



agence d'évaluation de la recherche
et de l'enseignement supérieur

Department for the evaluation of
research units

AERES Report on the Thematic Network for Advanced Research (RTRA):

Fondation Sciences Mathématiques de Paris

FSMP

Founding institutions of the network:

Université Paris 6 – Pierre et Marie Curie

Université Paris 7 – Denis Diderot

Ecole Normale Supérieure de Paris

Centre National de la Recherche Scientifique



May 2013



RTRA

RTRA name: Fondation Sciences Mathématiques de Paris

Name of managing director: Mr Jean DOLBEAULT

Expert committee members

Chairman:

Mr Nassif GHOUSOUB, University of British Columbia, Vancouver, Canada

Experts:

Mr Michel PIERRE, ENS Cachan-Bretagne, Rennes

Mr Andreas PODOLSKI, University of Freiburg, Germany

Mr Jean-Marc SCHLENKER, University of Luxembourg, Luxembourg

Mr Gisbert WUESTHOLZ, ETH Zürich, Switzerland

Representatives who attended the visit

Scientific delegate representing AERES:

Mr Christian LE MERDY

Representative(s) of the founding institutions:

Mr Gilles PAGES (UPMC)

Mrs Laure ELIE (UPD)

Mr Olivier DEBARRE (ENS Paris)

Mr Michel BIDOIT (CNRS)



Evaluation report

1 • Introduction

This report reflects the deliberations of the external committee of experts regarding the evolution, the current state and the future plans of the “Fondation Sciences Mathématiques de Paris” (FSMP). The site visit occurred on May 14-15, 2013. The committee met, questioned and heard testimonials from more than 50 individuals who are connected in one way or another to the activities of the FSMP.

The committee met with those responsible for the delivery of the FSMP programs: The Board of Directors, the scientific management, the scientific panel, as well as the staff.

The external committee of experts got also to hear first hand from the users of the programs: the current senior and junior chairs, several postdoctoral fellows as well as French and foreign doctoral students.

A particularly insightful meeting happened with more than 25 directors of research laboratories, leaders of research teams and heads of doctoral schools.

Evaluation procedure:

The committee focused its evaluation on the following aspects of the foundation:

- The value-added to the scientific activities in the Paris region,
- The coherence of the vision,
- The buy-in and commitment of the partner organizations,
- The value-added to the national mathematical activity,
- The financial governance of the endowment as requested by la “Cour des Comptes”,
- The sustainability of the network,
- The efficiency of the management structure.

Presentation of the network, geographic location and brief description of its field of activity:

Besides its four founding institutions, the Foundation has 5 affiliated institutions:

- Université Paris-Dauphine,
- Collège de France,
- Institut National de Recherche en Informatique et en Automatique,
- Université Paris-Descartes,
- Université Paris-Nord.

The FSMP supports all the “Unités Mixtes de Recherche” (UMR) in the mathematical sciences (including statistics) and some in theoretical computer science, located in Paris-Centre and Paris-Nord, various INRIA teams located in Paris-Rocquencourt, as well as Chairs at the College de France. This corresponds to a substantial critical mass of first class researchers, which compares, and in some areas surpasses, the Boston axis of Harvard-MIT-Northeastern and the NYU-Columbia-Rutgers-Princeton academic cluster.

Organisation and governance:

The FSMP is under the oversight of a Board of Directors (CA), which consists of representatives of the founding partners of the network, namely Paris 6, Paris 7, the ENS and the CNRS, as well as elected members and prominent personalities from outside the perimeter of the network.

The scientific activities of the FSMP are evaluated and selected by a Scientific Committee (CS) consisting of various prominent researchers from outside the perimeter of the network.



The management committee (CP) consists of the director, 2 deputy-directors and seven representatives of the research laboratories. All of them are fully active faculty members of the universities or CNRS researchers.

The council of the network (“Conseil des composantes”) consists -unlike the scientific committee- of representatives of the various research laboratories and doctoral schools that form the network.

Structure’s own staff (assigned to the network); change in staff numbers since the network was set up:

Five highly dedicated administrators assisted by a full-time communication officer and 2-3 supporting staff manage the network:

- A director and 2 deputy-directors who are full-time research faculty members seconded from either the CNRS or the universities,
- A director for development seconded from Paris 6,
- One administrative and financial director, who is also seconded from the CNRS.

