



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

Section des Unités de recherche

Report from the visiting committee

Research unit :

Laboratoire de Probabilités et Modèles

Aléatoires (LPMA) – UMR 7599

University Pierre et Marie Curie



February 2008



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Section des unités
de recherche

Le Directeur

Jean-Jacques Aubert

february 2008



Report from the visiting committee

The research unit :

Name of the research unit : Laboratoire de Probabilités et Modèles Aléatoires (LPMA)

Requested label : UMR

N° in case of renewal : 7599

Head of the research unit : Mrs Dominique PICARD (new director as of January 1, 2009, Mr Gilles PAGES)

University or school :

University Pierre et Marie Curie - Paris 6

Other institutions and research organization:

University Paris Diderot - Paris 7

CNRS (Dept MPPU)

Date(s) of the visit :

January 7 to 10 of 2008



Members of the visiting committee

Chairman of the committee :

Sir John BALL, Professor, Oxford University

Other committee members :

Mrs Claudia KLÜPPELLBERG, Professor, Munchen Technic University

Mrs Ragni PIENE, Professor, Oslo University

Mr. Dominique BAKRY, Professeur, University of Toulouse 3

Mr Andreas BLASS, Professeur, University of Michigan

Mr Donald DAWSON, Professor, University of Carleton

Mr Philippe DEPOUILLY, IR1, Bordeaux

Mr Bjorn ENGQUIST, Professor, University of Texas

Mr Richard GILL, Professor, University of Leiden

Mr Fritz GRÜNEWALD, Professor, University of Dusseldorf

Mr Gilles LEBEAU, Professor, University of Nice-Sophia Antipolis

Mr Pierre PANSU, Professor, University of Paris-Sud

Mr J. Tobias STAFFORD, Professor, University of Manchester

Mr Dominique DE WERRA, Professor, Ecole Polytechnique Fédérale de Lausanne

CNU, CoCNRS, CSS INSERM, représentant INRA, INRIA, IRD.....) representatives :

Mr Fabrice PLANCHON, Professor, CNRS representative for UMR_S, section 1, for IMJ, LOGIQUE MATH., LJLL, LPMA

Mr Philippe BAPTISTE, Chargé de Recherches, section 7, for ECO, CNRS representative for UMR_S

H. QUEFFELEC, Professor, University of Lille 1, CNU 25 representative, for IMJ and LOGIQUE MATH.

E. SONNENDRÜCKER, Professor, University of Strasbourg 1, CNU 26 representative, for LJLL and ECO

A. DEBUSSCHE, Professor, ENS Cachan, CNU 26 representative, for LPMA and LSTA

AERES scientific representative:

Mr Pascal AUSCHER and Mr Michel PIERRE

University or school representative:

Mr Jean-Charles POMEROL, President of the University Pierre et Marie Curie - Paris 6

Mr Guy COUSINEAU, President of the University Denis Diderot - Paris 7

Research organization representative (s) :

Mr Jean-Marc GAMBAUDO, Directeur Scientifique Adjoint, CNRS, MPPU, Mathématiques and Interactions

Mrs Valérie BERTHE, Chargée de mission, CNRS, ST2I, Informatique et Mathématiques

Report from the visiting committee



1 • Short presentation of the research unit

- Numbers of lab members including researchers with teaching duties, full time researchers, engineers, PhD. students, technicians and administrative assistants : Total of 115,5 , with 53 teaching-researchers, 9 researchers, 4,5 technicians/administrative assistants, 42 PhD. students, 6 associated researchers and 1 emeritus professor from other institutions
- Numbers of HDR and of HDR who are PhD students advisors : 33 (out of 53 t-r + 9 r) and 18 are advisors
- Numbers of PhD. Students who have obtained their PhD and average length of a PhD during the past 4 years, Numbers of PhD students currently present in the research unit, number of PhD students with fellowships: 41 students obtained their PhD during the previous 4-year period; there are currently 42 PhD students, all but 2 having financial support
- Number of lab members who have been granted a PEDR: 22 (out of 53 t-r) at least
- Number of « publishing » lab members : 52 (out of 53+9=62)

2 • Preparation and execution of the visit

The committee was in charge of making a review of six mathematical laboratories in the Chevaleret centre, of a federation and of an internal ERT. The committee was asked to produce an overall report on the mathematics of the Chevaleret centre, which is at the end. During the first day, the committee heard presentations by the directors. There was also a short presentation of the Masters programs and of the Ecole Doctorale de Mathématiques de Paris-Centre, and a presentation, with a visit, of the Chevaleret Research Mathematics Library. During the second and third day, the committee split into three subcommittees to review each laboratory separately. A review on technicians and administrative assistants was done in parallel. The committee ended the third day with a long debriefing. On the fourth day, the committee gathered again to meet the university and CNRS representatives. A brief summary of each subcommittee's conclusions was then presented to the directors and group leaders, in the context of a meeting of the whole review committee and the leaders of all the units under review. The fourth day ended with a long session during which the committee started the preparation of the reports.

