



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL
TRAINING AT THE UNIVERSITY OF HELSINKI 2005–2010

RC-Specific Evaluation of ANDY – Analysis and Dynamics

Seppo Saari & Antti Moilanen (Eds.)



Evaluation Panel: Natural Sciences

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Title: International Evaluation of Research and Doctoral Training at the University of Helsinki 2005–2010 : RC-Specific Evaluation of ANDY – Analysis and Dynamics	Type of publication: Evaluations
Summary: Researcher Community (RC) was a new concept of the participating unit in the evaluation. Participation in the evaluation was voluntary and the RCs had to choose one of the five characteristic categories to participate. Evaluation of the Researcher Community was based on the answers to the evaluation questions. In addition a list of publications and other activities were provided by the TUHAT system. The CWTS/Leiden University conducted analyses for 80 RCs and the Helsinki University Library for 66 RCs. Panellists, 49 and two special experts in five panels evaluated all the evaluation material as a whole and discussed the feedback for RC-specific reports in the panel meetings in Helsinki. The main part of this report is consisted of the feedback which is published as such in the report. Chapters in the report: 1. Background for the evaluation 2. Evaluation feedback for the Researcher Community 3. List of publications 4. List of activities 5. Bibliometric analyses The level of the RCs' success can be concluded from the written feedback together with the numeric evaluation of four evaluation questions and the category fitness. More conclusions of the success can be drawn based on the University-level report.	
RC-specific information:	
Main scientific field of research: Natural Sciences	RC-specific keywords: Analysis, dynamics. mathematical physics, mathematical biology
Participation category: 1. Research of the participating community represents the international cutting edge in its field	
RC's responsible person: Kupiainen, Antti	
Keywords: Research Evaluation, Meta-evaluation, Doctoral Training, Bibliometric Analyses, Researcher Community	

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Contents

Panel members	1
1 Introduction to the Evaluation	5
1.1 RC-specific evaluation reports	5
1.2 Aims and objectives in the evaluation	5
1.3 Evaluation method	5
1.4 Implementation of the external evaluation	6
1.5 Evaluation material	7
1.6 Evaluation questions and material	8
1.7 Evaluation criteria	10
1.8 Timetable of the evaluation	13
1.9 Evaluation feedback – consensus of the entire panel	13
2 Evaluation feedback	15
2.1 Focus and quality of the RC's research	15
2.2 Practises and quality of doctoral training	15
2.3 The societal impact of research and doctoral training	16
2.4 International and national (incl. intersectoral) research collaboration and researcher mobility	16
2.5 Operational conditions	16
2.6 Leadership and management in the researcher community	17
2.7 External competitive funding of the RC	17
2.8 The RC's strategic action plan for 2011–2013	17
2.9 Evaluation of the category of the RC in the context of entity of the evaluation material (1-8)	18
2.10 Short description of how the RC members contributed the compilation of the stage 2 material ...	18
2.11 How the UH's focus areas are presented in the RC's research	18
2.12 RC-specific main recommendations	18
2.13 RC-specific conclusions	18
2.14 Preliminary findings in the Panel-specific feedback	18
3 Appendices	19

Foreword

The evaluation of research and doctoral training is being carried out in the years 2010–2012 and will end in 2012. The steering group appointed by the Rector in January 2010 set the conditions for participating in the evaluation and prepared the Terms of Reference to present the evaluation procedure and criteria. The publications and other scientific activities included in the evaluation covered the years 2005–2010.

The participating unit in the evaluation was defined as a Researcher Community (RC). To obtain a critical mass with university-level impact, the number of members was set to range from 20 to 120. The RCs were required to contain researchers in all stages of their research career, from doctoral students to principal investigators (PIs). All in all, 136 Researcher Communities participated in this voluntary evaluation, 5857 persons in total, of whom 1131 were principal investigators. PIs were allowed to participate in two communities in certain cases, and 72 of them used this opportunity and participated in two RCs.

This evaluation enabled researchers to define RCs from the “bottom up” and across disciplines. The aim of the evaluation was not to assess individual performance but a community with shared aims and researcher-training activities. The RCs were able to choose among five different categories that characterised the status and main aims of their research. The steering group considered the process of applying to participate in the evaluation to be important, which led to the establishment of these categories. In addition, providing a service for the RCs to enable them to benchmark their research at the global level was a main goal of the evaluation.

The data for the evaluation consisted of the RCs’ answers to evaluation questions on supplied e-forms and a compilation extracted from the TUHAT – Research Information System (RIS) on 12 April 2011. The compilation covered scientific and other publications as well as certain areas of scientific activities. During the process, the RCs were asked to check the list of publications and other scientific activities and make corrections if needed. These TUHAT compilations are public and available on the evaluation project sites of each RC in the TUHAT-RIS.

In addition to the e-form and TUHAT compilation, University of Leiden (CWTS) carried out bibliometric analyses from the articles included in the Web of Science (WoS). This was done on University and RC levels. In cases where the publication forums of the RC were clearly not represented by the WoS data, the Library of the University of Helsinki conducted a separate analysis of the publications. This was done for 66 RCs representing the humanities and social sciences.

The evaluation office also carried out an enquiry targeted to the supervisors and PhD candidates about the organisation of doctoral studies at the University of Helsinki. This and other documents describing the University and the Finnish higher education system were provided to the panellists.

The panel feedback for each RC is unique and presented as an entity. The first collective evaluation reports available for the whole panel were prepared in July–August 2011. The reports were accessible to all panel members via the electronic evaluation platform in August. Scoring from 1 to 5 was used to complement written feedback in association with evaluation questions 1–4 (scientific focus and quality, doctoral training, societal impact, cooperation) and in addition to the category evaluating the fitness for participation in the evaluation. Panellists used the international level as a point of comparison in the evaluation. Scoring was not expected to go along with a preset deviation.

Each of the draft reports were discussed and dealt with by the panel in meetings in Helsinki (from 11 September to 13 September or from 18 September to 20 September 2011). In these meetings the panels also examined the deviations among the scores and finalised the draft reports together.

The current RC-specific report deals shortly with the background of the evaluation and the terms of participation. The main evaluation feedback is provided in the evaluation report, organised according to the evaluation questions. The original material provided by the RCs for the panellists has been attached to these documents.

On behalf of the evaluation steering group and office, I sincerely wish to thank you warmly for your participation in this evaluation. The effort you made in submitting the data to TUHAT-RIS is gratefully acknowledged by the University. We wish that you find this panel feedback useful in many ways. The bibliometric profiles may open a new view on your publication forums and provide a perspective for discussion on your choice of forums. We especially hope that this evaluation report will help you in setting the future goals of your research.

Johanna Björkroth
Vice-Rector
Chair of the Steering Group of the Evaluation

Steering Group of the evaluation

Steering group, nominated by the Rector of the University, was responsible for the planning of the evaluation and its implementation having altogether 22 meetings between February 2010 and March 2012.

Chair

Vice-Rector, professor **Johanna Björkroth**

Vice-Chair

Professor **Marja Airaksinen**

Chief Information Specialist, Dr **Maria Forsman**

Professor **Arto Mustajoki**

University Lecturer, Dr **Kirsi Pyhälä**

Director of Strategic Planning and Development, Dr **Ossi Tuomi**

Doctoral candidate, MSocSc **Jussi Vauhkonen**

Panel members

CHAIR

Professor Jan-Otto Carlsson

Materials science in chemistry and physics, nanotechnology, inorganic chemistry
Uppsala University, Sweden

VICE-CHAIR

Professor Jan van Leeuwen

Computer science, information technology
University of Utrecht, the Netherlands

Professor Caitlin Buck

Probability and statistics, archeology, palaeoenvironmental science
University of Sheffield, Great Britain

Professor David Colton

Mathematics, inverse problems of acoustic and electromagnetic scattering
University of Delaware, USA

Professor Jean-Pierre Eckmann

Mathematics, dynamical systems, mathematical physics
University of Geneva, Switzerland

Professor Ritske Huismans

Geosciences, geodynamics
University of Bergen, Norway

Professor Jukka Jurvelin

Medical physics and engineering
University of Eastern Finland

Professor Lea Kauppi

Environmental sciences, water research
The Finnish Environment Institute, Finland

Professor Riitta Keiski

Chemical engineering, heterogeneous catalysis, environmental technology, mass and heat transfer processes
University of Oulu, Finland

Professor Mats Larsson

Experimental molecular physics, chemical dynamics, molecular spectroscopy, astrobiology
Stockholm University, Sweden

Professor Holger Stark

Medicinal, organic and pharmaceutical chemistry, pharmacology
Johann Wolfgang Goethe Universität, Germany

The panel, independently, evaluated all the submitted material and was responsible for the feedback of the RC-specific reports. The panel members were asked to confirm whether they had any conflict of interests with the RCs. If this was the case, the panel members disqualified themselves in discussion and report writing.

Added expertise to the evaluation was contributed by the members from the other panels.

Experts from the Other Panels

Professor Barbara Koch, from the Panel of Biological, Agricultural and Veterinary Sciences

Professor Peter York, from the Panel of Medicine, Biomedicine and Health Sciences

EVALUATION OFFICE

Dr Seppo Saari, Doc., Senior Adviser in Evaluation, was responsible for the entire evaluation, its planning and implementation and acted as an Editor-in-chief of the reports.

Dr Eeva Sievi, Doc., Adviser, was responsible for the registration and evaluation material compilations for the panellists. She worked in the evaluation office from August 2010 to July 2011.

MSocSc Paula Ranne, Planning Officer, was responsible for organising the panel meetings and all the other practical issues like agreements and fees and editing a part the RC-specific reports. She worked in the evaluation office from March 2011 to January 2012.

Mr Antti Moilanen, Project Secretary, was responsible for editing the reports. He worked in the evaluation office from January 2012 to April 2012.

TUHAT OFFICE

Provision of the publication and other scientific activity data

Mrs Aija Kaltera, Project Manager of TUHAT-RIS served the project ex officio providing the evaluation project with the updated information from TUHAT-RIS. The TUHAT office assisted in mapping the publications with CWTS/University of Leiden.

MA Liisa Ekebon, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation. She also assisted the UH/Library analyses.

BA Liisa Jäppinen, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation.

HELSINKI UNIVERSITY LIBRARY

Provision of the publication analyses

Dr Maria Forsman, Chief Information Specialist in the Helsinki University Library, managed with her 10 colleagues the bibliometric analyses in humanities, social sciences and in other fields of sciences where CWTS analyses were not applicable.

Acronyms and abbreviations applied in the report

External competitive funding

AF - Academy of Finland
TEKES - Finnish Funding Agency for Technology and Innovation
EU - European Union
ERC - European Research Council
International and national foundations
FP7/6 etc. /Framework Programmes/Funding of European Commission

Evaluation marks

Outstanding (5)
Excellent (4)
Very Good (3)
Good (2)
Sufficient (1)

Abbreviations of Bibliometric Indicators

P - Number of publications
TCS - Total number of citations
MCS - Number of citations per publication, excluding self-citations
PNC - Percentage of uncited publications
MNCS - Field-normalized number of citations per publication
MNJS - Field-normalized average journal impact
THCP10 - Field-normalized proportion highly cited publications (top 10%)
INT_COV - Internal coverage, the average amount of references covered by the WoS
WoS - Thomson Reuters Web of Science Databases

Participation category

Category 1. The research of the participating community represents the international cutting edge in its field.

Category 2. The research of the participating community is of high quality, but the community in its present composition has yet to achieve strong international recognition or a clear break-through.

Category 3. The research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation.

Category 4. The research of the participating community represents an innovative opening.

Category 5. The research of the participating community has a highly significant societal impact.

Research focus areas of the University of Helsinki

Focus area 1: The basic structure, materials and natural resources of the physical world

Focus area 2: The basic structure of life

Focus area 3: The changing environment - clean water

Focus area 4: The thinking and learning human being

Focus area 5: Welfare and safety

Focus area 6: Clinical research

Focus area 7: Precise reasoning

Focus area 8: Language and culture

Focus area 9: Social justice

Focus area 10: Globalisation and social change

1 Introduction to the Evaluation

1.1 RC-specific evaluation reports

The participants in the evaluation of research and doctoral training were Researcher Communities (hereafter referred to as the RC). The RC refers to the group of researchers who registered together in the evaluation of their research and doctoral training. Preconditions in forming RCs were stated in the Guidelines for the Participating Researcher Communities. The RCs defined themselves whether their compositions should be considered well-established or new.

It is essential to emphasise that the evaluation combines both meta-evaluation¹ and traditional research assessment exercise and its focus is both on the research outcomes and procedures associated with research and doctoral training. The approach to the evaluation is enhancement-led where self-evaluation constituted the main information. The answers to the evaluation questions formed together with the information of publications and other scientific activities an entity that was to be reviewed as a whole.

The present evaluation recognizes and justifies the diversity of research practices and publication traditions. Traditional Research Assessment Exercises do not necessarily value high quality research with low volumes or research distinct from mainstream research. It is challenging to expose the diversity of research to fair comparison. To understand the essence of different research practices and to do justice to their diversity was one of the main challenges of the present evaluation method. Understanding the divergent starting points of the RCs demanded sensitivity from the evaluators.

1.2 Aims and objectives in the evaluation

The aims of the evaluation are as follows:

- to improve the level of research and doctoral training at the University of Helsinki and to raise their international profile in accordance with the University's strategic policies. The improvement of doctoral training should be compared to the University's policy.²
- to enhance the research conducted at the University by taking into account the diversity, originality, multidisciplinary nature, success and field-specificity,
- to recognize the conditions and prerequisites under which excellent, original and high-impact research is carried out,
- to offer the academic community the opportunity to receive topical and versatile international peer feedback,
- to better recognize the University's research potential.
- to exploit the University's TUHAT research information system to enable transparency of publishing activities and in the production of reliable, comparable data.

1.3 Evaluation method

The evaluation can be considered as an enhancement-led evaluation. Instead of ranking, the main aim is to provide useful information for the enhancement of research and doctoral training of the participating RCs. The comparison should take into account each field of science and acknowledge their special character.

¹ The panellists did not read research reports or abstracts but instead, they evaluated answers to the evaluation questions, tables and compilations of publications, other scientific activities, bibliometrics or comparable analyses.

² [Policies on doctoral degrees and other postgraduate degrees at the University of Helsinki.](#)

The comparison produced information about the present status and factors that have lead to success. Also challenges in the operations and outcomes were recognized.

The evaluation approach has been designed to recognize better the significance and specific nature of researcher communities and research areas in the multidisciplinary top-level university. Furthermore, one of the aims of the evaluation is to bring to light those evaluation aspects that differ from the prevalent ones. Thus the views of various fields of research can be described and research arising from various starting points understood better. The doctoral training is integrated into the evaluation as a natural component related to research. Operational processes of doctoral training are being examined in the evaluation.

Five stages of the evaluation method were:

1. Registration – Stage 1
2. Self-evaluation – Stage 2
3. TUHAT³ compilations on publications and other scientific activities⁴
4. External evaluation
5. Public reporting

1.4 Implementation of the external evaluation

Five Evaluation Panels

Five evaluation panels consisted of independent, renowned and highly respected experts. The main domains of the panels are:

1. biological, agricultural and veterinary sciences
2. medicine, biomedicine and health sciences
3. natural sciences
4. humanities
5. social sciences

The University invited 10 renowned scientists to act as chairs or vice-chairs of the five panels based on the suggestions of faculties and independent institutes. Besides leading the work of the panel, an additional role of the chairs was to discuss with other panel chairs in order to adopt a broadly similar approach. The panel chairs and vice-chairs had a pre-meeting on 27 May 2011 in Amsterdam.

The panel compositions were nominated by the Rector of the University 27 April 2011. The participating RCs suggested the panel members. The total number of panel members was 50. The reason for a smaller number of panellists as compared to the previous evaluations was the character of the evaluation as a meta-evaluation. The panellists did not read research reports or abstracts but instead, they evaluated answers to the evaluation questions, tables and compilations of publications, other scientific activities, bibliometrics and comparable analyses.

The panel meetings were held in Helsinki:

- On 11–13 September 2011: (1) biological, agricultural and veterinary sciences, (2) medicine, biomedicine and health sciences and (3) natural sciences.
- On 18–20 September 2011: (4) humanities and (5) social sciences.

³ TUHAT (acronym) of Research Information System (RIS) of the University of Helsinki

⁴ Supervision of thesis, prizes and awards, editorial work and peer reviews, participation in committees, boards and networks and public appearances.

1.5 Evaluation material

The main material in the evaluation was the RCs' self-evaluations that were qualitative in character and allowed the RCs to choose what was important to mention or emphasise and what was left unmentioned.

The present evaluation is exceptional at least in the Finnish context because it is based on both the evaluation documentation (self-evaluation questions, publications and other scientific activities) and the bibliometric reports. All documents were delivered to the panellists for examination.

Traditional bibliometrics can be reasonably done mainly in medicine, biosciences and natural sciences when using the Web of Science database, for example. Bibliometrics, provided by CWTS/The Centre for Science and Technology Studies, University of Leiden, cover only the publications that include WoS identification in the TUHAT-RIS.

Traditional bibliometrics are seldom relevant in humanities and social sciences because the international comparable databases do not store every type of high quality research publications, such as books and monographs and scientific journals in other languages than English. The Helsinki University Library has done analysis to the RCs, if their publications were not well represented in the Web of Science databases (RCs should have at least 50 publications and internal coverage of publications more than 40%) – it meant 58 RCs. The bibliometric material for the evaluation panels was available in June 2011. The RC-specific bibliometric reports are attached at the end of each report.

The panels were provided with the evaluation material and all other necessary background information, such as the basic information about the University of Helsinki and the Finnish higher education system.

Evaluation material

1. Registration documents of the RCs for the background information
2. Self evaluation material – answers to the evaluation questions
3. Publications and other scientific activities based on the TUHAT RIS:
 - 3.1. statistics of publications
 - 3.2. list of publications
 - 3.3. statistics of other scientific activities
 - 3.4. list of other scientific activities
4. Bibliometrics and comparable analyses:
 - 4.1. Analyses of publications based on the verification of TUHAT-RIS publications with the Web of Science publications (CWTS/University of Leiden)
 - 4.2. Publication statistics analysed by the Helsinki University Library - mainly for humanities and social sciences
5. University level survey on doctoral training (August 2011)
6. University level analysis on publications 2005–2010 (August 2011) provided by CWTS/University of Leiden

Background material

University of Helsinki

- [Basic information about the University of the Helsinki](#)
- [The structure of doctoral training at the University of Helsinki](#)
- Previous evaluations of research at the University of Helsinki – links to the reports: [1998](#) and [2005](#)

The Finnish Universities/Research Institutes

- [Finnish University system](#)
- [Evaluation of the Finnish National Innovation System](#)
- [The State and Quality of Scientific Research in Finland. Publication of the Academy of Finland 9/09.](#)

The evaluation panels were provided also with other relevant material on request before the meetings in Helsinki.

1.6 Evaluation questions and material

The participating RCs answered the following evaluation questions which are presented according to the evaluation form. In addition, TUHAT RIS was used to provide the **additional material** as explained. For giving the feedback to the RCs, the panellists received the evaluation feedback form constructed in line with the evaluation questions:

1. Focus and quality of the RC's research

- Description of
 - the RC's research focus.
 - the quality of the RC's research (incl. key research questions and results)
 - the scientific significance of the RC's research in the research field(s)
- Identification of the ways to strengthen the focus and improve the quality of the RC's research

The additional material: TUHAT compilation of the RC's publications, analysis of the RC's publications data (provided by University of Leiden and the Helsinki University Library)

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, innovativeness

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

2. Practises and quality of doctoral training

- Organising of the doctoral training in the RC. Description of the RC's principles for:
 - recruitment and selection of doctoral candidates
 - supervision of doctoral candidates
 - collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes
 - good practises and quality assurance in doctoral training
 - assuring of good career perspectives for the doctoral candidates/fresh doctorates
- Identification of the RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.

The additional material: TUHAT compilation of the RC's other scientific activities/supervision of doctoral dissertations

A written feedback from the aspects of: processes and good practices related to leadership and management

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

3. The societal impact of research and doctoral training

- Description on how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).
- Identification of the ways to strengthen the societal impact of the RC's research and doctoral training.