2 • Assessment of the network

Overall opinion:

The committee was favorably impressed by the evolution and performance of the network. In 5 short years, the FSMP has become a major player on the international mathematical scene. The Fondation has had a measurably positive impact on the Parisian academic scene, especially through the new opportunities it created, its contributions to the training of highly qualified personnel, to scientific industrial outreach and to the communication of mathematical research to the public. The committee was extremely impressed with the record of the FSMP in creating and maintaining a collaborative atmosphere between its members institutions, as well as with its ability to leverage its newly acquired status and its community to secure additional funds for the mathematical sciences.

Strengths and opportunities:

- The critical (even supercritical) mass of outstanding mathematical scientists that form the basis of the FSMP,
- The outstanding and committed management and administrative teams that run the day-to-day operations of the network,
- The robustness and objectivity of its scientific evaluation processes,
- The new opportunities for training, which address the financial needs of young mathematical talent as well as the challenges of the partner institutions in competing internationally for this talent,
- The unique platform it provides for the partner institutions to collaborate, plan, coordinate and execute together their national and international mathematical sciences policies,
- An optimal vehicle to successfully compete nationally (LabEx) for research funding,
- The network’s winning strategy to collaborate regionally with Orsay (a traditional competitor) in order to secure that mathematics becomes a high priority area (Domaine d’Intérêt Majeur - DIM) in the Ile-de-France region,
- The network’s ambitious science communication strategy, which has already started to bear some fruit as good relations with mainstream media are starting to materialize,
- The FSMP’s reaching out to industrial partners such as EADS, AREVA and TOTAL, with a quest to improve much needed academic-industrial interactions.



Weaknesses and threats:

- The sustainability of the network beyond the expiration of the LabEx grant,
- The discrepancy between the financial commitments and expectations of some of the founding institutions and those of the new institutional partners,
- The membership of the Board of Directors, which is neither representative of the new partners nor does it allow for independent, arms-length and potentially hugely beneficial representation from the private sector,
- The lack of an audit and finance subcommittee of the Board of directors, which could/should be in charge of overseeing the endowment and recommending to the Board annual spending parameters.

Recommendations:

- Rebalance the Board to include representatives from the new partner institutions,
- Add to the Board a healthy number of arms-length directors from the public and private sectors,
- Create an audit and investment subcommittee of the Board,
- Revise the terms and conditions for the participation of the various institutional partners by taking into consideration the changed landscape in terms of funding and partnerships,
- Keep up and develop further the network's efforts towards industrial outreach,
- Encourage the mathematical scientists whose research was impacted by the support of the FSMP to acknowledge this support in their publications and presentations,
- Extend certain programs, such as the Master 2, outside the Île-de-France region in order to improve the national mathematical impact of the network.

3 • Detailed assessments

Review of the scientific activity (international standing, outputs, striking facts):

From the onset, the FSMP was founded on a tremendous critical mass of world-class mathematical researchers. There is no doubt whatsoever about the prominent international standing of the Parisian research laboratories that are supported by the Foundation. One only needs to look at the number of medals, prizes, awards and distinctions received by many of the scientists involved. It is however difficult to give a quantitative assessment of the direct impact of the FSMP on all these activities, hence futile to sort out which ones to include as scientific output of the FSMP. The committee recognizes that all the scientific activities happen at the Labs, who track their own record of activities and publications on an annual basis.

One can however pinpoint certain activities that couldn't have happened without the FSMP. First, we mention the chairs program, which has so far been of tremendous value for French mathematical science. For example, the site visit committee believes that this year's holder of the FSMP senior chair, Berkeley's Michael Jordan (and his 15 students) will have a lasting impact on French statistics and information science, particularly on the emerging and fast developing domain of machine learning. Most relevant for the outreach effort is that Dr. Jordan was asked during his tenure as the FSMP chair, to join the advisory board of the giant firm Thomson Technicolor.

The junior chairs allowed at least one French mathematical expatriate to come back home and earn a position at the CNRS.

The introduction by the FSMP of the "Paris Graduate School of Mathematics" has also been a substantial contribution to French mathematics in the context of an increasingly fierce worldwide competition for scientific talent. This was mainly due to the grants for masters' level students offered by the FSMP.

The postdoctoral program of the FSMP allows Parisian universities to compete for a very first time with North American universities for this extremely important slice of young highly qualified personnel, just before these prized individuals commit to a permanent position.

