

Improvement measures in response to Research Evaluation Mathematics 2009-2014

October 2016

Compliments

Before presenting the action plan in response to the research evaluation, we give a summary of the positive feedback the Institute received from the review committee in their final report.

The Mathematical Institute received an excellent rating from the committee at the Research Evaluation Mathematics 2009-2014:

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|----------------------|---------------|
| Research quality | Excellent (1) |
| Relevance to society | Excellent (1) |
| Viability | Excellent (1) |

Some quotes from the report¹:

Organization, leadership, strategy and targets of the research Institute (page 75-76)

The committee was left with a very positive impression after the interview with the management of MI during the site visit. A clear and convincing strategy was presented on how to move forward to improve the future of the institute. The institute was restructured after a number of staff members left (either to other universities or retirement), the two research programs were introduced and a total of four new professors as well as a number of more junior staff members were appointed. In 2016 another two tenure track positions will be filled that are especially dedicated to female researchers.

Research Quality (page 77)

The quality of the research that is done in the FM research program has a very long tradition and has always been world leading. In addition, the excellent tradition in high quality research led to impressive hiring at various levels of seniority. The excellent quality of the research is also displayed by a number of high quality research monographs. Also, some prestigious prizes were awarded in the evaluation period, like a Spinoza award, Descartes, Huygens and Lichnerowicz awards.

The committee would specifically like to mention the very small, but very good and internationally well recognized group in History of Mathematics. This topic has a strong tradition in Utrecht and is greatly valued by the committee. It hopes that this topic will keep its position in MI.

Relevance to society (page 78)

The Utrecht Fundamental Mathematics program is actively involved in a number of impressive outreach activities. These include the Olympiad high school contest and publications aimed at high school teachers in mathematics. Also the History of Mathematics group deserves a very positive notification in the assessment of this criterion. It plays an important role in making the society aware of the long cultural traditions of mathematics and the contributions from the Islamic world.

The research areas that the MM program treats are more closely connected to applications. The program played the key mathematical role in a biological project to understand how to reduce spread of bacteria. It also analyzed a simple model to understand the effect shifting climate might have on ecology. Another example of societal relevance is the software tool MATCONT, which is used by many universities, also in other disciplines. The development of open source software is also very

¹ Research Evaluation Mathematics 2009-2014, QANU 2016.

impressive. With respect to collaboration with other disciplines, the Utrecht Centre for Infection Dynamics (UCID) is an excellent example, since the mathematics program was actively involved in setting up and operating this centre.

There is also a fair amount of contract research through master students with an internship in industry. The committee would like to mention the NWO program on Mathematics of Planet Earth, which could be very interesting for Utrecht. Concerning outreach, the committee is impressed by the excellent organization of the research program.

Viability (page 79)

FM is considered a young, excellent program by the committee. Not only at the level of full professors this is high quality, also at the level below (assistant and associate professors) there are some very talented researchers. To crown it all, the world-leading researcher who was lost to another university at the beginning of the evaluation period will return as a university professor. Not only does this rather unique position emphasize the excellence of the individual, but it also displays the support of the Board of the University for mathematics.

Conclusion (page 79)

The institute should continuously balance the coherence of the two research programs on the one hand and hiring of the most talented researchers regardless of their expertise on the other hand. If they manage to do so, all signs are directed towards an excellent future.

Recommendations

The evaluation committee concluded her evaluation with the following recommendations:

- A. Contract research is now mainly done through master students with an internship in industry. The societal relevance and the external funding would even grow more if this could be combined with research on the PhD level;
- B. MI is recommended to pursue the Top-sector opportunities;
- C. MI is recommended to maintain the selection and monitoring procedures for PhD students to ensure quality, and completion of the thesis in a reasonable time;
- D. The MM program is recommended to increase collaborations both within the MM program and with other departments and research institutes;
- E. MI is recommended to continue to support the small group on the history of mathematics, with the goal to secure its future beyond the current decade.

Attached to this document we present an action plan with concrete measures to benefit from the recommendations of the research evaluation committee.

Minor comments and suggestions by the research evaluation committee

In addition to the formal recommendations that are addressed in the action plan, the committee also gave some minor suggestions in the main text of the evaluation.

On page 76: the committee does remark that the institute needs to keep in mind that in fulfilling its goals with the current strategy, there is the risk of imbalance in the institute. ... Letting one outgrow the other will not benefit the institute. It is the strategy of the Institute to keep the programs FM and MM at roughly the same size despite fluctuating performance in the ability to attract external funding. Both for education and research it is essential that such a balance will be maintained.

On page 76: The committee recommends to the institute management to make sure the strategy (hiring strategy: shift towards an increased focus on quality rather than a specific expertise, but still aiming at mass and focus in certain areas) is known and maintained at all levels of the institute. The Fact Sheet of the Mathematical Institute on the intranet will be updated and the management will continue to discuss this strategy at staff meetings.

On page 76: *The committee recommends providing all tenure trackers with a PhD student to supervise within his/her own area of expertise.* In general, it is very difficult to allocate budget for PhD students, but it is the strategy of the Mathematical Institute to support tenure trackers as much as can.

On page 77: *The committee recommends that the Faculty Board helps MI to be preferred partner in teaching mathematics in the other departments.* It is the strategy of the Mathematical Institute to do as much teaching for other departments as possible given the (financial) constraints, and we consider it part of our duties to deliver the highest quality in teaching mathematics in other departments.

On page 78: *Although improvements are already visible there is additional need for funding for PhD students and postdocs.* The Board of the Mathematical Institute and the Research Support Office of the Faculty of Science have bimonthly meetings in which we discuss concrete opportunities for research funding for faculty of the Institute. Each meetings ends with a list of actions, and identified potential researchers are approached personally by a member of the Board of the Mathematical Institute.