The additional material: TUHAT compilation of the RC's other scientific activities.

A written feedback from the aspects of: societal impact, national and international collaboration, innovativeness

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

4. International and national (incl. intersectoral) research collaboration and researcher mobility

- Description of
 - the RC's research collaborations and joint doctoral training activities
 - how the RC has promoted researcher mobility
- Identification of the RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.

A written feedback from the aspects of: scientific quality, national and international collaboration

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

5. Operational conditions

- Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).
- Identification of the RC's strengths and challenges related to operational conditions, and the actions planned for their development.

A written feedback from the aspects of: processes and good practices related to leadership and management

- Strengths
- Areas of development
- Other remarks
- Recommendations

6. Leadership and management in the researcher community

- Description of
 - the execution and processes of leadership in the RC
 - how the management-related responsibilities and roles are distributed in the RC
 - how the leadership- and management-related processes support
 - high quality research
 - collaboration between principal investigators and other researchers in the RC
 - the RC's research focus
 - strengthening of the RC's know-how
- Identification of the RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes

7. External competitive funding of the RC

- The RCs were asked to provide information of such external competitive funding, where:
 - the funding decisions have been made during 1.1.2005-31.12.2010, and
 - the administrator of the funding is/has been the University of Helsinki
- On the e-form the RCs were asked to provide:
 - 1) The relevant funding source(s) from a given list (Academy of Finland/Research Council, TEKES/The Finnish Funding Agency for Technology and Innovation , EU, ERC, foundations, other national funding organisations, other international funding organisations), and
 - 2) The total sum of funding which the organisation in question had decided to allocate to the RCs members during 1.1.2005-31.12.2010.

Competitive funding reported in the text is also to be considered when evaluating this point.

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, innovativeness, future significance

- Strengths
- Areas of development
- Other remarks
- Recommendations

8. The RC's strategic action plan for 2011-2013

- RC's description of their future perspectives in relation to research and doctoral training.

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, processes and good practices related to leadership and management, national and international collaboration, innovativeness, future significance

- Strengths
- Areas of development

- Other remarks
- Recommendations

9. Evaluation of the category of the RC in the context of entity of the evaluation material (1-8)

The RC's fitness to the chosen participation category

A written feedback evaluating the RC's fitness to the chosen participation category

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

10. Short description of how the RC members contributed the compilation of the stage 2 material

Comments on the compilation of evaluation material

11. How the UH's focus areas are presented in the RC's research?

Comments if applicable

12. RC-specific main recommendations based on the previous questions 1-11

13. RC-specific conclusions

1.7 Evaluation criteria

The panellists were expected to give evaluative and analytical feedback to each evaluation question according to their aspects in order to describe and justify the quality of the submitted material. In addition, the evaluation feedback was asked to be pointed out the level of the performance according to the following classifications:

- outstanding (5)
- excellent (4)
- very good (3)
- good (2)
- sufficient (1)

Evaluation according to the criteria was to be made with thorough consideration of the entire evaluation material of the RC in question. Finally, in questions 1-4 and 9, the panellists were expected to classify their written feedback into one of the provided levels (the levels included respective descriptions, 'criteria'). Some panels used decimals in marks. The descriptive level was interpreted according to the integers and not rounding up the decimals by the editors.

Description of criteria levels

Question 1 – FOCUS AND QUALITY OF THE RC'S RESEARCH

Classification: Criteria (level of procedures and results)

Outstanding quality of procedures and results (5)

Outstandingly strong research, also from international perspective. Attracts great international interest with a wide impact, including publications in leading journals and/or monographs published by leading international publishing houses. The research has world leading qualities. The research focus, key research questions scientific significance, societal impact and innovativeness are of outstanding quality.

In cases where the research is of a national character and, in the judgement of the evaluators, should remain so, the concepts of "international attention" or "international impact" etc. in the grading criteria above may be replaced by "international comparability".

Operations and procedures are of outstanding quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are in alignment with the documentation. The ambition to develop the community together is of outstanding quality.

Excellent quality of procedures and results (4)

Research of excellent quality. Typically published with great impact, also internationally. Without doubt, the research has a leading position in its field in Finland.

Operations and procedures are of excellent quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of excellent quality.

Very good quality of procedures and results (3)

The research is of such very good quality that it attracts wide national and international attention.

Operations and procedures are of very good quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of very good quality.

Good quality of procedures and results (2)

Good research attracting mainly national attention but possessing international potential, extraordinarily high relevance may motivate good research.

Operations and procedures are of good quality, shared occasionally in the community. The improvement of research and other efforts are occasionally documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of good quality.

Sufficient quality of procedures and results (1)

In some cases the research is insufficient and reports do not gain wide circulation or do not have national or international attention. Research activities should be revised.

Operations and procedures are of sufficient quality, shared occasionally in the community. The improvement of research and other efforts are occasionally documented and operations and practices are to some extent in alignment with the documentation. The ambition to develop the community together is of sufficient quality.

Question 2 – DOCTORAL TRAINING

Question 3 – SOCIETAL IMPACT

Question 4 – COLLABORATION

Classification: Criteria (level of procedures and results)

Outstanding quality of procedures and results (5)

Procedures are of outstanding quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are in alignment with the documentation. The ambition to develop the community together is of outstanding quality. The procedures and results are regularly evaluated and the feedback has an effect on the planning.

Excellent quality of procedures and results (4)

Procedures are of excellent quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of excellent quality. The procedures and outcomes are evaluated and the feedback has an effect on the planning.

Very good quality of procedures and results (3)

Procedures are of very good quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and

management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of very good quality.

Good quality of procedures and results (2)

Procedures are of good quality, shared occasionally in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of good quality.

Sufficient quality of procedures and results (1)

Procedures are of sufficient quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are occasionally documented and operations and practices are to some extent in alignment with the documentation. The ambition to develop the community together is of sufficient quality.

Question 9 – CATEGORY

Participation category – fitness for the category chosen

The choice and justification for the chosen category below should be reflected in the RC's responses to the evaluation questions 1–8.

1. *The research of the participating community represents the international cutting edge in its field.*
2. *The research of the participating community is of high quality, but the community in its present composition has yet to achieve strong international recognition or a clear break-through.*
3. *The research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation.* The research is of high quality and has great significance and impact in its field. However, the generally used research evaluation methods do not necessarily shed sufficient light on the merits of the research.
4. *The research of the participating community represents an innovative opening.* A new opening can be an innovative combination of research fields, or it can be proven to have a special social, national or international demand or other significance. Even if the researcher community in its present composition has yet to obtain proof of international success, its members can produce convincing evidence of the high level of their previous research.
5. *The research of the participating community has a highly significant societal impact.* The participating researcher community is able to justify the high social significance of its research. The research may relate to national legislation, media visibility or participation in social debate, or other activities promoting social development and human welfare. In addition to having societal impact, the research must be of a high standard.

An example of outstanding fitness for category choice (5)⁵

The RC's representation and argumentation for the chosen category were convincing. The RC recognized its real capacity and apparent outcomes in a wider context to the research communities. The specific character of the RC was well-recognized and well stated in the responses. The RC fitted optimally for the category.

- Outstanding (5)
- Excellent (4)
- Very good (3)
- Good (2)
- Sufficient (1)

The above-mentioned definition of outstanding was only an example in order to assist the panellists in the positioning of the classification. There was no exact definition for the category fitness.

⁵ The panels discussed the category fitness and made the final conclusions of the interpretation of it.

1.8 Timetable of the evaluation

The main timetable of the evaluation:

- | | |
|--|-----------------------|
| 1. Registration | November 2010 |
| 2. Submission of self-evaluation materials | January–February 2011 |
| 3. External peer review | May–September 2011 |
| 4. Published reports | March–April 2012 |
| - University level public report | |
| - RC specific reports | |

The entire evaluation was implemented during the university's strategy period 2010–2012. The preliminary results were available for the planning of the following strategy period in late autumn 2011. The evaluation reports will be published in March/April 2012. More detailed time schedule is published in the University report.

1.9 Evaluation feedback – consensus of the entire panel

The panellists evaluated all the RC-specific material before the meetings in Helsinki and mailed the draft reports to the evaluation office. The latest interim versions were on-line available to all the panellists on the Wiki-sites. In September 2011, in Helsinki the panels discussed the material, revised the first draft reports and decided the final numeric evaluation. After the meetings in Helsinki, the panels continued working and finalised the reports before the end of November 2011. The final RC-specific reports are the consensus of the entire panel.

The evaluation reports were written by the panels independently. During the editing process, the evaluation office requested some clarifications from the panels when necessary. The tone and style in the reports were not harmonized in the editing process. All the reports follow the original texts written by the panels as far as it was possible.

The original evaluation material of the RCs, provided for the panellists is attached at the end of the report. It is essential to notice that the exported lists of publications and other scientific activities depend how the data was stored in the TUHAT-RIS by the RCs.

2 Evaluation feedback

2.1 Focus and quality of the RC's research

- *Description of*
 - *the RC's research focus*
 - *the quality of the RC's research (incl. key research questions and results)*
 - *the scientific significance of the RC's research in the research field(s)*
- *Identification of the ways to strengthen the focus and improve the quality of the RC's research*

ASPECTS: Scientific quality, scientific significance, societal impact, innovativeness

This is a group in mathematics with very high international visibility. Starting from a group in complex analysis, it has expanded in the last decade to mathematical physics and mathematical biology. Its members are most highly recognized, both by the Academy of Finland (e.g. through the Center of Excellence in Analysis and Dynamics and several 5-year research fellowships) as well as internationally. The ERC advanced researcher grant of Kupiainen as well as several invitations to the International Congress of Mathematicians are further signs of their excellence.

This RC is certainly one of the gems of UH. As the main exponents and scientific leaders are in the age group of about 50 to 60, maintaining the international excellence is an important responsibility of UH for the next few years. The university should therefore give highest priority to recruitment of new members to this excellent group.

Numeric evaluation: 5 (Outstanding)

2.2 Practises and quality of doctoral training

- *Organising of the doctoral training in the RC. Description of the RC's principles for:*
 - *recruitment and selection of doctoral candidates*
 - *supervision of doctoral candidates*
 - *collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes*
 - *good practises and quality assurance in doctoral training*
 - *assuring of good career perspectives for the doctoral candidates/fresh doctorates*
- *Identification of the RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.*
- *Additional material: TUHAT compilation of the RC's other scientific activities/supervision of doctoral dissertations*

ASPECTS: Processes and good practices related to leadership and management

The doctoral training is excellent. Also, in the last 5–10 years, PhD students and post-docs have been travelling more abroad, increasing the outreach of the RC. The RC could perhaps profit from a closer association with the activities in St-Petersburg, where the Fields medalist Smirnov is building a new activity.

Numeric evaluation: 5 (Outstanding)

2.3 The societal impact of research and doctoral training

- *Description on how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).*
- *Identification of the ways to strengthen the societal impact of the RC's research and doctoral training.*
- *Additional material: TUHAT compilation of the RC's other scientific activities.*

ASPECTS: Societal impact, national and international collaboration, innovativeness

Although mathematics is perceived by many as an activity in an ivory tower, its outreach in society is well recognized through the skills of its graduates.

The RC actively applies its fundamental research in areas of clear societal relevance, e.g. in two joint projects with the Finnish Meteorological Institute as well as in collaborations with Nokia Research and the MTT Agrifood company.

Other activities include articles in the press, appearances on TV as well as presentations in Helsinki high schools. For a pure mathematics group, this outreach to society is very good to excellent.

The popularization of mathematics and its applications is one of the stated missions of this RC.

Numeric evaluation: 3.5 (Very good)

2.4 International and national (incl. intersectoral) research collaboration and researcher mobility

- *Description of*
 - *the RC's research collaborations and joint doctoral training activities*
 - *how the RC has promoted researcher mobility*
- *Identification of the RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.*

ASPECTS: Scientific quality, national and international collaboration

In Finland, the RC is a natural center of attraction due to its COE and the scientific quality of its members. It has contacts and collaborations with most groups in mathematics in Finland. Internationally it is participating in many networks. PhD students and EU post-docs visit and stay in many places abroad.

Finland has two handicaps in attracting non-Finnish scientists: the peripheral situation in Europe and a language which is difficult to learn. Thus, in general, few people from other countries want to move to UH. Perhaps this could be compensated by more visible visitors programs or conferences.

Numeric evaluation: 5 (Outstanding)

2.5 Operational conditions

- *Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).*
- *Identification of the RC's strengths and challenges related to operational conditions, and the actions planned for their development.*

ASPECTS: Processes and good practices related to leadership and management

The management of the RC is excellent. However, the reviewers are not convinced and see no effort on the side of UH to make management tasks easier. It seems to us that the current evaluation is an example of a huge administrative effort whose impact on the lives of the scientists is largely unclear.

2.6 Leadership and management in the researcher community

- *Description of*
 - *the execution and processes of leadership in the RC*
 - *how the management-related responsibilities and roles are distributed in the RC*
 - *how the leadership- and management-related processes support*
 - *high quality research*
 - *collaboration between principal investigators and other researchers in the RC*
 - *the RC's research focus*
 - *strengthening of the RC's know-how*
- *Identification of the RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes*

ASPECTS: Processes and good practices related to leadership and management

Through the COE, the RC has the opportunity to organize regular seminars at a high level. The senior researchers complain about the high administrative burden coming from grant applications and evaluations. This takes away time which is needed for good research, not only in mathematics, but in many other fields.

2.7 External competitive funding of the RC

- *The RCs were asked to provide information of such external competitive funding, where:*
 - *the funding decisions have been made during 1.1.2005–31.12.2010, and*
 - *the administrator of the funding is/has been the University of Helsinki*
- *On the e-form the RCs were asked to provide:*
 - 1) *The relevant funding source(s) from a given list (Academy of Finland/Research Council, TEKES/The Finnish Funding Agency for Technology and Innovation, EU, ERC, foundations, other national funding organisations, other international funding organizations), and*
 - 2) *The total sum of funding which the organisation in question had decided to allocate to the RCs members during 1.1.2005–31.12.2010.*

Competitive funding reported in the text is also to be considered when evaluating this point.

ASPECTS: Scientific quality, scientific significance, societal impact, innovativeness and future significance

The RC has been able to attract money which, for a theoretical science, is rather large. Some of the sources are extremely competitive (like the ERC) and the success of the applications attests again for the quality of the members of the RC.

2.8 The RC's strategic action plan for 2011–2013

- *RC's description of their future perspectives in relation to research and doctoral training.*

ASPECTS: Scientific quality, scientific significance, societal Impact, processes and good practices related to leadership and management, national and international collaboration, innovativeness, future significance

The plans for the future are an excellent mix of continuity in areas where the RC excelled so far, as well as exploring new avenues. UH should encourage these developments, perhaps allowing to 'replace' people before they retire. This is important in view of the age structure of the RC. It should also be kept in mind that one can hire much better people by attracting young "rising stars" with "instant tenure" at a relatively high salary level. Recruitments should be advertised internationally.

2.9 Evaluation of the category of the RC in the context of entity of the evaluation material (1-8)

The RC's fitness to the chosen participation category.

Category 1. The research of the participating community represents the international cutting edge in its field.

This RC is of course the very top UH can hope for and thus rightly puts itself in Participation Category 1. The COE, which I know very well, is certainly one of the showcases of UH. Given the regular, excellent output the RC provides over the years, I am confident that UH will help them to maintain this level in the coming years. Since it is difficult to maintain such a high level, UH should do everything possible to prepare the transition which will happen in the next 5-10 years, when many of the key exponents will have to retire.

Numeric evaluation 5 (Outstanding)

2.10 Short description of how the RC members contributed the compilation of the stage 2 material

The executive committee of the CoE acted as coordinating body of the process. The compilation of the Stage 2 materials was an open process which involved all members of the RC.

2.11 How the UH's focus areas are presented in the RC's research

Focus area 7: Precise reasoning

The RC fits in the focus area 'Precise Reasoning' perfectly.

2.12 RC-specific main recommendations

The HU should help the RC in making new tenured recruitments soon, to maintain the high level of the RC.

2.13 RC-specific conclusions

The RC is operating at an outstanding level.

2.14 Preliminary findings in the Panel-specific feedback

Panel-specific feedback

The (meta-)evaluation is based solely on the documentation provided.

Quality in research and doctoral training

- **Research focus.** The RC is operating at an outstanding level.

3 Appendices

- A. Original evaluation material
 - a. Registration material – Stage 1
 - b. Answers to evaluation questions – Stage 2
 - c. List of publications
 - d. List of other scientific activities
- B. Bibliometric analyses
 - a. Analysis provided by CWTS/University of Leiden
 - b. Analysis provided by Helsinki University Library (66 RCs)



International evaluation of research and doctoral training
at the University of Helsinki 2005-2010

RC-SPECIFIC MATERIAL FOR THE PEER REVIEW

NAME OF THE RESEARCHER COMMUNITY:

Analysis and Dynamics (ANDY)

LEADER OF THE RESEARCHER COMMUNITY:

Professor Antti Kupiainen, Department of Mathematics and Statistics, Faculty of Science

RC-SPECIFIC MATERIAL FOR THE PEER REVIEW:

- Material submitted by the RC at stages 1 and 2 of the evaluation
 - STAGE 1 material: RC's registration form (incl. list of RC participants in an excel table)
 - STAGE 2 material: RC's answers to evaluation questions
- TUHAT compilations of the RC members' publications 1.1.2005-31.12.2010
- TUHAT compilations of the RC members' other scientific activities 1.1.2005-31.12.2010
- Web of Science(WoS)-based bibliometrics of the RC's publications data 1.1.2005-31.12.2010 (analysis carried out by CWTS, Leiden University)

NB! Since Web of Science(WoS)-based bibliometrics does not provide representative results for most RCs representing humanities, social sciences and computer sciences, the publications of these RCs will be analyzed by the UH Library (results available by the end of June, 2011)



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

1 RESPONSIBLE PERSON

Name: Kupiainen, Antti

E-mail:

Phone: 19151482

Affiliation: Department of Mathematics and Statistics

Street address: P.O.Box 68, 00014

2 DESCRIPTION OF THE PARTICIPATING RESEARCHER COMMUNITY (RC)

Name of the participating RC (max. 30 characters): Analysis and Dynamics

Acronym for the participating RC (max. 10 characters): ANDY

Description of the operational basis in 2005-2010 (eg. research collaboration, joint doctoral training activities) on which the RC was formed (MAX. 2200 characters with spaces): Analysis and Dynamics RC is formed around the Helsinki group of Academy of Finland Center of Excellence in Analysis and Dynamics.

The RC contains apart from the CoE members some senior and several junior researchers who work on closely related fields of Analysis and collaborate in research with the CoE and in doctoral training within the graduate school of Mathematics and Applications.

3 SCIENTIFIC FIELDS OF THE RC

Main scientific field of the RC's research: natural sciences

RC's scientific subfield 1: Mathematics

RC's scientific subfield 2: --Select--

RC's scientific subfield 3: --Select--

RC's scientific subfield 4: --Select--

Other, if not in the list:

4 RC'S PARTICIPATION CATEGORY

Participation category: 1. Research of the participating community represents the international cutting edge in its field

Justification for the selected participation category (MAX. 2200 characters with spaces): The RC is formed around around the Academy of Finland Center of Excellence in Analysis and Dynamics which combines top researchers in Finland in Analysis and its applications in mathematical physics and mathematical biology.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

The group includes one Academy Professor, one European Research Council (ERC) Advanced grant, one Finland Distinguished Professor (FiDiPro), and three Academy of Finland 5-year research fellows. Four of its members have been invited speakers at ICM (International Congress of Mathematicians).

5 DESCRIPTION OF THE RC'S RESEARCH AND DOCTORAL TRAINING

Public description of the RC's research and doctoral training (MAX. 2200 characters with spaces): Our group consists of international leaders in the fields of complex analysis, geometric measure theory, mathematical physics and mathematical biology.

We have a common interest in the theme of dynamics, which includes models of deterministic and stochastic dynamics and the geometric study of their attractors. This is one of the central fields in modern mathematics and one of the most central in applications.

