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UNIVERSITY OF HELSINKI

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

RC-Specific Evaluation of ASP – Astronomy and Space Physics

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 ASP – Astronomy and Space Physics

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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

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

RC's responsible person:
Koskinen, Hannu

RC-specific keywords:
galaxies, stars, interstellar matter, the Sun, planets, comets, asteroids, meteorites, solar wind, magnetospheres, turbulence, light scattering

Keywords:
Research Evaluation, Meta-evaluation, Doctoral Training, Bibliometric Analyses, Researcher Community

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Contents

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 lead 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 Pyhältö**
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 Kaitera, 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 Ekebom, 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-evaluation[1] 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. TUHAT[3] compilations on publications and other scientific activities[4]
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

The Astronomy and Space Physics (ASP) RC includes 3 professors (all PIs), 6 lecturers (2 PIs), 11 researchers (1 PI), 6 postdocs, and 35 PhD students. The competitive funding is distributed as follows: AF 7.7 M€, Tekes 14.8 M€, EU 4.2 M€, various foundations 0.06 M€, and other international funding 0.43 M€.

The ASP RC consists of 5 research areas: 1. interstellar medium and star formation; 2. stellar astrophysics; 3. planetary systems; 4. space physics; and 5. planetary geophysics. The merger that took place on January 1, 2010, of astronomy (1–3) to the Department of Physics (which already included the space physics and planetary geophysics) resulted in the ASP belong to one department and with location at Kumpula Campus. The Panel notes in passing that the previous evaluation (2005) advised against such merger. It is unclear to the Panel why a well known astronomer like Kalevi Mattila is not part of the evaluation except in the list of publications (retirement?).

Finland's membership in two intergovernmental organisations, the European Southern Observatory (ESO) and the European Space Agency (ESA) is of critical importance to the ASP team, but also the Nordic collaboration in terms of the Nordic Optical Telescope is important.

The interstellar medium and in particular the dark molecular clouds are sites for star formation, and with the help of new ground-based and space-based instruments in combination with theoretical modelling it is now possible to attempt to understand how stars (and planets) are formed. This is an important part of contemporary astrophysics. The ASP team members participate in the EAS corner-stone mission Herschel, which is now producing data in a wavelength window never explored before and demonstrating how astronomy can be advanced by opening a new window. The ASP team has also used instruments at shorter wavelengths than Herschel (such as Spitzer and AKARI) and longer (ESO's APEX telescope). The Atacama Large Millimeter/submillimeter Array (ALMA) in Chile is now at the threshold of starting its early science phase, holding promise that the next few years will be very exciting. The ASP team is well placed to make use of this new telescope.

The stellar astrophysics group with its focus on stellar magnetic activity also combines ground- and space-based instruments of its research, such as ESO's HARPS, NOT's SOFIN, XMM-Newton, and Chandra, the two latter satellites for the high-energy phenomena in the Solar corona and galaxies. The observational results are combined with very computer heavy simulations. The group participates actively in the planning of new missions (such as BepiColombo).

Light scattering of arbitrary targets seems like a Finnish speciality and is used, among other things, for the study of the Solar System.

The space plasma physics group is placed central in the areas, addressing questions such as coronal mass ejection, solar wind interaction with the Earth's magnetosphere, and the physics of shock waves.

The planetary geophysics group studies impact cratering processes by means of laboratory techniques, and satellite and airborne techniques. This is the smallest group in the ASP RC, and has during the reporting period only produced one PhD.

The ASP RC is internationally well known and strong in instrument development in particular in the X-ray regime (and with funding from Tekes for the instrument development). The field-normalized number of citations per publication is quite a bit lower than unity (0.67).

Numeric evaluation: 4 (Excellent)

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 PhD students undergoing doctoral training are recruited from the MSc students, from the international networking, and sometimes by electronic announcements. The principles for the recruitment and the selection process were not described further, however, it was pointed out that a successful MSc thesis provides a bridge to PhD studies. Another route for recruitment is through summer trainee programmes either in the ASP RC, or at the Finnish Meteorological Institute (located at the Kumpula Campus) and the Finnish Geodetic Institute.

Once a doctoral student has been accepted, a supervisor and frequently a co-supervisor are assigned, and a course and thesis plan is worked out. The course plan can include credits from for example summer schools. The subject areas at the Department of Physics are astronomy, physics, theoretical physics, geophysics, and meteorology. (It is unclear to the Panel which area a PhD student in space physics would select.)

The ASP RC provides a scientific environment that fulfils important criteria for doctoral training. Excellent research, critical mass, access to the best available international infrastructure in astronomy and space physics, and extensive international contacts are to mention some of the most important criteria.

There are nation-wide Finnish graduate schools in astronomy, space physics, and geology with which the PhD students in the ASP RC are affiliated. Many of the students spend time at foreign observatories and universities, thus broadening the international perspectives.

The PhD theses consist of a collection of peer-reviewed articles combined with an introduction written by the student. The publications in peer-reviewed journals are a quality assurance.

The doctoral training works very well, and the Panel has only two additional comments. It is not clear to what extent all students entering the ASP RC could take a common block of ECTS credits, which can then be complemented with credits depending on their specialty. This would create an ASP graduate school. Secondly, it is not clear whether there is an annual revision of the study plan. Even if the supervisor-student interact on a daily basis, such revisions, during scheduled time, could be very valuable.

Numeric evaluation: 4 (Excellent)

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

Astronomy and space physics attract a lot of interest from the general public. The members of ASP respond to this interest by giving lectures and writing popular science articles. Members of ASP have also

appeared often in interviews in newspapers and radio programmes. Visits for high school children to the Kumpula Campus are organized and apparently very popular.

The ASP members collaborate with public sector institutes, and one can assume that the geographic closeness between the Finnish Meteorological Institute and ASP at Kumpula Campus must be advantageous for both parts. The public sector institutes also offer employment for doctors having completed their theses at ASP.

Research activities in ASP have found practical applications. An interesting example is the use of the light scattering studies in the solar system group in climate change predictions and development of weather radars.

The strong tradition in instrument development for space missions contributes to the Finnish space sector, but no further details are given in the written documentation.

The ASP RC is well aware that their outreach activities can be further improved, and it is clear that this is part of its strategy. A plus sign should be added to "excellent" below.

Numeric evaluation: 4 (Excellent)

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

The ASP RC has extensive international research collaborations, in particular, but by no means exclusive, channeled through ESO and ESA. Members of ASP are also visible in many ESO and ESA related committees, and the responsible person for ASP is even the Finnish delegate to the ESA Science Programme Committee.

ASP members are involved in several ESA satellite missions that are presently in operation, such as Herschel (mentioned in item 1.), Planck (mentioned in item 1.), Mars Express, Venus Express, Rosetta (comet mission), SMART-1 (mainly a technology mission); planning is ongoing for future missions, to be discussed under item 2.8.

ASP members are active in ALMA, the next large ground-based telescope, soon to be opened for an early science phase, and where Europe participates through ESO.

ASP collaborates with all institutions in Finland involved in astronomy and space physics through the Finnish Centre for Astronomy with ESO (FINCA), which is a new operation based in Turku and with a mandate for Finland's participation in ESO (Finland became a member in 2004) similar to that of Helsinki Institute of Physics concerning Finland's participation in CERN.

Active participation in COST should be mentioned. Members of ASP also scored a big success in the EU FP7 programme when they led to large consortia (SEPServer and E-SQUID) to funding in 2011.

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 ASP RC has access to outstanding research infrastructure owing to Finland's membership in ESO and ESA. Having said this, it is clear that this access is highly dependent on the skill and inventiveness of the researchers. The Panel makes the assessment that the researchers at UH are at the cutting edge and make excellent use of the research infrastructure provided by ESO and ESA.

The ASP RC has access to the best computer resources in Finland for their computational work, the CSC – IT Center for Science, and complemented with local computer resources the needs of the ASP RC seem fulfilled.

There is also state-of-the-art in-house equipment available, most notably the superconducting SQUID magnetometer for studies of rocks and materials.

The balance between teaching and research is presented as reasonable, and with an average of 4–5 lecture hours per week, the Panel agrees that this is a reasonable number. As is often the case at departments, some are overloaded with teaching. This is not an unusual situation in a department, where revenues are based on the number of students passing the exams and with some teachers simply being much better than others. According to the documentation provided, ASP is working to get a better teaching balance.

The ASP RC points at a critical challenge for instrument development for future ESA missions. It is a widely recognized problem at the national level but is not explained in the document. The Panel makes the following observation. Space science is funded by the Academy of Finland whereas instrument development for satellite missions is funded by Tekes. Top priority for Tekes appears to be the interest of a specific mission from a technological point of view. This prioritization need not agree with the interest from a scientific point of view. This type of tension between technology and science is unavoidable but probably enhanced when two different funding agencies are involved.

The ASP RC advocates more permanent positions and suggest as one possible solution the use of external funding ("soft money") to increase the number of positions. This is certainly a possibility, but needs careful considerations since it could lead to an organic growth rather than a strategic one.

Office space is a pressing problem for the RC, a problem which has increased with the move of the observatory to the Kumpula Campus.

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

The ASP RC is 85% of the Division of Geophysics and Astronomy of the Department of Physics, and there is no member of ASP outside the division. The division is led by the Division head, who is also the leader of the RC.

The five research groups form the RC but seem to function quite independently from each other. It is not obvious that the sum is more than the sum of the five groups.

The research area of interstellar medium and star formation is an important component in the RC, but the Panel was unable to identify the scientific leader (PI) of this research. Is it Kalevi Mattila, who is not part of the evaluation?

It is evident that the external funding plays an important role and defines the research directions, but it is not clear to the Panel how, for example, recruitment of new faculty takes place (although the recruitment scheme is outlined in item 8.)

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 external competitive funding for 2005–2010 is summarized below:

- AF 7.7 M€
- Tekes 14.8 M€
- EU 4.2 M€
- various foundations 0.06 M€
- other international funding 0.43 M€.

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 strategic action plan is closely knit to the future plans of ESO and ESA, and this also dictates the recruitment of new faculty. Whereas this strategy does not pose any significant problems for the ground-based astronomy part, the ESA future science programme contains an element of risk. The selection process in Cosmic Vision is in full swing, and there is of course no guarantee that the satellite missions for which the ASP members have invested time and money to participate in will be selected.

ASP members are involved in the L mission candidate IXO and the M mission Solar Orbiter, and neither of these missions has yet been selected. What are the plans if Laplace and Plato are selected instead? The Panel of course recognizes that this is a general problem posing any small country, which cannot participate in everything and which has developed a strong competence in a certain area, in the Finnish case the construction of X-ray instruments. There are of course also the already decided missions with Finnish participation, such as GAIA and BepiColombo, and the ASP RC should be able to cope even if the ESA decisions go against them during the coming year.

Finland's continued participation in ESO and ESA should ensure a very adequate and competitive doctoral training for the coming years.

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.

The ASP RC fulfils very well the criteria for the category 1. The members of the RC are internationally well known and they produce science at the cutting edge. They make very effective use of the world-leading research infrastructure provided by ESO and ESA.

The doctoral training is excellent. The experimental/observational PhD students are given the possibility to work at the international forefront, and they are an asset to the Finnish society.

The strategic action plan for 2011–13 is closely linked to ESO and ESA, not entirely without risk, of course, but with great promise. The ASP RC has very high ambitions, namely to become the leading European astronomy and space research community and the best doctoral training unit in Finland. These are very high ambitions indeed, and the Panel does not want to claim that it is impossible. However, there are some question marks to iron in order to reach this goal.

Numeric evaluation: 4 (Excellent)

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

Small drafting group with participation from all five teams were formed. The drafting group sent their contributions to the RC leader, who prepared a first draft. All RC members were invited to a joint discussion meeting and based on this and written comments, a new draft was prepared. The draft was circulated for final comments, and based on these the RC leader finalized the report.

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

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

2.12 RC-specific main recommendations

The research carried out by ASP RC makes very effective use of the Finnish membership in ESO and ESA, and a further development along these lines is recommended.

The leadership of the astrophysics programmes (interstellar medium and star formation; stellar astrophysics) needs to be addressed. It was not clear from the evaluation material why Kalevi Mattila was not included, although the Panel suspects that retirement could be one reason. Earlier internal conflicts among the astronomers need to be resolved, if they have not already been resolved.

The integration of astrophysics and space physics into a single RC is not an easy task, since the traditions within these two areas are quite different. (This is true in the other Nordic countries as well, although the integration may have advanced farthest in Norway.) ASP has come a long way towards such integration, and the Panel encourages further work along this line.

It is important that limited office space does not delay the integration.

The doctoral training works very well, but there is still room for a tighter integration of astrophysics and space physics students. An annual revision of the study plans is recommended.

ASP has very high ambitions: to become the leading European astronomy and space research community within its fields of expertise. The Panel recognizes that this is a very ambitious goal, and identifies astronomy as presently the weaker link in ASP.

ASP has a strong tradition in the building of space instruments. It is important that this tradition is maintained and driven by science problems. The Panel realizes that the organization of Finnish space research, with the two main funding agencies applying different priorities, but with the location at Kumpula Campus, close to the FMI, it should be possible to overcome this problem.

The strategy for future space missions is not without risk, but the leader of ASP is well placed in the European space community and should be able to act quickly to remedy decisions going against ASP.

2.13 RC-specific conclusions

The ASP RC belongs without doubt to category 1.

The quality of the research is very high. The field-normalized number of citations per publication is lower than unity. This could have natural explanations, but is a question that should be addressed.

The research is strongly linked to Finland's membership in ESO and ESA, and the outstanding research infrastructures provided by these two European organisations. ASP has also access to excellent in-house research infrastructure.

The doctoral training is excellent, and ASP participates in several national graduate schools. The PhD students are exposed to a very strong and international research environment, which make them well prepared for their future careers, be it in or outside academia.

Astronomy and space physics generate a lot of interest from the general public and ASP has responded to this interest in an excellent way. ASP has also recognized that their expertise can be of great value for non-academic activities and has also in this respect shown an excellent response.

2.14 Preliminary findings in the Panel-specific feedback

The RC should be commended for its integration of space physics and astrophysics, not an easy task given the different traditions in these two fields. In order to fulfil its ambition to become Europe's leading centre for space physics and astrophysics, the integration must be pursued further, the governance must be clearly defined, and the PhD programme must be further developed with study plans and maybe a common block of courses for the students. Finland's participation in ESO and ESA give the RC access to world-leading infrastructure and the ambitious goal is realistic. A more clearly defined leadership for the astrophysics part is a first mandatory step.

2.15 Preliminary findings in the University-level evaluation

There is now a considerable concentration of Finland's space based physics and astronomy located at the Kumpula Campus (including FMI). An organisation similar to HIP, with funding directly from the ministry and a mandate to serve as the contact point for Finland's ESA related research is something the university management may want to consider.

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:
Astronomy and Space Physics (ASP)

LEADER OF THE RESEARCHER COMMUNITY:
Professor Hannu Koskinen, Department of Physics, 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: Koskinen, Hannu

E-mail:

Phone: +358-504155356

Affiliation: University of Helsinki, Department of Physics

Street address: Gustaf Hällströminkatu 2, 00560 Helsinki

2 DESCRIPTION OF THE PARTICIPATING RESEARCHER COMMUNITY (RC)

Name of the participating RC (max. 30 characters): Astronomy and Space Physics

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

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): Our researcher community consists of five research groups studying: 1) interstellar medium and star formation, 2) stellar astrophysics, 3) planetary system, 4) space physics and 5) planetary geophysics. The operational basis of forming this researcher community is the merging of astronomy (groups 1-3) to the Department of Physics on January 1, 2010. Now astronomers, space physicists and solid earth geophysicists work in the same organization and their futures are tied together. Thus while this evaluation is retrospective, for us the exercise is very much forward-looking.

Already before the organizational merging the members of our RC have had close collaboration, for example, in development of new instruments for high-energy astrophysics or determining reflectance spectra of meteorites. Our RC has the main responsibility for the presently largest Finnish space instrument project in the Science Programme of the European Space Agency. The education and training of our doctoral students and post-doctoral researchers have much in common. At the master's level we have operated a joint Master's Degree Programme in Space Sciences since 2007 and we are active members in the nationwide Graduate Schools in Astronomy and Space Physics and in Geosciences.

Scientifically our research groups complete each other's expertise in many ways. Astronomy obtains its scientific data through remote observations using ground-based and space-borne telescopes, whereas space physics deals with physical phenomena of which it is possible to get direct in situ observations. Today we can make in situ observations also of celestial bodies, such as planets, comets and asteroids, which belong to the traditional objects of astronomy, by sending space probes to their vicinity and even to their surfaces, which makes them accessible for geophysical surveys. The Sun is another tie between astronomy and space physics. It is the star, of which we have the most detailed observations. On the other hand, it is the driver of phenomena studied in situ around the Earth and the planets as well as in the interplanetary space.

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

3 SCIENTIFIC FIELDS OF THE RC

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

RC's scientific subfield 1: Astronomy and Astrophysics

RC's scientific subfield 2: Physics, Fluids and Plasmas

RC's scientific subfield 3: Geochemistry and Geophysics

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): In the last evaluation in 2005, which was based on the Department structure, the Department of Astronomy got the highest grade 7/7 and space physics and geophysics were evaluated as a part of the Department of Physical Sciences and also got 7/7. We are sure that the quality of our research has not declined during the past 6 years. Earlier this year about a half of the present RC formed the core of a proposal for an Academy of Finland Centre of Excellence in Space Research together with space researchers from the Finnish Meteorological Institute. While not successful, our proposal was evaluated by one of the two referees to belong to the best 1% in its field internationally and to the best 5% by the other. Thus the first category is the only natural choice for us.

