Dutch Research School of Theoretical Physics

ANNUAL REPORT 2011

Landelijke Onderzoekschool voor Theoretische Natuurkunde

Dutch Research School of Theoretical Physics (DRSTP)
Landelijke Onderzoekschool voor Theoretische Natuurkunde (LOTN)

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Preface

This DRSTP Annual Report 2011 provides an overview of the educational and research activities during 2011. The report also presents two research highlights written by staff members of the Research School. In addition, it offers information, such as a list of the participating staff, of the PhD students, a comprehensive list of publications, as well as other relevant statistics.

The Annual Report is not the only information that is provided by the DRSTP throughout the year. The DRSTP also publishes the monthly DRSTP Newsletter and a yearly Educational Guide of its educational activities. Up-to-date information is also readily available on internet at: `http://web.science.uu.nl/drstp/`.

We would like to thank all of those who contributed to the Research School during this past year.

prof. dr. R. Loll
Scientific Director

prof. dr. E. Verlinde
Chair Governing Board

August 2012

Contents

1 General information **7**

2 The DRSTP in 2011 **9**

3 Scientific highlights **13**

4 PhD program **21**
4.1 Educational program 21
4.1.1 Postgraduate courses (AIO/OIO schools) 21
4.1.2 PhD Day 22
4.1.3 Symposium Trends in Theory 2011 22
4.2 PhD degrees and subsequent employment 22
4.3 PhD degrees granted in the DRSTP in 2011 23
4.4 Other PhDs advised by DRSTP staff 33
4.5 PhD students (per 31-12-2011) 35
4.6 Scientific and educational activities of PhD students (theme 1) 46
4.7 Scientific and educational activities of PhD students (theme 2) 60

5 Scientific staff (per 31-12-2011) **71**
5.1 Permanent staff 71
5.2 Temporary staff 74
5.3 Associate members 75

6 Academic publications **77**
6.1 Theme 1 77
6.2 Theme 2 85

7 Scientific activities **97**
7.1 Theme 1 97
7.2 Theme 2 114

8 Science-related activities **129**
8.1 Physics-related publications 129
8.2 Public lectures 130
8.3 Other contributions 133

9 Research funding **137**
9.1 Personal grants 137
9.2 FOM funding 138
9.3 FOM-Nikhef 141
9.4 EU-networks 142
9.5 Other 142

10 Organization (per 31-12-2011) **143**

11 Partners and associate members **145**

Appendix A
Mission statement **150**

Appendix B
Selection and supervision procedure of PhD students **154**

Appendix C
Postgraduate courses (AIO/OIO schools) **156**

Appendix D
Symposium Trends in Theory 2011 **161**

Appendix E
PhD Day **168**

Appendix F
National seminars **173**

Appendix G
Statistics **175**

1 General information

The Netherlands has a long tradition in theoretical physics which involves research performed at university institutes, industrial laboratories, and government institutions. The strength of this research area is, for a large part, based on the unity of methods employed in a wide range of applications. This manifests itself both in scientific research and in academic education.

To structure and coordinate the graduate education in theoretical physics, the Dutch Research School of Theoretical Physics (DRSTP) was formed. The school is a cooperation between the theoretical physics groups of six Dutch universities: University of Amsterdam (UvA), Vrije Universiteit Amsterdam (VUA), University of Groningen (RUG), Leiden University (UL), Radboud University Nijmegen (RU), Utrecht University (UU) (commissioner) and of the National Institute for Subatomic Physics (Nikhef). In addition, there are several associate members. The DRSTP was accredited in 1994 by the Royal Netherlands Academy of Arts and Sciences (KNAW) and reaccredited in 1999, 2004 and 2010.

The main objectives of the DRSTP are to implement a joint program of graduate education in theoretical physics and to maintain and strengthen research in theoretical physics from a broad unifying perspective that exploits the interrelationships between different fields of theory. The DRSTP is based on the conviction that a joint venture of all the moderately sized local theory groups, each with its own profile, offers added value for the achievement of these objectives.

Theoretical physics is based on universal principles. New concepts often have a much wider validity than in the field in which they are discovered, and methods developed in one field are sometimes very useful in another. Hence, theoretical physics is characterized by unity in diversity. The research program of the DRSTP is organized according to two themes:

- Theme 1: Particle physics, cosmology, quantum gravity and string theory.
- Theme 2: Quantum matter, quantum information, soft condensed matter and biophysics.

The specific content of the research program depends on the responsible project leaders, on their creativity as well as their success in acquiring research funding from their home university, from the Dutch research councils of NWO, or from international sources such as European Union programs.

The research output of DRSTP members presented in this Annual Report is presented according to the two mentioned research themes.

2 The DRSTP in 2011

On 31 December 2011, 103 PhD students were affiliated to the DRSTP, 55 tenured and 55 non-tenured staff (postdocs).
The research output led to 16 PhD dissertations and 299 academic publications.

Symposium Trends in Theory 2011
Every other year the DRSTP organizes the symposium *Trends in Theory*. On 19 and 20 May 2011 the symposium was held for the ninth time. This symposium is part of the educational program for PhD students and students are encouraged to present a poster at this event. The symposium also provides an opportunity for members of the DRSTP to meet and share their ideas on recent developments in the area of theoretical physics.
Further information is available in Appendix D.

Changes in the DRSTP organization
* Scientific Advisory Committee members, Prof. J. Fröhlich (ETH Zürich) and Prof. S. Sachdev (Harvard), ended their term and were succeeded as of 27 May 2011 by three new members: Prof. M. Henneaux (Brussels), Prof. R. Kallosh (Stanford) and Prof. X.-G. Wen (MIT).

* Prof. E.P. Verlinde (UvA) started his term as chairman of the DRSTP Governing Board per 1 May 2011.

* W. den Dunnen MSc (VUA) and L. Rademaker MSc (UL) became members of the DRSTP PhD Student Council in 2011.

See Chapter 10 for an overview of DRSTP committee members.

Staff mutations in 2011
* Prof. J. Ambjørn ended his affiliation with the DRSTP per 1 January 2011.

* Dr. S. Ando (UvA) was appointed Assistant Professor per 1 September 2011.

* Dr. G.F. Bertone (UvA) was appointed Associate Professor per 1 October 2011.

* Prof. D. Boer (RUG) was appointed Associate Professor at the Kernfysisch Versneller Instituut (KVI) per 1 February 2011.

* Dr. A. Boyarsky (UL) was appointed Assistant Professor per 1 September 2011.

* Prof. M. de Roo (RUG) retired per 1 November 2011.

* Dr. D. Garlaschelli (UL) was appointed Assistant Professor per 1 September 2011.

* Dr. A. Parnachev (UvA) was appointed Assistant Professor per 2 March 2011.

* Prof. K. Skenderis (UvA) accepted the tenured position of Full Professor of Theoretical Physics at the Faculty of Science per 1 March 2011.

* Dr. A.M. Turner (UvA) was appointed Assistant Professor per 7 September 2011.

* Dr. J.P. van der Schaar (UvA) was appointed Associate Professor at the Korteweg-de Vries Institute for Mathematics and is also a member of the String Theory Group at the University of Amsterdam.

* Prof. A.C.D. van Enter (RUG) was appointed Adjunct Professor at the Stichting Leonardo da Vinci per 1 March 2011.

* Prof. J.-W. van Holten (Nikhef/UL) delivered his inaugural lecture in Leiden on 18 April 2011 entitled: *Theory of supergravity and cosmology [Theorie van superzwaartekracht en kosmologie].*

Awards and distinctions

* Dr. A.R. Akhmerov (UL) won the jury prize for the best thesis in 2011, entitled: *Dirac and Majorana edge states in graphene and topological superconductors* and was also awarded the honorary title 'Discoverer of the Year 2011'.

* V. Atal MSc and A. Ivashko MSc (UL) won the Leiden/Huygens Fellowship Prize 2011.

* M. Baggio MSc (UvA) received the Physics and Astronomy 'Best Teaching Assistant' award of year two, for the academic year 2010-2011.

* Prof. F.A. Bais (UvA) was awarded the Royal distinction 'The Order of Orange-Nassau' on 28 April 2011.

* Dr. W.J.P. Beenakker (RU) received the Physics and Astronomy Educational Award 2011.

* N.J.H. Boon MSc (UU) and co-author/promotor dr. R.H.H.G. van Roij (UU) received first prize out of 800 posters at the 8th European Liquid Matter Conference, 6-10 September 2011, Wien, Austria. The poster was entitled: *"Blue energy" from ion adsorption and electrode charging in sea- and river water.*
N. Boon also won the Molecular Physics Longuet-Higgins Young Author's Prize for 2011.

* A.T. Franzen MSc (UU) won the Shell poster prize of 500,– Euros at the DRSTP Symposium Trends in Theory, 19-20 May 2011, Dalfsen, the Netherlands. The poster was entitled: *Scalar waves in Kerr background.*

* Prof. M.I. Katsnelson (RU) was awarded the Royal distinction 'The Order of the Dutch Lion' on 29 April 2011. Professor Katsnelson also achieved the title of 'Honorable Doctor' of Uppsala University in Sweden.

* Y. Korovin MSc (UvA) was voted 'Tutorial Teacher of the Year'.

* Prof. P.J. Mulders (VUA) was elected APS Fellow by the Council of the American

Physical Society, *for his influential contributions to the field of spin physics and in particular to the development of the theoretical formalism of transverse momentum dependent parton distribution functions.*

* Prof. E. Pallante (RUG) was a finalist for the Wim Nieuwpoort Award 2011.

* Drs. S.F. Reker (RUG) received the Physics and Astronomy 'Teaching Assistant of the Year' award for the academic year 2010-2011.

* Prof. G. 't Hooft (UU) was appointed 'Distinguished Professor' by the Executive Board of Utrecht University on 1 July 2011.
Professor 't Hooft was awarded the Ettore Majorana Prize, Science for Peace 2009, EMFCC, Pontifica Academia, World Federation of Scientists (other laureats: W. Arber, Y.T. Lee, S. Ting). Full citation: see website `http://www.staff.science.uu.nl/~hooft101/`, 29 January 2011.

* Dr. R.H.H.G. van Roij (UU) was awarded 'Teacher of the Year 2010-2011'.

* Prof. E.P. Verlinde (UvA) was awarded the NWO Spinoza Prize 2011 on 9 September 2011.

Guest chairs
Each year eminent theoretical physicists hold guest chairs at our affiliated institutes.

* Sir R. Penrose (Oxford) occupied the Lorentz Chair at Leiden University from 21 April to 18 June 2011. Professor Penrose taught five lectures entitled: *New developments in physics and cosmology* and presented a Colloquium Ehrenfestii entitled: *Is there evidence for quantum coherence in neuronal microtubules?.*

* Prof. B. Evans (Bristol) occupied the Kramers Chair at Utrecht University from 19 September to 19 December 2011. During his stay Emeritus Professor Evans taught a course on the subject of: *Density functional theory: classical and quantum.*

Visiting professorships held by DRSTP staff
* Prof. F.A. Bais (UvA) was an external professor at the Santa Fe Institute, USA, from 8 to 23 September 2011.

* Prof. R. Loll (UU) visited the Perimeter Institute for Theoretical Physics (Waterloo, Canada) as a Distinguished Research Chair from 15 April to 14 May 2012.
* Dr. Th.M. Nieuwenhuizen (UvA) was a visiting professor at the Center for Cosmology and Particle Physics at New York University, USA in spring 2011.

Visiting scientists (long term)
* Prof. R. Godbole (Indian Institute of Science) was a guest at Utrecht University from 1 February to 1 July 2011 and taught a course entitled: *Supersymmetry and colliders.*

* Dr. R. Linares (Universidad autonoma metropolitana, Mexico) was a guest at the University of Groningen in the High-Energy Physics group during the month of April

2011 .

* A. Naseh MSc (Sharif University of Technology, Iran) was a guest at the University of Amsterdam from 1 September 2011 to 1 June 2012.

* X. Otero Camano MSc (University of Santiago de Compostela, Spain) was a guest at the University of Amsterdam from 15 September to 31 December 2011.

* Prof. C. Quigg (Fermi National Accelerator Laboratory, USA) was a guest at the Nikhef Theory Group during the month of September 2011.

* Dr. M. Shigemori (Nagoya University, Japan) was a guest at the University of Amsterdam from 16 April to 15 May 2011.

3 | Scientific highlights

This chapter describes two highlights of research in theoretical physics, presented from the personal point of view of members of the Research School who have been actively involved in them. One describes recent progress in embedding inflation in string theory and the crucial role played by broken supersymmetry and sGoldstini. This work belongs to theme 1 of the school and the contribution was written by Diederik Roest. A second highlight belongs to theme 2 and deals with a new approach to detecting and quantifying non-Gaussianities present in random fields, based on geometry and topology. This contribution was written by Vincenzo Vitelli.

Inflation and broken supersymmetry

(Diederik Roest, University of Groningen)

Our understanding of the Universe has improved dramatically over the last decade. The very largest part of the history of 13.7 billion years has been unraveled, leaving room only for question marks close to the Big Bang. Moreover, independent astronomical observations have provided conclusive evidence that the present Universe consists not only of visible matter, but also large components of dark matter and dark energy, leading to an accelerated expansion of the Universe. The matter components are arranged in galaxies, (super-)clusters thereof and at very large scales in the cosmic web. An intriguing connection seems to exist between the present and the very early Universe: to understand the matter distribution at present one is led back to the first second after the Big Bang.

