Lorentz center

Lorentz Center
Self-Evaluation
2008-2013

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Contents

1.

OBJECTIVES AND RESEARCH AREA

a. The Lorentz Center's mission

The Lorentz Center organizes international workshops in the sciences and beyond. We promote innovative research, at the scientific frontiers as well as on complex societal challenges. Our specialty is to foster collaboration between research communities, reaching also outside of academia. Our workshops are characterized by ample time for active discussions and informal interactions.

b. Scientific progress through open interactions

Science thrives on the interaction between creative scientists. The Lorentz Center therefore intends to provide a meeting platform where all workshop participants actively partake in the scientific exchanges.

Openness is pivotal for scientific progress. Scientists should be comfortable to discuss their ideas, results and problems and be receptive to suggestions from others. Such openness is not trivial. It is actively promoted by focusing on three elements:

i. *Ample discussion*
The surplus value of scientists meeting with each other lies in the exchange of ideas and experiences – beyond presenting results. We discourage a standard conference format of lectures only and we urge the program to include ample time for active scientific exchange.

ii. *Organizational support*
Scientists go to a meeting to concentrate on their science. The Lorentz Center takes care of the practical organization of the workshop.

iii. *A welcoming entourage*
Scientific interactions are helped by a casual environment. Both Lorentz Center venues radiate homeliness: we let people have their own Lorentz Center for the week.

All in all, we aim to provide an environment where scientists interact in candor and where they can do science also for the fun of science, away from their daily hassles.

c. Innovation within the sciences - and beyond

The Lorentz Center hosts workshops in all disciplines in the sciences. At the outset in 1997, our spectrum encompassed astronomy, informatics, mathematics and physics. This spectrum was expanded to the life sciences in 2006 and to computational science in 2010, but workshops in other disciplines in the sciences are also welcomed. Since the NIAS-Lorentz Program in 2006, we also host workshops that bridge the sciences with the humanities or social sciences.

The Lorentz Center strives to promote top science that is innovative and bridges scientific topics, fields or minds. Many workshops are indeed interdisciplinary, whether between scientific disciplines or within, and interdisciplinarity is now one of the Lorentz Center's trademarks. Yet, we very much value our mono-disciplinary workshops as these provide the essential pillars of science.

d. A meeting platform for scientists

Lorentz Center meetings target three groups of scientists: i) established scientists (senior faculty); ii) upcoming scientists (junior faculty); and iii) junior scientists (PhD students and postdocs). Any scientist, whether or not from academia, can organize or attend a Lorentz Center meeting. The scientific organizers of Lorentz Center workshops typically have a faculty position, albeit that the junior scientists may also organize a Lorentz Center meeting.

Organizing a Lorentz Center workshop is an opportunity for junior faculty members to make themselves and their research agenda known within their scientific community. For the senior faculty it often is a chance to spend a week submerged in science. The Lorentz Center actively stimulates participation of women. Lorentz Center workshops naturally should benefit science in the Netherlands and, indeed, about one-third of our participants are from Dutch research communities.

e. The Lorentz Center's meeting formats

The prevailing meeting format at the Lorentz Center is its workshops, where an international group of scientists meets to present and discuss in all openness the latest scientific developments and often also to decide on future research lines and new collaborations. Lorentz Center workshops are characterized by innovative topics at the scientific frontiers and have ample time for active discussion and interaction.

We encourage meetings that specifically focus on junior scientists. The Lorentz Center schools aim to train juniors in a particular scientific topic or technology and they are often followed by a Lorentz Center workshop in the field. During the study groups with industry, junior scientists aim to solve real industrial problems. The study groups broaden their horizons beyond academia, allowing junior scientists to taste the world of applied R&D and *vice versa*.

Other Lorentz Center meetings focus on hands-on science. Consortia meetings allow a collaborative group of scientists to meet in a more or less closed setting, for in depth analysis of a dataset or to set a new research agenda, for example. Other workshops focus on disseminating scientific approaches or techniques. The hands-on workshops typically are smaller in size than the regular workshops and we aim to evolve this format to smaller groups or to a work-in-pairs format.

Key for a successful Lorentz Center workshop is that the participants all know each other by the end of the meeting; hence there is a natural limit to the number of participants and a minimal duration of the meetings. Five days is preferred for workshops, allowing for sufficient scientific progress without weariness. Participation in Lorentz Center meetings is mostly on invitation. Since 2012 the Lorentz Center has two workshop venues: Lorentz Center@Oort for up to 55 persons and Lorentz Center@Snellius for up to 25. The smaller size of the Lorentz Center@Snellius venue renders it particularly well suited for schools, hands-on workshops and for more explorative workshops. Together, the two workshop venues allow for a variety of workshop formats – we welcome unusual workshops or combinations of formats.

f. Active participation of junior scientists

The Lorentz Center very much values the active participation of junior scientists. The scientific advisory boards stimulate organizers to invite junior scientists to their workshops and challenge them to include them actively in the program. Indeed, annually 40-45% of the participants are PhD students or postdocs. Our no-hierarchy policy promotes an atmosphere where all workshop participants can speak up freely, but it is even more attuned to the junior scientists. The junior scientists are our next generation but they also are the ones that most easily "think out of the box". The input of the junior scientists indeed is much appreciated by organizers and participants alike.

Junior scientists frequently present contributed talks at Lorentz Center workshops. Our poster sessions during the "wine and cheese" welcome reception are quite successful. The scientific posters are displayed near to where the reception takes place, allowing the reception to blend naturally into the poster session. The posters are displayed throughout the week, often inciting informal discussions in front of the posters later on. Many junior scientists treasure these opportunities to make themselves known to the other participants already at the beginning of the workshop.

The Lorentz Center schools and the study groups with industry specifically focus at junior scientists. The schools aim to bring junior scientists up to date in a particular scientific field, often also through hands-on exercises or experiments. The schools frequently precede a Lorentz Center workshop in the field, allowing the junior scientists to immediately bring their newly acquired knowledge into practice and to interact at an international level with the senior scientists in the field.

During the study groups with industry, groups of about eight junior scientists each aim to solve a real industrial problem, under guidance of a few senior scientists from academia and the private sector. The study groups give junior scientists a taste of problems with direct industrial relevance and allow them to interact with scientists from the private sector. They find it very encouraging that several problems are actually solved during the week, or have significantly progressed. The private sector scientists often are enthused by the different approaches that are taken to solve their problem and by their acquired insight in novel scientific developments. The study groups provide both parties the opportunity to expand their network in areas that otherwise may stay inaccessible. Not to be underestimated is the job recruitment that takes place during the study groups and thereafter, which is an added value for both parties.

g. The Lorentz Center's special programs

i. *Sciences with social sciences and humanities*

Societal problems often require an interdisciplinary approach extending beyond the spectrum of the traditional sciences. The Lorentz Center began an exceptional collaboration with the Netherlands Institute for Advanced Study (NIAS) in 2006 (www.nias-lorentz.nl). The two institutes represent different scientific cultures: the Lorentz Center is a workshop center that

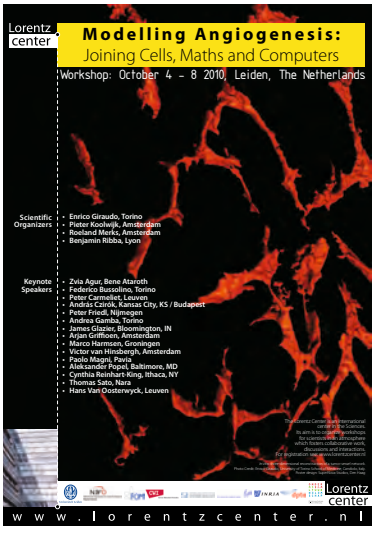
focuses on the natural sciences and technology, NIAS is a visitor center in the humanities and social sciences. While both institutes enjoy prominent positions in their respective communities, the joint NIAS-Lorentz Program aims to bridge the gap between the two. The timelines of the institutes also differ: a fellow in residence at NIAS typically works for one year on a subject while Lorentz Center meetings usually last one week. On the other hand, about 40 fellows stay at NIAS at a given moment, similar to the size of Lorentz Center workshops. Pivotal to the NIAS-Lorentz Program is the shared philosophy that scientists need time to explore their ideas and turn them into tangible results or hypotheses.

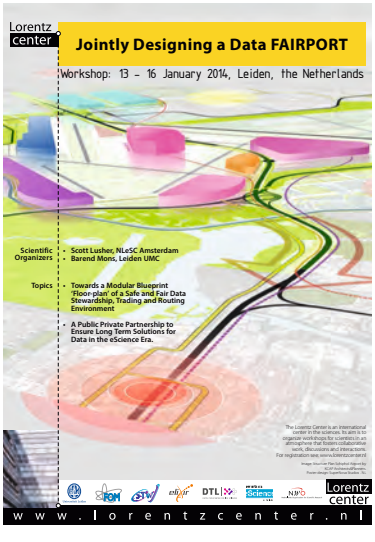
The NIAS-Lorentz Program knows three activities. First, the annual Distinguished Lorentz Fellow (DLF) is selected from nominees by leading figures in the Dutch scientific community. The DLF is a well-established and highly acclaimed scientist willing to take up a subject that bridges the domains represented by the two institutes while staying at NIAS for one year. Second, the annual NIAS-Lorentz Theme Group (NLTG) consists of three to five (upcoming) scientists from different scientific backgrounds who together work on an interdisciplinary topic while staying at NIAS for three or five months. Third, about eight NIAS-Lorentz workshops are held at the Lorentz Center each year, including those organized by the DLF and NLTG. Each of the three activities of the NIAS-Lorentz Program aims to stimulate innovative science through understanding and collaboration across academic disciplines. By now, the NIAS-Lorentz Program is acclaimed for achieving this.

ii. *Computational science*

Computational approaches have become common practice in many scientific fields. The Lorentz Center has expanded its scientific spectrum with computational science in 2010. Taking along computational science naturally blended in our scientific program because these workshops almost inherently have an interdisciplinary character. Our expansion went together with a national initiative to put this new discipline on the Dutch science agenda. In fact, the Lorentz Center scientific advisory board for computational science started out as a national committee that explored Dutch computational science initiatives, chaired by Daan Frenkel (University of Cambridge).

At the outset, NWO granted 2-year funding for a highly successful joint venture between the Lorentz Center, the Amsterdam Center for Multiscale Modeling (ACMM) and the Centre Européen de Calcul Atomique et Moléculaire (CECAM) to finance computational science activities in the Netherlands. Since then, the Netherlands eScience Center (NLeSC) has been established, an NWO institute aimed at innovation of ICT infrastructures and scientific

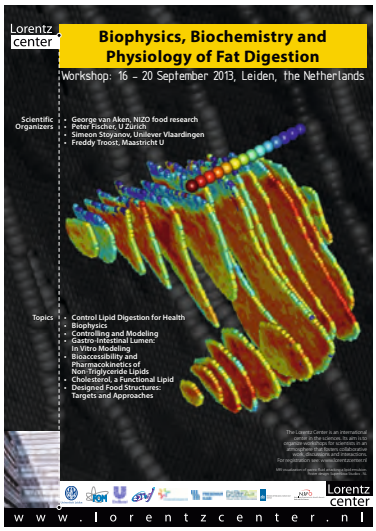




applications in the Netherlands with a focus on large data sets. The NLeSC and the Lorentz Center joined forces in 2013, in that the NLeSC aims to organize and fund about five Lorentz Center workshops each year. CECAM and the Lorentz Center recently intensified their collaboration by initiating a prestigious annual CECAM-Lorentz workshop for daring computational science initiatives in multiscale modeling and simulation.

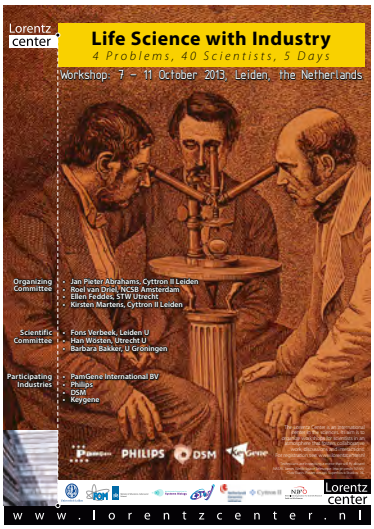
iii. *Academia and the private sector*

Valorization of scientific breakthroughs often goes through industrial channels. Conversely, progress in the private sector may profit if these applied scientists were more involved in scientific developments in academia. The Lorentz Center stimulates initiatives that connect scientists in the private sector with those from academic communities, including workshops being organized by or with scientists from the private sector. The first private sector initiative to organize a Lorentz Center workshop was in 2010, when scientists at the high-tech companies Océ Technologies and ASML Netherlands together with scientists at the University of Twente organized the Lorentz Center workshop "Contact Line Instabilities". Since then, the Lorentz Center hosts each year several workshops on initiative of the private sector.

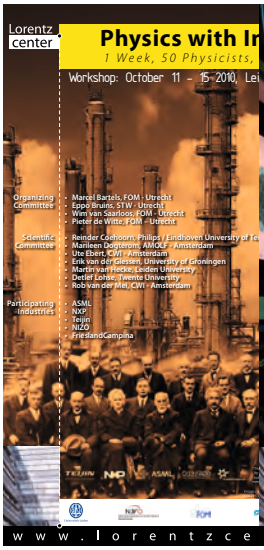


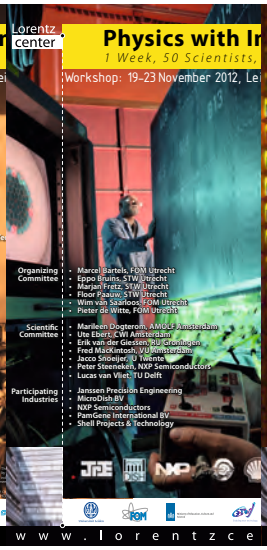
A showpiece is our study groups with industry, where a group of mostly junior scientists under the guidance of senior scientists from the private sector and academia aim to solve several real industrial problems in a week. The concept was developed in Oxford in 1968 for industrial problems in mathematics, and the Lorentz Center hosted "Mathematics with Industry" study groups in 2003 and 2013. On initiative of the foundation for fundamental research on matter FOM and the technology foundation STW, the Lorentz Center held its first "Physics with Industry" study group in 2010 and, due to its instantaneous success, the "Physics with Industry" study groups have become an annual event at the Lorentz Center. Our collaboration with STW was intensified in 2013, among others by hosting the "Life Science with Industry" and "ICT with Industry" study groups. This collaboration is not only a stimulus for the study groups with industry but also strengthens our scientific program with workshops in the applied technological sciences.


Lorentz center
Study Group
Mathematics with Industry 2013
Workshop: 28 January – 1 February 2013, Leiden, the Netherlands
Scientific Organizers
Markus Heydenreich, Leiden U
Sander Hille, Leiden U
Vivi Rottschäfer, Leiden U
Lotte Sewalt, Leiden U
Floske Spieksma, Leiden U
Frits Veerman, Leiden U
Evgeny Verbitsky, Leiden U
Participating Industries
Fytagoras
Heineken
Nedcoffee
Philips
Rijkswaterstaat Waterdienst
TNO
http://websites.math.leidenuniv.nl/SWI-2013/
www.lorentzcenter.nl


Lorentz center
Life Science with Industry
4 Problems, 40 Scientists, 5 Days
Workshop: 7 – 11 October 2013, Leiden, the Netherlands
Organizing Committee
Jan Pieter Abrahams, Cyttron II Leiden
Roel van Driel, NCSB Amsterdam
Ellen Fedders, STW Utrecht
Kirsten Martens, Cyttron II Leiden
Scientific Committee
Fons Verbeek, Leiden U
Han Wosten, Utrecht U
Barbara Bakker, U Groningen
Participating Industries
PamGene International BV
Philips
DSM
Keygene
PHILIPS
DSM
www.lorentzcenter.nl


Lorentz center
ICT with Industry
from Specific Problems to Innovative Solutions
Workshop: 11–15 November 2013, Leiden, the Netherlands
Scientific Organizers
Margriet Jansz, STW Utrecht
Rosamarie van der Veen - Oei, NWO The Hague
Assessment Committee
Antal van den Bosch, Radboud U
Arnold Bregt, Wageningen UR
Frank van Harmelen, VU Amsterdam
Cees Snoek, U Amsterdam
Participating Organizations
Kadaster
Netherlands Institute for Sound and Vision
Rijkswaterstaat
SEECR Software Craftsmanship
seecr
www.lorentzcenter.nl


Lorentz center
Physics with In
1 Week, 50 Physicists,
Workshop: October 11 – 15, 2010, Le
Organizing Committee
Marcel Bartels, FOM - Utrecht
Eppo Bruins, STW - Utrecht
Wim van Saarloos, FOM - Utrecht
Pieter de Witte, FOM - Utrecht
Scientific Committee
Reinder Coehoorn, Philips / Eindhoven University of Te
Marileen Dogterom, AMOLF - Amsterdam
Ute Ebert, CWI - Amsterdam
Erik van der Giessen, University of Groningen
Martin van Hecke, Leiden University
Detlef Lohse, Twente University
Rob van der Meij, CWI - Amsterdam
Participating Industries
ASML
NXP
Teijin
NLCO
FrieslandCampina
www.lorentzce


Lorentz center
Physics with In
1 Week, 50 Scientists,
Workshop: 19–23 November 2012, Le
Organizing Committee
Marcel Bartels, FOM Utrecht
Eppo Bruins, STW Utrecht
Marjan Fretz, STW Utrecht
Floor Pauuw, STW Utrecht
Wim van Saarloos, FOM Utrecht
Pieter de Witte, FOM Utrecht
Scientific Committee
Marileen Dogterom, AMOLF Amsterdam
Ute Ebert, CWI Amsterdam
Erik van der Giessen, U Groningen
Fred MacKintosh, VU Amsterdam
Jacco Snoeijer, U Twente
Peter Steeneken, NXP Semiconductors
Lucas van Vliet, TU Delft
Participating Industries
Janssen Precision Engineering
MicroDish BV
NXP Semiconductors
PamGene International BV
Shell Projects & Technology
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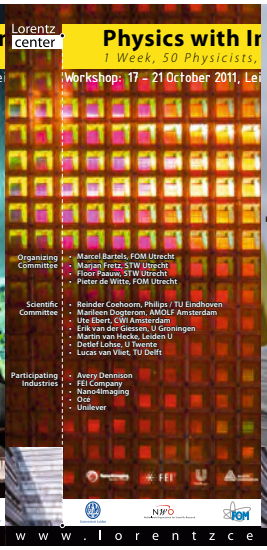
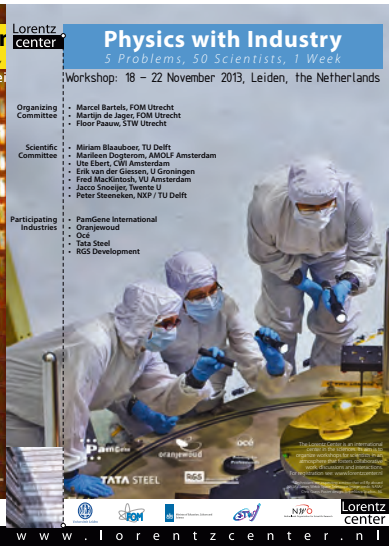

Lorentz center
Physics with In
1 Week, 50 Physicists,
Workshop: 17 – 21 October 2011, Le
Organizing Committee
Marcel Bartels, FOM Utrecht
Marjan Fretz, STW Utrecht
Floor Pauuw, STW Utrecht
Pieter de Witte, FOM Utrecht
Scientific Committee
Reinder Coehoorn, Philips / TU Eindhoven
Marileen Dogterom, AMOLF Amsterdam
Ute Ebert, CWI Amsterdam
Erik van der Giessen, U Groningen
Martin van Hecke, Leiden U
Detlef Lohse, U Twente
Lucas van Vliet, TU Delft
Participating Industries
Avery Dennison
FEI Company
Nano4Imaging
Océ
Unilever
www.lorentzce


Lorentz center
Physics with Industry
5 Problems, 50 Scientists, 1 Week
Workshop: 18 – 22 November 2013, Leiden, the Netherlands
Organizing Committee
Marcel Bartels, FOM Utrecht
Martijn de Jager, FOM Utrecht
Floor Pauuw, STW Utrecht
Scientific Committee
Miriam Blaauboer, TU Delft
Marileen Dogterom, AMOLF Amsterdam
Ute Ebert, CWI Amsterdam
Erik van der Giessen, U Groningen
Fred MacKintosh, VU Amsterdam
Jacco Snoeijer, Twente U
Peter Steeneken, NXP / TU Delft
Participating Industries
PamGene International
Oranjewoud
Océ
Tata Steel
RGS Development
TATA STEEL
www.lorentzcenter.nl

2.

PROCEDURES AND APPROACH

a. Governance departing from science and scientists

The Lorentz Center governance aims to support the scientists' objectives: scientific progress with as little as possible rules or bureaucracy.

i. The Lorentz Center's management consists of the director, the executive manager and the scientific manager. The management is responsible for all policies and operations.

ii. The scientific advisory boards consist of eminent scientists from the various disciplines covered by the Lorentz Center's scientific program. The members of the seven boards are the Lorentz Center's ambassadors, who inform and advise the Lorentz Center on scientific developments and on its scientific policy, including evaluation of applications for Lorentz Center workshops and other activities.

iii. The Lorentz Center is managerial accountable to the board of the Faculty of Science of Leiden University, i.e. the dean, the deputy dean and the managing director. The faculty board guides the Lorentz Center in operational, financial and juridical matters. An advisory board was installed in the spring of 2014.

b. Scientific advisory boards as a window to the scientific world

The Lorentz Center strives to host workshops that are innovative and of high scientific quality. The scientific program is guarded by the scientific advisory boards. Currently, the Lorentz Center has seven discipline-specific boards: astronomy, computational science, informatics, life sciences, mathematics, physics and the NIAS-Lorentz advisory board, totaling to 88 board members in 2013. The opinion of the boards is decisive in issues involving scientific know-how and is leading in the scientific policies of the Lorentz Center – and often also in its operational policies. We hold that scientific quality can only be evaluated by peers and therefore highly value the boards' advices.

