The Research Council of Norway

Evaluation of Mathematics, ICT and Technology 2023-2024

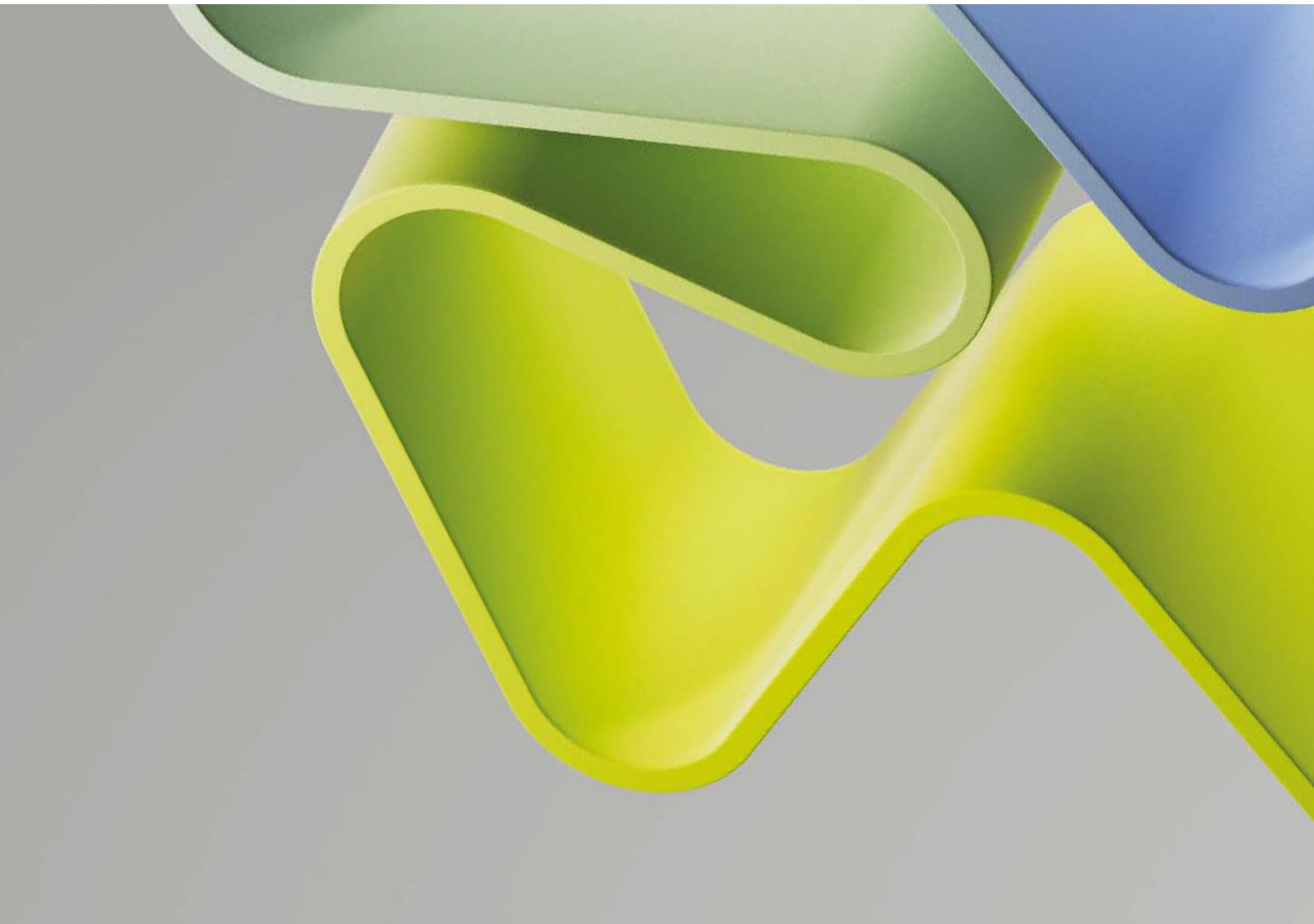
Evaluation Report for Administrative Unit

