



P2IO Scientific Council Report

(Meeting in Paris, December 17-18, 2014)

This was the third Science Council (SC) meeting following previous SC meetings held in September 2013 and June 2012. We note the excellent preparation for this meeting done in close collaboration between P2IO management and the SC that allowed us to review and update the P2IO SC mandate and make several iterations of the agenda. The availability prior to the meeting of a large number of documents and complete information about the status and progress of the various P2IO projects is appreciated and is an improvement from last year's SC meeting. The summary by Anne-Isabelle of the major 2014 P2IO activities was very helpful.

The timing for the meeting was originally dictated by a desire for the SC to help P2IO prepare its midterm report. The following questions were suggested by Paris-Saclay University for the general 2015 LabEx evaluation: Is the LabEx fulfilling its objectives and goals? Is there a need to reconsider them? What is the relevance and ambition of future plans, and of the strategy to achieve them? What are the obstacles and problems the LabEx faces? Is the LabEx funding strategy appropriate? Are there key, overarching scientific questions that may have been overlooked in the current activities? Does the LabEx promote the exploration of new frontiers? Our report will address some of these issues below. Unfortunately, due to lack of information, P2IO was not quite ready to address issues related to its midterm progress report at the time of the SC meeting. The current schedule has the midterm report due in March and an oral presentation in June.

Recap of the SC Agenda

On the morning of December 17, the SC had an open meeting with presentations from the major P2IO projects. These showed excellent preparation and the presentations made very clear the added value of the P2IO contribution to these projects (another appreciated improvement from last year, corresponding to one of our major requests). That afternoon the SC held a closed

meeting with the postdoc and R&D project selection committee chairs: they provided their feedback and suggestions for improvement. This was followed by a presentation from the president of the Senat Academique (J. Zinn-Justin) and a discussion of the progress and plans of the University Paris-Saclay. The SC met in closed session with the representatives of the 4 “tutelles” concerning the new governance arrangements for P2IO, and then met with the laboratory directors to solicit their feedback and conduct a constructive exchange about the new plan of governance.

On the morning of December 18, the SC held an open meeting to discuss preparation of the P2IO midterm review in 2015 and additional details of the new P2IO governance plan. On both days after lunch, the SC attended poster sessions. On December 17, these presented some of the R&D projects supported by P2IO while on December 18, the SC met with some of the postdocs and Ph.D. students working on P2IO projects. Overall, these posters were excellent and the SC very much appreciated this venue for providing a very efficient opportunity with direct exchange between SC members and the students and researchers responsible for these projects. The participation of the researcher responsible for the work at the poster session was found by the SC to be extremely useful and should be systematically encouraged in the future. If possible, we would encourage a higher proportion of the Postdoc and PhD projects to be presented next year in the poster session. In addition to the posters we note that there was appropriate time for discussion and comments during both the open and closed sessions and this was another major improvement from last year’s SC meeting.

The P2IO SC was pleased to hear feedback concerning the P2IO Open Day held on November 3, 2014. This event appeared to have been quite successful in presenting the value of P2IO to the local community, improving the visibility of P2IO and contributing to team building for members of P2IO. The event resulted in excellent feedback from the local community and attracted more than 200 people. A subsequent meeting with ANR (French National Agency) produced very positive feedback on the progress made by P2IO as evidenced by publications and R&D breakthroughs.

Review of Success Criteria for the Midterm Progress Report

The SC appreciated the P2IO reflection about the success criteria as recommended at the last SC meeting, “P2IO should develop more specific, quantitative success criteria that go beyond the very general list of accomplishments that must be achieved to meet the “official” criteria defined in the P2IO proposal. While official criteria, such as total numbers of scientific publications, must of course be tabulated, more specific criteria directly related to the goal of closer cooperation among P2IO Laboratories, such as the number of cross-lab publications, cross-lab proposals (funded or not), etc. should be developed and used to measure the success of P2IO in fostering a more integrated scientific community. Such measures of success would go far in making the case that this LabEx was much more than the sum of its parts.” An example of some additional criteria that could be tracked and that could be reported at both the midterm and in the