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): Astronomy and space physics cover research topics from the origins of the Universe to phenomena in the upper atmosphere of the Earth. Our research objects include galaxy clusters, interstellar media, star formation, magnetic activity of stars, solar activity, solar wind and its interactions with planetary magnetospheres, planetary system, light scattering and radiative transfer in planetary regoliths and atmospheres, and meteorite impacts on the Earth and other planets. Our research community consists of about 60 scientists, including experts in observations, data analysis, theory, computer simulations, laboratory studies and instrument building. About 50% of our community are doctoral students. They are active members of their supervisors' research groups, which guarantees high-quality supervision and introduces them to international collaboration. The students belong to the nation-wide Finnish Graduate School in Astronomy and Space Physics or in Geology.

In our research we use observations obtained by international infrastructures and data bases. For us the most important ground-based telescopes are the facilities

of the European Southern Observatory (ESO) in Chile and the Nordic Optical Telescope in La Palma. We are participating in several European Space Agency's (ESA) missions, including the Planck and Herschel satellites, which we use for astrophysical research. These data are supplemented with observations of several US and Japanese satellites. In addition to our observational programme, we conduct laboratory measurements in our astrophysics and geophysics laboratories.

We are also one of the leading Finnish units providing scientific satellite instruments. Presently we work intensively with a solar X-ray and particle instrument onboard ESA's Mercury mission to be launched in 2014. The instrument can be used independently in studies of solar eruptions, whereas its main task is to provide background information to a UK-led X-ray instrument to determine the elemental composition of the surface of Mercury. We have also developed a mobile meteorite research laboratory and toured several European meteorite centres to study their meteorite collections.

Significance of the RC's research and doctoral training for the University of Helsinki (MAX. 2200 characters with spaces): Astronomy is a key element of science curricula in most universities oriented to basic research in natural sciences. Many of the fundamental problems of astronomy, such as the origin and evolution of the universe, formation of complex molecules and the origin of life, belong to the greatest science questions. Space physics and planetary geophysics, in turn have direct applications contributing, e.g., to our understanding of the potential hazards to society arising from solar storms and the near-Earth objects. Spacecraft and their state-of-the-art instruments provide great technological challenges and some of our basic theoretical studies, e.g., on light scattering from complex media or on magnetism of surface materials, have direct industrial applications. Some other, e.g., turbulence in stars and interstellar media, force us to apply the state-of-the-art high-performance computing tools. Thus investing in these fields of research contributes to the development of many critical skills within the University and the maintenance of its position among the leading research oriented universities in Europe with strong scientific and societal impact.

Stars and space provide great inspiration to the wider public. Our people actively popularize science and thus contribute to the University's outreach goals. Our research objects are among the most important motivations for young people to start studying science. The competition for the best students is getting tougher and we believe that our activities help the University in this competition. We also recruit internationally in master's, doctoral, and post-doctoral levels. On the other hand, most of our PhDs do their post-doctoral work elsewhere. To enhance our doctoral student's competitiveness in the international markets we have recently developed two new courses "Introduction to project work" and "Introduction to expert tasks". The Faculty of Science has adopted these as general postgraduate studies. These concepts could easily be transferred to other parts of the University. Thus our RC directly contributes to the University's international and research training goals.

Keywords: galaxies, stars, interstellar matter, the Sun, planets, comets, asteroids, meteorites, solar wind, magnetospheres, turbulence, light scattering

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): Our RC is a multidisciplinary astronomy and space research community. In astronomy we are one of the two leading units in Finland. In solar system physics the Kumpula Space Centre, which we form together with Finnish Meteorological Institute, is the clear leader in Finland, as is also our planetary geophysics unit. Internationally we are highly respected as was evident from the excellent marks our proposal for the Centre of Excellence in Space Research got in 2010.

We publish our papers in the most important international peer-reviewed journals in our fields, typically some 60-70 articles annually. Our researchers have been very successful in obtaining external academic funding. For example, 4 of our researchers have at the end of 2010 an Academy Research Fellow position and we currently run about a dozen other Academy projects. The presently only large Tekes-funded spacecraft instrument project is managed by our RC. In 2010 we obtained three new projects from the EU FP7 Space Call.

Our researchers have had during 2005-2010 several high-profile positions in various European research organizations, e.g., as a Finnish Delegate in the Science Programme Committee and the Programme Board of the Space Situational Awareness Programme of ESA, membership in the Observing Programme Committee and in the Scientific Technical Committee of ESO, in the ALMA Science Advisory Committee, in various Commissions of the International Astronomical Union, in management roles of EU COST Actions, in organizing committees of international conferences, etc.

The quality of our doctoral training is illustrated by the production of 3 to 6 PhD theses annually. As our theses include typically 4-6 peer-reviewed articles, our new doctors often are more mature scientists than their international competitors for the best post-doctoral positions. Consequently, many of them have got positions in the highly-regarded Universities, such as Yale, Berkeley, ETH.

Comments on how the RC's scientific productivity and doctoral training should be evaluated (MAX. 2200 characters with spaces): Our main publication vehicles are the international peer-reviewed scientific journals in the fields of astronomy, space physics and planetary geophysics. These include Astrophysical Journal, Astronomy and Astrophysics, Planetary and Space Science, Icarus, Solar Physics, Meteoritics and Planetary Science, Earth and Planetary Science Letters, Journal of Geophysical Research, Journal of Quantitative Spectroscopy and Radiative Transfer, etc.. Occasionally, publications are also sent to more general high-profile series such as Nature, Nature Geosciences, Science, or Physical Review Letters. The research results are also communicated to the scientific community by active participation in both general as well as topical scientific conferences.

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

The main criterion to assess our scientific productivity is the number of articles appearing in peer-reviewed international journals and the citations to these articles. Also the number of articles in peer-reviewed compilations and conference proceedings that are not included in citation data bases need be taken into account although with smaller weight than the peer-reviewed journal articles. Other important metrics are successful observing time applications at large telescopes or space-borne observatories, success in applying significant academic funding, success of applications to EU Framework Programme or ESF, organization of scientific conferences, etc. As an important fraction of our research effort is in spacecraft instrument production, it needs to be taken into account, although the scientific results of this effort will not appear until much later.

The most important criteria to evaluate the success in doctoral training include the number of completed PhD studies as compared to the number of thesis supervisors, and the early career record of doctors graduated during the evaluation period.

LIST OF RC MEMBERS

NAME OF THE RESEARCHER COMMUNITY:			Astronomy and Space Physics		
RC-LEADER			H. Koskinen		
CATEGORY			1		
	Last name	First name	PI-status (TUHAT, 29.11.2010)	Title of research and teaching personnel	Affiliation
1	Koskinen	Hannu	X	Professor	Science, Physics
2	Muinonen	Karri	X	Professor	Science, Physics/Astronomy
3	Pesonen	Lauri	X	Professor	Science, Physics
4	Janhunen	Pekka		Professor (mvs)	Science, Physics
5	Kallio	Esa		Professor (mvs)	Science, Physics
6	Lumme	Kari		Professor (emer.)	Science, Physics/Astronomy
7	Alha	Lauri		Postdoctoral Researcher (PhD 11/2010)	Science, Physics/Astronomy
8	Andreeova	Katerina		Postdoctoral Researcher	Science, Physics
9	Hackman	Thomas		University Researcher	Science, Physics/Astronomy
10	Haikala	Lauri		University Researcher	Science, Physics/Astronomy
11	Hakala	Pasi		University Researcher	Science, Astronomy
12	Hannikainen	Diana		Senior Researcher (Acad. Research Fellow)	Science, Astronomy
13	Harju	Jorma		University Researcher	Science, Physics/Astronomy
14	Huovelin	Juhani	X	University Lecturer	Science, Physics/Astronomy
15	Jetsu	Lauri		University Lecturer	Science, Physics/Astronomy
16	Juvela	Mika		University Lecturer	Science, Physics/Astronomy
17	Kilpua	Emilia		Senior Researcher (Acad. Research Fellow)	Science, Physics
18	Kohout	Tomas		Postdoctoral Researcher	Science, Physics
19	Korpela	Seppo		University Researcher	Science, Physics/Astronomy
20	Käpylä	Petri		Senior Researcher (Acad. Research Fellow)	Science, Physics/Astronomy
21	Lehtinen	Kimmo		University Researcher	Science, Physics/Astronomy
22	Mantere	Maarit		Senior Researcher (Acad. Research Fellow)	Science, Physics/Astronomy
23	Miettinen	Oskari		Postdoctoral Researcher (PhD 12/2010)	Science, Physics/Astronomy
24	Nousiainen	Timo	X	Senior Researcher (Acad. Research Fellow)	Science, Physics
25	Vainio	Rami	X	University Lecturer	Science, Physics
26	Vilhu	Osmi		University Lecturer	Science, Astronomy
27	Ysard	Nathalie		Postdoctoral Researcher	Science, Physics/Astronomy
28	Zubko	Yevgen		Postdoctoral Researcher	Science, Physics/Astronomy
29	Chandrasekhar	Anekallu		Doctoral Candidate	Science, Physics
30	Elbra	Tiiu		Doctoral Candidate	Science, Physics
31	Granvik	Mikael		Doctoral Candidate, PhD 2008	Science, Astronomy
32	Hietala	Heli		Doctoral Candidate	Science, Physics
33	Hjalmarsdotter	Linnea		Doctoral Candidate, PhD 2008	Science, Astronomy
34	Honkonen	Ilja		Doctoral Candidate	Science, Physics
35	Isavnin	Alexey		Doctoral Candidate	Science, Physics
36	Järvinen	Riku		Doctoral Candidate	Science, Physics
37	Kainulainen	Jouni		Doctoral Candidate, PhD 2009	Science, Astronomy
38	Kajatkari	Perttu		Doctoral Candidate	Science, Physics/Astronomy
39	Kettula	Kimmo		Doctoral Candidate	Science, Physics
40	Lehtinen	Jyri		Doctoral Candidate	Science, Physics/Astronomy
41	Lindborg	Marjaana		Doctoral Candidate	Science, Physics/Astronomy
42	Lindqvist	Hannakaisa		Doctoral Candidate	Science, Physics/Astronomy
43	Lunttila	Tuomas		Doctoral Candidate	Science, Physics/Astronomy
44	Malinen	Johanna		Doctoral Candidate	Science, Physics/Astronomy
45	Mäkelä	Minja		Doctoral Candidate	Science, Physics/Astronomy
46	Näränen	Jyri		Doctoral Candidate, PhD 2009	Science, Astronomy
47	Oszkiewicz	Dagmara		Doctoral Candidate	Science, Physics/Astronomy
48	Parviainen	Hannu		Doctoral Candidate	Science, Physics/Astronomy
49	Pelkonen	Veli-Matti		Doctoral Candidate, PhD 2009	Science, Astronomy
50	Pomoell	Jens		Doctoral Candidate	Science, Physics
51	Penttilä	Antti		Doctoral Candidate	Science, Physics/Astronomy
52	Porceddu	Sebastian		Doctoral Candidate	Science, Physics/Astronomy
53	Raiskila	Selen		Doctoral Candidate	Science, Physics
54	Sandroos	Arto		Doctoral Candidate, PhD 2010	Science, Physics
55	Schultz	Juho		Doctoral Candidate, PhD 2006	Science, Astronomy
56	Sipilä	Olli		Doctoral Candidate	Science, Physics/Astronomy
57	Snellman	Jan		Doctoral Candidate	Science, Physics/Astronomy
58	Solin	Otto		Doctoral Candidate	Science, Physics/Astronomy
59	Torppa	Johanna		Doctoral Candidate, PhD 2008	Science, Astronomy
60	Tyynelä	Jani		Doctoral Candidate	Science, Physics/Astronomy
61	Virtanen	Jenni		Doctoral Candidate, PhD 2005	Science, Astronomy
62	Väisälä	Miikka		Doctoral Candidate	Science, Physics/Astronomy
63	Väänänen	Mikko		Doctoral Candidate, PhD 01/2011	Science, Physics/Astronomy
					Affiliation "Astronomy"
					indicates the affiliation
					2005-2009

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: Koskinen, Hannu

E-mail of the RC's responsible person:

Name and acronym of the participating RC: Astronomy and Space Physics, ASP

The RC's research represents the following key focus area of UH: 1. Maailman perusrakenne, materiaalit ja luonnonvarat – The basic structure, materials and natural resources of the physical world

Comments for selecting/not selecting the key focus area:

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).**

  Astronomy and Space Physics (ASP) is a RC consisting of researchers in astronomy, astrophysics, planetary research, space physics and geophysics at the University of Helsinki. Our research activities span the path from star formation through stellar astronomy to the Sun and the Solar System, ending with analysis of extraterrestrial materials in our own geophysics laboratory. Our strategic goal is to be a leading European astronomy and space research community within our fields of expertise, and to maintain our national leadership both in research and doctoral training. To reach this goal ASP is organized into 5 research teams who are specialists in: 1) interstellar medium and star formation, 2) stellar astrophysics, 3) planetary system, 4) space physics and 5) planetary geophysics.

  In studies of the interstellar medium our focus is in the early stages of the star formation process. Observations are carried out from optical to radio wavelengths using major international facilities, especially the telescopes of the European Southern Observatory (ESO). Data is used from major infrared satellites (Spitzer, AKARI), and we have a significant role in the studies carried out with European Space Agency's (ESA) Planck and Herschel satellites. Both the gas and dust components are examined to locate pre-stellar and protostellar objects and to determine their dynamical and chemical properties. Our strong participation in ESO's APEX telescope early science resulted, e.g., in the first direct evidence of ~6K gas inside pre-stellar cores and the identification of candidate high-mass pre-stellar cores, important for the understanding of the origins of massive star formation. The studies are complemented with theoretical and numerical work on the structure, physics, and chemistry of star forming clouds. We have written widely recognised radiative transfer codes for continuum and line radiation and developed chemical models for pre-stellar cores. With modelling, we have tested the observability and importance of magnetic fields in star forming regions. The key questions we seek to answer are (i) what are the dominant mechanisms in the formation and evolution of star-forming clouds and (ii) what are the physical and chemical conditions at the onset of star formation?

  In stellar astronomy our focus is in stellar magnetic activity. Photometry and high resolution spectropolarimetry have been used to study activity cycles, differential rotation and active longitudes. Time series analysis and magnetic Doppler imaging methods have been developed to obtain information of the rapid changes of the starspot distributions. The group has access to data from two state-of-the-art spectropolarimeters: HARPS of ESO and SOFIN of the Nordic Optical Telescope (NOT). Solar and stellar magnetic activity is studied with numerical MHD-models of varying complexity from simple mean-field models to direct simulations in spherical coordinates. This is possible only with high-

performance computing facilities (CSC - IT Center for Science and the Distributed European Infrastructure for Supercomputing Applications, DEISA). As the most important result we have been able to demonstrate a large-scale dynamo in direct 3D simulations and also explain it within the turbulent mean-field dynamo framework. More recently, direct simulations in spherical coordinates have shown cyclic dynamo action, reminiscent that of the Sun. We also study high energy phenomena in the Solar corona and in clusters of galaxies using X-ray satellites SMART-1 (ESA), Chandrayaan1 (India), XMM-Newton (ESA) and Chandra (USA). These studies also lead better understanding of dark matter distributions in clusters of galaxies.

We participate in development of new instruments for scientific spacecraft, in particular BepiColombo of ESA to be sent to Mercury in 2014, as well as planned future mission SPICA (Japan), IXO (ESA-USA-Japan) and NHXM (ESA), based on cryogenic detectors and modern applications of semiconductor technology. We are also starting space weather instrument development within the Space Situational Awareness Programme of ESA. We have written analysis software to ESO and continue this work on data mining methodology for astronomy and new analysis methods for scientific data.

In planetary system research we accrue knowledge on the Solar System. We focus on asteroids and comets as well as small particles in regoliths and atmospheres. We aim at understanding light scattering mechanisms and solving light scattering problems accurately for arbitrary targets. We also assess the impact hazard due to near-Earth objects. In order to reach the goals, we develop methods for light scattering by small particles, soft X-ray fluorescence from rough particulate surfaces, related inverse problems involving observations of astronomical, remote-sensing, and meteorological character, as well as for dynamics of small Solar System bodies. We specialize in statistical inverse methods to study problems such as initial orbital and spin-shape inversion for near-Earth objects. The research highlights include: (i) unveiling the interference mechanisms in single-particle polarization; (ii) application of exact scattering methods to particles with sizes record large as compared to the wavelength; (iii) pioneering studies of regolith effects on the elemental abundance derivation using soft X-ray fluorescence; and (iv), completion of the paradigm change from deterministic to statistical asteroid identification and orbital inversion. Astronomical observations are carried out using modern ground-based telescopes (e.g., VLT of ESO) and satellite instruments. Our future spacecraft involvement includes the ESA GAIA and BepiColombo missions.

In space physics our focus is on the dynamics of Solar System plasmas. Our key research questions are lift-off, propagation and geoefficiency of coronal mass ejections (CMEs), solar-wind interaction with the Earth's magnetosphere and other planetary environments, physics of shock waves and solar energetic particle acceleration. We develop state-of-the-art numerical simulations and use them to analyse satellite observations. Our simulation models include global MHD models for the solar corona, solar wind and Earth's magnetosphere, global 3-D hybrid models for planetary environments, global particle simulation models for acceleration and transport as well as magnetospheric dynamics. This has allowed us to reach greatly improved understanding, e.g., on the propagation of CMEs and their shocks in the solar corona and solar wind, on the response of the magnetosphere to CMEs, their shocks and their sheath regions, on solar-wind energy transfer through the magnetopause, on dynamics of plasma environments of Venus and Mars and on heavy-ion and relativistic proton acceleration at coronal shocks.