At the root of these scientific initiatives is the desire of the FSMP to well position the Parisian universities on the international scene. By providing graduate and postgraduate positions at more competitive fellowships (by world standards), coupled with an attractive support system for new comers to the French system, the FSMP can be seen as an optimal vehicle for stimulating the international recruitment and training effort of the Parisian institutions.



The FSMP provides a unique platform for the partner organizations to collaborate, plan, coordinate and execute together their national and international mathematical sciences policies.

Reputation and appeal of the RTRA (cooperation strategy, reality and quality of scientific leadership, quality of recruitments, appeal, funding amount on projects, particularly under “investments of the future” programmes):

During the site visit, more than 25 research Lab directors, heads of doctoral schools and INRIA team leaders participated in the session dedicated to the “directeurs des composantes”. It was evident that the mathematical scientists within the member institutions have bought into the FSMP collaborative structure and the strategic concept of cooperating locally in order to compete internationally.

The leaders present expressed clearly the importance of the FSMP in developing and encouraging a collaborative spirit within a coherent discipline dynamic as opposed to the isolating silos of competing institutions. The FSMP transversal structure allows for a common desire to collaborate in the training of the next generations of mathematicians, while removing redundancies, encouraging complementary activities and using critical mass to go after major funding. The FSMP also provides a unique gateway to industrial partners, and a common portal for the communication of scientific discoveries to the public.

We believe that the success of the cooperation strategy is largely due to the outstanding and dynamic leadership of the first director as well as the current one. The testimonials of the Lab directors and team leaders spoke volume of the position of trust that the Foundation has managed to establish within the Parisian mathematical landscape. The high level expertise of the scientific committees, the arms-length status of the panelists, and the new opportunities in fellowships and scholarships all contributed to a solid buy-in from the member institutions into the FSMP. The Foundation is perceived as an anchor and as an honest broker of scientific activities.

The quality of recruitments at the chair level (junior and senior) is obviously outstanding. The committee didn't have a chance to evaluate all the postdocs and graduate students, but the few who participated in the site visit were clearly very competent, ambitious and well aware of the impact of the FSMP on their careers. The funding available for each chair, postdoctoral fellow, and graduate student seemed to be adequate enough to attract the very best. However, in view of the size of the community it supports, the committee believes that the FSMP should aim to eventually support a larger number of mathematical scientists in each one of the above categories.

RTRA as a catalyst (new actions set up, partnership with economic, cultural or social sectors, interaction with the environment, the network's impact on training):

The FSMP is best described as a catalyst, an enabler, a facilitator and an extremely efficient vehicle to leverage opportunities for the mathematical sciences. The most evident impact of the Fondation is that it allowed Parisian universities to compete successfully during the «Initiatives d'Excellence» exercise, and consequently gain a status of national centre of excellence (LabEx). This helped it obtain substantial additional funds for its programs, old and new, thus essentially safeguarding the bulk of its initial endowment.

And, in a successful move, the FSMP allowed the mathematical sciences to be classified as a high priority domain (Domaine d'Intérêt Majeur - DIM) in the Ile-de-France region. This now allows the FSMP to provide eleven additional doctoral scholarships per year. None of these resources for training would have been available without the network. The network's decision to collaborate regionally, like with the equally scientifically strong but historical competitor Orsay cluster, in order to secure that mathematics becomes a DIM, is to be commended. Besides the DIM success itself, this new interaction and partnership between the Parisian mathematical powerhouses is a big step forward and is due to a large extent to the leadership of the FSMP. This action has also led to a new and original collaboration between the various Île-de-France labs via FSMP, the Fondation Jacques Hadamard and the LabEx Bézout.

The value-added that the network provide to the Parisian universities is measurable in so many ways. Besides providing the optimal structure to attract major funding, the FSMP also provides a coherent platform for collaboration, which helps in attracting the best talents from all over the world, while providing training through a cohort system that was once only reserved for the students of the Ecole Normale Supérieure. Through side agreements with Embassies such as the one of Romania and the one of Chile, the FSMP managed to leverage its support for graduate students and increase the number of scholarships for students from those countries.



Governance (running of project selection committees or scientific committees, evaluation of scientific findings, exploitation of research findings, signature of articles, internal and external communication):

As mentioned above, the academic and scientific governance, i.e., the selection and evaluation processes are above any reproach. Besides the world-class reputation of the panelists, the fact that they are all required to be from universities outside the FSMP perimeter hence at arms-length, insures objectivity and fairness. That nominations must come from the Labs themselves adds another layer of scrutiny, which strengthens the selection process.

