



# Report on **Advanced Particle Therapy center for the Baltic States**

*Prof. Toms Torims*

*Chairman of CBG «Advanced Particle Therapy center for the Baltic States» working group*



# Advanced Particle Therapy center for the Baltic States

Research  
institution

## Clinical facility

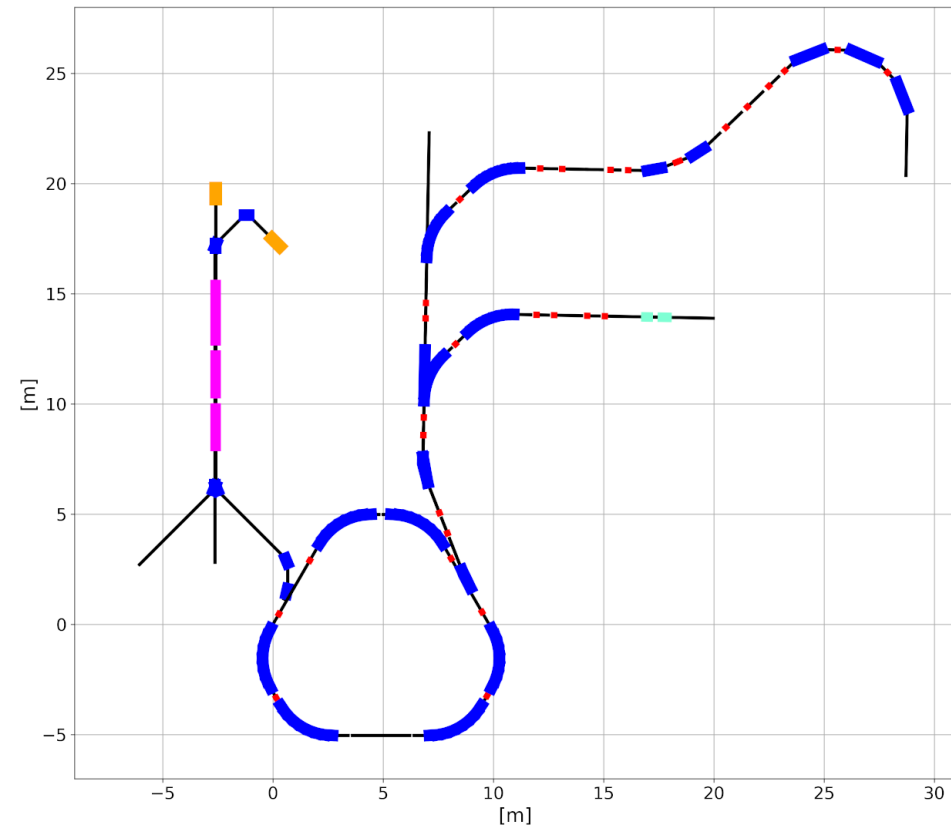
Particle therapy      Nuclear  
therapy                  medicine

Infrastructure  
for industry  
involvement  
and future  
innovations

# Overview

- Helium synchrotron technology developed by CERN NIMMS collaboration
- Unifying: clinically established **proton therapy**, research and clinical future on **helium ion therapy**, parallel **LINAC based radioisotope production**
- Dedicated beamline for **research** – pre-clinical, medical physics, material science , nuclear physics etc.
- Future perspective of innovations for the needs of particle therapy community

**More – dedicated presentations in events**



Design by *Mariusz Sapinski, Elena Benedetto and Maurizio Vretenar*



# Current progress report



# CERN Baltic Group discussions with CERN NIMMS collaboration on particle therapy facility options in the Baltic States

<https://indico.cern.ch/event/1071872/>

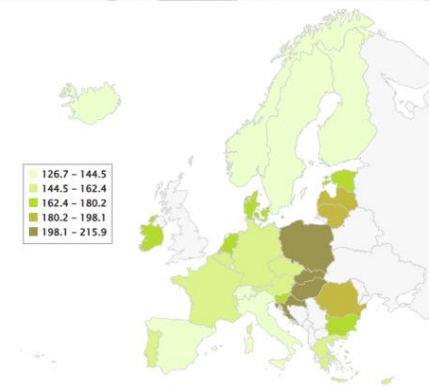
End of 2021

## Initial steps

*Particle therapy centre geography in Europe, ENLIGHT 2020*



*Cancer mortality rate in Europe per 100000 inhabitants, data of 2020*





# Initial steps

**Helium synchrotron** – developing technology proving to be most cost-effective, sufficiently ambitious and minimum risk for our region