In planetary geophysics we study impact cratering processes, using satellite, airborne and ground geophysical techniques. The study of terrestrial impact structures is in key role because they provide ground truth data of impact processes also applicable to other Solar System bodies. The key problem is to determine the impact flux through the Solar System history, which requires dating of the impact

events in collaboration with isotope dating laboratories. Another topic is composition, structure and evolution of Solar System bodies through laboratory studies of extraterrestrial materials. To address these issues we conduct extensive laboratory studies and field research in close cooperation with the materials research and geoscience research groups in the Kumpula Campus as well as from established national and international organizations

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

  Our strategy to follow the stars from their formation to the present Solar System provides good possibilities for increased interdisciplinary research and at the same time necessary diversity for renewal and competence to respond to the opportunities arising within the international organizations, in particular ESA and ESO. As ASP is a merger of scientists having worked rather separately until January 2010, we are in fact in the middle of a process that is leading towards stronger collaboration between different groups within ASP. For example, our solar and stellar dynamo studies are directly linked to our solar-terrestrial physics research owing to related questions and through complementary numerical simulation approaches. Another actively pursued avenue toward more coherence is within planetary system studies and planetary geophysics. Also our growing participation in the ESO and ESA activities can and will be used to improve both the internal co-operation and the quality of our research results.

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 doctoral students are recruited from our own graduates, through our international networks, and in some cases through open announcements in the electronic media. The most promising doctoral candidates are often recognized already during the last years of their master's studies and in those cases a successful Master's Thesis is a bridge to the doctoral training. The recruitment is becoming increasingly active, as the competition for the most talented students is hardening. Most of our doctoral students have started as summer trainees in some of our research groups or with our collaborators, e.g., at the Finnish Meteorological Institute (FMI) or Finnish Geodetic Institute (FGI).

  At the recruitment a supervisor-student combination, often including co-supervisors, is identified and the plan for the course work and the thesis is formulated. The course plan is based on the wide choice of post-graduate level courses and seminar activities of the Department of Physics. Our students also earn credits from various national and international doctoral level courses and summer-schools. Longer visits to collaborating institutes or observatory facilities are a normal part of the study plan. The students have a choice to graduate with astronomy, physics, theoretical physics, geophysics or meteorology as their major subject.

  In addition to 50 mandatory ECTS credits within the field of the thesis the Faculty of Science presently requires 10 credits' worth of general studies. Training for our doctoral students includes courses in general skills, e.g., project management and leadership, as well as training for contacts with media. In particular, the project management studies play an important role in creating systematic and goal oriented work practices, and also help in realistic scheduling of the PhD studies and preparation for the dissertation. Training on scientific writing and preparation for the thesis defence are arranged to improve the quality of the thesis and its presentation. The investments in media skills improve the quality of public outreach activities, e.g., in the form of television or radio interviews. These efforts are a

part of our strategy to create wider perspectives and competitiveness for the graduated PhDs in searching work also outside the university and research institutes, e.g., in various expert and administrative positions in the private sector and within public authorities. Professional authorship of grant applications, observation time applications, instrument proposals, etc., is an essential competence in our field. Thus, a part of the training of our students is to train them to write successful applications to various foundations for subsistence and travel costs. This way they keep on upgrading their study plans and learn to present their goals consistently.

The most important part of our doctoral training is to involve the students in active international research projects and collaborations. Consequently, all our doctoral students work closely together with their supervisors/co-supervisors and have a regular contact with them. The supervisors are professors and senior researchers of ASP or senior research personnel at the collaborating institutes. In addition to direct supervisor-student contacts, we have found regular meetings involving a number of students and post-docs working on related problems particularly efficient. Collaborative efforts in thesis supervision and graduate studies extend to foreign institutions including external co-supervisors and mentors. International summer schools are becoming increasingly important in doctoral training, as they often bring the latest progress in science directly to the attention of the students. The international exchange is mutual; our students visit foreign laboratories and foreign students us. Many of our students spend longer periods at different observatories, e.g., NOT in La Palma, or at top-level universities making and analysing their own observations, and participating in the projects of the collaborators.

Our students are affiliated with the nation-wide Finnish Graduate Schools either in Astronomy and Space Physics or in Geology. In 2010 the GS in Astronomy and Space Physics initiated a regular summer school co-operation with a German counterpart from the University of Würzburg. A very efficient international education tool has been the NIR-programme (Network on Impact Research funded by Nordforsk) that has offered high-level summer courses on impact cratering. This type of team efforts and national and international collaboration greatly facilitate the building of doctoral students' scientific networks. All our doctoral candidates attend international conferences presenting their own results. Our students also often participate in various roles in organizing of international conferences including co-convening scientific sessions.

The Faculty of Science requests a funding plan before the registration of a new doctoral student. The funding of our doctoral students comes from various sources. Most students are employed in their supervisors' projects either at the University or at the collaborating research institutes, annually 2-4 students have heavily competed positions at the national graduate schools, and about half dozen students are supported by private foundations (e.g., Väisälä Foundation, Magnus Ehrnrooth Foundation, Renlund Foundation), and in case of foreign students also by CIMO. Some of our students have had employment in the private sector, even as private entrepreneurs.

The PhD theses produced at ASP consist of peer-reviewed articles plus an introduction. This implies that the quality assurance is an integral part of the thesis process from the start. As a result each of the fresh graduates already has a number, sometimes even a relatively large number, of publications giving them a considerable edge in competition for post-doc positions in world-leading institutes. All students working at the University and also most of those employed at research institutes participate in the teaching programme of the Department of Physics and thus gain important competence for their future career. The teaching load is kept at such a level that it is not expected to delay the completion of the PhD thesis.

During 2005-2010 we graduated 20 PhDs (10 in astronomy, 9 in physics/theoretical physics and 1 in geophysics). One more astronomy thesis was defended in December 2010 with the degree granted in 2011. The graduates have been very successful in finding positions after their graduation not only in the academia but also in the private sector. Only 4 of these doctors are presently employed at the University of Helsinki, and furthermore one of these three meanwhile had a 3-year post-doc position in Berkeley. Presently, 7 of our graduates work abroad and 3 in the private sector. The main reasons for the excellent post-doctoral employment are the internationally high professional quality of the graduates and the wide professional networks of our researchers.

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

The main strengths of our doctoral training are the close supervisor-student contacts, doctoral thesis topics within top-level international science projects, active international collaboration, good selection of doctoral level course work, and excellent laboratories. The production of 3-4 fresh doctors annually is at a healthy balance with career opportunities. It is noteworthy that we are not educating doctors for our own needs only.

The most important challenges are in the recruiting of the best students to our research teams and their funding, as well as too few permanent positions for supervision, in particular at the university lecturer level. The non-permanent nature of a large part of the personnel limits our possibilities of applying long-term project funding, which can be used to support the students. The Division of Geophysics and Astronomy is actively pursuing for more permanent resources, the first success having been our first tenure-track assistant professorship that is currently in the filling process. Here we clearly have a long way to go.

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).

There is a particularly wide public interest in astronomy, space research and geophysics in Finland. Our scientists respond to this interest by giving public lectures, writing popular articles and being frequently interviewed in news media on matters between the Earth and the Heavens. Members of ASP participate in the activities of the amateur astronomical society Ursa and contribute to its very popular magazine Tähdet ja Avaruus. Contacts with schools, adult education institutions, and even senior citizen organizations are frequent. One of the highlights during the visits of school children and their teachers in Kumpula is the meteorite and rock exhibition, including rare extraterrestrial samples. Thus we are in an excellent position to spread scientific world view and to attract new generations to studies in natural sciences, also beyond our own topics.

In the professional level we have significant collaborations with public sector research institutes, in particular FMI, FGI, and the Geological Survey of Finland (GTK). Both FMI and FGI recognize the collaboration strategically important by partially fund two of our professors. In doctoral training we supervise students employed at these institutes and their senior researchers contribute to the training of our students. After graduation several of our doctors find research positions at these institutes, e.g., FMI and FGI presently employ 7 of our 20 doctors in 2005-2010.

Some of our research topics have direct links to wider applications. In the field of space weather practical consequences of solar and geomagnetic storms on the modern technology are under active research and this is also promoted to the private sector. A fundamental discovery, electric solar wind sail

that originated from our team is being developed towards revolutionary deep-space propulsion and space debris removal methods. Both space weather and space debris are essential elements in the ESA Space Situational Awareness Programme (SSA). Another SSA-activity, directly related to our fundamental research, is the study of potential hazards due to Near-Earth Objects.

Our scientific data analysis and data mining methodology development has found applications in several sectors. Presently the methods are being applied in development of situation awareness systems for security research (Tekes Security programme), and in search and analysis of news material for the major media companies (Tekes SHOK programme NextMedia). Both activities include close collaboration with private companies.

The results of our light scattering studies are applicable to radiation balance calculations of climate models and will contribute to better climate change predictions. Light scattering studies have also found industrial applications, examples being paper industry and pigment studies of new painting methods. Furthermore, knowledge on light scattering is critical in the development of new generation weather radars, which is conducted in industrial collaboration with Vaisala Ltd by another research group of the Department of Physics.

Last but not least, our role as a leading spacecraft instrument provider to international space missions directly contributes to the knowledge base of the Finnish companies active in the space sector.

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

  When planning for new research projects, we must be increasingly alert on opportunities where our research can benefit the society. It is positive when our research leads to applications beyond astronomy and space science. In those cases, we will be more active in promoting their transfer to companies and also encourage our students to consider an own enterprise as a career option after graduation.

  Further development of our new doctoral training courses on project work and management skills will be an important activity during the next several years. Here we will widen our collaboration with research institutes and industry, thus spreading the knowledge of our capabilities and giving useful skills to our students.

  It is always possible to strengthen our outreach activities. A positive way of achieving this is to actively promote our younger people's public presence. For this we need to arrange not only more possibilities but also more training. Resources permitting, we see the production of educational material for schools as a very useful activity in the future.

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 research of ASP is characterized by wide international networks, in particular through our participation in ESA and ESO activities. The leader of the RC serves as the national delegate in the ESA Science Programme Committee and the SSA Programme Board. Several RC members have served in the ESO observing time committee and panels, ESO Scientific Technical Committee, the European ALMA Science Advisory Committee, and the Nordic node of the European ALMA Regional Centre, as well as in various committees of NOT. RC's researchers are involved as PIs, Co-Is, coordinators and participants in

various satellite instruments and observing programmes including ESA satellites Herschel, Planck, BepiColombo, Mars Express, Venus Express, Rosetta, SMART-1 and the future Solar Orbiter. We collaborate with Japanese institutes on submillimetre observations in the southern hemisphere and use the AKARI satellite data.

We have participated in a number of COST activities and are currently active in the COST action Chemical Cosmos and the ESF network on computational astrophysics. Recently, we had great success in the 2009 Space Call of the 7th Framework Programme of the EU. We are leading two large consortia (SEPServer and E-SQUID) and participate in two other projects starting in 2011.

In Finland we collaborate with all institutions active in astronomy and space research both through the Finnish Centre for Astronomy with ESO (FINCA) and the Finnish Graduate School in Astronomy and Space Physics. Both organizations include the Universities of Helsinki, Oulu and Turku and the Aalto University. We also take advantage of close collaboration with other research groups located at Kumpula Science Campus. Other central national collaborators are FGI, FMI, and GTK.

International mobility is a natural element in our activities. During 2005-2010 our scientists have had at least one-month long visits to following institutions: International Space Science Institute (Bern), Lowell Observatory (Flagstaff), Max-Planck Institute for Solar System Research, NOT, NORDITA, University of California (Berkeley), and University of Colorado (Boulder). Presently 2 of our doctoral students work in Canary Islands and one in Lowell Observatory. The number of our foreign staff is increasing. Right now we have 5 foreign doctoral students and 5 foreign post-doctoral researchers.

Some of the most significant research collaborators in addition to the above mentioned come from: Army Research Laboratory Adelphi, Astronomical Institute and the Institute of Geology of the Academy of Sciences of the Czech Republic, Astronomical Observatory of Torino, Astrophysical Institute Potsdam, CEA Saclay, CESR/IRAP, Charles University Prague, Hokkaido University, Humboldt University Berlin, Instituto de Astrofísica de Andalucía, IPAC Pasadena, Kharkov National University, Kobe University, Max Planck Institute Heidelberg, Nobeyama Radio Observatory, Observatoire de la Cote d'Azur, Swedish Institute of Space Physics, Tennessee State University, University of Alabama, University of Barcelona, University of California San Diego, University of Cologne, University of Illinois, University of Leicester, University of Münster, University of Oslo, University of Würzburg, Uppsala University.

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

The ongoing international research projects and the personal networks are our most important strength. Through these networks we can participate in large-scale, ambitious research initiatives and provide to the students opportunities for research visits and help them to find good post-doctoral positions. The recently established FINCA is expected to foster further collaboration in astronomy between the Finnish institutes.

To enable continued participation in major science projects, the maintenance of a high-level world-leading expertise in selected science areas is a continued challenge. While mobility is necessary for modern research, it sometimes introduces problems because export of best brains can cause instability within the limited local personnel resources and, in the worst case, threaten successful filling of obligations, e.g., in ESA or EU projects. It is important that we establish procedures to be alert of such risks and that our projects have a "plan-B" whenever possible.

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).

  Most important astronomy and space physics infrastructures are the large facilities provided by the international organizations, in particular ESA, ESO and NOT. Finland is a member of these organizations and thus we have access to their research programmes and data. This access is, however, strongly competed at the international level, which requires quite some effort to get, but at the same time forces us to aim at the highest scientific standards in our research.

  In modern research the computational infrastructure is of utmost importance. For heavy computing we have the access to the best infrastructure in Finland through the CSC - IT Center for Science and internationally through the Distributed European Infrastructure for Supercomputing Applications (DEISA). These supplemented by the local computing facilities and up-to-date personal workstations/laptops provide ASP excellent resources.

  In 2010 we also initiated several actions to improve our laboratory facilities. The planetary geophysics research group has a unique laboratory with state-of-art instruments, notably a superconducting SQUID magnetometer for studies and teaching on physical properties of terrestrial as well as extraterrestrial rocks and materials. Purchase agreement of several new instruments was recently reached including state-of-art instrumentation for porosity and magnetic properties determination. In the astrophysics laboratory the refurbishing of tools for light scattering experiments and the educational telescopes are in progress. Furthermore, we are in close collaboration with various other laboratories of the Department of Physics, e.g., the accelerator and X-ray facilities for testing of space instruments and ultrasonics and X-ray tomography facilities in the research of extraterrestrial materials. Overall our laboratory environment is in good shape and improving.

  The most critical issue is the limited office space. Although the number of rooms was quite sufficient at the end of 2009 when the astronomers moved from the Observatory to the Kumpula Campus, the number of personnel has increased, including three persons working under a contract with FINCA. The shortage of office space is a common problem with the Department of Physics and solutions are continuously being sought.

  At the Department of Physics all researchers teach and all teachers research. The normal teaching load of senior personnel is 4-5 lecture hours per week during the semesters, most of which is at the Bachelor's and Master's levels. This is considered overall to be a reasonable requirement, the positive side of which is the contact with the students at all levels, including the potential future doctoral students. It is clear that some of the personnel are overloaded by teaching and administrative duties and we are putting significant effort in creating more balanced distribution of the teaching responsibilities. Regular teaching duties pose challenges for the scientists to arrange for longer periods when they can concentrate in research, typically abroad. We see it utmost important that our University creates a fair and effective system of sabbaticals. The disappearance of the Senior Scientist appropriations of the Academy of Finland was very bad for research in Finland.

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

  Our main operational assets are our excellent networks within the large international infrastructures and our access with world-class computing facilities. We also see the Kumpula Science Campus as a

particular asset hosting, in addition to our own topics, chemistry, geology, mathematics and computer sciences as well as our main national collaborator, the FMI.

One of the most critical challenges is to ensure a reasonable level of instrument participation in future ESA missions. This has been a widely recognized issue at national level for a long time but no realistic solutions have been identified. Also the large amount of external funding compared to the budget funding and consequently too few permanent positions is a challenge. We need to push toward more positions in particular at the university lecturer level. This could partly be solved by using external funding to increase the number of permanent positions, even with the risk of terminating a contract in case of funding crisis sometime in the future. This is a general challenge to the personnel policy of the University.

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.

ASP is a research community involving about 85% of the research personnel of the Division of Geophysics and Astronomy of the Department of Physics. ASP is led by the Division head and the general management procedures are those of the Department of Physics. For example, ASP follows the personnel policy of the Department. Secretarial help is provided by the General Division of the Department and contributions to project administration by the Kumpula Campus services. The Department's Study Office provides excellent help in the administration of the practical teaching bureaucracy and the contacts with the Faculty thus significantly lightening the burden of the academic staff.

As the composition and size of the five research teams are quite different, they all have their own approaches to internal management. The external funding of the research comes from about 20 different projects, most of them from the Academy of Finland, Tekes and EU. Each funding recipient carries the responsibility of his or her project, including high quality of research. The continued success in gaining external funding is a sign of good project leadership competence not limited to the formal leaders of the research teams. Specialists in the research teams aim at high-quality research in their processes and this is supported by the division administration in the background.

The overall strategic goals (see item 8) are consistent with the Department's strategy of highest quality international research. It is characteristic for our RC that most of the research is carried out through international research networks and through participation in international science projects. The relative independence of the research teams enables agile participation in research initiatives, where we can best use and develop our special expertise. Locally the senior researchers coordinate joint research work where we pool our knowledge that can be complemented by contributions from our foreign collaborators.

While there is substantial co-operation between the various research teams, both at individual and project level, the Division leadership and the team leaders actively encourage increased internal co-operation.

RC-SPECIFIC STAGE 2 MATERIAL

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

  The relative autonomy of the research teams of ASP is a strength that, together with specialisation and high scientific standards, makes it possible for us to participate in a number of important international projects. Conversely, it is a challenge to simultaneously preserve sufficient focus and internal coherence within the RC so that internal collaboration remains strong and can be further enhanced. This requires continuous efforts to improve upward, downward as well as lateral information flows.

  The external funding, consisting of a large number of autonomous and, in most cases, relatively small individual grants, is not conducive to pooling of resources. The economic management procedures of the Department of Physics to channel the departmental overheads to the Divisions provide means of arranging equal operational conditions and also balancing short-term problems in funding. However, it is important not to create lasting transfer of funds between teams having different capabilities of raising them.