Administrative Unit: **Department of Mathematics**

Institution: **University of Oslo (UiO)**

Evaluation Committee Higher Education Institutions 1

December 2024



Contents

Statement from Evaluation Committee Higher Education Institutions 1 1
Description of the Administrative Unit 2
Overall Assessment 3
Recommendations 4
1. Strategy, Resources, and Organisation of Research 4
1.1 Research Strategy 5
1.2 Organisation of Research 5
1.3 Research Funding 6
1.4 Research Infrastructures 6
1.5 National and international collaboration 6
1.6 Research staff 7
1.7 Open Science 7
2. Research production, quality and integrity 7
2.1 Research quality and integrity 8
3. Diversity and equality 10
4. Relevance to institutional and sectorial purposes 10
5. Relevance to society 10
5.1 Impact cases 11
Methods and limitations 12
List of administrative unit's research groups 13
Terms of Reference (ToR) for the administrative unit 14
Appendices 16

Statement from Evaluation Committee Higher Education Institutions 1

The members of this Evaluation Committee have evaluated the following administrative units at the higher education institutions within Mathematics, ICT and Technology 2023-2024 and has submitted a report for each administrative unit:

- Department of Informatics, University of Bergen (UiB)
- Department of Mathematics, University of Bergen (UiB)
- Department of Informatics, University of Oslo (UiO)
- Department of Mathematics, University of Oslo (UiO)
- Department of Computer Science (IFI), UiT The Arctic University of Norway
- Department for Mathematics and Statistics (IMS), UiT The Arctic University of Norway
- Department of Mathematical Sciences (IMF), Norwegian University of Science and Technology (NTNU)
- Department of Computer Science (IDI), Norwegian University of Science and Technology (NTNU)
- Department of Mathematics and Physics (IMF), University of Stavanger (UiS)
- Faculty of Engineering and Science (TekReal), University of Agder (UiA)
- Department of Electrical Engineering and Computer Science (IDE), University of Stavanger (UiS)

The conclusions and recommendations in this report are based on information from the administrative units (self-assessment), digital meetings with representatives from the administrative units, bibliometric analysis and personnel statistics from the Nordic Institute for Studies of Innovation, Research, and Education (NIFU) and Statistics Norway (SSB), and selected data from the National survey for academic staff in Norwegian higher education and the National student survey (NOKUT). The digital interviews took place in the autumn 2024.

The members of the Evaluation Committee are in collective agreement with the assessments, conclusions and recommendations presented in this report. None of the committee members has declared any conflict of interest.

The Evaluation Committee consisted of the following members:

Professor Rebecka Jörnsten (Chair)
Univ. Gothenborg/Chalmers

Professor Matthias Schütt
Leibniz Universität Hannover

Professor Jan Hesthaven
École Polytechnique Fédérale de Lausanne

Professor Mads Nielsen
University of Copenhagen

Professor Tiziana Margaria
University of Limerick

Dr. Joanna Staneva
Helmholtz Zentrum Hereon

Professor Björn Engquist,
University of Texas at Austin

Professor Plamen Angelov
Lancaster University

Description of the Administrative Unit

The Department of Mathematics is organized into six research sections, each consisting of 1-3 research groups. These sections cover a broad range of areas including Mechanics, Statistics and Data Science, Risk and Stochastics, Differential Equations and Computational Mathematics, Algebra, Geometry and Topology, and Several Complex Variables, Logic, and Operator Algebras. Section leaders develop research plans and oversee PhD/postdoc applications, while an educational committee coordinates teaching responsibilities. A research consultant aids in preparing applications and identifying funding opportunities, and researcher training is managed within sections, with events like PhD Welcome Day organised by study administration.

The department has a scientific staff of approximately 116 members, including 28 professors and 16 associate professors, with many associate professors holding foreign PhDs. Women represent 24% of the scientific staff, with an increase in female representation among permanent staff but a decline in female PhD candidates. The number of doctoral research fellows and postdoctoral fellows is also significant, with 41 and 24 individuals, respectively.

The research is organised in the following research groups:

- Mechanics (MEK) – Section 1
- Statistics and Data Science - Section 2
- Risk and Stochastics – RaS – Section 3
- Partial differential equations and computational mathematics – section 4
- Algebra, Geometry and Topology – Section 5
- Several Complex Variables, Logic and Operator algebras – section 6

The department is committed to preserving its national leadership in mathematical research while enhancing its impact in applied research and interdisciplinary collaborations, particularly in fields such as energy, climate, and data science. To achieve this, the strategy emphasizes generating high-quality research applications for diverse funding sources, fostering a well-rounded representation in mathematical sciences, and ensuring high educational standards through attractive study programs and dedicated faculty involvement. Future objectives include bolstering the department's international visibility in mathematics, improving the recruitment of ambitious younger staff, and promoting cross-disciplinary collaborations. Additionally, the department aims to increase student engagement in research activities and leverage opportunities in artificial intelligence and external funding avenues.

