Izglītības un zinātnes ministrija

Implementation of CERN - Latvia Strategy

CERN National Contact point of Latvia
Prof. Toms TORIMS, Kristaps PAĻSKIS, Gundega SELGA-HORSTE

3rd Joint CERN-Latvia Liaison Committee Meeting, CERN, 13.12.2024

Ministry of
Education and Science
Republic of Latvia

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Latvia is a reliable and honest partner of CERN

Latvia – CERN Strategy

Latvia - CERN strategy

Publicly available, including its English translation

- Approved by Government in Dec 2022
- Has very clear and detailed implementation plan
- Is being successfully **coordinated** by CERN National Contact Point of Latvia and **implemented by all** involved parties
- Benefits from **comprehensive** public **funding** mechanism and **stakeholder engagement**
- The main **goals are** being **steadily assured**
  1. Meaningful and coordinated participation of Latvia at CERN in the Associate Member state status
  2. To become Full Member state by 2027

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Meaningful and coordinated participation of Latvia at CERN in the Associate Member state status

Tasks for associate membership

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1. To benefit from the **opportunities** at CERN – in the best possible way and at all levels
2. To provide sustainable contribution in attaining the **State priorities** in education, science, economic development and R&D
3. To foster environment of the **scientific excellence and industrial leadership**
4. To concentrate available and to attract new **human resources** / to use strategically available **financial instruments**
5. Within the next years to achieve "**well balanced country**" status and to ensure **60/40 proportion** for scientific HR / industrial return

Scientific/research portfolio

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

CERN based experiments and collaborations

- **CMS** as a **HEP flagship** project (RTU+LU)
- **MEDICIS** (RTU+LU)
- AEgIS (LU)
- ISOLDE (LU)
- Crystal Clear Collaboration (LU)

EU funded projects CERN coordinated/associated

Riga Technical University (RTU)

- I.FAST
- HITRIplus
- NIMMS

University of Latvia (UL)

- PRISMAP

Development of new projects and technologies at CERN

- Accelerator & Technology Sector /ATS-DO and numerous groups
- Future Circular Collider study (FCC)
- International Muon Collider Collaboration (IMCC)

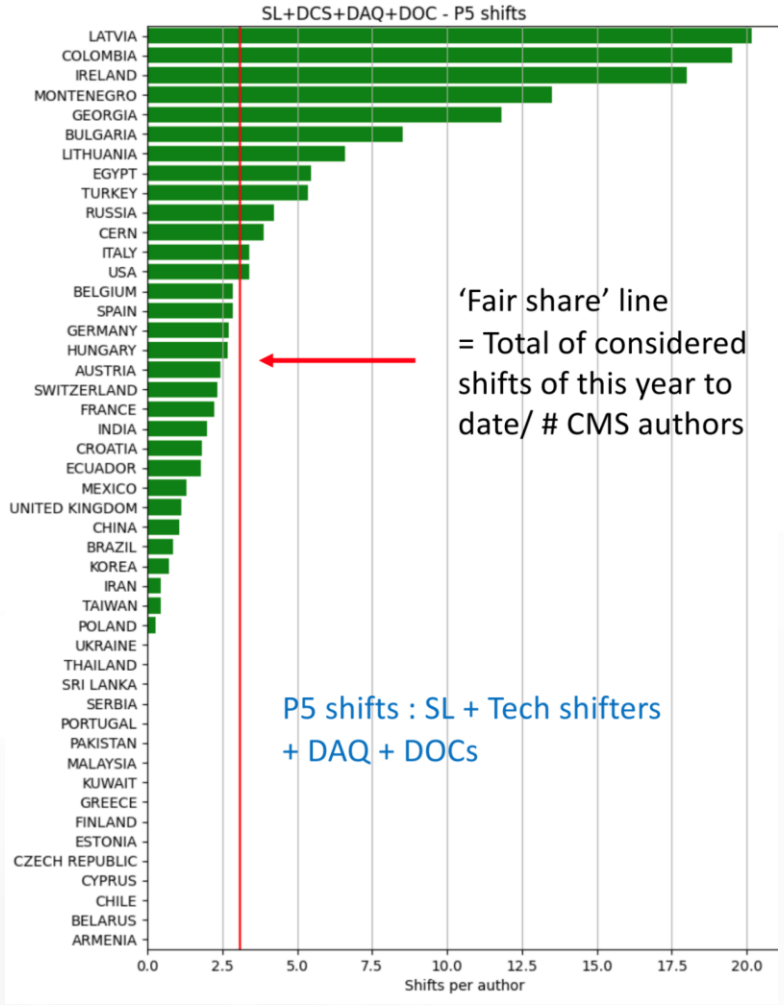
Where we stand?