During this period, the Universe experienced a phase of very rapid, exponential expansion, known as *inflation*. Quantum fluctuations have been amplified to macroscopic structures during the inflationary phase, which have subsequently seeded structure formation. This remarkable hypothesis has been tested by observing both the temperature anisotropies in the cosmic microwave background (CMB, see Figure 3.1) as well as the details of the present large-scale structure (LSS).

Inflation has taken place at very high energies, where quantum gravity naturally enters the scene. For this reason, inflation offers a unique window on quantum gravity effects, such as predicted by string theory. Indeed, one of the focal points of the FOM programme *"A string theoretic approach to cosmology and quantum matter"* are the implications of string theory for inflation and future observations of e.g. the CMB or the LSS.

One complication that arises in the endeavour of embedding inflation in string theory is related to *supersymmetry*. This symmetry between fermions, making up matter, and bosons, giving rise to forces, is a natural element of string theory. From a theoretical point of view, one of its attractive features is that it gives a certain stability to a theory. Specific calculations, such as the microscopic derivation of the entropy of black holes, are simplified tremendously by supersymmetry. Unfortunately this powerful tool cannot be employed during inflation: even if supersymmetry exists, it would be spontaneously broken in this phase. However, it turns out to still be possible to extract information from this broken symmetry.

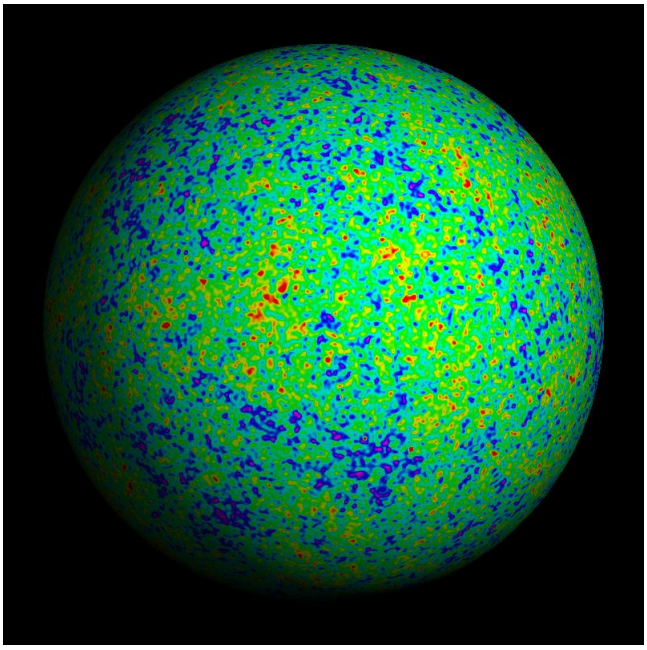

Figure 3.1: The temperature anisotropies in the cosmic microwave backgrounds (CMB), as measured by WMAP. Red and blue spots are resp. 10^{-4} K warmer and colder than the average temperature of 2.725 K. The Planck satellite is currently measuring these anisotropies in much greater detail. From these results, which are due early 2013, we will hopefully learn about more specific characteristics of inflation. In particular, a detection of a non-vanishing three-point correlation function (in other words, non-Gaussianity) in the fluctuations would provide strong constraints on inflationary models.

A useful analogy is provided by elementary particle physics, in which the fundamental forces are described in terms of gauge symmetries. The symmetry of the weak interaction is also spontaneously broken: via this mechanism the W- and Z-bosons acquire their mass in the Standard Model. An accompanying prediction is that there must be a scalar Higgs particle, which is the gauge partner of other scalar fields that participate in the Higgs mechanism. This Higgs particle is one of the holy grails of the LHC experiment at CERN.

For supersymmetry one can identify a similar particle, known as the *sGoldstino*. In this case spontaneously broken supersymmetry gives rise to massive gravitini, which are spin-3/2 particles. The sGoldstini are the supersymmetric partners of the spin-1/2 fields that participate in this super-Higgs mechanism. Therefore this phenomenon is completely general when supersymmetry is broken spontaneously. In a number of recent publications we have investigated to what extent the sGoldstino can be used to yield further stability to the theory, also in the case of broken supersymmetry. It turns out that the sGoldstino indeed is an excellent litmus test for stability, in that it signals possible instabilities very efficiently. We are presently considering the implications of sGoldstino stability for inflation (Figure 3.2).

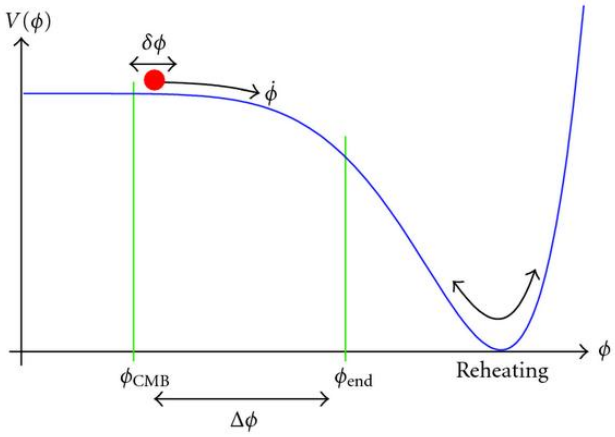

Figure 3.2: Inflation is often modelled in terms of a scalar potential for a scalar field ϕ subject to quantum fluctuations $\delta\phi$. The latter provide the seeds for the anisotropies, while the former drives the Universe's exponential expansion during inflation. A necessary condition is that the potential is sufficiently flat: inflation only takes place in the almost horizontal part, followed by reheating. The sGoldstino method can be used to verify whether complicated, higher-dimensional scalar potentials satisfy this condition.

Stochastic geometry and topology of non-Gaussian fields

(T.H. Beuman, Leiden University; A.M. Turner, University of Amsterdam; Vincenzo Vitelli, Leiden University)

Gaussian random fields pervade all areas of science and have distinctive and well understood stochastic properties [1, 2]. A disparate class of phenomena, ranging from the cosmic background radiation [3] and surface roughness [4] to medical images of brain activity [5] and optical speckle patterns [6], can be approximated as Gaussian fields. More generally, upon averaging over a sufficiently large scale, most signals in nature acquire approximately Gaussian statistics on account of the central limit theorem. However, it is often tiny departures from Gaussianity that carry the crucial signature of the nonlinear microscopic mechanisms at the heart of these phenomena.

As an illustration, consider a low resolution measurement of the spatial magnetization of a material well above the critical temperature. The magnetization fluctuates like a Gaussian random variable – each region contains many domains oriented up or down in arbitrary proportion. However, a small non-Gaussian contribution remains, because there is a maximum possible magnetization per unit area that can be traced all the way down to the quantization of the spin of the electrons. In order to unveil such elusive effects, one needs an indicator that is sensitive to both *small signals* and *short distances*. For example, non-Gaussian effects in the cosmic background radiation are tiny, but once detected, they offer a unique window on the primordial field(s) that caused the universe to expand [3].

The most common tool used to probe the statistics of a random field is to measure its correlation functions. For example, the statistical properties of a random scalar field, $h(x, y)$, with Gaussian statistics, are entirely determined by its two-point correlation function $\langle h(x, y)h(x', y')\rangle$, where the brackets denote an average over a Gaussian probability distribution. For Gaussian signals, the higher-order correlation functions can be written as the sum of products of two-point correlation functions. The non-factorizability of these higher-order correlation functions is one of the standard indicators of non-Gaussian statistics.

Here we propose an alternative approach: view the scalar field as the height of a surface and study its random topography as a mean to infer the statistical properties of the signal (see inset of Figure 3.3). The densities of peaks (troughs), or topological defects in the curvature lines (known as umbilics), are sensitive indicators of how jagged the height field is at *short distances*. As we shall see, they provide an independent pipeline to detect non-Gaussianities, distinct from multiple-point correlation functions.

This geometric approach has been applied successfully to track the power spectrum of a Gaussian field and it has been the subject of extensive theoretical and experimental studies [2, 7-10]. For example, the relation between the density of umbilics in a Gaussian field and the fluctuations of its local curvature has been demonstrated in elegant optical experiments [6], whereby the curvature lines represent the direction of maximum polarization of a Gaussian beam of light, see Figure 3.3. By counting

the umbilical points (where the polarization vanishes) one can probe the power spectrum of the Gaussian signal. In our work, we introduce the key physical concepts and mathematical techniques necessary to study the stochastic geometry of signals that can be described as a Gaussian random field plus a perturbation that we wish to track.

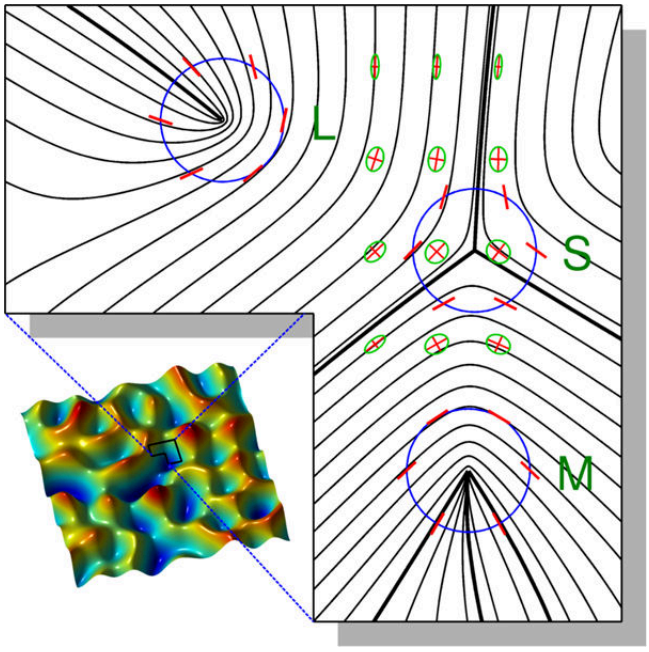

Figure 3.3: The principal curvature of a surface. The major and minor axes of the small ellipses represent the direction and relative size of maximum and minimum curvature at the centre, equivalent to the direction of maximum and minimum polarization for an optical field. The curvature lines are always tangent to the direction of maximal curvature. At some points the curvature is the same along all directions (the equivalent polarization is circular); these are called umbilical points, of which there are three types, all shown in this image: on the top left is a lemon, on the top right a star and on the bottom right a monstar. The circles demonstrate their topological indices: $-1/2$ for a star, $+1/2$ for the other two. The lemon has one (locally) straight curvature line terminating at it (indicated with a thick line), the other two have three. The inset shows a computer-generated Gaussian surface with periodic boundary conditions, a small patch of which served as the source of this picture.

The statistics of extrema is a versatile tool to determine whether a field has Gaussian or near-Gaussian statistics, provided that its signal can be measured directly. Irrespective of its power spectrum, a Gaussian field has equal densities of maxima and minima. Hence, a non-vanishing imbalance Δn between these two types of extrema serves as a probe to detect and quantify the non-Gaussian component of a signal. For example, consider the primordial curvature perturbation field, Φ, a nearly Gaussian field of central interest to modern cosmological studies [3]. Within a *local* approximation, the primordial field is obtained from a Gaussian field Φ_G via the nonlinear relation $\Phi = \Phi_G + f_{nl}\Phi_G^2 + g_{nl}\Phi_G^3$. Determining the parameters f_{nl} and g_{nl} is one of the central tasks in the study of cosmological non-Gaussianities. We demonstrate that the quadratic coefficient f_{nl} can be determined from the imbalance Δn between maxima and minima of Φ.

The near-Gaussian fields under investigation are not always directly accessible experimentally. For example, the mass distribution along the line of sight, responsible for weak gravitational lensing, is believed to be mostly composed of dark matter and hence it cannot be detected directly [11]. However, the shear field that describes deformations in the images of distant galaxies can be measured and, from it, the statistics of the mass fluctuations can be inferred [3]. In this case, one can reconstruct the statistics of the mass fluctuations from the distribution of umbilical points in the shear field, by treating the projected gravitational potential as the height field of an imaginary surface [12]. The connection between height fluctuations and umbilical points in the principal curvature (line) field is illustrated in Figure 3.3. The ratio between different types of umbilical points (which is a universal number for an isotropic Gaussian field) serves as an indicator of non-Gaussianities in lieu of the extrema that cannot be detected. A similar reasoning can be applied to study polarization singularities in the cosmic microwave background [13] and topological defects in a nematic or superfluid near criticality [14, 15].

To gain some insights into the physical mechanisms that generate non-Gaussianities, consider first how an isotropic Gaussian field $H_G(\vec{r})$ arises from the random superposition of waves (or equivalently, Fourier modes)

$$H_G(\vec{r}) = \sum_{\vec{k}} A(k)\cos(\vec{k}\cdot\vec{r} + \phi_{\vec{k}}), \tag{3.1}$$

with an amplitude spectrum $A(k)$[1] that depends only on the magnitude of the wave vectors, $k = |\vec{k}|$. The phases $\phi_{\vec{k}}$ are uncorrelated random variables uniformly distributed in the range $[0, 2\pi]$. The statistical properties of the Gaussian field $H_G(\vec{r})$, which could describe a speckle pattern or the order parameter near a critical point, are entirely encoded by the function $A(k)$, or equivalently, its moments $K_{2n} = \sum_{\vec{k}} k^{2n}\frac{1}{2}A(k)^2$.

In general, non-Gaussianities are generated dynamically from the nonlinear equations of motion that a field $h(r,t)$ obeys, even if the initial condition $h(\vec{r},0) = H_G(\vec{r})$ is

[1]The power spectrum $A(k)^2$ is the Fourier transform of the two-point correlation function.