The unit’s research in mathematical sciences is characterized by extensive international collaboration, with members typically engaging with researchers from various universities and institutions worldwide, particularly in mathematics. In contrast, statistics and data science projects often align with larger programs involving multiple national and international partners, while mechanics research collaborates with medicine and industry, especially in areas like biomechanics and hydrodynamics. The department has successfully fostered local collaborations, contributing to initiatives such as the dScience center and the CoE Integreat (focusing on AI and machine learning).

Overall Assessment

The Department of Mathematics at the University of Oslo, henceforth referred to as the administrative unit, is a high performing unit with a strong research track record and international standing. External funding levels are high (currently around 40%), and the unit has been successful in obtaining center-of-excellence awards as well as ERC funds. The research education program is excellent, with around 40% of graduates continuing in academia or employed at research institutes. The administrative unit safeguards academic freedom and curiosity-based research through internal funding of PhD students to complement the project-driven, externally funded positions. The administrative unit take a very active role in cross-disciplinary research and collaboration with external stakeholders, as exemplified by the impact cases.

The Evaluation Committee considered the points raised by the unit in their Terms-of-Reference document and have commented on those throughout the report where applicable. In this report, a number of detailed comments and recommendations are provided. Key observations, challenges and opportunities are summarized here.

Strengths

- The administrative unit is an active collaborative partner with municipalities, research institute, industry and government agencies, as demonstrated by the excellent impact cases provided to the evaluation committee.
- The administrative unit is highly successful in obtaining external funding
- The research contributions of the administrative unit places it in the top three among Norwegian Universities.
- The administrative unit balances theory, methodology and applied research.
- The administrative unit makes active strategic decisions to build up research strength in new areas where there is an outside need/potential for growth (e.g., AI/machine learning).

Weaknesses

- The number and intensity of collaborations comes with the risk of decreased visibility/research contribution in field-specific outlets – something that the administrative unit recognizes in the report.
- While most of the research groups are doing very well, the Mechanics and PDE and Computational Mathematics research groups could improve in one or more evaluation dimensions. This will be commented on further in the next section and is also commented on in detail in the research group level reports.
- There is room for improvement through increased collaboration between (and within) the research groups within the administrative unit.
- The administrative unit should develop a long-terms strategic plan that includes a more dynamic resource allocation between research groups, staff composition (PhD students vs hiring to replace vs hiring to renew).
- The administrative unit should evaluate whether resource allocation, such as reduced teaching, leads to increased funding levels. Other tools should also be considered (e.g., scientific advisory boards, strategic network/sabbaticals, industry collaborations).

The Terms of Reference for the administrative unit is attached to the report.

Recommendations

1. The administrative unit and research groups should develop more detailed and specific strategic plans, including long-term recruitment strategies, prioritizations, staff composition and resource allocation between research groups.
2. The evaluation committee recommends that the administrative unit prioritize and incentivise participation in international networks and consortia to increase the odds of being successful at obtaining EU (and other international) grants.
3. The evaluation committee recommends that the administrative unit explores incentives for faculty members to be active participants in other international networks (e.g., panels, research programs, funding agencies) to increase their visibility internationally.
4. The evaluation committee recommends that the administrative unit reviews where collaborations lead to research that is directly impactful or visibility-raising for the faculty members in a more tangible fashion (i.e., in domain-specific top outlets, with high-profile institutes, etc). Be selective/strategic when committing to collaborations.
5. The evaluation committee recommends that the administrative unit diversifies the incentives to apply for international grants, for example through establishing a scientific advisory board, or direct coordination/strategic selection of sabbaticals or other mobility/network opportunities.
6. The Mechanics group should prioritize industry collaborations and collaborations with other groups to try to reverse the trend of decreasing industry funding.
7. The PDE and Computational Mathematics need to broaden their research program, through e.g., increasing collaboration with other groups at the department and university.
8. The Statistics and Data Science group could benefit from a deeper collaboration with the Department of Informatics.
9. The evaluation committee and research group committees have noted that the productivity is unevenly spread in some of the research groups. The evaluation committee recommends that the administrative unit incentivises new collaborations and new research directions within the unit to help researchers stay research active.
10. The unit should try to diversify funding sources through deeper collaboration with industry partners (e.g., industry PhD funding).
11. The evaluation committee recognizes the difficulty in recruiting women to improve gender balance at the unit. The committee recommends that the administrative unit involves external partners (industry, government agencies) to identify job opportunities for significant others.
12. The evaluation committee recommends that the administrative unit continues to involve junior faculty as work package leaders, providing opportunity for career building and supervision experience. However, keep an eye on reporting requirements and administrative burdens for junior faculty.

