Report of the International Scientific Committee on the P2IO LabEx

Maria José Garcia Borge, Barbara Erazmus, Fernando Ferroni, Alvaro Giménez, Andrew Hutton, Christine Joblin, Karl-Heinz Kampert, Paul Lecoq (Chair), Chiara Mariotti, Lucia Popescu, Paraskevas Sphicas, Mikhail Shaposhnikov

The International Scientific Committee (ISC) met on 13 & 14 October 2021 to evaluate the status and progress of the P2IO LabEx over the past two years. There were ten presentations of the projects, two site visits, a presentation and discussion with Michel Guidal, Deputy Vice-President for Research and Valorisation at the University Paris-Saclay in charge of Sciences & Engineering, and a discussion with representatives of all the institutions of P2IO.

The ISC was impressed by the presentations and particularly the enthusiasm of the speakers. It was obvious that involved early career researchers were maximally profiting from the opportunities afforded by the P2IO LabEx.

The P2I LabEx policy on gender balance was not presented explicitly. However, and perhaps more convincing, the speakers and the ISC were demonstrably gender balanced, indicating the importance of this topic to the P2IO management.

A list of tentative conclusions was presented orally at the end of the last day, and are expanded in this report, which has been approved by all members of the ISC.

1) Management and Organization

Comments:

The P2IO LabEx has been managed extremely well, considering the very complex organizational structure in which it operates. Its calls for proposals for projects have been oversubscribed and the winning projects were selected after a comprehensive review. The ISC notes the appreciation for the flexibility in the fund distribution. The implementation of the Flagship projects was an excellent idea that has been providing a new avenue for collaboration among different institutes, crucial funding for the development and demonstration of proposed initiatives with budgets close to 1M€ and allowing for adequate time for the selected projects to grow. The ISC notes the success of two of the Flagship projects that ran in 2015-2020 in obtaining funding from the TGIR. The flexibility in the use of the money has been crucial to an optimal use of the resources.

On the other hand, the organizational structure has several layers of oversight, which appears disproportionate with the funding made available to the center (€1.4 M/year). The inclusion of representatives from the 17 member institutions in the Assembly of Unit Directors is justified, as it encourages interaction between the leaders of the various institutions involved in P2IO. We suggest that it would be beneficial if this body also examined the completed proposals to recommend whether they should continue, and if so, which institution would sponsor the continuing work.

The richness of initiatives and success of the projects have been largely due to the availability of dynamic and motivated postdocs, some of them are now part of the Paris-Saclay staff.

Recommendations:

1.1 Maintain the present management scheme until 2022, with possible simplification as suggested above.

1.2 Negotiate with the University of Paris-Saclay a smooth transition to the next organizational structure in the framework of graduate schools with the double objective of not stopping (and possibly increasing) the momentum created by P2IO and setting up as light an executive management structure as possible.

1.3 Maintain in the future structure the availability of hiring knowledgeable, and motivated post-docs.

2) Ongoing Flagship Projects

Comments:

BSM-Nu (Sara Bolognesi)

This project is exemplary in every way. Led by a talented young researcher (Sara Bolognesi, winner of many prestigious awards and a leader in the neutrino community), who has attracted a team of researchers working on 4 different experiments as well as on theory. The team is combining results from different experiments in neutrino physics to generate new information. This is precisely the kind of approach that could, and should, develop into a real center of excellence. The project is moving in the right direction for neutrino physics, helping to increase the mutualization of disparate efforts and resources, and developing a common language in this domain.

Recommendations:

2.1 The Committee recommends that this project be supported and grown into a center of excellence after the present funding runs out.

Gluodynamics (Cyrille Marquet, Michael Winn)

This project is a good start in creating synergies between theory and experiments and also between different experiments.

Recommendations:

2.2 We support and encourage the contacts with the heavy ion and EIC communities

3) Emerging projects

Comments:

The 4 projects presented (out of a total of 9) were disparate in nature. This is appropriate for a center whose task is to be an incubator of ideas. It is most unfortunate that the P2IO LabEx does not have the resources, i.e., necessary funding, needed to further grow even the most successful of these projects after their completion.

Recommendations:

3.1 The ISC notes that some of the emerging projects, although interesting individually, do not share a common vision. We recommend to continue give priority to generic and cross-cutting projects.

3.2 The P2IO is encouraged to determine how many of the past emerging projects obtained follow-on funding, and to advertise this information.

4) Training

Comments:

The ISC recognizes a strong added value of the P2IO LabEx in offering PhD students a rich multidisciplinary environment. The concept of co-funding is an effective way of creating synergies with the institutions comprising the LabEx and increasing opportunities for hiring PhD students. We applaud the initiative to distribute 2 PhD awards/year, which promotes excellence and generates visibility for both the institutions and the graduates. The ISC is pleased to see that the LabEx attracts talented PhDs and postdocs from worldwide.

Recommendations:

4.1 Continue promoting within the LabEx or a new structure, the training of students in an interdisciplinary environment.

5) LabEx P2IO after 2022

Comments:

In 2023, the present LabEx structure will cease and its current funding will be taken over by the University of Paris-Saclay. This is a major opportunity for the university to create Centers of Excellence, after identifying promising projects, which, after an initial trial period, would be funded at a level that allows them to reach their full potential. University of Paris-Saclay has the resources to do this and would profit from the investment.

According to the ARWU, University of Paris-Saclay is currently #1 in Mathematics, #9 in Physics and #13 overall in the world. To maintain or reach higher than this already impressive level of international recognition would require the University to target a few projects that would attract world-wide attention. The P2IO LabEx has clearly put some seeds to reach this objective and needs to be supported by continuing funding for further growth.

The ISC recommends that University of Paris-Saclay continues the LabEx model as an incubator of new ideas and projects, and integrates the best of the best into an ecosystem that can nurture and grow them.

The ISC notes that not all of the institutions that are currently participating in the P2IO LabEx are going to be a part of the enlarged University of Paris-Saclay conglomerate. In particular, the two laboratories from Ecole Polytechnique, which have contributed significantly to the scientific output of P2IO, will no longer be included in the subsequent organization, namely the P2I department of the Physics School of University of Paris-Saclay. Every effort should be made to maintain and further develop this collaboration between these two centers of excellence.

Furthermore, the ISC stresses the importance of the P2IO LabEx in supporting postdoctoral researchers in its projects. These postdocs have played a crucial role in fostering collaborations among the participating institutions and in securing the success of the projects. University of Paris-Saclay is strongly encouraged to make every effort to ensure that this support continues, and, to the extent possible, even increases in the future.

Recommendations for the post LabEx era

5.1 Identify promising ambitious collaborative projects, likely to increase the visibility of University of Paris-Saclay and support them to allow them to reach their full potential.

5.2 Try and maintain the funding level at the same, or increased level, and avoid spreading the money over too many little projects.

5.3 Initiate international projects led by the University of Paris-Saclay integrating international collaborators.

5.4 Create the conditions for maintaining, and possibly increasing, the level of postdoc funding.