The activities of the scientific advisory boards include:

i. Informing the Lorentz Center on significant developments in their scientific field and on emerging scientific topics. The boards give feedback and advice on scientific strategies and policies of the Lorentz Center.

ii. The board members are the ambassadors of the Lorentz Center in that they inform outstanding established scientists and upcoming scientists in relevant fields about the Lorentz Center and stimulate them to organize a Lorentz Center workshop.

iii. Evaluation of workshop applications, with three rounds per year. The boards are asked to evaluate the merit and timeliness of the scientific case, the workshop format and program – in particular the amount of time allocated to discussions – and the relevance for the Dutch scientific community. The NIAS-Lorentz advisory board also evaluates the DLF and NLTG proposals once a year. In addition, the boards advice on scientific procedures and the format of the workshops.

The members of the scientific advisory boards are active scientists. New board members are shortlisted by current board members, typically during the annual board meetings. Selection of new board members is based on scientific merit, while taking into account a balanced composition of the board regarding scientific background, representation of Dutch universities and academic institutes, as well as gender. The chairs, however, are deliberately not affiliated with Leiden University, to ensure the national character of the Lorentz Center. A new chair is typically selected by the current chair from among the current members of the board, in consultation with the Lorentz Center. The chair determines the size and composition of the board and decides on its specific operating procedures. Each board meets at the Lorentz Center once a year, attended by the board members and the Lorentz Center management. The chairs of the seven boards meet together with the Lorentz Center management once a year in a separate meeting.

c. A reiterative application procedure promotes exciting initiatives

Organizing a workshop at the Lorentz Center goes by peer-reviewed application, with three evaluation rounds per year. Applicants are to submit a proposal that includes i) the scientific case; ii) a preliminary program; iii) the prospective key participants; and iv) a budget sheet. The scientific case entails a brief description of the topic and its timeliness, with a free format and length. The program for Lorentz Workshops@Oort is relatively detailed, with proposed topics and/or speakers as well as timelines on lectures, break-out groups, discussions, and such. The program for Lorentz Workshops@Snellius suffices with an outline of the time dedicated to the various items. The list of prospective key participants includes their expertise and academic level, as well as their intention to attend the meeting. The budget sheet has a fill-in format. We aim to keep the application procedure simple and indeed most proposals are no longer than 6 pages.

Applicants are encouraged to initiate their application by contacting the scientific manager of the Lorentz Center. The scientific manager supports applicants in developing their application, specifically pinpointing the main objectives of their meeting and by providing suggestions on how various discussion formats can help to reach these objectives, how the flow of the program may influence the outcome and how openness among the participants can be induced. The feedback often is reiterative, including personal or phone contacts and feedback on draft proposals in writing. This approach significantly improves the quality of the submitted proposals and is particularly helpful for novel and daring initiatives, such as those that bring together thus far separate scientific topics or communities.

The scientific advisory boards evaluate the submitted proposals on scientific merit and timeliness. An important criterion is the amount of time in the program that is allocated for discussions; preferably coming close to 40 percent of the program time albeit that this varies substantially among the different scientific communities. We discourage a standard conference format and we promote long lunch breaks of two hours or more. The tentative commitment of prospective key participants reflects the quality but also the interest for the workshop in the field, and it implies a serious effort from the applicants. Women are underrepresented in the sciences and organizers are stimulated to invite and actively involve female participants in their workshop. Given the structural funding from the Dutch science foundations to the Lorentz Center, the workshops naturally should benefit the Dutch scientific community. We therefore encourage the organizing committee to include a scientist from the Dutch scientific community, even though application is open to any scientist. This approach promotes participation by the Dutch scientific community – at the senior and especially at the junior level. The final outcome of the proposals is decided on by the chairs of the boards, for which we know five: approved, approved with comments, conditionally approved, resubmission and rejection. The outcome is made known to the applicants within 10 weeks of the submission deadline, which is about one year before the workshop takes place – or less in case of an application through our fast track procedure.

Suggestions and comments from the board members are passed on to the applicants, as requirement in a revision of the proposal or for their inspiration in the further organization of the workshop. The structure of the scientific advisory boards ensures a high quality of the feedback. The feedback includes suggestions on the scientific focus, on the format and flow of the program, or naming scientists that may benefit the workshop. Many workshop proposals are interdisciplinary and these are evaluated by all the boards concerned. As the innovation of interdisciplinary proposals often lies in bringing together separate scientific communities or topics, the scientific quality is sometimes considered suboptimal from a mono-disciplinary viewpoint. Then the most positive board evaluation is leading, yet the applicants are requested to take into account the comments of the less positive board evaluation as well.

We may also put considerable effort in workshop proposals that in potential are interesting and relevant but are not optimally developed at the moment of submission. In fact, these typically more explorative workshops benefit most from the feedback of the boards or the scientific manager and from our reiterative application procedure.

d. A dedicated workshop coordinator allows scientists to focus on their science

Scientists often have tight schedules and little time to organize the practicalities around a meeting. Upon acceptance of the proposal, each Lorentz Center workshop is therefore assigned to a single person from our staff — the workshop coordinator — who takes care of as much as possible of the practical organization. The practical organization starts off with an intake meeting with (some of) the scientific organizers, the workshop coordinator, the executive manager, and usually also the scientific manager. At the intake meeting, an outline of the workshop is drawn and the details of some of the practicalities are discussed. The intake also is another moment where the organizers receive suggestions on how to reach their workshop goals, including the flow of their program, how to actively involve speakers, moderators and participants, and how to create an open atmosphere – particularly when different scientific cultures are brought together. Soon after, the workshop coordinator initiates the organization of the workshop, taking care of the workshop webpage, the invitation and registration of participants, hotel bookings, reimbursements and other financial matters, the social program, and support during the workshop and afterwards. All queries may be addressed to the workshop coordinator — by the scientific organizers and the participants. This approach evokes a relaxed feeling among the scientists as they don't need to worry about anything but their science.

e. A welcoming entourage promotes scientific exchange

Scientific interactions are helped by a casual environment. Both Lorentz Center venues radiate homeliness, with a comfortable common room where one can have a break. As nowadays not many people can stay out of touch with work for a week, each participant is provided a shared office where they can withdraw. The offices are often also used to discuss or work "in pairs" and both venues have ample white and black boards. The lecture rooms and meeting rooms are permanently available so that one has the liberty to make *impromptu* changes in the program. We have a quick-response ICT service and all participants have 24/7 access to the Lorentz Center. We aim to make participants feel comfortable by conveying the (subconscious) feeling that the Lorentz Center is theirs for the week.

3.

RESEARCH ENVIRONMENT AND EMBEDDING

a. The Lorentz Center is a Dutch international workshop center

The Lorentz Center hosts workshops for the international scientific community. The Lorentz Center is a national institute that is hosted by the Faculty of Science of Leiden University. Our Lorentz Center@Oort venue is situated in the Oort building that also houses the astronomy and physics departments. Lorentz Center@Snellius is across the street from the Oort venue, in the Snellius building that houses the informatics and mathematics departments. The Science campus also includes the biology, chemistry and pharmacology departments, all together providing a vibrant scientific environment for our workshop participants. The Lorentz Center is near to the city center of Leiden and is readily accessible by car, train or plane.

Our scientific advisory boards provide a dense network of scientists within the Dutch scientific community and beyond, with respect to their scientific background as well as geographically. The board members inform the Lorentz Center on emerging scientific topics and areas.

Importantly, they inspire scientists in the Netherlands who are active at these frontiers to organize a Lorentz Center workshop. As a consequence, the workshops at the Lorentz Center are not only timely, but they also know a significant Dutch participation of 35-40%.

b. The Lorentz Center is unique among its sister institutes

There are at least fifteen workshop centers world-wide, often combined with visitor centers. The multidisciplinary spectrum of the Lorentz Center program is unique. Most workshop centers are predominantly mono-disciplinary in their scientific program, such as Oberwolfach in mathematics and Dagstuhl in informatics, and there is a stronger history of mathematics and physics centers than of other scientific disciplines. Some workshop centers have a relatively broad interpretation of their discipline, such as Banff as compared to Oberwolfach, or they combine two disciplines, such as KITP, MBI and the Newton Institute. The Lorentz Center's broad scientific spectrum in the natural sciences is only met by a few visitor centers that have their basis in the humanities or social sciences, such as the Ernst Strüngmann Forum or the Stellenbosch Institute for Advanced Studies.

The Lorentz Center also is unique in its strong program for junior scientists. We share with our partner CECAM that we organize schools and training workshops, albeit that CECAM's focus is on computational science. The study groups with industry are a growing specialty in our scientific program. In addition, the Lorentz Center encourages workshop organizers to invite junior scientists and have them actively partake in the workshop program. With 40-45% PhD students and postdocs among our participants, the Lorentz Center is one of few centers with this many junior scientists.

The Lorentz Center's broad scientific spectrum implies that it is not as visible among (some of) its scientific communities as is customary for mono-disciplinary workshop centers. While for those centers the initiative to organize a meeting is almost naturally taken by scientists in the field, a more directed approach is necessary for the Lorentz Center. An important role in informing and inspiring scientists to organize a Lorentz Center workshop is fulfilled by our scientific advisory boards, together with our scientific manager. Such steering has been especially beneficial for the scientific disciplines that over time have been added to the Lorentz Center's scientific spectrum, and it still is crucial for emerging areas that we aim to stimulate. A corollary of this approach is that the Lorentz Center hosts many exciting workshops at the scientific frontiers. Our short timelines ensure that the workshops are held timely – within 16 months of the application deadline.

The Lorentz Center adheres to a workshop program of four days or more, while other centers also organize shorter workshops of up to three days. Those centers usually also host visitors who stay for a period of weeks or months to work on a particular topic or theme, such as the Fields Institute and the Newton Institute in mathematics, or KITP and the Aspen Center in physics. However, the dynamics of a combined workshop/visitor center differs from that of the Lorentz Center. At the Lorentz Center, the participants only have the span of the workshop to get to know each other, for which three days is short. To further a cordial atmosphere, we organize a "wine and cheese" welcome reception on the first workshop day and a midweek workshop dinner. The workshop participants also are accommodated in a single hotel so that interactions can continue in the evenings, as they usually do. These measures ensure that the participants indeed get to know each other, which in our opinion is pivotal for scientific progress – especially for the collaborations afterwards.

4.

COMPOSITION OF THE LORENTZ CENTER

a. The management

Director
Prof. Dr. Arjen Doelman, PhD in mathematics

The director is the Lorentz Center's figurehead for the scientific community, from active scientists through funding agencies and policy makers. The scientific program and fund raising are major tasks and the director has the ultimate responsibility for all Lorentz Center activities. The director combines the directorate with scientific research. Doelman was appointed director of the Lorentz Center and professor at the Mathematics Institute of Leiden University in 2009. His research group studies dynamical systems and pattern formation, often cross-disciplinary with other scientific fields.

Executive manager
Dr. Mieke Schutte, PhD in biology

The executive manager is responsible for the Lorentz Center's operational management and for the practical organization of the Lorentz Center meetings. The executive manager is in charge of the everyday activities of the Lorentz Center, making a part-time position for the director possible. The executive manager is required to hold a PhD and to have a history in scientific research. Before her appointment at the Lorentz Center in 2009, Schutte was associate professor and heading a research group in breast cancer genomics at the Daniel den Hoed Cancer Clinic of Erasmus MC Rotterdam.

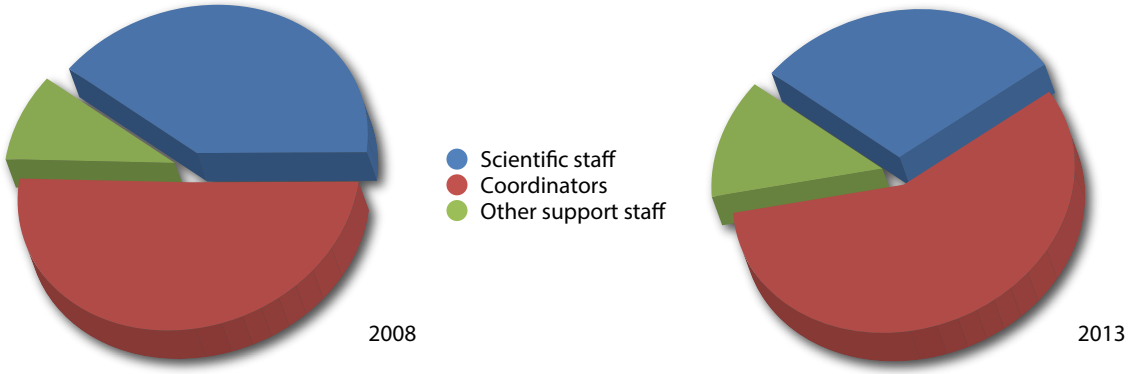
Scientific manager
Dr. Henriette Jensenius, PhD in physics

The scientific manager is responsible for the scientific programming and evaluation and for developing the workshop format and the scientific procedures. The scientific manager is the main contact for the workshop applicants and the scientific advisory boards. The scientific manager is required to hold a PhD and to have a history in scientific research. Before her appointment at the Lorentz Center in 2005, Jensenius was postdoc in biophysics at the Leiden Institute for Physics of Leiden University.

b. The staff

	2008	2009	2010	2011	2012	2013
Director	1 / 0.40	1 / 0.40	1 / 0.40	1 / 0.40	1 / 0.40	1 / 0.40
Executive manager	1 / 1.00	1 / 1.00	1 / 1.00	1 / 1.00	1 / 1.00	1 / 1.00
Scientific manager	1 / 0.74	1 / 0.74	1 / 0.74	1 / 0.74	1 / 0.84	1 / 0.84
Total scientific staff	**3 / 2.14**	**3 / 2.14**	**3 / 2.14**	**3 / 2.14**	**3 / 2.24**	**3 / 2.24**
Workshop coordinators	3 / 2.68	3 / 2.73	3 / 2.73	4 / 3.68	4 / 3.63	4 / 3.63
Program coordinator			1 / 0.63	1 / 0.74	1 / 0.74	1 / 0.74
Other support staff	2 / 0.49	2 / 0.54	2 / 0.54	3 / 0.75	3 / 0.75	4 / 0.96
Total support staff	**5 / 3.17**	**5 / 3.27**	**6 / 3.90**	**8 / 5.17**	**8 / 5.12**	**9 / 5.33**
Total staff	**8 / 5.31**	**8 / 5.41**	**9 / 6.04**	**11 / 7.31**	**11 / 7.36**	**12 / 7.57**

Indicated are the number of employees and full time equivalents (fte), respectively.



c. The scientific advisory boards in the year 2013

The Lorentz Center's scientific program is guided and monitored by external peer-review through seven discipline-specific scientific advisory boards. In 2013, the scientific advisory boards together consisted of 88 members. The board members usually take place on the board for a term of four to five years.

Astronomy board

Conny Aerts (chair)	University of Leuven & Radboud University Nijmegen
Henk Hoekstra	Leiden University
Jelle Kaastra	Netherlands Institute for Space Research SRON
Martin Kessler	ESA ESAC
Huib Jan van Langevelde	Joint Institute for VLBI in Europe
Sera Markoff	University of Amsterdam
Marina Rejkuba	European Southern Observatory Garching
Rien van de Weijgaert	University of Groningen
David Wilner	Harvard University

Computational science board

Daan Frenkel (chair)	University of Cambridge
Matthias Bickelhaupt	VU University Amsterdam
Hester Bijl	Delft University of Technology
Antal van den Bosch	Radboud University Nijmegen
Herman Clercx	Eindhoven University of Technology
Henk Dijkstra	Utrecht University
Marjolein Dijkstra	Utrecht University
Ute Ebert	CWI Amsterdam
Jason Frank	CWI Amsterdam
Peter Hilbers	Eindhoven University of Technology
Joost Kok	Leiden University
Marc Koper	Leiden University
Barry Koren	Eindhoven University of Technology
Kees Mandemakers	International Institute of Social History
Jaap Murre	University of Amsterdam
Simon Portegies Zwart	Leiden University
Peter Sloot	University of Amsterdam
Jeannot Trampert	Utrecht University
Jaap van der Vegt	University of Twente
Luuk Visscher	VU University Amsterdam
Jakob de Vlieg	Bayer CropScience
Pieter Rein ten Wolde	FOM Institute AMOLF

Informatics board

Jos Roerdink (chair)	University of Groningen
Mark de Berg	Eindhoven University of Technology
Arie van Deursen	Delft University of Technology
Lynda Hardman	CWI Amsterdam
Marieke Huisman	University of Twente
Catholijn Jonker	Delft University of Technology
Peter Lucas	Radboud University Nijmegen
Erik Poll	Radboud University Nijmegen
Leen Stougie	VU University Amsterdam & CWI Amsterdam
Remco Veltkamp	Utrecht University

Life sciences board

Martha Merrow (chair)	Ludwig Maximilians University Munich
Duur Aanen	Wageningen University
Jan Pieter Abrahams	Leiden University
Hans Aerts	Academic Medical Center Amsterdam
Nicole van Dam	Radboud University Nijmegen
Rachel Giles	University Medical Center Utrecht
Roland Kanaar	Erasmus MC Rotterdam
Roeland Merks	Netherlands Institute for Systems Biology
Matthijs Verhage	VU University Amsterdam & VU University Medical Center

Mathematics board

Barry Koren (chair)	Eindhoven University of Technology
Karen Aardal	Delft University of Technology
Odo Diekmann	Utrecht University
Gerard van der Geer	University of Amsterdam
Mai Gehrke	Radboud University Nijmegen
Mathisca de Gunst	VU University Amsterdam
Geurt Jongbloed	Delft University of Technology
Arno Kuijlaars	University of Leuven
Hans Schumacher	Tilburg University
Bart de Smit	Leiden University
Harry Trentelman	University of Groningen
Rob van der Vorst	VU University Amsterdam
Jan Wiegerinck	University of Amsterdam

Physics board

Tony Donné (chair)	FOM Institute DIFFER
Daniel Bonn	University of Amsterdam
Herman Clercx	Eindhoven University of Technology
Ute Ebert	CWI Amsterdam
Renate Loll	Radboud University Nijmegen
Paul van Loosdrecht	University of Cologne
Thijs Michels	Eindhoven University of Technology
Cristiane de Morais Smith	Utrecht University
Frieder Mugele	University of Twente
Antoine van Oijen	University of Groningen
Elisabetta Pallante	University of Groningen
Vinod Subramaniam	FOM Institute AMOLF
Erik Verlinde	University of Amsterdam
Pieter Rein ten Wolde	FOM Institute AMOLF
Wim van der Zande	Radboud University Nijmegen

NIAS-Lorentz advisory board

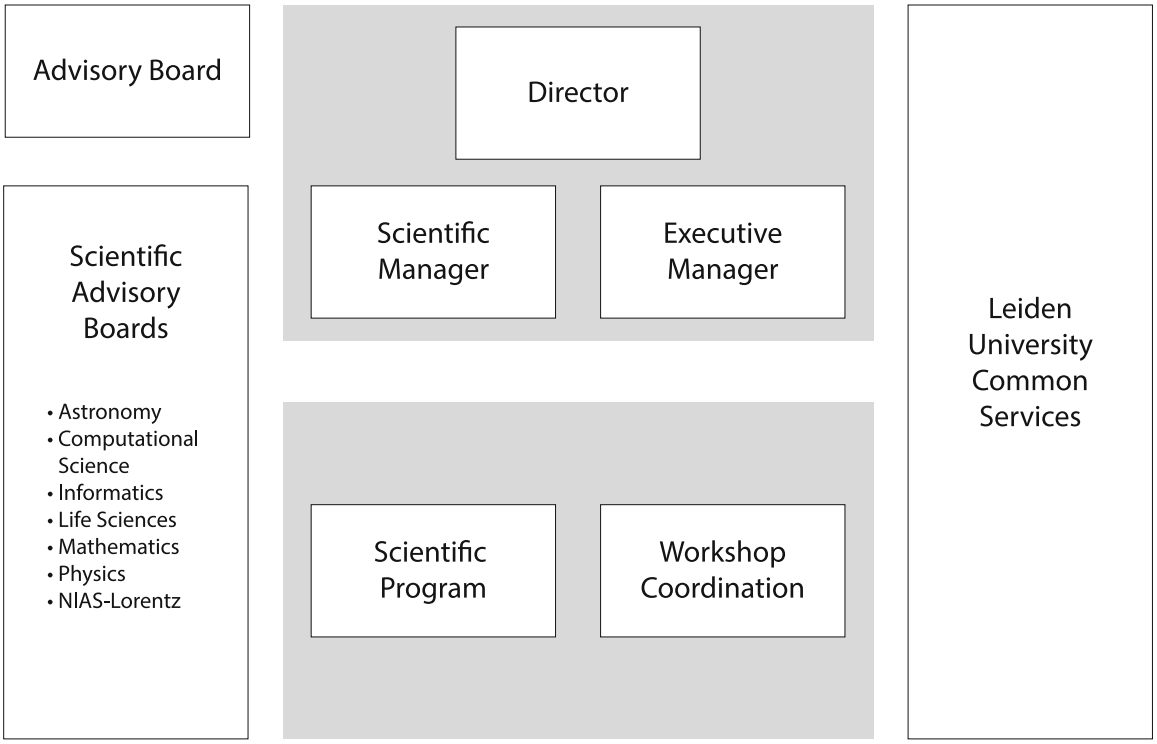
Sijbolt Noorda (chair)	University of Amsterdam
Alexander Rinnooy-Kan (chair)	University of Amsterdam
Emile Aarts	Eindhoven University of Technology
Rens Bod	University of Amsterdam
Mieke Boon	University of Twente
Dirk van Delft	Museum Boerhaave
José van Dijck	University of Amsterdam
Pearl Dykstra	Erasmus University Rotterdam
André Knottnerus	Scientific Council for Government Policy WRR
Rineke Verbrugge	University of Groningen

d. The advisory board

The advisory board was installed in the spring of 2014 and will have its first meeting in the fall of 2014.