Gaussian. As an example, consider a nonlinear diffusion equation of the form

$$\frac{\partial h(\vec{r},t)}{\partial t} = \nabla^2 h(\vec{r},t) + F_{NL}(\nabla h, h), \tag{3.2}$$

where F_{NL} is a nonlinear function that, as time progresses, couples the Fourier modes in Eq. (3.1) and generates a non-Gaussian component in $h(\vec{r},t)$. Examples include phase ordering kinetics [16], several models of surface growth [4] and structure formation in both condensed matter [17] and cosmology [3].

In [18], we first show how to treat non-Gaussianities within the local approximation and calculate how the statistics of extrema [19] and umbilics [20] change when a nonlinear transformation $F_{NL}(H_G)$ is applied locally to a Gaussian field H_G.

Then we turn to the class of nonlinear diffusion equations [4] and go beyond the local approximation by considering the effects of spatial gradients that couple values of the field at different locations [21]. As an illustration, we solve explicitly for the nonlocal non-Gaussianities generated dynamically, as governed by the deterministic KPZ equation of surface growth [4].

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[**18**] T.H. Beuman, A.M. Turner and V. Vitelli, *Stochastic geometry and topology of non-Gaussian fields*, pnas. 1212028109 (Proceeding of the National Academy of Science, in press).

[**19**] T.H. Beuman, A.M. Turner and V. Vitelli, *Critical points of a non-Gaussian random field*, arXiv: 1210.6871.

[**20**] A.M. Turner, T.H. Beuman and V. Vitelli, *Umbilical points of a non-Gaussian random field*, arXiv: 1211.0643.

[**21**] T.H. Beuman, A.M. Turner and V. Vitelli, *Extrema statistics in the dynamics of a non-Gaussian random field*, arXiv: 1211.0993.

4 PhD program

This chapter provides an overview of the educational program and of the PhD degrees granted in 2011. Research projects of current PhD students and data on their scientific and educational activities in 2011 are given.

The DRSTP offers a joint program of graduate education leading to a PhD. The educational program is based in part on the regular advanced courses, seminars and topical courses offered at the participating universities. The DRSTP organizes at least two postgraduate schools every year. Furthermore, students can gain international experience by attending (international) workshops or summer schools and, in certain cases, by making extended research visits abroad. The Governing Board is advised on educational matters by the Educational Board. Regular advanced courses at the universities are published in a nationwide survey at the beginning of each academic year.

The Governing Board of the DRSTP decides on admission of individual PhD students and monitors their progress.
An extended description of the selection and supervision procedure is presented in Appendix B.

On 31 December 2011, one hundred and three (103) PhD students were affiliated with the DRSTP. Sixteen (16) PhD students obtained their PhD in 2011.

4.1 Educational program

4.1.1 Postgraduate courses (AIO/OIO schools)

The following courses were given in 2011:

Theoretical High Energy Physics (THEP)
The DRSTP Postgraduate Course (AIO/OIO school) Theoretical High Energy Physics was held from 6 to 18 February 2011 in São Paulo, Brazil in collaboration with the Jorge André Swieca Summer School and the Instituto de Física Teórica (IFT/UNESP). The program was organized by N. Berkovits (IFT/UNESP, São Paulo), J. de Boer (UvA) and E. Laenen (Nikhef/UvA/UU). Twenty-six (26) students participated.
Further information is available in Appendix C.

Statistical Physics and Theory of Condensed Matter (SPTCM)
The DRSTP Postgraduate Course (AIO/OIO school) Statistical Physics and Theory of Condensed Matter was held from 7 to 18 March 2011 at Hotel Bergse Bossen in Driebergen. The program was organized by R. Duine (UU) and K. Storm (TU/e). Seventeen (17) students participated.
Further information is available in Appendix C.

4.1.2 PhD Day

The PhD Day is an annual fall event organized by members of the PhD Student Council and is part of the educational program for PhD students. The PhD Day is aimed at exchanging ideas, inviting former PhD students to discuss career options, presenting scientific talks and discussing recent trends in theoretical physics.
The PhD Day is primarily intended for PhD and Master's students.
On 14 October 2011 the DRSTP PhD Student Council organized their fourth PhD Day at the Centre for Visual Arts in Utrecht. Sixty-six (66) people attended of which forty-nine were PhD students, fourteen were Master's students and three were postdocs.
Further information is available in Appendix E.

4.1.3 Symposium Trends in Theory 2011

Every other year the DRSTP organizes the symposium *Trends in Theory*. On 19 and 20 May 2011 the symposium was held for the ninth time. This symposium is part of the educational program for PhD students and students are encouraged to present a poster at this event. The symposium also provides an opportunity for members of the DRSTP to meet and share their ideas on recent developments in the area of theoretical physics.
Further information is available in Appendix D.

4.2 PhD degrees and subsequent employment

In 2011, sixteen (16) PhD students received their degree. Nine students accepted postdoctoral positions in: France (1), Germany (1), the Netherlands (4) and in the USA (2) and Japan (1); four (4) accepted a position at a commercial company and two (2) are currently unemployed. One student passed away on 7 July 2011.
Further information on career moves of former PhD students during the last six years can be found in Appendix G.

4.3 PhD degrees granted in the DRSTP in 2011

In this section a short summary of the PhD theses published in 2011 is given. The summaries were written by the students.

Akhmerov, A.R. (UL)
thesis title: *Dirac and Majorana edge states in graphene and topological superconductors*
advisor: prof. dr. C.W.J. Beenakker
date: 31 May 2011 (cum laude)
present position: postdoctoral fellow, Instituut-Lorentz for Theoretical Physics, Leiden University, the Netherlands

This dissertation is about transport and electronic properties of two types of electronic states occurring at the edges, which are protected by symmetry between positive and negative energies. One type of these states is shown to occur universally in graphene. It is also described how another type of edge states, Majorana fermions, can be used for topological quantum computation.

Beekman, A.J. (UL)
thesis title: *Vortex duality in higher dimensions*
advisor: prof. dr. J. Zaanen
date: 1 December 2011
present position: postdoctoral fellow, RIKEN Advanced Science Institute, Wako, Saitama, Japan

A dynamic vortex line traces out a world sheet in spacetime. This thesis shows that the information of all its dynamic behaviour is completely contained in the world sheet. Furthermore a mathematical framework for order-disorder phase transitions in terms of the proliferation of such vortex world sheets is presented, leading to the prediction of quantized vortex lines of electric current in phase-disordered superconductors.

Broedersz, C.P. (VUA)
thesis title: *Mechanics and dynamics of biopolymer networks*
advisor: prof. dr. F.C. MacKintosh
date: 16 May 2011 (cum laude)
present position: Lewis-Sigler Theory Fellow, Princeton University, New Jersey, USA

In this thesis we studied the collective mechanical and dynamical behavior of biopolymer networks. This work is directly inspired by the cytoskeleton of living eukariotic cells. One of the major structural components of the cytoskeleton is actin that forms several micrometers long semiflexible protein filaments, which are cross-linked into a network. Even though the important molecular components of the cytoskeleton are

known, relatively little is understood of how this large ensemble of proteins collectively contributes to the mechanical response of the cell. We approached this problem from two different directions. Certain chapters are aimed at investigating generic properties of disordered fibrous networks using toy models, while other chapters are dedicated to modeling more realistic networks with a more explicit physiological relevance.
Fibrous networks, such as those that form the cellular cytoskeleton or the extracellular matrix, exhibit rigidity at remarkably low connectivity—well bellow the Maxwell central force isostatic point. This rigidity is due to additional constraints provided by the fibers' resistance to bending. We studied disordered fibrous networks with variable coordination number, both above and below the central-force isostatic point. This point controls a broad crossover from stretching- to bending-dominated elasticity. We showed that this crossover exhibits an anomalous power-law dependence of the shear modulus on both stretching and bending rigidities. At the central-force isostatic point—well above the rigidity threshold—we find divergent strain fluctuations together with an associated divergent correlation length, implying a breakdown of continuum elasticity. Thus, in this simple mechanical system we observe a remarkably rich demonstration of zero-temperature critical phenomena.

Deuzeman, A. (RUG)
thesis title: *Flavours of gauge theories*
advisor: prof. dr. E. Pallante
date: 14 January 2011
present position: postdoctoral fellow, University of Bern, Germany

The introduction of fermionic degrees of freedom in non-Abelian gauge theories has the potential of substantially altering the gauge dynamics. This dissertation present the results of studies of $SU(3)$ gauge theories with increasing fundamental quark content by means of lattice simulations. After an introduction to the effects of including dynamical quarks in lattice simulations, results on pioneering attempts of the inclusion of dynamical charm quarks in large scale lattice simulations are reported. Subsequent chapters move beyond phenomenology of the Standard Model, to study the effects of large numbers of light quark flavours. Results from perturbation theory suggest the possible appearance of a new phase in theories possessing more than a certain critical number of quark flavours. The appearance of such a phase potentially has a large impact on physics beyond the Standard Model, but the particular critical value of quark flavours and indeed the existence of such a phase itself have been disputed. Using methods inspired by the physics of phase transitions, the absence of such a novel phase in the case of eight quark flavours is shown. At twelve flavours, however, strong indications are found that the theory is no longer in the regulare phase of QCD. Preliminary results on the properties of such a theory are presented.

Diederix, J.M. (UU)
thesis title: *Non-perturbative phenomena in resonantly interacting quantum gases*
advisor: prof. dr. ir. H.T.C. Stoof
date: 28 September 2011
present position: currently unemployed

This thesis is about gases of ultracold atoms, either fermions or bosons, trapped in a high vacuum, that display a collective quantum behavior, called super fluidity. Methods by which this behavior is realized in experiments have been developed in the last two decades, while the search for new discoveries and understanding of these systems is still ongoing research by many groups all over the world.

In the first part of this thesis, we present an inhomogeneous theory for the low-temperature properties of a resonantly interacting Fermi mixture in a trap that goes beyond the local-density approximation. We compare a Bogoliubov-de Gennes and a Landau-Ginzburg approach that both include mean-field-like self-energy effects to account for the strong interactions at unitarity. We conclude that the Landau-Ginzburg approach is more appropriate when dealing with a first-order phase transition. We show diagrammatically how these self-energy effects arise from fluctuations in the superfluid order parameter. Gradient terms of the order parameter are included to account for inhomogeneities. This approach incorporates the state-of-the-art knowledge of the homogeneous mixture with a population imbalance exactly and gives good agreement with the experimental density profiles of Shin et al. [Nature 451, 689 (2008)]. We calculate the universal surface tension due to the observed interface between the equal-density superfluid and the partially polarized normal state of the mixture. We find that the exotic and gapless superfluid Sarma phase can be stabilized at this interface, even when this phase is unstable in the bulk of the gas. We also discuss the possibility of a metastable state to explain the deformation of the superfluid core that is seen in the experiment of Partridge et al. [Science 311, 503 (2006)]. In the second part, we show that a two-channel mean-field theory for a Bose gas near a Feshbach resonance allows for an analytic computation of the chemical potential, and therefore the universal constant β, at unitarity. To improve on this mean-field theory, which physically neglects condensate depletion, we study a variational Jastrow ansatz for the ground-state wavefunction and use the hypernetted-chain (HNC/0) approximation to minimize the energy for all positive values of the scattering length. We also show that other important physical quantities such as Tan's contact and the condensate fraction can be directly obtained from this approach.

Hardeman, S.R. (UL) 27 January 1982 - 7 July 2011
thesis title: *Non-decoupling of heavy scalars in cosmology*
advisor: prof. dr. Achúcarro
co-advisor: dr. K.E. Schalm
date: 1 March 2011; the PhD degree was awarded posthumously

Inflationary physics takes place at the highest energy scales, where string theory becomes relevant. It is for this reason that many attempts have been made to find string theory models for inflation. Almost all four-dimensional reductions of string theory bring many degrees of freedom, moduli, that need some mechanism to be stabilised. No matter the mechanism, these modes will be lighter than the Planck mass and thus be relatively light as seen from the point of view of inflation. This warrants a study of an effective field theory description of string inflation, which in turn requires a discussion of the role, or rather the removal, of these light fields. That is the topic of this thesis.

Huisman, E.M. (UL)
thesis title: *Simulations of biopolymer networks under shear*
advisor: prof. dr. G.T. Barkema
co-advisor: dr. C. Storm
date: 14 April 2011
present position: consultant, McKinsey & Company, Amsterdam, the Netherlands

In this thesis we present a new method to simulate realistic three-dimensional networks of biopolymers under shear. These biopolymer networks are important for the structural functions of cells and tissues. We use the method to analyze these networks under shear, and consider the elastic modulus, the non-affinity during deformation, the normal modes and the density of states. We expand our analysis to composite networks consisting of stiff and floppy filaments. In the final chapter of the thesis we incorporate the thermal and viscous interactions of the surrounding medium in the calculations, and present the results of the simulations of the shear frequency dependence of the network response. We find that non-affine reorientations are important for understanding the network response. These non-affine reorientations make the networks relatively soft under shear and delay the onset of stiffnening. In composite networks non-affine reorientations allow for an intricate interplay between the stiff and floppy filaments. The frequency-dependent response shows a transition from a soft, non-affine regime at low frequencies to a stiff, close-to-affine response at high frequencies.