Benefiting from the **opportunities** at CERN – **in the best** possible **way** and **at all levels -** *participation and contribution*

1. Consortium (RTU+LU) in the **CMS experiment – since 2017**
2. Consortium (RTU+LU) in the **MEDICIS experiment – since 2020**
   - The European medical isotope programme: Production of high purity isotopes by mass separation (**PRISMAP**) project **– since 2021**
3. LU in **AEgIS** experiment **– since 2021**
4. LU in **ISOLDE** experiment **– revitalised in 2023**
5. Participation of the RTU in CERN **accelerator technology projects**
   - Future Circular Collider (**FCC**) **– since 2015**
   - International Muon Collider Collaboration (**IMCC**) **– since 2023**
   - Next Ion Medical Machine Study (**NIMMS**) project **– since 2019**
   - Innovation Fostering in Accelerator Science and Technology (**I.FAST**) project
   - Heavy Ion Therapy Research Integration plus (**HITRIplus**) Project **– since 2021**

CMS case

Latvia is a reliable and honest partner of CERN
We are making important contributions to CERN scientific programme



MEDICIS case

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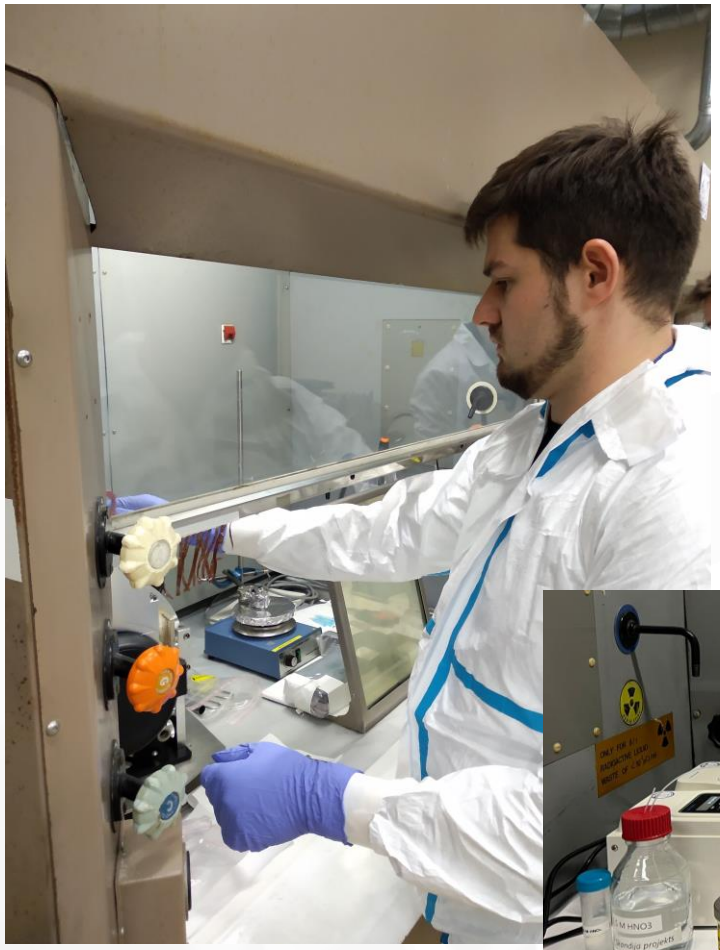


MED-015: Scandium radionuclide production and mass separation.

1st Latvian-CERN Doctoral Student programme PhD defended

Where Latvia is today?