Eppo Bruins	Technology Foundation STW
Eveline Crone	Leiden University
Frank den Hollander	Leiden University
Detlef Lohse	University of Twente
Jakob de Vlieg	Bayer CropScience NV

e. Organogram



5.

FINANCES IN THE YEARS 2008-2013

a. Funding sources

From the outset in 1997, the Faculty of Science of Leiden University has supported the Lorentz Center in kind through housing and common services. The office space for the Lorentz Center@Oort venue was made available since 1996 and for our second venue Lorentz Center@ Snellius since 2011. Common services include support by the financial and HRM departments, ICT and technical services, security, and such. The in kind support is significant and allows the Lorentz Center to operate at relatively low operational costs as all staff can be dedicated to the core business of the Lorentz Center: hosting workshops. The Faculty of Science also has provided financial support from the outset, providing for scientific personnel and standard operational costs.

The Netherlands Organisation for Scientific Research NWO has since 2000 provided structural financial support for Lorentz Center meetings in the original four disciplines of our scientific spectrum: astronomy, informatics and mathematics by the division NWO-physical sciences (EW), and physics by the foundation for fundamental research on matter FOM. FOM and NWO-EW have since then supported the Lorentz Center. The most recent NWO grant, for 2011-2015, had a broader scientific scope, including chemical sciences (CW), earth and life sciences (ALW), humanities (GW), social and behavioral sciences (MaGW) and the Netherlands Genomics Initiative (NGI). In recognition of this unprecedented joint venture of its scientific divisions, the governing board (AB) of NWO granted the Lorentz Center a "bonus" budget to further broaden its activities. Together, the NWO/FOM funding now equaled the Leiden University funding from the Faculty of Science. In 2013, the technology foundation STW switched from financing specific workshops to structural funding for the years 2013-2015, along with a substantial increase in its budget.

In 2006, the Dutch ministry of Education, Culture and Science (OCW) has granted the Lorentz Center one-time funding of 1.8 M€. The grant allowed the Lorentz Center to broaden its scientific spectrum through expansion with life sciences and computational science, and to initiate the NIAS-Lorentz Program. The OCW grant also made it possible to professionalize our outreach and our administrative processes and, importantly, to build the second workshop venue Lorentz Center@Snellius.

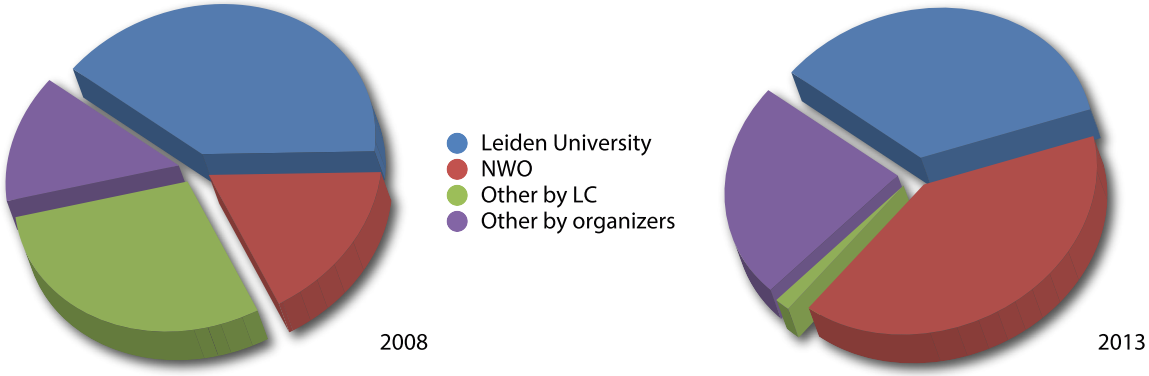
The Royal Netherlands Academy of Science (KNAW) finances activities of the NIAS-Lorentz Program since 2006, at a fifty-fifty basis for NIAS and the Lorentz Center. The funding for the NIAS-Lorentz Program was continued from 2014 until 2016, based on the evaluation and recommendations of a committee of Rob Reneman (chair), Eveline Crone and Henk van der Vorst in 2011. The Lorentz Center also is granted funding to finance other specific workshops, such as the annual funding by the Lorentz Fund for theoretical physics workshops, and since 2014 funding by NLeSC and CECAM for computational and e-sciences workshops.

Each Lorentz Center meeting is granted a workshop budget by the Lorentz Center, in 2013 amounting 11 k€ on average. Many workshops are financed in addition to the Lorentz Center's workshop budget, through *ad hoc* funding that is granted to the scientific organizers of a workshop. This funding therefore is allocated to the costs of these particular workshops. The additional funding is noteworthy as it gradually but steadily has grown to over 40% of our annual workshop budget. The wide spectrum of additional funding agencies – near one hundred in 2013 – reflects the broad scope of our scientific program as well as the increasing interest for our activities.

The Lorentz Center's funding changed fundamentally in 2011. The termination of the one-time OCW grant was balanced by an increase in the structural funding from both Leiden University and NWO. The structure of our funding reflects that the Lorentz Center indeed is a national institute that benefits the Dutch scientific community at large. It also reflects the broadening of the Lorentz Center's scientific spectrum, now covering essentially all fields of the NWO divisions (table 6b).

b. Funding

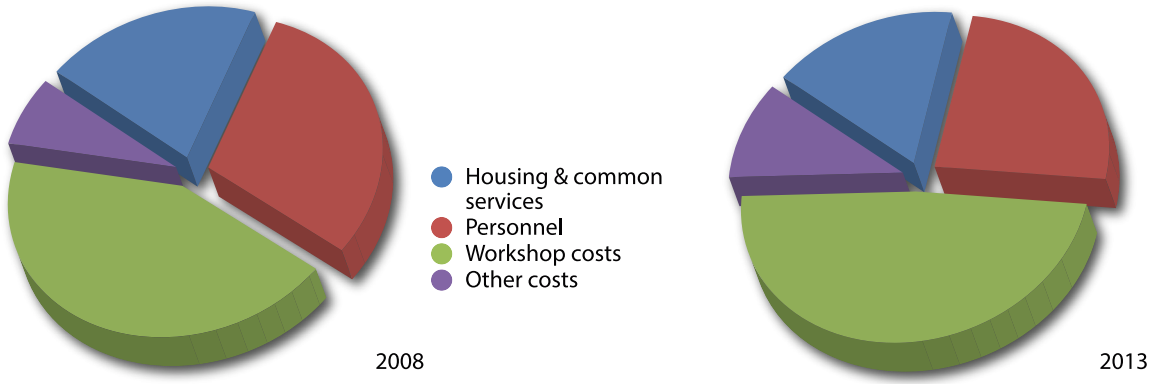
	2008	2009	2010	2011	2012	2013
	k€	*k€*	*k€*	*k€*	*k€*	*k€*
Leiden University						
- *Housing & common services*	239	243	272	329	331	340
- *Funding*	336	328	336	335	318	303
Netherlands Organisation for Scientific Research NWO						
- *Governing Board (AB)*					50	250
- *Physics (FOM)*	140	150	150	150	150	150
- *Physical Sciences (EW)*	100	100	100	150	150	150
- *Computational Science (EW&CW)*			90	90		
- *Chemical Sciences (CW)*				50	50	50
- *Technology (STW)*				8	4	40
- *Earth and Life Sciences (ALW)*				30	30	30
- *Netherlands Genomics Initiative (NGI)*				30	30	30
- *Humanities (GW)*				15	15	15
- *Social and Behavioral Sciences (MaGW)*				15	15	15
Ministry of Education, Culture and Science OCW	360	360	360	335		
Royal Netherlands Academy of Science KNAW	40	40	40	24		
Lorentz Fund for Theoretical Physics	27	26	25	25	25	28
***Ad hoc* funding granted to scientific organizers**	193	224	296	306	313	429
Total funding	**1,435**	**1,471**	**1,669**	**1,892**	**1,481**	**1,830**



c. Expenditures

	2008	2009	2010	2011	2012	2013
	k€	*k€*	*k€*	*k€*	*k€*	*k€*
Housing & common services	239	243	272	329	331	340
Personnel	360	341	396	416	500	497
Workshop costs	523	617	764	722	745	968
Other costs	86	157	167	139	1,006 *	203
Total expenditures	**1,169**	**1,315**	**1,527**	**1,607**	**2,581**	**1,912**

**, Other costs in 2012 include the one-time costs for renovation of the Lorentz Center@Snellius venue and a new computerized administration system, both financed by OCW.*



6.

OUTPUT AND SCIENTIFIC RELEVANCE

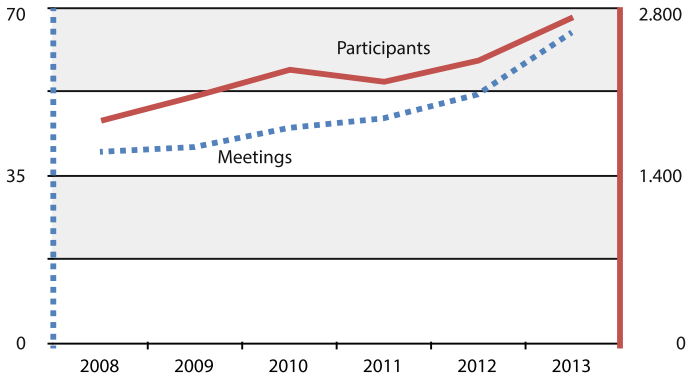
From the outset in 1997, the Lorentz Center has hosted an increasing number of meetings, reflecting the positive experiences of the scientists. The saturation point of 48 weeks of occupation per year for the Lorentz Center@Oort venue was reached in 2010 (table 6a). Upon opening our second Lorentz Center@Snellius venue in July 2012, the occupancy almost immediately went up to near 65 weeks per year. This amount of workshops is a financial saturation: the Lorentz Center is not sufficiently funded to host workshops at full capacity (i.e., 95 weeks per year for both venues combined).

The increasing number of workshops naturally went along with an increase in registered workshop participants, amounting to over 2,700 participants in 2013 (table 6c). The participants cover all scientific levels, with a steady 40-45% of junior scientists but also extremely busy senior scientists. The Lorentz Center also hosts auditors who only attend one or several lectures. We receive about 150 auditors annually, mostly scientists affiliated with Dutch universities or academic institutes and about half of them are from Leiden University.

a. Meetings and occupancy

	2008	2009	2010	2011	2012	2013
Meetings	**40**	**41**	**45**	**47**	**52 ***	**65**
- *Workshops*	36	40	42	44	47	57
- *Schools*		2	4	1	5	3
- *Study groups*			1	1	1	4
- *Consortia*	4		1	1		2
Weeks of occupancy	**43**	**43**	**48**	**48**	**57**	**66**
- *1-week meetings*	36	39	42	46	49	64
- *2-week meetings*	4	2	3	1	2	1
- *4-week meetings*					1	
Applications	**n.d.**	**n.d.**	**n.d.**	**54**	**55**	**67**

n.d., not determined.
**, The first workshop in our second venue Lorentz Center@Snellius was held in July 2014.*



b. Meetings by scientific field

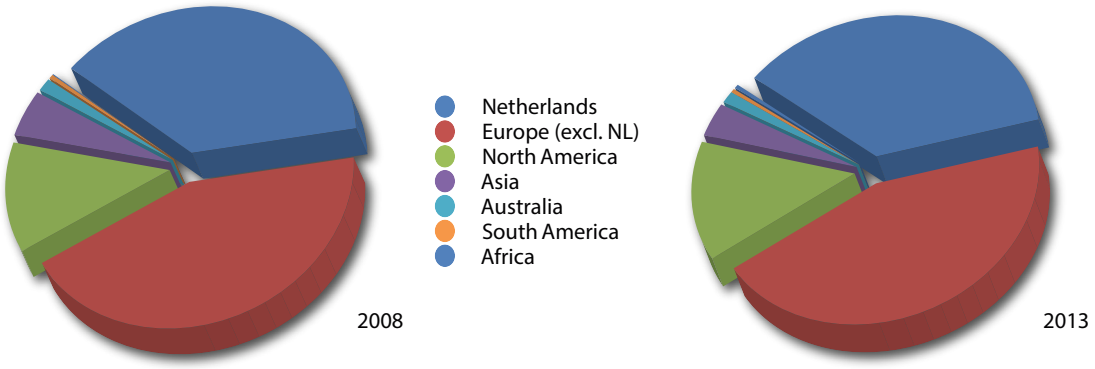
	2008	2009	2010	2011	2012	2013
All Lorentz Center meetings	**40**	**41**	**45**	**47**	**52**	**65**
NIAS-Lorentz meetings	**5**	**2**	**8**	**6**	**8**	**12**
Meetings with the private sector	**2**	**1**	**6**	**4**	**6**	**9**
Astronomy	14	12	8	11	12	20
Chemistry	4	3	6	4	10	7
Computational Science	7	10	9	16	10	14
Earth Sciences		1		5	1	2
Economics			1	3	2	2
Humanities	5		7	2	5	7
Informatics	7	5	12	5	14	10
Life Sciences	5	11	9	7	18	16
Mathematics	10	13	12	15	9	17
Medical Sciences	3	3	1	2	6	4
Physics	12	16	16	23	23	17
Social Sciences	1	2	2	5	5	14
Technology & Engineering	2	4	8	3	5	9

A significant contribution of the scientific disciplines is counted for each meeting, with most meetings being multidisciplinary. For details, see the list of all workshops in the years 2008-2013 in chapter 12.

c. Visiting scientists

	2008	2009	2010	2011	2012	2013
Participants	**1,871**	**2,076**	**2,296 ***	**2,196**	**2,373**	**2,734**
- *Junior scientists (PhD and postdoc)*	686	980	949	1,017	1,087	1,053
- *Women*	388	415	425	425	535	690
- *Netherlands*	702	848	918	823	851	995
- *Africa*	2	3	4	11	10	11
- *Asia*	92	64	114	82	90	101
- *Australia*	25	21	26	22	11	35
- *Europe (excl. Netherlands)*	811	883	940	942	996	1201
- *North America*	231	248	287	310	396	380
- *South America*	8	9	7	6	19	11
Auditors	**219**	**196**	**280**	**186**	**176**	**120**

**, A maximum of 55 participants at the Lorentz Center@Oort venue was introduced in 2011.*



d. Scientific relevance

The scientific relevance of the Lorentz Center's activities is perhaps best evaluated by our stakeholders: the scientists. In December 2013, the Lorentz Center systematically questioned the scientific organizers about the output from their workshop. All organizers of Lorentz Center meetings that were held in the years 2002 through 2012 have been emailed. We reached 880 organizers who together organized 425 Lorentz Center workshops and other meetings. We received a response from 148 organizers, representing over one-third of the workshops.

The organizers were specifically asked to mention output concerning:

- scientific breakthroughs or their seeding;
- adaptations in their research line or career, or in those of the participants of their workshop;
- collaborations;
- grants;
- publications;
- any other item that they felt could be relevant.

The output is summarized below, classified in six groups i-vi. A selection of quotes from the organizers, selected for their combined informativeness, illustrates the responses.

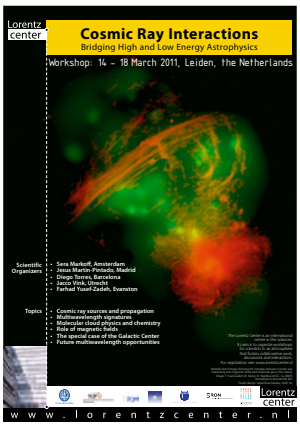
i. *Emerging themes and new communities*

The Lorentz Center aims to promote innovative science: novel scientific themes as well as bringing together separate research communities. It is rewarding that the organizers of one-quarter of the workshops stated that their workshop had been an early initiative of what now has become an internationally important scientific topic or field, or that their workshop had brought together communities that essentially had no interaction with each other before the workshop. Organizer Matteo Marsili phrased a feeling that was rather common among the organizers:

> *"Our workshop has been very useful to gather researchers from different disciplines […] and to exchange ideas. It is difficult to spot precise achievements that can be traced back to that workshop. However, these meetings typically have inconspicuous effects in the long run that are very important and sizable, though not exactly measurable."*

Analysis and Visualization of Moving Objects (2011)
Daniel Weiskopf

> *"The workshop was very successful and productive. Most importantly, I see a big impact by bringing together researchers from the discipline of movement ecology with researchers from GI science and visual analytics because we had essentially no interaction before. The workshop resulted in many joint papers by many of the participants, including a summary paper from the workshop."*



Cosmic Ray Interactions: Bridging High and Low Energy Astrophysics (2011)
Diego Torres

> *"I believe it is to be mentioned that our workshop was perhaps the first, or one of the very first ones, where two different communities were joined together: those astronomers studying ionization in clouds and those studying high and very high energy gamma and cosmic rays. The same kind of workshop was then held in several other places."*

Single Dopant Control (2010)
Paul Koenraad

> *"The workshop has certainly contributed strongly to the advancement of this new field in physics, by bringing together many specialists in the sub directions for the first time. The success of our workshop was the basis for an annual single dopant meeting at the MRS meetings and contributed to a review paper in Nature Materials."*

ii. *Workshop series*

Over the years, the Lorentz Center has hosted several series of workshops on a particular scientific theme. Such series involve a relatively closed research community or consortium, where the workshops served to analyze data sets, perform hands-on work, and such. These workshops often focused on discussion of the implications of new research data and setting the next research agenda.

Workshop series do not directly support our mission of promoting new themes or bringing together separate research communities and, consequently, they have essentially disappeared from our scientific program in the years with high workshop application pressure. The Lorentz Center has welcomed their come back to its scientific program in 2012 – upon opening of our second Lorentz Center@Snellius venue. We believe that these workshop series have been important in establishing large consortia that do top quality research at the scientific frontiers. As put aptly by Marijn Franx, scientific (co-)organizer of eleven workshops, upon being awarded the Spinoza prize in 2010:

> *"I would not have received the Spinoza prize without all those Lorentz Center workshops."*

The Biofuel workshops
Huub de Groot

1. Responsive Matrices for Solar Fuels (2013)
2. The Artificial Leaf (2010)
3. Solar Biofuels from Microorganisms (2009)

"We had several breakthroughs and publications on how we can convert solar energy into fuels by mimicking natural photosynthesis. A major outcome of the workshops is the 42 M€ ESF EuroSolarFuels EUROCORES program. The ESF program particularly aims at fulfilling the need for fundamental research – which was discussed and identified in part at the Artificial Leaf workshop. Another major outcome is new collaborations within the BioSolar consortium. With BioSolar now fully operational, it is clear that the Lorentz Center workshops have indeed been important for establishing collaborations, both nationally and internationally.

Many junior scientists have used the workshops to determine direction to their personal careers at the PhD level and VENI/ VIDI/ERC starting level. We have assembled a fine crowd of PhD students in our BioSolar Cells program who meet every 6 months. The first postdocs coming out of this community are now finding their ways into tenure track positions across the entire world.

The most important thing about the Lorentz Center workshops is that they allow for vision scanning. Solar fuels and artificial photosynthesis is now becoming hype, while in 2009 we were still establishing a new trend. The Lorentz Center workshops are very important for nurturing novel scientific developments ahead of the masses."

iii. *Collaborations and grants*

The Lorentz Center aims to stimulate scientific collaborations by providing a meeting platform where scientists interact in candor. Indeed, half of the organizers mentioned collaborations that had been established or intensified because of their workshop. Grants were mentioned for one-quarter of the workshops, including FP5-7 European Science Foundation grants, ERC Starting and Advanced Grants, Dutch NWO VENI, VIDI and VICI grants, and KNAW and EMBO fellowships.