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: 7720000

- 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: 14850000

- 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: 4200000

- 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:

- 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: Väisälä Foundation, Renlund Foundation
  - total amount of funding (in euros) from the above-mentioned foundations: 60000

- 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: ESA, ESO, US Army research laboratory
  - total amount of funding (in euros) from the above-mentioned funding organizations: 430000

- 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: OKM, Graduate Schools, CIMO, Private companies
  - total amount of funding (in euros) from the above-mentioned funding organizations: 720000

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 strategic goal of ASP is set to year 2015 when we will be a leading European astronomy and space research community and the best doctoral training unit in Finland. This goal implies that we must be the most active Finnish user of observational data obtained by the ESO telescopes and ESA spacecraft, supplemented with data coming from other relevant international infrastructures. Observations and data analysis are not sufficient alone, success also requires strong components in theory, laboratory and field works, modelling and numerical simulations. Furthermore, direct participation in instrument development needs to be maintained and, in particular within ESO, strengthened.

To achieve this goal we will prioritize the ESO- and ESA-related research and continue to enhance the internal coherence within ASP. At the same time we must maintain sufficient amount of diversity for renewal and directing our research according to the opportunities arising within the international organizations. This is all well aligned with our scientific strategy to follow the stars from their formation to the physics of the present Solar System.

These strategic positions will be taken seriously when filling open positions and in our efforts of creating more permanent positions in the future. The first in line will be a new tenure-track assistant professor position in astrophysics in 2011. In a full professor position in astronomy and another in geophysics will become to be filled due to retirements in 2012.

We will continue making observations with the best available ground-based and space-borne instruments. We will further strengthen the use of ESO instruments and aim at active participation in the early science studies with the ESO ALMA interferometer. The interpretation of data from the new instruments requires improved, physically motivated, and very high resolution modelling. In the coming years we will raise our modelling efforts to a new level by combining our strengths in numerical MHD, astrochemistry, and radiative transfer. The result will be a more detailed, self-consistent description of the evolution of cloud cores to protostars and towards the formation of stars and planetary systems.

We will continue to have the international lead in studies of light scattering by Solar System small particles, underscored by the Electromagnetic and Light Scattering XII -conference organized by us in Helsinki in 2010. We will offer next-generation statistical inverse methods for orbits, rotational properties, shapes, scattering properties, and elemental abundances of Solar System objects. Future space mission involvement includes the GAIA and BepiColombo missions.

The major task in impact cratering research is to date the existing terrestrial impact crater events because it is the only way to estimate the impact flux through time. One of the future perspectives in our planetary geophysics research is to expand our current laboratory activities in Solar System exploration including development of minor Solar System bodies' exploration strategies and of related spaceflight instruments. We will focus on in-situ physical property determination of planetary surfaces and on sample return research where the group has solid background. We will actively contribute to

planetary exploration space missions planned by ESA and other international organizations. We will also participate in laboratory studies of sample returns from space.

On the domestic front we will continue to strengthen the collaboration both with other groups on the Kumpula Campus and with our major partners FMI, FGI, FINCA, GTK and CSC. Concrete examples are enhanced co-operation with FMI and CSC in high-performance computer simulations in solar and stellar astrophysics and space plasma physics.

Doctoral training is an essential part of all these actions. We will maintain the present level of 3-4 fresh doctors per year, putting more effort on quality than quantity.

We will also closely follow our success applying various universally adopted metrics, including number of peer-reviewed articles, citations thereupon, success in observing time applications, success in heavily competed project funding (both domestic and international), number of new doctors, and their early career record.

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

In early January a small drafting group, where all teams were represented, met on January 18 to agree upon the writing tasks. Thereafter each team discussed their contributions to the material and the drafting group members sent their contributions to the RC leader. He compiled the first draft that was distributed to the RC members on February 6. All RC members presently in Kumpula were invited to a joint meeting to discuss the material on February 8. Based on this discussion and written comments from the RC members a new draft was distributed on February 14 for final comments by February 18. The final version was compiled by the RC leader during the calendar week 8. The funding figures were compiled by the former head of the Department of Astronomy and the RC leader in consultation with persons who have received external funding. All RC members were responsible for checking and updating their information in the TUHAT data base.

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

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ASP/Koskinen

1 Analysis of publications

- Associated person is one of Hannu Koskinen , Karri Muinonen , Lauri Pesonen , Pekka Janhunen , Kari Lumme , Lauri Sakari Alha , Katerina Andreeova , Thomas Hackman , Lauri Haikala , Pasi Hakala, Diana Hannikainen , Jorma Harju , Juhani Huovelin , Lauri Jetsu , Mika Juvela , Emilia Kilpua , Tomas Kohout , Seppo Olavi Korpela , Petri Käpylä , Kimmo Lehtinen , Maarit Mantere , Oskari Samuel Miettinen , Timo Petteri Nousiainen , Rami Vainio , Osmi Vilhu , Nathalie Ysard , Evgenij Zubko , Tiiu Elbra , Mikael Matias Sebastian Granvik , Heli Hietala , Alexey Isavnin , Jouni Tapani Kainulainen , Perttu Johannes Kajatkari , Kimmo Kettula , Jyri Juhana Lehtinen , Marjaana Lindborg , Hannakaisa Lindqvist , Tuomas Lunttila , Johanna Malinen , Minja Maria Mäkelä , Jyri Antero Näränen , Dagmara Oszkiewicz , Hannu Parviainen , Jens Aarre Vilhelm Pomoell , Antti Penttilä , Sebastian Devamitra Porceddu , Selen Raiskila , Juho Schultz, Olli Juhani Sipilä , Jan Eskil Snellman , Otto Solin , Johanna Torppa , Jani Kristian Tyynelä , Jenni Virtanen , Miikka Väisälä , Mikko Kalervo Väänänen ,

	Publication Year						
Publication type	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**Total Count 2005 - 2010**
A1 Refereed journal article	40	68	53	50	62	48	321
A2 Review in scientific journal		2			3		5
A3 Contribution to book/other compilations (refereed)	1	3	1	4	3		12
A4 Article in conference publication (refereed)	21	16	28	25	13	26	129
B1 Unrefereed journal article	5	8	7	2	1		23
B2 Contribution to book/other compilations (non-refereed)	3	1	4	1	2		11
B3 Unrefereed article in conference proceedings	15	12	9	21	9	22	88
C1 Published scientific monograph	1						1
C2 Edited book, compilation, conference proceeding or special issue of journal	1	1	1	1		3	7
D1 Article in professional journal	12	15	9	5		3	44
D4 Published development or research report		1		1		1	3
D5 Text book or professional handbook or guidebook or dictionary	1	1				1	3
E1 Popular article, newspaper article					1		1
E1 Popular contribution to book/other compilations	1						1
E2 Popular monograph				1			1
F4 Model or plan taken into production / exploited						2	2

2 Listing of publications

A1 Refereed journal article

2005

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ASP/Koskinen

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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ASP/Koskinen

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2010

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Lindqvist, H, Nousiainen, TP, Zubko, E **2010**, 'Optical modeling of vesicular volcanic dust particles', in **NATO Advanced Study Institute on Special Detection Technique (Polarimetry) and Remote Sensing**, pp. 85.

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Mitra, D, Tavakol, R, Brandenburg, A, Käpylä, P **2010**, 'Oscillatory migratory large-scale fields in mean-field and direct simulations', in **Solar and Stellar Variability: Impact on Earth and Planets**, pp. 197-201 **Proceedings of the International Astronomical Union, no. S264**.

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C1 Published scientific monograph

2005

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

2005

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2006

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2007

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2008

Lilensten, J, Belehaki, A, Messerotti, M, Vainio, R, Watermann, J, Poedts, S (eds) **2008**, *Developing the scientific basis for monitoring, modelling and predicting space weather,* **COST Office, Bruessels**.

2010

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D1 Article in professional journal

2005

Hietala, H **2005**, 'Ihmeitä ja haasteita – fysiikan tulevaisuus opiskelijan silmin', **Arkhimedes**, vol 2005, no. 2, pp. 8-9.

Korja, A, Pesonen, LJ, Beckmann, A **2005**, 'Indonesian luonnonkatastrofi: tietoa maanjäristyksistä ja hyökyaalloista', **Geologi**, vol 57, no. 2, pp. 37-46.

Koskinen, H **2005**, 'Menestyä vai tuhoutua?: pääkirjoitus', **Arkhimedes**, vol 2005, no. 4, pp. 3.

Koskinen, H **2005**, 'Maa ja planeetat aurinkotuulessa', **Dimensio**, vol 69, no. 4, pp. 12-15.

Koskinen, H **2005**, 'Einsteinin jalanjäljissä keväisessä Bernissä', **Arkhimedes**, vol 2005, no. 3, pp. 6-7.

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2006

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Pesonen, LJ **2006**, 'Uusi NordForsk-hanke NORDIC IMPACT RESEARCH -verkosto "NIR" 2006-2008', **Geologi**, vol 58, no. 3, pp. 110.

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2007

Koskinen, H **2007**, 'Fysiikan rajoja ylittämässä: 41. Fysiikan päivät Tallinnassa 15.-17.3.2007', **Arkhimedes**, vol 2007, no. 2, pp. 10-15.

Koskinen, H **2007**, 'Kansainvälistä liikkuvuutta, kenen kustannuksella ja mihin suuntaan?: pääkirjoitus', **Arkhimedes**, vol 2007, no. 5-6, pp. 3.

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2008

Järvenpää, M, Koskinen, H **2008**, 'Vahdinvaihto: pääkirjoitus', **Arkhimedes**, vol 20078, no. 1, pp. 3.

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Koskinen, H **2008**, 'Sputnikista universiumun alkuhetkiin: 50-vuotta avaruuslentoja', **Dimensio**, vol 72, no. 3, pp. 25-28.

Koskinen, H **2008**, 'XLII Fysiikan päivät Turussa 27.-29.3.2008', **Arkhimedes**, vol 2008, no. 2, pp. 10-12.

Koskinen, H **2008**, 'Jos metsään haluat mennä nyt: kirja-arvostelu', **Arkhimedes**, vol 2008, no. 3, pp. 25-25.

2010

Hackman, T **2010**, 'Kirja-arvostelu: Tähtitieteen perusteet', **Arkhimedes**, vol 2010, no. 5, pp. 26.

Nousiainen, TP **2010**, 'Mikrofysiikasta säteilyvaikutuksiin: Jääkiteiden, aerosolien ja talvisateen mallintaminen', **Arkhimedes**, vol 2010, no. 3, pp. 10-14.

Romu, I, Pesonen, L **2010**, 'Kuudes kansainvälinen juonikokous (IDC 6) Varanasissa Intiassa 4.-7.2.2010', **Geologi**, vol 62, no. 3, pp. 116-121.

D4 Published development or research report

2006

Koskinen, H, Merikallio, S, Stigell, P (eds) **2006**, *Space research in Finland: report to Cospar 2006,* **Tekes, Helsinki**.

2008

Koskinen, H, Merikallio, S, Stigell, P (eds) **2008**, *Space Research in Finland: Report to COSPAR 2008,* **Tekes**.

2010

Koskinen, H, Merikallio, S, Stigell, P (eds) **2010**, *Space Research in Finland: Report to COSPAR 2010,* **Tekes, Helsinki**.

D5 Text book or professional handbook or guidebook or dictionary

2005

Huovelin, J, Schultz, J **2005**, *Tähtien rakenne ja kehitys,* **Report / Observatory, University of Helsinki, no. 1/2005**, 2. painos edn**, Helsingin yliopisto, observatorio, Helsinki**.

2006

Huovelin, J, Alha, L **2006**, *Havaitsevan tähtitieteen peruskurssi II, röntgen -ja gammatähtitiede,* **Report / Observatory, University of Helsinki, no. 1/2006, Yliopistopaino, Helsinki**.

2010

Koskinen, H, Vainio, R **2010**, *Klassinen mekaniikka,* **Limes ry, Helsinki**.

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E1 Popular article, newspaper article

2009

Väisälä, MS **2009**, 'Sa□hko□a□? Avaruudessa?', **Sössö**, vol 2009, no. 2, pp. 13-15.

E1 Popular contribution to book/other compilations

2005

Koskinen, HEJ **2005**, 'Suomalaisen avaruustutkimuksen juhlavuosi 2005', **Mitä missä milloin 2006 , Otava, Helsinki**.

E2 Popular monograph

2008

Söderström, H, Pesonen, L **2008**, *Mannerheimintien yhteiskoulu: katsaus historiaan,* **[Helsinki]**.

F4 Model or plan taken into production / exploited

2010

Koskinen, H, Vainio, R (ed.), Hietala, H **Kannen suunnittelu: Klassinen mekaniikka, Limes, Helsinki**.

Pomoell, JAV (ed.), Vainio, R (ed.), Hietala, H **Cover design for an abstract book: Abstracts of the 22nd European Cosmic Ray Symposium, Multiprint, Espoo**.

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

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

ASP/Koskinen

1 Analysis of activities 2005-2010

- Associated person is one of Hannu Koskinen , Karri Muinonen , Lauri Pesonen , Pekka Janhunen , Kari Lumme , Lauri Sakari Alha , Katerina Andreeova , Thomas Hackman , Lauri Haikala , Pasi Hakala, Diana Hannikainen , Jorma Harju , Juhani Huovelin , Lauri Jetsu , Mika Juvela , Emilia Kilpua , Tomas Kohout , Seppo Olavi Korpela , Petri Käpylä , Kimmo Lehtinen , Maarit Mantere , Oskari Samuel Miettinen , Timo Petteri Nousiainen , Rami Vainio , Osmi Vilhu , Nathalie Ysard , Evgenij Zubko , Tiiu Elbra , Mikael Matias Sebastian Granvik , Heli Hietala , Alexey Isavnin , Jouni Tapani Kainulainen , Perttu Johannes Kajatkari , Kimmo Kettula , Jyri Juhana Lehtinen , Marjaana Lindborg , Hannakaisa Lindqvist , Tuomas Lunttila , Johanna Malinen , Minja Maria Mäkelä , Jyri Antero Näränen , Dagmara Oszkiewicz , Hannu Parviainen , Jens Aarre Vilhelm Pomoell , Antti Penttilä , Sebastian Devamitra Porceddu , Selen Raiskila , Juho Schultz, Olli Juhani Sipilä , Jan Eskil Snellman , Otto Solin , Johanna Torppa , Jani Kristian Tyynelä , Jenni Virtanen , Miikka Väisälä , Mikko Kalervo Väänänen ,

Activity type	Count
Supervisor or co-supervisor of doctoral thesis	50
Prizes and awards	7
Editor of research journal	39
Editor of research anthology/collection/conference proceedings	6
Peer review of manuscripts	118
Editor of series	1
Editor of special theme number	3
Assessment of candidates for academic posts	5
Membership or other role in review committee	8
Membership or other role in research network	24
Membership or other role in national/international committee, council, board	147
Membership or other role in public Finnish or international organization	24
Membership or other role of body in private company/organisation	7
Participation in interview for written media	129
Participation in radio programme	33
Participation in TV programme	17
Participation in interview for web based media	3

2 Listing of activities 2005-2010

Supervisor or co-supervisor of doctoral thesis

Hannu Koskinen ,

PhD Thesis supervision, Hannu Koskinen, 2001 → 2005, Finland

PhD Thesis supervision, Hannu Koskinen, 2002 → 2007, Finland

PhD Thesis supervision, Hannu Koskinen, 2008 → 2012, Finland

PhD Thesis Supervision, Hannu Koskinen, 2009 → 2013, Finland

Karri Muinonen ,

Ph.D. thesis supervision, Karri Muinonen, 2005, Finland

Ph.D. thesis co-supervision, Karri Muinonen, 2008, Finland

Ph.D. thesis supervision, Karri Muinonen, 2008, Finland

Ph.D. thesis supervision, Karri Muinonen, 2009, Finland

Lauri Pesonen ,

PhD-Thesis supervisor for Fabio Donadini, Lauri Pesonen, 2007, Finland

PhD-Thesis co-supervisor for Tellervo Hyvönen, Lauri Pesonen, 2008, Finland

PhD-Thesis supervisor for Päivi Mäntyniemi, Lauri Pesonen, 2008, Finland

PhD-Thesis supervisor for Robert Klein, Lauri Pesonen, 2009, Finland

PhD-Thesis supervisor for Johanna Salminen, Lauri Pesonen, 2009, Finland

PhD-Thesis supervisor for Tomas Kohout, Lauri Pesonen, 2009, Finland

PhD-Thesis supervisor for Toni Veikkolainen, Lauri Pesonen, 2010, Finland

Thomas Hackman ,

Supervisor of PhD thesis work, Thomas Hackman, 2009 → ..., Finland

Supervisor of PhD thesis work, Thomas Hackman, 2010 → ..., Finland

Supervisor of PhD thesis work, Thomas Hackman, 2010 → ..., Finland

Jorma Harju ,

PhD thesis supervision (Oskari Miettinen), Jorma Harju, 01.09.2005 → 19.11.2010, Finland

PhD thesis supervision (Olli Sipilä), Jorma Harju, 01.09.2008 → 31.12.2012, Finland

PhD thesis supervision (Aleksi Suutarinen), Jorma Harju, 01.09.2010 → 31.12.2013, Finland

PhD thesis supervision (Miikka Väisälä), Jorma Harju, 01.06.2010 → 31.12.2013, Finland

Juhani Huovelin ,

Väitöskirjatyön ohjaus, Juhani Huovelin, 01.01.2002 → 03.12.2010

Väitöskirjatyön ohjaus, Juhani Huovelin, 01.01.2003 → 01.11.2010

Mika Juvela ,

Väitöskirjatyön ohjaus, Mika Juvela, 19.10.2004 → 26.05.2009

Väitöskirjatyön ohjaus, Mika Juvela, 2004 → ...

Väitöskirjatyön ohjaus, Mika Juvela, 28.09.2005 → 02.10.2009

Väitöskirjatyön ohjaus, Mika Juvela, 06.09.2007 → ...