**CERN NIMMS establishes helium synchrotron working group with participants from CERN Baltic Group**

End of 2021

February 2022



# Initial steps

9th CERN Baltic Group General Meeting

**«Advanced Particle Therapy center for the Baltic States» working group is established within CERN Baltic Group**

Chairman: Professor Toms Torims (RTU)

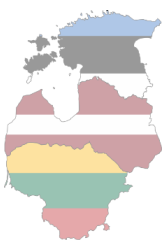
Deputy chair: Dr. Diana Adlienė (KTU)

<https://indico.cern.ch/event/1138329/>

End of 2021

February 2022

April 12<sup>th</sup> 2022



# Concept paper development



A dedicated *draft* concept paper has been developed for the proposed facility

Outlines: relevant clinical aspects and rationales, proposed research directions, technical aspects etc.

Draft concept-paper  
Advanced Particle Therapy Center for the Baltic States

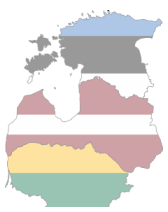
*Technical concept: Detailed rationales and aspects*

End of 2021

February 2022

March – April 2022





Report on the concept paper of  
**Advanced Particle Therapy  
center in the Baltic States**

*Kristaps Palskis (RTU, CERN)  
on behalf of CERN Baltic Group*

# Concept presentation: Scientific communities

- 21<sup>st</sup> meeting of the TIARA Collaboration Council  
<https://indico.cern.ch/event/1137672/> (March 29th , 2022)
- Internally – NIMMS collaboration «Joint NIMMS-SEIIST Meeting #82  
<https://indico.cern.ch/event/1176297/> (July 1st, 2022)

March – April 2022

Spring, summer 2022



# Concept presentation: Political stakeholders

- *Initial meeting: Baltic Assembly and CERN Baltic Group meeting*  
<https://indico.cern.ch/event/1117311/> (February 7th , 2022)
- **Baltic Assembly meeting of Health, Welfare and Family Committee**  
(June 9th and 10th, 2022, Tallinn)
- Also presented to:
  - Baltic States ambassadors within EU COREPER I
  - Investment and innovations agencies within the Baltic States

March – April 2022

Spring, summer 2022



H.E. Mr Arturs Krišjānis Kariņš  
Prime Minister of the  
Republic of Latvia

H.E. Ms Kaja Kallas  
Prime Minister of the  
Republic of Estonia

H.E. Ms Ingrida Šimonytė  
Prime Minister of the  
Republic of Lithuania

17 August 2022  
No. 1/0822-177

Your Excellencies,

On behalf of the Health, Welfare and Family Committee of the Baltic Assembly, we would like to extend the assurances of our highest consideration to the Baltic Council of Ministers.

On 9-10 June 2022, the meeting of the Health, Welfare and Family Committee of the Baltic Assembly was held in Tallinn. The parliamentarians discussed the cooperation of the Baltic States in health care, focusing on cancer treatment, joint projects and procurements, and the implementation of the recommendations of the Baltic Assembly in 2021.

In this letter, we want to address two main issues discussed in detail during the meeting. Firstly, the joint initiative of the CERN Baltic Group and CERN on Advanced Particle Therapy Center for the Baltic States; and, secondly, joint procurements of the Baltic States.

During the meeting, the Health, Welfare and Family Committee assessed the joint initiative of the CERN Baltic Group and CERN on **Advanced Particle Therapy Center for the Baltic States** and the members of the Committee are convinced that such a project is significant and will have a huge impact on the cancer treatment in the Baltic States. The CERN Baltic Group and CERN have approached the Baltic Assembly as an interparliamentary organisation for cooperation among the parliaments of the Baltic States. After careful evaluation of the project, its benefits and also challenges, the parliamentarians would like to request the governments of the Baltic States to:

- assess the initiative on Advanced Particle Therapy Center;
- engage the corresponding ministries, national agencies and relevant stakeholders to jointly apply for co-financing from the European Union for the implementation of the joint initiative.

Find attached to the letter draft concept paper “Advanced Particle Therapy Center for the Baltic States” that in detail describes and justifies the initiative.