The third Distinguished Lorentz Fellow of the NIAS-Lorentz Program, Johan Rooryck, was granted a 2.75 M€ NWO Horizon grant "Knowledge and Culture" in 2012. Rooryck:

> *"My fellowship at NIAS and the Lorentz Center workshop were instrumental for my Horizon grant. The DLF gave me time and freedom to develop my research in a new and unconventional direction. The highly interdisciplinary environment both at NIAS and at the Lorentz Center forces one to be very specific and to thoroughly think things through. It was all very stimulating."*

Majorana Fermions in Condensed Matter (2012)
Anton Akhmerov

> *"The workshop was the first event dedicated to the physics of Majorana zero modes. It was already in its organizational phase at the Lorentz Center when the field had a major breakthrough with the first experimental observations of Majorana fermions. The workshop was then expanded beyond its original, mostly theoretical focus.*
>
> *The workshop was an extremely timely event, followed up by at least three more workshops about Majorana fermions. The meeting has initiated efficient information exchange between the experimental and theoretical parts of the community. This has lead to new collaborations among the participants which already resulted in publications."*

Circulating Tumor Cell Isolation and Diagnostics (2010)
Anja van de Stolpe

> *"The concept of Lorentz Center workshops is an excellent initiative to open up new fields and establish worldwide collaborations. Together with the other major Dutch participating group of the workshop, we received the 5 M€ FP7 grant CareMore on Circulating Tumor Cell research. The consortium consists of two academic research groups (Erasmus MC Cancer Institute and Stockholm University) and three private sector partners (Cyto Track ApS, Olink Bioscience and Philips Electronics Nederland)."*

Central Mass Concentrations in Galaxy Nuclei (2008)
Eric Emsellem

> *"To be frank, it is hard to single out the contribution from that workshop so many years after it happened. It is clear that the workshop has been a milestone […]. Just to clearly state something which is well-known in the astronomy community: the Lorentz Center workshops are just amazing opportunities to informally discuss serious science matters. These workshops are fantastic ways to boost specific projects or collaborations. They are paramount to gather people who sometimes find it difficult to exchange views without the heavy burden triggered by the intense competition."*

iv. *Publications and research infrastructures*

Publications are not an immediate objective of Lorentz Center workshops. Also, a full publication can usually not be traced back to a single meeting. Yet three-quarters of the organizers mentioned one or multiple publications as an (indirect) result of their workshop. Publications included books, book chapters, review papers and original research papers, including papers in high quality journals, such as Science, Nature and the field-specific Nature journals, Proceedings of the National Academy of Science, *etcetera*.

Noteworthy is a special issue of the journal Nature Nanotechnology on the workshop "Future Directions of Molecular Electronics" (2012). The issue was initiated by Nature editor Christian Martin. Martin spontaneously applied and participated in the workshop, and became very enthusiastic about the work that was presented and discussed at the workshop. The issue contains original articles by several workshop participants, among others. It also features leading researchers, including workshop participants, in molecular electronics who discuss the motivation behind their work and what they consider to be the grand challenges for the field. Organizer Sense Jan van der Molen:

> *"The workshop and the special issue certainly provided a strong boost to the field of molecular electronics."*

Several organizers mentioned the implementation of "research infrastructures", such as joint databases, new research tools and models. The Lorentz Center feels honored with two "copycats" of our workshop center, one at Tohoku University in Japan and another at Ludwig Maximilians University in Germany. Organizer Stella Seitz:

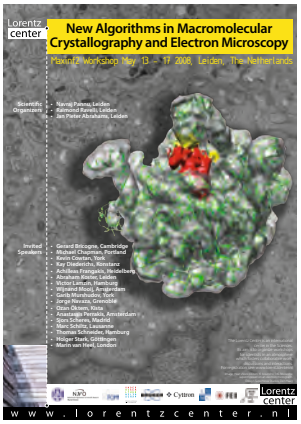
> *"Here at the University Observatory in Munich, we found the concept of the Lorentz Center workshops so convincing that we are copying it now. Maybe this is "bad" if seen as competition, but it can also be seen as the best confirmation that your concept is very successful."*

Control of Burning Plasmas (2011)
Tony Donné

"After one of the fusion people showed his latest results in the area of sawtooth control, one of the control engineers got very enthusiastic. In the evening he built a simulation code to mimic the experimental results and the next day he showed the simulations to the workshop participants. This was so exciting that we already during the workshop made an application for doing experiments on the Swiss TCV tokamak. The experiment was plugged in a few weeks later, while the formal procedure normally takes about half a year, and it led to a Letter in Nuclear Fusion, the most prestigious peer-reviewed journal in the field of fusion research."

Summer School on Models for Embedded Signal Processing Systems (2010)
Shuvra Bhattacharyya

"Our school was a pilot event – the very first pilot – for the IEEE Signal Processing Society's new program "Seasonal Schools in Signaling Processing". The great success of the school, including the very positive feedback from the students, helped us to swiftly gain the endorsement of the IEEE to make this a permanent event in their program. This is a major contribution to the international research and post-graduate education communities because the IEEE is the world's premier professional and scientific society in the fields of electronics and electrical engineering."



New Algorithms in Macromolecular Crystallography and Electron Microscopy (2008)
Navraj Pannu

"The conference brought together two different, but related fields of method development in X-ray crystallography and cryo-electron microscopy (cryo-EM). Since the meeting, NeCEN was set up at Leiden University for cryo-EM. Several workshop participants are actively working on improving methods in cryo-EM."

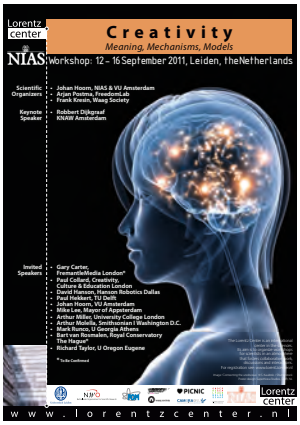
v. *Impact on Dutch research and scientific careers*

The Lorentz Center is a Dutch workshop center and its activities naturally should benefit the Dutch scientific community – whether within specific research fields or for individual careers. Of interest is that one-quarter of the organizers mentioned beneficial effects of their workshop on the career of junior scientists, such as a postdoctoral position for PhD students or an exchange visit with one of the workshop participants. Geert Wijts, participant of the 2013 "Physics with Industry" workshop:

> *"After last year's study group, I applied for a position with Shell in Amsterdam and I recently started working with them. One of the other participants got a job with Shell in Rijswijk."*

Representing Streams (2012)
Robbert Fokkink, Jan Willem Klop and Robert Tijdeman

> *"In other countries, particularly France, mathematicians and computer scientists in the field of streams are essentially indistinguishable. In contrast, in the Netherlands these communities used to operate separately but since our Lorentz Center workshop they really collaborate. The contact between established senior researchers and upcoming junior researchers was also felt to be very fruitful and resulted in several invitations by the senior participants for working visits by the juniors to their institutes."*



Creativity: Meaning, Mechanisms, Models (2011)
Johan Hoorn

> *"This workshop was part of my Lorentz fellowship, awarded through the NIAS-Lorentz Program. During the workshop, we worked out an integrated vision on creativity, from particle physics to cultural history, which was published as a book. I have changed my career and even my way of working thanks to the Lorentz fellowship and subsequent Lorentz Center workshop. Everything is now focused on creativity and innovation."*

Cavity Enhanced Spectroscopy: Recent Developments and New Challenges (2009)
Harold Linnartz

> *"The workshop resulted in an overview of the state-of-the-art of broad band technology and it has put my group at Leiden University on the map as one in which this technology is used for astronomical research. Several of the PhD students and postdocs who participated have become active in this field. The workshop definitely helped in establishing one of the research lines I proposed in a successful VICI application."*

vi. *Impact on society and policy making*

The Lorentz Center's primary objective is to promote innovative science. This often implies that our workshops have little direct societal impact. Nevertheless, some Lorentz Center workshops reach beyond the scientific community. A fascinating spin-off from the workshop "Creativity: Meaning, Mechanisms, Models" (2011) is the production of a feature length documentary on the lives of Albert Einstein and Hendrik Lorentz, celebrating the relevance and impact of the creative scientific process. The documentary is planned to premier worldwide during the festivities around the international Year of Light and the next lustrum of Leiden University, both in 2015. Producer Nicholas Barris:

> *"If you ask people who is the most influential scientist of all times, their answer is very likely to be Albert Einstein. Einstein's answer to the same question would be Professor Lorentz."*

Complexity Models for Systemic Instabilities and Crises (2013)
Cars Hommes

> *"What was very stimulating and interesting of our workshop was the interaction between scientists and policy makers from the World Bank, International Monetary Fund, Bank of England, Federal Reserve Bank of New York, Dutch Central Bank DNB and the Netherlands Bureau for Economic Policy Analysis CPB (CPB director Coen Teulings attended the Friday sessions). Policy makers were very interested in complexity tools for managing the financial-economic crisis."*

Transgenes Going Wild? Risk Assessment of Transgene Introgression from Crops into Wild Relatives (2011)
Tom de Jong

"We had a paper in the journal Environmental Science & Policy as a result of the workshop. The message is that science can further detail the probability of genes being transferred from genetically modified crops to wild plant species, but the predictions will never be 100% precise. In risk assessment one needs to stop at some point. The message of our paper was picked up by competent authorities like the European Food and Safety Association, who cited our paper in recent EFSA publications.

I was also asked for the working group in Parma that currently prepares European regulation. No doubt that this invitation was a positive effect of the workshop and it is an excellent opportunity to improve EU procedures in the field."

Literature and Evolutionary Theory (2007)
Ineke Sluiter

"We published several joint papers with some workshop participants, including the paper "In het hoofd van Medea. Gedachtenlezen bij een moordende moeder." This paper was presented at the so-called Fall Conference of the Dutch Organization of Classics Teachers, in preparation of the national exam in Greek on Euripides' Medea. Some 120 high school teachers were thus informed about these new paradigms and were enabled to teach their students about them."

7.

ACADEMIC REPUTATION

The Lorentz Center's major stakeholders are, of course, the scientists who partake in our workshops. The Lorentz Center's policy is to minimize bureaucracy and our staff is small. We therefore are cautious to trouble the participants with written questionnaires. Instead, the executive manager and the scientific manager make a directed effort to talk with the scientists. While these conversations typically start with open questions on how the workshop is going, we then zoom in on the scientific impact of the meeting and how the format of the workshop is affecting the flow of the workshop, or how the Lorentz Center staff or approach is being supportive. These informal interviews are held with organizers of the workshop as well as participants at senior and junior level, as they may have a different perspective on the workshop. We document this feedback in writing since 2010. An impression of the feedback is provided below, by a selection of quotes from participants and from organizers of the workshops. The selection of quotes was guided by our aim to present a representative sampling of the feedback, with a broad scope and without being repetitive. We also included a number of remarks that are being made quite frequently.

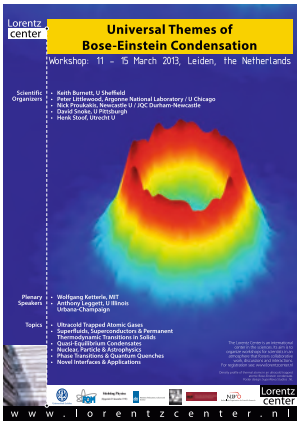
a. Feedback from participants

Prisca Bauer
Models of Consciousness and Clinical Implications (2013)

> *"It was a great week, with a very special atmosphere: science was in the air – with ample time to talk with each other, in the common room or near a white board. Henk Barendregt [organizer and Distinghuished Lorentz Fellow] and I are going to do some work together soon. One of the senior participants asked me to mail my resume if I aspire to a postdoc position with him after my PhD graduation."*

Eelco Vogt
Operando Research in Catalysis: ORCA (2013)

> *"Joost Frenken [organizer] was impressed that we from industry were here all the week. But this really was a good conference with lots of great new developments that are directly applicable in the industry."*



Thierry Giamarchi
Universal Themes of Bose-Einstein Condensation (2013)

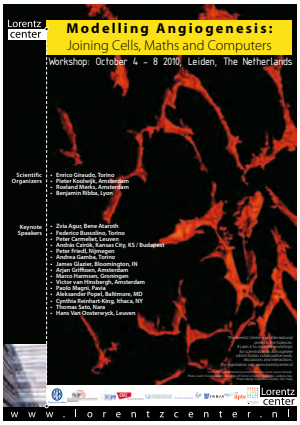
> *"This was a really good workshop that brought two groups together that do not know much about each other. It is a very good crowd. It is rather special that we had two nobel prize winners [Wolfgang Ketterle and Anthony Leggett] staying around for the whole week."*

Oren Tal
Future Directions of Molecular Electronics (2012)

"I would say that is was a perfect workshop. This may sound overdone but it really was. The offices where you can work, the common room which is a kind of living room where we could meet each other, the fact that everything is very close and connected – it all attributes to the atmosphere. Scientifically there was sufficient time to discuss things and the program was not too crowded with seminars. This gave time to discuss things without being rushed."

Arend-Jan Adriaanse
Dynamics of Complex Fluid-Fluid Interfaces (2011)

"Maybe you do not realize it, but you really have the top of the bill in the field walking around at the Lorentz Center this week."



James Glazier
Modelling Angiogenesis: Joining Cells, Maths and Computers (2010)

"The designated blocks of discussion time made all the difference to reach a high scientific level. It distinguished the meeting as a workshop as compared to a regular conference. The informal atmosphere was very helpful in getting the discussions going: talks that could be interrupted and then followed by designated discussions. The science was very well balanced with regard to the different subfields. I liked it a lot that not only the usual persons in the field had been invited, so that there was something new to be learned for all of us."

Ten recurrent remarks from participants:

- Great science
- There was a lot of discussion going on
- It feels like a mini sabbatical
- This was the best meeting in my life
- There was no such a thing as like-knows-like
- The office was great to do some work
- Good coffee
- Friendly and professional staff
- Beautiful posters
- My country should have something like it

b. Feedback from organizers

Jacco Uden and Lucas Evers
The Future of Art-Science Collaborations (2013)

> *"This is a good workshop. There are people with all kinds of backgrounds and we have lively discussions. The venue is very good for this purpose. You would do well in the humanities."*

Rafael Wittek
Gossip and the Management of Reputation (2013)

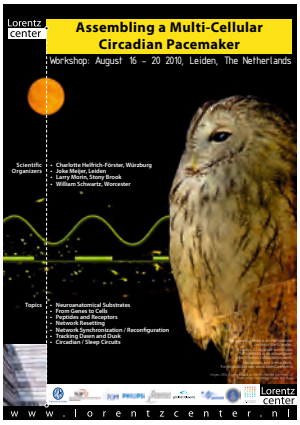
> *"When preparing the workshop, I asked around among colleagues with experience as participant or organizer of Lorentz Center workshops. One thing they consistently said was, as you told us, not to plan too many lectures. "*

Jan Willem Klop
Representing Streams (2012)

> *"I don't know how you do it, but we [mathematicians and computer scientists] are actually talking with each other."*

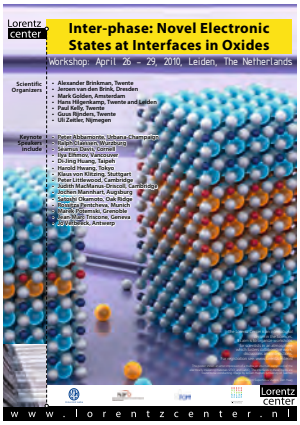
Ray Norris
Probing the Radio Continuum Universe with SKA Pathfinders (2011)

> *"This is a great facility you have here. I have brought together scientists with the objective to let them talk many times before. But here they really talk. I believe that the secret lies in the way you have set up the location. Having your own office is one aspect and the good coffee is another, but it also is the surroundings that make people feel comfortable."*



Bill Schwartz
Assembling a Multi-Cellular Circadian Pacemaker (2010)

> *"This is great; there is no such a thing in the US. Gordon conferences come closest to it but are really not like it: those are still traditional conferences with groups of about 100 people where often a few big shots dominate the audience. The discussions worked very well and there was a relaxed atmosphere during the discussions."*



Jeroen van den Brink
Inter-Phase: Novel Electronic States at Interfaces in Oxides (2010)

> *"People are enjoying the Lorentz Center simply because there is so much space in the program to discuss things at your leisure."*

Jan van Leeuwen and Johan Rooryck
Distinguished Lorentz Fellows 2009 and 2011

> *"We had a lot of contact with Henriette [Lorentz Center scientific manager] at an early stage. Henriette gave useful feedback and she urged us to invite people from both the natural sciences and the humanities and social sciences. She gave guidance in how to organize a workshop and that it is different from a regular conference. She pushed us a bit out of our comfort zone to add more open sessions in the program and that was good and it turned out very well. The Lorentz Center clearly has an approach that works."*

Ten recurrent remarks from organizers:

- We have really moved forward
- The best thing we did was giving the participants time.
- Your suggestions on the format were very helpful
- The coordination of the workshop was great: adequate, fast, and very helpful and friendly
- The Lorentz Center's facilities are outstanding: the offices, common room, and lecture room are all close at hand
- The lecture room is nice: simple but good, without complicated knobs and things like that – just knowing that you can plug in a stick or connect a cable to a laptop and it will work
- It's nice that you do not have rules on what we should or should not do
- One of the very good things of the Lorentz Center is that you do not have evaluation sheets
- There is nothing as easy as organizing a Lorentz Center workshop
- I hope to come back soon

8.

SOCIETAL RELEVANCE

a. Bringing together scientific cultures and communities

Scientific research is increasingly directed towards solving complex societal challenges. These challenges usually ask for interdisciplinary approaches, concerning a wide spectrum of scientific fields. The Lorentz Center is proficient in bringing together scientists who differ regarding scientific objectives and know-how of the methods and approaches they apply. In particular, we guide the scientific organizers in how the format, content and focus of their workshop may serve their objectives and the outcome of the workshop. The majority of our workshops indeed is multidisciplinary and about one-quarter of the workshops is successful in initiating new scientific themes or bringing together new research communities (table 6b and paragraph 6d).

Effective valorization of academic results typically requires close interaction between scientists from academia and those of the private and public sectors. The Lorentz Center stimulates

participation of scientists from the private sector and other non-academic institutes in its activities. The number of workshop participants who are affiliated with non-academic organizations has steadily grown to over 5% of all participants. From 2010 onwards, the Lorentz Center also hosts workshops that are organized on initiative of scientists from the private sector as well as a growing number of study groups with industry – expanded to four disciplines in 2013: mathematics, physics, life sciences and ICT. The workshops and the study groups effectively connect scientists from the private sector with those in academia, including the initiation of collaborations and junior scientists who decide to pursue a career in the private sector.

b. The Dutch scientific community

The Lorentz Center's activities have a tangible spin-off for the Dutch scientific community at large. On the one hand, the Lorentz Center's scientific program provides international visibility of Dutch research activities, including novel scientific topics and themes. On the other hand, our workshops bring many eminent scientists to the Netherlands. The international workshop participants frequently combine their workshop with a working visit to scientists elsewhere in the Netherlands. These meetings take place around almost all workshops – sometimes also at the Lorentz Center, during the breaks, the "wine and cheese" welcome reception or the workshop dinner.

The lectures of Lorentz Center workshops are open to anyone interested, provided that the workshop is not fully booked. We indeed see auditors from Dutch institutes at almost all workshops, on average 2-6 persons (table 6c). A spin-off directly benefitting Leiden University is the Lorentz Center lectures at the "This Week's Discoveries" lunch colloquia. These weekly lectures are organized by the dean of Leiden University's Faculty of Science, highlighting recent breakthroughs by scientists of the faculty. The dean regularly invites prominent participants of Lorentz Center workshops to present their discoveries for this multidisciplinary audience. In 2013, ten Lorentz Center "This Week's Discoveries" lectures were held. A special highlight consisted of the back-to-back lectures of the two physics Nobel laureates Wolfgang Ketterle and Anthony Leggett, who attended the Lorentz Center workshop "Universal Themes of Bose-Einstein Condensation".

c. Science communication with the general public

The Lorentz Center holds that informing the general public is an important task of the scientific community. Although not part of the Lorentz Center's core activities, we aim to facilitate communication of the general public with participants of our workshops. The Lorentz Center and the Leiden Boerhaave science museum collaborate since 2013 in organizing public lectures around Lorentz Center workshops. The lectures are being held in the Boerhaave museum by participants of Lorentz Center workshops. We aim to organize about six public lectures per year. The first Boerhaave public lecture on the workshop "The Antikythera Mechanism: Science and Innovation in the Ancient World" in June 2013 was an immediate success, with 160 persons in attendance and much national media attention. Other public lectures were organized around the workshops "The Future of Science and Arts Collaborations" and "Cold War Science" and these again attracted large audiences.

