

OCEVU STEERING COMMITTEE

December 2, 2015

The OCEVU Steering Committee (OSTC hereafter) met Wednesday, December 2, 2015. This was the third meeting of the committee since the establishment of OCEVU, a Laboratory of Excellence (Labex hereafter) on the Origins, Constituents, and Evolution of the Universe selected by an international jury as part of the French government "Investissements d'Avenir" program in March 2012.

OCEVU is a cluster of scientific excellence in the fields of cosmology, particle physics and astroparticle physics, located in the southern part of France (Marseille, Montpellier and Toulouse). Through a unique combination of theory, observations and experiments, a multidisciplinary approach to the exploration of the universe is possible, from the very large cosmological scales to very small physical scales of the particles.

During this meeting, OSTC was especially mandated to:

- review the scientific, financial and operational assessments for 2015,
- advise on the computing resources for OCEVU,
- question the relevance of the priorities and funding amounts involved for 2016,
- make recommendations to better coordinate the LabEx projects with the scientific priorities of the institutions and organizations partners in the LabEx.

OSTC proceeded in two stages with firstly an open session during which the Labex and working group coordinators reported in details on the on-going projects and the ones envisaged for the following years. The committee then met in closed session to evaluate and make recommendations, if necessary.

Evaluations and recommendations of the OSTC

General remark

During the various presentations, OCEVU showed a remarkable vitality: all the working groups are particularly active. More generally, OSTC noted the remarkable spirit in which the Labex works, which greatly contributes to its success.

This excellent work was particularly highlighted in the ANR mid-term report (June 2015), which contains strictly no negative remark.

- ➔ OSTC is convinced that the excellent assessment made in the ANR mid-term report is fully justified and warmly congratulates all the OCEVU members for the efforts they have produced.



Future of the Labex

Labex will officially stop December 31, 2019. The members are willing to continue to work together and to capitalize on past efforts. They therefore question the environment in which such cooperation could take place.

It is naturally difficult to predict the environment in 2020. Concerning A*Midex, it will apply for an unlimited extension to be submitted December 22, 2015 (response expected in June 2016). If the answer is positive, it plans to evaluate before their end date the various Labex projects that are under its management responsibility (the precise arrangements of this evaluation will be known later). However, if A*Midex finally decides to extend its financial support to OCEVU beyond 2019, it could only apply it to the laboratories under its tutorship (namely CPPM, CPT, and LAM).

Therefore it raises the problem of the participation of the laboratories located in Montpellier and Toulouse, which are part of OCEVU (LUPM, L2C, IRAP). In this latter case, one possibility would be to have a contribution of the IDEX in Toulouse, which would be the counterpart of the A*Midex contribution.

- ➔ OSTC requests the representatives of IRAP to question their IDEX on the possibility of contributing to an OCEVU's extension.

The situation is much more complex for the laboratories located in Montpellier since there is no IDEX in this university (a priori there will be none by 2020).

- ➔ OSTC requests the representative of the laboratories of Montpellier to assess all the funding opportunities that may provide an official framework to pursue this collaboration.

If it turns out that it is impossible to find an official framework, an informal collaboration could still exist between Montpellier and the two IDEXs (Marseille and Toulouse). However such a solution would not put all laboratories on the same footing. OSTC suggests assessing the impact of such a context and thinking about a possible evolution of the scientific scopes of the Labex. It wishes to emphasize that after 8 years of operation, it is not unreasonable to conduct such a process, which is basically in the spirit of such a structure.

- ➔ OSTC wants to have an information point at the next meeting on the future of the Labex, together with a first proposal of the possible evolution of its scope beyond 2019.

Scientific activities

OSTC is very pleased with the various scientific presentations that were made. It noted with pleasure that scientific groups are very active and scientific results are present. It also enjoys the real synergy between the various sites that composes OCEVU, which is one of the most important motivations that led to the creation of this structuring environment.

OSTC also appreciated the presentations of young researchers (PhD students and postdocs). Once more, it wishes to emphasize the very high level of the recruited young researchers who provide substantial and high quality work in the framework of collaborative projects funded by OCEVU.



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This activity leads to a large number of publications (at that date, more than 100 in peer reviewed journals). OSTC is delighted that students and postdocs are very sensitive to this process, which is very important for their future.

- ➔ OSTC congratulates the scientists for their activities and encourages them to continue publishing their results. This is important, particularly for the future of the youngest scientists and to quantify the impact of the Labex.

As already discussed in the OSTC meetings, it is very difficult to add an acknowledgment to ANR in the publications involving a very large number of authors, as Atlas or Euclid. However the situation seems to evolve slowly, as for example LHCb agrees now to add an acknowledgement. Although the situation is difficult and each case is unique, the OCEVU members must continue to insist that these acknowledgments are added in their publications, as it is an effective way to quantify the impact of OCEVU.