One of our main goals is to develop a new culture in Finnish mathematics that encourages collaboration between different fields in pure mathematics and connects the highest level of pure mathematics with applications. As has been seen in numerous cases, this will also have an invigorating effect on pure mathematics. Indeed, the whole modern theory of dynamical systems is a prime example of such fruitful interaction between pure theory and real world applications. Our group is truly interdisciplinary and provides a framework for pure mathematicians to contribute to problems of mathematical physics and biology as well as to more practical applications.

We have renewed also our researcher training. A broad cultural background is becoming more and more essential even in pure mathematics. Finnish PhD students in mathematics traditionally specialize very early in their career and often lack the capacity to enter new fields or acquire unfamiliar tools even when this would be useful. We want to change this by offering them a broad education. The presence of applied fields in our group will also improve the job opportunities of pure mathematics students.

We have created a research and researcher training centre in Helsinki of top international level which can compete for the best PhD students and post-docs in our fields on the market. The individual groups are of highest level in their fields and by bringing them together we have reached the critical mass. The members have strong international collaboration networks with top researchers in the world in their respective fields, for example with two recent Fields medal recipients. This has facilitated student and post-doc mobility to and from Finland.

Significance of the RC's research and doctoral training for the University of Helsinki (MAX. 2200 characters with spaces): The RC is one of the top research units in UH.

It has attracted plenty of external research funding to UH. This includes funding from the Academy of Finland (Center of Excellence, Academy Professor positions, FiDiPro position, Academy researcher and post-doc positions) and the European Union (European Research Council Advanced grant and EU research network).



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

Within the UH the group has collaboration with the Climate Science group of Zilitinkievich at the Physics department and the Metapopulation Ecology group of Hanski at the Biosciences campus.

With its active doctoral training program and close connections to the graduate school of Analysis it is a major PhD training unit in mathematics in Finland.

Keywords: Analysis, dynamics, mathematical physics, mathematical biology

6 QUALITY OF RC'S RESEARCH AND DOCTORAL TRAINING

Justified estimate of the quality of the RC's research and doctoral training at national and international level during 2005-2010 (MAX. 2200 characters with spaces): The quality of the research of the RC can be inferred in part from the grants it has received on the national and international level. During the past 5 years these include:

- Academy of Finland Center of Excellence in Analysis and Dynamics,
- Academy Professorships (Astala, Kupiainen),
- European Research Council (ERC) Advanced researcher grant (Kupiainen),
- Finland Distinguished Professor (FiDiPro) grant (T. Iwaniec),
- EU network Conformal Dynamics (Astala)
- Presently three Academy of Finland 5-year research fellow grants (Hytönen, Lukkarinen, Kytölä)
- Presently three Academy of Finland 3-year post-doc grants (Stenlund, Korte, Pankka)

Recent research achievements include:

A breakthrough in understanding of conformally invariant random curves

The solution of long-standing open problem on the optimal regularity of mappings of exponential distortion



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

–

The first proof of the convergence of the original Adaptive Metropolis Algorithm for unbounded targets

–

Solution of the general linear dependence conjecture for A_p -weights.

Establishing linearized stability for a general class of structured population models

Quality of researcher training:

Our students have been successful. A. Kemppainen got a post-doc position in Paris with the Fields medalist W. Wener and collaborated with the Fields Medalist S. Smirnov (Geneva). K. Kytölä was a post doc with S. Smirnov. M. Stenlund got a post-doc position at the prestigious Courant Institute at NYU. Luiro, Stenlund and Kemppainen received Rolf Nevanlinna Institute prizes for best PhD thesis. Kytölä got Academy 5-year position and Pankka and Stenlund 3-year positions.

We have engaged in renewing mathematics PhD education by organizing intensive courses in new active fields by top international mathematicians.

There have been 7 such courses during the past 3 years.

Comments on how the RC's scientific productivity and doctoral training should be evaluated (MAX. 2200 characters with spaces): To evaluate the quality of our research one should consult international top mathematicians in our fields. Bibliometric studies are not sufficient for this.

To evaluate the quality of our researcher training one should consider the careers of our recent PhD's and the number and quality of the special courses given by leading foreign experts that we have organized.

We publish in the best journals of our fields in pure mathematics, mathematical physics and mathematical biology.

LIST OF RC MEMBERS

NAME OF THE RESEARCHER COMMUNITY:			ANDY		
RC-LEADER			A. Kupiainen		
CATEGORY			1		
	Last name	First name	PI-status (TUHAT, 29.11.2010)	Title of research and teaching personnel	Affiliation
1	Ajanki	Oskari		Doctoral candidate	
2	Ala-Mattila	Vesa		Doctoral candidate	
3	Arponen	Heikki		Doctoral candidate - Postdoctoral Researcher	
4	<i>Astala</i>	<i>Kari</i>	X	<i>Professor</i>	UH
5	Bandyopadhyay	Jogia		Postdoctoral Researcher	UH
6	Boldin	Barbara		Postdoctoral Researcher	UH
7	Chousionis	Vasileios		Doctoral candidate - Postdoctoral Researcher	
8	Clark	Jeremy		Postdoctoral Researcher	UH
9	Clop	Albert		Postdoctoral Researcher	UAB
10	Costea	Serban		Postdoctoral Researcher	EPFL
11	Cristina	Jan		Doctoral candidate	
12	De Roeck	Wojcieh		Postdoctoral Researcher	U Heidelberg
13	Dhirasakdanon	Thanate		Postdoctoral Researcher	UH
14	Diekman	Odo		Visiting professor	UU
15	Dubois	Loic		Postdoctoral Researcher	UH
16	Eskola	Hanna		Doctoral candidate	
17	Fang	Chun		Doctoral candidate	
18	Faraco	Daniel		Postdoctoral Researcher	UAM
19	Filin	Ido		Postdoctoral Researcher	UH
20	<i>Geritz</i>	<i>Stefan</i>		<i>University Lecturer</i>	UH
21	<i>Gyllenberg</i>	<i>Mats</i>	X	<i>Professor</i>	UH
22	Harju	Antti		Doctoral candidate	
23	Harjulehto	Petteri		Postdoctoral Researcher	UH
24	<i>Holopainen</i>	<i>Ilkka</i>	X	<i>Professor</i>	UH
25	Hovila	Risto		Doctoral candidate	
26	Hurri-Syrjänen	Ritva		University Lecturer	UH
27	<i>Hytönen</i>	<i>Tuomas</i>	X	<i>Academy research fellow</i>	UH
28	Iwaniec	Tadeusz		FIDIPRO professor	UH
29	Joensuu	Jani		Doctoral candidate	
30	Jääskeläinen	Jarmo		Doctoral candidate	
31	Karonen	Ilmari		Doctoral candidate	
32	Kempainen	Antti		Doctoral candidate - Postdoctoral Researcher	
33	Kempainen	Mikko		Doctoral candidate	
34	<i>Kisdi</i>	<i>Eva</i>		<i>University Researcher</i>	UH
35	<i>Koivisto</i>	<i>Juhani</i>		Doctoral candidate	
36	Korte	Riikka		Postdoctoral Researcher	UH
37	<i>Kupiainen</i>	<i>Antti</i>	X	<i>Professor</i>	UH
38	<i>Kytölä</i>	<i>Kalle</i>	X	<i>Doctoral candidate - Academy research fellow</i>	UH
39	Laine	Kim		Doctoral candidate	
40	Lehto	Saara		Doctoral candidate	
41	Lindberg	Sauli		Doctoral candidate	
42	Lipponen	Henri		Doctoral candidate	
43	Liu	Xiaoli		Doctoral candidate	
44	Llorente	Marta		Postdoctoral Researcher	JYU
45	Luiro	Hannes		Doctoral candidate	
46	<i>Lukkarinen</i>	<i>Jani</i>	X	<i>Academy reserch fellow</i>	UH
47	Marin	Laurent		Doctoral candidate	
48	Marola	Niko		Postdoctoral Researcher	UH
49	Martin	Jussi		Doctoral candidate	
50	<i>Mattila</i>	<i>Pertti</i>	X	<i>Professor</i>	UH
51	Mei	Peng		Doctoral candidate	
52	Metz	Johan Anton J.		Visiting Professor	Leiden
53	Meyer	Daniel		Postdoctoral Researcher	UH
54	<i>Mickelsson</i>	<i>Jouko</i>	X	<i>Professor</i>	UH
55	Miihkinen	Santeri		Doctoral candidate	
56	<i>Muratore-Ginanneschi</i>	<i>Paolo</i>		<i>University Researcher</i>	UH
57	Nieminen	Pekka		Doctoral candidate - Postdoctoral Researcher	
58	Nikula	Miika		Doctoral candidate	
59	Orponen	Tuomas		Doctoral candidate	
60	Paajanen	Pirita		Postdoctoral Researcher	UH
61	Pakkanen	Mikko		Doctoral candidate	
62	Pankka	Pekka		Doctoral candidate - Postdoctoral Researcher	UH
63	Perälä	Antti		Doctoral candidate	

64	Prause	Istvan		Doctoral candidate - Postdoctoral Researcher	UH
65	Priklopil	Tadeas		Doctoral candidate	
66	Roto	Elina		Doctoral candidate	
67	Sahlsten	Tuomas		Doctoral candidate	
68	<i>Saksman</i>	<i>Eero</i>	X	<i>Professor</i>	UH
69	Service	Robert		Doctoral candidate	
70	Soto	Tomas		Postdoctoral Researcher	UH
71	Soultanis	Elefterios		Doctoral candidate	
72	<i>Taskinen</i>	<i>Jari</i>	X	<i>University Lecturer</i>	UH
73	Tiimonen	Mika		Doctoral candidate	
74	Toth	Peter		Postdoctoral Researcher	Budapest
75	Tuovinen	Riikka		Doctoral candidate	
76	<i>Tylli</i>	<i>Han-Olav</i>	X	<i>University Lecturer</i>	UH
77	Tähtinen	Vesa		Doctoral candidate	
78	Uriarte-Tuero	Ignacio		Postdoctoral Researcher	Umissouri
79	Utz	Margarete		Doctoral candidate	
80	Wang	Yi		Postdoctoral Researcher	UH
81	Webb	Christian		Doctoral candidate	
82	Vihola	Matti		Postdoctoral Researcher	JYU
83	<i>Vilonen</i>	<i>Kari</i>		<i>Visiting professor</i>	UH, Northwestern
84	Vähäkangas	Aleksi		Doctoral candidate - Postdoctoral Researcher	UH
85	Vähäkangas	Antti		Doctoral candidate - Postdoctoral Researcher	UH
86	Yan	Ping		Postdoctoral Researcher	UH
87	Laitila	Jussi		Doctoral candidate	Univerity of Essex
88	Talponen	Jarno		Doctoral candidate	Aalto Univerity
89	Virtanen	Jani		Postdoctoral Researcher	New York University
90	Stenlund	Mikko			New York University, Courant Institute



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

BACKGROUND INFORMATION

Name of the RC's responsible person: Kupiainen, Antti

E-mail of the RC's responsible person:

Name and acronym of the participating RC: Analysis and Dynamics, ANDY

The RC's research represents the following key focus area of UH: 7. Eksakti ajattelu – Exact thinking

Comments for selecting/not selecting the key focus area: Our field is mathematics which fits very well to "exact thinking". Our group contains also mathematical

physicists and mathematical biologists so focus areas 1 and 2 are also relevant for us.

1 FOCUS AND QUALITY OF RC'S RESEARCH (MAX. 8800 CHARACTERS WITH SPACES)

- **Description of the RC's research focus, the quality of the RC's research (incl. key research questions and results) and the scientific significance of the RC's research for the research field(s).**

RESEARCH FOCUS OF THE RC

We have set as our mission to develop a new culture in Finnish mathematics that encourages collaboration between different fields in pure mathematics and connects the highest level of pure mathematics with applications.

The RC's research focus is in analysis and its applications in mathematical physics and mathematical biology. In analysis the focus lies in geometric and harmonic analysis and geometric measure theory. In mathematical physics we work in random systems and mathematical aspects of non-equilibrium statistical mechanics and quantum field theory. In mathematical biology the focus is in adaptive and evolutionary dynamical systems. Unifying themes for the pure and applied work are dynamical systems theory and aspects of random geometry.

Present research directions include:

Random geometry: Theory of conformally invariant random curves in the plane, especially SLE and its connection to discrete models and the theory of random conformal welding.

Geometric measure theory: Analysis in the Heisenberg group. Singular integrals and Fourier analytic methods in geometric measure theory.

Geometric analysis: Calculus of variations and minimization of non-convex energy functionals with applications to geometry and rigidity of microstructures. Geometric methods in impedance tomography.

Mappings of finite distortion. Nonlinear potential theory.

Harmonic analysis: Weighted estimates for singular integrals and vector-valued harmonic analysis. Non-linear Calderon-Zygmund theory.

Mathematical physics: Derivation of diffusion from reversible dynamical systems. Approach to equilibrium in classical and quantum dynamical systems. Derivation and analysis of Boltzmann equations. Applications of gerbes and twisted K-theory to quantum field theory.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

Mathematical biology: Theory of structured population dynamics and theory of attractors in monotone random dynamical systems.

Applied research: Adaptive MCMC. Applications of 2d turbulence to atmospheric science.

QUALITY OF RESEARCH

Our group is a leader internationally in the field of quasi-conformal mappings (a leading figure in the field, T. Iwaniec joined us for 5 years), mathematical statistical mechanics where we were granted the highly competitive ERC advance grant and geometric measure theory.

Our articles have appeared in the best journals of pure and applied mathematics (Annals of Mathematics, Acta Mathematica, Inventiones, Commun. Pure Appl. Math.) and in the leading journals of the fields of biology, physics, and statistics (Science, Phys. Rev. Lett., Physics Reports, Commun. Math. Phys., J. Stat. Phys., J. R. Stat. Soc. Ser. B, J. Math. Biol., Ecology, Evolution).

We have appeared as invited and plenary speakers in main conferences of our fields, including the ICM (once in 2005-2010, 6 times altogether) and Seminaire Bourbaki. Our foreign collaborators are major figures in our fields, including three recent Fields medalists.

We have received major grants in the national and international level. During the past 5 years these include:

- Two Academy of Finland Centers of Excellence
- Two Academy Professorships
- European Research Council (ERC) Advanced Researcher grant
- Finland Distinguished Professor (FiDiPro) grant
- Industrial grants (TEKES, TT)
- EU and ESF networks: see section 5
- Three Academy of Finland 5-year research fellow grants
- Five Academy of Finland 3-year research fellow grants

SCIENTIFIC SIGNIFICANCE AND INNOVATIVENESS OF RESEARCH

We work on important and timely problems in our fields. Conformal and geometric methods play an increasing role in nonlinear analysis, stochastic methods in analysis in general and Fourier analysis in geometric measure theory. Non-equilibrium and transport problems are topical in mathematical physics as are adaptive and competitive dynamics in mathematical biology. In all these fields and many others the members of the group have a significant impact on the international level. By bringing together pure mathematicians of the highest caliber with mathematical physicists and biologists we are in a unique position to make real advances in the latter fields as well as to bring new ideas to pure mathematics. The expertise of the analysts and mathematical physicists in deterministic and stochastic dynamics is of genuine help to the mathematical biology group. Likewise, joining leading complex analysts with experts in statistical mechanics is precisely what is needed in the hot topic of random geometry.

Some highlights of our research during 2005-2010 are:

- A breakthrough in understanding of conformally invariant random curves through conformal welding
- Solution of the fundamental Calderon problem in impedance tomography
- Solution of a long-standing open problem on the optimal regularity of mappings of exponential distortion



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

- Derivation of diffusion from microscopic deterministic theories
- The first proof of the convergence of the original Adaptive Metropolis Algorithm for unbounded targets
- Solution of the general linear dependence conjecture for Ap-weights in singular integrals.
- Basic geometric measure theory in Heisenberg groups with connections to singular integrals
- Establishing linearized stability for a general class of structured population models
- Proof of the codimension-three conjecture

These are internationally recognized achievements that have led to the establishment of new methods and opened new research areas.

SOCIETAL IMPACT OF RESEARCH

Our work has impact on physics and biology as well as on more applied fields and society. Research in population dynamics and adaptive dynamics is connected to and to an extent also motivated and inspired by current problems in conservation biology (the conservation of endangered species), the control of spread of infectious diseases like malaria and avian flu, and the implementation of vaccination programmes against childhood diseases.

Understanding and controlling turbulence is extremely important for a wide range of technological applications. Results in this field can be of great interest to industry, and we investigated this in an industrial (TEKES) project involving several industrial partners from major corporations in processing industry.

Our theoretical work on two dimensional turbulence is relevant for understanding atmospheric energy spectra and has led to a collaboration at the Finnish Meteorological Institute (FMI).

Our theoretical work on MCMC methods has been applied in other sciences (e.g. [Efficient quantum memory for light', Nature 465 (2010), 1052--1056] and in various practical applications. It has led to a project with the Finnish Meteorological Institute in weather and climate predictability.

Finally the main areas of our research are prominent in two the Research focus areas of the Faculty of Science of Helsinki University (dynamical systems and mathematical analysis).

• **Ways to strengthen the focus and improve the quality of the RC's research.**

Finnish mathematics has traditionally been analysis centered. However, in recent years new active fields have emerged in the border between analysis-algebra-geometry. We should take steps in improving our expertise in these fields. For this reason a leading figure in representation theory K. Vilonen (Northwestern U.) has joined our RC as an external member and spends yearly two months with us. We hope this will lead to the creation of a new generation of researchers that will complement our expertise. An example is our member P. Paajanen. She got her PhD in Oxford and joined us as an Academy of Finland postdoc.

We believe a cutting edge research center with an international atmosphere is an attractive career choice for the talented students. However, there are also obstacles. The prospect for a long battle for tenure coupled with the increasing bureaucratic pressures on senior researchers' time are facts that make the university career less attractive for the best students. We need to be more active towards the university administration to counter these tendencies.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

2 PRACTISES AND QUALITY OF DOCTORAL TRAINING (MAX. 8800 CHARACTERS WITH SPACES)

- How is doctoral training organised in the RC? Description of the RC's principles for recruitment and selection of doctoral candidates, supervision of doctoral candidates, collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes, good practises and quality assurance in doctoral training, and assuring good career perspectives for the doctoral candidates/fresh doctorates.

Our RC aims to provide for young researchers an interdisciplinary environment for learning and research that will be internationally competitive and able to attract also some of the best students in Europe and elsewhere. Our goal is to renew the researcher training in mathematics. Finnish PhD students in mathematics traditionally specialize very early in their career and often lack the capacity to enter new fields or acquire unfamiliar tools even when this would be useful. We want to change this by offering them a broad education which we think is nowadays essential also in pure mathematics (see e.g. <http://wiki.helsinki.fi/display/huippu/Courses>). The presence of applied fields in our group also improves the job opportunities of pure mathematics students.

RECRUITMENT AND SELECTION OF DOCTORAL CANDIDATES

Our aim is to attract the best mathematics students to work in the CoE. A relatively large fraction of them can expect a career in academia and will eventually form a significant part of the next generation of Finnish university mathematicians. This is our primary task. However, we also expect to attract mathematically oriented physics and biology students. Especially for the latter there is a constantly growing demand as biology is becoming more and more quantitative.

We recruit students actively by

- Offering summer internships for promising second to fourth year undergraduates who do their bachelor or master degree in our supervision and then continue with us on PhD.
- Giving attractive advanced undergraduate level courses. These attract also good students from other fields and institutions (physics, biology, Institute of Technology) some of which end up doing PhD with us.
- An important part of recruitment is to attract talented high school students to study mathematics. We have been active in building up and running a center at the department for this. We encourage our senior and junior members to give talks in a special club for high school students at the department as well as in some Helsinki area high schools.

By engaging the students early (i.e. before the master's degree) into our research groups we are able to select better the ones that are suitable for PhD work.

SUPERVISION OF DOCTORAL CANDIDATES

Supervision of PhD students is done by actively engaging them in our research groups. Besides the actual thesis supervision by the adviser our students participate in the weekly research seminars (there are five of them) and are encouraged to form among themselves journal clubs and reading circles which foster a co-operation and a sense of community among them.