Väitöskirjatyön ohjaus, Mika Juvela, 26.08.2008 → ...

Väitöskirjatyön ohjaus, Mika Juvela, 30.09.2008 → ...

Väitöskirjatyön ohjaus, Mika Juvela, 08.09.2010 → ...

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Väitöskirjatyön ohjaus, Mika Juvela, 20.08.2010 → ...

Petri Käpylä ,

Jan Snellman, Ph.D. thesis supervision: "Nonlinear closure models in magnetohydrodynamics", Petri Käpylä, 2008 → ...

Maarit Mantere ,

Petri Käpylä, Ph.D. thesis supervision: "Local numerical modelling of magnetoconvection and turbulence: implications for mean-field theories", Maarit Mantere, 2002 → 2006, Finland

Jan Snellman, Ph.D. thesis supervision: "Nonlinear closure models in magnetohydrodynamics", Maarit Mantere, 2008 → ..., Finland

Marjaana Lindborg, Ph.D. thesis supervision: "Temperature and magnetic field distribution on the surfaces of active late-type stars: II Peg", Maarit Mantere, 2008 → ..., Finland

Frederick Gent, co-supervision of Ph.D. thesis project: "Numerical models of Supernova-regulated ISM", Maarit Mantere, 2010 → ..., United Kingdom

Miikka Väisälä, Ph.D. thesis supervision: Dynamics of molecular cloud core collapse in the ISM: observations and MHD modelling, Maarit Mantere, 2010 → ..., Finland

Timo Petteri Nousiainen ,

Anu-Maija Sundströmin väitöskirjan ohjaus, Timo Petteri Nousiainen, 2005 → 2007, Finland

Hannakaisa Lindqvistin väitöskirjan ohjaus, Timo Petteri Nousiainen, 2008 → 2012, Finland

Jani Tyynelän väitöskirjan ohjaus, Timo Petteri Nousiainen, 2009 → 2011, Finland

Päivi Maunon väitöskirjan ohjaus, Timo Petteri Nousiainen, 2009 → 2013, Finland

Jussi Leinosen väitöskirjan ohjaus, Timo Petteri Nousiainen, 2010, Finland

Rami Vainio ,

Supervision of doctoral thesis: Joni Tammi, Rami Vainio, 22.01.2003 → 06.05.2006, Finland

PhD thesis supervision: Arto Sandroos (2005-2010), Rami Vainio, 2005 → 2010, Finland

Supervision of doctoral thesis: Neus Agueda, Rami Vainio, 01.01.2005 → 28.04.2008, Spain

PhD thesis supervision: Jens Pomoell (2006-), Rami Vainio, 2006 → ..., Finland

PhD thesis supervision: Heli Hietala (2007-), Rami Vainio, 2007 → ..., Finland

Participation in supervision of Doctoral thesis: Urs Ganse, Rami Vainio, 2009 → ..., Germany

PhD thesis supervision: Markus Battarbee (2009-), Rami Vainio, 11.2009 → 12.2012, Finland

Prizes and awards

Hannu Koskinen ,

Theodor Homén's price of the Finnish Society of the Sciences and Letters, Hannu Koskinen, 2010, Finland

Karri Muinonen ,

JQSRT Milestone Paper Award, Karri Muinonen, 2010, Netherlands

Lauri Pesonen ,

Award for most cited Tectonophysics paper during 2003-2007, Elsevier Publ. Co, Lauri Pesonen, 2003 → 2007

Timo Petteri Nousiainen ,

The National Aeronautics and Space Administration's Group Achievement Award, Timo Petteri Nousiainen, 17.05.2005, United States

JQSRT Milestone Paper Award, Timo Petteri Nousiainen, 2010

Tiiu Elbra ,

Certificate of Achievement for an outstanding student presentation, Tiiu Elbra, 07.09.2006, Czech Republic

Heli Hietala ,

Best Presentation in Parallel Sessions, Physics Days 2009, Heli Hietala, 14.03.2009

ASP/Koskinen

Editor of research journal

Hannu Koskinen ,

Arkhimedes, Hannu Koskinen, 01.01.2005 → 31.12.2007

Karri Muinonen ,

Advances in Space Research, Karri Muinonen, 01.01.2005 → 31.12.2005

Astronomy and Astrophysics, Karri Muinonen, 01.01.2005 → 31.12.2005

Comet/Asteroid impacts and human society, Karri Muinonen, 01.01.2005 → 31.12.2005

Electromagnetic and Light Scattering by Nonspherical Particles: Theory, Measurements, and Applications, Karri Muinonen, 01.01.2005 → 31.12.2005

Journal of Quantitative Spectroscopy and Radiative Transfer, Karri Muinonen, 01.01.2005 → 31.12.2005

Advances in Geosciences (Asian-Oceanian Geosciences Society), Karri Muinonen, 01.01.2006 → 31.12.2006, Singapore

Advances in Space Research, Karri Muinonen, 01.01.2006 → 31.12.2006, Netherlands

Astronomy & Astrophysics, Karri Muinonen, 01.01.2006 → 31.12.2006, France

Electromagnetic and Light Scattering by Nonspherical Particles: Theory, Measurements, and Applications, Karri Muinonen, 01.01.2006 → 31.12.2006, Russia

Icarus, Karri Muinonen, 01.01.2006 → 31.12.2006, United States

Journal of Quantitative Spectroscopy and Radiative Transfer, Karri Muinonen, 01.01.2006 → 31.12.2006, United States

Astronomy & Astrophysics, Karri Muinonen, 01.01.2007 → 31.12.2007

Earth, Planets, and Space, Karri Muinonen, 01.01.2007 → 31.12.2007

Icarus, Karri Muinonen, 01.01.2007 → 31.12.2007

Planetary and Space Science, Karri Muinonen, 01.01.2007 → 31.12.2007

Icarus, Karri Muinonen, 11.04.2008 → 31.12.2008, United States

Planetary and Space Science, Karri Muinonen, 30.06.2008 → 31.12.2008, Netherlands

Lauri Pesonen ,

Journal of Geophysical Research, Lauri Pesonen, 01.01.2005 → 31.12.2005

MAPS, Lauri Pesonen, 01.01.2005 → 31.12.2005

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Precambrian Research, Lauri Pesonen, 01.01.2006 → 31.12.2006

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Lauri Haikala ,

Astrophysical Journal, Lauri Haikala, 01.08.2006 → 31.08.2006

Diana Hannikainen ,

Radiation Imaging Detectors 2006, Diana Hannikainen, 01.01.2006 → 31.12.2006

Monthly Notices of the Royal Astronomical Society, Diana Hannikainen, 01.01.2007 → 31.12.2007, United Kingdom

Nuclear Instruments and Methods in Physics Research, Diana Hannikainen, 01.01.2007 → 31.12.2007

Jorma Harju ,

Referee, Jorma Harju, 12.12.2007 → 31.12.2007

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Juhani Huovelin ,

Earth and Planetary Science, Juhani Huovelin, 01.01.2005 → 31.12.2005

Earth and Planetary Science, Juhani Huovelin, 01.01.2007 → 31.12.2007, Japan

Earth and Planetary Science, Juhani Huovelin, 01.01.2008 → 31.12.2008, Japan

Tomas Kohout ,

Guest editor of Geophysica journal, Tomas Kohout, 11.2010 → 02.2011

Rami Vainio ,

Astrophysics and Space Sciences Transactions (ASTRA), Rami Vainio, 01.01.2004 → ..., Germany

Acta Geophysica, Guest Editor, Rami Vainio, 01.01.2008 → 31.12.2008, Germany

Advanced Science Letters, Rami Vainio, 01.01.2008 → ...

Editor of research anthology/collection/conference proceedings

Hannu Koskinen ,

Kymmenes Suomen avaruustutkijoiden kokous (FinCOSPAR), kokousjulkaisu, Hannu Koskinen, 01.01.2005 → 31.12.2005, Finland

Karri Muinonen ,

Electromagnetic and Light Scattering XII, Karri Muinonen, 2010, Finland

Lauri Pesonen ,

Lithosphere 2006- A Symposium on the Structure, Composition and Evolution of the Lithosphere in Finland, Lauri Pesonen, 2006

Lithosphere 2008- A Symposium on the Structure, Composition and Evolution of the Lithosphere in Finland, Lauri Pesonen, 2008, Finland

Lithosphere 2010- A Symposium on the Structure, Composition and Evolution of the Lithosphere in Finland, Lauri Pesonen, 2010, Finland

Antti Penttilä ,

Proceedings of International Conference on Electromagnetic and Light Scattering XII, Antti Penttilä, 2010

Peer review of manuscripts

Hannu Koskinen ,

Advances in Space Research, Hannu Koskinen, 15.05.2005

Annales Geophysicae, Hannu Koskinen, 15.07.2005

Journal of Geophysical Research - Space Physics, Hannu Koskinen, 20.09.2005

Geophysical Research Letters, Hannu Koskinen, 29.10.2006

Journal of Atmospheric and Solar-Terrestrial Physics, Hannu Koskinen, 27.06.2006

EOS of American Geophysical Union, Hannu Koskinen, 18.10.2007

Journal of Atmospheric and Solar-Terrestrial Physics, Hannu Koskinen, 15.06.2007, United States

Journal of Geophysical Research - Space Physics, Hannu Koskinen, 30.10.2007

Annales Geophysicae, Hannu Koskinen, 18.01.2008

Annales Geophysicae, Hannu Koskinen, 17.11.2008

Bidrag till kännedom av Finlands folk och natur, Hannu Koskinen, 15.09.2008, Finland

Earth, Planets and Space, Hannu Koskinen, 27.08.2008

Journal of Geophysical Research - Space Physics, Hannu Koskinen, 14.11.2008

Journal of Geophysical Research - Space Physics, Hannu Koskinen, 21.04.2008

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Geohysical Review Letters, Hannu Koskinen, 11.01.2010

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Karri Muinonen ,

Astronomy & Astrophysics, Karri Muinonen, 2009, Netherlands

Science, Karri Muinonen, 2009, United States

Astronomy & Astrophysics, Karri Muinonen, 2010, Netherlands

Electromagnetic and Light Scattering XII, Conference Proceedings, Karri Muinonen, 2010, Finland

Lauri Pesonen ,

Lauri J. Pesonen acted as a reviewer of paper by R. Hanson et al. (2005) on paper Mesoproterozoic infrapalte magmatism in the Kalahari Craton, Journal of African Earth Sciences, v. 46, No.1-2, pp- 141-167., Lauri Pesonen, 2005

Lauri J. Pesonen acted as a reviewer of an NSF application by A. Maloof et al. (Princeton University) concerning "Testing the GAD-model", Lauri Pesonen, 2008

Lauri J. Pesonen acted as a reviewer of Austrian Res. Council in "Variation of archaeomagnetic intensity since 1500 BC" by E.Schnepp, Lauri Pesonen, 2010, Austria

Lauri J. Pesonen acted as a reviewer of a paper by J. Kakkuri on the history of the Geodesy Research in Finland, to appear in an Springer Special Book, Lauri Pesonen, 2010

Lauri J. Pesonen acted as a reviewer of paper by Satu Mertanen and F. Karell : "Paleomagnetic and AMS studies on Satulinmäki and Koijärvi fault and shear zones" to appear in GTK Special Issue, Lauri Pesonen, 2010

Thomas Hackman ,

Referee for astronomical journals, Thomas Hackman, 07.2010, United Kingdom

Jorma Harju ,

Referee, Jorma Harju, 10.01.2005 → 24.01.2005, France

Referee, Jorma Harju, 10.01.2006 → 15.01.2006, France

Referee, Jorma Harju, 09.03.2007 → 29.03.2007

Referee, Jorma Harju, 01.01.2008 → 18.03.2008

Rerereeing a manuscript, Jorma Harju, 04.04.2010 → 13.04.2010, France

Mika Juvela ,

Astronomy and Astrophysics, Mika Juvela, 01.01.2005 → 31.12.2005, France

Astrophysical Journal Letters, Mika Juvela, 10.11.2005 → 16.11.2005, United States

Astronomy & Astrophysics, Mika Juvela, 01.01.2006 → 17.09.2006, France

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

ASP/Koskinen

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Nature, Mika Juvela, 01.01.2008 → 31.12.2008, United Kingdom

Publications of the Astronomical Society of Japan, Mika Juvela, 01.01.2008 → 31.12.2008, Japan

Artikkelin referointi, Astromy & Astrophysics, Mika Juvela, 01.08.2010 → 08.10.2010

Artikkelin referointi, Astromy and Astrophysics, Mika Juvela, 05.08.2010 → 04.09.2010

Artikkelin referointi, Astronomy & Astrophysics, Mika Juvela, 15.09.2010 → 30.11.2010

Artikkelin referointi, Astrophysical Journal Supplement, Mika Juvela, 15.03.2010 → 15.04.2010

Proceedings artikkelin referointi, IAUS-270, Mika Juvela, 20.08.2010 → 24.08.2010

Tomas Kohout ,

Review of a manuscript for Journal of Magnetism and Magnetic Materials, Tomas Kohout, 2007

Review of a manuscript for Meteoritics and Planetary Science journal, Tomas Kohout, 2007

Review of a manuscript for Geophysical Research Letters journal, Tomas Kohout, 2008

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Review of a manuscript for Science journal, Tomas Kohout, 2008

Review of a manuscript for Science journal, Tomas Kohout, 2009 → 2010

Review of the manuscript for Geophysica journal., Tomas Kohout, 2010

Petri Käpylä ,

Astronomy and Astrophysics, Petri Käpylä, 01.02.2009 → 15.02.2009

The Astrophysical Journal, Petri Käpylä, 15.04.2009 → 30.04.2009

Astronomische Nachrichten, Petri Käpylä, 15.10.2010 → 30.10.2010

Geophysical and Astrophysical Fluid Dynamics, Petri Käpylä, 01.04.2010 → 15.04.2010

Monthly Notices of the Royal Astronomical Society, Petri Käpylä, 15.04.2010 → 30.04.2010

The Astrophysical Journal, Petri Käpylä, 15.09.2010 → 30.09.2010

Maarit Mantere ,

Reviewer for the Astrophysical Journal, Maarit Mantere, 01.01.2006 → 28.02.2006, United States

Reviewer for the Astrophysical Journal Letters, Maarit Mantere, 01.07.2006 → 31.07.2006, United States

Reviewer for the Astronomical Notes, Maarit Mantere, 01.10.2008 → 30.10.2008, Germany

Reviewer for the Astronomical Notes, Maarit Mantere, 01.09.2009 → 01.11.2009

Reviewer for the Astrophysical Journal, Maarit Mantere, 01.05.2010 → 01.08.2010

Timo Petteri Nousiainen ,

Atmospheric Research, Timo Petteri Nousiainen, 01.01.2005 → 31.12.2005

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Geophysica, Timo Petteri Nousiainen, 01.01.2008 → 31.12.2008, Finland

Journal of Quantitative Spectroscopy and Radiative Transfer, Timo Petteri Nousiainen, 2009

Peer Reviewer for Applied Optics, Timo Petteri Nousiainen, 2010

Peer Reviewer for Journal of Atmospheric and Oceanic Technology, Timo Petteri Nousiainen, 2010

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ASP/Koskinen

Peer Reviewer for the Journal of Aerosol Science, Timo Petteri Nousiainen, 2010

Rami Vainio ,

Advances in Space Research, Rami Vainio, 01.01.2004 → ...

Annales Geophysicae, Rami Vainio, 01.01.2004 → ...

Astronomy and Astrophysics, Rami Vainio, 01.01.2004 → ...

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AGU Monograph "Solar Eruptions and Energetic Particles", Rami Vainio, 01.01.2005 → 31.12.2005

Astrophysics and Space Sciences Transactions (ASTRA), Rami Vainio, 01.01.2005 → ..., Germany

AIP Conf. Proc. "Turbulence and Nonlinear Processes in Astrophysical Plasmas", Rami Vainio, 01.01.2007 → 31.12.2007

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Space Weather, Rami Vainio, 01.01.2008 → ...

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Space Science Reviews, Rami Vainio, 01.01.2010 → ...