The concerned subcommittee members (D. Dawson (chair), D. Bakry, C. Klüppellberg, R. Gill, A. Debussche) received the Evaluation Handbook and the Laboratoire de Probabilités et modèles Aléatoires (LPMA) Contrat Quadriennal 2009-2012 prior to the visit to Chevaleret. At the initial presentation on January 7 the Director gave an overview of the history and activities of the Laboratory. On Tuesday January 8 each of the five teams presented an overview of the research activities of the past four years and a number of short lectures on some highlights of their work. The subcommittee also met with the Executive Board (conseil de laboratoire), the LPMA Ph.D. students, and five staff members as well as informal discussion with individuals members. Finally the subcommittee had a wrap-up session with the Director. The subcommittee met on January 10 to formulate its conclusions and completed the preparation of this report by email correspondence.

3 • Overall appreciation of the activity of the research unit, of its links with local, national and international partners

The Laboratory has a long tradition tracing its roots back to Poisson, Poincaré, Borel and Fortet. The current configuration of the Laboratory is a result of the creation in 1960 of the Laboratoire de Probabilités (CNRS Unit 007) of Université Pierre et Marie Curie (Paris 6), and the union in 1998 of this laboratory and the "Probabilités et



Statistiques" team of Université Denis Diderot (Paris 7) to form the Laboratoire de Probabilités et modèles Aléatoires (UMR 7599). Today this Laboratory is one of the leading international research centres in these disciplines.

The research of the Laboratory is carried out by the five teams: ergodic theory and dynamical systems, probability models, Brownian motion and stochastic calculus, statistics, and numerical probability and mathematical finance. There is excellent interaction among the teams and a healthy balance between theory and applications. On the theoretical side the Laboratory has produced some of the major advances in probability, stochastic analysis and mathematical statistics including the interface with other areas of mathematics including combinatorics, number theory and partial differential equations. The spheres of application include statistical mechanics, wave propagation, polymers, genetics, signal processing and imaging, networks, statistical learning and mathematical finance. During the past four years a number of important advances in these areas were made by members of the Laboratory which has been remarkably productive with over 300 articles and 40 books. Senior members of the Laboratory are at the highest level world-wide in probability and mathematical statistics and are responsible for fundamental developments that have had a profound impact on the development of these subjects. Among the younger members there is truly impressive talent. Ph.D. students in the Laboratory benefit from the exciting intellectual environment and the opportunity to work with some of the leading researchers in their fields. Over the years the Laboratory has produced many of the leading researchers in these fields at the international level including W. Werner who received the Fields Medal in 2006. Members of the Laboratory also play a key role in the highly successful Masters programs of Paris 6 and Paris 7 with a total enrolment of around 300 students. These programs provide highly trained specialists for industry and financial institutions in Europe. Members of the Laboratory serve on editorial boards of the major periodicals and are active at the national, European and international levels in the organization of conferences, workshops and summer schools. The remarkable intensity of scientific activity is demonstrated by the large number of active seminars including Séminaire de Probabilités, Séminaire de Théorie Ergodique, Séminaire de Probabilités et Physique, Groupe de Travail Biologie, Probabilités et Statistiques, Groupe de travail Probabilités Numériques et Finance, Groupe de travail Processus Stochastiques, Matrices Aléatoires, Groupe de Travail Statistique, Groupe de Travail Aspects Fractals, Groupe de Travail des Thésards, participation in Séminaire Bachelier and Séminaire Parisien de Statistiques. Members are also very active in Jeunes probabilistes et statisticiens, journées de probabilités, and École d'été de Saint Flour.

The LPMA is a remarkable success and plays a leading role in theoretical and applied probability, stochastic analysis, statistics and mathematical finance not only within France but also at the international level.