We offer a wide range of graduate courses in our fields and encourage our students to profit from this by avoiding too early specialization. In particular, during the past three years we have organized 8 intensive courses in new active fields by top international mathematicians. These courses have been highly popular among our students and have already had an effect in widening their perspectives.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

We encourage our students to establish international contacts via working visits abroad and via participation at significant international conferences. PhD-students are requested to participate in at least one international summer school. We strongly encourage our students to take post-doc positions abroad. Mobility of our young researchers is facilitated by our excellent international collaboration network.

COLLABORATION WITH GRADUATE SCHOOLS, FACULTY, DEPARTMENT

We collaborate in researcher training with three graduate schools in our fields where our members are in prominent positions:

- The Finnish National Graduate School in Mathematics and its Applications combines seven Finnish universities. Its director H-O Tylli and its research coordinator P. Nieminen are members of our RC. Its board has two members (K. Astala, H-O Tylli) from our RC.
- Graduate School in Computational Biology, Bioinformatics, and Biometry consists of research groups in four Finnish universities developing computational, mathematical, and statistical methods and models for biological sciences. Mats Gyllenberg from our RC is in the board of the school.
- Finnish Doctoral Program in Computational Sciences is a network of 22 departments in 9 universities in Finland which acts as a channel for cooperation in research and thesis supervision in computational sciences. M. Gyllenberg is one of the six board members of the school and A. Kupiainen a member of the Board of Advisors.

All three schools recruit graduate students and organize intensive courses. They are very important for the Ph.D. training in the RC and in particular for the national contacts of the graduate students of the RC between other Finnish universities.

Together with the HU Physics Department we have created a joint mathematical physics program which coordinates courses and thesis (master and PhD) advising for students specializing in mathematical physics in either department.

GOOD PRACTICES AND QUALITY ASSURANCE

We follow the following practices to assure our goals in the training of our students:

- beginning PhD students make a study plan with their advisor. We encourage a broad education instead of too early specialization
- the students act as a teaching assistants in our specialized courses
- the students take part in the weekly seminar of their research group and give talks there
- the students take part in our joint seminars and intensive courses and workshops
- the students are required to participate in at least one international summer school and are encouraged to do working visits to our foreign collaborators
- to assure the quality of the PhD thesis we choose as opponents in the thesis defense prominent foreign mathematicians (e.g. during the last 5 years we had one recent Fields medalist).

ASSURING GOOD CAREER PERSPECTIVES

The high level of research and good international connections provide our students good perspectives for a research career and many of them have successfully done this.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

During 2005-2010 several of our students have obtained post-doc positions in leading international centers (e.g. with two recent Fields medalists in Paris and in Geneva, at Harvard, NYU, Rutgers, Ann Arbor and others). They have received several prizes for best PhD thesis, and won competitive Academy of Finland 5 and 3 year researcher positions.

The applied projects in our group provide also good springboards towards industrial applied mathematics. We put special emphasis on combining pure and applied mathematics and on interdisciplinary training. This background will help our students to find jobs also as applied mathematicians in industry. Our recent post doc N. Brannström got a job as Software Engineer at Siemens PLM Software in Cambridge, UK. Our recent PhD's have obtained jobs at major software companies (e.g. F-Secure), science administration (ISER, UK), applied technological research (VTT) etc.

In general, we devote special care to forge a friendly and supportive environment for our students. Mentoring is offered to help our students in the planning of their future careers in academia as well as in business and industry. By encouraging our students to avoid early specialization, by encouraging mobility within the groups partaking the RC and possibly even to foreign institutions or towards industry we prepare them for their future life.

- RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.

Our strengths:

- strength of our research
- our diverse community with 5 research seminars integrating the students
- strong international network with top foreign specialists giving regularly crash courses
- strong presence in three national graduate schools
- good balance of pure mathematics and applications
- rigorous quality control of PhD thesis

Challenges:

Finland has strongly increased the production of PhD's during the last decade. This carries the risks of reduced quality and difficulties in employment. We have so far been able to avoid this: our PhD's have been highly qualified and they have had no problem in finding employment. However, we need to keep vigilant.

Another challenge is the current trend to restrict the PhD studies to 4 years. This favors working on small easy problems in contrast to concentrated work on harder ones. Avoiding this makes high demands on advising.

Finally the Graduate schools have 3 year periods which poses problems for continuity. Similarly the CoE has to have a good exit strategy so that students don't get abandoned.

3 SOCIETAL IMPACT OF RESEARCH AND DOCTORAL TRAINING (MAX. 4400 CHARACTERS WITH SPACES)

- Description of how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).

The main emphasis of the RC is in pure mathematics, and thus a major societal impact of the research and doctoral training of the RC comes from the dissemination of mathematical knowledge, mathematical skills and know-how transfer. The most effective knowledge transfer mechanism in an advanced economy is the output of highly educated persons. We regard as a major part of our



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

mission, alongside the generation of cutting edge research, the formation of such people in different areas of mathematics, who may later also flow into industry and the public services.

The general skills acquired during PhD studies in mathematics are in high demand. As concrete examples of such career paths we have e.g. our recent post doc N. Brännström, who is currently employed as Software Engineer at Siemens in Cambridge, UK. Our recent PhDs have obtained jobs at major software companies (e.g. V. Hakulinen at F-Secure), science administration (J. Laitila at ISER, UK), applied technological research (T. Korviola at VTT) etc. Other typical non-academic careers of our PhDs include banks and insurance companies.

The fundamental research carried out within the RC also includes applications of high societal impact. For instance, the MCMC methods developed in the RC have important applications in a large spectrum of areas such as remote sensing or tomography. In particular, the RC has here joint projects with the Finnish Meteorological Institute (FMI) in weather and climate predictability. Similarly the understanding of 2d turbulence is of extreme relevance for unveiling the physical processes underlying measured atmospheric energy spectra, which also has led to a joint project with FMI. Other recent collaborations on problems of practical interest have been with Nokia Research and MTT Agrifood company.

- Ways to strengthen the societal impact of the RC's research and doctoral training.

The popularization of mathematics and its applications is one of the missions of the RC. Mathematicians have been less effective than other scientists in getting their message through the media, perhaps partly due to their traditional modesty, partly due to the more abstract nature of their subject. We have tried to change this e.g. by being actively present in the "Science Days" (main bi-annual science festival). In the recent festival we organized two sections on mathematics in everyday life. Other such activity includes articles in popular press, TV and radio appearances and lectures in the popular science center Heureka.

The RC has been helping the Helsinki high schools to organize joint programs with the purpose of attracting students with mathematical and scientific ambitions. Such courses are important for the development of science awareness among high school students and serve also as an opportunity for us to attract bright students to pursue studies in our fields.

4 INTERNATIONAL AND NATIONAL (INCL. INTERSECTORAL) RESEARCH COLLABORATION AND RESEARCHER MOBILITY (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the RC's research collaborations and joint doctoral training activities and how the RC has promoted researcher mobility.

The RC has an extensive collaboration network involving outstanding research centers from many countries, as evidenced by joint publications, ongoing research projects and regular research visits. The list of international collaborators includes main figures such as the Fields medalists Werner (postdoc Kempainen), Tao (projects with Astala, Saksman), Smirnov (postdoc Kytola, joint projects with Kupiainen, Kempainen, Prause, Astala) or leading harmonic analysts such as McIntosh, Lacey, Volberg (projects with Hytonen), P. Jones (projects with Kupiainen, Saksman, Astala) and so on. Altogether, the research collaboration in recent years is done with over 90 leading scientists worldwide.

Nationally, the RC has collaboration with practically every department of mathematics inside Finland, with Oulu a member of our CoE in Analysis and Dynamics. The interaction and collaboration with Finnish CoE in Inverse Problems is particularly close, including several key projects. The hiring of T. Iwaniec, an international star in conformal geometry, as a FIDIPRO professor to Helsinki has generated a



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

host of new activities. Collaboration with the FIDIPRO group of E. Aurell (Aalto University), projects on population models with I. Hanski's CoE, and collaboration with the Finnish Meteorological Institute (FMI) on climate models evidence further the depth and large spectrum of research collaboration of the RC.

The joint collaboration in doctoral training is based on two major elements, the Finnish National Graduate Schools and the Nordic, EU- and ESF-funded networks. We are prominent in the graduate school in Mathematics and its Applications, the Graduate School in Computational Biology, Bioinformatics, and Biometry and the Finnish Doctoral Programme in Computational Sciences, see Section 2.

As for the second element, during the evaluation period the RC has participated, with a member either the coordinator or a member of the steering group, in five EU - training networks, in six ESF-funded networks and two Nordforsk networks.

Promotion of Research mobility

The members of the RC make regularly visits to international research centers, from shorter visits to longer ones lasting a term or two. Conversely, the RC has attracted regularly leading seniors for longer periods and hired a number of international post doctoral researchers to Helsinki.

It is a fundamental policy of the RC that its PhD's educated at Helsinki make longer research visits abroad, from 6 months to 3 years. The list of such research visits is extensive, including e.g. Canberra, Paris, Oxford, Cambridge, Ann Arbor, Texas Austin, NYU, Vienna, Stockholm, Lund, Geneva, Bern.

An important and regular source of international collaboration is provided by the Mittag-Leffler Institute, whose theme years are participated annually by members of RC, with a member of RC also in the board of trustees of the institute.

In addition the RC promotes mobility of doctoral students by strongly encouraging and financially supporting their participation in schools, workshops and conferences.

- RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.

Our strength is the large and active network, which includes several long term collaborations with leading international researchers. This network and the conferences and other meetings that come with it provide a fruitful basis also for the career development of our younger members. Many of our PhD's have found superb post-doc positions there. However, it still remains a challenge for us to convince them even more to profit from these opportunities.

5 OPERATIONAL CONDITIONS (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).

RC is part of the Department of Mathematics and Statistics at the University of Helsinki, which is the largest mathematics department in Finland. The fairly new building, where the department is located, offers excellent physical conditions for research. Also the basic infrastructure such as offices, computing facilities, libraries, access to on-line databases and journals and communication facilities, is of good quality. The overall very high level of general scientific activity generated by various research groups



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

working at the department provides an ideal environment for our RC. For example, we have close connections and real collaboration with the other COE at our department. The mathematics library is the largest one in Finland.

Most of the senior members of the group are teaching regularly. Postdoctoral researchers are expected to teach on less regular basis, perhaps one course or two during the period, and the teaching duty of doctoral students is restricted only to giving a couple of exercise hours every second term. The average expected amount of lectures given by professors is reasonable, and overall the balance between class teaching loads and time for research is fairly satisfactory. Couple of the members of the group have had academy positions (like academy professorships, academy researcher positions, or ERC-grants) that have temporarily reduced their teaching loads.

In the last decade the state has strongly encouraged PhD production and the resulting extra PhD student supervision (together with an expanding master's degree supervision) has put strong demand on researchers' time with less time left for actual research. The funding of PhD's has become almost totally grant based, with resulting grant application burdens for the researchers. At the same time the university has moved also other administrative duties to researchers, e.g. in the form of the YPJ salary management system.

The biggest unit of the RC is the Centre of Excellence in Analysis and Dynamics. Its management structure is explained in part 6 below. Joint research work, both within the CoE and between the other analysis groups, joint supervision and visits of both trainees and the seniors to collaborators at other universities, both in Finland and abroad, is strongly supported. Members of the RC run five departmental seminars, and a use is made of some other seminars run at the department. RC participates in several graduate schools recruiting graduate students and organizing intense courses. Every fall and spring leading international experts give crash courses on areas of fairly general interest. Active daily discussions between different parts of the RC are further activated by sheer physical closeness at the department. The department of mathematics has a quite supportive attitude on our RC, as well as towards all scientifically active groups.

- RC's strengths and challenges related to operational conditions, and the actions planned for their development.

The operational conditions the RC are in general excellent, as described above. The largest challenge is to find enough time for the actual cutting edge research after all the time spent on writing research grant applications to support students and doing the administrative duties required by the university (the present evaluation provides yet another example of this!). Inside the RC bureaucracy is kept to a minimal level. An important concern related to the research environment is an incomplete coverage of the online mathematics journals provided by the library.

6 LEADERSHIP AND MANAGEMENT IN THE RESEARCHER COMMUNITY (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the execution and processes of leadership in the RC, how the management-related responsibilities and roles are distributed in the RC and how the leadership- and management-related processes support high quality research, collaboration between principal investigators and other researchers in the RC, the RC's research focus and strengthening of the RC's know-how.

RC is part of the Department of Mathematics and Statistics and thus under the general administration of the Department, its chair and board. In particular, the basic infrastructure such as offices, computing facilities, libraries, access to on-line databases and journals and communication facilities are taken care



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

as a part of the departmental infrastructure administration. The Faculty of Science is helpful for the funding administration. As RC consists of several independent smaller research units, there is no need for a common management and leadership and various parts are managed in different appropriate ways. However, these different subunits co-operate actively in many levels: in running common weekly seminars, in organization of international conferences (for example, Ahlfors centennial conference in 2007), in participation in EU-programs (for example, CODY and GALA).

The biggest unit is the Centre of Excellence in Analysis and Dynamics, a research program funded by the Academy of Finland, which includes also a research group at the University of Oulu. It is lead by its director Antti Kupiainen, vice director Eero Saksman and its executive committee comprising the additional four full professors, three of them in Helsinki (one in Oulu) The executive committee has appointed a coordinator Eva Kisdi, who is in charge of the daily operation of the CoE. The members of the executive committee hold regular meetings dealing with scientific and financial guidelines. Special attention is paid to joint research work and seminars, both within the CoE and between the other analysis groups, recruitment and equal opportunity hiring, researcher training on pre- and postdoctoral level, joint supervision and visits of trainees between research groups and participating universities, quality of dissertations, interdisciplinary education among the fields involved in the CoE, mobility of young researchers, and organisation of international events such as courses and symposia. Distribution and use of CoE funding is decided at the same meetings.

The senior researchers of the RC not belonging to CoE are in charge of the operation of their small research groups. Among these Ilkka Holopainen, Tuomas Hytönen, Jani Lukkarinen, Jouko Mickelsson and Jari Taskinen have research grants from the Academy of Finland for hiring graduate students and post doc researchers and for international research contacts.

Members of the RC run five departmental seminars, three in analysis, one in mathematical physics and one in biomathematics. The speakers vary from graduate students to the senior members and distinguished foreign scientists.

As mentioned earlier, the Finnish National Graduate School in Mathematics and its Applications, Graduate School in Computational Biology, Bioinformatics, and Biometry and Finnish Doctoral Program in Computational Sciences all have members of the RC in their boards. They are very important for the Ph.D. training in the RC and in particular for the national contacts of the graduate students of the RC between other Finnish universities.

- RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes.

The leadership and management within the RC is working well. It is kept as simple as possible without unnecessary bureaucracy. The challenges and difficulties come mainly from outside. The application for funds and the funding administration have become very complex, in particular for funding from EU and the Academy of Finland. This has become an almost unbearable time consuming burden for the responsible researchers. One problem is long-term planning in funding. Many graduate students must be funded by yearly grants from private foundations. The Academy grants are usually for four years (for the CoE six years). When they end, there is no guarantee of continuation.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

7 EXTERNAL COMPETITIVE FUNDING OF THE RC

- Listing of the RCs external competitive funding, where:
 - the funding decisions have been made during 1.1.2005-31.12.2010, and
 - the administrator of the funding is/has been the University of Helsinki
- Academy of Finland (AF) - total amount of funding (in euros) AF has decided to allocate to the RC members during 1.1.2005-31.12.2010: 10.150.000
- Finnish Funding Agency for Technology and Innovation (TEKES) - total amount of funding (in euros) TEKES has decided to allocate to the RC members during 1.1.2005-31.12.2010: 140.000
- European Union (EU) - total amount of funding (in euros) EU has decided to allocate to the RC members during 1.1.2005-31.12.2010: 410.000
- European Research Council (ERC) - total amount of funding (in euros) ERC has decided to allocate to the RC members during 1.1.2005-31.12.2010: 1.294.000
- International and national foundations – names of international and national foundations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
 - names of the foundations: Väisälän rahasto
 - Suomalainen Tiedeakademia
 - Suomen Kulttuurirahasto
 - Emil Aaltosen säätiö
 - Magnus Ehrnroothin säätiö
 - Jenny ja Antti Wihurin rahasto
 - Technology Industries in Finland Centennial Fund
 - Osk Huttusen säätiö
 - Suomen Lähi-idän instituutin säätiö
 - Golda Meir Trust Israel
 - Lady Davis Fellowship Trust Israel
 - HYN tutkimusmääräraha ja dosenttimatkaraha
 - Svenska tekniska vetenskapsakademien i Finland
 - total amount of funding (in euros) from the above-mentioned foundations: 783.700
- Other international funding - names of other international funding organizations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
 - names of the funding organizations: NSF (USA)
 - total amount of funding (in euros) from the above-mentioned funding organizations: 100.982USD
- Other national funding (incl. EVO funding and Ministry of Education and Culture funded doctoral programme positions) - names of other national funding organizations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
 - names of the funding organizations: Ministry of education



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

- Helsinki University 3 year funds
- The Finnish National Graduate School in Mathematics and its Applications
- ComBi/FICS graduate school
- COMAS graduate school
- total amount of funding (in euros) from the above-mentioned funding organizations: 1.570.000

8 RC'S STRATEGIC ACTION PLAN FOR 2011–2013 (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the RC's future perspectives in respect to research and doctoral training.

The core of future activity is naturally to continue and renew our research activity, as well as our program for renewing the doctoral training in Finnish mathematics. The basic structure and already successful mode of operation of the RC will stay as before. Our aim is to still increase the amount of international collaboration, and the international contacts of students and our postdocs. Steps for this direction include the planned for international conferences we will organize, and participation to research programs in international research centers, eg. a 'Random Geometry' -conference in Finland in 2012, and the IPAM program 'Interactions between analysis and geometry' in spring 2013. Moreover, we will encourage even more long-term postdoctoral visits to abroad, and also inside Finland. Also we work on to get more top-level foreign postdoc's to visit us for extended periods.

Our main research topics for 2011-2013 include:

Random Geometry. We will study one-dimensional and two-dimensional versions of the (Liouville) quantum gravity model. We hope to invoke methods of conformal geometry and our previous work on random quasi-conformal maps (joint with Steffen Rohde and Terry Tao). Both SLE and Liouville quantum gravity are highly topical areas and we are internationally well connected to make major contributions there. E.g. we have started new collaboration with S.Smirnov, and Steffen Rohde will join us for the fall 2011.

Harmonic and Geometric Analysis. Analysis in Heisenberg and more general Lie groups is a new topic where extensive research is planned on basic questions of geometric measure theory and its relations to harmonic analysis. This will involve cooperation with several experts in different areas such as Heisenberg geometry, singular integrals and geometric measure theory. Also, we will study, via probabilistic approximation techniques, singular integrals in borderline situations, including two-weight inequalities.

Nonlinear PDE's and Deformations. The challenging problems here include the celebrated conjecture of Morrey, stating that in the two-dimensional target space the rank-one convex functionals are quasiconvex. This topic is a central one among the joint research programs with our new FiDiPro professor Tadeusz Iwaniec.

Mathematical Physics. The problem of how diffusion arises from deterministic dynamics is one of the most fundamental ones in mathematical physics and still mostly open. We study this in the context of classical extended dynamics and in the quantum context. An exciting and hot new topic is diffusion for random band matrices where we believe our renormalization ideas could be applicable. Also, we will study Quantum (q -) deformations of Dirac operators associated to loop groups.

Mathematical Biology. On the theoretical side a new initiative is to provide the fundamental theory of attractors in Monotone Random Dynamical Systems applied to various specific cooperative/competitive models. Another novel project is to solve Earnshaw and Keener's conjecture related to Markov jump



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

processes. On the applied side, we plan to apply our recent theory of structured population dynamics to models of fisheries and to parasite-host interactions. In adaptive dynamics, we seek new general results on stability and bifurcation structures, and apply the new methods to host-pathogen systems and to genetically explicit models of the origin of species.