French researchers have an obligation to identify their affiliated UMR and university on their research papers. There is no such an obligation for the FSMP. The committee recommends that the FSMP encourage the mathematical scientists whose research was impacted by its support to acknowledge this financial contribution in their publications and presentations. We also note that the dissemination of the information has recently improved dramatically with a major overhaul of the network's webpage. The network has recently an ambitious science communication strategy, which is starting to bear some fruit as good relations with the mainstream media are starting to materialize.

Serious attempts at developing youth fora involving industrial partners such as EADS, AREVA and TOTAL are a good beginning. The competence, dynamicism and steely determination of the director for development, Ms Sylvie DELABRIÈRE, is a major asset for the industrial outreach goals of the network.

Financial management of the network (increase in capital, use of resources, analysis of scientific expenditure and, with regard to support roles, use of the initial budgetary allocation, the budget's coherency in relation to the scientific challenges):

The FSMP managed to succeed under very difficult circumstances. The initial vision was for the RTRAs to invest their endowments and to fundraise so as to not spend more than a certain fraction of their initial endowments. However, the turmoil in the world's financial markets, which started in 2008, dictated otherwise. The yields on investments became negligible and the fundraising from a financially ailing and crippled private sector became extremely challenging.

In order to establish early on its credentials and its added-value, the FSMP had to initially use up a fraction of its endowment. This deliberate strategy and careful management eventually paid off as it put the FSMP into a good position to receive funding from alternative sources. The success in becoming a LabEx and a DIM, among others allowed the FSMP to sail through the turbulent times, and actually emerge as a major success story for French science, while at the same time safeguarding most of its endowment. This directly addresses the concerns expressed by the report of the « Cour des Comptes » about the way with which several RTRA's have been encroaching on their initial endowments. It is the committee's opinion that the concerns of the « Cour des Comptes » do not apply to the FSMP.

The committee acknowledges the dedication and excellent work of the administrative and financial director, Mr Etienne GOUIN-LAMOURETTE, who oversees the treasury and keeps an expert eye on the investments.

RTRA projects, particularly under the "investments of the future" scheme (development of the foundation, connection with the "investments of the future" projects for which the RTRA is a lead and/or associate partner, strategic thinking):

Both the vision and the governance of the LabEx are perfectly compatible with those of the RTRA. Strictly speaking, the scientific objectives are slightly different since the LabEx focus is on interdisciplinary research as well as industrial applications. But the FSMP management was quick to realize the importance of developing these aspects of research in tandem and in total coherence with the more basic and fundamental mathematical investigations.

Challenges and recommendations:

The sustainability of institutions whose operations are based on the proceeds of an endowment always presents challenges. The "Fondations" supporting the RTRAs are not immune to this universal problem, especially when the world's economic indicators are struggling. The FSMP, however, has managed to fare exceptionally well, thanks to various initiatives taken by its directors, such as the one behind their success in getting the LabEx funding. However, this funding has a finite horizon (2019) and other sources of funding should be sought before that date.

One suggestion is to opt for not using any funds from the remaining initial endowment till 2019, allowing it to grow and reach a threshold where it can be self-sufficient. Besides using the funds of the LabEx, the management can consider the following non-mutually exclusive options:



1. Continue to be entrepreneurial in the quest for alternative sources of funds. In particular, proceed with serious fundraising from industrial partners and others in the financial sector,
2. Revisit the terms for the contributions of both the founding and associate members. While we understand that the CNRS contribution was justifiably one off, we believe that there is a good case to be made for the other founding institutions to make annual contributions, considering the benefits that they are receiving from the FSMP,
3. Cut down on the current programs.

Related to 2) above is an apparent discrepancy between the financial commitments and expectations of some of the founding institutions and those of the new institutional partners. A coherent formula for the contributions of each partner could be developed so that the endowment be spared till 2019, the date at which the LabEx funding expires.

The membership of the Board of Directors could be revised. The network has evolved with several new institutional partners joining the FSMP. The current Board is neither representative of the new partners nor does it allow for independent, arms-length and potentially hugely beneficial representation from the private sector. The committee recommends that the network rebalance the membership of its Board so as to include representatives from the new partner institutions. It also proposes the addition to the Board of a healthy number of arms-length directors from the public and private sectors.

The committee also recommends the constitution of an audit and finance subcommittee of the Board of directors, which should be in charge of overseeing the endowment and recommending to the Board annual spending parameters.