1. Strategy, Resources, and Organisation of Research

The administrative unit aims to maintain its status as a leading mathematics department in Norway. Central to the administrative unit's long-term objectives is to foster a research environment where basic/free research is encouraged, and where the highest scientific contributions are produced in both theoretical and applied research.

The 6 sections are partly autonomous and are encouraged to develop recruitment plans and funding strategies. The section leaderships coordinate within the administrative unit and

replacement of staff may correspond to a strengthening of another section though the norm is to maintain the sizes of the different groups.

The administrative unit has been very successful at obtaining SFI grants, and the strategy is to continue to foster strong collaborations such that centre applications have a good chance of being funded. The administrative unit also aims to increase its share of EU funding and provide reduced teaching loads for faculty that are preparing EU applications.

The administrative unit has doubled its publication volume during the evaluation period and publishes at 90% in open access venues, aiming to increase its international recognition and profile according to the ToR.

The administrative unit has increased its PhD program and produce around 15PhDs per year. The administrative unit is conducting surveys to track career paths of graduates and estimate based on these that roughly half end up in academic or research positions. The unit recruits internationally and manages to retain recruited staff to a high degree.

1.1 Research Strategy

The strategy is to balance both theoretical and applied research. This seems for the most part to have played out well over the evaluation period, with the research groups producing high quality research in top outlets. The adminstrative is also active in collaborative networks within academia and with external partners.

The leadership structure allows for prioritization between the research groups, and recruitment is discussed at the department level. However, for the most part, the department has chosen to recruit to fill openings within the group in the case of retirements.

The department is a big player at the national and local level with many ongoing collaborations and centre activities.

Recommendations

- The department has identified raising their international profile as an important strategic opportunity. The panel agrees that the department should prioritize and incentivise participation in international networks and consortia to increase the odds of being successful at obtaining EU (and other international) grants.
- The research groups in the department are performing well for the most part. The PDE and computational mathematics group could benefit from increasing collaboration with other groups at the department and university. The group has made recent hires, as well as taken on new roles in education programs at the university that may help to strengthen this group. The mechanics group could benefit from raising their visibility and try to reverse the trend of decreasing industry funding by prioritizing industry collaborations and collaborations with other groups.

1.2 Organisation of Research

The department is well structured with six research groups with partial autonomy in terms of strategic decisions but where the group leadership coordinates at the department level. The groups are large enough that responsibility for supervision of PhD students can be shared with multiple members of staff. The PhD students can be recruited to the department with faculty funds or through external projects. The supervision is often done in teams, and postdocs may also assist in PhD supervision.

The PhD students are frequently recruited from abroad; while the new language policy could be a challenge for some recruits, the department does not think it will be a deterrent and have hitherto noted that PhD students learn the language quite fast.

The department encourages mobility for junior staff financed within the department budget. Participation in sabbatical programs is encouraged for all staff. The department organizes multiple career-path related events for junior staff.

Recommendations

- The department coordinates recruitment at the department level through discussion with the research group leadership. Here, the department has an opportunity to strengthen areas of growth as well as strengthen sections that are “underperforming” - in the sense of funding, sector relevance, strategic development, breadth of applications and collaborations etc (see research group evaluation for specific recommendations). The department could also consider the option of cross-section hirings to foster interactions.
- The department may also want to review the size of the research education program in the different research groups.

1.3 Research Funding

The department has been successful in obtaining research funds for the most part. The statistics and data science group has obtained several large center-of-excellence grants, most recently the Integreat center. The Algebra, Geometry and Topology group has used external funds to increase the PhD program. For the mechanics group, the panel noted a decreasing trend in obtaining industry funds. PDE and computational math is currently the host for a center-of-excellence. The RaS is also well funded. The several complex variables, logic and operator algebra is the host of an ERC grant.

