

CERN and Lithuania

A personal view from the experience as Chair of the International Advisory Committee for the implementation of the recommendations of the CERN task force

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Lithuania and CERN

- In 2016 the Lithuanian government asked the CERN council to become an associate member
- Following the standard procedures the CERN council set up a fact-finding Task Force whose role was to visit Lithuania and determine if the conditions for being a CERN associate country were met (these conditions essentially amount to verifying whether the country has a community/infrastructure able to benefit from /contribute to the CERN mission).
- The CERN Council's fact-finding Task Force made a positive recommendation for the association of Lithuania to CERN, despite having identified a fundamental weakness related to the lack of structures linked to Particle Physics.
- Lithuania joined CERN in 2017 as an associate member

From the report of the Fact-Finding Task Force of the CERN council

- Page 12:
Lithuanian academic institutions and Lithuanian industry today command a vast scope of competencies and resources in applied sciences and technologies, which have the potential to make significant contributions to CERN's research programme. Much of this potential has been convincingly demonstrated in the recent past, primarily in the areas of ICT and silicon detectors. **However, no structures are in place today in order to coordinate and steer these resources in a physics-driven and coherent manner, such that they can be deployed to make a visible impact on particle physics research at CERN, e.g. in the framework of a major LHC experiment.**
- The Lithuanian **political and academic authorities recognise this weakness and have committed to implement specific measures to address the problem, initially through the establishment of a Chair of experimental particle physics at Vilnius University** that will serve as a **nucleus for developing a competitive particle physics community, competent in basic science and able to stimulate and leverage the existing applied science competencies in the country for collaboration with CERN..** The establishment of this Chair will be supported by an adequate restructuring of the Faculty of Physics of the University.

From the report of the Fact-Finding Task Force of the CERN council

- Page 13:
The scope of this position should not be limited to the scientific aspects of CERN activities but should also maximise the overall benefits from membership. Consequently, it should assume a coordinating role with all other partners, notably the IT sector (mainly Vilnius University Faculty of Mathematics and Informatics, but also Kaunas University of Technology, Vilnius Gediminas Technical University, Vytautas Magnus University in Kaunas) and industry. **It would provide the necessary coordination of the various activities in academic and industrial institutions that are already involved today or which could benefit from future collaboration with CERN.**
....
Such a Chair will represent a significant investment that will need to be part of fresh domestic resources, not to be taken from existing commitments to CERN-related activities ...
The position should be filled with an internationally recognised scientist trained at **major particle physics laboratories.**
- The Task Force has recommended the establishment of an **International Advisory Committee** in order to assist with the search for appropriate candidates and to oversee the **further development of nuclear physics and elementary particle physics research in Lithuania**, to which **Lithuania has committed** (Annex 7).

International advisory committee

- The IAC was setup by a call by the Vilnius University rector and its composition is
Prof. Tiziano Camporesi (CERN and Boston University), chair
Prof. Guenakh Mitselmakher, (Univ. of Florida - USA)
Dr. Danek Kotlinski (Paul Scherrer Institute - CH)
Prof. Jonathan Ellis (King's College London - UK)
Dr. Christoph Schaefer (CERN)
- My understanding is that Vilnius University had been identified (and agreed to!) to be the entity to manage the setting up of a Particle Physics community in Lithuania and the structures related to it (which in principle could be hosted by the University albeit being OPEN the whole Lithuanian interested community).
- It has been meeting every year, having sessions dedicated to presentations of all activities related to CERN with presence of representatives of all bodies concerned by the CERN-Lithuania relations (Prime minister office, industry and education ministry, Academy , Vilnius and other universities)

A first positive step

- Vilnius university hired a recognized HEP physicist (Aurelijus Rinkevicius) as a professor and created an entity called 'Center for High Energy Physics' to be chaired by him.
- This entity was indeed in line with the recommendations of the CERN Council Task force and should have been naturally the point of aggregation of all existing activities and/or expressed interests related to CERN and HEP

Some hurdles

- It became clear that the “*adequate restructuring of the Faculty of Physics of the University.*” was easier said than done.
- Such restructuring was needed in order to allow people interested in CERN activities from different departments to join the CENTER
- We (as IAC) were discussing with the Vilnius Univ. management about these possibilities and it was clear that in order for this to happen one needed a change of rules and regulations which required a strong drive to implement. Such will, and the intention to support the CENTER with priority seemed to be present at the time of the first meetings.
- The management of Vilnius University changed and the attitude towards the Center clearly changed: it was not a priority any longer to try to fully integrate it in the University structures, rather the intention was to try to see how to ‘outsource ‘ it.
- The IAC had no problems with this as long as one would end up with a structure allowed to have the resources and the possibility to aggregate the Lithuanian groups/individuals linked to the CERN activities

Any progress?