Applied projects. In the context of Adaptive MCMC algorithms future goals include the extension of our convergence results to targets with slow decay and with no apriori smoothness. New intriguing directions of research are provided by study of the atmospheric turbulence and atmospheric spectra, and the application of MCMC-methods on climate research, all done within new collaborations with the Finnish Meteorological Institute.

Doctoral training will continue our fruitful philosophy of avoiding too early specialization -- our aim is to provide a wide mathematical background for our graduate students. We continue the successful series of intensive courses related to our research training initiative. Future lecturers include: N. Makarov (Caltech), M. Vergassola (Paris), L. Peliti (Napoli), A. Vulpiani (Rome) J. Bricmont (Louvain), C. Yoccoz (Paris) S. Rohde (Seattle), G. Roberts (Warw

9 SHORT DESCRIPTION OF HOW THE RC MEMBERS HAVE CONTRIBUTED TO THE COMPILATION OF THE STAGE 2 MATERIALS (MAX. 1100 CHARACTERS WITH SPACES).

The executive committee of the Analysis and Dynamics CoE acted as the coordinating body of the process. The evaluation questions were sent to all members for initial comments and suggestions. Based on these the committee drafted preliminary answers that were sent again for comments for everybody. These then formed the basis for the final version drafted by the committee. The whole evaluation process was of course a subject of active discussion in research group weekly meetings and daily discussions.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ANDY/Kupiainen

1 Analysis of publications

- Associated person is one of Oskari Ajanki , Vesa Ala-Mattila , Heikki Arponen , Kari
Astala , Jorgia Bandyopadhyay , Barbara Boldin , Vasileios Chousionis ,
Jeremy Clark , Albert Clop , Serban Costea , Jan Cristina ,
Wojcieh De Roeck , Thanate Dhirasakdanon , Odo Diekmann , Loic Patrick Marie
Joseph Dubois , Hanna Eskola , Chun Fang , Daniel Faraco , Ido Filin , Stefanus
Geritz , Mats Gyllenberg , Petteri Harjulehto , Ilkka Holopainen ,
Risto Matti Hovila , Ritva Hurri-Syrjänen , Tuomas Hytönen ,
Tadeusz Iwaniec , Jani Joensuu , Jarmo Jääskeläinen ,
Ilmari Karonen , Antti Kempainen , Mikko Kempainen , Eva Kiski ,
Juhani Alex Kasper Koivisto , Riikka Korte , Antti Kupiainen , Kalle
Kytölä , Kim Laine , Saara Maria Lehto , Sauli Lindberg , Henri
Lipponen , Xiaoli Liu , Marta Llorente , marta@ Hannes Luuro , Jani Lukkarinen ,
Laurent Marin , Niko Marola , Jussi Heikki Aleksi Martin , Pertti Mattila ,
Peng Mei , Johan Anton J. etz , Daniel Meyer , Jouko
Mickelsson , Santteri Miihkinen , Paolo Muratore Ginanneschi ,
Pekka J. Nieminen , Miika Pellervo Nikula , Tuomas Orponen , Pirita Maria
Paajanen , Mikko Pakkanen , Pekka Julius Pankka , Antti Ilmari Perälä ,
Istvan Prause , Tadeas Prikkopii , Suvi Elina Roto , Tuomas
Valtteri Aleksis Sahlsten , Eero Saksman , Robert Service , Tomas Soto ,
Elefterios Soultanis , Jari Taskinen , Miika Tiimonen , Imre
Toth , Riikka Marjut Tuovinen , Hans-Olav Tylli , Vesa Yrjö Antero Tähtinen ,
Ignacio Uriarte-Tuero , Margarete Utz , Yi Wang , Christian Webb ,
Vihola Matti , Kari Vilonen , Aleks Vähäkangas , Antti Ville Vähäkangas , Ping Yan , Jussi
Laitila , Jarmo Talponen , Jani Virtanen , Mikko Stenlund ,

Publication Year

Publication type	Publication Year						Total Count 2005 - 2010
	2005	2006	2007	2008	2009	2010	
A1 Refereed journal article	26	27	44	45	52	64	258
A3 Contribution to book/other compilations (refereed)	5	4	6	2	2	1	20
A4 Article in conference publication (refereed)	1	1	4	1	3	1	11
B1 Unrefereed journal article	2			1		1	4
B2 Contribution to book/other compilations (non-refereed)						1	1
B3 Unrefereed article in conference proceedings				1	1	1	3
C1 Published scientific monograph	3	9	11	7	10	11	51
C2 Edited book, compilation, conference proceeding or special issue of journal			2		1		3
D1 Article in professional journal	5	6	4	4	2	1	22
D4 Published development or research report					1		1
E1 Popular article, newspaper article					2		2



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ANDY/Kupiainen

2 Listing of publications

A1 Refereed journal article

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INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ANDY/Kupiainen

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UNIVERSITY OF HELSINKI

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ANDY/Kupiainen

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INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ANDY/Kupiainen

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INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
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- Taskinen, J, Virtanen, J **2010**, 'Toeplitz operators on Bergman spaces with locally integrable symbols', **Revista Matematica Iberoamericana**, vol 26, no. 2, pp. 693-706.
- Taskinen, J, Nazarov, S **2010**, 'On essential and continuous spectra of the linearized water-wave problem in a finite pond', **Mathematica Scandinavica**, vol 106, no. 1, pp. 141-160.
- Taskinen, J, Nazarov, SA, Ruotsalainen, K **2010**, 'Essential spectrum of a periodic elastic waveguide may contain arbitrarily many gaps', **Applicable Analysis**, vol 89, no. 1, pp. 109-124.
- Vilonen, K, Kashiwara, M **2010**, 'On the codimension-three conjecture', **Proceedings of the Japan Academy. Series A Mathematical Sciences**, vol 86, no. 9, pp. 154-158.
- Wang, Y, Xiao, M, Wu, SJ **2010**, 'A discussion on separability criteria', **Journal of University of Science and Technology of China**, vol 40, no. 3, pp. 239-244.
- de Roos, AM, Diekmann, O, Getto, P, Kirkilionis, MA **2010**, 'Numerical Equilibrium Analysis for Structured Consumer Resource Models', **Bulletin of Mathematical Biology**, vol 72, no. 2, pp. 259-297.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ANDY/Kupiainen

A3 Contribution to book/other compilations (refereed)

2005

Aksoy, AG, Tylli, H **2005**, 'Interpolation of the essential spectrum and the essential norm', in H Hudzik, J Musielak, L Skrzypczak (eds), **Orlicz Centenary Volume II, Banach Center publications, vol. 68, Polish Academy of Sciences, Institute of Mathematics, Warszawa**, pp. 9-18.

Gyllenberg, M, Jagers, P **2005**, 'Branching processes and structured population dynamics', in P Haccou, P Jagers, VA Vatutin (eds), **Branching Processes in Biology . Variation, Growth, Extinction ., Cambridge University Press**, pp. 94-106.

Gyllenberg, M **2005**, 'Metapopulations', in P Haccou, P Jagers, VA Vatutin (eds), **Branching Processes in Biology . Variation, Growth, Extinction ., Cambridge University Press**, pp. 249-265.

Harjulehto, P, Hästö, P, Koskenoja, M, Varonen, S **2005**, 'Variable Sobolev capacity and the assumptions on the exponent', in H Hudzik, J Musielak, L Skrzypczak (eds), **Orlicz Centenary Volume II, Banach Center publications, vol. 68, Polish Academy of Sciences, Institute of Mathematics, Warszawa**, pp. 51-59.

Kupiainen, A **2005**, 'Matematiikan suhteeton tehokkuus', **Suhteellista?, Yliopistopaino ja Tieteellisten seurain valtuuskunta, Helsinki**, pp. 284-296.

2006

Astala, K, Päivärinta, L **2006**, 'A boundary integral equation for Calderon's inverse conductivity problem', **Collectanea mathematica**, pp. 127-139.

Hytönen, T **2006**, 'Reduced Mihlin–Lizorkin multiplier theorem in vector-valued L_p spaces', in EKJVNBDPGS (ed.), **Partial Differential Equations and Functional Analysis. The Philippe Clément Festschrift., Operator Theory: Advances and Applications, vol. 168, Birkhäuser, Basel**, pp. 137-151.

Mickelsson, J **2006**, 'Gerbes and quantum field theory', in J Francoise, GL Naber, TS Tsun (eds), **Encyclopedia in Mathematical Physics, Elsevier, Amsterdam**.

Mickelsson, J **2006**, 'Star products and central extensions', in B Booß-Bavnbek (ed.), **Analysis, geometry and topology of elliptic operators, World Scientific cop., Hackensack, NJ**, pp. 401-410.

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Astala, K, Clop, A, Mateu, J, Orobitg, J, Uriarte-Tuero, I **2007**, 'Improved Painleve removability for bounded planar quasiregular mappings', in EA Gavosto, MK Korten, CN Moore, RH Torres (eds), **Harmonic analysis, partial differential equations, and related topics, Contemporary Mathematics, vol. 428, American Mathematical Society, cop., Providence, R.I.** pp. 1-12.

Diekmann, O, Gyllenberg, M, Metz, J **2007**, 'Physiologically structured population models: towards a general mathematical theory', in Y Takeuchi, Y Iwasa, K Sato (eds), **Mathematics for ecology and environmental sciences, Biological and Medical Physics, Biomedical Engineering, Springer, cop., Berlin**, pp. 5-20.

Diekmann, O, Gyllenberg, M **2007**, 'Abstract delay equations inspired by population dynamics', in H Amann, W Arendt et al. (eds), **Functional Analysis and Evolution Equations, Birkhäuser**, pp. 187-200.

Gyllenberg, M **2007**, 'Does modelling of complex biological systems require new types of mathematics?', **Systems biology, European Science Foundation, Brussels**, pp. 16-18.

Hytönen, T **2007**, 'Aspects of probabilistic Littlewood-Paley theory in Banach spaces', **Banach spaces and their applications in analysis, Walter de Gruyter, Berlin**, pp. 343-355.

Talponen, J **2007**, 'Asymptotically transitive Banach spaces', **Banach spaces and their applications in analysis, Walter de Gruyter, Berlin**, pp. 423-438.

2008

Astala, K, Iwaniec, T, Martin, G, Onninen, J **2008**, 'Schottky's theorem on conformal mappings between annuli: a play of derivatives and integrals', in M Agranovsky, D Bshouty, L Karp, S Reich, D Shoikhet, L Zalcman (eds), **Complex analysis and dynamical systems III. A Conference in Honor of the Retirement of Dov Aharonov, Lev Aizenberg, Samuel Krushkal, and Uri Srebro, January 2-6, 2006, Nahariya, Israel., Contemporary mathematics, vol. 455, American Mathematical Society, cop., Providence, RI**, pp. 35-39.

Kupiainen, A **2008**, 'Ergodic theory of SDE's with degenerate noise', **Stochastic analysis in mathematical physics, World Scientific cop., Hackensack, N.J.**, pp. 30-43.

2009

Dhirasakdanon, T, R. Thieme, H **2009**, 'Persistence of vertically transmitted parasite strains which protect against more virulent horizontally transmitted strains', in Z Ma, Y Zhou, J Wu (eds), **Modeling and Dynamics of Infectious Diseases, Series in Contemporary Applied Mathematics, vol. 11, World Scientific**, pp. 187-215.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ANDY/Kupiainen

Tylli, H 2009, 'Approximationsegenskaper hos Banach rum: en färgstark matematisk historia : föredrag hållet vid Finska Vetenskaps-Societetens sammanträde den 16 februari 2009', **Sphinx, Societas Scientiarum Fennica, Helsinki**, pp. 101-111.

2010

Hytönen, T 2010, 'Vector-valued extension of linear operators, and Tb theorems', in GCGMWR (ed.), **Vector Measures, Integration and Related Topics, Operator Theory: Advances and Applications**, vol. 201, **Birkhäuser, Basel**, pp. 245-254.

A4 Article in conference publication (refereed)

2005

Muratore Ginanneschi, P 2005, 'Optimal investment strategies and hedging of derivatives in the presence of transaction costs', in **Noise and Fluctuations in Econophysics and Finance**, **Proceedings of SPIE**, vol. 5848.

2006

Saksman, E, Tylli, H 2006, 'Multiplications and elementary operators in the Banach space setting', in **Methods in Banach space theory**, pp. 253-292 **London Mathematical Society Lecture Note Series**, no. 337.

2007

Holopainen, I, Pankka, P 2007, 'p-Laplace operator, quasiregular mappings and Picard-type theorems', in **Quasiconformal mappings and their applications**, pp. 117-150.

Hytönen, T 2007, 'Vector-valued singular integrals, and the border between the one-parameter and the multi-parameter theories', in **Proceedings of the Centre for Mathematics and its Applications**, 42, **Australian National University, Canberra**, 2007, pp. 11-41.

Kupiainen, A 2007, 'Statistical Theories of Turbulence', in **Random Media 2000**.

Mickelsson, J 2007, 'Twisted K-Theory, Twisted Cohomology, and Dirac Type Operators', in **Lie Theory and Its Applications in Physics**.

2008

Mickelsson, J 2008, 'From gauge anomalies to gerbes and gerbal actions', in **Motives, Quantum Field Theory, and Pseudodifferential Operators**, pp. 211-220 **Clay Mathematics Proceedings**, vol. 12.

2009

Boldin, B 2009, 'On the evolutionary dynamics of virulence', in **Proceedings of the 3rd Nordic EWM Summer School for PhD students in Mathematics (Anne-Maria Ernvall-Hytönen, Camilla Hollanti (eds.))**, pp. 43-60.

Kupiainen, A 2009, 'On the Derivation of Fourier's Law', in **New Trends in Mathematical Physics**, pp. 421-431.

Mattila, P 2009, 'Removability, rectifiability and singular integrals', in **Proceedings of the International Conference of Complex Analysis and Related Topics, Alba Iulia, Romania, 2008**, pp. 483-491.

2010

Hytönen, T, McIntosh, A 2010, 'Stability in p of the H^∞ -calculus of first-order systems in L^p ', in **Proceedings of the Centre for Mathematics and its Applications, Vol 44, Australian National University, Canberra, 2010**, pp. 167-181.

B1 Unrefereed journal article

2005

Gyllenberg, M 2005, 'Book review: [Differential equations and mathematical biology]', **Mathematical Biosciences**, vol 193, pp. 19-24.

Gyllenberg, M 2005, 'Book review: [Mathematics in population biology]', **Mathematical Biosciences**, vol 193, pp. 13-18.

2008

Gyllenberg, M 2008, 'Evolutionary suicide', **ERCIM news**, vol 73, pp. 18-18.

2010

Mattila, P 2010, 'Fraktaaligeometriaa ja matemaattista analyysiä', **Sphinx**, vol 2009-2010, pp. 63-68.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ANDY/Kupiainen

B2 Contribution to book/other compilations (non-refereed)

2010

Kinnunen, J, Korte, R **2010**, 'Characterizations for Hardy's inequality', in A Laptev (ed.), **Around the Research of Vladimir Maz'ya I, International Mathematical Series, Springer.**

B3 Unrefereed article in conference proceedings

2008

Mazzino, A, Muratore Ginanneschi, P, Musacchio, S **2008**, 'Scaling regimes of the 2d Navier-Stokes equation with self-similar stirring', in **ICTAM2008.**

2009

Hurri-Syrjänen, R **2009**, 'On Sobolev Spaces', in **Proceedings of the 3rd Nordic EWM Summer School for PhD Students in Mathematics**, pp. 89-118.

2010

Lukkarinen, J, Spohn, H **2010**, 'Decay of Equilibrium Time Correlations in a Weakly Nonlinear Schrödinger Equation', in **XVI International Congress on Mathematical Physics**, pp. 386-390.

C1 Published scientific monograph

2005

Holopainen, I, Lang, U, Vähäkangas, A **2005**, *Dirichlet problem at infinity on Gromov hyperbolic metric measure spaces*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 418 (2005), Helsinki.**

Laitila, J **2005**, *Composition operators and vector-valued BMOA*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 428 (2005), Helsinki.**

Prause, I **2005**, *A remark on quasiconformal dimension distortion on the line*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 429, Helsinki.**

2006

Costea, S **2006**, *Scaling invariant Sobolev-Lorentz capacity on $R[\text{sup } n]$* , **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 445, Helsinki.**

Englis, M, Taskinen, J **2006**, *Deformation quantization and Borel's theorem in locally convex spaces*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 432, Helsinki.**

Holopainen, I, Markvorsen, S, Palmer, V **2006**, *p-capacity and p-hyperbolicity of submanifolds*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 444, Helsinki.**

Laitila, J **2006**, *Weighted composition operators on BMOA*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 437, Helsinki.**

Mattila, P, Verdera, J **2006**, *Convergence of singular integrals with general measures*, **Reports in Mathematics / Department of Mathematics and statistics. University of Helsinki, no. 443, Helsinki.**

Nieminen, PJ **2006**, *Compact differences of composition operators on Bloch and Lipschitz spaces*, **Reports on Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 436, Helsinki.**

Pankka, P **2006**, *Slow quasiregular mappings and universal coverings*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 431, Helsinki.**

Talponen, J **2006**, *On asymptotic transitivity in Banach spaces*, **Reports in Mathematics / Department of Mathematics and statistics. University of Helsinki, no. 442, Helsinki.**

Taskinen, J **2006**, *Asymptotical behaviour of a class of semilinear diffusion equations*, **Reports in Mathematics / Department of Mathematics and statistics. University of Helsinki, no. 433, Helsinki.**

2007

Clop, A, Uriarte-Tuero, I **2007**, *Sharp nonremovability examples for Hölder continuous quasiregular mappings in the plane*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 468, Helsinki.**



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UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ANDY/Kupiainen

Costea, S 2007, *Besov capacity and Hausdorff measures in metric measure spaces*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 467, Helsinki.**

Costea, S 2007, *Sobolev capacity and Hausdorff measures in metric measure spaces*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 469, Helsinki.**

Gallardo-Gutierrez, EA, Gonzales, MJ, Nieminen, PJ, Saksman, E 2007, *On the connected component of compact composition operators on the Hardy space*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 464, Helsinki.**

Laitila, J, Tylli, H, Wang, M 2007, *Composition operators from weak to strong spaces of vector-valued analytic functions*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 450, Helsinki.**

Laitila, J, Laitila, J 2007, *Isometric composition operators on BMOA*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 461, Helsinki.**

Nazarov, SA, Sokolowski, J, Taskinen, J 2007, *Neumann Laplacian on a domain with tangential components in the boundary*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 472, Helsinki.**

Pakkanen, MS 2007, *Diffusion limits for endogeneous asset price fluctuations in a microstructural market model*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 470, Helsinki.**

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Talponen, J 2007, *Convex-transitivity and function spaces*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 473, Helsinki.**

Talponen, J, Talponen, J 2007, *Convex-transitive characterizations of Hilbert spaces*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 460, Helsinki.**

2008

Chousionis, V 2008, *Weak convergence of singular integrals*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 477, University of Helsinki, Helsinki.**

Chousionis, V, Mattila, P 2008, *Boundedness and convergence for singular integrals of measures separated by Lipschitz graphs*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 479, University of Helsinki, Helsinki.**

Gyllenberg, M, Silvestrov, DS 2008, *Quasi-stationary phenomena in nonlinearly perturbed stochastic systems*, **De Gruyter expositions in mathematics, no. v. 44, Walter de Gruyter, Berlin.**

Laitila, J, Tylli, H 2008, *Operator-weighted composition operators on vector-valued analytic function spaces*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 488, Helsinki.**

Mattila, P, Saaranen, P 2008, *Ahlfors-David regular sets and bilipschitz maps*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 484, University of Helsinki, Helsinki.**

Taskinen, J, Virtanen, J 2008, *Spectral theory of Toeplitz and Hankel operators on the Bergman space A^1* , **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 475, University of Helsinki, Helsinki.**

Taskinen, J, Virtanen, J 2008, *Toeplitz operators on Bergman spaces with locally integrable symbols*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 485, University of Helsinki, Helsinki.**

2009

Astala, K, Iwaniec, T, Martin, G 2009, *Elliptic Partial Differential Equations and Quasiconformal Mappings in the Plane*, **Mathematical Series, no. 48, Princeton University Press, cop..**