In summary, the department has been very good at attracting external funding which reflects a high quality of research.

Recommendations

- The department has incentives in place for staff to work on applications to EU. The department also encourages collaboration and involvement in consortia to increase funding through centers-of-excellence.
- All research groups could benefit from reviewing opportunities to diversify sources of external funding. In addition, in groups where the productivity may vary within the group, consider strategies to get more faculty members involved in funding applications, perhaps through new collaborations.
- The panel recognizes the difficulty in obtaining RCN projects and can only recommend that the department continues to encourage faculty members to apply and work proactively at the group and department level to quality assess applications before submission.

1.4 Research Infrastructures

The department participates in research infrastructures (e.g., high-performance computing) where needed in line with the research activities. Overall, all research infrastructure needs are met very well. FAIR principles are adopted.

Recommendations

No recommendation from the evaluation committee.

1.5 National and international collaboration

The department is active in national and international collaborations where the wide-spread academic network is used for mobility, network building for junior staff as well as recruitment opportunities.

The department is a particularly “big player” at the national and local level where collaboration with industry, government agencies and hospitals has led to made impactful projects. The department has identified raising the international profile as an ambition.

Research groups in the department actively encourage collaboration and the strategy of the department is to view both theoretical and applied research as meritorious, where faculty members ideally contribute to both areas.

Recommendations

- The department is very active in collaborative research nationally and locally. To increase their visibility internationally there must be enough time allocated for researchers to be active participants in international research networks. Some research groups with potential for increased international collaboration may be “over-stretched” in local/national collaborations. While collaboration should be encouraged in general, it is perhaps recommended to review where collaborations lead to research that is directly impactful or visibility-raising for the faculty members in a more tangible fashion (i.e., in domain-specific top outlets, with high-profile institutes, etc).

1.6 Research staff

The recruitment strategy is handled at the department level where research group leaders discuss the needs and strategic plans for their units. The majority of hires are at the associate professor’s level which automatically leads to a sustainable age distribution as senior professors retire and associate professors are promoted. Gender balance is a problem. While the department has an ambition to even out the gender distribution, it is difficult to recruit female candidates due to two-body problems and competition with other universities. The gender balance is much better at the PhD level.

The department allocates work time in research/teaching 50/50. However, as further incentive to write applications for international grants, staff can be granted reduced teaching during this period. Sabbaticals and other mobility programs are strongly encouraged to participate in. Career-promoting allocation, such as PhD students, is considered. PhDs are usually matched to supervisors but requirements for promotion are taken into account as well. When junior colleagues are part of large centers-of-excellence, they are allocated work-package coordination and PhD supervision within the center.

Recommendations

- The department has a very well-structured system in place for career development at all levels of seniority based on the self-assessment reports and the interview. As mentioned previously, a more pro-active take on resource allocation between research groups might be something that needs to be reviewed for a long-term strategy that promotes excellence in research at the department.

1.7 Open Science

The department is mainly publishing in open access outlets, including preprints, and is currently at 90% OA. No recommendations from the panel.

2. Research production, quality and integrity

The division into the six research groups appears quite established and for the most part functional with department-level coordination in place.

Based on the research group reports, the evaluation committee encourages the department to review if some of the research groups need to consider new strategies in terms of recruitment, resource allocation, organization and incentives to collaborate.

2.1 Research quality and integrity

The department overarching strategy has been to increase productivity at the department and publish in top outlets. This ambition is reflected in increased publication rates and good citation records. The department publishes in both traditional journal outlets as well as in top conference venues in AI/DS. There are policies at UiO in place and faculty support and courses for research ethics and integrity questions. Ultimately, the individual researcher is responsible for his/her own actions.

Research group Algebra, Geometry and Topology - Section 5 overall assessment

This is a very strong group in international comparison. It performs greatly on the research quality side and scores highly with regard to the societal impact.