Benefiting from the **opportunities** at CERN – **in the best** possible **way** and **at all levels** - *Where you can physically find Latvia @CERN?*

1. Latvia Accelerator Technology team is fully integrated within CERN
   - ATS-DO and @B 584
2. Close collaboration with Groups at CERN: Beams; Cryogenics and Vacuum
3. Leading role in CMS MTD and BTL in particular
   - CMS Tracker Integration Facility (TIF)
4. CMS and CMS Technical Coordination – @B40, @Prévessin site and Point5
5. AEgIS experiment – @Antimatter Factory
6. MEDICIS experiment - @ISOLDE/MEDICIS
7. + groups in Latvia @Riga Technical University and University of Latvia + Tier2 federative partners

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/PRISMAP**
2. Faculty of Physics, Mathematics and Optometry - Prof. Mārcis Auziņš group – **AEgIS**
3. Institute of the Solid State Physics – Dr. Anatoli Popov group- **Crystal Clear Collaboration**
4. Institute of Atomic Physics – Dr. Uldis Bērziņš group – **ISOLDE**
5. Quantum Computing group of Prof. Andris Ambainis - **QuantHEP**

Riga Technical University

1. Institute of Particle Physics and Accelerator Technology – **leading national institute** – see following info
2. Department of artificial intelligence and systems engineering - Prof. Agris Ņikitenko group – **I.FAST** + Mechatronics, **Robotics** and Operations section **at CERN**
3. Institute of technical Physics – Prof. Arturs Medvids group – **I.FAST**
4. Students of Institute of Mechanics and Mechanical Engineering - **I.FAST** and **HITRIplus**
5. Leading High Performance Computing (HPC) Centre – **Tier2** project - **WLCG**

Latvia in CERN – snapshot

Benefiting from the **opportunities** at CERN – **in the best** possible **way** and **at all levels - today at CERN 22 individuals**

1. CERN **Doctoral** Student Programme (DOCT) – 2
2. CERN – Latvia **Doctoral** Programme – 100% paid by Latvia – 1
3. Participation in CERN **Graduate** Programmes (GRAD) – 3
4. CERN (**STAF**) – 3
5. **Collaboration Associates** (COAS) – 2
6. **Users** 100% at CERN – CMS – 9

of those 10 authors

in total 21 users

https://greybook.cern.ch/country/detail?id=LV

To continue capacity and competency building in HEP and AT

To maintain strong CERN related scientific institute with multidisciplinary research team and presence at CERN

Dedicated doctoral programme

- In collaboration with CERN Baltic Group – **designed by CBG** Study Programme Working Group
- # of PhD students: 4th y – **6***; 3nd y **4**; 2st y **3**; 1st y **2**;
- Students are **co-supervised by CERN** staff
- Strong presence of **international 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 programme** is being developed

* +1 in "5th year" student in the process of completing/submitting their thesis

Where Latvia is today?

- To concentrate available and to attract new **human resources** / to use strategically available **financial instruments ~ 2M+/annum + ILO costs**
- To foster environment of the **scientific excellence and industrial leadership**

1. National **Research Programme** "High-Energy Physics and Accelerator Technologies" **– 300 000 EUR in 2024** – to be doubled in 2025
2. CERN **membership** payments **– 1.066 250 CHF in 2024**
3. Comprehensive **public funding** package **- 950 788 in 2024**, of which
   - participation in CERN experiments **– 511 282 EUR**
   - CERN National Contact Point, incl. Outreach and education activities **– 339 506 EUR**
   - Tier2 Computing Center **– 100 000 EUR**

Where Latvia is today?

Providing sustainable contribution in attaining the **State priorities** in education, science, economic development and R&D
Outreach / annual activities – fully paid by Latvia

1. CERN **Summer** Student Programme (2+2 every year) **– 27**
2. "**shadowing**" of the LV scientific and technical personnel at CERN **- 31**
3. High School pupil visits to CERN **- 49**
4. Pupil visits to CERN – the **School of Young Physicists - 6**
5. The **Riga TechGirls** visits to CERN **- 9**
6. Master and doctoral student (groups) **educational visits** to CERN **- 75**
7. Participation in the **CERN Teacher Programme – 100+** teachers

Rector of Riga Technical University, with delegation

Rector of the University of Latvia, with delegation

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'
- To prepare industrial portfolio for the full-membership @CERN
- To closely collaborate with Latvian scientific and engineering community at CERN

Where Latvia is today?