4 • Specific appreciation team by team and/or project by project

- **Ergodic theory and Dynamical Systems**
 - This team lists 11 permanent members. However one has recently been appointed at another university and one member is on leave on a fellowship.
 - The main research directions include abstract ergodic theory and dynamical systems.
 - During the past four years members of the team have made important contributions to Lyapunov exponents, KAM theoretical methods, diffeomorphisms of the sphere, ergodic properties of the geodesic flow and the horospherical foliation on $CAT(-1)$ -spaces, random walks in random environment, entropy, spectral theory and combinatorial constructions in ergodic theory, entropy for absolutely continuous processes, quasi-periodic Schrodinger operators.
 - There is an active ergodic theory seminar, and the team is also involved in the seminar on stochastic processes and random matrices. It has an active visitor program. The team offers two graduate courses but at present has only one Ph.D. student.
 - This team has produced work of exceptional quality in ergodic theory and dynamical systems and has published in the highest level journals. However, in view of recent changes and the low number of graduate students some attention to the vitality of this team is needed.



- **Stochastic Models**

- This team has 17 members and has produced 6 Ph.D. theses and co-supervised 2 other Ph.D. theses and 2 habilitations during the past 4 years. There are currently 8 Ph.D. students and one post-doc.
- This team has a broad range of research activities including relations with statistical mechanics, queuing theory, network theory, advances in the theory of polymers, random media, spin glass, random walks and branching random walks in random environment, wave propagation in random media, applications in imaging, particle systems, interacting systems out of equilibrium, random walk with interactions application to population dynamics and ecology, stochastic partial differential equations (SPDE) and Markovian models for large communications networks.
- During the past four years members of this group have contributed important advances in a number of directions including wave propagation in random media (time reversal refocusing for wave in random media with important applications to physics and engineering), SPDE, combustion fronts, models for directed polymers, delocalization vs localization, polymers with bulk disorder, local behavior of disordered spin systems and random energy models.
- This is an impressive team both for the exceptional quality of its work and its scientific breadth. Members of the team have made fundamental and far-reaching contributions to stochastic models most notably for basic phenomena in the physical sciences. The team has exceptionally talented younger members and two members. have recently been awarded prizes in recognition of their achievements.

- **Brownian Motion and Stochastic Calculus**

- This team has 16 members. During the past four years it produced 15 Ph.D. theses and 1 habilitation. There are currently 16 Ph.D. students.
- This team has a broad range of research directions including random matrices and number theory, free probability, Lévy processes, models in math finance, local time, squares of Bessel processes, Dynkin's isomorphism theorem, fractional Brownian motion and SDE, fragmentation and coagulation processes, random walk in random media, Malliavin calculus and Skorohod integrals, duality and optimal control, stochastic models in neurophysiology, SPDE and random interface models.
- During the past four years members of this team have made important contributions to numerous areas including random matrices and their role in analytic number theory, fragmentation and coagulation processes, coalescent processes, random trees, random walk in random environment, branching random walk, stochastic dynamics of Brownian excursions and stochastic partial differential equations with reflection.
- This team has a long history of international leadership in stochastic processes and stochastic analysis and has produced work which has had a profound impact in the development of these subjects. It also has an exceptional record in producing outstanding Ph.D.'s.

- **Statistics**

- This team has 18 members. In the past four years it produced 10 Ph.D. theses and 4 habilitations and currently 9 Ph.D. students. This is a net increase of 3 new members. 2004-2007.
- The research directions of this team include nonparametric and semi-parametric methods, statistical learning, inverse problems, coding and information theory, statistical biology, quantum statistics and empirical processes.
- During the past four years members of the team have made important progress in numerous directions including maxisets approaches, wavelet methods for inverse problems, aggregation with applications to classification problems, density estimation, sparsity, model selection, large dimensional data, inference for stochastic processes, applications to computerized tomography and Radon transforms.
- The team has begun developing industrial statistics and biostatistics.
- This is an exceptional team with senior members who are at the very top world-wide in mathematical statistics and are responsible for fundamental developments in asymptotic statistics, asymptotic minimax, statistical learning and wavelet methods in statistics. Among the younger



members there is truly impressive talent. Several members have received prizes and other distinctions.