On page 78: *One minor remark by the committee is to pay attention to connecting the areas of the staff members (MM), which vary strongly and do not automatically lead to a coherent group.* This point is part of recommendation D and addressed below.

On page 79: *The committee would like to mention the NWO program on Mathematics of Planet Earth, which could be very interesting for Utrecht.* This point was misunderstood by the committee. The PI of this program is a Professor at the Mathematical Institute.

On page 79: *The committee supports the plans for increasing collaborations with other departments and research centres. One threat that was mentioned is the fact that research funding is changing towards large projects rather than individual grants. The committee confirms that this is a challenge for all universities with a mathematical department. It furthermore considers Utrecht to be very well equipped to deal with this issue. Mathematical modelling requires an integrative approach involving expertise in many branches of mathematics. This is difficult to maintain, but with the excellent researchers and with a continuously fine-tuning of the hiring policy, this should not pose a real problem.* This is an important point that is addressed in our action regarding recommendation D and by the actions discussed above.

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List of abbreviations

FM = Fundamental Mathematics
MI = Mathematical Institute
MM = Mathematical Modelling

Attached: Action plan.

Improvement measures in response to Research Evaluation Mathematics 2009-2014

| Recommendation | Improvement measures | Planning |
|---|---|---|
| <p>A. Contract research is now mainly done through master students with an internship in industry. The societal relevance and the external funding would even grow more if this could be combined with research on PhD level.</p> <p>B. MI is recommended to pursue the TOP sector opportunities.</p> | <p>Goal</p> <ul style="list-style-type: none"> • Increase diversity in external funding of research projects • Improve societal relevance of research already at PhD level • Extend match making facilities <p>Approach</p> <ol style="list-style-type: none"> 1. Discuss desirability and new opportunities for internships in industry for our PhD students within the department. 2. Invite our alumni (students, PhD and postdocs), who work outside university, to build a community that can be used to facilitate the creation of internships in industry for our current master and PhD students. 3. Facilitate current and new PhD students who like to do an internship in industry by making this part of their Training & Supervising Agreement. <p>Securance</p> <ul style="list-style-type: none"> • PhD Program in Mathematical Sciences. | <p>2016 - 2017</p> <p>2017 - ...</p> <p>2017 - ...</p> |
| | <p>Goal</p> <ul style="list-style-type: none"> • Cooperation and multidisciplinary collaboration with industry and government institutions • Pursue TOP sector opportunities <p>Approach</p> <ol style="list-style-type: none"> 1. Use the network provided by our staff members in the department that have a joint appointment at the UU with an external partner to build hubs that can enhance multidisciplinary collaboration. 2. Facilitate (senior) staff members with contacts in industry to set up multidisciplinary collaboration. For example, by allowing them to have a sabbatical in industry. 3. Increase the number of joint PhD and postdoc positions UU – external partner (industry). 4. Install an informal advisory board in varying composition (varying from alumni, captains of industry, colleagues from mathematics (inter)nationally, and colleagues from other departments at the UU) that can advise the MI regarding societal and strategic challenges. <p>Securance</p> <ul style="list-style-type: none"> • Advisory board. | <p>2017 - ...</p> <p>2017 - ...</p> <p>2017 - ...</p> <p>2017 - ...</p> |
| <p>C. MI is recommended to maintain the selection and monitoring procedures for PhD students to ensure quality, and completion of the thesis in a reasonable time.</p> | <p>Goal</p> <ul style="list-style-type: none"> • PhD students finish their PhD research within the given period of 4 years. • The research of our PhD students is of excellent quality. <p>Approach</p> <ol style="list-style-type: none"> 1. Improve the relevance and quality of our PhD Program by regular evaluation by the PhD students, and by | <p>2016 - ...</p> |

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| | <p>collaborating with the Graduate School of Natural Sciences to provide transferable skills.</p> <ol style="list-style-type: none"> 2. Improve the quality of supervision by providing dedicated courses for supervisors. 3. Increase the role of the TSA during the project by yearly updating the TSA and by incorporating dedicated meetings discussing the career opportunities of the PhD (separate from the yearly appraisal meetings). <p>Securance</p> <ul style="list-style-type: none"> • Use P-Scan for PhD students to give during the project direct feedback to PhD students and supervisors. | <p>2016-2017 2016 - ...</p> |
| <p>D. The MM program is recommended to increase collaborations both within the MM program and with other departments and research institutes.</p> | <p>Goal</p> <ul style="list-style-type: none"> • Increase collaborations within the MM program, and with other departments and research institutes. <p>Approach</p> <ol style="list-style-type: none"> 1. Modify the organizational structure of MM to facilitate opportunities for interaction within MM. 2. Use the approach outlined under B to increase the interaction of MM with other departments and research institutes. 3. Facilitate special temporary appointment of external experts. For example, extraordinary professors such as CAN professor, Donders professorship, RIVM professorship, or double appointments with other departments. <p>Securance</p> <ul style="list-style-type: none"> • Department policies and Advisory board. | <p>2017 - ... 2016 - ...</p> |
| <p>E. MI is recommended to continue to support the small group on the history of mathematics, with the goal to secure its future beyond the current decade.</p> | <p>Goal</p> <ul style="list-style-type: none"> • Secure future of research group on the history of mathematics in Utrecht, within the Institute of Mathematics. <p>Approach</p> <ol style="list-style-type: none"> 1. Be flexible in the type and level of appointment to attract the appropriate talent. 2. Cooperate with external partners to co-finance a tenure track position starting already before the retirement of the current professor to secure the future of the group, to have a smooth transition, and to attract exceptional talent in this area. <p>Securance</p> <ul style="list-style-type: none"> • Strategic plan of the department. | <p>September 2016 2017 - ...</p> |