Strengths:

- outstanding track record in two topical areas of pure mathematics, in particular in terms of publications
- very high international visibility
- group growing and internationalising substantially thanks to big success in acquiring national funding

Weaknesses:

There is room for improvement in:

- acquiring funding on an international level
- collaborations, both within the group, but also with other groups within Norway and internationally, and outside academia
- interdisciplinary activities
- gender balance and diversity

Research group Several Complex Variables, Logic and Operator algebras – section 6 overall assessment

The overall impression is that the organisation dimension and environment are both excellent. The activities of the group are very well organised and supported by prestigious grants. The quality of the publications and the research group's contribution are outstanding, giving to the group a very high national and international visibility. The contribution of the group to societal and cultural development in Norway is very considerable as demonstrated by the activities of the group directed toward quantum computing and machine learning/deep learning.

Strengths:

- The group has publications in top academic journals and monograph series.
- The group is very active at the international level through networks.
- The organisation of research activities, as conferences and special focused research, is excellent.
- The group has received several extended funded projects, including an ERC starting grant, several RCN research grants, and several RCN postdoctoral grants.

- The research training both at the PhD and postdoc level is excellent. The group has ahigh number of PhD students.

Weaknesses:

- The interaction between the different subgroups is not evident.
- The size of the logic subgroup is very small compared with the other subgroups.

Research group Mechanics (MEK) overall assessment

The group enjoys an excellent organisational environment, which seems quite adequate in supporting the production of high-level research. On the other hand, the resources from industry and private sectors have considerably decreased recently. The group produces very good research quality in a wide variety of sectors in fluid mechanics, biomechanics, scientific computing and so on. On the other hand, the production on more theoretical features is almost inexistant, so it cannot be said that the quality is world leading. As for the societal impact dimension, the contribution hardly corresponds to what is expected from such a group, with a limited involvement of social partners in the research process.

Research group Partial differential equations and computational mathematics – section 4 overall assessment

Based on the self-assessment the group seems to have given up on improving performance. The group is not achieving its benchmarks and does not have a strategy for that. The group is not successful in attracting grants and has very limited collaboration outside the department. There are no societal contributions, i.e., no involvement of societal partners in the research process. The group performs research mostly on nonlinear PDEs but is isolated from applications and collaborations. The quality of the publications is moderate.

Weaknesses:

- Collaboration potential with other groups on PINN, and/or with AI/ML researchers in the department
- Strategic hiring for renewal of research
- Collaborate with research institutes like SIMULA, SINTEF
- Recruit master students for active participation in research projects.
- More ambitions in strategic planning.

Research group Statistics and Data Science - Section 2 overall assessment

Overall, the group is doing very well. The group has breadth of competence as well as expertise in the areas where they propose to advance as evidenced by the research outputs submitted for the evaluation. The group has been able to obtain significant external funding to build up a sizeable PhD programme which will help strengthen the research profile. In terms of organisation, the group is not large and there is a lot of demand for time in collaborative projects, supervision of PhD students in the group and outside. It is important to ensure that the permanent members have sufficient time for research and supervision is important. No significant weaknesses were identified across the dimensions of the evaluation. The group holds a very high international standard and is internationally leading in its research activities.

Research group Risk and Stochastics - RaS overall assessment

The group is very active in research, teaching and setting up collaborations. They have addressed previous comments on lack of cohesion. For the coming years, the group’s

strategy seems to fit the given benchmarks. However, the panel wonders what the long-term plan is. The numbers of PhDs and master's degrees are impressive. The group has an active role in teaching, setting up new programs as well as being active in teacher's education. The panel finds the amount of external funding attracted very good. They have excellent collaborators in industry and obtained several grants from RCN. However, the EU is lacking as funder. Concerning their output, the group has produced a few outstanding papers presenting innovative methodology with theoretical foundations. However, the individual contributions of the group members to this output are not clear. The group has economic impact beyond the expectation of their research area and group size. This is partly the result of their collaborations. On top of this, the group is active in disseminating their work in various ways

3. Diversity and equality

There are several policy documents in place at the faculty and the department level. There are promotion programs in place to assist in improving gender imbalance. The department is very well aware of the problem and is working actively to try to improve the balance within the department. However, the competition for female candidates is high and there have been several instances where a two-body problem resulted in a female candidate declining the offer for a position. This is not something that UiO can counteract directly, and the university can only assist the partner with connections to recruitment firms etc.

4. Relevance to institutional and sectorial purposes

The department works under the principle of research-based teaching and master students are frequently involved directly in research projects originating at the department as well as in industry projects where the department members are collaborative partners. There are not as many direct projects involving start-ups and spin-offs but there are faculty structures for encouraging and financing student innovation.