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Holopainen, I, Pigola, S, Veronelli, G 2009, *Global comparison principles for the p -Laplace operator on Riemannian manifolds*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 504, Helsinki.**

Iwaniec, T, V. Kovalev, L, Onninen, J 2009, *Doubly connected minimal surfaces and extremal harmonic mappings*, **arXiv e-prints.**

Llorente, M, Mattila, P 2009, *Lipschitz equivalence of subsets of self-conformal sets*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 502, Helsinki.**

Mattila, P, Serapioni, R, Serra Cassano, F 2009, *Characterizations of intrinsic rectifiability in Heisenberg groups*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 498, Helsinki.**

Pankka, P 2009, *Mappings of bounded mean distortion and cohomology*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 493, Helsinki.**



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UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ANDY/Kupiainen

Perälä, A, Taskinen, J, Virtanen, J **2009**, *Toeplitz operators with distributional symbols on Bergman spaces*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 503, Helsinki.**

Prause, I, Tolsa, X, Uriarte-Tuero, I **2009**, *Hausdorff measure of quasicircles*, **arXiv e-prints.**

Vähäkangas, A **2009**, *Dirichlet problem on unbounded domains and at infinity*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 499, Helsinki.**

2010

Astala, K, Iwaniec, T, Prause, I, Saksman, E **2010**, *Burkholder integrals, Morrey's problem and quasiconformal mappings*, **arXiv e-prints.**

Astala, K, Clop, A, Faraco, D, Jääskeläinen, J, Székelyhidi Jr, L **2010**, *Uniqueness of normalized homeomorphic solutions to nonlinear Beltrami equations*, **arXiv e-prints.**

Cristina, J, Iwaniec, T, V. Kovalev, L, Onninen, J **2010**, *The Hopf-Laplace equation*, **arXiv e-prints.**

Iwaniec, T, Koh, N, V. Kovalev, L, Onninen, J **2010**, *Existence of energy-minimal diffeomorphisms between doubly connected domains*, **arXiv e-prints.**

Iwaniec, T, V. Kovalev, L, Onninen, J **2010**, *Harmonic mapping problem and affine capacity*, **arXiv e-prints.**

Iwaniec, T, V. Kovalev, L, Onninen, J **2010**, *Hopf differentials and smoothing Sobolev homeomorphisms*, **arXiv e-prints.**

Iwaniec, T, V. Kovalev, L, Onninen, J **2010**, *Diffeomorphic approximation of Sobolev homeomorphisms*, **arXiv e-prints.**

Korte, R, Marola, N, Shanmugalingam, N **2010**, *Quasiconformality, homeomorphisms between metric measure spaces preserving quasiminimizers, and uniform density property*, **Reports in Mathematics, no. 506, University of Helsinki, Department of Mathematics and Statistics.**

Pankka, P, Rajala, K **2010**, *Quasiregularly elliptic link complements*, **University of Jyväskylä, Preprint, no. 388.**

V. Vähäkangas, A **2010**, *A T1 theorem for weakly singular integral operators*, **arXiv e-prints.**

Vähäkangas, A **2010**, *On extension of Green's operator on bounded smooth domains*, **arXiv e-prints.**

C2 Edited book, compilation, conference proceeding or special issue of journal

2007

Deutsch, A (ed.), Bravo de la Parra, R (ed.), de Boer, RJ (ed.), Diekmann, O (ed.), Jagers, P (ed.), Kisdi, E (ed.), Kretzschmar, M, Lansky, P, Metz, H **2007**, *Mathematical modeling of biological systems, volume II: Epidemiology, evolution and ecology, immunology, neural systems and the brain, and innovative mathematical methods. Modeling and simulation in science, engineering and technology*, **Birkhaeuser, Boston, MA.**

Fagerholm, H, Gyllenberg, M, Högnäs, G **2007**, *Competition and invasion in stochastic population models*, **Reports on computer science & mathematics. Ser. A, no. 191, Åbo Akademi University, Åbo.**

2009

Gyllenberg, M, Langlais, M, Milner, F (eds) **2009**, *Mathematics in Biointeractions : Special issue. Journal of Theoretical Biology*, vol. 258.

D1 Article in professional journal

2005

Gyllenberg, M **2005**, 'Sudoku', **Arkhimedes**, vol 2005, no. 6, pp. 31.

Gyllenberg, M **2005**, 'Att publicera eller inte publicera', **Arkhimedes**, vol 2005, no. 4, pp. 31.

Lehto, S, Sottinen, T **2005**, 'Sisarusingelma: paradoksi ehdollisesta todennäköisyydestä', **Solmu : matematiikkalehti**, vol 2005, no. 1, pp. 14-15.

Lehto, S **2005**, 'Toiminnallista matematiikkaa: fraktaaliaskartelua', **Solmu : matematiikkalehti**, vol 2005, no. 3, pp. 21-24.

Stenlund, M **2005**, 'A characterisation of the parabola', **Mathematical gazette.**, vol 89, no. 516, pp. 507-511.

2006

Ernvall-Hytönen, A, Hytönen, T **2006**, 'Kokonaisuus on pienempi kuin osiensa summa - arvioita sarjoille ja integraaleille', **Arkhimedes**, no. 6, pp. 21-24.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ANDY/Kupiainen

- Gyllenberg, M **2006**, 'Korkad formgivning', **Arkhimedes**, vol 2006, no. 4, pp. 31.
Gyllenberg, M **2006**, 'Det lutande tornet i PISA', **Arkhimedes**, vol 2006, no. 2, pp. 25.
Gyllenberg, M **2006**, 'Allmänningens tragedi', **Arkhimedes**, vol 2006, no. 6, pp. 27.
Harjulehto, P **2006**, 'Johtosuora ja polttopiste: toisen asteen käyrät', **Solmu : matematiikkalehti**, vol 2006, no. 2, pp. 7-10.
Hytönen, M, Lehto, S, Vanhatalo, S **2006**, 'Äärettömyys piirustuspaperilla', **Dimensio**, vol 70, no. 2, pp. 15-17.

2007

- Gyllenberg, M **2007**, 'Världens matematiskaste språk', **Arkhimedes**, vol 2007/2, pp. 35.
Gyllenberg, M **2007**, 'Var skall man dra gränsen?', **Arkhimedes**, vol 2007/4, pp. 31.
Gyllenberg, M **2007**, 'Biomatematiikan menestystarinoita', **Arkhimedes**, vol 2007/3, pp. 26-28.
Harjulehto, P **2007**, 'Kavaljeeri- ja sotilasprojektiot', **Solmu : matematiikkalehti**, vol 2007, no. 2, pp. 7-9.

2008

- Gyllenberg, M **2008**, 'Också namn kan översättas', **Arkhimedes**, vol 2008, no. 2, pp. 31.
Gyllenberg, M **2008**, 'Ett brev betyder så mycket', **Arkhimedes**, vol 2008, no. 6, pp. 35.
Gyllenberg, M **2008**, 'Matriklar och biografier', **Arkhimedes**, vol 2008, no. 4, pp. 35.
Harjulehto, P **2008**, 'Parallelipostulaatti', **Solmu : matematiikkalehti**, vol 2008, no. 3, pp. 10-12.

2009

- Gyllenberg, M **2009**, 'Herbariet rymmer inte bara växter', **Arkhimedes**, vol 2009, no. 4, pp. 31.
Paajanen, P **2009**, 'p-adinen integrointi ja asymptootinen ryhmäteoria', **Arkhimedes**, no. 5, pp. 14-18.

2010

- Nieminen, P **2010**, 'Raimo Lehti : Sfairopoia - Pallojen ja ympyröiden koneistot vanhalla ajalla.', **Arkhimedes**, vol 2010, no. 1, pp. 25-26.

D4 Published development or research report

2009

- Hosokawa, T, Nieminen, P, Ohno, S **2009**, *Linear combinations of composition operators on the Bloch spaces*, **Reports in Mathematics / Department of Mathematics and Statistics. University of Helsinki, no. 491, Helsinki.**

E1 Popular article, newspaper article

2009

- Gyllenberg, M **2009**, 'Vardagsmatematik', **Yliopisto : Helsingin yliopiston tiedelehti**, vol 2009/2, pp. 37.
Gyllenberg, M **2009**, 'Svarta tavlan - och den smarta', **Yliopisto : Helsingin yliopiston tiedelehti**, vol 2009/9, pp. 54.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

1 Analysis of activities 2005-2010

- Associated person is one of Oskari Ajanki , Vesa Ala-Mattila , Heikki Arponen , Kari
Astala , Jorgia Bandyopadhyay , Barbara Boldin , Vasileios Chousionis ,
Joseph Dubois , Jeremy Clark , Albert Clop, Serban Costea , Jan Cristina ,
Wojcieh De Roeck , Thanate Dhirasakdanon , Odo Diekmann , Loic Patrick Marie
Geritz , Hanna Eskola , Chun Fang , Daniel Faraco, Ido Filin , Stefanus
Risto Matti Hovila , Mats Gyllenberg , Petteri Harjulehto , Ilkka Holopainen ,
Tadeusz Iwaniec , Ritva Hurri-Syrjänen , Jarmo Jääskeläinen ,
Ilmari Karonen , Antti Kempainen , Mikko Kempainen , Eva Kisdi ,
Juhani Alex Kasper Koivisto , Riikka Korte , Antti Kupiainen , Kalle
Kytölä , Kim Laine , Saara Maria Lehto , Sauli Lindberg , Henri
Lipponen , Xiaoli Liu , Marta Llorente , marta@ Hannes Luuro , Jani Lukkarinen ,
Laurent Marin, Niko Marola , Jussi Heikki Alekski Martin , Pertti Mattila ,
Peng Mei , Johan Anton J. etz , Daniel Meyer , Jouko
Mickelsson , Santteri Miihkinen , Paolo Muratore Ginanneschi ,
Pekka J. Nieminen , Miika Pellervo Nikula , Tuomas Orponen , Pirita Maria
Paajanen , Mikko Pakkanen , Pekka Julius Pankka , Antti Ilmari Perälä ,
Istvan Prause , Tadeas Prikkopii , Suvi Elina Roto , Tuomas
Valtteri Aleksis Sahlsten , Eero Saksman , Robert Service , Tomas Soto ,
Toth , Elefterios Soultanis , Jari Taskinen , Miika Tiimonen , Imre
Ignacio Uriarte-Tuero, Margarete Utz , Hans-Olav Tylli , Vesa Yrjö Antero Tähtinen ,
Vihola Matti , Kari Vilonen, Alekski Vähäkangas, Antti Ville Vähäkangas , Christian Webb ,
Laitila , Jarno Talponen , Jani Virtanen , Ping Yan , Jussi
Mikko Stenlund ,

Activity type	Count
Supervisor or co-supervisor of doctoral thesis	63
Prizes and awards	18
Editor of research journal	24
Peer review of manuscripts	224
Editor of series	3
Editor of special theme number	1
Assessment of candidates for academic posts	7
Membership or other role in review committee	9
Membership or other role in research network	7
Membership or other role in national/international committee, council, board	45
Membership or other role in public Finnish or international organization	6
Membership or other role of body in private company/organisation	3
Participation in interview for written media	11
Participation in radio programme	4
Participation in TV programme	2



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

2 Listing of activities 2005-2010

Supervisor or co-supervisor of doctoral thesis

Kari Astala ,

Supervision of doctoral thesis, Kari Astala, 2004 → 2009, Finland
Supervision of doctoral thesis, Kari Astala, 2009 → ..., Finland
Supervision of doctoral thesis, Kari Astala, 2010 → ..., Finland

Stefanus Geritz ,

PhD co-supervision (Hanna Eskola), Stefanus Geritz, 2005 → 2009, Finland
PhD co-supervision (Petr Ondracek), Stefanus Geritz, 2005 → 2010, Finland
PhD co-supervision (Jaakko Toivonen), Stefanus Geritz, 2010 → ..., Finland

Mats Gyllenberg ,

Supervisor of Doctoral Thesis, Mats Gyllenberg, 2000 → 2005
Supervision of doctoral thesis (Tuomas Nurmi), Mats Gyllenberg, 01.01.2002 → ..., Finland
Supervisor of Doctoral Thesis, Mats Gyllenberg, 2003 → 2007
Supervisor of Doctoral Thesis, Mats Gyllenberg, 2004 → 2007
Supervision of Doctoral Thesis (Margarete Utz), Mats Gyllenberg, 2005 → 2010, Finland
Supervisor of Doctoral Thesis, Mats Gyllenberg, 2005 → 2010
Supervisor of Doctoral Thesis, Mats Gyllenberg, 2005 → 2009
Supervisor of Doctoral Thesis, Mats Gyllenberg, 2006 → 2008
Supervision of doctoral thesis (Arho Virkki), Mats Gyllenberg, 2007, Finland
Supervision of doctoral thesis (Laura Elo), Mats Gyllenberg, 2007, Finland
Dupervision od Coctoral Thesis (Hanna Eskola), Mats Gyllenberg, 2009, Finland

Ilkka Holopainen ,

Thesis supervision, finished PhD-thesis, Ilkka Holopainen, 2005, Finland
PhD-thesis supervision, work in progress, Ilkka Holopainen, 09.2007 → ..., Finland
Thesis supervision, finished PhD-thesis, Ilkka Holopainen, 2008, Finland
PhD-thesis supervision, work in progress, Ilkka Holopainen, 01.2009 → ..., Finland
PhD-thesis supervision, work in progress, Ilkka Holopainen, 01.04.2010 → ..., Finland

Ritva Hurri-Syrjänen ,

Doctoral Thesis Supervisor of Jani Joensuu, Ritva Hurri-Syrjänen, 2005 → 2009, Finland

Tuomas Hytönen ,

Väitöskirjatyön ohjaus, Tuomas Hytönen, 01.09.2009 → ..., Finland
Väitöskirjatyön ohjaus, Tuomas Hytönen, 01.01.2010 → ..., Finland
Väitöskirjatyön ohjaus, Tuomas Hytönen, 17.02.2010 → ..., Finland

Tadeusz Iwaniec ,

Co-advisor of Jan Cristina, Tadeusz Iwaniec, 01.09.2010 → ...

Eva Kiski ,

Thesis co-supervision: PhD thesis of Margarete Utz, Eva Kiski, 2005 → 2010, Finland
Thesis co-supervision: PhD thesis of Tadeas Priklopil, Eva Kiski, 2007 → ..., Finland
Thesis co-supervision: PhD thesis of Ilmari Karonen, Eva Kiski, 2009 → ..., Finland



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Antti Kupiainen ,

Thesis supervision, Antti Kupiainen, 2001 → 2006, Finland
Thesis supervisor, Antti Kupiainen, 2001 → 2006, Finland
Thesis supervisor, Antti Kupiainen, 2001 → 2006, Finland
Thesis supervision, Antti Kupiainen, 2005 → 2009, Finland
Thesis supervision, Antti Kupiainen, 2005 → 2009, Finland
Thesis supervision, Antti Kupiainen, 2006 → 2011, Finland
Thesis supervision, Antti Kupiainen, 2008 → 2012, Finland

Xiaoli Liu ,

Phd thesis of Xiaoli LIU, Xiaoli Liu, 09.2006, Finland

Jani Lukkarinen ,

Supervision of a doctoral thesis at U Helsinki, Jani Lukkarinen, 17.06.2008 → ..., Finland

Pertti Mattila ,

Supervision of doctoral thesis, Pertti Mattila, 01.01.2001 → 31.12.2005, Finland
Supervision of doctoral thesis, Pertti Mattila, 2004 → 2008, Finland
Supervision of doctoral thesis, Pertti Mattila, 06.2009 → ..., Finland
Supervision of doctoral thesis, Pertti Mattila, 06.2009 → ..., Finland
Supervision of doctoral thesis, Pertti Mattila, 01.2010 → ..., Finland

Jouko Mickelsson ,

supervision of doctoral thesis, Jouko Mickelsson, 01.11.2004 → ..., Finland
Supervision of doctoral thesis, Jouko Mickelsson, 01.01.2005 → 31.01.2010, Finland
Supervision of doctoral thesis, Jouko Mickelsson, 01.01.2006 → 28.02.2010, Sweden
supervision of doctoral thesis, Jouko Mickelsson, 01.01.2007 → ..., Finland
supervision of doctoral thesis, Jouko Mickelsson, 01.01.2009 → ..., Finland
supervision of doctoral thesis, Jouko Mickelsson, 31.01.2010 → ..., Finland

Paolo Muratore Ginanneschi ,

Co-Supervision of Ph.D. thesis, Paolo Muratore Ginanneschi, 01.01.2005 → 01.06.2009, Finland
Co-supervision of visiting graduate student, Paolo Muratore Ginanneschi, 01.03.2008 → 30.06.2008, Italy

Pekka J. Nieminen ,

Doctoral thesis supervision, Pekka J. Nieminen, 2010 → ..., Finland

Pekka Julius Pankka ,

Doctoral thesis supervision, Pekka Julius Pankka, 01.01.2009 → ...

Eero Saksman ,

Supervision of doctoral thesis, Eero Saksman, 17.02.2007, Finland
Supervision of doctoral thesis, Eero Saksman, 13.09.2008, Finland
Supervision of doctoral thesis, Eero Saksman, 06.03.2010, Finland

Jari Taskinen ,

Supervision of Ph.D. thesis, Jari Taskinen, 01.01.2005 → 09.06.2006, Finland
Supervision of Ph.D. thesis (partial), Jari Taskinen, 01.01.2006 → 30.11.2007, Finland
Supervision of Ph.D. thesis, Jari Taskinen, 01.01.2008 → 12.12.2010
Supervision of Ph.D. thesis, Jari Taskinen, 01.01.2009 → 31.12.2010



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Hans-Olav Tylli ,

Supervision of doctoral thesis, Hans-Olav Tylli, 01.01.2002 → 31.12.2006

Supervision of doctoral thesis, Hans-Olav Tylli, 01.01.2003 → 30.06.2008

Prizes and awards

Ritva Hurri-Syrjänen ,

Life Member of Clare Hall, University of Cambridge, Ritva Hurri-Syrjänen, 2010 → ..., United Kingdom

Tadeusz Iwaniec ,

Distinguished Professorship at Syracuse University (named John Raymond French), Tadeusz Iwaniec, 1996 → ...

Honorary Doctorate at the University of Helsinki, Tadeusz Iwaniec, 25.05.2007

Chancellor's Citation for Faculty Excellence and Scholarly Distinction, Tadeusz Iwaniec, 17.03.2008

2009 Sierpinski Medal, Tadeusz Iwaniec, 2009

Finland Distinguished Professorship, Tadeusz Iwaniec, 2009 → ...

Antti Kemppainen ,

Doctoral thesis award of Finnish Academy of Science and Letters, Antti Kemppainen, 12.04.2010, Finland

The Rolf Nevanlinna doctoral thesis award, Antti Kemppainen, 21.09.2010, Finland

Antti Kupiainen ,

Magnus Ehrnroth Prize, Antti Kupiainen, 2009

Helsinki City Science prize, Antti Kupiainen, 2010

Santeri Miihkinen ,

Onni Talaan säätiön opintostipendi vuodelle 2010, Santeri Miihkinen, 31.12.2009

Pirita Maria Paajanen ,

Dissertation prize, Pirita Maria Paajanen, 2006, Finland

Olli Lehto Scholarship, Pirita Maria Paajanen, 2006, Israel

Pekka Julius Pankka ,

The Rolf Nevanlinna doctoral thesis award 2005, Pekka Julius Pankka, 2005

NSF Award #0757732, Pekka Julius Pankka, 23.04.2008 → 31.12.2009

Eero Saksman ,

Väisälä prize for mathematics 2007, Eero Saksman, 2007

Hans-Olav Tylli ,

Finska Vetenskaps-Societeten, Hans-Olav Tylli, 2007 → ..., Finland

Mikko Stenlund ,

Rolf Nevanlinna doctoral thesis award 2006, Mikko Stenlund, 18.12.2010, Finland

Editor of research journal

Kari Astala ,

Advances in Calculus of Variations, Kari Astala, 2008 → ...