Evgenij Zubko ,

Icarus, Evgenij Zubko, 01.08.2010 → 10.09.2010, United States

Journal of Quantitative Spectroscopy and Radiative Transfer, Evgenij Zubko, 01.12.2010 → 14.12.2010, United States

Monthly Notices of the Royal Astronomical Society, Evgenij Zubko, 01.08.2010 → 21.08.2010, United Kingdom

Tiiu Elbra ,

Review of manuscript published in Evans, K. R. Horton, J. W. Jr., King, D. T., Jr., and Marrow, J. R., eds., The Sedimentary Record of Meteorite Impacts: Geological Society of America Speicial Paper 437, Tiiu Elbra, 09.2006

Review of manuscript: Pierce, H.A., and Murray, J.B., 2009. Physical property data from the ICDP-USGS Eyreville cores A and B, Chesapeake Bay impact structure, Virginia, USA, acquired using a multisensor core logger. In Gohn, G.S., Koeberl, C., Miller, K.G., and Reimold, W.U., eds., Deep drilling in the Chesapeake Bay impact structure: Geological Society of America Special Papers 2009, 458, 165-179., Tiiu Elbra, 06.10.2008

Hannakaisa Lindqvist ,

Applied Optics, Hannakaisa Lindqvist, 2009

Antti Penttilä ,

Proceedings of International Conference on Electromagnetic and Light Scattering VIII, Antti Penttilä, 2005

Journal of Quantitative Spectroscopy and Radiative Transfer, Antti Penttilä, 01.01.2006 → 31.12.2006, Netherlands

Proceedings of International Conference on Electromagnetic and Light Scattering IX, Antti Penttilä, 2006

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Brazilian Journal of Chemical Engineering, Antti Penttilä, 2010

Journal of Quantitative Spectroscopy and Radiative Transfer, Antti Penttilä, 2010

Proceedings of International Conference on Electromagnetic and Light Scattering XII, Antti Penttilä, 2010

Selen Raiskila ,

Architecture of the northeastern rim of the Kärdla impact crater, Estonia, based on ground penetrating-radar studies., Selen Raiskila, 06.03.2009, United States

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Editor of series

Hannu Koskinen ,

Reports to COSPAR, Hannu Koskinen, 2000 → 2010

Editor of special theme number

Maarit Mantere ,

Guest-editor for Astronomical Notes, Maarit Mantere, 01.04.2009 → 31.12.2009

Timo Petteri Nousiainen ,

Guest editor for the ELS XII special issue in JQSRT, Timo Petteri Nousiainen, 08.2010 → 03.2011

Evgenij Zubko ,

Journal of Quantitative Spectroscopy and Radiative Transfer, Evgenij Zubko, 15.09.2010 → 01.03.2011, United States

Assessment of candidates for academic posts

Karri Muinonen ,

Docent committee membership, Karri Muinonen, 04.03.2010, Finland

Docent committee membership, Karri Muinonen, 17.12.2010, Finland

Docent committee membership, Karri Muinonen, 09.04.2010, Finland

University lecturer, committee chair, Karri Muinonen, 21.05.2010, Finland

University lecturer, committee chair, Karri Muinonen, 31.05.2010, Finland

Membership or other role in review committee

Hannu Koskinen ,

Canadian Space Agency, Hannu Koskinen, 06.06.2005, Canada

Vetenskapsrådet funding panel, Hannu Koskinen, 17.09.2008 → 18.09.2008, Sweden

Evaluation of funding application, NSF, Hannu Koskinen, 07.02.2010, United States

Karri Muinonen ,

Swedish Space Board Proposal Review, Karri Muinonen, 15.09.2009, Sweden

Jorma Harju ,

ESO OPC LABOCA Special Panel member, Jorma Harju, 01.08.2007 → 24.08.2007

ESO OPC panel member, Jorma Harju, 01.11.2007 → 29.05.2008

Rami Vainio ,

National Science Foundation - Evaluation of funding proposals, Rami Vainio, 01.09.2004 → ..., United States

National Science Foundation, Rami Vainio, 01.01.2008 → 31.12.2008, United States

Membership or other role in research network

Hannu Koskinen ,

ESA:n Merkurius-ohjelma BepiColombo, Co-investigator, Hannu Koskinen, 2003 → ...

Membership in research network, Hannu Koskinen, 2003 → 2007

Rosetta Lander (Philae) Steering Committee, Hannu Koskinen, 2009 → 2013

Karri Muinonen ,

Lowell Observatory Near-Earth-Object Search (LONEOS), Karri Muinonen, 1993 → 2009, United States

Advanced Moon micro-Imager Experiment (AMIE), Karri Muinonen, 1999 → 2010, Switzerland

Compact Imaging X-Ray Spectrometer (D-CIXS), Karri Muinonen, 1999 → 2010, United Kingdom

ASP/Koskinen

X-Ray Solar Monitor (XSM), Karri Muinonen, 1999 → 2010, Finland

NEOSSat Near-Earth Space Surveillance Mission, Karri Muinonen, 2002 → 2007, Canada

Physical and dynamical characterization of near-Earth objects (Nordic Near-Earth-Object Network NEON), Karri Muinonen, 2003 → 2006, Finland

Mercury Imaging X-ray Spectrometer (MIXS), Karri Muinonen, 2004 → 2010

Solar Intensity X-ray and particle Spectrometer (SIXS), Karri Muinonen, 2004 → 2010

Gaia Data Processing and Analysis pipeline (DPAC), Development Unit DU456, Karri Muinonen, 2005 → 2010, France

Transneptunian Objects: Characterization of Surface Properties, Karri Muinonen, 2006 → 2008, France

EuroPlaNet, Karri Muinonen, 2007 → 2010, France

European Leadership in Space Astrometry (ELSA), Karri Muinonen, 2007 → 2010, Sweden

Lauri Pesonen ,

Member in the cc-committee of the NordForsk Research School, Lauri Pesonen, 2005

Jorma Harju ,

Membership in a COST action, Jorma Harju, 01.01.2010 → ...

Juhani Huovelin ,

BepiColombo SIXS ja MIXS projekti, Juhani Huovelin, 2005 → 2010, Finland

Sampo in-kind projekti, Juhani Huovelin, 2005 → 2008, Finland

MIFSAS-projekti, Juhani Huovelin, 2009 → 2010, Finland

Maarit Mantere ,

HPC2-Europa high-performance mobility network: host, Maarit Mantere, 01.01.2010 → ..., Finland

Heli Hietala ,

Finnish Physical Society, Heli Hietala, 2008 → ...

American Geophysical Union, Heli Hietala, 2009 → ...

Antti Penttilä ,

Young Scientist in team Light Scattering Phenomena in Small Body Surfaces, Antti Penttilä, 2007 → 2008, Switzerland

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

Hannu Koskinen ,

Scientific Committee on solar-Terrestrial Physics (SCOSTEP), Hannu Koskinen, 01.01.1994 → ...

National Committee membership, Hannu Koskinen, 1998 → ...

Delegate of Finland in COSPAR Councilissa, Hannu Koskinen, 2000 → 2011

URSIn kansalliskomitea, Hannu Koskinen, 01.01.2000 → ..., Finland

National Delegate in ESA bodies, Hannu Koskinen, 2002 → ...

Advisory body membership, Hannu Koskinen, 2003 → 2005, United States

ILWS (International Living With a Star -ohjelma), magnetosfäärityöryhmä (M-TG), Hannu Koskinen, 2003 → 2007

Avaruusasiain neuvottelukunta, Hannu Koskinen, 01.04.2004 → 31.03.2010, Finland

Scientific academy membership, Hannu Koskinen, 2004 → 2009

Chilean Research Fund Council, Hannu Koskinen, 01.01.2005 → 31.12.2005, Chile

Norges Forskningsråd, Hannu Koskinen, 01.01.2005 → 31.12.2005, Norway

Scientific academy membership, Hannu Koskinen, 2005 → ...

Board membership, Hannu Koskinen, 2006 → ...

Kumpula Space Centre, director, Hannu Koskinen, 01.01.2006 → ..., Finland

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Kungliga vetenskapsakademien, member of a job position panel, Hannu Koskinen, 01.03.2006 → 30.04.2006, Sweden

National Science Foundation, evaluation of a wide Network of Excellence of Simulation, Hannu Koskinen, 01.01.2006 → 31.12.2006, United States

Norges Forskningsråd, Hannu Koskinen, 01.01.2006 → 31.12.2006, Norway

Physics Days 2007 (41. Annual Meeting of the Finnish Physical Society), Tallinn 15.-17.3.2007, organising committee, Hannu Koskinen, 2006 → 2007, Finland

Physics Days 2007 (41. Annual Meeting of the Finnish Physical Society), Tallinn 15.-17.3.2007, program committee, Hannu Koskinen, 2006 → 2007, Finland

Rymdstyrelsen, Hannu Koskinen, 01.01.2006 → 31.12.2006, Sweden

Vetenskapsrådet, member of the financing panel, Hannu Koskinen, 11.09.2006 → 12.09.2006, Sweden

FinCOSPAR 2007, Suomen avaruustutkijoiden XI kansallinen COSPAR-kokous, 4.-5.10.2007 Korpilampi, member of the organising committee, Hannu Koskinen, 04.10.2007 → 05.10.2007, Finland

Scientif academy membership, Hannu Koskinen, 2007 → ...

Suomen Tiedeseura, hallituksen varajäsen, Hannu Koskinen, 01.05.2007 → 30.04.2011, Finland

Vetenskapsrådet funding panel, Hannu Koskinen, 01.08.2007 → 31.08.2007, Sweden

Scientific academy membership, Hannu Koskinen, 2009 → ...

Vetenskapsrådet funding panel, Hannu Koskinen, 09.09.2009 → 10.09.2009, Sweden

Board membership, Hannu Koskinen, 2010 → ...

National Delegate in ESA bodies, Hannu Koskinen, 2010 → ...

Karri Muinonen ,

International Astronomical Union, Commission 15 Organizing Committee, Karri Muinonen, 01.01.2005 → 31.12.2005, France

International Astronomical Union, Working Group on Comets and Distant Objects, Karri Muinonen, 01.01.2005 → 31.12.2005, France

International Astronomical Union, Working Group on Near-Earth Objects, Karri Muinonen, 01.01.2005 → 31.12.2005, France

Scientific Organizing Committee for 8th Conference on Electromagnetic and Light Scattering by Nonsphe-rical Particles: Theory, Measurements, and Applications, Salobrena, Granada, Spain, 2005 May 16-20, Karri Muinonen, 01.01.2005 → 31.12.2005, Spain

ELSA Steering Committee (European Leadership in Space Astrometry), Karri Muinonen, 01.01.2006 → 31.12.2006, Sweden

International Astronomical Union, Karri Muinonen, 2006 → 2010, France

International Astronomical Union, Commission 15, Karri Muinonen, 2006 → 2010, Italy

International Astronomical Union, Commission 15, Karri Muinonen, 2006 → 2010, Argentina

International Astronomical Union, Commission 15 Organizing Committee, Karri Muinonen, 01.01.2006 → 31.12.2006, France

International Astronomical Union, Task Group on Asteroid Magnitudes, Karri Muinonen, 01.01.2006 → 31.12.2006, France

International Astronomical Union, Task Group on Asteroid Polarimetric Albedo Calibration, Karri Muinonen, 01.01.2006 → 31.12.2006, France

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ELSA Steering Committee (European Leadership in Space Astrometry), Karri Muinonen, 01.01.2007 → 31.12.2007, Sweden

ESA Marco Polo Mission Proposal, Karri Muinonen, 2007 → 2010, Netherlands

International Astronomical Union, Commission 20 Organizing Committee, Karri Muinonen, 01.01.2007 → 31.12.2007, France

International Astronomical Union, Task Group on Asteroid Magnitudes, Karri Muinonen, 01.01.2007 → 31.12.2007, France

International Astronomical Union, Task Group on Asteroid Polarimetric Albedo Calibration, Karri Muinonen, 01.01.2007 → 31.12.2007, France

Marco Polo Science Study Team, ESA, Karri Muinonen, 01.01.2007 → 31.12.2007, France

ELSA Steering Committee (European Leadership in Space Astrometry), Karri Muinonen, 01.01.2008 → 31.12.2008, Sweden

International Astronomical Union, Commission 15, Karri Muinonen, 2008 → 2010, Finland

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International Astronomical Union, Task Group on Asteroid Magnitudes, Karri Muinonen, 01.01.2008 → 31.12.2008, France

International Astronomical Union, Task Group on Asteroid Polarimetric Albedo Calibration, Karri Muinonen, 01.01.2008 → 31.12.2008, France

International Astronomical Union, Task Group on Geophysical and Geological Properties of Asteroids and Cometary Nuclei, Karri Muinonen, 01.01.2008 → 31.12.2008, France

Marco Polo Science Study Team, ESA, Karri Muinonen, 01.01.2008 → 31.12.2008, France

Gaia Research for European Astronomy Training (GREAT), Karri Muinonen, 2009 → 2010, France

Lauri Pesonen ,

Member in the organizing committee of the Lithosphere 2010, 2006 Symposiums of the Finnish ILP-programme, Lauri Pesonen, 2000 → 2010, Finland

Member in Science Advisory Board, Lauri Pesonen, 2005, Finland

Participating subproject leader in the IGCP-509 "Supercontinents", impact subproject, Lauri Pesonen, 2005

Archaeomagnetic Applications for the Rescue of Cultural Heritage, Lauri Pesonen, 01.01.2006 → 31.12.2006

International Geological Congress 33 (Oslo 2008), Impact Symposium and its associated field trips, principal organizer, Lauri Pesonen, 01.01.2006 → 31.12.2006

Litosphere 2006 symposium, member of the organizing committee, Lauri Pesonen, 01.01.2006 → 31.12.2006, Finland

NSRC-based PIRE-project on Supercontinents, member of the Co-ordinating committee, Lauri Pesonen, 01.01.2006 → 31.12.2006

Finnish national International Lithosphere Program (ILP) committee, Lauri Pesonen, 01.01.2008 → 31.12.2008, Finland

Litosphere 2008 symposium, member of the organizing committee, Lauri Pesonen, 2008

Member in Finnish Geology Graduate School, Lauri Pesonen, 01.01.2008

Appointed member of the co-ordinating committee of the 6th ICD Mafic Dyke Conference, Lauri Pesonen, 2009, India

6th International Dyke Conference in Varanasi, India (Organizing committee), Lauri Pesonen, 2010

Litosphere 2008 symposium, member of the organizing committee, Lauri Pesonen, 2010

Member in Science Advisory Board, Lauri Pesonen, 2010, India

Thomas Hackman ,

Nordic Optical Telescope Instrument User Group on High Resolution Spectroscopy, Thomas Hackman, 12.05.2003 → ...

Nordic Optical Telescope, Observing Programmes Committee, Thomas Hackman, 01.01.2006 → 31.12.2008

Nordic Optical Telescope Observing Programmes Committee, Thomas Hackman, 2009 → 2011

Lauri Haikala ,

Europen Southern Observatory/ Scientific Technical Committee, Lauri Haikala, 18.04.2007 → 19.04.2007, Germany

Europen Southern Observatory/ Scientific Technical Committee, Lauri Haikala, 23.10.2007 → 24.10.2007, Germany

ESO Scientific Technical Committee, Lauri Haikala, 16.04.2008 → 17.04.2008, Germany

Europen Southern Observatory/ Scientific Technical Committee, Lauri Haikala, 21.10.2008 → 22.10.2008, Germany

Europen Southern Observatory/ European Science Advisory Committee, Lauri Haikala, 12.06.2009, Germany

Europen Southern Observatory/ European Science Advisory Committee, Lauri Haikala, 09.10.2009, Germany

Europen Southern Observatory/ Scientific Technical Committee, Lauri Haikala, 22.04.2009 → 23.04.2009, Germany

Europen Southern Observatory/ Scientific Technical Committee, Lauri Haikala, 21.10.2009 → 22.10.2009, Germany

Europen Southern Observatory/ European Science Advisory Committee, Lauri Haikala, 10.03.2010, Germany

Europen Southern Observatory/ European Science Advisory Committee, Lauri Haikala, 18.10.2010, Germany

Europen Southern Observatory/ Scientific Technical Committee, Lauri Haikala, 20.04.2010 → 21.04.2010, Germany

Europen Southern Observatory/ Scientific Technical Committee, Lauri Haikala, 15.06.2010 → 16.06.2010

Europen Southern Observatory/ Scientific Technical Committee, Lauri Haikala, 19.10.2010 → 20.10.2010, Germany

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

ASP/Koskinen

Diana Hannikainen ,

International Workshop on Radiation Imaging Detectors, Diana Hannikainen, 01.01.2005 → 31.12.2005

Nordic Optical Telescope Observing Proposals Committee, Diana Hannikainen, 01.01.2005 → 31.12.2005

XMM-Newton evaluation panel, Diana Hannikainen, 01.01.2005 → 31.12.2005

INTEGRAL Time Allocation Committee, Diana Hannikainen, 01.01.2006 → 31.12.2006

International Workshop on Radiation Imaging Detectors, Diana Hannikainen, 01.01.2006 → 31.12.2006

XMM-Newton evaluation panel, Diana Hannikainen, 01.01.2006 → 31.12.2006

ESO Observing Proposal Committee, Diana Hannikainen, 01.01.2007 → 31.12.2007

International Workshop on Radiation Imaging Detectors, Diana Hannikainen, 01.01.2007 → 31.12.2007

Jorma Harju ,

European ALMA Science Advisory Committee member, Jorma Harju, 01.01.2005 → 31.12.2005

Finnish National Committee of URSI, Jorma Harju, 01.01.2005 → 31.12.2005, Finland

European ALMA Science Advisory Committee, Jorma Harju, 01.01.2006 → 31.12.2006

Suomen radiotieteen kansalliskomitea, Jorma Harju, 01.01.2006 → 31.12.2006, Finland

European ALMA Science Advisory Committee member, Jorma Harju, 01.01.2007 → 31.12.2007

Suomen Radiotieteen Kansalliskomitea, Jorma Harju, 01.01.2007 → 31.12.2007, Finland

ESO OPC panel member, Jorma Harju, 01.11.2008 → 30.11.2008

European ALMA Science Advisory Committee member, Jorma Harju, 01.01.2008 → 31.12.2008

Finnish Natioanl Committee of URSI, Jorma Harju, 01.01.2008 → 31.12.2008, Finland

European ALMA Science Advisory Committee member, Jorma Harju, 01.01.2009 → 31.01.2009, Germany

Juhani Huovelin ,

Avaruusasiain neuvottelukunnan pysyvä asiantuntija, Juhani Huovelin, 01.04.1997 → 31.03.2010, Finland

Suomen Fyysikkoseura, astro- ja avaruusfysiikan jaosto, Juhani Huovelin, 01.01.2005 → 31.12.2005, Finland

Suomen Akatemia, kansainvälinen arvioitsijapooli, Juhani Huovelin, 01.01.2006 → 31.12.2006, Finland

Suomen COSPAR-komitea, Juhani Huovelin, 01.01.2006 → 31.12.2006, Finland

Suomen Fyysikkoseura, astro- ja avaruusfysiikan jaosto, Juhani Huovelin, 01.01.2006 → 31.12.2006, Finland

Tuorlan observatorio, Juhani Huovelin, 01.01.2006 → 31.12.2006, Finland

Tähtitieteen ja avaruusfysiikan tutkijakoulu, Juhani Huovelin, 01.01.2006 → 31.12.2006, Finland

Suomen Akatemia, kansainvälinen arvioitsijapooli, Juhani Huovelin, 01.01.2007 → 31.12.2007, Finland

Suomen COSPAR-komitea, Juhani Huovelin, 01.01.2007 → 31.12.2007, Finland

Tuorlan Observatorio, Juhani Huovelin, 01.01.2007 → 31.12.2007, Finland

Tähtitieteen ja avaruusfysiikan tutkijakoulu, Juhani Huovelin, 01.01.2007 → 31.12.2007, Finland