- **Numerical Probability and Mathematical Finance**

- This team was created in 2001. There are 10 members listed in the “Contrat” including one on leave and one retired. There are currently 11 Ph.D. students and one post-doc.
- The main directions of research are numerical probability and modelling in mathematical finance, optimization in finance, portfolio management, risk hedging, optimal vector and functional quantization, stochastic approximation and learning.
- During the past four years progress has been made in a number of directions including numerical approximation of SPDE involving functional quantification and discretizations schemes, convergence of stochastic algorithms, functional quantization for Gaussian processes, convergence of Kohonen algorithm, pricing and hedging in American options, the calibration of financial models driven by Lévy processes, and applications to modelling portfolio management strategies, energy markets and market liquidity.
- The team has an active Working Group in Probabilités numériques et finance and plays an active role in the organizing committee of the Séminaire Bachelier. It also holds a number of grants and industrial contracts and is a member of the European network AMAMEF.
- Aspects of mathematical finance related to Brownian Motion and Stochastic Calculus remain with that team. Together these two teams cover the major directions of research in mathematical finance and provide the expertise for the masters program in mathematical finance. This is one of the leading programs of its type in Europe and is highly integrated into the financial community in France.
- This team has produced excellent work in numerical probability and plays a central role in mathematical finance in France. However it has experienced a number of membership changes: two members have left, one retired, one is on leave and two new members have recently arrived. This situation is mainly due to the challenge faced by university groups worldwide who have difficulty in hiring and retaining permanent members in mathematical finance because the universities cannot compete with salaries offered by companies. In spite of these challenges the environment of LPMA provides stability which gives good reason to be optimistic about the future development of this team.

5 • Appreciation of resources and of the life of the research unit

- **Management**

The current Director and Executive Board have done an excellent job in creating a harmonious and vibrant scientific environment. There is a position on the Board for a representative of the Ph.D. students but is apparently vacant at the moment. The Director and administrative staff have worked to ensure that the laboratory functions well in spite of the complexities of working with two university systems and CNRS. The exception is the computing facilities and IT support which is inadequate for reasons to be outlined below. There are some aspects of the management that could be improved - these are listed in the appropriate section below.

- **Members**

- The number of members has remained stable over the past four years. There has been a net loss of CNRS positions but this has been compensated by University Paris 6 recruitments and an increase in the number of University Paris 7 recruitments.
- Departures from CNRS positions due to habilitation and promotion to positions at other universities indicates both the quality of the CNRS recruitments and the ideal conditions in LPMA for habilitation and success for appointment at other universities with promotion. However the lack of predictability in the number of CNRS positions creates problems in longer range planning.



- There has also been difficulty in hiring in math finance since much higher salaries are offered in the financial organizations.

Graduate Students

LPMA belongs to l'Ecole Doctorale des sciences mathématiques de Paris Centre. In the subcommittee meeting with the Ph.D. students they emphasized that they have excellent relationships with their research directors whom they meet on a regular basis. They also confirmed that essentially all students have a grant. They expressed appreciation of the rich scientific environment of the laboratory with many seminars and working groups. They note that the position for a student representative on the Board is currently vacant. They emphasized the importance of the LPMA Library and find the website very useful. There is a Ph.D. student Working Group and they are provided funds to invite speakers. Support is available to go to conferences in France. However in questioning the students present, we were surprised by their lack of knowledge of summer schools such as Saint Flour and conferences in France and internationally as well as information on possibilities for their future careers. The students expressed considerable dissatisfaction with the available office space, computing facilities and IT support. There are 4 offices for 51 students and we were told that some students have to "share seats". The subcommittee visited a student office. There is one computer for 9-10 students, the two universities have different networks, the local net does not work, and there are many crashes.

We note that there were 48 publications by doctoral students during past four years which is a strong indication of the high quality and vitality of the Ph.D. program.

Members of the Laboratory are involved in a number of masters programs (2 Master M2 programs Paris 6,7), Master Mathématiques et applications: spécialité ingénierie mathématiques (Paris 6), Master Professionel ISIFAR: ingénierie et informatique de la Finance, de l'Assurance et du Risque (Paris 7) and Master (IFMA) Paris 6) with a total enrollment of about 300 students. We understand that essentially all graduates of the masters programs get jobs in industry or financial institutions.