Computer resources

Since its inception, OCEVU wants to offer computer resources at the forefront. It then setup an internal committee, which was mandated to analyze the current situation and propose an evolution of the computing capacities.

This OCEVU internal committee presented its conclusions to OSTC. The reflection led to a proposal based on two axes:

- It proposes first to develop a Dark Energy Centre (DEC), a common initiative from the cosmological groups. The next decade will see the advent of several major projects in this scientific domain, as Euclid, LSST, PFS, etc. will begin to deliver their data. Dedicated centers will be necessary to process these data and to compare them with theoretical models of increasing complexity. National centers like CCIN2P3, local centers as the *Mesocentre* in Marseille or dedicated centers for LSST and Euclid will be necessary in the exploitations phases, but are not tailored for development phases. The internal committee therefore proposes to develop a Dark Energy Centre whose performances allow a partial analysis of existing data (BOSS/eBOSS for example) and provide an environment to prepare the scientific analysis of the upcoming major projects, as Euclid, LSST, etc.
- It proposes also to reinforce the LUPM–Cloud in order to provide to all the scientists a new platform built on top of reliable and powerful new hardware. Virtualization has led to an increasing use of computing resources by LUPM research teams, in particular by the EMA (*Expérience et Modélisation en Astroparticules*) and the theoretical groups who are involved in OCEVU. With a more reliable and powerful infrastructure, it will become possible to open an access to this cloud, as a service, to all the OCEVU members.

OSTC is well aware of the importance of computer resources for the preparation and operation of future projects, and therefore supports the approach taken by OCEVU. However it is concerned that the entire budget is allocated to the hardware and nothing is provided for software developments and user training,



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which is likely to restrict the access to these centers. OSTC also stresses that private companies are very interested by software developers and that this can be a very good opportunity to propose a job that can offer interesting perspectives.

- OSTC requests that a training plan and a support to software developments are included in the proposal. This must be done in the initial budget, even if this leads to slightly reduce the hardware budget.

OCEVU proposes to setup an external expert committee to evaluate in more details the technical proposal of the OCEVU internal committee.

- OSTC supports this proposal and wishes to be informed of the conclusions of the external committee.

Education

OSTC appreciated the many actions in the direction young students. This task is very important and it congratulates all group members for the quality of their work. It also likes the idea of a doctoral school, as well as the concept of a Summer Camp devoted to L2 students (the first edition organized in 2015 was clearly a success).

- OSTC supports the financing of these actions by OCEVU.

At the last meeting, OSTC suggested exploring the possibility of creating an Erasmus Mundus, which is a very efficient way to reach very good students and to capitalize all these efforts in the long term. It is obvious that setting up an Erasmus requires considerable efforts, but A*Midex reminds that it is officially committed to co-finance such a structure.

- OSTC suggests exploring the possibility of creating an Erasmus Mundus.

Outreach

OSTC appreciated the many actions in outreach and in direction of the schools. Once more, it congratulates all the group members for the quality of their work and dynamism.

At previous meetings, OSTC requested to quantify the impact of the education actions on the young students. This exercise is particularly difficult and the problem is obviously not unique to OCEVU. Real efforts have been made in the latest annual report, which gives figures indicating a significant impact of the actions carried out by OCEVU.

- OSTC is grateful of all the efforts to quantify the impact of the outreach actions and recommends pursuing them.



OSTC notes the establishment of two educational platforms, one on astronomy (IRiS) and another on particle physics (e-péron). The first one is now fully operational and the second should be soon. It is naturally important that these platforms, which will remain after the Labex work perfectly and are open to the national and international communities.

OSTC notes also that certain actions are transverse to several structures, such as several Labex, OSU, etc. This is a very appropriate use of resources and encourages proposers to continue in this direction.

→ OSTC recommends pursuing the sharing of the efforts between various partners.

Technological Transfer

OSTC is aware that technological transfer is particularly difficult in OCEVU because of the Labex's scopes. An action has been however successfully carried out, the development of an underwater connector (WetMate).

At the last meeting, OSTC suggested relying on the competitiveness clusters to facilitate this process. It was then proposed to organize a first meeting with the laboratories in order to present their activities to the clusters, so that these ones can identify topics that might interest private companies. Once those topics identified by the clusters, it is possible to organize a meeting with the identified companies with the clusters' support.

→ OSTC suggests again trying to strengthen actions in this domain, even though it is not easy. For example it could be a good idea to implement the proposal described above.