Providing sustainable contribution in attaining the **State priorities** in education, science, economic development and R&D
- To promote collaboration between Latvia and CERN, scientific groups and entrepreneurs

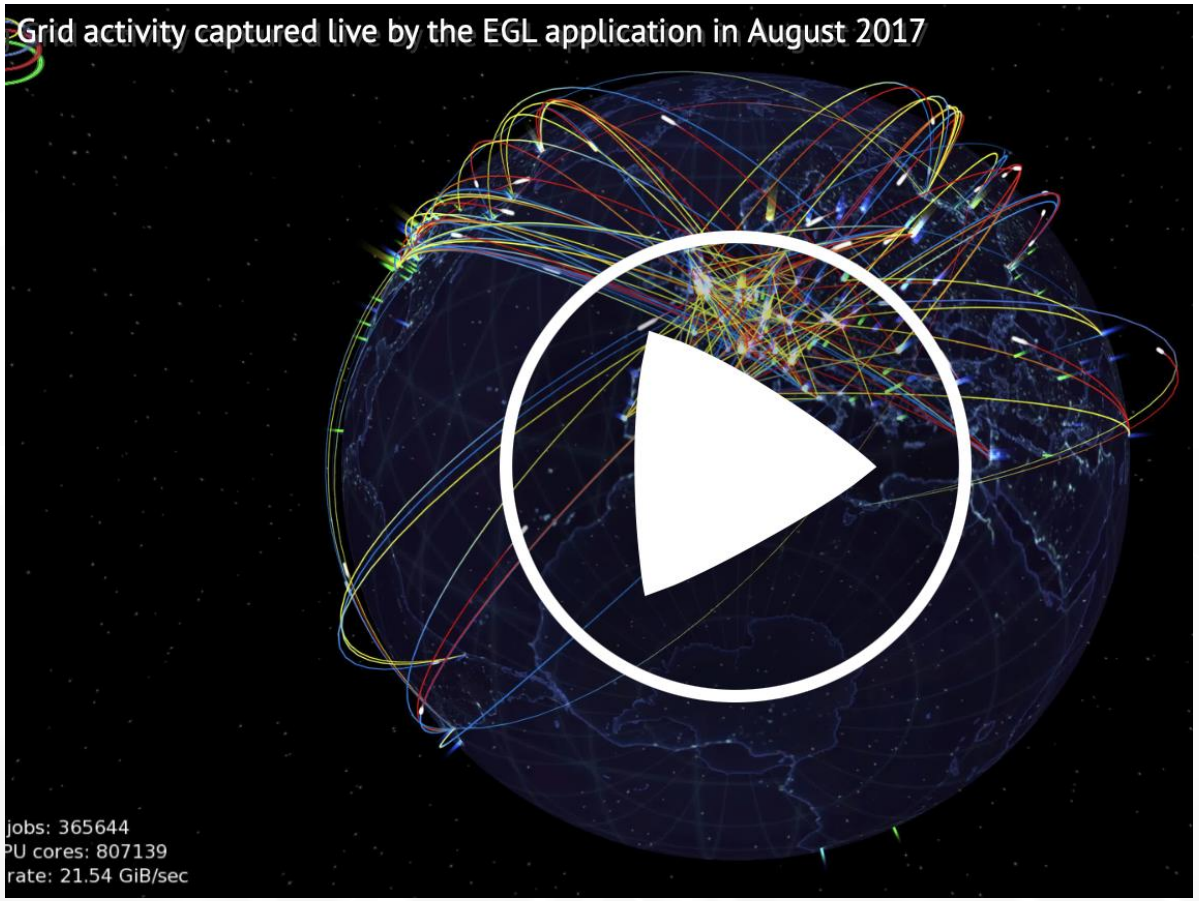
1. CERN **Latvia** (stakeholder) **Group** and close link with Latvian **staff at CERN – 15th meeting was on 14 Oct @Daugavpils**
2. Joint **doctoral study programme** "Particle Physics and Accelerator Technologies" by the RTU and LU **– up and running – thanks to CBG!**
3. Federated **Tier-2** CERN/CMS computing centre – **up and running**
   Institute of Particle Physics and Accelerator Technologies – up and running

Inauguration of federated Tier2 site of Latvia 05.06.2024

Other important contributions

1. **IPPOG** - International Particle Physics Outreach Group – joined in 2023
2. **WLCG** - Worldwide LHC Computing Grid – joined in 2024
3. **ECFA** - The European Committee for Future Accelerators – joining now
4. The **Open Quantum Institute** – joined in 2024
5. Consulting Chile and Ireland on CERN Associate Member state experience and Latvia-CERN strategy and its implementation – ongoing
6. Keeping CERN topics high in Brussels agenda – i.e. IGLO - Informal Group of R&D Liaison Offices & Network of Nordic and Baltic R&I Liaison Offices in Brussels – ongoing