The department has worked closely with industry partners, hospitals and government agencies and such collaboration has led to methodological research which form the basis for center-of-excellence applications.

PhD education is funded to 50% through external sources where the department members have formulated the research problems. However, the department is also funding research education with more open calls allowing for PhD education that is more "curiosity based" as well. The department produces a high volume of PhDs where roughly 40% end up pursuing a career in academia either at a university or research institute.

PhDs are encouraged to participate in mobility programs. There are also national programs in place to encourage graduates with international experience to return to Norway.

5. Relevance to society

The department is highly active in collaborative research project with industry partners, other universities in Norway and abroad, hospitals, municipalities and government agencies. The department members produce popular press articles, textbooks and software packages. While some research groups are more active in outreach and research with direct societal relevance than others, at the department level the contribution to society is at a high level. Groups that are not as active could become so by increasing their collaboration within the department and thus contributing new perspectives and expertise to these types of projects.

5.1 Impact cases

As evidenced by the case studies, the department is active in public health research, transportation solutions, impact of industry on the environment, medical applications, and many more.

Comments to impact case 1: BigInsight – Center for research based innovation

BigInsight was an RCN funded center-of-excellence. Department researchers worked closely with industry analyzing data and developing methods for autonomous vessels (shipping industry) and fraud detection (banking).

The methodological challenges that researchers at the department addressed were the analysis of complex and large-scale data which required the development of new models and computational solutions.

The research resulted in many publications in top outlets as well as direct impact in the business models of the collaborative partners. The research also appeared in the popular press.

Comments to impact case 2: Ship-driven mini-tsunamis

This is a perfect example of an impact case on societal relevance and societal involvement. A member of the department was contacted by a journalist investigating the complaints on a shipping line creating erosion of the beach front along the Oslo fjord through the creation of unusually large waves when the ship was passing. The faculty members developed a mathematical model to predict the wave formation by the vessel and obtained citizen-science data to verify the results.

The research resulted in journal publications in excellent outlets, mentions in popular press and news, a hearing with the shipping company and the public, a documentary – and ultimately a change of praxis by the shipping company.

Comments to impact case 3: Sequential Monte-Carlo analysis for Covid-19 analysis

Members of the department worked closely with the Norwegian institute of public health to analyze Covid-19 data during the pandemic to predict disease spread and load on the public health sector.

The research resulted in journal publications as well as joint papers and reports with the NIPH. The department researchers worked very closely with the government agency to provide rapid response analysis.

Comments to impact case 4: The biomechanics of sleep

Members of the department worked closely with the Oslo hospital and the medical school to propose novel mechanistic models of sleep based on imaging data from a large set of patients. The research was published in top outlets and recognized in the popular press.

The biggest impact is through the international research community picking up on the research direction which has led to publications in internationally wide-spread top outlets.

Methods and limitations

Methods

The evaluation is based on documentary evidence and online interviews with the representatives of Administrative Unit.

The documentary inputs to the evaluation were:

- Evaluation Protocol that guided the process
- Terms of Reference
- Administrative Unit's self-assessment report
- Administrative Unit's impact cases
- Administrative Unit's research groups evaluation reports
- Bibliometric data
- Personnel and funding data
- Data from Norwegian student and teacher surveys (only for HEI's)

After the documentary review, the Committee held a meeting and discussed an initial assessment against the assessment criteria and defined questions for the interview with the Administrative Unit. The Committee shared the interview questions with the Administrative Unit at least two weeks before the interview.

Following the documentary review, the Committee interviewed the Administrative Unit in an hour-long virtual meeting to fact-check the Committee's understanding and refine perceptions. The Administrative Unit presented answers to the Committee's questions and addressed other follow-up questions.

After the online interview, the Committee attended the final meeting to review the initial assessment in light of the interview and make any final adjustments.

A one-page summary of the Administrative Unit was developed based on the information from the self-assessment, the research group's evaluation reports, and the interview. The Administrative Unit had the opportunity to fact-check this summary. The Administrative Unit approved the summary and asked for the following changes:

- second paragraph "The department has ….": remove "permanent"
- third paragraph: some sections are without number (Mechanics, sect 1, and Risk and Stochastics, sect. 3). Maybe one should use same order as in initial paragraph (or by section number).
- final sentence: replace "SFF" by "CoE"

The Committee judged the information received through documentary inputs and the interview with the Administrative Unit sufficient to complete the evaluation.