SVOM Ground Follow-up Telescope

OCEVU has planned to build a facility mainly devoted to the follow-up of the Gamma-Ray Bursts (GRBs) detected by the Sino-French satellite SVOM. This mission is an important challenge for a large number of OCEVU researchers as four of the five laboratories contributing to the Labex participate to SVOM.

After the official decision on SVOM by CNES and CNSA in August 2014, OSTC requested a review to be held to evaluate the technical concept and the project organization (chairman: J.-L. Beuzit). This committee conducted a first review on November 2014. On this occasion, two scenarios were identified by the project:

- The LCOGT approach consists in a partnership with the Las Cumbres Observatory Global Telescope Network (LCOGT), a non-profit organization, which operates a worldwide network of telescopes. In this case, Labex OCEVU would contribute financially to the installation of an additional 1-m telescope at the Tenerife observatory (Canary Islands) and provide an infrared camera.
- The Ground Follow-up Telescope (GFT) approach relies on a standard collaboration between academic partners, OCEVU and the Institute of Astronomy of UNAM in Mexico, to build and operate a dedicated facility at the national observatory located in San Pedro Mártir (Baja California, Mexico). In this scenario, France and Mexico will share the access to the telescope.



The OCEVU review recognized the scientific interest of the project and requested the project to clarify as soon as possible its strategy in relation to the two proposals submitted. It presented its conclusions at OSTC in December 2014, which in turn recognized the importance of this project and endorsed all the conclusions.

Following the recommendation of the OCEVU review, the project has pursued its studies to lead a complementary phase in order to reach a clear statement on the two proposals. Concerning the LCOGT approach, the technical studies have unfortunately raised real major issues: the studies carried by the project indicate that it is really difficult to implement a panchromatic camera on their telescopes. The project decided then to drop this idea as going further in the study, other problems quickly appeared, leading to major technical and programmatic risks.

On the contrary, UNAM showed a great motivation in the project consisting in developing and operating a dedicated robotic telescope. It is ready to participate in its development and to provide any assistance necessary for proper operation. This is part of the strong will of UNAM to develop its national astronomical site located at the San Pedro Mártir site.

All these studies have then convinced all the scientists involved in the project that the only viable solution is to setup a dedicated system fulfilling exactly the SVOM requirements, the GFT, in collaboration with Mexico. This strategy was then presented to the OCEVU review in April 2015, which endorsed it.

The main partners are now engaged through a Letter of Intent signed at the time of the visit of the President of Mexico in France. This letter was signed in July 2015 by AMU (on behalf of OCEVU), CNES and CNRS presidents for France, and UNAM and CONACyT presidents for Mexico.

The GFT project then made a complete report to OSTC:

- ➔ OSTC endorses the strategy to install a dedicated system fulfilling the SVOM requirements, the Ground Follow-up Telescope in San Pedro Mártir, Mexico.
- ➔ OSTC emphasizes that the schedule is very tight and recalls that the OCEVU budget must be absolutely spent before December 31, 2019. It is therefore important that the OCEVU review continues to follow closely the project's progress in order to avoid drifts in the development plan.

Agenda

Subject	Speaker
Welcome & Agenda	S. Basa
Labex status report	E. Kajfasz
Particle physics group status report	L. Feligioni



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Cosmological group status report	O. Le Fèvre
Astroparticle group status report	E. Nezri
Teaching group status report	V. Buat
Outreach group status report	C. Baudouin
Technology transfer group status report	R. Potheau
Presentation of 3 young OCEVU researchers (postdoc or PhD)	C. Torrero
	M. Bonamigo
	T. Fitousi
Status of the Ground Follow-up Telescope	S. Basa
Computing resources for OCEVU	A. Tilquin
Labex perspective	E. Kajfasz
AMIDEX perspective	P. Chiappetta
Closed session	

List of participants

OSTC full members

Chair: Saul Perlmutter

Secretary: Stéphane Basa

A*MIDEX Director & Aix-Marseille University: Pierre Chiappetta (also representing Denis Bertin, excused)

CNRS/INSU: Jean-Luc Beuzit (representing Denis Mourard, excused)

Pôle Mer Méditerranée: Guy Herrouin

OSTC invited members

OCEVU Coordinator: Eric Kajfasz

OCEVU Astroparticles WG: Emmanuel Nezri

OCEVU Particle Physics WG: Lorenzo Feligioni

OCEVU Cosmology WG: Olivier Le Fèvre.

OCEVU Technological Transfer WG: Rémy Potheau

OCEVU Outreach WG: Cyrille Baudouin

OCEVU Teaching WG: Véronique Buat

LAM: Jean-Gabriel Cuby, Mario Bonamigo

LUPM: Denis Puy

IRAP: Thierry Contini, Thomas Fitousi

CPT: Christian Torrero

CPPM: André Tilquin