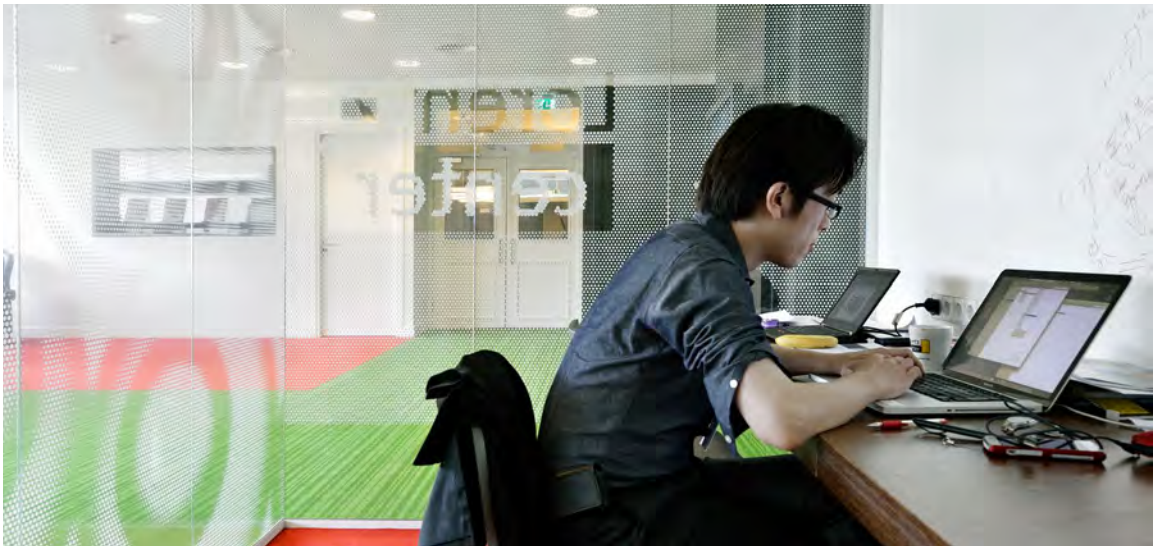
The Lorentz Center also stimulates science communication indirectly by incidentally hosting workshops that aim to improve science communication, such as the "ESA / GTTP Teacher Training Workshop 2013" that allowed European high school science teachers to acquire new knowledge and teaching methods in space science and astronomy. Another noteworthy example is the two EU-Universe Awareness Workshops that the Lorentz Center hosted in 2008 and 2012. These UNAWE workshops are part of a global program "to inspire and educate young underprivileged children with the beauty and scale of the universe."

d. The Lorentz Center's outreach to the scientific community

The Lorentz Center mug can be found in numerous coffee corners of scientific institutes across the globe. Many scientists are familiar with the Lorentz Center because of its appealing and recognizable workshop posters, which have earned a place in offices and laboratories world-wide. The posters announce a workshop but often they also become an icon for the participants of that workshop. Near 200 workshop posters are each week distributed by postal mail to the workshop participants, board members and scientific institutes, and to almost 100 announcees. We also distribute flyers with our workshop program and annual scientific reports by the organizers of our workshops, by postal mail to over 500 addresses. The Lorentz Center advertizes upcoming workshops through weekly email announcements to over 500 announcees. We had three calls for applications in 2013, including the ones for the CECAM-Lorentz workshop and the annual NIAS-Lorentz Theme Group. The calls are distributed to thousands of email addresses of participants of relevant Lorentz Center workshops and of scientific institutes and universities. Information on our activities is also made available through our website (www.lorentzcenter.nl) and the NIAS-Lorentz website (www.nias-lorentz.nl). Our announcees are from all over the world and their steadily growing number exemplifies the interest in our activities.

9.

VIABILITY: THE YEARS 2008-2013



The Lorentz Center is a continuously evolving institute. The Lorentz Center's adaptations aim to optimize its mission: promoting innovative science by providing an open platform where scientists can interact and collaborate. The viability of the Lorentz Center is perhaps best illustrated by the growth and developments that it has seen during the years 2008-2013.

a. A multidisciplinary program with interdisciplinary workshops

The Lorentz Center aspires to a balanced scientific program that encompasses all disciplines within the sciences. By 2008, the Lorentz Center's scientific spectrum included five disciplines in the natural sciences and technology, and we hosted interdisciplinary NIAS-Lorentz workshops that connected to the humanities and social sciences. Computational science was added to the spectrum in 2010. Our multidisciplinary scientific program induced an increase in interdisciplinary workshops, within the NIAS-Lorentz Program but also within the natural sciences.

Interdisciplinary workshops imply bringing together different scientific communities and cultures, which influences the flow and the format of the workshops. The Lorentz Center staff supports the organizers in handling the often more intricate processes around these workshops and we have adapted our application procedure to a reiterative procedure. It may be extra challenging to achieve high scientific quality for interdisciplinary workshops, yet they more often than not are novel and exciting – and therefore very much worth the effort.

b. Reaching out to scientific communities in academia and beyond

A solid scientific foundation is essential in maintaining the high quality of Lorentz Center workshops. Our mono-disciplinary board structure was already in place in 2008. We since installed a rotation procedure to replace board members every four to five years. The board members not only are active ambassadors of the Lorentz Center during their term, but they also stay involved afterwards. The scientific advisory boards thus provide us with an ever growing network of influential scientists in the disciplines of our scientific spectrum.

The Lorentz Center has established collaborations with several partners. Each of these collaborations improves the visibility of the Lorentz Center in specific communities and they offer an opportunity to broaden our activities, because of the nature of the collaborator's activities and/or their connection with specific (scientific) communities.

The NIAS-Lorentz Program is pivotal for the Lorentz Center's outreach to the humanities and social sciences. Similarly, we have teamed up with CECAM and the NLeSC in the computational and e-sciences – CECAM with its extensive European network and NLeSC with its network in the Dutch private sector. These collaborations are reflected in our scientific program with specific collaborative workshops.

The Lorentz Center's connection with the private sector is steadily growing. The first workshop organized on initiative of scientists from the private sector was held in 2010 and was then followed by several others.

We currently host 5-10 workshops with an industrial involvement each year (table 6b).

The technology foundation STW provides a connection with scientists in technology and engineering, from both academia and private enterprises. In collaboration with STW, the industry-oriented study groups were expanded to four scientific disciplines in 2013.

Lastly, the Boerhaave museum is unique in its science outreach to the general public. Our recently initiated but already successful collaboration with the Boerhaave museum allows us to organize public lectures around our workshops for an audience that we otherwise could not have assembled.

c. Maturation of the Lorentz Center workshop format

During recent years, the Lorentz Center has become more conscious of the factors underlying the success of the Lorentz Center workshops. We have experienced that for fruitful collaborative interactions, all participants should get to know each other during the meeting. We have therefore limited the number of participants to 55 persons at the Lorentz Center@Oort venue, with a minimum duration of four days. Our second Lorentz Center@Snellius venue followed this format naturally, with its smaller size of up to 25 participants. In fact, we suspect that four days may not always be necessary for these more intense workshops. The Lorentz Center@Snellius venue turns out to be particularly suitable for hands-on workshops and for more explorative workshops. The sharp increase in workshops immediately upon opening of the Lorentz Center@Snellius venue in 2012, supports our notion that the Lorentz Center offers a more attractive spectrum of workshop activities with the combination of the two venues.

The interactions of the Lorentz Center staff with the organizers and participants of workshops have been optimized. The scientific support for organizers is more structured, with verbal feedback on workshop proposals during the application phase and further suggestions on the workshop format during the intake meetings. The workshop coordinators have more responsibilities and operate proactively. All of the staff is aware of the Lorentz Center concept and how their activities may influence the flow and outcome of the workshops.

d. Professionalization of the center

In order to maintain its high standards, the Lorentz Center has put effort into reaching the next level of organizational maturity. The increasing number of workshops naturally required a larger staff. A Lorentz Center management was established that regularly reviews the Lorentz Center's strategies and policies. Staff positions have been assigned and team meetings have been installed. Operational procedures were streamlined and made less ambiguous – for staff as well as organizers – while avoiding unnecessary bureaucracy. The assignment of workshop weeks has been changed from a first-come-first-serve procedure to open competition, with assignment of the weeks based on the evaluation of the workshop proposals. The workshop budget granted to organizers is no longer a fixed amount per week but is coupled to the

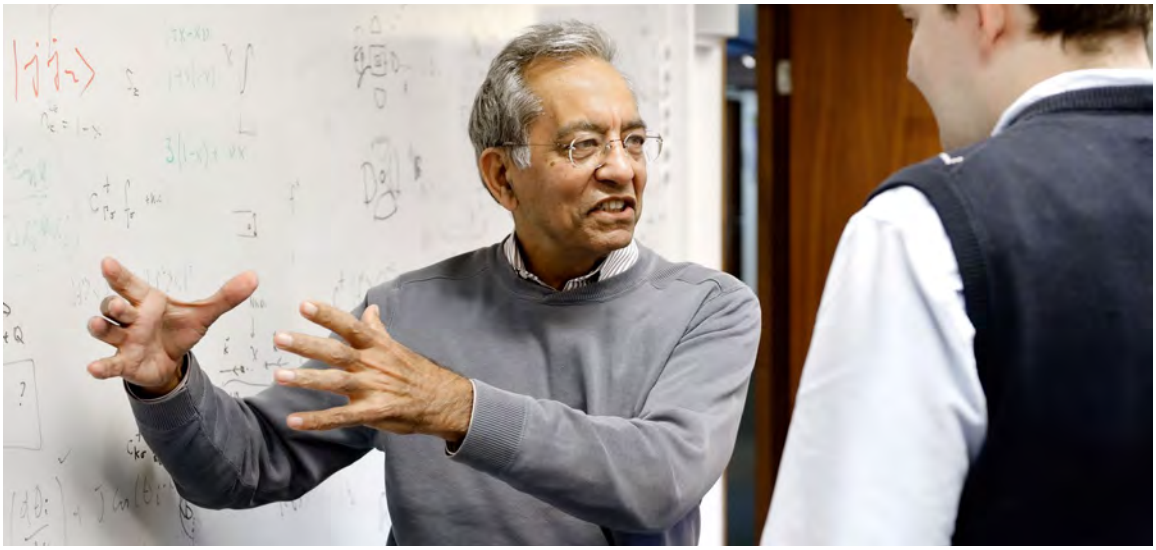
number of participants and days of the workshop. The workshop budget is further simplified so that it now only contains that part of the budget that is to be spent at the discretion of the organizers. Some practical matters were reformed because of changing times: reimbursements are no longer paid in cash but are transferred electronically; the participant's offices no longer have computers as they bring their own laptops; and our outreach material is more recognizable. Lastly, we switched to another hotel for our workshop participants; with careful consideration of quality and price but also that its atmosphere is conductive to the objectives of the Lorentz Center. All in all, the Lorentz Center has transformed from a pioneer organization to a mature professional organization.

e. A broader spectrum of funding sources

The financial position of the Lorentz Center is steadily becoming more robust. The workshop costs reflect our "good value for money" policy, with the actual costs in 2013 amounting to an average 18 k€ per week (excluding housing, common services and staff; table 5c). The increasing number of agencies that structurally fund the Lorentz Center provides a natural buffer in economically turbulent times. Yet, most of the Lorentz Center's structural funding is up for renewal every five years, which may pose a recurrent challenge. Nevertheless, our successful and ongoing expansions – even in the current economically difficult times – make us look forward with confidence.

10.

SWOT-ANALYSIS



a. Strengths

i. The scientific program of the Lorentz Center is unique in that it covers a broad spectrum of disciplines ranging from the natural sciences and technology to the humanities and social sciences. The solid foundation in each of its disciplines provides an optimal embedding for initiating and organizing interdisciplinary workshops. The scientific quality of the meetings is excellent.

ii. The mono-disciplinary structure of the scientific advisory boards ensures broad coverage of the Dutch scientific community. The board members provide direct contact with scientific developments and the scientists active therein, resulting in many novel and exciting workshops.

iii. The Lorentz Center appreciates and stimulates unusual workshops. The reiterative application procedure improves the quality of many workshops, particularly those with a more explorative character. Favoring the evaluation of the most positive board promotes daring interdisciplinary workshops.

iv. The Lorentz Center has a successful workshop format, providing scientists a platform where they can interact candidly.
v. The Lorentz Center has professional procedures with little bureaucracy and operates with a small and efficient staff.

b. Weaknesses

i. The Lorentz Center's trademark in interdisciplinary workshops may threaten to overpower the mono-disciplinary workshops, particularly in the perception of potential organizers of those workshops. Active stimulation of scientists by our board members thus far has resulted in a constant input of mono-disciplinary workshops.
ii. The Lorentz Center is internationally acclaimed for the scientific quality of its workshops. Yet it is difficult to objectively evaluate their impact or quantify their output, especially for those workshops that are the Lorentz Center's pride: workshops that bring together separate communities or that explore novel and daring topics. We recently started collecting output of our workshops from the organizers and we will continue to do so regularly.
iii. The Lorentz Center is an international workshop center, with about two-thirds of workshop participants from abroad (table 6c). Yet, the Lorentz Center is solely supported by Dutch funding agencies. We aim to collaborate with international partners and thus generate a basis for international funding.
iv. The Lorentz Center website does not provide a comprehensive impression of the Lorentz Center's mission, interests, procedures and facilities. We are currently developing a new website.

c. Opportunities

i. The increasing complexity of current professional and social life more and more hampers scientists in focusing on their scientific interests. The Lorentz Center not only offers scientists an open and interactive meeting place, but also provides a retreat from their everyday responsibilities.
ii. Whereas the concept of small interactive workshops is well known in the Lorentz Center's original disciplines in the physical sciences, it is relatively new in the life sciences, medical sciences, social sciences and humanities. All the same, Lorentz Center workshops are highly appreciated by scientists from these disciplines. The Lorentz Center will take advantage of the growing (international) appreciation for its activities by further expanding the depth and scope of its scientific spectrum.
iii. The Lorentz Center regularly receives applications for workshops in chemistry and in the medical sciences, and the interdisciplinary workshops in the Lorentz Center's core disciplines already frequently bridge with these disciplines (table 6b). To fully encompass these disciplines in our scientific spectrum, we are currently setting up chemistry and medical sciences advisory boards.
iv. Valorization of innovative results often requires collaboration between scientists in academia and those in the private sector. With its expertise in bringing together different communities and cultures, the Lorentz Center is uniquely suitable for uniting the academic and private sectors. We are strengthening our ties with the technology foundation STW, aiming to further our special program on academia with the private sector.

d. Threats

i. The Dutch national status of the Lorentz Center as well as its embedding within Leiden University is reflected by the financial support from both NWO and Leiden University; roughly at a fifty-fifty basis. NWO provides funding for the workshop costs and Leiden University provides housing, common services and funding for scientific personnel and standard operational costs. This funding structure implies that the Lorentz Center depends on *ad hoc* funding for the costs of the support staff as well as incidental operational costs, such as renovation of facilities or renewal of administrative support structures. The Lorentz Center is in need of a robust funding structure for all of its activities.

ii. The structural funding from NWO is subject to periodical evaluation of the Lorentz Center's quality and viability. Whereas it is desirable and necessary that the Lorentz Center follows the course of Dutch science funding, the renewal of NWO funding is currently too susceptible to short term economical and political developments. As a mature and professional workshop center, the Lorentz Center requires a funding structure that safeguards the medium long term – such as the six-year external evaluation and mid-term internal review that are customary for the SEP procedure for Dutch academic institutes.

iii. Some scientific disciplines ask for continuous nurture, notably informatics and to a lesser extent the life sciences. The chairs and members of these scientific advisory boards are active ambassadors of the Lorentz Center and there is intensive follow-up on their initiatives by the scientific manager of the Lorentz Center.

11.

STRATEGY AND VISION: 2014 AND THEREAFTER

a. Further expansion of our scientific spectrum

The Lorentz Center is a workshop center that provides scientists an open platform where they candidly interact and collaborate. The Lorentz Center is unique in its multidisciplinary program, but also in its expertise in bringing together different communities and cultures. Its successful workshop format is the Lorentz Center's greatest asset. Our workshops are renowned for their excellent scientific quality and the innovations that they incite. The Lorentz Center's scientific structure provides a solid foundation to further deepen and expand the scientific spectrum of our activities.

The Lorentz Center's ambition to expand its scientific spectrum is guided by present-day developments in both science and society. Our global society is increasingly confronted with fundamental and highly interrelated challenges – such as climate change, sustainability, food production and population pressures. The solutions to these challenges ask for an

inherently interdisciplinary approach, both between scientific fields and at the intersections of academia with the private and public sectors. In turn, the scientific impact and relevance of the interdisciplinary cross-fertilization is substantial. Lastly, everyday life has become more complex – both professional and personal – and scientists often find it difficult to find time to focus on their scientific activities. The Lorentz Center has the potential and the expertise to respond to all of these developments.

In our experience, expansion of the Lorentz Center's scientific spectrum must be accompanied with an underlying structure in that particular discipline: a scientific advisory board. The Lorentz Center is in the process of installing scientific advisory boards for chemistry and the medical sciences, building on the fact that we already host about five workshops per year that bridge with each of these disciplines (table 6b). Both boards are being set-up in close collaboration with the associated NWO divisions, NWO-CW for chemistry and ZonMW for the medical sciences, and with the relevant institutes within Leiden University, the Leiden Institute for Chemistry (LIC) and Leiden University Medical Center (LUMC).

The success of the NIAS-Lorentz Program not only signals a growing interest in workshops in areas beyond the sciences, but also indicates that the Lorentz Center has the expertise to host such workshops. The executive board of Leiden University, supported by the deans of the relevant faculties, encourages and supports expansion of the activities of the Lorentz Center in the social sciences and humanities. Thus, whereas all Lorentz Center workshops thus far have an explicit component of the natural sciences and technology, plans are being developed to also host workshops without a sciences component. Of course, these plans include installing scientific advisory boards that cover the particular areas – areas that are still to be determined. To ensure full embedding in the Dutch scientific community, this initiative of Leiden University will soon be brought to a national level – similar to events at the outset of the Lorentz Center's existence.

b. More collaboration with partners in academia and beyond

The Lorentz Center is firmly embedded in the Dutch scientific community. The scientific advisory boards provide a growing network of renowned scientists who are active ambassadors of the Lorentz Center – during and after their term. In addition, the Lorentz Center has established collaborations with several scientific institutes: NIAS, CECAM and NLeSC, each enriching our scientific program with specific collaborative workshops. The number of meetings in the Lorentz Center program that connect academia with the private and public sectors is also increasing, with workshops organized by scientists from the private sector, the study groups with industry that are organized with technology foundation STW, and the public lectures at the Boerhaave museum.

The Lorentz Center aims to steadily further its collaborations with partners in academia and beyond, in and outside of the Netherlands. We seek collaborations with partners who have access to communities or cultures that support the Lorentz Center's expansion in areas of interest. Collaboration with industrial partners in chemistry and pharmacology, for example, seems a corollary of our intended expansion in chemistry and the medical sciences. Whether with the private or public sector, such collaborations could also provide a basis for extending our funding sources. Of course, the impact on the quality of our scientific program will always be leading.

c. A workshop center that is ready to grow

The Lorentz Center is a mature organization in its operational procedures and the staff is professional with a flexible approach and little bureaucracy. The Lorentz Center supports workshop organizers in developing the format and dynamics of their workshop and in coordinating practical matters. Most important, the Lorentz Center is proficient in accommodating a wide variety of scientists, irrespective of their scientific background or culture.

The Lorentz Center has two workshop venues, allowing for a variety of workshop formats. Although the two venues enable us to host up to 95 workshops per year, current financial constraints limit the occupancy to about 65 workshops per year. Our primary goal is to expand to full capacity as soon as funding is being made available. Expansion to full capacity is essential for the intended expansion in chemistry and the medical sciences since, in our experience, sufficient visibility within a scientific community requires us to host 8-10 workshops per year in that discipline. The additional expansion in the social sciences and humanities may be initiated in the current two venues but will soon require a third venue elsewhere at Leiden University. We can comfortably build these future expansions on the present success of the Lorentz Center and its scientific activities, with the Leiden University's initiative for the social sciences and humanities as an ambitious but at the same time realistic next step.

12.

