

LATVIA - CERN COOPERATION

State-of-play

Prof. Toms Torims - representative of Latvia at CERN

2nd CERN Baltic Group Conference, Vilnius, 10-12 Oct 2022



Outline

1. Latvia – CERN Strategy
2. Scientific / research portfolio – emphasis on HEP and AT
3. Latvia @CERN and related research
4. Institute of Particle Physics and Accelerator Technologies
5. Doctoral Programme in HEP and AT
6. CERN related outreach activities
7. Latvia CERN Stakeholders Group
8. Geneva/CERN based ILO
9. Relevant Government decisions and financial framework



Latvia is a reliable and honest partner of CERN

Latvia – CERN Strategy



Latvia - CERN strategy

Government approved – consensus based - stakeholders and ministries

Overarching goals:

- 1. Meaningful and coordinated** participation of Latvia at CERN as an **Associate Member** state
- 2. To become a Full Member** state within **2-3 years**



Meaningful and coordinated participation of Latvia at CERN

Tasks for the associate membership:

1. To maximise the benefit from the **opportunities** at CERN for Latvia at all levels
2. To provide a sustainable contribution in achieving the **State priorities** in education, science, economic development and R&D
3. To foster the environment of **scientific excellence and industrial leadership**
4. To concentrate the existing **human resources** and to attract new ones
5. To strategically utilize the available **financial instruments**
6. To achieve the “**well balanced country**” status with CERN within the next few years and to ensure the **60/40 proportion** for scientific HR / industrial return



Benefit from the opportunities at CERN

***– in the best possible way and
at all levels***



Scientific/research portfolio

Based on the bottom-up initiatives / balance & diversity / strategic approach

CERN-based experiments and collaborations:

- **CMS** [flagship HEP experiment for Latvia] (RTU+LU)
- **MEDICIS** (RTU+LU)
- AEGIS (LU)
- ISOLDE/LIEBE (LU)
- Crystal Clear Collaboration (LU)

Development of new projects & technologies at CERN:

- Accelerator & Technology Sector /ATS-DO
- Engineering and Technology Departments
- FCC

+ Muon Collider Collaboration

EU funded projects

(CERN coordinated/associated):

Riga Technical University (RTU)

- I.FAST
- HITRIplus
- HERTIS
- NIMMS

University of Latvia (UL)

- PRISMAP
- QuantHEP



Latvia @ CERN

Personal based long term @CERN: USER, COAS, PJAS, DOCT, FELL
- snapshot at 01/10/2022

CMS-Latvia HEP group

Users (rec. COLA) 100% at CERN

1. Senior researcher PhD in HEP – CMS Team leader
2. Senior researcher PhD in HEP – Top physics analysis group
3. PhD student – Technical Integration
4. PhD student – Top physics analysis group

Latvia Accelerator Technology group

PJAS and COAS 100% at CERN

5. Senior researcher – COAS / ATS-DO
6. Senior researcher – PJAS / ATS-DO
7. PhD Student AT – COAS / ATS-DO+CMS
8. PhD Student AT – DOCT /ATS-DO **paid by NIMMS**

AD-Antihydrogen Experiment

9. PhD Student Atomic physics - USER / AEgIS+CMS

CERN-Latvia doctoral programme

10. PhD Student AT – DOCT / ATS-DO+CMS
11. PhD Student MEDICIS – DOCT/SY-STI-RBS+CMS
12. **PhD Student Top physics – DOCT** / EP-CMG+CMS

CERN Doctoral Programme

13. **PhD Student Higgs physics – DOCT** / EP-CMD+CMS – **only DOCT paid by CERN**
14. PhD Student AT – DOCT / ATS-DO so far paid by Latvia

With no current link to Latvia scientific community

15. CERN Fellow - FELL / EP-DT-EO - **only FELL paid by CERN**

+ numerous short (2-3 months) term stays @CERN paid from the Latvian budget



To continue capacity and competency building in HEP and AT

Aim to create and build a strong CERN-related scientific institute with a multidisciplinary research team and a continuous presence at CERN