Current Success Criteria:

Criteria	2015	2020	Achieved (2014)
Number of scientists incoming	2	8	No specific grant 16 visitors
Number of national and international contracts	5	10	2 (platforms) 8 (PhD Grants)
Publications	25	60	55
Conferences	5	10	6 specific P2IO 25 funding
Technological breakthroughs	3	8	6 R&D projects achieved
Platforms	4	8	5
Common bids	3	8	3
Actions inter Labex	3	5	2
Interdisciplinary partnerships	2	5	3
Industrial partnerships	2	5	1

Possible Update to Reflect More Achievements

Criteria	Comments
Number of national and international contracts	Submitted/successful + specify amount of money thus obtained Separate national and european contracts
Publications	Could be more ambitious then the actual criteria
Conferences	Could be more ambitious (require high level conferences related to incoming visitors,..)
Technological breakthroughs	Give the number of patents?
Platforms	OK
Interdisciplinary partnerships	Number of P2IO interdisciplinary projects
Industrial partnerships	Difficult to disentangle from strong, existing partnerships → underestimated now

final report might be something like what is shown in the table above proposed by the P2IO management. The SC strongly suggests that P2IO “bend over backwards” to assure the funding agency that money spent on this LabEx leveraged many more resources to accomplish a much

more diverse set of objectives than would have ever been possible under a traditional research grant of the same size.

SC Comments on Individual Presentations

R2: CaptInnov platform

The P2IO Scientific Council is impressed by the progress made by the CaptInnov team in installing and commissioning the Probe Station and Bonding Machine. The CaptInnov platform serves the needs of the P2IO lab groups that are involved in large national and international experimental collaborations. Sharing the expertise among a small dedicated group of users through training sessions is appropriate. The procedure for distributing user time among internal and external user groups on the two machines at the two different sites, though engendering some logistical problems, seems to be reasonable. The integrated use of the two machines should be optimized to serve all user needs, i.e. the bonding process followed by the probe process and vice versa. One measure of success will be how many groups outside the two sites are making use of the two set-ups. An effective policy should be formulated for the use of the facilities by external groups, i.e. institution of a user fee, payment of local expertise, establishment of priorities for outside users compared to users from P2IO, etc. Such a policy will allow all users to understand the rules and plan for the efficient use of these facilities.

R3: Virtual Data platform

A priority for P2IO from its inception has been to build a computing platform common to all P2IO laboratories to address their needs in simulation, processing and storage of large data volumes. Such a shared platform for P2IO laboratories is a relevant way to cope with the challenge of maintaining state-of-the-art facilities that remain up-to-date in spite of rapidly evolving technologies. Coordination between P2IO and Paris-Saclay is seen as a logical path to share these computation facilities rather than duplicating the equipment, facilities and personnel required to maintain the equipment. We note that possible cost sharing strategies for P2IO and external users and for potential users from Paris-Saclay were not addressed. If this facility is to serve the longer term needs of the community, then such considerations are essential for the continued maintenance and growth of the platform.

P1: LHC physics

This is a central theme for P2IO. Many labs are involved and activities span the range from data analyses, development of new hardware and pushing the bounds of theory. In Data Analyses the SC was informed of research on the top asymmetries and polarization at ATLAS, a joint effort between Saclay (experimental group) and Orsay (theory), and of the studies of the Higgs parity/couplings in 2-photon decays carried out at CMS, which made a very good impression despite the fact that it was the work of only one lab. P2IO support appears to have been crucial for the timely involvement of local French groups in these and other very interesting analyses.

This was further reinforced by presentations from the 2014 LHC postdocs. In Detector R & D, P2IO support has been essential in the Saclay-LAL collaborations on a sampler for picosecond timing and on an upgrade of the ATLAS calorimeter L1 trigger. In other Theory efforts, one lab has worked on the possible localization of the Higgs field in extra dimensions.