Laboratory Staff

The staff of LPMA includes 3 administrative members, 0.5 computer engineer and one library technician and have the responsibility for 72 permanent members, 50 Ph.D. students, 5 CIFRE contracts, 3 ATER, 2 post-docs and about 40 visitors each year. There has been a loss of one position (CNRS) due to retirement and not replaced. The administrative staff is responsible for all administrative matters of LPMA and appears to be functioning very well. They are responsible for personnel matters, financial management, student matters, arrangements for visiting researchers, contracts, relations with various agencies and service providers, relations with international partners, data bases, circulation of information. This is a complex operation due to the different reporting requirements and procedures of the two universities and CNRS as well as the constantly changing reporting procedures and other demands on the staff.

IT Staff

There is currently a 0.5 position for IT staff. The individual in this position was hired to provide support for the scientific activity such as simulations in climate modelling and numerical simulation in mathematical finance. However he is completely over-worked in handling the routine support for the administrative staff, scientific members, graduate students and visitors.

This is completely inadequate with the increasing needs from interdisciplinary activities, mathematical finance, industrial partnerships. This constitutes a serious problem for the laboratory. This problem should be addressed by an external audit of IT support at the level of the Federation. This should consider the efficient operation of routine aspects such as email, webpages, latex, etc but also the needs of groups within LPMA that require the computational infrastructure to develop simulations - e.g. climate modelling, numerical simulation in math finance, numerical solution of SPDE, etc.



Communications

The Lab has an excellent website that contains information about seminars, working groups, colloquia, list of theses and access to preprints. The Ph.D. students send out information on the weekly Ph.D. Student Working Group by email and this is also available on the website. There also appears to be excellent communications among the teams.

6 • Recommendations and advice

– Strong points :

- Highest international scientific level in probability and statistics.
- Success of integrating the probability group of Paris 6 and the statistics group of Paris 7.
- Wide mathematical and scientific breadth with interfaces to pure mathematics, physics, mathematical finance and applications in a range of other fields such as biology, signal processing and imaging.
- Ph.D. program that produces probabilists and statisticians at the highest level.
- Successful Masters in math finance.

– What needs to be improved :

In order to build on the current strengths and to ensure the future success of the laboratory, the following points should be given consideration.

- Develop a longer term vision and initiatives to ensure that laboratory can build on its current success and take advantage of emerging scientific developments and at the same time to formulate a rationale for the replacement of positions lost by retirement and other departures. This should include a coherent hiring policy at the level of the Laboratory consistent with the needs of the two universities but also with a vision to the future as well as to achieve the expressed ambitions to increase activity in certain directions, for example, applications in the biological sciences and computer science.
- Consideration should be given to the situation of the ergodic theory and dynamical systems team in the light of the recent departure of one member and a second on leave as well as the low number of Ph.D. students.
- To provide encouragement and help for members who are not active or minimally active.
- To increase communications with graduate students concerning information on external conferences and summer schools and information and advice on their future careers. Also first year Ph.D. students could be given more help in integrating into the program.
- In addition to the existing relations with LJLL and IMJ increased interaction with LSTA is desirable. Interaction between members of LPMA and LSTA takes place among individual members but more systematic cooperation could have benefits to both labs. The statistics team of LPMA is beginning to develop projects in industrial statistics and has expressed the ambition to develop biostatistics. LSTA has an well-established program of industrial collaboration and has expressed ambitions to develop medical statistics. Cooperation between the labs in these areas could be useful. LPMA expertise in numerical probability, risk modelling, imaging, modelling of communications networks would complement the range of applied statistics in LSTA. On the other hand the emphasis on applications in LSTA would complement the more theoretical orientation of the LPMA statistics group.

– Recommendations :

The subcommittee has the following recommendations. Recommendations 1-2 are primarily addressed to the two universities and CNRS, recommendation 3 is also addressed to the Federation de Recherche en mathematiques de Paris-Centre and the remaining recommendations 4-5 are addressed to LPMA.



1. LPMA is an important center of excellence both in France and internationally. It is of vital importance to maintain the strength in the number of permanent members as future retirements and other departures occur. It is also essential to provide LPMA with sufficient square meters for graduate students and other activities of the Laboratory.
2. The bringing together of the statisticians of Paris 7 and probabilists of Paris 6 in 1998 has been enormously successful and created a unique environment. Everything possible should be done to maintain the integrity of LPMA in the post-Chevaleret era.
3. The current IT support staff is totally inadequate if LPMA is to achieve its potential in areas requiring scientific computing such as climate modelling, imaging and financial mathematics. A solution to this problem including an external audit of the IT resources and support should be given high priority.
4. The management of the laboratory should consider ways to address the items listed under "Points to Improve".
5. Since both universities have indicated flexibility and the willingness to accommodate the needs of the labs, the Laboratory should be pro-active in formulating their needs, priorities and proposals for how to locate and structure LPMA in the post-Chevaleret era.