Institute of Particle Physics and Accelerator Technologies

@Riga Technical University

Faculty of Materials Science and Applied Chemistry

100% CERN related research

Elected academic and research staff

1. Prof. Yuri Dokshitzer, HEP-TH:

lecturer, PhD supervisor;

2. Asoc.prof.* Kārlis Dreimanis, HEP-EX:

lecturer, PhD supervisor, senior researcher;

3. Dr Markus Seidel, HEP-EX:

lecturer, PhD supervisor, senior researcher;

4. Prof. Toms Torims, AT:

lecturer, PhD supervisor, senior researcher;

5. Asoc.prof.* Andris Ratkus, AT

PhD supervisor, researcher;

- Leading and running **CMS-Latvia HEP group**;
 - Executing **State Research Program** in HEP and AT;
 - Implementing the **Doctoral Program** (jointly with University of Latvia) in HEP and AT;
 - Institutional partner of **CMS, FCC** and the **Muon Collider** collaborations;
 - Collaborator and contributor to the **I.FAST, HITRIplus** and **NIMMS** projects;
 - Leader of the **HERTIS** project;
 - Leader of the CMS **Tier2 center** project;
 - Representing RTU at the **CERN Baltic Group**;
- + supervisory and support role for all LV students based at CERN;

Totals (as of today):

- **5 academic/research staff** (3-HEP, 2-AT);
- **12 PhD students** (5-HEP, 7-AT);

* to be elected to the academic position shortly;



Dedicated doctoral program

- Designed in collaboration with CERN Baltic Group (by the **CBG Study Program Working Group**);
- Enrolled students: 3rd year – **1**; 2nd year **6**; 1st year **5** ;
- Students are **co-supervised by CERN** staff;
- Strong presence of **international/Baltic students**;
- Executed in Latvia with mandatory **term at CERN**;
- **World class** lecturers: Latvia, CBG, CERN, PSI;
- Balance between **HEP** and **AT**;
- [International Study Program Council](#);
- Relevant **master program** under development;



Other CERN research in Latvia

Other institutes carrying out CERN related research and projects

University of Latvia

1. Institute of Chemical Physics – Prof. Elina Pajuste group - **CMS** and **MEDICIS**
2. Faculty of Physics, Mathematics and Optometry - Prof. Mārcis Auziņš group – **AEgIS**
3. Faculty of Medicine – Prof. Maija Radziņa group – **MEDICIS/PRISMAP**
4. Institute of the Solid-State Physics – Dr. Anatoli Popov group- **Crystal Clear Collaboration**
5. Institute of Physics – Dr. Kalvis Kravalis group – **ISOLDE / LIEBE**
6. Quantum Computing group of Prof. Andris Ambainis - **QuantHEP**

Riga Technical University

1. Department of artificial intelligence and systems engineering - Prof. Agris Nikitenko group – **I.FAST** + Mechatronics, **Robotics** and Operations section **at CERN**
2. Institute of technical Physics – Prof. Arturs Medvids group – **I.FAST**
3. Institute of Industrial Electronics and Electrical Engineering – Prof. Pēteris Apse-Apsītis group - **ARIES**
4. Students of Institute of Mechanics and Mechanical Engineering - **I.FAST** and **HITRIplus**
5. High Performance Computing (HPC) Centre – **Tier2** project at **CMS**



State Research Programme

Strengthening the development of the Latvian scientific community in the fields of **high-energy physics** and **accelerator technology** in cooperation with the CERN

**Programme call
(2020-2022)**
to be finalized
31.10.2022

➤ **900 000 EUR** ➤

Project leader:



RIGA TECHNICAL
UNIVERSITY

Project partners:



UNIVERSITY
OF LATVIA



INSTITUTE OF SOLID STATE PHYSICS
UNIVERSITY OF LATVIA



Develop world-class knowledge



Develop human capital & technologies



Create products & services



Involve scientific & academic staff, students, PhD applicants & young scientists

**Programme call
(2022-2026)**
to begin
implementation
Autumn 2022

➤ **1 500 000 EUR** ➤

**Eligible participants of the
open call:**

Research organizations,
public organizations. Several
partners must be involved



Ensure the programme's continuity



Foster research capacity



Outreach activities in Latvia

Integral part of the Latvia – CERN strategy / boosting interest in STEM

Latvian National Library:

- permanent CERN exposition and classroom for children and for the general public;
- CERN as a centre of excellence for technology and innovation;

Latvian Physics Teachers Association:

- Participation in events and lectures of Latvian scientists @CERN and CERN staff / selection of teachers for the CERN visits;

School of the Young Physicists of Latvia:

- Virtual and in-person lectures + events;

Job shadowing at CERN:

- Every year 4-5 high-school pupils come to CERN to shadow Latvian scientists and engineers with preparatory and post-events in Latvia;

+ many other events and activities



Latvia - CERN Stakeholders Group

Encompassing all relevant stakeholders - platform for engagement and exchange

<https://indico.cern.ch/category/11669/>

- 10 **regular meetings** since Nov 2019;
- Organised by the CERN **National Contact point**;
- All **relevant** research institutions, business entities and associations, related ministries and agencies, CERN Council Delegates and the ILO;
- **Informing** the stakeholders about the relevant CERN-based and CERN-related activities;
- Directly supporting the stakeholders' **engagement** with CERN;
- Managing the information **exchange** and **collaboration** vis-à-vis CERN and the stakeholders.



Geneva / CERN based ILO

To ensure meaningful Latvian business participation @CERN

CERN as priority

- ILO KPI's are directly based on industry engagement;

Knowledge Transfer

- Technological and knowledge return to Latvia by engaging R&D capable companies;

Well-balanced industrial return

- To ensure fulfilment of the current 'quota' ~ 400 000 CHF;
- To prepare industrial portfolio for the full-membership @CERN;
- To closely collaborate with Latvian scientific and engineering community at CERN;



Latvia – CERN Strategy

Full membership to CERN



Full membership at CERN

Main task – to liaison with decisionmakers and stakeholders

1. To **ensure the support** of the CERN Management and Member states;
2. To actively **participate** in the work of the CERN Council and its committees – *inter alia* to cultivate a **positive attitude** towards Latvia's full membership;
3. To **coordinate** Latvia's position at the Council meetings and its committees;
4. To facilitate the coordination among the **Baltic States**: at CERN Baltic Group and Baltic Assembly level – to foster a **joint position** vis-à-vis CERN;
5. To ensure **continuous support** from the Government, Parliament, scientific community, entrepreneurs, other partners and the society at large;



Full membership at CERN

Tasks – scientific and technical measures

1. To ensure stable **financial framework** for CERN activities in Latvia – ensuring **50/50 principle** – where proportion of the national funding is gradually exceeding CERN membership
2. To continue **capacity and competency** building in HEP and AT: to maintain strong CERN related **scientific institute** with interdisciplinary research team and presence at CERN; to run master level programme in HEP and AT
3. To facilitate **industrial return** and engagement with CERN; including ILO organised dedicated events in Latvia
4. To cultivate **positive image** of Latvia – CERN cooperation *#LatvijaCERN*