P2: HARPO

The development of a gas-filled time projection chamber (TPC) detector system for gamma-ray astronomy is seen as providing potentially important advances in sensitivity and resolution and holds out the possibility of polarisation measurements in the MeV-GeV range. It was clear that strong collaborations between laboratories now exist and that P2IO funding was crucial to the progress of this instrument concept. P2IO funding rescued the project from ‘imminent death’, allowed its development to its current state of readiness and is the basis for the next phase of the project, testing the system in Japan in 2017. Ultimately, the goal is to propose an instrument for, for example, a mission beyond the ESA Cosmic Vision M4 mission and this is strongly encouraged by the SC.

P3: Nuclear Physics

The SC took note of the interesting programs of the P2IO nuclear physics community at the national (GANIL-SPIRAL2) and international facilities (NSCL, GSI, HIE-ISOLDE, LNL&LNS, RIKEN and RCNP). In particular, Nuclear Structure and Nuclear Astrophysics studies with radioactive beams require innovative detection systems for measuring reactions in inverse kinematics. The P2IO SC supports the evolution of the Si-detector arrays from MUST, to MUST2 to the 4π Si-array GASPARD and its integration within 4π γ -ray arrays, e.g. AGATA, in the framework of an international collaboration. GASPARD is intended to detect low-energy recoil particles and requires state-of-the art techniques for particle identification (PID) and pulse-shape discrimination (PSD). The SC is impressed by the results obtained within the P2IO project (HIGHSPId) to develop the electronics (ASIC preamp & Digitizer) for GASPARD (IPNO, LAL, IRFU collaboration) with excellent PID for light elements. The SC recommends that the group involved in HIGHSPId should speed up the R&D on the PSD and build the GASPARD prototype for tests under realistic experimental conditions. The GASPARD Collaboration should secure the total funding for the GASPARD detector array, which is essential for experiments with radioactive beams.

P4: Conditions for the Emergence of Life

The INGMAR experiment, a close collaboration between IAS and CSNSM to simulate solar-wind effects on solid objects in the solar system, demonstrated good progress and high potential impact for meteorite, asteroid and cometary studies. The project was well planned and systematically executed in a logical and methodical manner. Given the current high interest in asteroids and comets as well as numerous planned missions to such bodies, this experimental work will be of great interest in planning, executing and analysing the results of these missions.

We note that there are very few reports of other work on this platform (P4). In particular, no significant star formation work appears to be in progress currently despite the potential availability of several new and very exciting observational assets (ALMA, etc.).

I2: Health imaging

Significant progress was reported in the two projects supported by P2IO and we note that P2IO funding was key to support both projects at critical stages in their development. P2IO support clearly promoted the exploration of new frontiers from the technological point of view, but the added value from the biology perspective was not as obvious to the SC. Since support of the CALYPSO project was only for one year, the possibility to extend support until another source of funding is available could be considered. While future scientific plans were clear, the funding strategy was not obvious for the CALYPSO project.