Katmadas, S. (UU)
thesis title: *External blackholes in $N = 2$ supergravity*
advisor: prof. dr. B. de Wit
date: 4 July 2011
present position: postdoctoral fellow, Centre for Theoretical Physics (CPHT), Ecole Polytechnique, Paris, France

An explanation for the entropy of black holes has been an outstanding problem in recent decades. A special case where this is possible is that of extremal black holes in N=2 supergravity in four and five dimensions. The best developed case is for black holes preserving some supersymmetry (BPS), which are well understood in the context of the lowest order two derivative action. For ungauged theories, one can use the experience gained from this example to study the effect of higher order corrections on BPS solutions or to construct nonsupersymmetric black holes. We first present a detailed discussion of the four derivative terms allowed by $N = 2$ supersymmetry in four and five dimensions respectively. Each of these invariants is parametrised by an arbitrary function, which can be fixed when one considers the embedding in a microscopic theory, such as string theory. We present a detailed investigation of the possible N=2 backgrounds, described in a unified way for both black holes and rings. Restricting to the class of theories obtained by string theoretic models, we connect to known microscopic constructions of black holes. The end result is a successful match of the entropy to the string theory counting for black rings and for large black holes. Issues remain with small black holes in the five-dimensional case. Beyond supersymmetric solutions, we discuss some recent results on the construction of non-BPS solutions in N=2 theories, emphasising the description in terms of first order equations and the attractor mechanism. We introduce a special class of five-dimensional solutions which are supersymmetric on local patches of spacetime, but nevertheless completely break supersymmetry globally. The new solutions obtained turn out to allow for a number of features that are present in generic extremal solutions, but forbidden in the supersymmetric case. Based on this fact, we then go on to propose a framework for constructing more general extremal solutions, including rotating black holes.

Koksma, J.F. (UU)
thesis title: *Quantum field theory and decoherence in the early universe*
advisor: prof. dr. G. 't Hooft
co-advisor: dr. T. Prokopec
date: 22 June 2011
present position: strategy consultant, McKinsey & Company, Amsterdam, the Netherlands

Quantum field theory is indispensable for understanding many aspects of cosmology, both in the early Universe and today. For example, quantum processes could be paramount to understand the nature of the mysterious dark energy resulting in the Universes recently observed accelerated expansion. Inspired by these considerations,

this PhD thesis is concerned with two aspects of quantum field theory relevant to cosmology: quantum backreaction and decoherence. Quantum backreaction is a line of research where the impact of quantum fluctuations on the background spacetime geometry in perturbative quantum gravity is investigated. The cosmological constant problem and the process of quantum backreaction are intimately related: quantum backreaction might provide us with a dynamical mechanism to effectively make the cosmological constant almost vanish. We investigate the quantum backreaction of the trace anomaly and of fermions. We find that the trace anomaly does not dynamically influence the effective value of the cosmological constant. We furthermore evaluate the fermion propagator in FLRW spacetimes with constant deceleration. Although the dynamics resulting from the one-loop stress-energy tensor need yet to be investigated, we find that we certainly cannot exclude a significant effect due to the quantum backreaction on the Universes expansion. Decoherence is a quantum theory which addresses the quantum-to-classical transition of a particular system. The idea of the decoherence formalism is that a macroscopic system cannot be separated from its environment. The framework of decoherence is widely used, e.g. in quantum computing, black hole physics, inflationary perturbation theory, and in elementary particle physics, such as electroweak baryogenesis models. We formulate a novel "correlator approach" to decoherence: neglecting observationally inaccessible correlators gives rise to an increase in entropy of the system, as perceived by an observer. This is inspired by realising that higher order, non-Gaussian correlators are usually perturbatively suppressed. A quantum system with a large entropy corresponds to an effectively classical, stochastic system. To allow for a quantitative comparison between our correlator approach and the conventional approach to decoherence, we apply both formalisms to two simple quantum mechanical models. We find that the entropy in the conventional approach to decoherence quite generically reveals secular growth, indicating physically unacceptable behaviour. The conventional approach furthermore suffers from the fact that no well-established treatment to take perturbative corrections into account exists, nor has the framework of renormalisation ever been implemented. Our correlator approach to decoherence is taylored to applications in quantum field theory. We perform the first realistic study of decoherence in a renormalised quantum field theoretical setting. Using out-of-equilibrium field theory techniques, we extract two quantitative measures of decoherence in our model: the total amount of decoherence and the decoherence rate. The main finding in this part of the thesis is that, although a pure state remains pure under unitary evolution, an observer perceives this state over time as a mixed state with positive entropy as non-Gaussianities are dynamically generated. Alternatively, one could say that a realistic observer cannot probe all information about the system and thus discerns a loss of coherence of the pure state.

Maio, M. (Nikhef)
thesis title: *Permutation orbifolds in conformal field theories and string theory*
advisor: prof. dr. A.N.J.J. Schellekens
date: 5 October 2011
present position: postdoctoral fellow, Nikhef, Amsterdam, the Netherlands

In this thesis we consider the Conformal Field Theory (CFT) approach to String Theory. Simple-current invariants will be the main tool. These are partition functions that exist because the CFT has very special fields, called simple currents, in its spectrum. Sometimes these simple currents admit "fixed points". Then the CFT built out of extensions has non-trivial modular matrices that are not known. The problem of determining these matrices is called the "fixed point resolution problem".
More precisely, we study permutations of identical CFT's and their orbifolds, limiting ourselves to the order-two case. We address the problem of extensions of these permutations and resolve the fixed points of its simple current. Although this is a purely mathematical problem, it has interesting physical implications. We apply our results to building of four-dimensional spectra using heterotic strings. In our construction, building blocks called $N = 2$ minimal models are tensored to form the internal conformal field theory of a heterotic string.
In cases where two of these building blocks are identical, we may build a new CFT by applying an order 2 permutation. After resolving the simple current fixed points, we are able to extend the heterotic CFT landscape in a substantial way. We study the emergence of standard model spectra in this novel part of the landscape, focusing on the number of families and the presence or absence of fractional charges in the spectrum.

Reska, P.M. (UU)
thesis title: *Physical consequences of black holes in non-perturbative quantum gravity and inflationary cosmology*
advisor: prof. dr. R. Loll
date: 28 February 2011
present position: senior quantitative analyst, Atradius, Amsterdam, the Netherlands

In this thesis the consequences of the presence of a Schwarzschild black hole in de Sitter space are studied in the setting of non-perturbative quantum gravity and in inflationary cosmology. We first review the formalism of Causal Dynamical Triangulations (CDT) which implements a lattice regularization of the gravitational path integral and discuss the emergence of Euclidean de Sitter space in the four-dimensional pure gravity model. Coupling the model to matter in the form of a point-like mass, the question is posed whether the corresponding classical limit is also correct. On the classical level, this matter source generates a Schwarzschild-de Sitter background geometry for a universe with a positive cosmological constant. In order to test the classical limit of the matter-coupled model, we study the properties of an observable that is sensitive to the presence of the mass. More specifically, it is shown that

the volume profile of the Euclidean Schwarzschild-de Sitter solution in the proper-time gauge deviates in a characteristic manner from the profile of Euclidean de Sitter space. The appearance of coordinate caustics puts an upper bound on the total mass for which the results are expected to be valid. We also discuss some of the implementation details for numerically measuring the expectation value of the volume profiles in the framework of CDT with the matter source. In the second part of the thesis the implications of the presence of black holes in inflationary cosmology are analyzed. This work is motivated by anomalies in the cosmic microwave background (CMB) which have so far not been explained. To this end, we first estimate the formation probability of small primordial black holes from Gaussian density fluctuations during a pre-inflationary matter dominated era. Then, the Keldysh propagator of a scalar field on Schwarzschild-de Sitter space is constructed perturbatively to first non-trivial order in a dimensionless mass parameter. Using this result we determine the correction from a black hole to the scale invariant power spectrum of a scalar field on de Sitter space. In the zero curvature gauge this correction is closely related to the correction to the spectrum of scalar cosmological perturbations on quasi de Sitter space. Numerical results are presented for different black hole masses and positions. They suggest that the effect is strong enough to be tested and possibly even ruled out by observations. The last chapter deals with the generalization to primordial magnetic monopoles. These heavy relics generate a background geometry which is well-approximated by the Reissner-Nordstr om-de Sitter solution away from the center but regular in the center. We evaluate the corrections to the Keldysh propagator from the mass and the charge of the monopole perturbatively in momentum space. Although the effect of a single monopole is smaller than that of a primordial black hole their number in our past light cone is expected to be significantly larger, thus possibly leaving an observable imprint on the CMB.

She, J.-H. (UL)
thesis title: *Fermions, criticality and superconductivity*
advisor: prof. dr. J. Zaanen
date: 3 May 2011
present position: postdoctoral fellow, Los Alamos National Laboratory, New Mexico, USA

By tuning control parameters like pressure, magnetic field or doping, a fermionic system can be driven to a state with vanishing Fermi energy and power law behavior in many observables. Such fermionic quantum critical states have been identified in systems including heavy fermions, cuprates and pnictides. We study the superconducting transition in such systems. We propose that the superconducting instability, which is marginal in Fermi liquids, becomes relevant, leading naturally to a high transition temperature. This picture has been verified numerically in the 2-dimensional Hubbard model by using the Dynamical Cluster Approximation. We also propose tunneling experiments which can distinguish our mechanism from others.

van de Meent, M. (UU)
thesis title: *Piecewise flat gravity in* $3+1$ *dimensions*
advisor: prof. dr. G. 't Hooft
date: 19 December 2011
present position: currently unemployed

We study a model for gravity in 3+1 dimensions, inspired in general relativity in 2+1 dimensions. In contrast regular general relativity in 3+1 dimensions, the model postulates that space in absence of matter is flat. The requirement that the Einstein equation still holds for the complete spacetime, implies that matter may only appear as conical defects of co-dimension 2, which may be interpreted as straight cosmic strings moving at a constant velocity. The study of collisions of these defects reveals that the dynamics of the model is incomplete. Certain highly energetic collisions of almost parallel defects suggest that no dynamic completion may exist that is fully compatible with the principles on which the model was based. We also study the phase space of the model in the continuum limit. We find that even though does not contain gravitational waves at the fundamental level, they do appear as an emergent feature in the continuum limit.

van Dijk, T. (VUA)
thesis title: *Experimental and theoretical studies in optical coherence theory*
advisors: prof. dr. T.D. Visser; prof. dr. W.M.G. Ubachs
date: 4 April 2011
present position: Beckman Fellow, Department of Electrical and Computer Engineering, University of Illinois, Urbana, USA

The thesis consists of a set of studies in the field of optical coherence theory. Subjects range from the influence of the state of coherence on the focal intensity distribution to the affects of the state of coherence on the scattering of light on a homogenous sphere.
In Chapter 2 the intensity and the state of coherence are examined in the focal region of a converging, partially coherent wave field. In particular, Bessel-correlated fields are studied in detail. It is found that it is possible to change the intensity distribution and even to produce a local minimum of intensity at the geometrical focus by altering the coherence length. It is also shown that, even though the original field is partially coherent, in the focal region there are pairs of points at which the field is fully correlated, and pairs of points at which the field is completely incoherent. The relevance of this work to applications such as optical trapping and beam shaping is discussed. The evolution of phase singularities and coherence singularities in a Laguerre-Gauss beam that is rendered partially coherent by letting it pass through a spatial light modulator is studied in Chapter 3. The original beam has an on-axis minimum of intensity (a phase singularity) that transforms into a maximum of the far-field intensity. In contrast, although the original beam has no coherence singularities, such singularities are found to develop as the beam propagates. This disappearance of one kind of singu-

larity and the gradual appearance of another is illustrated with numerical examples. We analyze the coherence singularities that occur in the far field that is generated by a broad class of partially coherent sources. In Chapter 4 it is shown, that for rotationally symmetric, planar, quasi-homogeneous sources the coherence singularities form a two-dimensional surface in a reduced three-dimensional space. We illustrate our results by studying the topology of the coherence singularity of a partially coherent vortex beam. We find that the geometry of the phase singularity can be associated with conic sections such as ellipses, lines and hyperbolas. In Chapter 5, a novel setup that allows the observation of the geometric phase that accompanies polarization changes in monochromatic light beams for which the initial and final states are different (so-called non-cyclic changes), is presented. This Pancharatnam-Berry phase can depend in a linear or in a nonlinear fashion on the orientation of the optical elements, and sometimes the dependence is singular. Experimental results that confirm these three types of behavior are presented. The observed singular behavior may be applied in the design of optical switches. If the state of polarization of a monochromatic light beam is changed in a cyclical manner, the beam acquires (in addition to the usual dynamic phase) a geometric phase. This geometric or Pancharatnam-Berry phase, equals half the solid angle of the contour traced out on the Poincare sphere. We show, in Chapter 6, that such a geometric interpretation also exists for the Pancharatnam connection, the criterion according to which two beams with different polarization states are said to be in phase. This interpretation offers a new and intuitive method to calculate the geometric phase that accompanies non-cyclic polarization changes.
In the analysis of light scattering on a sphere it is implicitly assumed that the incident field is spatially fully coherent. However, under usual circumstances the field is partially coherent. The partial waves expansion method is generalized, in the seventh Chapter, to this situation and we examine the influence of the degree of coherence of the incident field on the radiant intensity of the scattered field in the far zone. We show that when the coherence length is comparable to or is smaller than the radius of the sphere, the angular distribution of the radiant intensity depends strongly on the degree of coherence. The results have implications for, for example, scattering in the atmosphere and colloidal suspensions.

van Zalk, M. (UU)
thesis title: *New deformations of $N = 2$ supergravity*
advisor: prof. dr. B. de Wit
date: 26 September 2011
present position: medical physicist, University Medical Centre, Utrecht, the Netherlands

Supergravity is a field theory that combines general relativity with local supersymmetry. It serves as a framework for studying a large variety of phenomena, such as black holes and cosmology. Supergravity also describes the low-energy degrees of freedom associated with string theory, which has been proposed as a consistent theory of quantum gravity. In this thesis we study new deformations of $N = 2$ supergrav-

ity in four space-time dimensions. One class of deformations we consider consists of gauge deformations. Applying the so-called embedding tensor formalism, we present general gauge deformations of N=2 supergravity, which, due to the presence of electric/magnetic duality, lead to the introduction of both electric and magnetic charges. As an application we briefly review partial supersymmetry breaking in maximally symmetric space-times in the presence of general gaugings. We confirm the result found in previous literature, that in a Minkowski background, partial supersymmetry breaking is only possible in the presence of magnetic charges. As a new application we study possible supersymmetric solutions in space-times that describe the near-horizon geometry of a static black hole. We find two classes of solutions. One is fully supersymmetric. It contains the near-horizon solution of ungauged supergravity that appears for BPS black holes. The other class exhibits four supersymmetries. It contains near-horizon solutions of BPS black holes in $N = 2$ gauged supergravity. Other deformations we consider in this thesis are supersymmetric higher-derivative couplings. These couplings play an important role as next-to-leading order corrections to low-energy effective actions of string theory. In this thesis we introduce a systematic procedure to construct a large variety of new higher-derivative deformations in $N = 2$ supergravity. We study the possible contribution of these new couplings to the entropy and the electric charges of BPS black holes. We derive a 'non-renormalization' theorem according to which these contributions vanish.