# Concept presentation: Political stakeholders

August 2022  
Following Health, Welfare and  
Family Committee, **Baltic Assembly**  
addresses letters to the 3 Baltic  
State Prime ministers

March – April 2022

Spring, summer 2022





# Concept presentation: Initial steps in medical community

14:00 - 15:30

Plenary session, Parallel session, [Woodblock Hall](#)

## **S3-5 Interventional Oncology**

Chairperson: [Sergei Nazarenko \(Estonia\)](#)

[On the conceptual design of advanced particle therapy center in the Baltic States](#)  
[Kristaps Palskis \(Latvia\)](#)

[Interventional oncology TACE/embolization, needle guided biopsy and ablations](#)

- **Presentation at 8<sup>th</sup> Baltic Radiology Congress**  
<https://www.conference-expert.eu/en/bcr2022> (October 7th - 8th, 2022)
- *Also – at 2nd CERN Baltic conference*  
<https://indico.cern.ch/event/1147717/> (July 10th – 12th, 2022)

March – April 2022

Spring, summer 2022

October 2022



# Addressing Baltic medical communities

- CBG «Advanced Particle Therapy center for the Baltic States» working group identified **the crucial need to organize bilateral meetings with communities of radiologists, radiation oncologists, medical physicists, research institutions and political stakeholders**
- Main goals of the meetings:
  - Informing community on technical aspects and latest developments of the project
  - Understand position of the above-mention
  - **Identify relevant representatives for the further worked stakeholders**

October 2022

November 2022



# Addressing Baltic medical communities



Discussion in Riga, Latvia  
**18th of October, 2022**

<https://indico.cern.ch/event/1201786/>

October 2022

November 2022



# Addressing Baltic medical communities



Discussion in Kaunas, Lithuania  
**16th of November, 2022**

<https://indico.cern.ch/event/1216261/>

October 2022

November 2022





# Addressing Baltic medical communities

Final discussion:

**Tomorrow, 22nd of November, 2022  
in Tallinn, North Estonia Medical center**

<https://indico.cern.ch/event/1221170/>

October 2022

November 2022



# Current *key take-aways*

There is high stakeholder interest, **but further clinical aspect investigations must be done**

Clinical indications for particle therapy, clinical trial results of proton therapy

Baltic States cancer statistics and *localization profile*

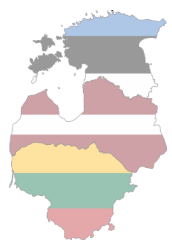
Patient selection and funding models in other European ion therapy centers

Experience exchange visits necessary, future learning opportunity identification . . .

October 2022

November 2022

End of 2022



## Joint Baltic stakeholder workshop on Advanced Particle Therapy center in the Baltic States

# Future steps

- CERN, Geneva in first quarter of 2023
- Based on the identified concerns in medical community discussion meetings – **workshop adressing and discussing potential development**
- Clear involved medical community and association consensus to be reached for the future of the project

End of 2022

Going into 2023



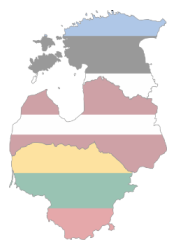
# Future steps

**Educational visit to one of the European particle therapy centers**

- To understand the workflow and clinical gains of particle therapy, educational visit to be done to one of European particle therapy centers in the first quarter of 2023 (*possibly – CNAO or HIT*)
- **A clinical team of 2 specialists (radiation oncologist + medical physicist) from each country to work on clinical case that could not be treated with conventional therapy in the Baltic States**

End of 2022

**Going into 2023**



# Future steps

## IPAC 2023 contribution

- A report on helium synchrotron design advancements are to be presented in International Particle Accelerator Conference 2023
- **A case study is proposed to be included in the contribution, indicating the cancer profile and statistics in the Baltic States and applicability of helium therapy for the future**

End of 2022

**Going into 2023**



# Future steps

*A possible* clinical seminar on particle therapy gains

- A dedicated clinical specialist giving overview of **particle therapy gains over conventional radiation therapy** from one of the European particle therapy centers
- *Possibly*, two seminars should be done – on particle therapy and **on novel radioisotope usage in nuclear medicine**

End of 2022

Going into 2023



# Identified team members

<b>Torims Toms</b>	Riga Technical University/CERN
<b>Paļskis Kristaps</b>	Riga Technical University/CERN
<b>Adliene Diana</b>	Lithuanian Association of Medical Physicists and Engineers/KTU
<b>Korobeinikova Erika</b>	Lithuanian University of Health Sciences
<b>Juozaitytė Elona</b>	Lithuanian University of Health Sciences
<b>Radziņa Maija</b>	Latvian Society of Radiology
<b>Šorubalko Arturs</b>	Latvian Therapeutic Oncology Association
<b>Kalniņa Marika</b>	Baltic Nuclear Medicine Association
<b>Gershkevitsh Eduard</b>	Estonian Society for Biomedical Engineering and Medical Physics



## ***CERN Baltic Group***

***We are strong  
together***