Proposed timeline for full membership

2022 2nd half

December Council

Government letter of intent to the President of CERN Council and DG

2023 1st half

March Council

Favourable CERN Council decision and invitation to apply for the full membership

- subsequently application is submitted

2023 2nd half

June Council

CERN Council Decision to form the Task Force

Task Force visit to Latvia

September Council

CERN Task Force report is evaluated and DG is mandated to negotiate agreement

2024 1st half

Agreement is reached

Cabinet of Ministers decision

Signature of pre-stage Agreement

Ratification procedure is concluded

2026

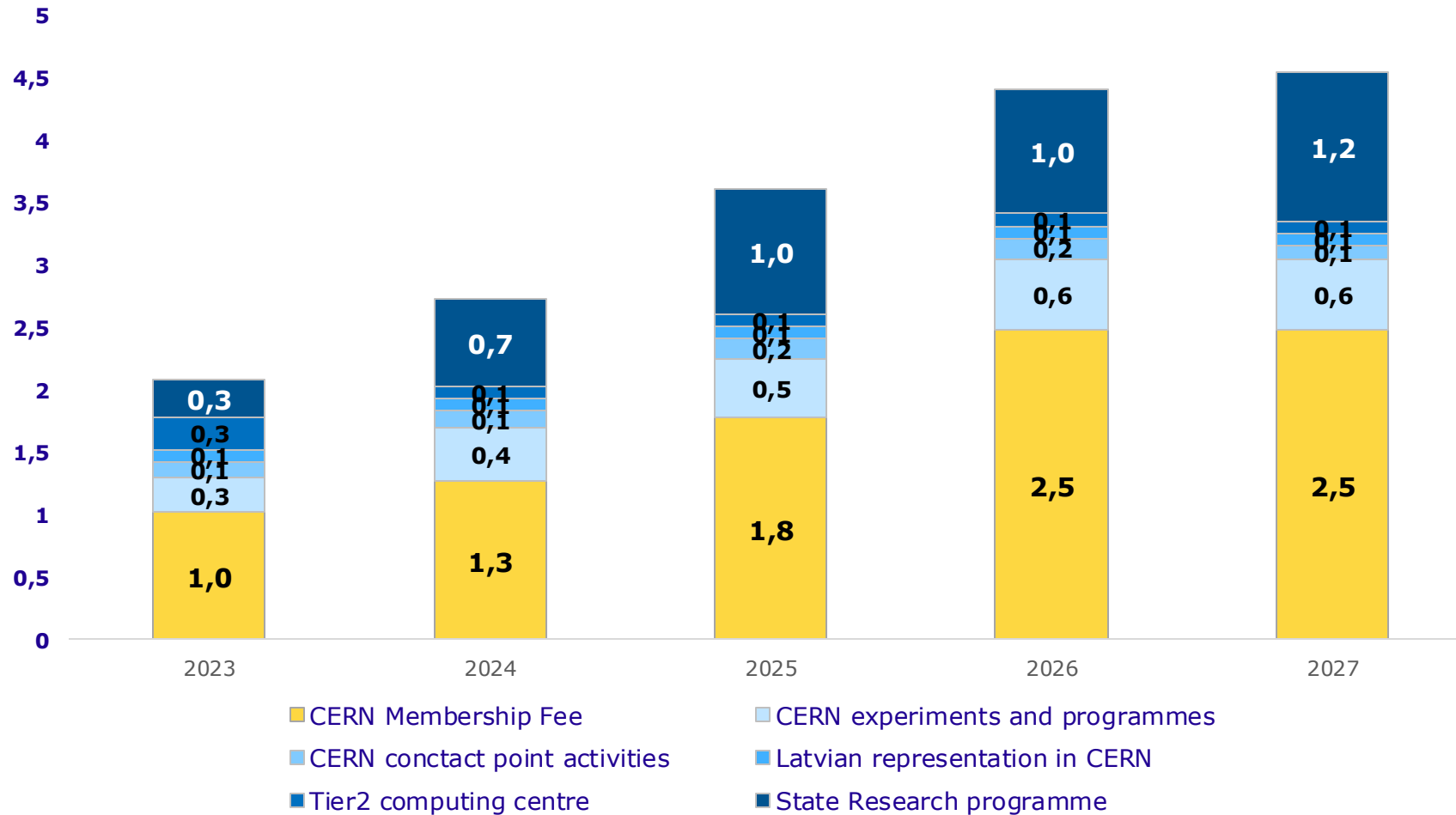
prospective time when Latvia becomes full member of CERN



**To ensure stable financial
framework for CERN-related
activities in Latvia**

Proposed Latvia - CERN budget until 2027

Latvia - CERN budget (in million euros)



Ensuring 50/50 principle – where proportion of the national funding is gradually exceeding CERN membership



The take-away message(-s)

Latvia is a reliable and honest partner of CERN

CERN – Latvia collaboration is yielding many mutual benefits

Latvia is ready to take the next step – to become full member of CERN