Teaching and Outreach

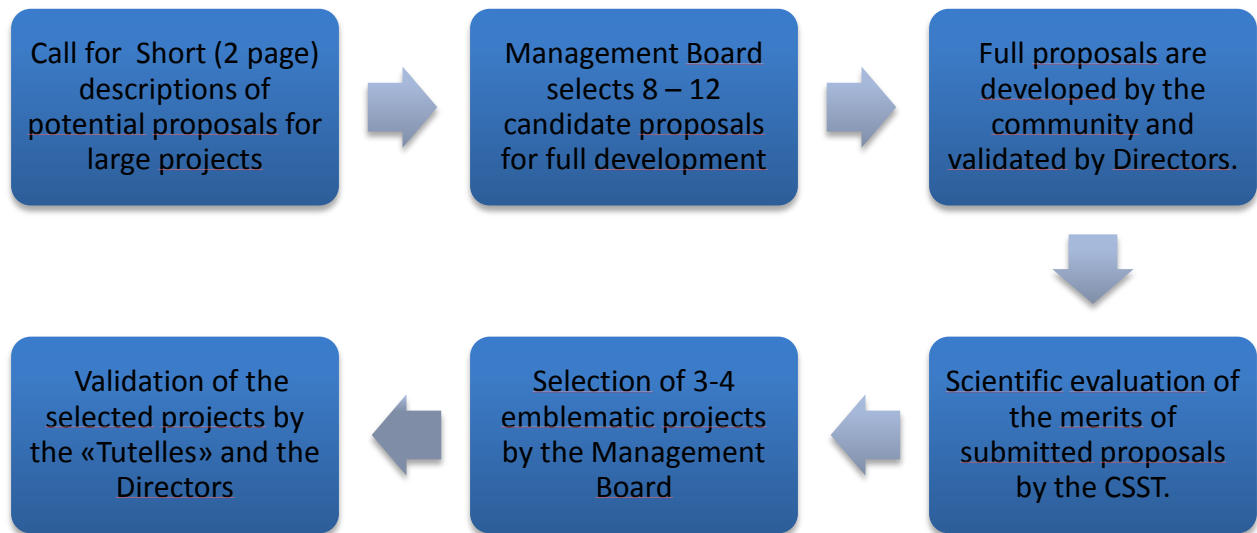
Excellent work is being undertaken and provides good value for the money expended in this area. Enhancements to current program support, including translation of the P2IO book into English, wide distribution of the P2IO poster and teacher training (including a cascade via ‘training the trainers’) would be quite appropriate. Future developments based on existing programs are seen as sensible and are fully supported by the SC.

P2IO Organization

Generally the SC is pleased with the evolution of the management structure of P2IO to a system based on Physics experts representing each major P2IO theme, reflecting the maturity of the project and the progress made in fostering collaboration across the Institutes. There was concern that involvement of a larger fraction of active scientists in management could lead to instances of conflicting interests or to the elimination of such imaginative individuals from participation in competitions for P2IO resources. No information on this topic was presented but we hope that steps will be taken to mitigate such concerns.

The SC is concerned with the absence of female members in the composition of the new management board, given the high-level of female expertise that is locally available. We strongly suggest and expect that this imbalance will be remedied in the very near future without gender issues taking precedence over quality.

The SC was very interested in the revised process to be used in the selection of the next group of emblematic research projects that will be supported by P2IO. We have made some suggested modifications to the process originally proposed in order to speed up the selection of worthy projects and to ensure that each project selected will have all of the support required to carry out the proposed work. Our suggested process is shown below.



The SC welcomes the combination of the two selection committees for the postdocs and R&D projects into a single “Comité de Sélection Scientifique et Technique (CSST)”. Although difficulties have been reported about the efficient participation of international experts, the inclusion of a few well selected international experts in the pools of experts advising each theme expert is strongly encouraged.

Midterm Review

This meeting was initially scheduled to help prepare the (important) P2IO midterm review in 2015. Unfortunately no basic information has yet been provided by ANR. Directives will be provided mid-January for a report to be prepared by March 2015. A full ANR review will be held in June 2015. This report will require preparation by the present (status & accomplishments) and future (plans) P2IO management. The SC stands ready to support such efforts in any way possible. If P2IO needs any help from the SC, please do not hesitate to request it.

The committee notes that there were very mixed results to our request for the identification of the key role played by P2IO in the progress made by individual research projects. This is unfortunate as such information could be quite useful in the preparation of the P2IO midterm report and could be highlighted during the oral presentation.

Acknowledgements

The SC would like to express its thanks to all speakers for their excellent preparation and very informative presentations, to the P2IO management for the excellent scientific organization and the very complete information package provided before the meeting, and to the administrative

staff for excellent support. Many thanks to Anne-Isabelle and Laurent for the successful organization of P2IO which made excellent progress during the last two years under their combined leadership. Congratulations to Anne-Isabelle and good luck in her new position. We are looking forward to her input next year concerning P2IO from the other (Director's) side and to work closely in the future with Philippe Busson and Pierre-Olivier Lagage, taking over respectively as P2IO Director and Deputy from January 2015.