

## Evaluation report

Evaluated point	Grade	Comments
Scientific impact of research	Very good	<p>NICPB is divided into four laboratories with research in high-energy physics (HEP), condensed matter, bioenergetics and environmental toxicology. The laboratory of high-energy and computational physics has a first-class research activity as a collaborating institution of CERN. Research in the institute has contributed to Estonia becoming a member state of CERN in the future. The participation in the discovery of the Higgs Boson is sufficient to attest to very high quality and potential. This could not be carried out without an environment of high performance computation. The centre also conducts more applied work in cloud computing that has been developed to support HEP but is successful in generating wider impact. In all areas, and particularly HEP and toxicology, there is evidence of publication at the top of the field and scientific impact internationally. The institute collaborates with all Universities to have PhD students conducting research under supervision of its experienced staff. In the reporting period, 2-3 PhDs were completed per year, which is good but not outstanding. Structural funds have been used to maintain the infrastructure but the facilities are ageing. Other highlights concern emerging quantum materials and technology. The laboratory of toxicology presents challenging results on toxicity of nanomaterials. The last component, the laboratory of Bioenergetics, investigates cancer bioenergetics. The excellence of research is attested by an impressive list of publications in the best international journals. The institute attracts researchers from all over the world.</p>
Sustainability and potential of research	Satisfactory	<p>There is no doubt concerning the sustainability of research in terms of topics, globally and for each of the four laboratories. The institute focuses its research strategically. All areas have potential to grow in terms of their relevance at national and international levels. In spite of the institute's scientific excellence, the level of international funding attracted is modest, and the dependency on structural funds and national programmes has remained high. However, sustainability of the very good research programme is entirely dependent on the successful obtaining of research grant support. It is anticipated that changes in the grant awarding system after 2020 will result in a decline in research support, and increased difficulties for longer-term planning. Long-term sustainability is also threatened by the lack of a regular investment programme for research infrastructure. It is clear that the NICPB contains gifted and energetic scientists who will ensure sustainability of their research despite the aforementioned threats. Efforts should be made to explore new collaborative groupings,</p>

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		alternative sources of income such as industrial sponsorship, and greater participation in EU grant programmes.
Societal importance of research	Very good	The overall societal impact is very good. This includes impact of the computing activity through spin-outs, and work of relevance to the environment and health. This is attested also by part of the research itself that concern societal issues (toxicology, cancer), by the fact that the knowledge in high performance computation induced start-up companies, e.g. OpenNode and Lingvist, which develop cloud platforms for scientific computing, and computer systems for language learning respectively. The Environmental Toxicology Lab provides important information on the toxicity of nanoparticles to a range of microbial and animal systems, of relevance to understanding environmental fate of nanoparticles and implications for ecosystem and human health.
Scientific basis in the field is sufficient to conduct doctoral studies. (This question should be answered only if: a) institution being evaluated is conducting doctoral studies and; b) The field being evaluated is proposed to grant positive evaluation. If these conditions are met then: a) If the level of scientific basis is sufficient for conducting doctoral studies in every structural unit being evaluated, then the answer should be „yes“; b) If the scientific basis is not sufficient in some structural units, then those units should be listed.)		The answer is yes. PhD students are not administratively attached to this institute and depend also on an university. However, they work there with excellent conditions and have the opportunity to participate in the high-level research programmes of this institute. The evaluation committee met some of them and could see this first hand.

## Summary assessment

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<p>Areas of special note as appropriate (Where necessary indicate sub-fields, assessment criteria, and/or structural units which, in the committee's opinion, were of a notably high level.)</p>		<p>Laboratories are well equipped and led by scientist experts in their fields. Large amounts of data are generated and there is an impressive publication record. The NICPB provides a very good location and training for PhD students. That Estonia is about to join CERN is a very significant development for the NICPB.</p>
<p>Areas in need of improvement as appropriate (Where necessary indicate sub-fields of the field being evaluated, assessment criteria, and/or structural units which, in the committee's opinion, revealed significant shortcomings.)</p>		<p>The financing of the institute is a concern. The position of the NICPB within the Estonian research system needs to be assessed and clarified so that it is eligible to receive base funding for maintenance and infrastructure. As far as high energy is concerned, this is not an isolated problem at the international level: the CERN community has to collaborate with the whole scientific community everywhere and to find a way to do it. All relevant actors in Estonia, and in particular the institute itself, should participate in necessarily constructive discussions.</p>
<p>Assessment proposal to the Minister of Education and Research</p>	<p>To grant positive evaluation</p>	<p>An impressive organization carrying out high-level research of fundamental and practical significance. It plays a unique role in Estonia.</p>

## Feedback

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Feedback for institution (This question should be answered only if the institution asked for feedback from the evaluation committee in the self-report (about up to three specific areas of R&D which it finds to be currently important, e.g., related to its development plan).)	NA
Suggestions for unit, institution, state etc. (As appropriate, committee can give additional feedback for the structural unit, the institution, or the State (please specify whom feedback is directed to) according to the directive assessment criteria for regular evaluation (article 7).	Its future status and financing problems should be clarified quickly and solidly, otherwise it is conceivable or even likely that the unresolved problem will lead to a decline (or further decline) of this institution.