Stefanus Geritz ,

Theory in Biosciences, Stefanus Geritz, 2004 → ...

Mats Gyllenberg ,

Journal of Mathematical Biology, Mats Gyllenberg, 01.01.2000 → 31.12.2008

Journal of Biological Dynamics, Mats Gyllenberg, 01.05.2006 → ...



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

International Journal of Biomathematics, Mats Gyllenberg, 01.07.2007 → ...
Differential Equations and Applications, Mats Gyllenberg, 01.07.2008 → ...
Communications in Applied and Industrial Mathematics, Mats Gyllenberg, 01.11.2009 → ...
Journal of Mathematical Biology, Mats Gyllenberg, 01.01.2009 → ...

Tadeusz Iwaniec ,

Annales Academiæ Scientiarum Fennicæ, Tadeusz Iwaniec, 2005 → ...
Functiones et Approximatio, Commentarii Mathematici, Tadeusz Iwaniec, 2005 → ...

Eva Kisdi ,

Acta Biotheoretica, Eva Kisdi, 1999 → ...
Evolutionary Ecology Research, Eva Kisdi, 2004 → ...
Journal of Evolutionary Biology, Eva Kisdi, 2006 → 2009
Theoretical Population Biology, Eva Kisdi, 2009 → ...

Antti Kupiainen ,

Electronic Journal of Mathematical Physics, Editorial board, Antti Kupiainen, 1994 → ...
Journal of Statistical Physics, Editorial board, Antti Kupiainen, 01.01.1995 → 31.12.2007
Reviews in Mathematical Physics, Editorial board, Antti Kupiainen, 1995 → ...
Communications in Mathematical Physics, Editorial board, Antti Kupiainen, 1999 → 2010

Pertti Mattila ,

Acta Mathematica, Pertti Mattila, 1996 → 2007, Sweden
Annales Academiæ Scientiarum Fennicæ, Pertti Mattila, 1996 → ...
Publicacions Matemàtiques, Pertti Mattila, 2008 → ...

Kari Vilonen

Annals of Mathematics, Kari Vilonen, 2001 → 2009

Mikko Stenlund ,

Communications in Mathematical Physics, Mikko Stenlund, 01.07.2005 → 31.07.2005
Communications in Mathematical Physics, Mikko Stenlund, 01.01.2006 → 31.12.2006, United States

Peer review of manuscripts

Jogia Bandyopadhyay ,

Journal of Mathematical Physics, Jogia Bandyopadhyay, 08.2008 → 11.2008

Ido Filin ,

Review for "Evolutionary Applications", Ido Filin, 2010
Review for "The American Naturalist" #1, Ido Filin, 2010
Review for "The American Naturalist" #2, Ido Filin, 2010

Stefanus Geritz ,

Ecological Modelling, Stefanus Geritz, 2006 → ...
Journal of Theoretical Biology, Stefanus Geritz, 2006 → ...
American Naturalist, Stefanus Geritz, 2007
Theoretical Population Biology, Stefanus Geritz, 2007 → ...
Analysis of Evolutionary Processes (book), Stefanus Geritz, 2008, United States
Journal of Mathematical Biology, Stefanus Geritz, 2008 → ...
Journal of Biological Dynamics, Stefanus Geritz, 2010 → ...



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Mathematical Biosciences, Stefanus Geritz, 2010 → ...

Royal Society Biology Letters, Stefanus Geritz, 2010

Petteri Harjulehto ,

Ann. Acad. Sci. Fenn. Math., Petteri Harjulehto, 01.01.2002 → 31.12.2010, Finland

Mathematical Inequalities & Applications, Petteri Harjulehto, 01.01.2004 → 31.12.2010

Journal of Approximation Theory, Petteri Harjulehto, 01.01.2005 → 31.12.2005

Journal of Approximation Theory, Petteri Harjulehto, 01.01.2005 → 31.12.2005

J. Inequal. Appl., Petteri Harjulehto, 01.01.2007 → 31.12.2010

J. Math. Anal. Appl., Petteri Harjulehto, 01.01.2008 → 31.12.2009

Journal of mathematical analysis and applications, Petteri Harjulehto, 01.01.2008 → 31.12.2009

Nonlinear Anal., Petteri Harjulehto, 01.01.2008 → 31.12.2010

Journal of Computational and Applied Mathematics, Petteri Harjulehto, 01.01.2009 → 31.12.2009

Publicacions Matemàtiques, Petteri Harjulehto, 01.01.2009 → 31.12.2011

Complex Analysis and Operator Theory, Petteri Harjulehto, 01.01.2010 → 31.12.2010

Complex Variables and Elliptic Equations, Petteri Harjulehto, 01.01.2010 → 31.12.2010

Illinois Journal of Mathematics, Petteri Harjulehto, 01.01.2010 → 31.12.2010

Mathematical and Computer Modelling, Petteri Harjulehto, 01.01.2010 → 31.12.2010

Ilkka Holopainen ,

Ann. Acad. Sci. Fenn. Ilkka Holopainen, 01.01.2005 → 31.12.2005, Finland

Arab Journal of Mathematical Sciences, Ilkka Holopainen, 01.01.2005 → 31.12.2005, Saudi Arabia

Journal of Mathematical Analysis and Applications, Ilkka Holopainen, 01.01.2005 → 31.12.2005

Potential analysis, Ilkka Holopainen, 01.01.2005 → 31.12.2005

Annales Academiæ Scientiarum Fennicæ, Ilkka Holopainen, 01.01.2006 → 31.12.2006, Finland

Bulletin de la Société Mathématique de France, Ilkka Holopainen, 01.01.2006 → 31.12.2006

Manuscripta mathematica, Ilkka Holopainen, 01.01.2006 → 31.12.2006

Annales Scientifiques de l'École Normale Supérieure, Ilkka Holopainen, 01.01.2007 → 31.12.2007, France

Bulletin de la Société Mathématique de France, Ilkka Holopainen, 01.01.2007 → 31.12.2007, France

Czechoslovak Mathematical Journal, Ilkka Holopainen, 01.01.2007 → 31.12.2007

Discrete Applied Mathematics, Ilkka Holopainen, 01.01.2007 → 31.12.2007

Journal of Mathematical Analysis and Applications, Ilkka Holopainen, 01.01.2007 → 31.12.2007

Milan Journal of Mathematics, Ilkka Holopainen, 01.01.2007 → 31.12.2007

SIGMA, Ilkka Holopainen, 01.01.2007 → 31.12.2007

Transactions of the American Mathematical Society, Ilkka Holopainen, 01.01.2007 → 31.12.2007, United States

Ritva Hurri-Syrjänen ,

Indiana University Mathematics Journal, Ritva Hurri-Syrjänen, 2005, United States

Annales Academiæ Scientiarum Fennicæ, Series A. I. Mathematica, Ritva Hurri-Syrjänen, 2006, Finland

Computers and Mathematics with Applications, Ritva Hurri-Syrjänen, 2006, United States

Illinois Journal of Mathematics, Ritva Hurri-Syrjänen, 2006, United States

Transactions of American Mathematical Society, Ritva Hurri-Syrjänen, 2006, United States

Journal of Fourier Analysis and Applications, Ritva Hurri-Syrjänen, 2008, Austria

Annales Academiæ Scientiarum Fennicæ, Series A. I. Mathematica, Ritva Hurri-Syrjänen, 2009, Finland



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Tuomas Hytönen ,

Mathematica Scandinavica, Tuomas Hytönen, 04.09.2006
Mathematische Nachrichten, Tuomas Hytönen, 04.08.2006
Acta Mathematica, Tuomas Hytönen, 26.10.2007
Mathematica Scandinavica, Tuomas Hytönen, 12.09.2007
Proceedings of the American Mathematical Society, Tuomas Hytönen, 22.10.2007
Journal of Functional Analysis, Tuomas Hytönen, 09.03.2008
Advances in Mathematics, Tuomas Hytönen, 30.11.2009
Journal of Mathematical Analysis and Applications, Tuomas Hytönen, 24.11.2009
Journal of the Australian Mathematical Society, Tuomas Hytönen, 03.02.2009
Mathematica Scandinavica, Tuomas Hytönen, 18.08.2009
Mathematical Modelling and Analysis, Tuomas Hytönen, 06.07.2009
Positivity, Tuomas Hytönen, 27.11.2009
Positivity, Tuomas Hytönen, 15.09.2009
Publicacions Matemàtiques, Tuomas Hytönen, 12.08.2009
Publicationes Mathematicae Debrecen, Tuomas Hytönen, 24.11.2009
8th International Conference of Numerical Analysis and Applied Mathematics, Tuomas Hytönen, 24.05.2010
Comptes Rendus Mathématique, Tuomas Hytönen, 16.12.2010
International Mathematics Research Notices, Tuomas Hytönen, 03.11.2010
Journal d'Analyse Mathématique, Tuomas Hytönen, 26.05.2010
Journal of Evolution Equations, Tuomas Hytönen, 31.08.2010
Journal of Mathematical Analysis and Applications, Tuomas Hytönen, 06.11.2010
Journal of the London Mathematical Society, Tuomas Hytönen, 22.06.2010
Mathematical Inequalities & Applications, Tuomas Hytönen, 16.04.2010
Mathematische Annalen, Tuomas Hytönen, 15.12.2010
The Royal Society of Edinburgh Proceedings A, Tuomas Hytönen, 03.11.2010

Antti Kemppainen ,

Communications in Mathematical Physics, Antti Kemppainen, 01.04.2010 → ..., Germany

Eva Kisdi ,

Referee for Ecology Letters, 2005, Eva Kisdi, 2005
Referee for Evolution, 2005, Eva Kisdi, 2005
Referee for Genetics, 2005, Eva Kisdi, 2005
Referee for Science, 2005, Eva Kisdi, 2005
Referee for Theoretical Population Biology, 2005a, Eva Kisdi, 2005
Referee for Theoretical Population Biology, 2005b, Eva Kisdi, 2005
Referee for the Proceedings of the Royal Society B, 2005a, Eva Kisdi, 2005
Referee for the Proceedings of the Royal Society B, 2005b, Eva Kisdi, 2005
Referee for the Proceedings of the Royal Society B, 2005c, Eva Kisdi, 2005
Referee for Evolution, 2006a, Eva Kisdi, 2006
Referee for Evolution, 2006b, Eva Kisdi, 2006
Referee for The American Naturalist, 2006a, Eva Kisdi, 2006



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Referee for The American Naturalist, 2006b, Eva Kisdi, 2006
Referee for Theoretical Population Biology, 2006a, Eva Kisdi, 2006
Referee for Theoretical Population Biology, 2006b, Eva Kisdi, 2006
Referee for the Journal of Mathematical Biology, 2006, Eva Kisdi, 2006
Referee for the Proceedings of the Royal Society B, 2006a, Eva Kisdi, 2006
Referee for the Proceedings of the Royal Society B, 2006b, Eva Kisdi, 2006
Referee for Evolution, 2007a, Eva Kisdi, 2007
Referee for Evolution, 2007b, Eva Kisdi, 2007
Referee for Evolution, 2007c, Eva Kisdi, 2007
Referee for Evolution, 2007d, Eva Kisdi, 2007
Referee for The American Naturalist, 2007a, Eva Kisdi, 2007
Referee for The American Naturalist, 2007b, Eva Kisdi, 2007
Referee for Theoretical Ecology, 2007, Eva Kisdi, 2007
Referee for Theoretical Population Biology, 2007a, Eva Kisdi, 2007
Referee for Theoretical Population Biology, 2007b, Eva Kisdi, 2007
Referee for the Journal of Mathematical Biology, 2007a, Eva Kisdi, 2007
Referee for the Journal of Mathematical Biology, 2007b, Eva Kisdi, 2007
Referee for the Journal of Theoretical Biology, 2007, Eva Kisdi, 2007
Referee for the Proceedings of the Royal Society B, 2007, Eva Kisdi, 2007
Referee for Oikos, 2008, Eva Kisdi, 2008
Referee for The American Naturalist, 2008a, Eva Kisdi, 2008
Referee for The American Naturalist, 2008b, Eva Kisdi, 2008
Referee for Theoretical Population Biology, 2008a, Eva Kisdi, 2008
Referee for Theoretical Population Biology, 2008b, Eva Kisdi, 2008
Referee for Theoretical Population Biology, 2008c, Eva Kisdi, 2008
Referee for Theoretical Population Biology, 2008d, Eva Kisdi, 2008
Referee for Theoretical Population Biology, 2008e, Eva Kisdi, 2008
Referee for the Journal of Mathematical Biology, 2008a, Eva Kisdi, 2008
Referee for the Journal of Mathematical Biology, 2008b, Eva Kisdi, 2008
Referee for the Journal of theoretical Biology, 2008a, Eva Kisdi, 2008
Referee for the Journal of theoretical Biology, 2008b, Eva Kisdi, 2008
Referee for the Proceedings of the Royal Society B, 2008, Eva Kisdi, 2008
Referee for Evolution, 2009, Eva Kisdi, 2009
Referee for The American Naturalist, 2009, Eva Kisdi, 2009
Referee for Theoretical Population Biology, 2009a, Eva Kisdi, 2009
Referee for Theoretical Population Biology, 2009b, Eva Kisdi, 2009
Referee for Theoretical Population Biology, 2009c, Eva Kisdi, 2009
Referee for the Journal of Mathematical Biology, 2009a, Eva Kisdi, 2009
Referee for the Journal of Mathematical Biology, 2009b, Eva Kisdi, 2009
Referee for Ecology Letters, 2010a, Eva Kisdi, 2010
Referee for Ecology Letters, 2010b, Eva Kisdi, 2010



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Referee for Evolution, 2010a, Eva Kisdi, 2010
Referee for Evolution, 2010b, Eva Kisdi, 2010
Referee for Journal of Mathematical Biology, 2010, Eva Kisdi, 2010
Referee for The American Naturalist, 2010, Eva Kisdi, 2010
Referee for Theoretical Population Biology, 2010, Eva Kisdi, 2010
Referee for the Bulletin of Mathematical Biology, 2010a, Eva Kisdi, 2010
Referee for the Bulletin of Mathematical Biology, 2010b, Eva Kisdi, 2010
Referee for the Journal of theoretical Biology, 2010a, Eva Kisdi, 2010
Referee for the Journal of theoretical Biology, 2010b, Eva Kisdi, 2010

Kalle Kytölä ,

Journal of Statistical Physics, Kalle Kytölä, 2008, France
Journal of Mathematical Physics, Kalle Kytölä, 2009, United States

Jani Lukkarinen ,

Central European Journal of Physics, Jani Lukkarinen, 21.10.2005 → 21.11.2005
Communications in Mathematical Physics, Jani Lukkarinen, 01.08.2005 → 31.12.2009
Insurance: Mathematics and Economics, Jani Lukkarinen, 24.11.2005
Journal of Physics A: Mathematical and General, Jani Lukkarinen, 01.01.2005 → 31.12.2009
Acta Mathematica, Jani Lukkarinen, 01.10.2006 → 03.04.2007
Journal of Statistical Physics, Jani Lukkarinen, 01.01.2006 → 31.12.2009
Letters in Mathematical Physics, Jani Lukkarinen, 05.03.2007 → 14.03.2007
Communications on Pure and Applied Analysis, Jani Lukkarinen, 17.11.2008 → 18.02.2009
Communications on Pure and Applied Mathematics, Jani Lukkarinen, 05.02.2008 → 31.12.2009
Archive for Rational Mechanics and Analysis, Jani Lukkarinen, 11.05.2010
Archive for Rational Mechanics and Analysis, Jani Lukkarinen, 15.07.2010
Nonlinearity, Jani Lukkarinen, 07.09.2010
RIMS Kôkyûroku Bessatsu, Jani Lukkarinen, 08.04.2010, Japan

Niko Marola ,

MathSciNet, Niko Marola, 2008 → ..., United States
Ann. Acad. Sci. Fenn. Math., Niko Marola, 2010 → ..., Finland
Rend. Semin. Mat. Univ. Padova, Niko Marola, 2010 → ..., Italy

Jouko Mickelsson ,

Communications in Mathematical Physics, Jouko Mickelsson, 01.01.2005 → 31.12.2005
Letters in Mathematical Physics, Jouko Mickelsson, 01.01.2005 → 31.12.2005
Reviews in Mathematical Physics, Jouko Mickelsson, 01.01.2005 → 31.12.2005
Ann. Acad. Scient. Fennicae, Mathematica, Jouko Mickelsson, 01.01.2006 → 31.12.2006
Commun. Math. Phys., Jouko Mickelsson, 01.01.2006 → 31.12.2006
Physical Review Letters, Jouko Mickelsson, 01.01.2006 → 31.12.2006
Mod. Phys. Letters A, Jouko Mickelsson, 01.01.2007 → 31.12.2007
Physical Review, Jouko Mickelsson, 01.01.2007 → 31.12.2007
Physical Review Letters, Jouko Mickelsson, 01.01.2007 → 31.12.2007



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Paolo Muratore Ginanneschi ,

Physical Review E, Paolo Muratore Ginanneschi, 05.11.1999 → ...
The European Physical Journal B, Paolo Muratore Ginanneschi, 01.06.1999 → ...
Physical Review Letters, Paolo Muratore Ginanneschi, 02.01.2002 → ...
Journal of Turbulence, Paolo Muratore Ginanneschi, 14.03.2006 → ...
Physica D: Nonlinear Phenomena, Paolo Muratore Ginanneschi, 01.01.2007 → ...
Journal of Mathematical Biology, Paolo Muratore Ginanneschi, 23.03.2010 → ...
Nuclear Physics B, Paolo Muratore Ginanneschi, 10.03.2010 → ...

Pekka J. Nieminen ,

Reviewer for Bulletin of the London Mathematical Society, Pekka J. Nieminen, 2006, United Kingdom
Reviewer for New York Journal of Mathematics, Pekka J. Nieminen, 2008, United States
Reviewer for Czechoslovak Mathematical Journal, Pekka J. Nieminen, 2010, Czech Republic
Reviewer for Glasgow Mathematical Journal, Pekka J. Nieminen, 2010, United Kingdom
Reviewer for Journal of Mathematical Analysis and Applications, Pekka J. Nieminen, 2010
Reviewer for Journal of the London Mathematical Society, Pekka J. Nieminen, 2010, United Kingdom

Pirita Maria Paaajanen ,

Journal of Group Theory, Pirita Maria Paaajanen, 2008

Mikko Pakkanen ,

The Annals of Statistics, Mikko Pakkanen, 2009

Pekka Julius Pankka ,

Michigan Mathematical Journal, Pekka Julius Pankka, 2009
Proceedings of American Mathematical Society, Pekka Julius Pankka, 2009
Annales Academiæ Scientiæ Fennicæ, Pekka Julius Pankka, 2010
Annales Academiæ Scientiæ Fennicæ, Pekka Julius Pankka, 2010
Journal of Mathematical Analysis and Its Applications, Pekka Julius Pankka, 2010

Tadeas Priklopil ,

PloS, Tadeas Priklopil, 2009 → ...
Evolution of assortative mating in a population expressing dominance, Tadeas Priklopil, 2010 → ...
Journal of Mathematical Biology, Tadeas Priklopil, 2010 → ...
Journal of Theoretical Biology, Tadeas Priklopil, 2010 → ...