7 • Overall report on mathematics at Chevaleret

The IMJ and the other laboratories at Chevaleret constitute probably the largest collection of mathematicians working in the same location anywhere in the world. The research interests cover the full range of pure and applied mathematics, including statistics and scientific computation. The overall research quality is at the highest international level. With world-famous researchers in many areas, and great strength in depth, Chevaleret offers remarkable opportunities for all who work there, and especially for the young mathematicians it educates and attracts.

An important factor in the success of this cooperation between the mathematicians of Paris 6 and 7 is the strong support of the two parent universities. The cooperation has led successively to the creation of the IMJ, the strengthening of the various laboratories, the founding of the Federation, and most recently to the establishment of the Foundation.

This very successful community of mathematicians has generally a stimulating and supportive atmosphere, in which mathematical research flourishes. However, there are some substantial structural issues which need to be addressed with care and determination. The committee believes that the most important of these are :

1. Management of the move from Chevaleret

Current estimates are that Paris 6 Mathematics will return to the Jussieu campus in 2009 or 2010, while Paris 7 Mathematics will move to Tolbiac in 2012. Despite the uncertainties in these dates, the planning for the future location and functioning of IMJ and the laboratories should not be allowed to drift, so that morale is damaged through anxiety about the future. The committee observed some reluctance to address these issues. Of course there are many problems to resolve regarding both research and teaching, and it will not be easy to find solutions that retain the advantages of the Paris 6/7 cooperation and allow it to flourish in the future. However, the committee was very encouraged to hear from the two university Presidents of their belief that these solutions are best found by the mathematicians involved themselves, and of their willingness to consider radical measures to implement them, including exchanges of office locations, teaching and posts.

2. Administration and IT

The committee heard from many administrators their concerns that they were seriously understaffed. This was reinforced by the opinions of many mathematicians at Chevaleret, who themselves carry out routine tasks that would in other major mathematics departments be done by administrative staff. It is undoubtedly true both that the number of administrative support staff is low as regards international comparisons, and that the administrative load in mathematics has increased markedly in recent years due to the increased importance of obtaining research grant



income. Nevertheless the committee believes that the first issue to be addressed is the ineffective management of the existing administrative resources, which should be reorganized so that certain key tasks are allocated to individuals, rather than these tasks being just one part of the remit of several different individuals. The tutelles should consider how best to ensure that effective management is put in place. It is only after an overall assessment and reorganization of the existing resources that the shortfall in administrative posts can be properly estimated. Such a reorganization should be stable as regards the post-Chevaleret configuration.

A similar situation exists as regards the computer (IT) provision, which is somewhat chaotic, and obviously underresourced. We recommend that there should be an external audit of the IT provision, which will advise on how best to solve the immediate problems and organize the move away from Chevaleret.

More mathematicians need to be involved in the human resources issues. This in turn requires that the tutelles recognize the importance of this increased involvement by giving teaching relief to those who contribute to this process of improving the infrastructure for the benefit of all.

3. The Federation

The Federation can and should play a key role in helping to organize the administrative and IT problems. The committee is concerned that there seems to be some confusion between the functions of the Federation and the Foundation, functions which should be very clearly separated. In particular it feels that the Federation and Foundation should be led by different people.

4. The nurturing of young faculty

The committee was troubled by the high proportion of faculty (especially in IMJ) who are minimally research active. The proportion of such younger faculty is particularly disturbing, and indicates a failure to provide the necessary encouragement, advice and mentoring needed to ensure that talented young mathematicians retain their confidence and desire to remain productive. The directors of the relevant laboratories should put in place mechanisms to provide such support.

5. Leadership and representation

The tutelles should ensure that there is a transparent and open procedure, which is respected, for the appointment of Directors of laboratories. This should include the requirements that (i) the person or persons leading the process should have no conflict of interest (in particular if a current Director has the possibility of having their appointment renewed, then they should not be involved in the process of choosing a successor). (ii) all members of the laboratory concerned should have the opportunity to make their views known confidentially.

The committee wishes to make it clear that they did not receive any expressions of discontent about recent appointments, but there was both unease about the process and an ignorance among some senior faculty about how it worked.