List of administrative unit's research groups

Institution	Administrative Unit	Research Groups
University of Oslo	Department of Mathematics	Algebra, Geometry and Topology - Section 5
		Risk and Stochastics – RaS – Section 3
		Partial differential equations and computational mathematics – section 4
		Several Complex Variables, Logic and Operator algebras – section 6
		Statistics and Data Science - Section 2
		Mechanics (MEK) – Section 1

Terms of Reference (ToR) for the administrative unit

The board of The Department of Mathematics mandates the evaluation committee appointed by the Research Council of Norway (RCN) to assess The Department of Mathematics based on the following Terms of Reference.

Assessment

You are asked to assess the organisation, quality and diversity of research conducted by The Department of Mathematics as well as its relevance to institutional and sectoral purposes, and to society at large. You should do so by judging the unit's performance based on the following five assessment criteria (a. to e.). Be sure to take current international trends and developments in science and society into account in your analysis.

a) Strategy, resources and organisation

b) Research production, quality and integrity

c) Diversity and equality

d) Relevance to institutional and sectoral purposes

e) Relevance to society

For a description of these criteria, see Chapter 2 of the mathematics, ICT and technology evaluation protocol. Please provide a written assessment for each of the five criteria. Please also provide recommendations for improvement. We ask you to pay special attention to the following 5 aspects in your assessment:

1. Research should be at the international research front, and some environments shall be world leading.
2. Ability to obtain national and international research funding.
3. The education and researcher training should be of high quality, emphasize high scientific integrity, and prepare candidates for suitable careers in academia and other sectors.
4. Successful strategies for academic early career development (post doc and beyond).
5. Ability to contribute in connecting theoretical and methodological research to societal relevance.

In addition, we would like your report to provide a qualitative assessment of The Department of Mathematics as a whole in relation to its strategic targets. The committee assesses the strategy that the administrative unit intends to pursue in the years ahead and the extent to which it will be capable of meeting its targets for research and society during this period based on available resources and competence. The committee is also invited to make recommendations concerning these two subjects.

Documentation

The necessary documentation will be made available by the mathematics, ICT and technology secretariat at Technopolis Group.

The documents will include the following:

- a report on research personnel and publications within mathematics, ICT and technology commissioned by RCN
- a self-assessment based on a template provided by the mathematics, ICT and technology secretariat

Interviews with representatives from the evaluated units

Interviews with the Department of Mathematics will be organised by the evaluation secretariat. Such interviews can be organised as a site visit, in another specified location in Norway or as a video conference.

Statement on impartiality and confidence

The assessment should be carried out in accordance with the *Regulations on Impartiality and Confidence in the Research Council of Norway*. A statement on the impartiality of the committee members has been recorded by the RCN as a part of the appointment process. The impartiality and confidence of committee and panel members should be confirmed when evaluation data from The Department of Mathematics are made available to the committee and the panels, and before any assessments are made based on these data. The RCN should be notified if questions concerning impartiality and confidence are raised by committee members during the evaluation process.

Assessment report

We ask you to report your findings in an assessment report drawn up in accordance with a format specified by the mathematics, ICT and technology secretariat. The committee may suggest adjustments to this format at its first meeting. A draft report should be sent to the Department of Mathematics and RCT]. The Department of Mathematics should be allowed to check the report for factual inaccuracies; if such inaccuracies are found, they should be reported to the mathematics, ICT and technology secretariat within the deadline given by the secretariat. After the committee has made the amendments judged necessary, a corrected version of the assessment report should be sent to the board of The Department of Mathematics and the RCN no later than two weeks after all feedback on inaccuracies has been received from The Department of Mathematics.

Appendices

1. Description of the evaluation of EVALMIT
2. Invitation letter to the administrative unit including address list
3. Evaluation protocol
4. Template of self-assessment for administrative unit (short-version)

The Research Council of Norway

Norges forskningsråd
Besøksadresse: Drammensveien 288
Postboks 564
1327 Lysaker

Telefon: 22 03 70 00

post@forskningsradet.no
www.forskningsradet.no

Publikasjonen kan lastes ned fra
www.forskningsradet.no/publikasjoner

Design: [design]
Foto/ill. omslagsside: [fotokreditt]

ISBN 978-82-12-04132-5 (pdf)