Zozulya, O.S. (UvA)
thesis title: *Entanglement and order in many-body systems*
advisor: prof. dr. K. Schoutens
date: 9 June 2011
present position: software developer and algorithm researcher in image processing / computer vision field, Crystalix-evolution GmbH, Berlin, Germany

Quantum entanglement is a phenomenon in quantum mechanics when two or more physical objects are connected in a such way that they cannot be described independently of each other, also if the objects are separated in space. Recently entanglement became an indispensable ingredient of the emergent field of quantum information and computation. Increasingly entanglement is being used to receive new incites into the fundamental properties of the matter. Oleksandr Zozulya explored entanglement in several contexts and concluded that it can serve as a useful tool to describe properties of quantum particles in various physical systems.

4.4 Other PhDs advised by DRSTP staff

Ermolaev, V.N. (RUG)
thesis title: *Gibbsian properties: examples of failures and an application*
advisors: prof. dr. C. Külske (Bochum); prof. dr. A.C.D. van Enter; prof. dr. E.A. Verbitskiy (Leiden-Groningen)
date: 9 September 2011

present position: research and development engineer, Nedap N.V., Groenlo, the Netherlands (company that focuses on developing and supplying solutions in the fields of security)

Fleurke, S.R. (RUG)
thesis title: *Stochastic models for particle deposition, car parking and frequency assignment*
advisors: prof. dr. C. Külske; prof. dr. H. Dehling; prof. dr. A.C.D. van Enter
date: 25 March 2011
present position: mathematician, Radio Communications Agency Netherlands (RA/AT), Groningen, the Netherlands

Piechocka, I.K. (AMOLF)
thesis title: *Biopolymers: from structural hierarchy to nonlinear rheology*
advisors: prof. dr. G.H. Koenderink; prof. dr. F.C. MacKintosh
date: 23 November 2011
present position: postdoctoral fellow, FOM Institute AMOLF, Amsterdam, the Netherlands

Soares e Silva, M. (AMOLF)
thesis title: *Structure and dynamics of active actio-myosin networdk- An in vitro perspective*
advisors: prof. dr. G.H. Koenderink; prof. dr. F.C. MacKintosh
date: 21 October 2011
present position: postdoctoral fellow, Sloan-Kettering Institute, New York, USA

4.5 PhD students (per 31-12-2011)

This section gives an overview of the PhD students affiliated to the DRSTP on 31 December 2011. The projects are chronologically ordered according to starting date. The research themes mentioned refer to particle physics, cosmology, quantum gravity and string theory (theme 1) and quantum matter, quantum information, soft condensed matter and biophysics (theme 2).

University of Amsterdam (UvA)

- Oberreuter, J.M. as of 15 September 2007 with E.P. Verlinde.
  project: cosmological vacua in string theory (theme 1).
- Smolic, J. as of 18 January 2008 with K. Skenderis (E.P. Verlinde, formal advisor).
  project: non-equilibrium dynamics and black hole formation (theme 1).
- Smolic, M. as of 18 January 2008 with M.M. Taylor (E.P. Verlinde, formal advisor).
  project: the fuzzball proposal for black hole physics (theme 1).
- Mossel, J.J. as of 1 September 2008 with J.-S. Caux (K. Schoutens, formal advisor).
  project: cracking the quantum quench (theme 2).
- Romers, J.C. as of 1 September 2008 with K. Schoutens and F.A. Bais.
  project: topological quantum registers (theme 2).
- Baggio, M. as of 1 September 2009 with prof. dr. J. de Boer.
  project: to explore applications of the AdS/CFT correspondence to various systems (theme 1).
- Bzowski, A.W. as of 16 September 2009 with dr. K. Skenderis (E.P. Verlinde, formal advisor).
  project: holographic cosmology (theme 1).
- Haaker, S.M. as of 1 October 2009 with K. Schoutens.
  project: topological quantum computation - fractional quantum Hall effect devices (theme 2).
- Panfil, M. as of 1 October 2009 with J.-S. Caux (K. Schoutens, formal advisor).
  project: a new launch pad for renormalization (theme 2).
- Caldeira Costa, R.N. as of 24 November 2009 with M. Taylor (E.P. Verlinde, formal advisor).
  project: holography and black hole dynamics; use of gravity gauge duality to explore singularity resolutions (theme 1).

- Holsheimer, K. as of 1 September 2010 with J. de Boer.
  project: applications of the AdS-CFT correspondence to non-relativistic systems, with possible applications to strongly coupled condensed matter systems (theme 1).

- Korovin, Y. as of 1 September 2010 with K. Skenderis.
  project: string theory in AdS spacetimes (theme 1).

- Wouters, B.M. as of 1 October 2010 with E.P. Verlinde.
  project: string theory and the emergence of gravity (theme 1).

- Klauser, A.M. as of 1 November 2010 with J.-S. Caux (J. van den Brink, formal advisor).
  project: theory of resonant inelastic X-ray scattering on integrable spin-1/2 quantum spin chains (theme 2). PhD exam: 5 April 2012.

- Eliëns, I.S. as of 1 September 2011 with J.-S. Caux (K. Schoutens, formal advisor).
  project: to provide the theory support in the search for and recognition of Luttinger liquid behaviour in the planned experiments by other teams (theme 2).

- Mayerson, D.R. as of 1 September 2011 with J. de Boer.
  project: research in the topic of the AdS/CFT correspondence, a conjecture in string theory that makes it possible to study strongly coupled field theories holographically using gravity models. An especially active topic at the moment is applications of AdS/CFT to condensed matter theory, which includes the study of holographic models for superconductors and (non-)fermi liquids (theme 1).

- Mosk, B. as of 1 September 2011 with J.P. van der Schaar (J. de Boer, formal advisor).
  project: to investigate how the vacuum evolves if compact dimensions grow in size and to what kind of excitations such an evolution might lead (theme 1).

- Fokkema, T.B. as of 12 September 2011 with J.-S. Caux (K. Schoutens, formal advisor).
  project: focus on the theory for the in- and out-of-equilibrium dynamics of interacting Bose gases, using the exact integrability of the underlying system as a base (theme 2).

- de Lange, P. as of 13 September 2011 with E.P. Verlinde.
  project: most prominently the fundamental role of space-time will be investigated by considering both black-hole solutions in string theory and both sides of the AdS/CFT conjecture (theme 1).

- De Nardis, J. as of 1 October 2011 with J.-S. Caux (K. Schoutens, formal advisor).

project: the main focus will be on the calculation of observable dynamical response functions such as spin-spin correlations (theme 2).

- Pinzani Fokeeva, D. as of 19 October 2011 with M.M. Taylor (K. Skenderis, formal advisor).
  project: development of holographic models for condensed matter systems (theme 1).

- Wegloop, A.J. as of 1 November 2011 with E.P. Verlinde.
  project: string theory and the emergence of gravity (theme 1).

Vrije Universiteit Amsterdam (VUA)

- Mantz, C.L.M. as of 1 September 2008 with P.J.G. Mulders.
  project: to investigate the ways in which the color flow affects the hard process by using recently developed theoretical tools, applicable in a large variety of scattering processes (theme 1).

- den Dunnen, W. as of 15 December 2008 with D. Boer (P.J.G. Mulders, formal advisor).
  project: CP-violation at LHC from new gauge bosons (theme 1).

- Buffing, M.G.A. as of 1 September 2011 with P.J.G. Mulders.
  project: transverse momentum dependent gluon distributions and color gauge invariance (theme 1).

- Licup, A.J. as of 24 November 2011 with F.C. MacKintosh.
  project: development of computational models for fiber networks (theme 2).

University of Groningen (RUG)

- Kadosh, A. as of 1 September 2006 with E. Pallante.
  project: understanding and constraining extra-dimensional theories (brane worlds) derived as effective low-energy realizations of M-theory (theme 1). PhD exam: 23 April 2012.

- Reker, S.F. as of 1 February 2008 with E. Pallante.
  project: clarify properties of strong and weak interactions of baryonic matter from first principles, through a lattice formulation of the field theory for strong and weak forces (theme 1).

- Andringa, R. as of 1 September 2008 with E.A. Bergshoeff.
  project: properties of gravitational theories in three-dimensional space-time, in particular with regard to contributions of higher order in the curvature, and to black holes (theme 1).

- Dibitetto, G. as of 1 November 2008 with E.A. Bergshoeff.
  project: realistic compactifications of string M-theory that give rise to four-dimensional effective theories with moduli stabilisation (no massless scalar fields)

and interesting cosmological aspects (inflation, late-time acceleration) (theme 1). PhD exam: 1 October 2012.

- Noordmans, J.P. as of 1 September 2009 with R.G.E. Timmermans.
  project: theory of Lorentz and CPT violation in the weak interaction (theme 1).
- Yin, Y. as of 1 September 2009 with D. Roest (E.A. Bergshoeff and M. de Roo, formal advisors)
  project: focus on the issue of stabilising parameters of the extra dimensions in string theory, which bridges the gap between theory and experiment (theme 1).
- Romanets, O. as of 1 October 2009 with R.G.E. Timmermans.
  project: improving the theoretical framework for open charm embedding not only D, but also D_s and D_s^* (theme 1).
- Borghese, A. as of 15 November 2009 with D. Roest (E.A. Bergshoeff, formal advisor).
  project: to investigate De Sitter vacua, corresponding to positive minima of the scalar potentials and hence a positive cosmological constant; special emphasis in this project will be placed on so-called N-2 theories (theme 1).
- de Haan, S. as of 13 September 2010 with E.A. Bergshoeff.
  project: understanding a new model of gravity in three space-time dimensions and looking for applications (theme 1).
- Nunes da Silva, T.J. as of 1 October 2010 with E. Pallante.
  project: understanding how conformality is restored in non-abelian gauge theories and its consequences, with particular focus on LHC physics (theme 1).
- Merbis, W. as of 1 November 2010 with E.A. Bergshoeff.
  project: to look for applications of string theory using the so-called AdS-CFT correspondence at different distance scales. This research is embedded into the national string program (theme 1).
- Dekens, W.G. as of 1 September 2011 with D. Boer and R.G.E. Timmermans.
  project: parity violation and weak charges of quarks (theme 1).
- Kovačevič, M. as of 1 October 2011 with E.A. Bergshoeff.
  project: gravity in three dimensions as a road to quantum gravity (theme 1).
- Vos, K., as of 1 December 2011 with R.G.E. Timmermans and H.W. Wilschut.
  project: theory beyond the standard model of particle physics in β-decay (theme 1).

Leiden University (UL)

- Emanuel, M.O. as of 1 December 2005 with H. Schiessel.
  project: theoretical biophysics of DNA and its complexation with proteins (theme 2).

- Woldhuis, E.L. as of 4 June 2008 with M. van Hecke and W. van Saarloos.
  project: statistical properties and rheology of foams near the jamming point (theme 2).

- Lanzani, G. as of 1 July 2008 with H. Schiessel.
  project: theoretical study of the organization and dynamics of chromatin (theme 2).

- van der Aalst, T.A.F. as of 6 October 2008 with K.E. Schalm (A. Achúcarro, formal advisor).
  project: experimental signatures of string theory in cosmology or collider experiments (theme 1). PhD exam: 19 December 2012.

- Rademaker, L. as of 1 January 2009 with J. van den Brink and J. Zaanen.
  project: electron correlation effects in coupled electron-hole doped Mott insulating interfaces (theme 2).

- Čubrović, M. as of 9 February 2009 with J. Zaanen.
  project: investigation of fermion sign structure through Ceperleg's constrained path integral formalism for fermions (theme 2).

- van Ostaay, J. as of 1 September 2009 with C.W.J. Beenakker.
  project: majorana fermions in topological insulators and graphene (theme 2).

- Dahlhaus, J. as of 1 October 2009 with C.W.J. Beenakker.
  project: quantum transport in topological insulators and graphene; in particular transport along line defects in 3D topological insulators (theme 2). PhD exam: 21 November 2012.

- Fulga, I.C. as of 1 June 2010 with C.W.J. Beenakker
  project: entangled spin pairs in graphene (theme 2).

- Upadhyaya, N. as of 1 July 2010 with V. Vitelli (M. van Hecke, formal advisor)
  project: theoretical and computational studies of non-equilibrium phenomena in disordered and jammed systems (theme 2).