COSPAR kansalliskomitea/jäsen, Juhani Huovelin, 2008 → 2010, Finland

Suomen Akatemia, kansainvälinen arvioitsijapooli, Juhani Huovelin, 01.01.2008 → 31.12.2008, Finland

Suomen COSPAR-komitea, Juhani Huovelin, 01.01.2008 → 31.12.2008, Finland

Tuorlan Observatorio, Juhani Huovelin, 01.01.2008 → 31.12.2008, Finland

Tähtitieteen ja avaruusfysiikan tutkijakoulu, Juhani Huovelin, 01.01.2008 → 31.12.2008, Finland

Lauri Jetsu ,

Suomen tähtitieteen kansalliskomitea, Lauri Jetsu, 01.01.2005 → 31.12.2005, Finland

Suomen tähtitieteen kansalliskomitea, Lauri Jetsu, 01.01.2006 → 31.12.2006, Finland

Suomen tahtitieteen kansalliskomitea, Lauri Jetsu, 01.01.2007 → 31.08.2007, Finland

Mika Juvela ,

European time allocation committee of the ASTRO-F satellite, Mika Juvela, 12.12.2005 → 13.12.2005, Spain

ASTROSIM steering committee (European Science Foundation), Mika Juvela, 01.01.2006 → 31.12.2006, France

Organizing committee of IAU Division VI, Interstellar Matter, Mika Juvela, 01.09.2006 → 31.12.2010

European Southern Observatory, member in Observing Programmes Committee, Mika Juvela, 06.09.2007 → 31.12.2007, Germany

European Southern Observatory, panel member in Observing Programmes Committee, Mika Juvela, 01.01.2007 → 31.12.2007, Germany

Steering committee of the project ASTROSIM, European Science Foundation, Mika Juvela, 01.01.2007 → 31.12.2007, France

The organizing committee of IAU Division VI, Interstellar Matter, Mika Juvela, 01.01.2007 → 31.12.2007, United States

COST The Chemical Cosmos, Management Committee, Mika Juvela, 11.12.2008 → 31.12.2011

European Southern Observatory, Observing Programmes Committee, Mika Juvela, 01.01.2008 → 31.12.2008, Germany

Steering committee of the project ASTROSIM, European Science Foundation, Mika Juvela, 01.01.2008 → 31.12.2008, France

The organizing committee of IAU Division VI, Interstellar Matter, Mika Juvela, 01.01.2008 → 31.12.2008, France

Steering committee of ASTROSIM, an ESF program in Computational Astrophysics and Cosmology, Mika Juvela, 01.09.2010 → 31.12.2011

Maarit Mantere ,

Finnish Astronomers' Society; board member, Maarit Mantere, 04.06.2010 → ..., Finland

Physics Department; vice-member of the departmental council, Maarit Mantere, 01.09.2010 → ...

Physics-chemistry network of the national supercomputing center; member, Maarit Mantere, 01.05.2010 → ..., Finland

Oskari Samuel Miettinen ,

Physics Days 2011 (Helsinki), member of the Finnish Programme committee, Oskari Samuel Miettinen, 03.2010 → 03.2011

Timo Petteri Nousiainen ,

Co-chair of a Scientific Organizing Committee, Timo Petteri Nousiainen, 2010, Finland

Member of the Local Organizing Committee, Timo Petteri Nousiainen, 2010

Member of the Scientific Committee of ISALSaRS'11, Timo Petteri Nousiainen, 08.2010 → 06.2011

Rami Vainio ,

COST, Management Committee of COST Action 724, Rami Vainio, 09.10.2002 → 31.12.2007, Finland

COST Action 724, Working Group 2: Radiation environment, Rami Vainio, 01.01.2003 → 31.12.2007

Physics Days 2007 (41. Annual Meeting of the Finnish Physical Society), Tallinn 15.-17.3.2007, organising committee, Rami Vainio, 01.01.2006 → 31.03.2007, Finland

International Heliophysical Year, National coordinator, Rami Vainio, 01.01.2007 → 31.12.2008, Finland

Osmi Vilhu ,

Royal Swedish Academy, Osmi Vilhu, 01.04.2005 → 31.12.2005, Sweden

Membership or other role in public Finnish or international organization

Hannu Koskinen ,

Space Research Unit, Finnish Meteorological Institute, director, Hannu Koskinen, 01.10.2005 → 30.09.2006, Finland

Karri Muinonen ,

Helsingin yliopiston Matias -työryhmä, Karri Muinonen, 01.01.2005 → 31.12.2005, Finland

Helsingin yliopiston Matias -työryhmä, Karri Muinonen, 01.01.2007 → 31.12.2007, Finland

Helsingin yliopiston Matias -työryhmä, Karri Muinonen, 01.01.2008 → 31.12.2008, Finland

Helsingin yliopiston tähtitieteen laitoksen johtoryhmä, Karri Muinonen, 01.01.2008 → 31.12.2008, Finland

Suomen Akatemia, Tieteen tila ja taso -työpaja, Karri Muinonen, 03.04.2008 → 31.12.2008, Finland

ASP/Koskinen

Lauri Pesonen ,

Board of the Institute of the Seismology, Lauri Pesonen, 01.01.2005 → 31.12.2005, Finland

Finnish Committee of the International Union of Geodesy and Geophysics, Lauri Pesonen, 01.01.2005 → 31.12.2005, Finland

Scientific Advisory Board of the Finnish Geodetic Institute, Lauri Pesonen, 01.01.2005 → 31.12.2005, Finland

Board of the Institute of the Seismology, Lauri Pesonen, 01.01.2006 → 31.12.2006, Finland

Finnish Committee of the International Union of Geodesy and Geophysics, Lauri Pesonen, 01.01.2006 → 31.12.2006, Finland

Scientific Advisory Board of the Finnish Geodetic Institute, Lauri Pesonen, 01.01.2006 → 31.12.2006, Finland

Board of the Institute of the Seismology, Lauri Pesonen, 01.01.2007 → 31.12.2007, Finland

Finnish Committee of the International Union of Geodesy and Geophysics, Lauri Pesonen, 01.01.2007 → 31.12.2007, Finland

Scientific Advisory Board of the Finnish Geodetic Institute, Lauri Pesonen, 01.01.2007 → 31.12.2007, Finland

Participating member in Elgy`gytkyn Impact Crater Drilling Project (ICDP), Lauri Pesonen, 2010

Thomas Hackman ,

Kansainvälisten ihmisoikeusasiain neuvottelukunta, Thomas Hackman, 01.01.2004 → 01.04.2011, Finland

Juhani Huovelin ,

Tuorlan Observatorion johtokunnan jäsen, Juhani Huovelin, 2006 → 2008, Finland

Kauppa- ja teollisuusministeriö, Avaruusasiain neuvottelukunta, Juhani Huovelin, 01.01.2007 → 31.12.2007, Finland

Tähtitieteen ja avaruusfysiikan tutkijakoulu, hallituksen jäsen, Juhani Huovelin, 2007 → 2010, Finland

Kauppa- ja teollisuusministeriö, Avaruusasiain neuvottelukunta, pysyvä, Juhani Huovelin, 01.01.2008 → 31.12.2008, Finland

Mika Juvela ,

FINCA (Finnish Centre for Astronomy with ESO) board, Mika Juvela, 01.01.2010 → 31.12.2011

Timo Petteri Nousiainen ,

Helsingin Sanomat, Kysy Torstilta -palsta, konsultaatio, Timo Petteri Nousiainen, 01.01.2006 → 31.12.2006, Finland

Tähtitieteellinen yhdistys URSA ry, sähköpostilistan asiantuntijana toimiminen, Timo Petteri Nousiainen, 01.01.2006 → 31.12.2010, Finland

Membership or other role of body in private company/organisation

Thomas Hackman ,

Amnesty international - finländska sektionen, Thomas Hackman, 01.04.2002 → 30.03.2008, Finland

Diana Hannikainen ,

Soroptimist International of Finland, Diana Hannikainen, 01.01.2007 → 31.12.2007, United Kingdom

Jorma Harju ,

Helsingin yliopiston tieteentekijät (HYT), Jorma Harju, 01.01.2005 → 31.12.2005, France

Helsingin yliopiston tieteentekijät, Jorma Harju, 01.01.2006 → 31.12.2006, Finland

Helsingin yliopiston tieteentekijät, Jorma Harju, 01.01.2007 → 31.12.2007, Finland

Helsingin yliopiston tieteentekijät, Jorma Harju, 01.01.2008 → 31.12.2008, Finland

Kimmo Lehtinen ,

Artjärven viestitekninen yhdistys ry, Kimmo Lehtinen, 01.01.2006 → 31.12.2006, Spain

Participation in interview for written media

Hannu Koskinen ,

Helsingin Sanomain uutissivu Internetissä, Hannu Koskinen, 31.10.2005, Finland

Tekniikka & Talous, haastattelu, toimittaja Raili Leino, Hannu Koskinen, 01.12.2005, Finland

Tieteen tietotekniikkaa, tietoyhteys-lehti 4/2005, haastattelu, Hannu Koskinen, 2005, Finland

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

ASP/Koskinen

Yliopistolainen-lehti 9/2005, referaatti koululaisten fysiikkatapahtumasta Kumpulassa, toimittaja Virve Pohjanpalo, Hannu Koskinen, 29.11.2005, Finland

Helsingin Sanomat, Tiede & Luonto D1, haastattelu, toimittaja Johanna Mannila, Hannu Koskinen, 14.11.2006, Finland

Tekniikan Maailma nro 1/2006, haastattelu, toimittaja Kyösti Isosaari, Hannu Koskinen, 2006, Finland

Universitas Helsingiensis 3/06, Quartely Journal of the University of Helsinki, interview, editor Virve Pohjanpalo, Hannu Koskinen, 2006, Finland

YLE, tunti kontaktiohjelmassa Kysykää, Hannu Koskinen, 08.05.2006, Finland

Yliopisto, HY:n tiedelehti, 1/2006, haastattelu toimittajana Pekka Raittinen, Hannu Koskinen, 23.01.2006, Finland

Yliopisto-lehti 11/2006, haastattelu, toimittaja Virve Pohjanpalo, Hannu Koskinen, 2006, Finland

Yliopisto-lehti, haastattelu, toimittaja Anu Vallinkoski, Hannu Koskinen, 25.01.2008, Finland

Karri Muinonen ,

Helsingin SAnomat, haastattelu, Karri Muinonen, 17.12.2000 → 31.12.2011, France

Ikäihmisten yliopisto, Espoo, esitelmä, Karri Muinonen, 14.03.2000 → 31.12.2011, France

Helsingin Sanomat, Karri Muinonen, 13.12.2001 → 31.12.2011, Finland

Suomenmaa, Karri Muinonen, 14.02.2001 → 31.12.2011, Finland

Astronomia 2000 -haastattelu, Karri Muinonen, 17.09.2002 → 31.12.2011, Sweden

Helsingin Sanomat, Karri Muinonen, 25.07.2002 → 31.12.2011, Sweden

Iltasanomat, Karri Muinonen, 08.10.2002 → 31.12.2011, Sweden

Kyrkpressen -lehti, Karri Muinonen, 14.11.2002 → 31.12.2011, Sweden

T-lehti -haastattelu, Karri Muinonen, 02.10.2002 → 31.12.2011, Sweden

Tiede -lehti, Karri Muinonen, 10.09.2002 → 31.12.2011, Sweden

Tähdet ja Avaruus -lehti, Karri Muinonen, 22.11.2002 → 31.12.2011, Sweden

Aamulehti, Karri Muinonen, 07.01.2003 → 31.12.2011, Finland

Avaruus 2003 -näyttely, Karri Muinonen, 30.10.2003 → 31.12.2011, Finland

ET-lehti, Karri Muinonen, 04.08.2003 → 31.12.2011, Finland

Ilta-Sanomat, Karri Muinonen, 02.09.2003 → 31.12.2011, Finland

Iltalehti, Karri Muinonen, 07.02.2003 → 31.12.2011, Finland

Iltalehti, Karri Muinonen, 02.09.2003 → 31.12.2011, Finland

Keskisuomalainen, Savon Sanomat, Karjalainen, Karri Muinonen, 26.05.2003 → 31.12.2011, Finland

Tieteen päivät, Karri Muinonen, 08.01.2003 → 31.12.2011, Finland

YLE-Teema, Tieteen päivät sekä Asteroidikeskustelu, mukana Mika Purhonen, Arto Oksanen, Karri Muinonen, 01.01.2003 → 31.12.2011, Finland

Esitelmä Kirkkonummen tähtiharrastuskerhossa, Karri Muinonen, 13.01.2004 → 31.12.2011, Finland

Helsingin Sanomat, Pulmakulma, Karri Muinonen, 16.02.2004 → 31.12.2011, Finland

Kirkkonummen Sanomat, lehtijuttu, Karri Muinonen, 22.01.2004 → 31.12.2011, Finland

HIP Seminar Series, Physicum, Helsingin yliopisto, Karri Muinonen, 08.03.2005 → 31.12.2011, Finland

Helsingin yliopiston WWW-sivujen Mitä tutkin palsta, Simo Salmela, Karri Muinonen, 24.08.2005 → 31.12.2011, Finland

Kauppalehti Presso, Karri Muinonen, 16.09.2005 → 31.12.2011, Finland

Geofysiikan seuran kokous, Karri Muinonen, 19.09.2006 → 31.12.2011, Finland

Ilta-Sanomat, Karri Muinonen, 24.08.2006 → 31.12.2011, Finland

MAOL vuosikokous, Mikkeli, Karri Muinonen, 03.02.2006 → 31.12.2011, Finland

Maataloustieteen päivät, Helsinki, Karri Muinonen, 11.01.2006 → 31.12.2011, Finland

Satakunnan Kansa, Karri Muinonen, 23.08.2006 → 31.12.2011, Finland

ASP/Koskinen

Tekniikka ja Talous -lehti, Karri Muinonen, 17.02.2006 → 31.12.2011, Finland
Tähdet ja Avaruus, Karri Muinonen, 20.10.2006 → 31.12.2011, Finland
Tähtitieteilijäpäivät, Karri Muinonen, 19.05.2006 → 31.12.2011, Finland
Vihreä lanka -lehti, Karri Muinonen, 10.05.2006 → 31.12.2011, Finland
YLE Radiaattori, Karri Muinonen, 16.08.2006 → 31.12.2011, Finland
Radiaattori, Sisko Loikkanen, Karri Muinonen, 21.11.2007 → 31.12.2011, Finland
Tiede-lehti, Leena Tähtinen, Karri Muinonen, 09.02.2007 → 31.12.2011, Finland
Helsingin Sanomat, Karri Muinonen, 30.12.2008 → 31.12.2011, Finland
Helsinki Times, Karri Muinonen, 10.12.2008 → 31.12.2011, Finland
Iltalehti, Karri Muinonen, 16.04.2008 → 31.12.2011, Finland
Tiede, Karri Muinonen, 14.04.2008 → 31.12.2011, Finland
Turun Sanomat, Karri Muinonen, 03.12.2008 → 31.12.2011, Finland
Tästä puhutaan tilaisuus Observatoriolla, Karri Muinonen, 10.12.2008 → 31.12.2011, Finland
URSA Tähdet ja Avaruus, Karri Muinonen, 16.04.2008 → 31.12.2011, Finland
Valitut palat, Karri Muinonen, 04.11.2008 → 31.12.2011, Finland
YLE Tiedelinko, Karri Muinonen, 01.01.2008 → 31.12.2011, Finland
Yliopistotiedotus, ruotsinkielinen, Karri Muinonen, 11.12.2008 → 31.12.2011, Finland
Asteroidit, Karri Muinonen, 20.03.2009, Finland
Asteroidit ja perunat, Karri Muinonen, 29.10.2009, Finland
Electromagnetic and Light Scattering XII, Karri Muinonen, 18.05.2010, Finland
Kuun vesi, Karri Muinonen, 15.06.2010

Lauri Pesonen ,

Jippii-Forum, Lauri Pesonen, 13.12.2005 → 31.12.2011, Finland
Keskisuomalainen, haastattelu, Lauri Pesonen, 30.09.2006 → 31.12.2011, Finland
TIEDE-lehti, haastattelu, toimittaja Eeva Mäkelä, Lauri Pesonen, 01.01.2006 → 31.12.2011, Finland
Tähdet & Avaruus -lehti 1/2006, s. 2, Lauri Pesonen, 01.01.2006 → 31.12.2011, Finland
Yliopisto-lehti 13/2006, haastattelu, toimittaja Virve Pohjanpalo, Lauri Pesonen, 27.11.2006 → 31.12.2011, Finland
Geotieteellinen symposium, Physicum, Lauri Pesonen, 11.01.2008 → 31.12.2011, Finland
Yliopisto-lehti, uutinen, toim. Virve Pohjanpalo, Lauri Pesonen, 20.03.2008 → 31.12.2011, Finland

Kari Lumme ,

Kirkkonummen komeetta, yleisöluento, Kari Lumme, 10.12.2001 → 31.12.2011, United States

Lauri Sakari Alha ,

Yleisöesitelmä Tiedekeskus Heurekassa, Lauri Sakari Alha, 01.01.2003 → 31.12.2011, Netherlands

Thomas Hackman ,

Hufvudstadsbladets Volt-bilaga, Thomas Hackman, 26.01.2008, Finland
Interview for "Löntagaren", Thomas Hackman, 13.09.2010

Diana Hannikainen ,

INTEGRAL press conference, Diana Hannikainen, 04.10.2002 → 31.12.2011, United Kingdom
Helsingin Sanomat, Nimiä tänään -osasto, Diana Hannikainen, 09.05.2004 → 31.12.2011, Finland
Kirkkonummen Komeetta, esitelmätilaisuus, Diana Hannikainen, 21.09.2004 → 31.12.2011, Finland
Yliopistolainen 4/2004, Diana Hannikainen, 26.04.2004 → 31.12.2011, Finland