Eero Saksman ,

Acta Mathematica, Eero Saksman, 01.01.2007 → 31.12.2007
Acta Mathematica (screening reviewer), Eero Saksman, 2007
JMAA, Eero Saksman, 01.01.2007 → 31.12.2007, United States
Math. Scand., Eero Saksman, 01.01.2007 → 31.12.2007
Acta Mathematica (screening reviewer), Eero Saksman, 2008
Acta Mathematica (screening reviewer), Eero Saksman, 2009
Acta Mathematica (screening reviewer), Eero Saksman, 2010

Jari Taskinen ,

Ann. Acad. Sci. Fenn. Jari Taskinen, 01.01.2005 → 31.12.2005, Finland
Reviewer, Jari Taskinen, 01.01.2005 → 31.12.2010



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Ann. Acad. Sci. Fenn. Jari Taskinen, 01.01.2006 → 31.12.2006, Finland
Indian J. Pure Appl. Math., Jari Taskinen, 01.01.2006 → 31.12.2006, India
Ann.Acad.Sci.Fenn, Jari Taskinen, 01.01.2007 → 31.12.2007, Finland
Rocky Mountain Math. Journal, Jari Taskinen, 01.05.2007 → 31.05.2007, United States
Illinois Journal of Mathematics, Jari Taskinen, 01.05.2009 → 31.08.2009, United States
Journal of Mathematical Analysis and Applications, Jari Taskinen, 01.01.2009 → 31.03.2009, United States
Matemacki Vesnik, Jari Taskinen, 23.07.2009 → 30.09.2009, Serbia
Journal of Mathematical Analysis and Applications, Jari Taskinen, 24.08.2010 → 31.10.2010, United States

Hans-Olav Tylli ,

Annales Academiae Scientiae Fennicae Mathematica, Hans-Olav Tylli, 01.04.2005 → 31.10.2005, Finland
Banach Center Publications, Hans-Olav Tylli, 01.04.2005 → 30.04.2005, Poland
Birkhäuser Verlag, Hans-Olav Tylli, 01.11.2005 → 30.11.2005, Germany
Journal of the Australian Mathematical Society, Hans-Olav Tylli, 01.02.2005 → 28.02.2005, Australia
Mathematical Reviews, Hans-Olav Tylli, 01.01.2005 → 31.12.2005, United States
Journal of Mathematical Analysis and Applications, Hans-Olav Tylli, 01.06.2006 → 30.06.2006, United States
Mathematical Reviews, Hans-Olav Tylli, 01.01.2006 → 31.12.2006, United States
Studia Mathematica, Hans-Olav Tylli, 01.03.2006 → 31.03.2006, Poland
Zentralblatt der Mathematik, Hans-Olav Tylli, 01.01.2006 → 31.12.2006, Germany
Birkhäuser Verlag, Hans-Olav Tylli, 01.01.2007 → 31.12.2007, Switzerland
Canadian Journal of Mathematics, Hans-Olav Tylli, 01.09.2007 → 30.09.2007, Canada
Mathematical Reviews, Hans-Olav Tylli, 01.01.2007 → 31.12.2007, United States
Topology and Its Applications, Hans-Olav Tylli, 01.10.2007 → 31.10.2007, United States
Zentralblatt der Mathematik, Hans-Olav Tylli, 01.01.2007 → 31.12.2007, Germany

Margarete Utz ,

Reviewer for Journal of Theoretical Biology, Margarete Utz, 2008
Reviewer for Journal of Evolutionary Biology, Margarete Utz, 2009

Ping Yan ,

Referee for Journal of Mathematical Biology, Ping Yan, 2005 → ..., Germany
Referee for Differential Equations and Applications, Ping Yan, 01.07.2008 → 31.01.2011

Mikko Stenlund ,

Referee, Mikko Stenlund, 01.01.2005 → ...

Editor of series

Tadeusz Iwaniec ,

Mathematical Monographs, Birkhäuser and Polish Academy of Sciences, Tadeusz Iwaniec, 2005 → ...

Antti Kupiainen ,

Grundlehren der Mathematik, Antti Kupiainen, 1996 → ...
Theoretical and Mathematical Physics, Antti Kupiainen, 2010 → ...

Editor of special theme number

Stefanus Geritz ,

Journal of Biological Dynamics, Stefanus Geritz, 2010



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Assessment of candidates for academic posts

Ilkka Holopainen ,

Evaluation and review for tenure and promotion to Associate Professor, Ilkka Holopainen, 07.2008, United States

Evaluation of a candidate to "Profesor Titular", Ilkka Holopainen, 10.2010, Spain

Ritva Hurri-Syrjänen ,

Expert on Dr. Petteri Harjulehto's Dosenttuuri/Adjunct professorship application, Ritva Hurri-Syrjänen, 02.2005, Finland

Expert on Dr. Heli Tuominen's Dosenttuuri/Adjunct professorship application, Ritva Hurri-Syrjänen, 09.2009, Finland

Pertti Mattila ,

Assistant professorship Trondheim, Pertti Mattila, 01.10.2010 → 31.10.2010, Norway

Pirita Maria Paajanen ,

Peer reviewer, Pirita Maria Paajanen, 2009, United Kingdom

Eero Saksman ,

Reviewer for an Associate Professorship, Eero Saksman, 2008, Sweden

Membership or other role in review committee

Ilkka Holopainen ,

ESF Pool of peer reviewers, Ilkka Holopainen, 05.2009 → 04.2012

Quality Review of the Department of Mathematics, NUI Maynooth, Ireland, Ilkka Holopainen, 04.2009, Ireland

Publication Forum, Ilkka Holopainen, 11.2010 → 12.2011, Finland

Tadeusz Iwaniec ,

Panelist in analysis and PDE in NSF, Tadeusz Iwaniec, 2005 → ..., United States

Eva Kisdi ,

ESF Pool of Reviewers, Eva Kisdi, 2007 → ...

Evaluation for the Peccei and Mikhalevich Awards, Eva Kisdi, 2010, Austria

Evaluation of a Discovery Grant Application, Eva Kisdi, 2010, Canada

Pertti Mattila ,

Scientific evaluation (National Science Foundation), Pertti Mattila, 2004 → ..., United States

Scientific evaluation (Vetenskapsrådet), Pertti Mattila, 2004 → ..., Sweden

Membership or other role in research network

Kari Astala ,

Marie Curie-training network CODY (Conformal structures and dynamical systems), Kari Astala, 2007 → 2010

Stefanus Geritz ,

Centre of Excellence in Analysis and Dynamics (University of Helsinki), Stefanus Geritz, 2008 → 2013, Finland

FroSpects ESF Research Networking Programme, Stefanus Geritz, 2008 → 2013

Ilkka Holopainen ,

ESF PESC Programme, Harmonic and Complex Analysis and its Applications, Ilkka Holopainen, 12.2008 → 12.2011

NordForsk network, Analysis and Applications, Ilkka Holopainen, 2009 → 2011

Eva Kisdi ,

FroSpects ESF Research Networking Programme, Eva Kisdi, 2008 → 2013

Pirita Maria Paajanen ,

South of England Profinite Groups, Pirita Maria Paajanen, 2007 → ..., United Kingdom



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Membership or other role in national/international committee, council, board

Kari Astala ,

Finnish Academy of Sciences and Letters, Kari Astala, 1997 → ..., Finland
Finnish Mathematical Society, President, Kari Astala, 01.01.2002 → 28.02.2006, Finland
Finnish Academy of Sciences and Letters, section Mathematics and Computer Science, Kari Astala, 2004 → 2009, Finland
Mittag-Leffler Institute, Kari Astala, 01.01.2004 → 31.12.2007, Sweden
Member of committee evaluating Swedish research in Mathematics, Kari Astala, 06.2010 → 11.2010, Sweden

Stefanus Geritz ,

FICS Board of advisers, Stefanus Geritz, 2010 → ..., Finland

Mats Gyllenberg ,

Svenska tekniska vetenskapsakademien i Finland / Swedish Academy of Engineering Sciences in Finland, Mats Gyllenberg, 1996 → ...
Suomen akatemian SYSBIO-tutkimusohjelma, Mats Gyllenberg, 01.01.2002 → 31.12.2009, Finland
OECD Global Science Forum on Industrial Mathematics, Mats Gyllenberg, 01.09.2005 → 31.12.2009
Suomen matemaattinen yhdistys, Mats Gyllenberg, 13.03.2006 → 07.03.2011, Finland
Member of the mathematics panel of the European Research Council, Mats Gyllenberg, 01.01.2007 → 31.12.2011, Belgium
Suomalainen tiedeakatemia / Academia Scientiarum Fennica (Finnish Academy of Science and Letters), Mats Gyllenberg, 2008 → ...
Chairman of PESC of the European Science Foundation (ESF), Mats Gyllenberg, 01.01.2009 → 31.12.2011, France
Finska vetenskaps-societeten / Societas Scientiarum Fennica (The Finnish Society of Sciences and Letters), Mats Gyllenberg, 2009 → ...
European Academy of Sciences, Mats Gyllenberg, 2010 → ..., Belgium

Ilkka Holopainen ,

Member of the Faculty Council, Ilkka Holopainen, 01.01.2004 → 31.12.2006, Finland
Member of the Board of the Kumpula Science Library, Ilkka Holopainen, 01.01.2007 → 31.12.2009, Finland
Member of the Kumpula Campus Library Advisory Committee, Ilkka Holopainen, 01.01.2010 → ..., Finland

Ritva Hurri-Syrjänen ,

Governing body member of the Foundation of Mathematics and Natural Sciences at the University of Helsinki, Ritva Hurri-Syrjänen, 10.2004 → ..., Finland
Board member of the Finnish Mathematical Society, Ritva Hurri-Syrjänen, 03.2009 → ..., Finland

Tadeusz Iwaniec ,

Foreign member of Accademia di Scienze Fisiche e Matematiche, Tadeusz Iwaniec, 1998 → ..., Italy
Foreign Member of Polish Academy of Sciences, Tadeusz Iwaniec, 2005 → ..., Poland

Eva Kiski ,

Secretary of the European Society for Mathematical and Theoretical Biology, Eva Kiski, 2006 → 2011

Antti Kupiainen ,

Helsinki Institute of Physics, Board member, Antti Kupiainen, 01.01.1999 → ...
Erwin Schrödinger Institute, Scientific Advisory Board, Antti Kupiainen, 01.01.2002 → 31.12.2010
Scientific Committee, International Congress of Theoretical Physics, 2002, Antti Kupiainen, 2002 → ...
Service de Physique Theorique, CEA, Saclay, France, Scientific Board, President, Antti Kupiainen, 2005 → 2008

Pertti Mattila ,

Research Council for Natural Sciences and Engineering, Pertti Mattila, 01.01.2004 → 31.12.2009, Finland
The Finnish Academy of Science and Letters, Pertti Mattila, 05.2008 → 05.2013, Finland



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Pekka Julius Pankka ,

Suomen matemaattinen yhdistys, Pekka Julius Pankka, 01.01.2002 → 28.02.2005, Finland

Eero Saksman ,

Reviewer for NSF, Eero Saksman, 2006 → ..., United States

Membership: The Finnish Academy of Science and Letters, Eero Saksman, 2007 → ..., Finland

Board membership: Mittag-Leffler Institute, Eero Saksman, 05.2008 → ..., Sweden

Board membership: Support Foundation of the Rolf Nevanlinna -institute, Eero Saksman, 2008 → ..., Finland

Vice director: COE in Analysis and Dynamics, Eero Saksman, 01.01.2008 → ..., Finland

Secretary of the Mathematics and Computer Science Section: The Finnish Academy of Science and Letters., Eero Saksman, 2009 → ..., Finland

Jari Taskinen ,

Member of the Board, Treasurer, Jari Taskinen, 01.04.2004 → 31.12.2010, Finland

Rolf Nevanlinna - Instituutin tukisäätiö, Jari Taskinen, 01.01.2005 → 31.12.2005, Finland

Suomen matemaattinen yhdistys ry, Jari Taskinen, 01.01.2005 → 31.12.2005, Finland

Rolf Nevanlinna -instituutin tukisäätiö, Jari Taskinen, 01.01.2006 → 31.12.2006, Finland

Suomen matemaattinen yhdistys, Jari Taskinen, 01.01.2006 → 31.12.2006, Finland

Rolf Nevanlinna -Instituutin Tukisäätiö, Jari Taskinen, 01.01.2007 → 31.12.2007, Finland

Suomen matemaattinen yhdistys, Jari Taskinen, 01.01.2007 → 31.12.2007, Finland

Hans-Olav Tylli ,

Graduate School in Mathematical Analysis and Applications, Hans-Olav Tylli, 01.01.2005 → 31.12.2005, Finland

Graduate School in Mathematical Analysis and Applications, Hans-Olav Tylli, 01.01.2006 → 31.12.2006, Finland

Membership or other role in public Finnish or international organization

Jari Taskinen ,

Slovak Research and Development Agency, asiantuntijalausunto tutkimusprojektin rahoitusta varten, Jari Taskinen, 01.12.2007 → 31.12.2007, Slovakia

Hans-Olav Tylli ,

Matematiikan ja tilastotieteen laitoksen johtoryhmä, Helsingin yliopisto, Hans-Olav Tylli, 01.01.2005 → 31.12.2005, Finland

Pilot project Tuning Educational Structures in Europe, phase III (European Commission of Culture and Education), Hans-Olav Tylli, 01.03.2005 → 31.12.2005

Matematiikan ja tilastotieteen laitoksen johtoryhmä, Helsingin yliopisto, Hans-Olav Tylli, 01.01.2006 → 31.12.2006, Finland

pilot project "Tuning Educational Structures in Europe, phase III" (European Commission of Culture and Education), Hans-Olav Tylli, 01.01.2006 → 31.12.2006

"Tuning Educational Structures in Europe, phase IV" (European Commission of Culture and Education), Hans-Olav Tylli, 01.01.2007 → 30.04.2007

Membership or other role of body in private company/organisation

Antti Kupiainen ,

Niilo Helander Foundation, Board, Antti Kupiainen, 01.05.1993 → ..., France

Hans-Olav Tylli ,

ARKHIMEDES-lehden valtuuskunta, Hans-Olav Tylli, 01.01.2005 → 31.12.2005

Arkhimedes-lehden valtuuskunta, Hans-Olav Tylli, 01.01.2006 → 31.12.2006



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

ANDY/Kupiainen

Participation in interview for written media

Saara Maria Lehto ,

Aamulehti, Saara Maria Lehto, 08.11.2005 → 31.12.2011, Switzerland
LUMA-keskuksen koulutuspäivä, Saara Maria Lehto, 18.03.2005 → 31.12.2011, Switzerland
LUMA-keskuksen työpaja, Saara Maria Lehto, 24.11.2005 → 31.12.2011, Switzerland
Summamutikka-keskuksen avajaiset, Saara Maria Lehto, 07.11.2005 → 31.12.2011, Switzerland
YLE Teema: Tutkittu juttu, Saara Maria Lehto, 17.03.2005 → 31.12.2011, Switzerland
YLE Teema: YLE Foorumi, Saara Maria Lehto, 19.04.2005 → 31.12.2011, Switzerland
Espoon kaupungin veso-koulutus, Saara Maria Lehto, 22.03.2006 → 31.12.2011, Poland
Lehtikirjoitus: Dimensio 2/2006, Saara Maria Lehto, 01.01.2006 → 31.12.2011, Poland
Matematiikan päivät Tampereella, Saara Maria Lehto, 04.01.2006 → 31.12.2011, Poland
Summamutikkapäivä, Saara Maria Lehto, 25.01.2006 → 31.12.2011, Poland

Eero Saksman ,

Interview in the Journal 'Yliopisto', Eero Saksman, 11.2010, Finland

Participation in radio programme

Tuomas Hytönen ,

Radiohaastattelu, Tuomas Hytönen, 20.07.2009, Finland

Pekka J. Nieminen ,

Matematiikan aika, Pekka J. Nieminen, 21.04.2008, Finland

Eero Saksman ,

Radio interview in the Finnish National Radio, Eero Saksman, 2009 → ..., Finland

Mikko Stenlund ,

Matematiikan Aika, Mikko Stenlund, 28.01.2008

Participation in TV programme

Antti Kupiainen ,

TV ohjelma Prisma, Antti Kupiainen, 01.01.2007 → 31.12.2011, Finland

Saara Maria Lehto ,

YLEn Uudenmaan uutiset TV2, Saara Maria Lehto, 07.11.2005 → 31.12.2011, Switzerland



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

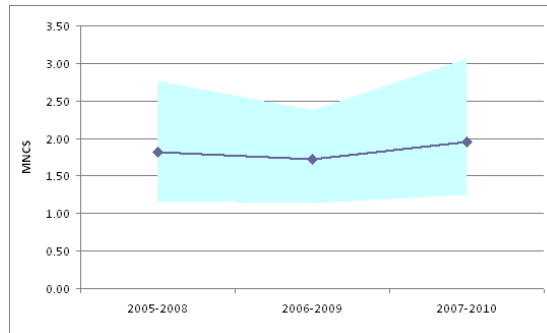
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Research Group: Kupiainen A

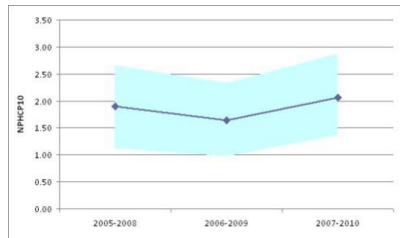
Basic statistics

Number of publications (P)	207
Number of citations (TCS)	462
Number of citations per publication (MCS)	2.23
Percentage of uncited publications	50%
Field-normalized number of citations per publication (MNCS)	2.20
Field-normalized average journal impact (MNJS)	1.21
Field-normalized proportion highly cited publications (top 10%)	2.03
Internal coverage	.58

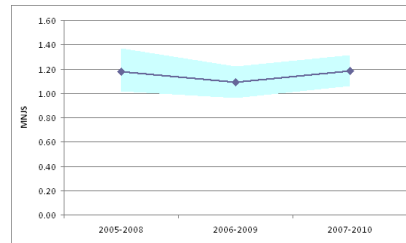
Trend analyses



MNCS

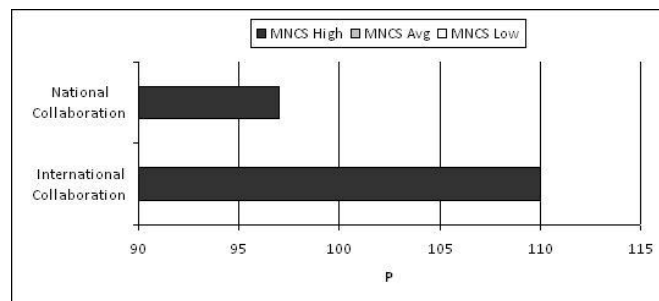


THCP10



MNJS

Collaboration



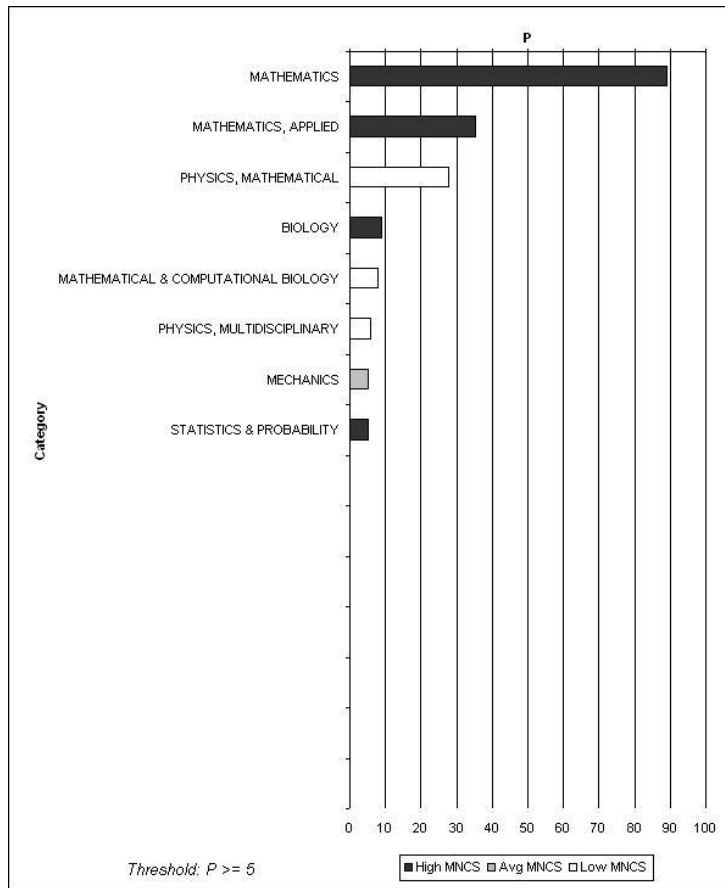
Performance (MNCS) by collaboration type



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING
AT THE UNIVERSITY OF HELSINKI

Web of Science(WoS)-based bibliometrics of the RC's publications data 1.1.2005-31.12.2010
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