- Ortiz, P. as of 1 September 2010 with A. Achúcarro and J.-W. van Holten
  project: theoretical cosmology, with a special emphasis on theories and models of inflation in the early universe (theme 1).

- Pikulin, D. as of 1 September 2010 with C.W.J. Beenakker and Y.V. Nazarov (TU Delft).
  project: the study of mesoscopic transport properties of topological insulators, in particular in contact with superconducting and ferromagnetic contacts (theme 2).

- Koning, V. as of 1 November 2010 with V. Vitelli (M. van Hecke, formal advisor).

project: to study crystal order fracture and phase nucleation on a curved substrate (theme 2).

- Iakubovskyi, D. as of 1 January 2011 with A. Boyarsky (A. Achúcarro, formal advisor).
  project: particle physics beyond the standard model, x-ray astronomy (theme 1).

- van Heck, B. as of 1 June 2011 with C.W.J. Beenakker.
  project: quantum transport in topological isulators and graphene (theme 2).

- Bagrov, A. as of 1 September 2011 with K.E. Schalm (J. Zaanen, formal advisor).
  project: application of AdS/DFT to condensed matter physics and quantum criticality in particular (theme 2).

- Goykhman, M. as of 1 September 2011 with A. Parnachev (J. Zaanen, formal advisor).
  project: studying strongly interacting matter with string theory (theme 2).

- Mi, S. as of 1 September 2011 with C.W.J. Beenakker.
  project: transport properties of topological insulators and graphene (theme 2).

- Atal, V. as of 1 October 2011 with A. Achúcarro.
  project: observational tests for inflationary cosmology (theme 1).

- Ivashko, A. as of 1 October 2011 with A. Boyarsky (A. Achúcarro, formal advisor).
  project: particle physics beyond the standard model, the early universe (theme 1).

- Schram, R. as of 1 October 2011 with H. Schiessel and G.T. Barkema.
  project: polymer simulation models for large scale chromatin organisation, identification of possible segregation mechanisms of the sister chromosomes after duplication (theme 2).

- Beuman, T.H. as of 1 December 2011 with V. Vitelli (M. van Hecke, formal advisor).
  project: the stochastic geometry of non-Gaussian fields (theme 2).

Radboud University Nijmegen (RU)

- van den Oord, G.J.W.M. as of 1 February 2007 with R.H.P. Kleiss and S.C.M. Bentvelsen.
  project: to probe the nature of the Higgs sector, comparing observed data with model-independent, Monte Carlo generated events (theme 1). PhD exam: 15 November 2012.

- Malamos, I.E. as of 1 January 2008 with R.H.P. Kleiss.
  project: tools and precision calculations for physics discoveries at colliders (theme 1). PhD exam: 2 July 2012.

- Niessen, A.I.M. as of 1 September 2008 with W.J.P. Beenakker (formal advisor, R.H.P. Kleiss).
  project: precise Higgs and supersymmetry predictions for the LHC (theme 1). PhD exam: 8 November 2012.

- Akhukov, M.A. as of 1 January 2009 with A. Fasolino and M.I. Katsnelson.
  project: calculations of electronic and structural properties of finite graphene structures (theme 2).

- van den Broek, T.C.H. as of 1 November 2009 with W.J.P. Beenakker and W.D. van Suijlekom (formal advisor, R.H.P. Kleiss).
  project: deriving the minimal supersymmetric standard model from noncommutative geometry (theme 1).

Utrecht University (UU)

- Boon, N.J.H. as of 1 February 2008 with R.H.H.G. van Roij (H. van Beijeren, formal advisor).
  project: theoretically predicting and/or explaining properties of soft matter systems in bulk and in external fields (theme 2). PhD exam: 31 January 2012.

- Swaving, A.C. as of 1 February 2008 with R.A. Duine (H.T.C. Stoof, formal advisor).
  project: understanding of the interplay between ferro and antiferromagnetism, and electric current (theme 2). PhD exam: 2 March 2012.

- Budd, T.G. as of 1 March 2008 with R. Loll.
  project: gravity, quantum gravity and quantum geometry (theme 1). PhD exam: 20 March 2012.

- Höhn, P.A. as of 1 May 2008 with R. Loll.
  project: quantum gravity and quantum cosmology, and their nonperturbative aspects (theme 1). PhD exam: 14 May 2012.

- Lucassen, M.E. as of 1 June 2008 with R.A. Duine (H.T.C. Stoof, formal advisor).
  project: current-driven magnetization dynamics in ferro and antiferromagnets (theme 2). PhD exam: 16 May 2012.

- Beugeling, W. as of 1 September 2008 with C. Morais Smith.
  project: the study of multi-layer quantum Hall systems (theme 2). PhD exam: 19 September 2012.

- Hristov, K.P. as of 1 September 2008 with S.J.G. Vandoren (B. de Wit, formal advisor).
  project: string theory compactifications and implications for cosmology (theme 1). PhD exam: 1 June 2012.

- Mink, M.P. as of 1 September 2008 with R.A. Duine (H.T.C. Stoof, formal advisor).
  project: cold atoms, especially on the boundary between cold atoms and (un)conventional condensed-matter systems (theme 2). PhD exam: 12 September 2012.

- van Driel, H.J. as of 1 December 2008 with R.A. Duine (H.T.C. Stoof, formal advisor).
  project: theoretical investigation of pseudospin transport in electron-hole and graphene bilayers (theme 2). PhD exam: 12 December 2012.

- van Heugten, J.J.R.M. as of 1 January 2009 with H.T.C. Stoof.
  project: microscopic description of the thermodynamical and dynamical properties of quark-gluon plasma aimed at observing color superconductivity in neutron stars (theme 2).

- Wever, C.S.P. as of 1 January 2009 with G. 't Hooft.
  project: effective multicomponent field theory for quantum chromodynamics (theme 1).

- Jordan, S. as of 1 March 2009 with R. Loll.
  project: nonperturbative quantum properties of gravitational interaction (theme 1).

- Franzen, A.T. as of 1 June 2009 with G. 't Hooft.
  project: algebraical description of quantum effects of the horizon of black holes and related aspects of quantum field theories (theme 1).

- van Gelderen, R. as of 1 June 2009 with C. Morais Smith.
  project: analogies between cold atoms and condensed matter systems (theme 2).

- Tieleman, O. as of 1 July 2009 with C. Morais Smith.
  project: to study the exotic quantum phases in strong correlated systems (theme 2). End of contract: 1 October 2011.

- Baarsma, J.E. as of 1 September 2009 with H.T.C. Stoof.
  project: microscopic description of degenerate atomic gases, directed to the possible observation of supersolidity in two species Fermi mixtures (theme 2).

- van Tongeren, S. as of 1 September 2009 with G.E. Arutyunov (B. de Wit, formal advisor).
  project: integrable quantum field theories in finite volume; development of the

thermodynamic Bethe Ansatz for strings on semi-symmetric superspaces (theme 1).

- Belli, S. as of 1 October 2009 with R.H.H.G. van Roij (M. Dijkstra, formal advisor).
  project: investigation of nucleation and clustering phenomena in suspensions of anisotropic particles (e.g., rods or platelets), by (dynamic) density functional theory, integral equation theory, and by simulation (theme 2).

- Weenink, J.G. as of 1 November 2009 with T. Prokopec (E.L.M.P. Laenen, formal advisor).
  project: compatibility of baryogenesis with the standard model that will emerge as a result of the future LHC experiments (theme 1).

- van der Bijl, E. as of 1 February 2010 with R.A. Duine (H.T.C. Stoof, formal advisor).
  project: theoretical research on manipulating magnetic materials, and, in particular, minipulating domain walls (theme 2).

- Troppenz, T. as of 7 September 2010 with R.H.H.G. van Roij (M. Dijkstra (UU), formal advisor).
  project: to study the thermodynamic and structural properties of (nano)rods in emulsion droplets exposed to external electric fields (theme 2).

- Lodato, I. as of 1 October 2010 with B. de Wit.
  project: aspects of black holes and string theory as part of the ERC Advanced Grant project "Supersymmetry: a window to non-perturbative physics", led by prof. B. de Wit (theme 1).

- Sfondrini, A. as of 1 October 2010 with G.E. Arutyunov.
  project: development of the thermodynamic Bethe Ansatz approach for the superstring theory on the AdS_5xS^5 space-time as a tool to determine the spectrum of primary operators in the maximally supersymmetric gauge theory (theme 1).

- Toldo, C. as of 1 October 2010 with S.J.G. Vandoren.
  project: study of black holes in anti de Sitter spacetimes, and its relation to the AdS/CFT correspondence. This includes the study of BPS bounds, extremal and non-extremal black hole solutions in $N = 2$ gauged supergravity. Embeddings into string theory, and microscopic entropy counting for black holes in asymptotically anti de Sitter spacetimes (theme 1).

- van der Schee, W. as of 1 October 2010 with G.E. Arutyunov (T. Peitzmann, formal advisor).
  project: applications of the gauge-string correspondence to the problem of heavy ion collisions. It includes determination of relaxation times and the elliptic flow by using phenomenologically relevant models of gravity in five space-time dimensions (theme 1).

- Glavan, D. as of 1 May 2011 with T. Prokopec (R. Loll, formal advisor).
  project: to develop methods for evaluating the backreaction of quantum fluctuations of scalar and tensor fields in general expanding space times on the evolution of the Universe. He will investigate to what extend can the backreaction change the evolution of the Universe during an inflationary phase as well as in a late universe, thereby studying its relevance for dark energy (theme 1).

- Stegen, J. as of 1 May 2011 with M.A.J. Michels and P.P.A.M. van der Schoot.
  project: to study interactions between proteins in aqueous solution at such high concentrations that there is a lack of hydration water and the proteins partially denature (theme 2).

- Di Liberto, M. as of 15 July 2011 with C. Morais Smith.
  project: to study strongly interacting cold atoms out of equilibrium in optical lattices. In particular, the Floquet theory will be used to derive effective models out of the time-dependent ones. Quantum novel phases will be investigated, always keeping in mind their possible experimental realization (theme 2).

- Armaitis, J. as of 1 September 2011 with R.A. Duine (H.T.C. Stoof, formal advisor).
  project: many-body effects in cold-atom systems, especially spin transport in mixtures of bosonic atoms (theme 2).

- Borsato, R. as of 1 September 2011 with G.E. Arutyunov.
  project: research is concentrated on study strings propagating in integrable backgrounds, the latter include beta-deformations of the AdS_5xS^5 space-time. The main goal is to construct a rigorous quantization scheme by using methods from the theory of exactly solvable models (theme 1).

- Jacobs, V. as of 1 September 2011 with S.J.G. Vandoren (H.T.C. Stoof, formal advisor).
  project: applications of the AdS/CFT correspondence to condensed matter systems at strong coupling. In particular, the study of black hole solutions with anisotropic Lifshitz scaling, and its connection to cold Fermi gasses at unitarity (theme 2).

Nikhef Theory Group (Nikhef)

- de Adelhart Toorop, R., as of 1 February 2008 with J.-W. van Holten.
  project: particle physics beyond the standard model, with focus on supersymmetry and family symmetries (theme 1). PhD exam: 21 February 2012.
- Hartgring, L., as of 1 January 2009 with E.L.M.P. Laenen.
  project: precise descriptions of single top production at the LHC (theme 1).
- Mooij, S.J.N., as of 1 April 2009 with M. Postma (E.L.M.P. Laenen, formal advisor).
  project: learning about particle physics from cosmology and inflation (theme 1).
- Knegjens, R.J., as of 1 February 2010 with R. Fleischer.
  project: B decays as probes of new physics (theme 1).
- De Bruyn, K.A.M., as of 1 June 2011 with R. Fleischer and M.H.M. Merk (VUA).
  project: CP-violating phenomena in B-meson decays (theme 1).
- D'Ambrosi, G., as of 15 September 2011 with J.-W. van Holten and J.F.J. van den Brand (VUA).
  project: research on the emission of gravitational waves by binary systems consisting of a massive black hole and a second compact object (theme 1).
- Bonocore, D., as of 1 December 2011 with E. Laenen.
  Project: QCD processes at the LHC; precision predictions via resummation and/or Monte Carlo. Development of new methods thereto (theme 1).

4.6 Scientific and educational activities of PhD students (theme 1)

Andringa, R. (RUG)
- *A new perspective on nonrelativistic gravity*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *A new perspective on nonrelativistic gravity*, SQS'2011, Supersymmetries and Quantum Symmetries, Dubna, Russia, 18-23 July 2011 (talk).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

Atal, V. (UL)
- *The role of massive fields during inflation*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- Grappa Kickoff, Amsterdam, the Netherlands, 21 October 2011 (attended).
- Solvay PhD School, Brussels-Paris-Amsterdam, l'Université libre de Bruxelles, Vrije Universteit Brussel, Ècole Normale Supérieure (Paris), University of Amsterdam (ITFA), Brussels, Paris, Amsterdam, 24 October-9 December 2011 (attended).

Baggio, M. (UvA)
- *1-loop determinants and black holes*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (attended).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- *Dualità Olografiche*, PhDs in Science, Padova, Italy, 24 November 2011 (talk).

Borghese, A. (RUG)
- *Exploiting SUSY breaking*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- De Sitter Lectures Series, Theoretical Physics 2011, Groningen, the Netherlands, 2-3 March 2011 (attended).
- Quantum Universie 1, Groningen, the Netherlands, 20-21 April 2011 (attended).
- Autumn School, Particle Physics and Cosmology Hamburg, CP3 Origin, DESY, Gottingen, Germany, 11-15 October 2011 (attended).
- All the group seminars, some of the faculty colloquia, some of the national theory seminar held in Amsterdam every month (attended).