ASP/Koskinen

Avaruus 2007, Diana Hannikainen, 11.11.2007 → 31.12.2011, United Kingdom

SI Helsinki, Diana Hannikainen, 07.05.2007 → 31.12.2011, United Kingdom

SI Valkeakoski, Diana Hannikainen, 18.09.2007 → 31.12.2011, United Kingdom

Juhani Huovelin ,

Yleisesitelmä / Kirkkonummen komeetta ry, Juhani Huovelin, 13.12.2000 → 31.12.2011, Finland

Haastattelu, Iltalehti, Juhani Huovelin, 08.06.2001 → 31.12.2011, Finland

Lehdistötilaisuus, Helsingin yliopiston Observatorio, Juhani Huovelin, 08.06.2001 → 31.12.2011, Finland

YLE:n Teema-kanava, televisiointi Avaruus2001-näyttelyn esitelmästä, Juhani Huovelin, 01.01.2001 → 31.12.2011, Finland

INTEGRAL tiedotustilaisuus, TEKES, Juhani Huovelin, 04.10.2002 → 31.12.2011, Finland

SMART-1 tiedotustilaisuus, Tieteiden talo, Juhani Huovelin, 03.06.2002 → 31.12.2011, Finland

Sähkö ja Tele 7/2002, Juhani Huovelin, 01.01.2002 → 31.12.2011, Finland

TEKES Avaruusuutiset 2/2002, Juhani Huovelin, 01.01.2002 → 31.12.2011, Finland

TEKES Avaruusuutiset 2/2002, Juhani Huovelin, 01.01.2002 → 31.12.2011, Finland

Tähtipäivät, Kirkkonummi, Juhani Huovelin, 18.05.2002 → 31.12.2011, Finland

Avaruus 2003-näyttely. Helsinki, Juhani Huovelin, 02.11.2003 → 31.12.2011, Finland

Studia Naturalia, Joensuun Yliopisto,, Juhani Huovelin, 04.03.2003 → 31.12.2011, Finland

Tähtitieteellinen yhdistys URSAn esitelmäsarja, Juhani Huovelin, 16.09.2003 → 31.12.2011, Finland

Yleisöluento, Hangon suomalainen kansalaisopistoja Helsingin yliopiston vapaan sivistystyön toimikunta, Hanko, Juhani Huovelin, 27.09.2005 → 31.12.2011, Finland

Huvudstadsbladet, lehti, Juhani Huovelin, 25.10.2007 → 31.12.2011, Finland

Lauri Jetsu ,

Helsingin Sanomat, mielipidesivut, Lauri Jetsu, 12.12.2000 → 31.12.2011, United States

Helsingin Sanomat, kotimaa, Lauri Jetsu, 13.01.2001 → 31.12.2011, Finland

Helsingin Sanomat, kotimaa, Lauri Jetsu, 16.01.2001 → 31.12.2011, Finland

Helsingin Sanomat, kotimaa, Lauri Jetsu, 18.01.2001 → 31.12.2011, Finland

Helsingin Sanomat, mielipide, Lauri Jetsu, 13.01.2001 → 31.12.2011, Finland

yliopistolainen, 2/2001, sivu 9, Lauri Jetsu, 01.01.2001 → 31.12.2011, Finland

Esitelmä Warkauden Kassiopeia -yhdistyksen tilaisuudessa, Lauri Jetsu, 26.10.2002 → 31.12.2011, Finland

Mika Juvela ,

Avaruus 2001 -näyttely, Espoo, Mika Juvela, 03.11.2001 → 31.12.2011, United States

Tähtiharrastusyhdistys Ursan (Etelä-Karjalan Nova) järjestämä yleisöluento, Mika Juvela, 27.11.2001 → 31.12.2011, United States

Tähtiharrastusyhdistys Ursan (Kirkkonummen Komeetta) järjestämä yleisöluento, Mika Juvela, 12.09.2001 → 31.12.2011, United States

Tähtiharrastusyhdistys Ursan järjestämä yleisöluento, Mika Juvela, 16.01.2001 → 31.12.2011, United States

Tähtiharrastusyhdistys Ursan järjestämä yleisökuento, Helsinki, Mika Juvela, 16.12.2003 → 31.12.2011, France

Tähtiharrastusyhdistys Ursan järjestämä yleisöluento, Seinäjoki, Mika Juvela, 07.04.2003 → 31.12.2011, France

Tähtiharrastusseura Ursan järjestämä yleisöluento, Tampere, Mika Juvela, 28.04.2005 → 31.12.2011, Finland

Tähdet ja avaruus -lehti, haastattelu, Mika Juvela, 22.08.2006 → 31.12.2011, France

Tähtiharrastusseura Ursan järjestämä yleisöluento, Tampere, Mika Juvela, 18.10.2006 → 31.12.2011, France

Espoon työväenopiston tähtitieteen kurssi, Mika Juvela, 13.11.2008 → 31.12.2011, Germany

Emilia Kilpua ,

Avaruuspäivä-tapahtuma, Ilmatieteenlaitos, Emilia Kilpua, 04.11.2002 → 31.12.2011, France

ASP/Koskinen

Kimmo Lehtinen ,

Avaruus 2003 -näyttely, Kimmo Lehtinen, 31.10.2003 → 31.12.2011, Finland

Tähtitieteellisen yhdistyksen 'Kirkkonummen komeetta' yleisöluento, Kimmo Lehtinen, 21.10.2003 → 31.12.2011, Finland

Maarit Mantere ,

Generation of the Sun's magnetic field verified by modeling, Maarit Mantere, 01.2010, Finland

Timo Petteri Nousiainen ,

Haastattelu Yliopisto-lehteen, Timo Petteri Nousiainen, 2010, Finland

Haastattelu Yliopistolainen-lehteen, Timo Petteri Nousiainen, 2010, Finland

Rami Vainio ,

Tieteen tietotekniikan tietoyhteys-lehti 2/2005, haastattelu toimittaja Heli Autere, Rami Vainio, 01.01.2005 → 31.12.2005, Finland

Tähdet ja Avaruus 1/2008, Keskustelua, haastatteluteksti toim. Leena Tähtinen, Rami Vainio, 07.03.2008 → 31.03.2008, United States

Kirkkonummen Sanomat N:o 16, s. 13, Seppo Linnaluodon raportti R. Vainion esitelmästä, Rami Vainio, 26.02.2009 → 31.12.2011, Finland

Osmi Vilhu ,

Avaruus 2001 näyttely Kaapelitehtaalla, Osmi Vilhu, 01.11.2001 → 31.12.2011, Finland

Tieteen päivät, Helsinki, Osmi Vilhu, 09.01.2003 → 31.12.2011, Switzerland

Heli Hietala ,

Maailman kielenä fysiikka, Heli Hietala, 02.2005

Physics as a global language, Heli Hietala, 02.2005

Hannakaisa Lindqvist ,

Haastattelu Yliopistolainen-lehteen, Hannakaisa Lindqvist, 2010

Antti Penttilä ,

Coating the synergy, yield and sequel, Antti Penttilä, 01.03.2006, Finland

Painopaperin kirkkaus kiinnostaa tähtitieteilijöitä, Antti Penttilä, 01.06.2007, Finland

Participation in radio programme

Hannu Koskinen ,

Radio Helsinki, tunnin haastattelu ohjelmassa Kaaosteoriaa, Hannu Koskinen, 15.06.2005, Finland

Tiedekahvila, radio-ohjelma, toimittaja Maija Typpi, Hannu Koskinen, 07.01.2005, Finland

Tiedekahvila, radio-ohjelma, toimittaja Maija Typpi, Hannu Koskinen, 05.01.2005, Finland

Radio Suomi, asiantuntijana ohjelmassa, Hannu Koskinen, 14.02.2007, Finland

Radio Suomen ohjelma Tähti-ilta, Hannu Koskinen, 27.02.2008, Finland

Osallistuminen radio-ohjelmaan, Hannu Koskinen, 17.07.2009

Radiohaastattelu Tieteen päivillä 09, Hannu Koskinen, 08.01.2009

Osallistuminen radio-ohjelmaan, Hannu Koskinen, 01.11.2010

Osallistuminen radio-ohjelmaan, Hannu Koskinen, 05.02.2010

Osallistuminen radio-ohjelmaan, Hannu Koskinen, 23.04.2010

Puhelinhaastattelu radio-ohjelmaan, Hannu Koskinen, 27.04.2010

Karri Muinonen ,

Yle Päivän Peili radio-ohjelma, Karri Muinonen, 28.12.2005 → 31.12.2011, Finland

Kysymyksiä ja vastauksia, suora radio-ohjelma, YLE Ykkönen, Karri Muinonen, 08.05.2006 → 31.12.2011, Finland

YLE radiohaastattelu, Karri Muinonen, 21.06.2006 → 31.12.2011, Finland

ASP/Koskinen

YLE radiotoimitus, Karri Muinonen, 18.08.2006 → 31.12.2011, Finland

Lähiavaruuden asteroidien aiheuttama törmäysuhka, Karri Muinonen, 19.11.2009, Finland

Tieteen päivät 2009, Karri Muinonen, 2009, Finland

Tieteen päivät 2009, Karri Muinonen, 2009, Finland

Vesi Kuussa, Karri Muinonen, 25.09.2009, Finland

Radiaattori, Karri Muinonen, 19.11.2010, Finland

Radiaattori, Karri Muinonen, 26.11.2010, Finland

Lauri Pesonen ,

Radio East Side, interview, Lauri Pesonen, 16.04.2005 → 31.12.2011, Finland

Thomas Hackman ,

Intervju, Radio Vega, Thomas Hackman, 04.10.2005, Finland

Radio Vega, Thomas Hackman, 25.07.2006, Finland

Radio Vega, Thomas Hackman, 09.05.2006, Finland

Radio Vega, Thomas Hackman, 04.11.2008, Finland

Interview for YLE radio, Thomas Hackman, 03.11.2009, Finland

Jorma Harju ,

Suomalaistutkimuksesta uutta tietoa uusien tähtien synnystä, Jorma Harju, 20.08.2006, Finland

Juhani Huovelin ,

Radiaattori, radio-ohjelma, Juhani Huovelin, 01.01.2007 → 31.12.2011, Finland

Radiaattori, radio-ohjelma, Juhani Huovelin, 01.01.2007 → 31.12.2011, Finland

Rami Vainio ,

YLE Radio 1, haastattelu ohjelmassa Radiaattori, toimittaja Sisko Loikkanen, Rami Vainio, 13.02.2008, Finland

YLE Radio 1, haastattelu ohjelmassa Radiaattori, toimittaja Sisko Loikkanen, uusinta, Rami Vainio, 13.02.2008, United States

YLE Radio 1, tiedeohjelma netistä, http://www.yleradio1.fi/tiede/kuuntele/, Rami Vainio, 13.02.2008 → 13.03.2008, United States

Participation in TV programme

Hannu Koskinen ,

MTV3, Huomenta Suomi lähetys, haastattelu, Hannu Koskinen, 12.04.2006, Finland

MTV3, haastattelu Huomenta Suomi-lähetyksessä, Hannu Koskinen, 03.11.2006, Finland

Osallistuminen TV-ohjelmaan, Hannu Koskinen, 21.07.2009

Karri Muinonen ,

TV Nelonen, uutistoimitus, Karri Muinonen, 24.08.2006 → 31.12.2011, Finland

YLE TV1, uutistoimitus (kaksi uutislähetystä, lisäksi uutisviikko-ohjelma), Karri Muinonen, 24.08.2006 → 31.12.2011, Finland

TV-ohjelma Prisma Studio, Karri Muinonen, 16.04.2008 → 31.12.2011, Finland

Tieteen päivät 2009, Karri Muinonen, 2009, Finland

Nelosen Uutiset, Karri Muinonen, 30.09.2010, Finland

Prisma Studio, Karri Muinonen, 31.03.2010, Finland

Uutiset, Karri Muinonen, 14.06.2010, Finland

Thomas Hackman ,

FST Obs, Thomas Hackman, 21.12.2007, Finland

Interview on astronomy, Thomas Hackman, 18.02.2009, Finland

Interview for the Swedish TV news, Thomas Hackman, 03.12.2010, Finland

ASP/Koskinen

Participation in the programme "Min morgon", Thomas Hackman, 09.09.2010

Participation in the programme "Min morgon", Thomas Hackman, 01.10.2010

Rami Vainio ,

TV-Nytt: International Heliophysical Year - Open doors day, Ursa ry:n tähtitorni, Helsinki, Rami Vainio, 10.06.2007, Finland

Yle FST (Finlands svenska television), TV Nytt, Rami Vainio, 10.06.2007, Finland

Participation in interview for web based media

Karri Muinonen ,

Kuun vesi, Karri Muinonen, 20.07.2009, Finland

Rami Vainio ,

Voisiko Auringon elinkaarta pidentää?, Rami Vainio, 15.01.2010

Hannakaisa Lindqvist ,

Suomen Akatemia: Tietobreikki, Hannakaisa Lindqvist, 18.05.2010

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

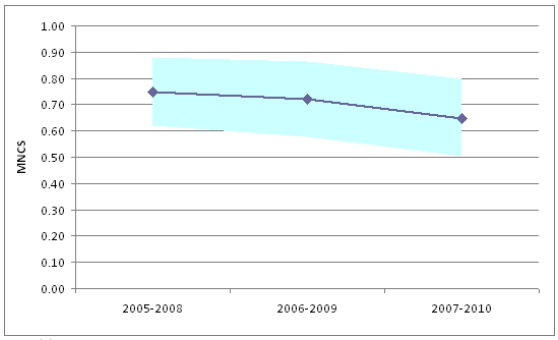
Web of Science(WoS)-based bibliometrics of the RC's publications data 1.1.2005-31.12.2010
by CWTS, Leiden University, the Netherlands

Research Group: Koskinen H

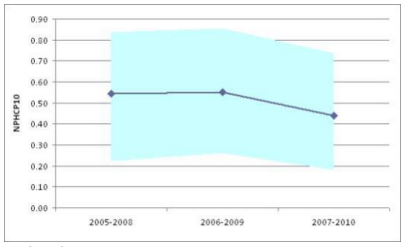
Basic statistics

Number of publications (P)	306
Number of citations (TCS)	1,256
Number of citations per publication (MCS)	4.11
Percentage of uncited publications	30%
Field-normalized number of citations per publication (MNCS)	.67
Field-normalized average journal impact (MNJS)	.94
Field-normalized proportion highly cited publications (top 10%)	.48
Internal coverage	.75

Trend analyses



MNCS



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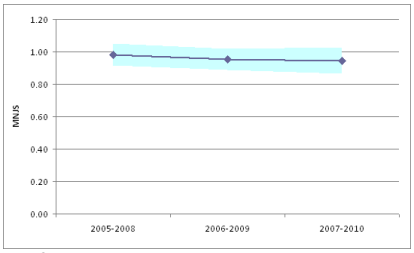
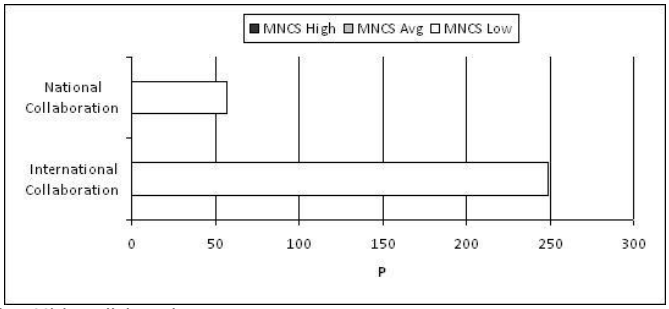


MNJS

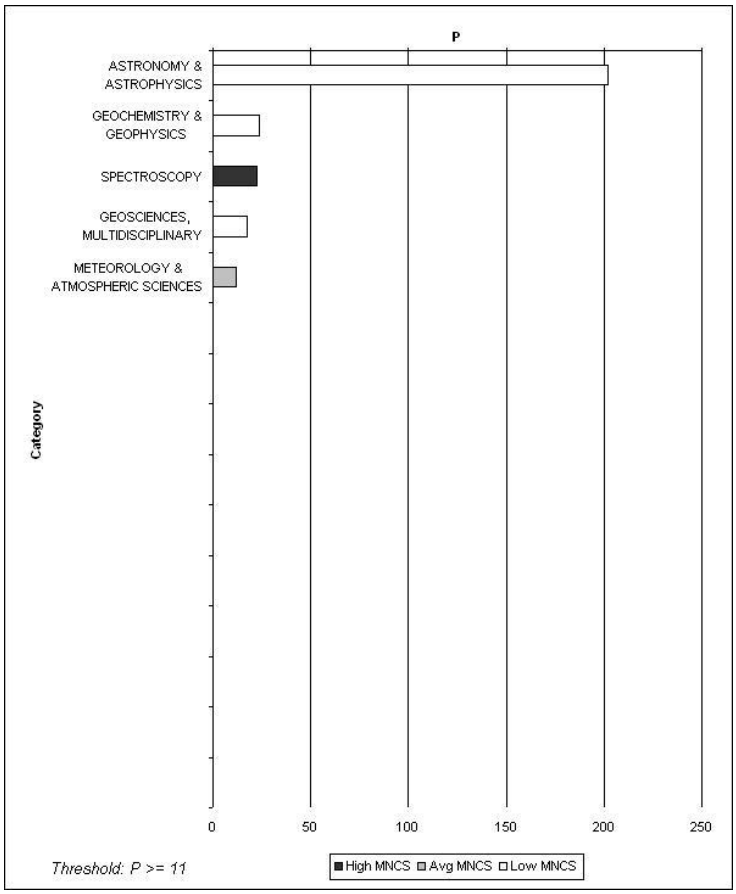
Collaboration



Performance (MNCS) by collaboration type

Web of Science(WoS)-based bibliometrics of the RC's publications data 1.1.2005-31.12.2010
by CWTS, Leiden University, the Netherlands

Research profile



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