OVERVIEW OF LORENTZ CENTER MEETINGS 2008-2013

2008

Week	Venue	Workshop Title	Scientific Organizers	Astonomy	Chemistry	Computational Science	Earth Sciences	Economics	Humanities	Informatics	Life Sciences	Mathematics	Medical Sciences	Physics	Social Sciences	Technology & Engineering	NIAS-Lorentz Workshops
2	Oort	Computer-Based Clinical Guidelines and Protocols	Frank van Harmelen, Amsterdam; Peter Lucas, Nijmegen; Annette ten Teije, Amsterdam							x			x				
3	Oort	Keeping Track of the Seasons	Alistair Dawson, Huntingdon; Barbara Helm, Andechs; Marcel Visser, Wageningen								x						
4	Oort	Astronomy in Europe: an Evolving Collaboration	Joachim Krautter, Heidelberg; Elias Brinks, Hertfordshire; Thierry Courvoisier, Geneva; Anne Dutrey, Bordeaux; Harm Habing, Leiden	x													
5	Oort	Galaxy Evolution from Mass-Selected Samples	Marijn Franx, Leiden	x													
6	Oort	The Dark Side of the Universe Through Extragalactic Gravitational Lensing	Matthias Bartelmann, Heidelberg; Koen Kuijken, Leiden; Yannick Mellier, Paris; Peter Schneider, Bonn; Stella Seitz, München; Mario Radovich, Naples; Andy Taylor, Edinburgh; Ludovic van Waerbeke, Vancouver	x													
7 8	Oort	Crystallization and Jamming in Soft Matter under Driving - Colloidal Suspensions, Granular Media, Foams, and Complex Plasmas	Hartmut Löwen, Düsseldorf; Stefan Luding, Enschede; Matthias Sperl, Köln											x			
9	Oort	UNAWE: Development of Educational Materials	Sarah Levin, Leiden; George Miley, Leiden; Carolina Odman, Leiden	x					x								x
11	Oort	Symmetry as a Modern Scientific Concept: Historical and Philosophical Perspectives	Giora Hon, Haifa; Vincent Icke, Leiden; James McAllister, Leiden						x			x		x			x
12	Oort	Ultravista Science Team Meeting	Jim Dunlop, Edinburgh; Marijn Franx, Leiden; Johan Fynbo, Copenhagen; Olivier Lefèvre, Marseille	x													
13	Oort	RFID Security: Theory and Practice	Kevin Fu, Amherst; Ari Juels, Bedford; Melanie Rieback, Amsterdam; Adam Stubblefield, Baltimore							x			x			x	
14	Oort	From Exoplanets to Galaxy Clusters: Science with Astro-WISE	Erik Deul, Leiden; Gijs Verdoes Kleijn, Groningen; Edwin Valentijn, Groningen	x						x							
15	Oort	Evolutionary Algorithms for Many-Parameter Physics	Thomas Bäck, Leiden; Marc Vrakking, Amsterdam			x				x				x			
17	Oort	Qumran - a Holistic View	Annemie Adriaens, Ghent; Joris Dik, Delft; Jan Gunneweg, Jerusalem		x				x								x
19	Oort	Numerical Modelling of Complex Dynamical Systems	Joke Blom, Amsterdam; Jason Frank, Amsterdam; Willem Hundsdorfer, Amsterdam; Ben Sommeijer, Amsterdam; Jan Verwer, Amsterdam			x						x					

Week	Venue	Workshop Title	Scientific Organizers	Astonomy	Chemistry	Computational Science	Earth Sciences	Economics	Humanities	Informatics	Life Sciences	Mathematics	Medical Sciences	Physics	Social Sciences	Technology & Engineering	NIAS-Lorentz Workshops
20	Oort	New Algorithms in Macromolecular Crystallography and Electron Microscopy	Jan Pieter Abrahams, Leiden; Navraj Pannu, Leiden; Raimond Ravelli, Leiden		x	x					x						
21 22	Oort	Network Synchronization: from Dynamical Systems to Neuroscience	Francesco Battaglia, Amsterdam; Nicolas Brunel, Paris; Massimo Cencini, Rome; Alessandro Torcini, Florence			x					x	x		x			
23	Oort	Hash Functions in Cryptology: Theory and Practice	Ronald Cramer, Amsterdam/Leiden; Lars Knudsen, Kongens Lyngby; Martijn Stam, Lausanne; Benne de Weger, Eindhoven							x		x					
24 25	Oort	Physics of Micro- and Nanofluids	Lyderic Bocquet, Lyon; Detlef Lohse, Enschede; Patrick Tabeling, Paris; Frederico Toschi, Rome			x								x		x	
26	Oort	Low-Frequency Pulsar Science	Ben Stappers, Manchester; Dan Stinebring, Oberlin; Richard Strom, Dwingeloo	x													
27	Oort	Algebraic Geometry	Bas Edixhoven, Leiden; Gerard van der Geer, Amsterdam; Eduard Looijenga, Utrecht									x					
28	Oort	The Geometric Langlands Program	Edward Frenkel, Berkeley; Gerrit Heckman, Nijmegen; Eduard Looijenga, Amsterdam; Eric Opdam, Amsterdam									x					
30	Oort	Operator Structures and Dynamical Systems	Marcel de Jeu, Leiden; Klaas Landsman, Nijmegen; Sergei Silvestrov, Lund; Christian Skau, Trondheim; Jun Tomiyama, Tokyo; Sjoerd Verduyn Lunel, Leiden									x					
31	Oort	Central Mass Concentrations in Galaxy Nuclei	Eric Emsellem, Lyon; Richard McDermid, Hilo	x													
32	Oort	Artificial Cold and International Cooperation in Science	Dirk van Delft, Leiden; Kostas Gavroglu, Athens; Frans van Lunteren, Amsterdam; Geert Somsen, Maastricht						x					x			x
33	Oort	Quantum Decoherence and Quantum Information Science	Dirk Bouwmeester, Leiden; Michiel de Dood, Leiden											x			
35 36	Oort	Dynamical Heterogeneities in Glasses, Colloids and Granular Media	Giulio Biroli, Gif-sur-Yvette; Jean-Philippe Bouchaud, Gif-sur-Yvette; Wim van Saarloos, Leiden											x			
37	Oort	The Cool, Cooler and Cold-Cluster Cooling Flows in a New Light	Françoise Combes, Paris; Alastair Edge, Durham; Andy Fabian, Cambridge; Walter Jaffe, Leiden; Christopher O'Dea, Rochester	x													

2008 / 2009

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38	Oort	Galaxies in Real Life and Simulations	Andrea Cimatti, Bologna; Pieter van Dokkum, New Haven; Natascha Forster Schreiber, Garching; Mariska Kriek, Princeton; Joop Schaye, Leiden; Rachel Somerville, Baltimore	x		x											
39	Oort	Logic and Information Security	Philippe Balbiani, Toulouse; Hans van Ditmarsch, Dunedin; Jan van Eijck, Amsterdam							x							x
41	Oort	Interstellar Surfaces: from Laboratory to Models	Herma Cuppen, Leiden; Ewine van Dishoeck, Leiden; Eric Herbst, Columbus; Harold Linnartz, Leiden; Serena Viti, London	x	x												
42	Oort	I-Science Workshop on Data Mining, Distributed Computing and Visualization for Astronomy	Farhad Arbab, Amsterdam; Cees de Laat, Amsterdam; Jos Roerdink, Groningen; Edwin Valentijn, Groningen; Jack van Wijk, Eindhoven	x		x				x							
43	Oort	The Physics of Genome Folding and Function	Roel van Driel, Amsterdam; Dieter Heermann, Heidelberg; Bela Mulder, Amsterdam								x			x			
44	Oort	DIAMANT Meets GQT	Gunther Cornelissen, Utrecht; Jan Draisma, Eindhoven									x		x			
45	Oort	Long Term Consequences of Exposure to Famine	Lambert Lumey, New York						x		x		x		x		x
46	Oort	PDE Approximations in Fast Reaction - Slow Diffusion Scenarios	Toyohiko Aiki, Gifu; Danielle Hilhorst, Paris; Masayasu Mimura, Kawasaki; Adrian Muntean, Eindhoven									x					
47	Oort	Fitting the Spectral Energy Distributions of Galaxies	Brent Groves, Leiden; Jakob Walcher, Paris	x													
48	Oort	Electrocatalysis@ Nanoscale: Techniques and Applications	David Fermin, Bristol; Marc Koper, Leiden; Patrick Unwin, Warwick; Alex Yanson, Leiden		x									x			
49	Oort	KAM Theory and its Applications	Henk Broer, Groningen; Heinz Hanßmann, Utrecht; Mikhail Sevryuk, Moscow									x		x			
50	Oort	Integrable Systems in Quantum Theory	Gerard Helminck, Amsterdam									x		x			
50	Oort	The First Science with LOFAR Surveys	Huub Rottgering, Leiden; Peter Barthel, Groningen; Philip Best, Edinburgh; Marcus Brueggen, Bremen; Matt Jarvis, Hertfordshire; George Miley, Leiden; Raffaella Morganti, Dwingelo; Ignas Snellen, Leiden	x													
3	Oort	Rich Cognitive Models for Policy Design and Simulation	Virginia Dignum, Utrecht; Wander Jager, Groningen; Catholijn Jonker, Delft							x					x		x
5	Oort	Karyotyping: from Microscope to Array - II	Martijn Breuning, Leiden; Nicole de Leeuw, Leiden; Claudia Ruivenkamp, Nijmegen								x		x				

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6	Oort	Deep IR Studies of the Distant Universe	Pieter van Dokkum, New Haven; Marijn Franx, Leiden	x													
7	Oort	Spin Caloritronics	Gerrit Bauer, Delft; Sadamichi Maekawa, Sendai			x								x			
9	Oort	Third International School of Design of Collective Intelligence	Virginia Dignum, Utrecht; Konrad Diwold, Leipzig; Martijn Schut, Amsterdam; William Veerbeek, Delft							x							
10	Oort	Animal Migration - Linking Models and Data	Zoltan Barta, Debrecen; Silke Bauer, Wageningen; Bruno Ens, Nijmegen; Marcel Klaassen, Wageningen; John McNamara, Bristol								x						
11	Oort	Mathematical Challenges in Climate Science	Daan Crommelin, Amsterdam; Rachel Kuske, Vancouver; Peter Jan van Leeuwen, Reading			x	x					x		x			
12	Oort	From Disks to Planets: Learning from Starlight 2009 EARA Workshop	Ewine van Dishoeck, Leiden; Michiel Hogerheijde, Leiden; Isa Oliveira, Leiden; Demerese Salter, Leiden	x													
13	Oort	Active Beam Spectroscopy for Control of the Fusion Plasma	Wolfgang Biel, Jülich; Roger Jaspers, Nieuwegein			x								x		x	
14	Oort	Solar Biofuels from Microorganisms	Thijs Aartsma, Leiden; Herbert van Amerongen, Wageningen; Roberta Croce, Groningen; Rienk van Grondelle, Amsterdam; Huub de Groot, Leiden; Klaas Hellingwerf, Amsterdam		x						x			x		x	
15	Oort	Interactions in the Dark: Physics of Dark Energy-Dark Matter Interactions	Henk Hoekstra, Leiden; Benoit Famaey, Brussels; Brendan Foster, Utrecht; HongSheng Zhao, Saint Andrews	x										x			
16 17	Oort	Counting Points on Varieties	Ted Chinburg, Philadelphia; Ronald van Luijk, Leiden; Lenny Taelman, Leiden									x					
19	Oort	Cambridge - Leiden: EasyMeeting on Quantum Matter	Luuk Ament, Leiden; Bas Overbosch, Leiden; Stephen Rowley, Cambridge; Jasper van Wezel, Cambridge											x			
20	Oort	The Giant Branches	Martin Groenewegen, Brussels; Maurizio Salaris, Liverpool; Achim Weiss, Garching	x													
21	Oort	Varying Fundamental Constants	Jarle Brinchmann, Leiden; Carlos Martins, Porto	x										x			
22	Oort	The Chemical Enrichment of the Intergalactic Medium	Stefano Borgani, Trieste; Xavier Prochaska, Santa Cruz; Joop Schaye, Leiden; Michael Shull, Boulder; Charles Steidel, Pasadena	x	x												
23	Oort	Experimental Design in Systems Biology: Data Analysis and Parameter Identification	Joke Blom, Amsterdam; Age Smilde, Amsterdam			x					x	x					

2009

Week	Venue	Workshop Title	Scientific Organizers	Astonomy	Chemistry	Computational Science	Earth Sciences	Economics	Humanities	Informatics	Life Sciences	Mathematics	Medical Sciences	Physics	Social Sciences	Technology & Engineering	NIAS-Lorentz Workshops
24	Oort	Géométrie Algébrique en Liberté XVII	Sultan Erdogan, Ankara; Alberto López, Zurich; Margarida Melo, Rome; Kaisa Taipale, Minneapolis; Inan Türkmen, Ankara; Filippo Viviani, Berlin; Tim Wouter, Leuven									x					
25	Oort	Monodromy and Geometric Phases in Classical and Quantum Mechanics	Konstantinos Efstathiou, Groningen; Jonathan Robbins, Bristol; Dmitrii Sadovskii, Dunkerque; Holger Waalkens, Groningen									x					
26	Oort	Brain Waves	Stan Gielen, Nijmegen; Stephan van Gils, Twente; Michel van Putten, Twente; David Termin, Columbus			x					x	x	x	x			
27	Oort	En Route to Jupiter and Saturn	Gareth Davies, Amsterdam; Daphne Stam, Utrecht; Bert Vermeersen, Delft; Wim van Westrenen, Amsterdam; Tanja Zegers, Utrecht	x													
28	Oort	Statistical Mechanics of Static Granular Media	Massimo Pica Ciamarra, Naples; Patrick Richard, Rennes; Matthias Schröter, Göttingen; Brian Tighe, Leiden											x			
29	Oort	Distribution of Mass in the Milky Way Galaxy	Leo Blitz, Berkeley; James Binney, Oxford; Anthony Brown, Leiden; Anatoly Klypin , Las Cruces; HongSheng Zhao, Saint Andrews	x													
30	Oort	Optimizing Drug Design	Andreas Bender, Leiden; Michael Emmerich, Leiden		x	x				x	x		x			x	x
32	Oort	Giant Fluctuations in Population Dynamics	Eli Ben-Naim, Los Alamos; Baruch Meerson, Jerusalem								x	x		x			
33	Oort	New Computational Methods in Quantum Many-Body Theory	Mikhail Katsnelson, Nijmegen; Alexander Lichtenstein, Hamburg; Andrew Millis, New York			x								x			
34	Oort	Flow of Foams	Simon Cox, Aberystwyth; Benjamin Dollet, Rennes; Martin van Hecke, Leiden											x			
35	Oort	Universe in a Box: from LHC, Cosmology and Lattice Field Theory	Maria Paola Lombardo, Frascati; Elisabetta Pallante, Groningen; Francesco Sannino, Odense											x			
36	Oort	Context, Causes and Consequences of Conflict	Jay Belsky, London; Sietse de Boer, Groningen; Douglas Fry, Vasa; Stephanie van Gooze, Cardiff; Marinus van IJzendoorn, Leiden; Maaike Kempes, Utrecht; Menno Kruk, Leiden; Steve Maxson, Storrs; Michael Potegal, Minneapolis; Juliette Schaafsma, Tilburg; Kipling Williams, West Lafayette								x				x		x
37	Oort	Physics Goes DNA: from Base-Pairs to Chromatin	Ralf Blossey, Villeneuve d'Ascq; Ralf Metzler, Garching; Helmut Schiessel, Leiden								x			x			

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39 40	Oort	Stellar Mergers	Evert Glebbeek, Ontario; Edward van den Heuvel, Amsterdam; Robert Izzard, Brussels; Simon Jeffery, Armagh; Gijs Nelemans, Nijmegen; Onno Pols, Utrecht	x													
41	Oort	Frobenius Lifts	James Borger, Canberra; Bart de Smit, Leiden									x					
42	Oort	Microbes in Ecosystems: Weaving Intracellular Processes into Ecological Networks	Peter van Bodegom, Amsterdam; Wilfred Röling, Amsterdam; Nico van Straalen, Amsterdam								x						
43	Oort	Scale Transitions in Space and Time for Materials	Katia Bertoldi, Enschede; Marc Geers, Eindhoven; Erik van der Giessen, Groningen; Stefan Luding, Enschede; Holger Steeb, Bochum			x						x		x		x	
44	Oort	Metabolic Pathways Analysis 2009	Frank Bruggeman, Amsterdam; Brett Olivier, Amsterdam; Marie-France Sagot, Lyon; Stefan Schuster, Jena; Leen Stougie, Amsterdam							x	x						
45	Oort	Cavity Enhanced Spectroscopy - Recent Developments and New Challenges	Harold Linnartz, Leiden; Andy Ruth, Cork; Wim Ubachs, Amsterdam	x										x			
47	Oort	Subdivide and Tile: Triangulating Spaces for Understanding the World	Monique Teillaud, Valbonne; Gert Vegter, Groningen; Rien van de Weygaert, Groningen			x				x		x					
48	Oort	Powerful Radio Galaxies: Triggering and Feedback	Philip Best, Edinburgh; Martin Hardcastle, Hatfield; Joanne Holt, Leiden; Raffaella Morganti, Dwingeloo; Nicole Nesvadba, Orsay; Clive Tadhunter, Sheffield	x													
49	Oort	.Astronomy 2009	Alisdair Allan, Exeter; Sarah Kendrew, Leiden; Chris Lintott, Oxford; Stuart Lowe, Manchester; Carolina Odman, Leiden; Robert Simpson, Cardiff	x		x											
50	Oort	New Directions in Dynamical Systems	Heinz Hanßmann, Utrecht; Ale Jan Homburg, Amsterdam; George Huitema, Groningen; Sebastian van Strien, Warwick; Floris Takens, Groningen									x					
51	Oort	Boundary Relations	Seppo Hassi, Vasa; Hendrik De Snoo, Groningen; Franciszek Hugon Szafraniec, Krakow									x					
1	Oort	Contact Line Instabilities	Ramin Badie, Veldhoven; Detlef Lohse, Enschede; Hans Reinten, Venlo; Michel Riepen, Veldhoven; Jacco Snoeijer, Enschede; Herman Wijshoff, Venlo											x		x	

2010

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2	Oort	Electrochemistry in Historical and Archaeological Conservation	Luis-Maria Abrantes, Lisbon; Mieke Adriaens, Ghent; Vasilike Argyropoulos, Athens; Virginia Costa, Meudon; Christian Degrigny, La-Chaux-de-Fonds; Mark Dowsett, Warwick; Paola Letardi, Genova; David Thickett, London		x				x								x
3	Oort	Micro- and Nanofluidics for Cell Biology	Albert van den Berg, Twente; Jan Eijkel, Twente; Séeverine Le Gac, Twente; Maxim Kuil, Leiden; Hans Tanke, Leiden								x			x			
4	Oort	Analysing First Imaging Data from LOFAR	Peter Barthel, Groningen; George Miley, Leiden; John Conway,Onsala; Marcus Brüggen, Bremen; Huub Röttgering, Leiden; Matt Lehnert, Meudon; Krzysztof Chyzy, Krakow; Philip Best, Edinburgh; Raffaella Morganti, Dwingeloo; Matt Jarvis, Herts; Gianfranco Brunetti, Bologna; Ignas Snellen, Leiden	x													
5	Oort	The Arteficial Leaf	Thijs Aartsma, Leiden; James Barber, London; Gyozo Garab, Szeged; Huub de Groot, Leiden; Alfred Holzwarth, Mülheim; Stenbjorn Styring, Uppsala		x	x					x			x		x	
6	Oort	Philosophy of Information and Computing Sciences	Jan van Leeuwen, Utrecht						x	x							x
7	Oort	Provable Security Against Physical Attacks	Ronald Cramer, Amsterdam/Leiden; Shafi Goldwasser, Cambrdige; Eike Kiltz, Amsterdam; David Naccache, Paris; Krzysztof Pietrzak, Amsterdam; Francois-Xavier Standaert, Louvain-la-Neuve							x		x				x	
8	Oort	Formal Theories of Communication	Johan van Benthem, Amsterdam; Ram Ramanujam, Chennai; Rineke Verbrugge, Groningen						x	x							x
10	Oort	Surveying the Low Frequency Sky with LOFAR	Peter Barthel, Groningen; Philip Best, Edinburgh; Gianfranco Brunetti, Bologna; Marcus Brüggen, Bremen; Krzysztof Chyzy, Krakaw; John Conway, Onsala; Matt Jarvis, Hatfield; Matt Lehnert, Meudon; George Miley, Leiden; Raffaella Morganti, Dwingeloo; Huub Röttgering, Leiden; Ignas Snellen, Leiden	x													
11	Oort	Quantum Measurement and Chemical Spin Dynamics	Peter Hore, Oxford; Jonathan Jones, Oxford; Joerg Matysik, Leiden; Ulrich Steiner, Konstanz		x									x			
12	Oort	Part and Whole in Physics	Richard Healey, Tuscon; Philip Stamp, Vancouver; Jos Uffink, Utrecht						x					x			x

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13	Oort	Single Dopant Control	Joaquín Fernández-Rossier, Alcante; Paul Koenraad, Eindhoven; Sven Rogge, Delft											x		x	
14	Oort	Integrating Cultures: Models, Simulations and Applications	Frank Dignum, Utrecht; Virginia Dignum, Delft; Jacques Ferber, Montpellier; Tiberiu Stratulat, Montpellier			x		x		x					x		x
15	Oort	The Interface of Integrability and Quantization	Aloysius Helminck, Raleigh; Gerard Helminck, Amsterdam									x		x			
16	Oort	How to Weigh Clusters of Galaxies?	Arif Babul, Victoria; Henk Hoekstra, Leiden; Andisheh Mahdavi, San Francisco	x													
17	Oort	Inter-Phase: Novel Electronic States at Interfaces in Oxides	Jeroen van den Brink, Dresden; Alexander Brinkman, Enschede; Hans Hilgenkamp, Enschede; Mark Golden, Amsterdam; Paul Kelly, Enschede; Guus Rijnders, Enschede; Uli Zeitler, Nijmegen											x		x	
18 19	Oort	Advanced School and Workshop on Computational Gravitational Dynamics	Steve McMillan, Drexel; Simon Portegies Zwart, Leiden; Alice Quillen, Rochester; Joachim Stadel, Zurich	x		x											
20	Oort	Capillary Shaping of Solutes	Laurent Limat, Paris; Vincenzo Vitelli, Leiden; Thomas Witten, Chicago								x			x			
21	Oort	Multi-frequency EPR in the Biosciences	Martin Engelhard, Dortmund; Maurice van Gastel, Bonn; Edgar Groenen, Leiden; Klaus Moebius, Berlin; Heinz-Juergen Steinhoff, Osnabrück		x						x			x			
22	Oort	Understanding and the Aims of Science	James McAllister, Leiden; Henk de Regt, Amsterdam						x					x			x
23 24	Oort	Numeration	Karma Dajani, Utrecht; Robbert Fokkink, Delft; Cor Kraaikamp, Delft; Rob Tijdeman, Leiden									x					
25 26	Oort	IPTA 2010: Detecting Gravitational Waves with Pulsars	Paul Demorest, Charlottesville; Samuel Finn, Philadelphia; Yuri Levin, Leiden; Ben Stappers, Manchester; Dan Stinebring, Oberlin	x													
27	Oort	Sage Days 23: Number Theory and Computer Algebra	Wieb Bosma, Nijmegen; Bart de Smit, Leiden; William Stein, Seattle							x		x					
28	Oort	Coherent Structures in Evolutionary Equations	Greg Pavliotis, London; Jens Rademacher, Amsterdam									x					
29	Oort	Flow Instabilities and Turbulence of Viscoelastic Fluids	Bruno Eckhardt, Marburg; Ronald Larson, Ann Arbor; Alexander Morozov, Edinburgh; Christian Wagner, Saarbrücken			x								x			