Borsato, R. (UU)
- Solvay Doctoral School, Brussels session, 28 September-14 October 2011 (attended).
- Solvay Doctoral School, Paris session, 24 October-10 November 2011 (attended).
- Solvay Doctoral School, Amsterdam session, 21 November-9 December 2011 (attended).

Budd, T.G. (UU)
- Perimeter Institute, Waterloo, Canada, 14-25 February 2011; 28 April-8 May 2011; 13-18 December 2011 (work visit).

- *CDT as a candidate quantum theory of gravity, but what gravity?*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *The effective kinetic term in CDT*, LOOPS '11, Madrid, Spain, 24 May 2011 (talk).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- *Probing moduli space using dynamical triangulations*, GRAFITI, Utrecht, the Netherlands, 7 November 2011 (talk).
- *Effective dynamics of CDT in 2+1 dimensions*, Quantum Gravity Seminar, Perimeter Institute, Waterloo, Canada, 14 December 2011 (talk).

Buffing, M.G.A. (VUA)

- National Seminar, Theoretical High Energy Physics, Amsterdam, the Netherlands, 25 March 2011 (attended).
- NNV Meeting (Dutch Physical Society), Fysica 2011, Vrije Universiteit Amsterdam, the Netherlands, 15 April 2011 (attended).
- *Color flow of quarks and gluons in high-energy collisions*, Master of Physics Symposium 2011, Amsterdam, the Netherlands, 29 April 2011 (talk).
- *Transverse momenta of partons and color gauge invariance*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- Course CLXXX, Three-Dimensional Partonic Structure of the Nucleon, International School of Physics "Enrico Fermi", Varenna, Italy, 28 June-8 July 2011 (attended).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- National Seminar, Theoretical High Energy Physics, Amsterdam, the Netherlands, 25 November 2011 (attended).
- Particle Physics Symposium, Theory and Experiment in the LHC Era, Amsterdam, the Netherlands, 30 November-2 December 2011 (attended).
- Nikhef Jamboree 2011, Nikhef Annual Meeting, Amsterdam, the Netherlands, 12-13 December 2011 (attended).
- Topical Lectures, Statistical Methods for Particle Physics, Nikhef, Amsterdam, the Netherlands, 14-16 December 2011 (attended).

Bzowski, A.W. (UvA)

- *Holography for cosmology*, DRSTP Postgraduate School, High Energy Physics, São Paulo, Brazil, 6-18 February 2011 (talk).
- *Holography for cosmology*, Conference, String Theory, University of Warsaw, Poland, 15-17 April 2011 (talk).
- *Holographic universe*, Summer School, The Frontiers of Physics in Cosmology, Institute for Advanced Study, Princeton, USA, 18-29 July 2011 (talk).
- Workshop, Holographic Fluids, University of Amsterdam, the Netherlands, November 2011 (attended).
- *Holographic universe*, Student Seminar, Nikhef, Amsterdam, the Netherlands, December 2011 (talk).

Caldera Costa, R.N. (UvA)

- DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (attended).
- *Aspects of non-relativistic holography*, DRSTP Symposium, Trends in Theory 2011,

Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– 17th International Symposium, Particles, Strings and Cosmology, Cambridge, UK, 3-8 July 2011 (attended).

D'Ambrosi, G. (Nikhef)
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
– Astro-Particle Physics@NL, Leiden, the Netherlands, 3 November 2011 (attended).

de Adelhart Toorop, R. (Nikhef)
– *Family physics and structure in the fermion mass sector*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).
– *Nieuwe natuurkunde op het VWO: quantum mechanica op de middelbare school?*, Onderwijsdag Natuurwetenschappen, Wolters Noordhoff, Ede, the Netherlands, 15 February 2011 (talk).
– *Family symmetries and the quest to explain quark and lepton masses*, Radboud University Nijmegen, the Netherlands, 3 March 2011 (talk).
– *Explaining fermion masses by family symmetries*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– *Particle physics at the time of the first results of the LHC*, University of Indonesia, Jakarta, 30 June 2011 (talk).
– *Particle physics at the time of the first results of the LHC*, Bandung Institute of Technology, Indonesia, 5 July 2011 (talk).
– *Particle Physics at the time of the first results of the LHC*, Indonesian Seminar, Nasional Fisiki 2011, LIPI, Indonesian Institute of Sciences, Jakarta, Indonesia, 12 July 2011 (talk).
– Les Houches Summer School, France, 1-26 August 2011 (attended).
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended; co-organizer).

De Bruyn, K.A.M. (Nikhef)
– *Penguin topologies in* $B_s^o \to J/\psi K_S$, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
– Conference, APPS, 30 November-2 December 2011, Amsterdam, the Netherlands (attended).

de Haan, S. (RUG)
– *Non relativistic holography*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
– Quantum Universe Symposium, Groningen, the Netherlands, 20-21 April 2011 (attended).
– DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (attended).

Dekens, W.G. (RUG)
– *Consequences of A4 family symmetry in left-right models*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).

de Lange, P. (UvA)
- *Strings, matrices and emergent attractive forces*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- Solvay PhD School, Brussels-Paris-Amsterdam, l'Université libre de Bruxelles, Vrije Universteit Brussel, Ècole Normale Supérieure (Paris), University of Amsterdam (ITFA), Brussels, Paris, Amsterdam, 24 October-9 December 2011 (attended).

den Dunnen, W. (VUA)
- *Measuring W-W'mixing with spin asymmetries at RHIC*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- National Seminar, Theoretical High Energy Physics, Amsterdam, the Netherlands, 25 March 2011 (attended).
- *Impact of Sivers effect on transversity measurements*, XIX International Workshop, Deep-Inelastic Scattering and Related Subjects (DIS 2011), Newport News, Virginia, USA, 11-15 April 2011 (talk).
- *Bounding W-W' mixing with spin asymmetries at RHIC*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *Can the LHC tell us the parity of the Higgs?*, DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (talk; co-organizer).
- *Can the LHC tell us the parity of the Higgs?*, NNV Fall Meeting, Lunteren, the Netherlands, 4 November 2011 (talk).
- National Seminar, Theoretical High Energy Physics, Amsterdam, the Netherlands, 25 November 2011 (attended).
- *Can the LHC tell us the parity of the Higgs?*, Universität Tuebingen, Germany, 8 December 2011 (talk).

Dibitetto, G. (RUG)
- DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (attended).
- *Vacua analysis in extended supersymmetry compactifications*, XVII European Workshop, String Theory, Padua, Italy, 6 September 2011 (talk).
- *The stability of extra dimensions*, DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (talk).
- *Vacua analysis in extended supersymmetry compactifications*, Instituto de Física Teórica UAM/CSIC, Madrid, Spain, 10 November 2011 (talk).
- *Vacua analysis in extended supersymmetry compactifications*, IPhT CEA/Saclay, Paris, France, 15 November 2011 (talk).
- *Vacua analysis in extended supersymmetry compactifications*, ITF, KU Leuven, Belgium, November 2011 (talk).
- *Vacua analysis in extended supersymmetry compactifications*, 28th Nordic Network Meeting, Strings, Fields and Branes, Stockholm, Sweden, 1 December 2011 (talk).
- *Vacua analysis in extended supersymmetry compactifications*, Laboratoire de Physique, ENS Lyon, France, 5 December 2011 (talk).

Franzen, A.T. (UU)
- *Scalar wave equation in Kerr background*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- *Scalar waves in Kerr background*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster prize 2011).
- *The interior of Kerr black holes*, International Conference on Gravitation and Cosmology [ICGC2011] Goa, India, 14-19 December 2011 (poster).

Glavan, D. (UU)
- DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (attended).

Hardeman, S.R. (UL)
- *Inflation in a time of crisis*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).
- *Heavy physics from the cosmic microwave background*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).

Hartgring, L. (Nikhef)
- *Single top production LHC*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).

Höhn, P.A. (UU)
- *Canonical simplicial gravity*, Loops '11 Conference, Madrid, Spain, May 2011 (talk).
- *An effective approach to the problem of time*, Loops '11 Conference, Madrid, Spain, May 2011 (talk).
- *Canonical simplicial gravity*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- Albert Einstein Institute, Potsdam, Germany, 1-16 August 2011 (work visit).
- *Canonical simplicial gravity*, 6th Aegean Summer School on Quantum Cosmology and Quantum Gravity, Naxos, Greece, 12-18 September 2011 (talk).
- Albert Einstein Institute, Potsdam, Germany, 29 September 2011 (work visit).
- *Canonical simplicial gravity*, QUIST Seminar, Utrecht, the Netherlands, 27 October 2011 (talk).
- *Canonical formalism for simplicial gravity*, International Loop Quantum Gravity (Phone) Seminar, 29 November 2011 (talk).
- Perimeter Institute, Waterloo, Canada, 5-10 December 2011 (work visit).
- *Canonical time evolution in simplicial gravity*, Perimeter Institute, Canada, 7 December 2011 (talk).
- *Effective relational dynamics*, University of New Brunswick, Canada, 12 December 2011 (talk).
- *Canonical time evolution in simplicial gravity*, University of New Brunswick, Canada, 13 December 2011 (talk).
- Albert Einstein Institute, Potsdam, Germany, 19-22 December 2011 (work visit).

Holsheimer, K. (UvA)
- *Dictionary for Lifshitz spacetime*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).

– DRSTP Symposium ,Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (attended).
– Modave Summer School, Mathematical Physics, Belgium, 28 August-2 September 2011 (attended).
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

Hristov, K.P. (UU)

– *Static supersymmetric black holes in AdS_4*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
– *Supersymmetric solutions in N=2 D=4 gauged supergravity*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– *On BPS bounds in D = 4 N = 2 gauged supergravity*, XVII European Workshop on String Theory, Padua, Italy, 11 June 2011 (talk).
– *On the causal structure of GR and the cosmic censorship conjecture*, Utrecht, the Netherlands, 2011 (PhD lunch talk).

Iakubovskyi, D. (UL)

– *How to find a dark matter decay line*, 18 Young Scientists Conference, Astronomy and Space Physics, Kiev, Ukraine, 2-7 May 2011 (talk).
– *Searching for decaying dark matter in x-rays*, 15th National APP Symposium, Astroparticle Physics NL, Leiden, the Netherlands, 3 November 2011 (talk).
– Particle Physics Symposium, Theory and Experiment in the LHC Era, Amsterdam, the Netherlands, 30 November-2 December 2011 (attended).
– *Search for sterile neutrino dark matter in x-rays*, International Conference of Young Scientists, Modern Problems of Theoretical Physics, Kiev, Ukraine, 21-23 December 2011 (poster).
– *Cosmic rays - an overview of current status and perspectives*, International Conference of Young Scientists, Modern Problems of Theoretical Physics, Kiev, Ukraine, 21-23 December 2011 (talk).

Ivashko, A. (UL)

– Particle Physics Symposium, Theory and Experiment in the LHC Era, Amsterdam, the Netherlands, 30 November-2 December 2011 (attended).
– *Sterile neutrinos, their role in the early universe confronted with the accelerator searches*, International Conference of Young Scientists, Modern Problems of Theoretical Physics, Kiev, Ukraine, 21-23 December 2011 (talk).

Jordan, S. (UU)

– *Phase transitions of quantum geometry*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).

Kadosh, A. (RUG)

– *Natural non-standard Higgs boson decays or how to bury and unbury the Higgs*, Theory Seminar, Nikhef, by Andreas Weiler, Amsterdam, the Netherlands, 27 January 2011 (attended).
– *An RS-A4 flavor model in light of T2K and MEG*, FLASY 2011, Valencia, Spain, 11-14 July 2011 (talk).

Knegjens, R.J. (Nikhef)
- *In pursuit of new physics with $B_s \to K + K-$ decays*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- *In pursuit of new physics with B_s mesons*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- Conference, Beauty 2011, Amsterdam, the Netherlands, 4-8 April 2011 (attended).
- *In pursuit of new physics with B mesons*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- CERN European School, Romania, 7-23 September 2011 (attended).
- FOM Course, Art of Presenting Science, Utrecht, the Netherlands, 7 October-4 November 2011 (attended).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- *Waar is al de antimaterie gebleven?*, Probus Club (Rotary), Roermond, the Netherlands, 24 November 2011.
- Particle Physics Symposium, Theory and Experiment in the LHC Era, Amsterdam, the Netherlands, 30 November-2 December 2011 (attended).
- *Recent theoretical studies of Bs physics*, Particle Physics Symposium, Theory and Experiment in the LHC Era, Amsterdam, the Netherlands, 30 November-2 December 2011 (talk).

Koksma, J.F. (UU)
- *Decoherence in quantum field theory*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *Decoherence and dynamical entropy generation in an interacting quantum field theory*, Utrecht, the Netherlands 9 June 2011 (talk).

Korovin, Y. (UvA)
- *Wilson loops at strong coupling in real-time formalism*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- Mathematica Summer School, Theoretical Physics, Perimeter Institute, Waterloo, Ontario, Canada, 31 July-6 August 2011 (attended).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- *Strong coupling and holography in cosmology*, Workshop, Amsterdam, the Netherlands, 7-8 November 2011 (attended).

Lodato, I. (UU)
- *Applications of the Noether potential*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- *Effect of supersymmetric higher-derivative terms on flat directions*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- 1st Summer School of ITN: Unification in the LHC Era, Corf, Greece, September 2011 (attended).

Maio, M. (Nikhef)
- FOM Course, Nyenrode Business Orientation, Nyenrode Business University, Breukelen, the Netherlands, 27 March-1 April 2011 (attended).
- DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (attended).

