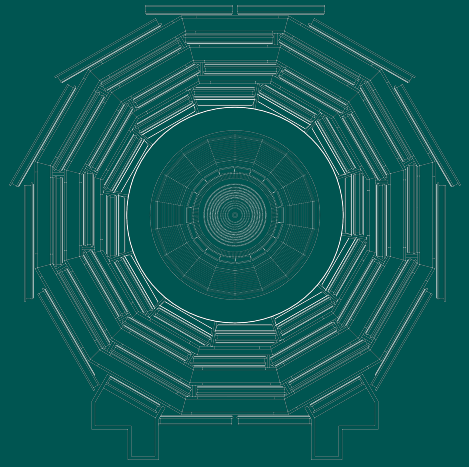
Proposed [elective] content

- To be distributed across the 3 countries and 4 semesters:
  - Lithuanian, Latvian, Estonian language for foreign speakers;
  - English, French language;
  - Ethics in science;
  - Scientific writing;
  - Science communication;

.. other ..

Inter-year summer jamboree

- Organise a yearly event following the completion of Year 1 for all students:
  - Multi-day event during the 3rd week of June;
  - Students are hosted by one of the CBG institutions (similarly to BSHEPAT);
  - For students:
    - Accelerator-track students *lecture* hep-track students;
    - Hep-track students *lecture* accelerator-track students;
    - Facilitate community-spirit for the whole year;
    - Facilitate connection between the tracks;
  - For universities:
    - Gives the host-institution the opportunity to advertise itself to the students as a potential future study/workplace;
  - For industry:
    - Gives the interested host-country businesses to *pitch* themselves as future employers;



Discussion