2010

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30	Oort	X-ray Bursts and Burst Oscillations	Andrew Cumming, Montreal; Erik Kuulkers, Madrid; Anna Watts, Amsterdam; Jean in 't Zand, Utrecht	x													
31	Oort	Symplectic Techniques in Conservative Dynamics	Viktor Ginzburg, Santa Cruz; Frederica Pasquotto, Amsterdam; Bob Rink, Amsterdam; Robert Vandervorst, Amsterdam									x					
33	Oort	Assembling a Multi-Cellular Circadian Pacemaker	Charlotte Förster, Würzburg; Joke Meijer, Leiden; Larry Morin, Stony Brook; William Schwartz, Worcester								x		x			x	
34	Oort	Poly and Polymer Electrolytes for Energy Conversion: Ab Initio, Molecular, and Continuum Models	Arjen Doelman, Leiden; Stephen Paddison, Knoxville; Keith Promislow, East Lansing		x	x						x		x			
35	Oort	Summer School on Models for Embedded Signal Processing Systems	Shuvra Bhattacharyya, College Park; Ed Deprettere, Leiden			x				x							
36	Oort	4th Euro-Japanese Workshop on Blow-up	Marek Fila, Bratislava; Joost Hulshof, Amsterdam; Juan Luis Vazquez, Madrid; Eiji Yanagida, Tokyo									x					
37	Oort	History of Software, European Styles	Gerard Alberts, Amsterdam; William Aspray, Austin; Helena Durnova, Brno; David Nofre, Amsterdam; Hannu Salmi, Turku						x	x							
38	Oort	Observational Signatures of Type Ia Supernova Progenitors	Andy Howell, Santa Barbara; Dani Maoz, Tel-Aviv; Paolo Mazzali, Garching; Gijs Nelemans, Nijmegen; Jacco Vink, Utrecht	x													
39	Oort	New Directions in Modern Cosmology	Ruth Durrer, Geneva; Theo Nieuwenhuizen, Amsterdam; Rudy Schild, Cambridge; Francesco Sylos Labini, Rome	x										x			
40	Oort	Modelling Angiogenesis: Joining Cells, Maths and Computers	Enrico Giraudo, Torino; Pieter Koolwijk, Amsterdam; Roeland Merks, Amsterdam; Benjamin Ribba, Lyon			x				x	x	x					
41	Oort	Physics with Industry	Marcel Bartels, Utrecht; Eppo Bruins, Utrecht; Wim van Saarloos, Utrecht; Pieter de Witte, Utrecht											x		x	
42	Oort	Aggression and Peacemaking in an Evolutionary Context	Douglas Fry, Vasa; Johan van der Dennen, Groningen								x				x		x
43	Oort	Arithmetic of Surfaces	Hendrik Lenstra, Leiden; Ronald van Luijk, Leiden; Cecilia Salgado, Leiden; Lenny Taelman, Leiden									x					

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44	Oort	Seeing Enzymes in Action	Thijs Aartsma, Leiden; Gerard Canters, Leiden; Gianfranco Gilardi, Torinol; Antoine van Oijen, Groningen		x	x					x			x			
45	Oort	WorKer 2010: Workshop on Kernelization	Hans Bodlaender, Utrecht; Fedor Fomin, Bergen; Saket Saurabh, Chennai							x							
46	Oort	Mining Patterns and Subgroups	Arno Knobbe, Leiden; Matthijs van Leeuwen, Utrecht; Marvin Meeng, Leiden; Stefan Wrobel, Bonn							x							
47	Oort	Analysis, Geometry and Group Representations for Homogeneous Spaces	Gerard Helminck, Amsterdam; Takaaki Nomura, Fukuoka									x					
48	Oort	Modeling with Images in the Life Sciences	Joost Batenburg, Antwerp; Fons Verbeek, Leiden			x				x	x						
49	Oort	Mathematical Life in the Dutch Republic	Fokko Jan Dijksterhuis, Enschede; Charles van den Heuvel, Amsterdam; Steven Wepster, Utrecht						x			x					x
50	Oort	HART - Human-Agent-Robot Teamwork	Jeff Bradshaw, Pensacola; Virginia Dignum, Delft; Catholijn Jonker, Delft							x						x	
3	Oort	Landing Sites for Exploration Missions	Agustin Chicarro, Noordwijk; Roderik Koenders, Delft; Tanja Zegers, Utrecht	x													
4	Oort	Physics of Mixing	Julyan Cartwright, Granada; Herman Clercx, Eindhoven; GertJan van Heijst, Eindhoven; Michel Speetjens, Eindhoven									x		x			
5	Oort	New Biology: Opportunities, Challenges and Myths	Johan Braeckman, Ghent; Roel van Driel, Amsterdam; Tsjalling Swierstra, Maastricht								x				x		x
6	Oort	Circulating Tumor Cell Isolation and Diagnostics	Klaus Pantel, Hamburg; Stefan Sleijfer, Rotterdam; Anja van de Stolpe, Eindhoven; Leon Terstappen, Eindhoven; Jaap den Toonder, Eindhoven								x		x			x	
7	Oort	Multiscale Fluid Dynamics with the Lattice Boltzmann Method	Herman Clercx, Eindhoven; Jens Harting, Eindhoven; Sauro Succi, Roma; Federico Toschi, Eindhoven			x								x			
8	Oort	Probing the Radio Continuum Universe with SKA Pathfinders	Rob Beswick, Manchester; Geoff Bower, Berkeley; Jim Condon, Charlottesville; Kurt van Heyden, Cape Town; Joseph Lazio, Pasadena; Ray Norris, Epping; Tom Oosterloo, Dwingeloo; Huub Röttgering, Leiden	x													
9	Oort	Herschel and the Characteristics of Dust in Galaxies	Frank Israel, Leiden; Xander Tielens, Leiden	x													

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10	Oort	Modeling Natural and Artificial Photosynthesis	Francesco Buda, Leiden; Markus Reiher, Zürich; Lucas Visscher, Amsterdam		x	x								x			
11	Oort	Cosmic Ray Interactions: Bridging High and Low Energy Astrophysics	Sera Markoff, Amsterdam; Jesus Martin-Pintado, Torrejón: Diego Torres, Barcelona; Jacco Vink, Utrecht; Farhad Yusef-Zadeh, Evanston	x													
12	Oort	Control of Burning Plasmas	Tony Donné, Nieuwegein; Barry Koren, Amsterdam; Jo Lister, Lausanne; Didier Mazon, Saint-Paul-lez-Durance; Pieter Nuij, Eindhoven; Maarten Steinbuch, Eindhoven			x						x		x		x	
13	Oort	Beam Shifts: Analogies between Light and Matter Waves	Andrea Aiello, Erlangen; Konstantin Bliokh, Galway; Eric Eliel, Leiden; Jörg Götte, Bristol; Wolfgang Löffler, Leiden; Victor de Haan, Puttershoek; Henning Schomerus, Lancaster											x			
14	Oort	100th Anniversary of Superconductivity: Hot Topics and Future Directions	Mark Golden, Amsterdam; Dirk van der Marel, Geneva; Kosmas Prassides, Durham; Anne de Visser, Amsterdam; Jan Zaanen, Leiden											x			
15	Oort	Advanced Magnetohydro-dynamics	Hans Goedbloed, Rijnhuizen; Rony Keppens, Leuven; Stefaan Poedts, Leuven; Alexander Vögler, Utrecht	x		x						x		x			
16	Oort	Quantitative Methods in Financial and Insurance Mathematics	Karel In 't Hout, Antwerp; Kees Oosterlee, Amsterdam			x		x				x					
17	Oort	Science Meets Justice	Ton Broeders, Maastricht; Ton Derksen, Nijmegen; Richard Gill, Leiden; Peter de Knijff, Leiden; Marijke Malsch, Amsterdam; Hans Nijboer, Leiden									x			x		x
18	Oort	Workweek: Towards Understanding Imaging Data from LOFAR	Roberto Pizzo, Dwingeloo; Huub Röttgering, Leiden	x													
19	Oort	Spin Caloritronics III	Gerrit Bauer, Delft; Sadamichi Maekawa, Tokai			x								x			
20	Oort	Coherent Structures in Dynamical Systems	Francisco Beron-Vera, Miami; Henk Broer, Groningen; María Olascoaga, Miami; Thomas Peacock, Cambridge				x					x		x			
21	Oort	The Motivic Fundamental Group	Spencer Bloch, Chicago; Dale Husemöller, Bonn; Jan Stienstra, Utrecht									x					
22	Oort	Molecular Logic	Françoise Remacle, Liège; Sven Rogge, Delft/Sydney; Itamar Willner, Jerusalem		x					x	x			x			
23	Oort	4th European Women in Mathematics Summer School	Dion Coumans, Nijmegen; Andrea Hofmann, Oslo; Janne Kool, Utrecht; Erwin Torreao Dassen, Leiden									x					

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24	Oort	Black Hole Answers for Condensed Matter Questions	Sean Hartnoll, Cambridge; Hong Liu, Cambridge; John McGreevy, Cambridge; Sung Sik Lee, Hamilton; Koenraad Schalm, Leiden; Jan Zaanen, Leiden											x			
25	Oort	Fluctuations and Response in Active Materials: from Driven Granular Systems to Swarming Bacteria	Bulbul Chakraborty, Waltham; Martin van Hecke, Leiden; Jean-François Joanny, Paris; Narayanan Menon, Amherst; Corey O'Hern, New Haven; Sriram Ramaswamy, Bangalore; Madan Rao, Bangalore											x			
26	Oort	Analysis and Visualization of Moving Objects	Ross Purves, Zürich; Judy Shamoun-Baranes, Amsterdam; Bettina Speckmann, Eindhoven; Daniel Weiskopf, Stuttgart			x				x							
27	Oort	Extreme Value Statistics in Mathematics, Physics and Beyond	Yan Fyodorov, Nottingham; Frank den Hollander, Leiden; Sergei Nechaev, Paris; Holger Rootzen, Göteborg; Senya Shlosman, Marseille									x		x			
28	Oort	Transgenes Going Wild? Risk Assessment of Transgene Introgression from Crops into Wild Relatives	Detlef Bartsch, Berlin; Hans Bergmans, Bilthoven; Patsy Haccou, Leiden; Tom de Jong, Leiden; Bao-Rong Lu, Shanghai; J. Rong, Leiden; Geert De Snoo, Leiden; Allison Snow, Columbus								x						
29	Oort	Discrete Integrable Systems	Peter van der Kamp, Victoria; Frank Nijhoff, Leeds; Reinout Quispel, Victoria; Jan Sanders, Amsterdam									x					
30	Oort	Groups and Clusters of Galaxies: Confronting Theory with Observations	Arif Babul, Victoria; Henk Hoekstra, Leiden; Christoph Pfrommer, Heidelberg; Graham Smith, Birmingham	x													
32	Oort	Computational Neuroscience and the Dynamics of Disease States	Stephen Coombes, Nottingham; Stephan van Gils, Enschede; Michel van Putten, Enschede; Wytse Wadman, Amsterdam			x					x	x	x	x			
33	Oort	Standards in Emotion Modelling	Tibor Bosse, Amsterdam; Joost Broekens, Delft; Stacy Marsella, Los Angeles			x				x					x		x
34	Oort	Strongly Disordered Superconductors and Electronic Segregation	Mikhail Feigel'man, Chernogolovka; Teun Klapwijk, Delft											x			
35 36	Oort	Baryogenesis and First Order Phase Transitions in the Early Universe	Björn Garbrecht, Aachen; Tomislav Prokopec, Utrecht											x			
37	Oort	Creativity: Meaning, Mechanisms, Models	Johan Hoorn, Amsterdam; Frank Kresin, Amsterdam; Arjan Postma, Amsterdam						x						x		x

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38	Oort	Challenges in Modelling the Reaction Chemistry of Interstellar Dust	Stefan Bromley, Barcelona; Fedor Goumans, Leiden; Ben Slater, London	x	x	x											
39	Oort	Dynamics of Complex Fluid-Fluid Interfaces	Dick Bedeaux, Trondheim; Peter Fischer, Zürich; Signe Kjelstrup, Trondheim; Leonard Sagis, Wageningen; Thijs Vlugt, Delft			x								x			
40	Oort	Quantum to Classical Crossover in Mechanical Systems	Yaroslav Blanter, Delft; Dirk Bouwmeester, Leiden; Eva Weig, München; Herre van der Zant, Delft											x			
41	Oort	Thunderstorm Effects on the Atmosphere-Ionosphere System	Elisabeth Blanc, Bruyères-le-Châtel; Ute Ebert, Amsterdam/Eindhoven; Francisco Gordillo-Vazquez, Granada; Torsten Neubert, Copenhagen	x			x							x			
42	Oort	Physics with Industry II	Marcel Bartels, Utrecht; Marjan Fretz, Utrecht; Floor Paauw, Utrecht; Pieter De Witte, Utrecht											x		x	
43	Oort	Error in the Sciences: Diagnosis, Prognosis and Rectifying Measures	Marcel Boumans, Amsterdam; Giora Hon, Haifa; Arthur Petersen, Bilthoven					x	x			x					x
44	Oort	Tipping Points in Complex Flows: Numerical Methods for Bifurcation Analysis of Large-Scale Systems	Henk Dijkstra, Utrecht; Fred Wubs, Groningen			x	x					x		x			
45	Oort	Uncertainty Analysis in Geophysical Inverse Problems	Andreas Fichtner, Utrecht; Peter Jan van Leeuwen, Reading; Jeannot Trampert, Utrecht			x	x					x		x			
46	Oort	Land for Bioenergy: Ecological, Economical and Societal Aspects	Ada Ignaciuk, Paris; Cornelia Krug, Paris; Jasper van Vliet, Den Haag; Rik Leemans, Wageningen			x	x	x			x				x		x
47	Oort	Towards a Consensus Model of Yeast Glycolysis	Joerg Stelling, Basel; Bas Teusink, Amsterdam; Matthias Heinemann, Groningen			x					x						
48	Oort	Mathematics: Algorithms and Proofs	Thierry Coquand, Göteborg; Henri Lombardi, Besançon; Marie-Françoise Roy, Rennes; Bas Spitters, Nijmegen							x		x					
49	Oort	Isotopes in Astrochemistry: an Interstellar Heritage for Solar System Materials?	Conel Alexander, Washington; Steven Charnley, Greenbelt; Ewine van Dishoeck, Leiden; Stefanie Milam, Greenbelt	x	x												
50	Oort	Modeling and Observing Dense Stellar Systems	Arjen van Elteren, Leiden; Piet Hut, Princeton; Vincent Icke, Leiden; Steve McMillan, Philadelphia; Simon Portegies Zwart, Leiden; Marco Spaans, Groningen; Inti Pelupessy, Leiden	x		x											

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51	Oort	MAO – Multi-Agent Organisation	Mehdi Dastani, Utrecht; Guido Governatori, Saint Lucia; John-Jules Meyer, Utrecht; Leendert van der Torre, Luxembourg							x							
2	Oort	Language Development in Childhood and Adolescence	Paul van den Broek, Leiden; Eveline Crone, Leiden; Niels Schiller, Leiden; Charles Perfetti, Pittsburgh						x		x						x
3	Oort	Cooperation in Multi-Partner Settings: Biological Markets & Social Dilemmas	Ronald Noë, Strasbourg; Mark van Vugt, Amsterdam					x			x				x		x
4	Oort	GREAT School on the Science and Techniques of Gaia	Anthony Brown, Leiden; Gisella Clementini, Bologna; Eva Grebel, Heidelberg; Nuno Santos, Porto; Caroline Soubiran, Bordeaux; Nicholas Walton, Cambridge	x													
5	Oort	Hot Topics in Spin-Hyperpolarization	Eike Brunner, Dresden; Konstantin Ivanov, Novosibirsk; Walter Köckenberger, Nottingham; Jörg Matysik, Leiden		x									x			
6	Oort	Biblical Scholarship and Humanities Computing: Data Types, Text, Language and Interpretation	Jan Krans, Amsterdam; Bert Jan Lietaert Peerbolte, Amsterdam; Wido van Peursen, Leiden; Dirk Roorda, Den Haag; Ulrik Sandborg-Petersen, Aalborg East; Eep Talstra, Amsterdam			x			x	x							x
7	Oort	Bioinformatics and Systems Biology – Bridging the Divide	Roeland Merks, Amsterdam; Perry Moerland, Amsterdam; Bas Teusink, Amsterdam; Lodewyk Wessels, Amsterdam			x				x	x	x	x				
8	Oort	Modeling Strategic Reasoning	Johan van Benthem, Amsterdam; Sujata Ghosh, Groningen; Rineke Verbrugge, Groningen			x			x	x							x
9	Oort	Exciting CO in the Local and High Redshift Universe	Edwin Bergin, Ann Arbor; Ewine van Dishoeck, Leiden; Lars Kristensen, Leiden; Edo Loenen, Leiden; Rowin Meijerink, Groningen; Volker Ossenkopf, Köln; Markus Rollig, Köln; Ruud Visser, Ann Arbor	x													
10 11	Oort	Casimir Physics School - Workshop 2012	Diego Dalvit, Los Alamos; George Palasantzas, Groningen; Serge Reynaud, Paris; Vitaly Svetovoy, Enschede											x			
12	Oort	Noncommutative Algebraic Geometry and its Applications to Physics	Uggo Bruzzo, Trieste; Gunther Cornelissen, Utrecht; Giovanni Landi, Trieste; Vladimir Rubtsov, Angers									x		x			

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13	Oort	Astronomy to Inspire and Educate Young Children: EU Universe Awareness Workshop	Mark Bailey, Armagh; Kevin Govender, Cape Town; Claus Madsen, Heidelberg; Sivuyile Manxoyi, Cape Town; George Miley, Leiden; Carolina Ödman-Govender, Cape Town; Franco Pacini, Florence; Andreas Quirrenbach, Heidelberg; Rosa Ros, Barcelona; Pedro Russo, Leiden; Cecilia Scorza, Heidelberg	x					x								x
15	Oort	Hacking the Biological Clock: Circadian Rhythm and Photosynthesis	A. Alia, Leiden; Raoul Bino, Wageningen; Wilhelm Gruissem, Zurich; Paul Hooykaas, Leiden		x						x						
16	Oort	Fundamental Aspects of Friction and Lubrication	Daniel Bonn, Amsterdam; Annalisa Fasolino, Nijmegen; Joost Frenken, Leiden; Erik van der Giessen, Nijmegen; Guido Janssen, Delft; Frieder Mugele, Enschede; Lucia Nicola, Delft; Merlijn van Spengen, Delft											x		x	
17	Oort	Acoustic Waves for the Control of Microfluidics Flows	Michael Baudoin, Lille; Philippe Brunet, Paris; Henrik Bruus, Kongens Lyngby; Michel Versluis, Enschede								x		x	x			
18	Oort	Search and Rendezvous	Steve Alpern, London; Robbert Fokkink, Delft; Leszek Gasieniec, Liverpool; Roy Lindelauf, Breda; V.S. Subrahmanian, Maryland							x		x					
19	Oort	Chemical Gardens	Julyan Cartwright, Granada; Michael Russell, Pasadena; Oliver Steinbock, Tallahassee		x									x			
20	Oort	Particles in Turbulence	Eberhard Bodenschatz, Göttingen; Federico Toschi, Eindhoven			x								x			
21	Oort	Ostracism, Exclusion, and Rejection	Ilja van Beest, Tilburg; Kipling Williams, Purdue								x				x		x
22	Oort	Core Knowledge, Language and Culture	Pierre Pica, Paris; Johan Rooryck, Leiden						x		x				x		x
23 24	Oort	Studies of Star and Planet Forming Regions with Herschel	Ewine van Dishoeck, Leiden; Neal Evans, Austin	x													
25	Oort	The Biology and Physics of Bacterial Genome Organization	Remus Dame, Leiden; Oliver Espeli, Gif-sur-Yvette; David Grainger, Birmingham; Paul Wiggins, Washington								x			x			
26	Oort	Future Directions of Molecular Electronics	Bernard Doudin, Strasbourg; Sense Jan van der Molen, Leiden; Mario Ruben, Karlsruhe; Stefano Sanvito, Dublin; Herre van der Zant, Delft		x	x					x			x		x	

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27	Oort	Majorana Fermions in Condensed Matter	Anton Akhmerov, Leiden; Carlo Beenakker, Leiden; Fabian Hassler, Aachen; Charles Kane, Philadelphia; Michael Wimmer, Leiden											x			
28	Oort	Web Science Summer School	Hans Akkermans, Amsterdam; Wendy Hall, Southampton; Frank van Harmelen, Amsterdam; James Hendler, New York; Guus Schreiber, Amsterdam							x					x		x
29	Oort	Effective Field Theory in Inflation	Ana Achúcarro, Leiden; Brian Greene, New York; Mark Jackson, Paris; Jan Pieter van der Schaar, Amsterdam; Koenraad Schalm, Leiden; Leonardo Senatore, Stanford; Gary Shiu, Madison	x										x			
30	Oort	Gas, Stars, and Black Holes in the Galaxy Ecosystem	George Miley, Leiden; Roderik Overzier, Austin; Vivienne Wild, St Andrews	x													
31	Oort	From Conservative Dynamics to Symplectic and Contact Topology	Hansjörg Geiges, Köln; Viktor Ginzburg, Santa Cruz; Federica Pasquotto, Amsterdam; Bob Rink, Amsterdam; Rob Vandervorst, Amsterdam									x					
31	Snellius	Asteroseismology in Red-Giant Stars	Saskia Hekker, Amsterdam; Joris de Ridder, Leuven	x													
32	Oort	The Dynamic Nature of Baryons in Halos	Joel Bregman, Ann Arbor; James Bullock, Irvine; Robert Crain, Leiden; Ben Oppenheimer, Leiden; Mary Putman, New York; Jason Tumlinson, Baltimore	x										x			
33 34 35 36	Oort & Snellius	Modelling the Dynamics of Complex Molecular Systems	Peter Bolhuis, Amsterdam; Bernd Ensing, Amsterdam; Benedict Leimkuhler, Edinburgh; Eric Vanden-Eijnden, New York		x	x				x	x			x			
34	Oort	Resonance and Synchronization	Domien Beersma, Groningen; Henk Broer, Groningen; Henk Nijmeijer, Eindhoven								x	x		x			
36	Oort	Modern Perspectives on Thin Sheets: Geometry, Elasticity, and Statistical Physics	Pascal Damman, Mons; Benny Davidovitch, Amherst; Eran Sharon, Jerusalem; Vincenzo Vitelli, Leiden											x			
37	Oort	Compact Binaries in Globular Clusters	Matthew Benacquista, Brownsville; Craig Heinke, Alberta; Christian Knigge, Southampton; David Pooley, Houston; Simon Portegies Zwart, Leiden; Rasmus Voss, Nijmegen	x													
38	Oort	Active Dynamics on Microscales: Molecular Motors and Self-Propelling Particles	Arjen Doelman, Leiden; Alexander Mikhailov, Berlin; Kenneth Showalter, Morgantown		x						x	x		x			