- Association to CERN opens to Lithuania the market to industrial and service contracts with CERN: this has been VERY successful, to the point that the indicators of industrial fair returns have been largely exceeded in certain years (to the point to block further orders in agreement with CERN council rules).
- Clearly this is among the goals of relation of any country with CERN: the industrial needs of CERN should have benefits for any of the associated countries. And such a situation would be 'WONDERFUL' news if this objective (clearly stressed as a *Lithuanian Interest* in the Task Force document) would be matched by the primary *CERN interest*, namely seeing signs of growth of the Particle Physics community and of the resources dedicated to it.

The IAC reports

- All our yearly reports were noting the positive industrial returns but remarking the lack on internal investments to allow the CENTER for High Energy Physics to grow and be an aggregation center.
- Over the years we were confronted with mixtures of encouraging news (like positive attitude of the central government to allocate resources towards the CENTER and the creation of infrastructures allowing real contributions to the CERN experimental program) followed by not so good news of seeing the original plans reduced in scope and size and funds not really allocated through the CENTER as advocated by the CERN task force recommendations.
- I am adding below some of the slides summarizing our reporting

From 2021 IAC: Not so good news

- The IAC has been formulating, over the last three years, very detailed and clear recommendation on how to proceed to progress towards achieving the goals set out in the Task Force recommendation.
- We were conscious of the obstacles related to reforming existing structures and promoting a whole new research field and we did not expect immediate results.
- We are disappointed by seeing that after 3 years of having implemented the new Chair and the Center for Particle and Nuclear Physics very little progress has been achieved towards *developing a competitive particle physics community, competent in basic science and able to stimulate and leverage the existing applied science competencies in the country*

From 2021 IAC :Why are we disappointed?

- Very little of our recommendations have been followed (though we would not care if alternative ways had been found to progress towards the stated goals)
- We saw as an encouraging sign the apparent positive attitude that the Lithuanian Government had towards the Action Plan submitted by Aurelijus at the end of spring 2021, but we have learned that
 - An alternative plan has been submitted subsequently without consulting the Chair of the Center
 - Supposedly this plan indicates the creation of an alternative structure which would not be controlled by the body which is supposed to promote particle physics (ie. the Center for Particle Physics)
 - The fact we learned from the Deputy Rector that *“the Faculty of Physics of Vilnius University (where the Center is hosted) has been appointed as the coordinator of the formation of this national consortium, the development of next period action plan and its implementation”* adds to our concern: at this moment it looks like none of the original recommendations of the task force are being addressed. The Chair and the Center for Particle Physics are apparently being set aside and every indication is that the new consortium will NOT have particle physics as a priority, but rather concentrate on technical developments.

What is CERN's core business ?

- CERN is meant to provide the international community the means to carry out fundamental research and to promote the physicist communities involved in the CERN member countries which are conducting fundamental research in Particle Physics.
- **The primary return and primary engagement** for any CERN Member state is the possibility to have privileged access to the infrastructure which allows the local particle physics community to participate in the experimental/theoretical programs and grow. We should not forget the return in education of the young generation, where the skills acquired in particle physics are largely recycled in the community at large.
- **Accessory returns** are Industrial contracts which can contribute to technology transfers that benefit the growth of the country
- **Accessory engagements** are the contributions of the country's engineering and applied physics groups, who will contribute to the development of the tools which are needed to either improve the accelerator setups at CERN or, equally important, support the development of detectors of the collaborations in which the particle physicists are engaged.

On a positive note:

- The proposal made in 2021 of setting a consortium is a way forward to overcome the problems linked to the internal bylaws of the University world.
- **The saga related to the setting up of a real laboratory (the so called 'PIXEL lab' meant to contribute to the Phase II LHC upgrade of CMS) which could provide an aggregation center for all resources focused to contribute effectively to the CERN experimental program seems to be converging (but we will believe in it once we see it, given the past experience) and getting some relevant resources to be technically sound**
- The role of the CENTER will not be as was suggested by the CERN task force a leading one for the Consortium: the future will tell if the way the Consortium will be managed (and above all the resources allocated to it !) will be in line with really building a competitive Particle Physics community in Lithuania.
- Personal consideration: there are several activities already on going in Lithuania linked to technologies which are part of the CERN domain. The consortium should aim to make sure that all these are seen as part of global plan aimed to establish a community which can really benefit of the Lithuanian investment in CERN.

In particular much care should be dedicated to the education of students aimed to form a generation of Lithuanian physicists and engineers able to act and evolve in the field of HEP. Adequate resources should be allocated to the hiring of POSTDOCS and the creations of tenured posts either in the CENTER for pure research positions or at the universities for professors with interests and curricula linked to HEP.

Summary

- The HEP community in Lithuania needs to be reinforced significantly to allow Lithuania to be an effective actor in the Particle Physics community
- Lithuania was the first Baltic country to seek Association with CERN, but without adequate investment will lag behind the other Baltic countries who are now also associated to CERN
- A crucial moment will be the visit fo the CERN council delegation which shall happen in the next months and which will verify whether the conditions set forth at the time of accession in 2017 are being met (in my opinion it will be fundamental to show at the time of the visit that the Infrastructure linked to the CENTER, like the PIXEL lab is well on track, funds committed, human resources planned...)