Spirit of collaboration



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Latvia – CERN Strategy

Full membership at CERN

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 a **positive image** of Latvia – CERN cooperation ***#LatvijaCERN***

Engagement of decision-makers and partners

1. To ensure **support from CERN** management and **Member States**
2. To actively participate in the work of the **CERN Council** and committees by forming a positive opinion about Latvia's eligibility for the status of a full-fledged Member State
3. To **coordinate** the participation of Latvia in the work of the CERN Council and its committees
4. To promote coordination at the level of the **Baltic States**, which involves speaking with one single voice in the context of CERN at the level of the **CERN Baltic Group** and **Baltic Assembly**

Premjerministres delegācija CERN
11.10.2024

Engagement of decision-makers and partners

1. To **ensure** unwavering **support** from the Latvian government, Parliament, scientific community, entrepreneurs, and collaboration partners
2. To promote indirect support from the European Commission
3. Regular high-profile **decision maker and stakeholder** visits to CERN and events in Latvia
4. Strong policy makers **commitment to the 50/50 principle**!

Scientific and technical measures

1. To ensure **stable** State **funding** for CERN activities in Latvia – multi-annual budget planning with the steady growth
2. To **increase the capacity and competence** in the field of high-energy physics and accelerator technologies (done!):
   - Establishment of a scientific institute associated with CERN in LV
   - A stable team of LV scientists operate independently at CERN
3. To promote the awarding of **industrial contracts** from CERN (ILO)
4. To build a **positive image** of collaboration with CERN in Latvia **#LatvijaCERN**

Estimated timeline for full membership

Beginning of 2025

Formal reiteration of interest to become Member State
- letter to the Council President

2025

Invitation to submit the application

CERN "Task force" visit

"Task force" report to Council

Expected formal invitation to go in pre-stage to the full membership

2025/2026

Cabinet of Ministers decision

Council decision

Signature of Agreement

Saeima ratifies law on Agreement

2026

CERN "Task force" visit for the full membership

"Task force" report to Council

Council decision

2027

Ratification procedures and completion of the full cycle
- Latvia becomes Member State of CERN


CERN's 70th Anniversary
70e anniversaire du CERN
01/10/2024
CERN's 70th Anniversary
70e anniversaire du CERN
01/10/2024
Evika SILIŅA
Prime Minister
Republic of Latvia

CERN experiments and programmes

Activity	2024	2025	2026	2027	2028
CMS*	384 134	404 824	491 651	539 146	586 641
MEDICIS	50 000	80 000	100 000	100 000	100 000
Muon Collider	55 925	55 925	111 850	111 850	111 850
AeGIS	3 223	2 000	2 000	2 000	2 000
Teacher programme	12 000	20 000	20 000	20 000	20 000
Student programmes	6 000	9 000	12 000	12 000	12 000
Total EUR	**511 282**	**571 749**	**737 501**	**784 996**	**832 491**

* 5 authors; 2->5 students at CERN; 3->4 senior scientists

+ Phase II upgrade

CERN National Contact Point @ Riga Technical University

Activity	2024	2025	2026	2027	2028
Staff and admin costs	107 791	112 800	112 800	112 800	43 498
Network events with CERN	17 500	32 500	32 500	32 500	32 500
Communication & PR	16 078	18 000	18 000	18 000	18 000
Outreach – visits to CERN	30 000	40 000	40 000	40 000	40 000
Total EUR	**171 369**	**203 300**	**203 300**	**203 300**	**133 998**

National CERN activities

	2024	2025	2026	2027	2028
State Research Prog. in HEP and AT	300 000	700 000	1 000 000	1 200 000	1 200 000
Tier 2 Site	100 000	100 000	100 000	100 000	500 000
Total EUR	**400 000**	**800 000**	**1 100 000**	**1 300 000**	**1 700 000**

Take away messages

Latvia is a reliable and honest partner of CERN

CERN – Latvia membership was and is a very good deed

Latvia has delivering tangible contribution to the CERN scientific programme

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

Latvia is navigating steadily

at cruise speed and with straight-forward course