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39	Oort	Organs on Chips: Human Disease Models	Hans Clevers, Utrecht; Don Ingber, Boston; Christine Mummery, Leiden; Anja van de Stolpe, Eindhoven; Jaap den Toonder, Eindhoven								x		x			x	
41	Oort	Holographic Thermalization	Jan de Boer, Amsterdam; Paul Chesler, Cambridge; Ben Craps, Brussels; Michal Heller, Amsterdam											x			
41	Snellius	Modeling of Multicellular Development and Cancer: European CompuCell3D/ SBW Hands-on Workshop	James Glazier, Bloomington; Roeland Merks, Amsterdam; Maciej Swat, Bloomington			x				x	x		x				
42	Oort	The Future of Phylogenetic Networks	Leo van Iersel, Amsterdam; Steven Kelk, Maastricht; David Morrison, Uppsala; Leen Stougie, Amsterdam							x	x	x					
43	Oort	How to Find Our Nearest Neighbors	Malcolm Fridlund, Noordwijk; Matthew Kenworthy, Leiden; Fabien Malbet, Grenoble; Ben Oppenheimer, New York; Andreas Quirrenbach, Heidelberg; Karl Stapelfeldt, Greenbelt; Wesley Traub, Pasadena	x													
43	Snellius	Model Integration for Sustainable Bioenergy Supply	Martin Banse, Braunschweig; Andre Faaij, Utrecht; Hans van Meijl, Wageningen; Edward Smeets, Wageningen; Detlef van Vuuren, Utrecht; Birka Wicke, Utrecht				x	x			x						
44	Oort	Foundations of Biomedical Knowledge Representation	Arjen Hommersom, Nijmegen; Peter Lucas, Nijmegen							x	x		x				
44	Snellius	Summer School on Spin-Hyperpolarization	Arno Kentgens, Nijmegen; Jörg Matysik, Leiden		x									x			
45	Oort	Post-Quantum Cryptography and Quantum Algorithms	Tanja Lange, Eindhoven; Michele Mosca, Waterloo; Christiane Peters, Lyngby							x		x					
46	Oort	Multiscale Systems Biology of Cancer	Roeland Merks, Amsterdam; Matthias Reuss, Stuttgart; Hans Westerhoff, Manchester			x				x	x		x				
47	Oort	Physics with Industry	Marcel Bartels, Utrecht; Eppo Bruins, Utrecht; Marjan Fretz, Utrecht; Floor Paauw, Utrecht; Wim van Saarloos, Utrecht; Pieter de Witte, Utrecht											x		x	
48	Oort	Dynamical Phenomena at Surfaces: the Role of Complexity	Carina Arasa, Leiden; Geert-Jan Kroes, Leiden; Petra Rudolf, Groningen; Meike Stöhr, Groningen		x	x								x			
48	Snellius	Is the Stellar Initial Mass Function Universal?	Léon Koopmans, Groningen; Scott Trager, Groningen; Tommaso Treu, Santa Barbara	x													
49	Oort	Elementary Reactive Processes at Surfaces	Axel Groß, Ulm; Ludo Juurlink, Leiden; Marc Koper, Leiden		x	x								x		x	

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49	Snellius	Assembly and Star Formation of Early-Type Galaxies in 3D	Davor Krajnović, Garching; Richard McDermid, Hilo; Paolo Serra, Dwingeloo	x													
50	Oort	Genome Mechanics at the Nuclear Scale	Ralf Everaers, Lyon; John Maddocks, Lausanne; Helmut Schiessel, Leiden		x					x				x			
50	Snellius	Representing Streams	Wieb Bosma, Nijmegen; Robbert Fokkink, Delft; Jan Willem Klop, Amsterdam; Cor Kraaikamp, Delft; Jan Rutten, Amsterdam/Nijmegen; Rob Tijdeman, Leiden							x		x					
51	Oort	Innovation at the Verge: Computational Models of Physical/Virtual Space Interaction	Galal Galal-Edeen, Giza; Johan Hoorn, Amsterdam; Paola Monachesi, Utrecht; Gert de Snoo, Groningen							x					x		x
2	Oort	Plasma to Plasma!	Herman Clercx, Eindhoven; Gerrit Kroesen, Eindhoven; Vinod Subramaniam, Twente; Miles Turner, Dublin								x		x	x		x	
3	Oort	Trends in Arithmetic Geometry	Johannes Nicaise, Leuven; Lenny Taelman, Leiden									x					
3	Snellius	Imaging the Low Frequency Radio Sky with LOFAR	John Conway, Goteborg; Neal Jackson, Manchester; Huub Röttgering, Leiden; Michael Wise, Dwingeloo	x													
4	Oort	High-Mass Star Formation, from Large to Small Scales in the Era of Herschel & ALMA	Gary Fuller, Manchester; Lex Kaper, Amsterdam; Pamela Klaassen, Leiden; Steve Longmore, Garching; Joseph Mottram, Leiden; Floris van der Tak, Groningen	x													
4	Snellius	A New View of Accretion onto Sgr A*	Frederick Baganoff, Cambridge; Geoffrey Bower, Berkeley; Charles Gammie, Urbana; Andrea Goldwurm, Gif-sur-Yvette; Sera Markoff, Amsterdam; Michael Nowak, Cambridge	x													
5	Oort	Study Group Mathematics with Industry 2013	Markus Heydenreich, Leiden; Sander Hille, Leiden; Vivi Rottschaffer, Leiden; Lotte Sewalt, Leiden; Frits Veerman, Leiden; Evgeny Verbitskiy, Leiden									x				x	
6	Oort	C+ as an Astronomical Tool	Jonathan Braine, Floirac; Maryvonne Gerin, Paris; Simon Glover, Heidelberg; Paul Goldsmith, Pasadena; Michael Kaufman, San Jose; Bhaswati Mookerjea, Mumbai; Volker Ossenkopf, Köln; Floris van der Tak, Groningen; Thangasamy Velusamy, Pasadena	x													

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6	Snellius	Hands-on Workshop on Computational Astrophysics	Arjen van Elteren, Leiden; Steve McMillan, Philadelphia; Simon Portegies Zwart, Leiden	x		x											
7	Oort	Eco-Evolutionary Dynamics in a Changing World	Stephanie Jenouvrier, Woods Hole; Thomas Reed, Wageningen; Marcel Visser, Wageningen				x				x						
8	Oort	Magellanic Cloud Star Formation: from the Milky Way to Distant Galaxies	Lynn Carlson, Leiden; John Gallagher, Madison; Elizabeth Lada, Gainesville; Margaret Meixner, Baltimore; Antonella Nota, Baltimore; Alexander Tielens, Leiden	x													
8	Snellius	System and Operator Realizations of Analytic Functions	Jussi Behrndt, Graz; Seppo Hassi, Vaasa; Henk de Snoo, Groningen; Franciszek Hugon Szafraniec, Krakow									x					
9	Oort	The PN.S: Future Projects and Ideas	Magda Arnaboldi, Garching; Ana Chies Santos, Nottingham; Lodovico Coccato, Garching; Konrad Kuijken, Leiden; Nicola Napolitano, Napels	x													
10	Oort	Formal Methods for the Informal World	Francien Dechesne, Delft; Frank Dignum, Utrecht; Virginia Dignum, Delft; Bruce Edmonds, Manchester; Liz Sonenberg, Melbourne							x					x		x
11	Oort	Universal Themes of Bose-Einstein Condensation	Keith Burnett, Sheffield; Peter Littlewood, Chicago; Nick Proukakis, Newcastle; David Snoke, Pittsburgh; Henk Stoof, Utrecht											x			
12	Oort	Obstacles and Catalysts of Peaceful Behavior	Doug Fry, Vasa; Peter Verbeek, Miyazaki								x				x		x
14	Oort	Models of Consciousness and Clinical Implications	Henk Barendregt, Nijmegen; Fabio Giommi, Milan; Antonino Raffone, Rome								x	x	x		x		x
14	Snellius	Statistical Network Science with Applications	Veronica Vinciotti, London; Ernst Wit, Groningen			x				x	x	x			x		
15	Oort	Complexity Models for Systemic Instabilities and Crises	Jean-Philippe Bouchaud, Palaiseau; Domenico Delli Gatti, Milan; Cees Diks, Amsterdam; Doyne Farmer, Oxford; Cars Hommes, Amsterdam; Domenico Massaro, Amsterdam			x		x		x				x	x	x	x
15	Snellius	Multiscale Modelling and Computing	Bastien Chopard, Geneva; Peter Coveney, London; Alfons Hoekstra, Amsterdam			x	x			x	x	x			x		
16	Oort	Mathematics and Biology: a Roundtrip in the Light of Suns and Stars	Mats Gyllenberg, Helsinki; Stephan van Gils, Enschede; Hans Heesterbeek, Utrecht; Yuri Kuznetsov, Utrecht; Hans Metz, Leiden								x	x					
17	Oort	What Regulates Galaxy Evolution?	Gabriella De Lucia, Triëste; Adam Muzzin, Leiden; Simone Weinmann, Leiden	x													

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19	Snellius	Galaxy Formation from z=5 to z=0	Pieter van Dokkum, New Haven; Marijn Franx, Leiden	x													
20	Oort	Locating Astrophysical Transients	Felix Aharonian, Heidelberg; Rob Fender, South Hampton; Bryan Gaensler, Redfem; Stefanie Komossa, Bonn; Chryssa Kouveliotou, Huntsville; Joeri van Leeuwen, Dwingeloo; Gijs Nelemans, Nijmegen; Zsolt Paragi, Dwingeloo; Steven Tingay, Perth	x													
20 21	Snellius & Oort	Mathematics of Information-Theoretic Cryptography	Ignacio Cascudo, Amsterdam; Ronald Cramer, Amsterdam; Venkatesan Guruswami, Pittsburg; Yuval Ishai, Haifa; Carles Padró, Barcelona; Chaoping Xing, Singapore							x		x					
21	Snellius	Seismology of Stellar Coronal Flares	Tom van Doorsselaere, Heverlee; Adam Kowalski, Washington; Mihalis Mathioudakis, Belfast; Valery Nakariakov, Coventry	x	x	x								x			
22	Oort	Econophysics and Networks Across Scales	Diego Garlaschelli, Leiden; Eugene Stanley, Boston					x						x	x		x
24	Oort	Heights and Moduli Spaces	Gerard Freixas i Montplet, Paris; Gerard van der Geer, Amsterdam; Robin de Jong, Leiden									x					
25	Oort	The Antikythera Mechanism	Niels Bos, Groningen; Mike Edmunds, Cardiff; Alexander Jones, New York; Onno van Nijf, Groningen; Rien van de Weygaert, Groningen	x					x								x
25	Snellius	Bayesian Nonparametrics	Subhashis Ghosal, North Carolina; Bas Kleijn, Amsterdam; Aad van der Vaart, Leiden; Harry van Zanten, Eindhoven									x					
26	Oort	Operando Research in Catalysis (ORCA)	Joost Frenken, Leiden; Stig Helveg, Lyngby; Karsten Reuter, Munich		x	x								x		x	
27	Oort	Steps Towards a New Generation of Stellar Models	Onno Pols, Nijmegen; Maurizio Salaris, Liverpool; Henk Spruit, Garching; Achim Weiss, Garching	x		x											
27	Snellius	Radio Halos of Galaxies	George Heald, Dwingeloo; Richard Henriksen, Kingston; Judith Irwin, Kingston; Marita Krause, Bonn; D.J. Saikia, Pune; Theresa Wiegert, Kingston	x													
28	Oort	Recent Insights in Mitochondrial Evolution Applied to Health and Ageing	Duur Aanen, Wageningen; Madeleine Beekman, Sydney; Marc Maas, Wageningen; Hans Spelbrink, Nijmegen								x		x				

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29	Oort	Elliptic Integrable Systems and Hypergeometric Functions	Erik Koelink, Nijmegen; Masatoshi Noumi, Kobe; Eric Rains, Pasadena; Hjalmar Rosengren, Gothenburg; Simon Ruijsenaars, Leeds; Jasper Stokman, Amsterdam									x					
29	Snellius	Language Interaction Design	William Cook, Austin; Tijs van der Storm, Amsterdam; Eelco Visser, Delft							x							
30	Oort	The Triggering Mechanisms for Active Galactic Nuclei	David Alexander, Durham; Sara Ellison, Victoria; Joanna Holt, Leiden; Cristina Ramos Almeida, Tenerife, Clive Tadhunter, Sheffield; Raffaella Morganti, Groningen	x													
30	Snellius	Sage Days: Algorithms in Arithmetic Geometry	Peter Bruins, Zürich; Maarten Derickx, Leiden; Michiel Kosters, Leiden									x					
31	Oort	The Molecular Physics of Interstellar PAHs	Lou Allamandola, Moffett Field; Annemieke Petrignani, Nijmegen; Xander Tielens, Leiden	x	x									x			
32	Oort	New Challenges for Early Universe Cosmologists	Henk Hoekstra, Leiden; Eiichiro Komatsu, Munich; Daniel Meerburg, Princeton; Enrico Pajer, Princeton; Koenraad Schalm, Leiden; Eva Silverstein, Stanford; David Spergel, Princeton; Licia Verde, Barcelona	x										x			
33	Oort	Clinical Relevance of Circadian Rhythms	Christopher Colwell, Los Angeles; Russell Foster, Oxford; Johanna H Meijer, Leiden; Dick Swaab, Amsterdam								x		x				
34	Oort	Normative Multi-Agent Systems: NorMAS 2013	Mehdi Dastani, Utrecht; Antonino Rotolo, Bologna							x					x		x
34	Snellius	DFT-based Multilayer Methods for Nanoscale Systems	Fedor Goumans, Amsterdam; Thomas Heine, Bremen; Luuk Visscher, Amsterdam		x	x								x			
35	Oort	Gossip and the Management of Reputation	Francesca Giardini, Rome; Rafael Wittek, Groningen			x			x	x					x		x
35	Snellius	Modeling with Measures: from Structured Populations to Crowd Dynamics	Azmy Ackleh, Louisiana; Rinaldo Colombo, Brescia; Sander Hille, Leiden; Adrian Muntean, Eindhoven									x			x		
36	Oort	SIMCO: Set-Oriented and Indicator-Based Multi-Criteria Optimization	Dimo Brockhoff, Lille; André Deutz, Leiden; Michael Emmerich, Leiden; Boris Naujoks, Gummersbach							x		x					
37	Oort	Modelling Meets Infant Studies in Language Acquisition	Christina Bergmann, Nijmegen; Rens Bod, Amsterdam; Paula Fikkert, Nijmegen; Maarten Versteegh,Nijmegen			x			x		x				x		x

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38	Oort	Biophysics, Biochemistry and Physiology of Fat Digestion	George van Aken, Ede; Peter Fischer, Zürich; Simeon Stoyanov, Vlaardingen; Freddy Troost, Maastricht		x						x			x		x	
39	Oort	Observational Signatures of Type Ia Supernova Progenitors II	Andy Howell, Goleta; Dani Maoz, Tel-Aviv; Paolo Mazzali, Garching; Gijs Nelemans, Nijmegen; Jacco Vink, Amsterdam	x													
41	Oort	Life Sciences with Industry 2013	Jan Pieter Abrahams, Leiden; Roel van Driel, Amsterdam; Ellen Feddes, Utrecht; Lydia Meesters, Leiden								x					x	
41	Snellius	The Future of Art-Science Collaborations	Lucas Evers, Amsterdam; Martijntje Hallmann, Amsterdam; Edwin van der Heide, Leiden; Joost Rekveld, The Hague; Jacco van Uden, The Hague; Louise Whiteley, Copenhagen; Rob Zwijnenberg, Leiden						x						x		x
42	Snellius	Noncommutative Geometry and Particle Physics	Thijs van den Broek, Nijmegen; Alain Connes, Bures-sur-Yvette; José Gracia-Bondia, Zaragoza; Piet Mulders, Amsterdam; Walter van Suijlekom, Nijmegen									x		x			
43	Oort	Hot Nanostructures	Jean-Louis Barrat, Grenoble; Frank Cichos, Leipzig; Michel Orrit, Leiden		x	x								x			
43	Snellius	Training Workshop Multidisciplinary Life Sciences	Roel van Driel, Amsterdam; Roeland Merks, Amsterdam, Jaap Molenaar, Wageningen			x					x						
44	Oort	Responsive Matrices for Solar Fuels	Richard Cogdell, Glasgow; Huub de Groot, Leiden; Alfred Holzwarth, Mülheim an der Ruhr; Sebastian Mackowski, Torun; Robin Purchase, Leiden		x						x			x			
45	Oort	Hidden Order, Superconductivity, and Magnetism in URu2Si2	Yuji Matsuda, Kyoto; John Mydosh, Leiden; Peter Oppeneer, Uppsala; Jan Zaanen, Leiden											x			
45	Snellius	Synthetic Biology and Symbolic Order	Henk Jochemsen, Wageningen; Bert Poolman, Groningen; Dirk Stemerding, The Hague; Hillie van de Streek, Amersfoort: Hub Zwart, Nijmegen						x		x				x		x
46	Oort	ICT with Industry 2013	Margriet Jansz, Utrecht; Rosemarie van der Veen - Oei, The Hague							x						x	
47	Oort	Physics with Industry	Marcel Bartels, Utrecht; Floor Paauw, Utrecht											x		x	
47	Snellius	The Complex Structure of Attracting Sets	Filippo Bracci, Rome; Han Peters, Amsterdam									x					

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48	Oort	Generalizations of Symmetric Spaces	Aloysius Helminck, Raleigh; Gerard Helminck, Amsterdam; Ralf Köhl, Giessen									x					
48	Snellius	ESA / GTTP Teacher Training Workshop 2013	Rebecca Barnes, Noordwijk; Rosa Doran, Sao Domingos de Rana	x					x								
49	Snellius	Modeling Kinetic Aspects of Global MHD Modes	Jonathan Citrin, Nieuwegein; Guido Huijsmans, Cadarache; Barry Koren, Eindhoven; Arthur Peeters, Bayreuth; Emanuele Poli, Garching; Egbert Westerhof, Nieuwegein			x								x		x	
50	Oort	Astrospheres: from the Sun to Red Super Giants	Nick Cox, Leuven; Vasilii Gvaramadze, Moscow; Lex Kaper, Amsterdam; Rosine Lallement, Paris; Allard Jan van Marle, Leuven;	x													
50	Snellius	Towards an Evolutionary Theory of Nongenetic Effects	Rufus Johnstone, Cambridge; Bram Kuijper, Cambridge; Ido Pen, Groningen			x					x						
51	Oort	Cold War Science	Dirk van Delft, Leiden; Jeroen van Dongen, Utrecht; David Kaiser, Cambridge; Frans van Lunteren, Leiden; Ad Maas, Leiden						x					x	x		x


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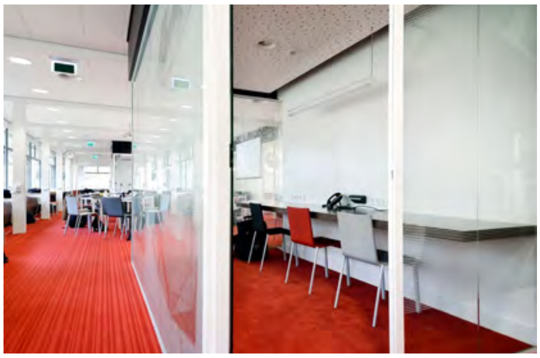

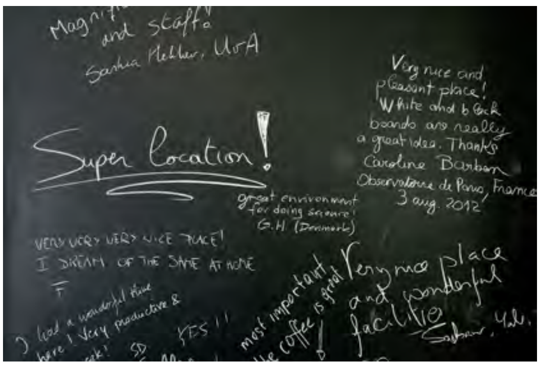
Super Location!
Very nice and pleasant place! White and black boards are really a great idea. Thanks
Caroline Barban
Observatoire de Paris, France
3 aug. 2012
great environment for doing science!
VERY VERY VERY NICE PLACE!
I DREAM OF THE SAME AT HOME
Very nice place and wonderful facilities


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