- *On R-symmetric fixed points and superconformality*, Theory Group Journal Club, Nikhef, Amsterdam, the Netherlands, 23 May 2011 (talk).
- FOM Career Planning Course, Utrecht, the Netherlands, May-June 2011 (attended).
- *Massless scalars in two dimensions*, Theory Center Meeting, Nikhef, Amsterdam, the Netherlands, 30 September 2011 (talk).
- *4d string models using 2d conformal field theory*, Theory Center Meeting, Nikhef, Amsterdam, the Netherlands, 11 November 2011 (talk).
- *Open strings in the D5/D9*, Theory Group Journal Club, Nikhef, Amsterdam, the Netherlands, 14 November 2011 (talk).
- Peer reviewer for American Mathematical Society - Mathematical Reviews (more or less ten papers to review during the whole year).

Malamos, I.E. (RU)

- *Reduction of 1-loop amplitudes, arguments for 2-loops*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- *Reduction of one and two loop Feynman integrals*, THEP Colloquium, Nijmegen, the Netherlands, March 2011 (talk).
- *Reduction of one loop (and more?) amplitudes at the integrand level*, Valencia, Spain, September 2011 (talk).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

Mayerson, D.R. (UvA)

- Solvay PhD School, Brussels-Paris-Amsterdam, l'Université libre de Bruxelles, Vrije Universteit Brussel, Ècole Normale Supérieure (Paris), University of Amsterdam (ITFA), Brussels, Paris, Amsterdam, 24 October-9 December 2011 (attended).

Merbis, W. (RUG)

- *Holographic renormalization and new massive gravity*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- *AdS/logarithmic-CFT correspondence*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *A holographic approach to logarithmic CFTs*, Corfu Summer Institute, 1st Summer School of ITN, Unification in the LHC Era, Corfu, Greece, 10 September 2011 (talk).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- *Logarithmic CFTs from gravitational models*, 28th Nordic Network Meeting, Stockholm, Sweden, 2 December 2011 (talk).

Mooij, S.J.N. (Nikhef)

- *Einstein valt*, Cultureel genootschap Vandiebank!, Amsterdam, the Netherlands, 6 January 2011 (talk).
- *Higgs inflation: a cosmological role for the Higgs boson?*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).

- *Goldstone bosons in Higgs inflation*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- *Goldstone bosons in Higgs inflation*, 6th Kosmologietag, Bielefeld University, Germany, 6 May 2011 (talk).
- *Goldstone bosons in Higgs inflation*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *Goldstone bosons in Higgs inflation*, PASCOS Conference, Cambridge, UK, 7 July 2011 (talk).
- *Goldstone bosons in Higgs inflation*, Workshop, Cosmology Meets Particle Physics, DESY, Hamburg, Germany, 28 September 2011 (talk).
- *Goldstone bosons in Higgs inflation*, Seminar, University of Groningen, the Netherlands, 25 October 2011 (talk).
- *Higgs in the sky*, NNV Fall Meeting, Lunteren, the Netherlands, 4 November 2011 (talk).
- Particle Physics Symposium, Amsterdam, the Netherlands, 30 November-2 December 2011 (attended).
- *Higgs in the sky*, Seminar, Anton Pannekoek Instituut, Amsterdam, the Netherlands, 8 December 2011 (talk).

Mosk, B. (UvA)

- Solvay PhD School, Brussels-Paris-Amsterdam, l'Université libre de Bruxelles, Vrije Universteit Brussel, Ècole Normale Supérieure (Paris), University of Amsterdam (ITFA), Brussels, Paris, Amsterdam, 24 October-9 December 2011 (attended).

Niessen, A.I.M. (RU)

- *How much SUSY are we looking for?*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).
- *Finding SUSY*, Workshop, The First Quantum Universe, Groningen, the Netherlands, 20-21 April 2011 (talk).
- *Supersymmetry vs extra dimensions*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (co-organizer/poster).
- *NNLL resummation for squark-antisquark production*, RADCOR 2011, Mammalapuram, India, 30 September 2011 (talk).
- Indian Institute of Science, Bangalore, India, 3-14 October 2011 (work visit).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (co-organizer).
- *NNLL resummation for squark-antisquark production*, BSM Meeting, Indian Institute of Science, Bangalore, India, 3 October 2011 (talk).
- *Madgraph intro*, BSM Meeting, Indian Institute of Science, Bangalore, India, 10 October 2011 (talk).
- FOM Workshop, Physics with Industry, Leiden, the Netherlands, 17-21 October 2011 (attended).

Noordmans, J.P. (RUG)

- *Lorentz invariance on trial*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).

– *Testing Lorentz symmetry*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster; co-organizer).
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended; co-organizer).

Nunes da Silva, T.J. (RUG)

– *Conformality in gauge theories*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
– *Conformality in gauge theories*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
– Quantum Universe Symposium, Groningen, the Netherlands, 20-21 April 2011 (attended).
– *Conformality in gauge theories*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– *The strong coupling bulk transition of twelve flavors*, XXIX International Symposium, Lattice Field Theory, Squaw Valley, California, USA, 11-16 July 2011 (poster).
– Meeting, European Twisted Mass Collaboration, Rome, Italy, 12-14 October 2011 (attended).
– Particle Physics Symposium, Amsterdam, the Netherlands, 30 November-2 December 2011 (attended).
– Some of the monthly Theory Meetings at Nikhef, Amsterdam, the Netherlands (attended).

Oberreuter, J.M. (UvA)

– *Inflation in a time of crisis, the π-problem and the hidden sector*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).
– *The ever present eta-problem: knowledge of all hidden sectors*, Conference, Iberian Strings, Instituto de Física Corpuscular, Universitat de Valencia, Spain, 15-18 February 2011 (talk).
– *Multiple problems with multiple sectors in supergravity*, Institute of Cosmology and Gravitation, Portsmouth, UK, 27 April 2011 (talk).
– *Multiple problems with multiple sectors in supergravity*, Rudolf Peierls Centre for Theoretical Physics, University of Oxford, UK, 28 April 2011 (talk).
– *Multiple problems with multiple sectors in supergravity*, Imperial College, London, UK, 4 May 2011 (talk).
– *Multiple problems with multiple sectors in supergravity*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– *Multiple problems with multiple sectors in supergravity*, University of Groningen, the Netherlands, 1 June 2011 (talk).
– Summer School, Prospects of Theoretical Physics, Frontiers of Physics in Cosmology, Institute of Advanced Study, Princeton, New Jersey, USA, 18-29 July 2011 (attended).
– *Multiple problems with multiple sectors in supergravity*, Montreal, Canada, 30 September 2011 (talk).
– *Multiple problems with multiple sectors in supergravity*, Northeast Cosmology Work-

shop, McGill University, Montreal, Canada, 30 September 2011 (talk).
- *Multiple problems with multiple sectors in supergravity*, Center for Particle Astrophysics, Fermilab, Batavia, Illinois, USA, 3 October 2011 (talk).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

Ortiz, P. (UL)
- Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (attended).
- *Multifield inflation*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- First Quantum Universe Symposium QU2, Groningen, the Netherlands, 20-21 April 2011 (attended).
- *Supersymmetry and supergravity*, Lecture course by J.-W. van Holten, Leiden, the Netherlands, Spring 2011 (attended).
- *Gauge-flation: inflation from non-abelian gauge fields*, Journal Club, Dutch Theoretical Cosmology Meeting, Leiden, the Netherlands, 6 May 2011 (talk).
- *Single-field inflation consistent with supergravity*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- PASCOS 2011, Centre for Mathematical Sciences, University of Cambridge, UK, 3-8 July 2011 (attended).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- Dutch Astroparticle Symposium, Leiden, the Netherlands, 3 November 2011 (attended).
- Institute for Theoretical Physics (IFT-UAM/CSIC), Workshop, Madrid, Spain, 13-16 December 2011 (attended).

Reker, S.F. (RUG)
- *Physics on the lattice with dynamical light and charm quarks*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- *Lattice QCD in the era of the LHC*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- ETMC Meeting, Bern, Switzerland, 23-25 March 2011 (attended).
- *Lattice QCD in the era of the LHC*, Quantum Universe 1 Workshop, Groningen, the Netherlands, 20-21 April 2011 (talk).
- Lattice 2011, Squaw Valley, California, USA, 11-16 July 2011 (attended).
- ETMC Meeting, Rome, Italy, 12-14 October 2011 (attended).
- *Superluminal neutrinos*, Honours College Seminar, Groningen, the Netherlands, 14 November 2011 (talk).
- *Particle physics on supercomputer*, 40th Year Anniversary of SARA, Amsterdam, the Netherlands, 9 December 2011 (talk).

Romanets, O. (RUG)
- *Charmed and strange baryon resonances*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).

Sfondrini, A. (UU)
- *The AdS/CFT conjecture and integrability*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).

- *TBA and lifting of degeneracies for AdS5XS5 strings*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- PhDs in Science 2011, Outreach event at the University of Padova, Italy, 24-25 November 2011 (organizing committee).
- *The mathematics of quantum mechanics*, Nikhef, Amsterdam, the Netherlands, 16 December 2011 (talk).

Smolic, M. (UvA)

- *Nonconformal branes and hydrodynamics*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster; co-organizer).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended; co-organizer).

Toldo, C. (UU)

- *Black holes in AdS_4 and the cosmic dyon*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- *(AdS) Black holes and supergravity*, PLaneT talk, Utrecht, the Netherlands, 19 April 2011 (talk).
- *BOSS (Black objects in supergravity school)*, School, Frascati, Italy, 9-13 May 2011 (attended).
- *Black holes and supergravity*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

van de Meent, M. (UU)

- *Piecewise flat gravity in 3+1 dimensions*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- *Piecewise flat gravitational waves*, Utrecht, the Netherlands, 8 December 2011 (talk).

van den Broek, T.C.H. (RU)

- *To commute ... or not to commute*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- *Noncommutative geometry, a new approach to supersymmetry?*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *Supersymmetry and noncommutative geometry*, Bayrischzell Workshop 2011, Noncommutativity and Physics: Spacetime Quantum Geometry, Germany, 20-23 May 2011 (talk).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- Particle Physics Symposium, Amsterdam, the Netherlands, 30 November-2 December 2011 (attended).

van der Aalst, T.A.F. (UL)

- *Observing strings in a realistic inflationary background*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- *Inflation in a time of crisis*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).

- *Putting the string back into string cosmology*, Spring School, Superstring Theory and Related Topics, ICTP, Trieste, Italy, 28 March-5 April 2011 (talk).
- *Fundamentele elementaire deeltjes*, "Pre-reis lezing" organized by Studievereniging "De Leidsche Flesch" for 2nd and 3rd year mathematicians and computational scientists, Leiden, the Netherlands, 13 April 2011.
- *Observing strings in a realistic inflationary background*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- Casimir Symposium, Science Communicated!, Delft, the Netherlands, 26 May 2011 (attended).
- Workshop, Cosmological Frontiers in Fundamental Physics, APC, Paris, France, 14-17 June 2011 (attended).
- Summer School, Prospects in Theoretical Physics, Frontiers of Physics in Cosmology, IAS, Princeton, New Jersey, USA, 18-29 July 2011 (attended).
- *A global perspective on string inflation*, String Theory Group, University of Wisconsin, Madison, USA, 4 October 2011 (talk).
- *A global perspective on string inflation*, University of Chicago, Illinois, USA, 11 October 2011 (talk).
- New York University, USA, 17 October 2011 (work visit).
- Princeton University, New Jersey, USA, 18 October 2011 (work visit).
- University of Pennsylvania, Philadelphia, USA, 19 October 2011 (work visit).
- *A global perspective on string inflation*, Syracuse University, New York, USA, 21 October 2011 (talk).
- Cornell University, Ithaca, New York, USA, 24-26 October 2011 (work visit).
- Coordinator for the physics cluster of the "profielwerkstuk steunpunt", a Leiden University run webpage `http://www.pws-exact.leidenuniv.nl` through which high school students can ask questions on how to write and perform a research proposal.

van der Schee, W. (UU)

- *Thermalisation time of the quark gluon plasma using AdS/CFT*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
- *Gravitational dual of a lead-lead collision*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *Gauge/gravity and condensed matter physics*, Condensed-Matter Theory group, Utrecht, the Netherlands 24 June 2011 (talk).
- *Gauge/gravity and heavy ion physics*, Institute of Subatomic Physics, Utrecht, the Netherlands, 29 June 2011 (talk).
- PhD School, Aspects of QCD at Finite Density, University of Bielefeld, Germany, 19-23 September 2011 (attended).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

van Tongeren, S. (UU)

- *Twisted integrability*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).

– *Mirror, mirror T B A, can you be changed yet preserved some way?*, String Seminar, Utrecht, the Netherlands, 11 May 2011 (talk).
– *Mirror, mirror T B A - scaling dimensions are found what way!?*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– *Lifting asymptotic degeneracies*, Integrability in Gauge and String Theory 2011, Perimeter Institute, Waterloo, Canada, 18 August 2011 (talk).
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

van Zalk, M. (UU)
– DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (attended).

Weenink, J.G. (UU)
– *Gauge invariant cosmological perturbations & the quantum equivalence of frames*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
– *Gauge invariant cosmological perturbations & the quantum equivalence of frames*, Kosmologietag, Bielefeld, Germany , 5 May 2011 (talk).
– *Gauge invariant cosmological perturbations and the quantum equivalence of frames*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– Workshop: Baryogenesis and First Order Phase Transitions in the Early Universe, Lorentz Center Leiden, the Netherlands 29 August9 September 2011 (attended).
– *Cosmological decoherence in the framework of stochastic inflation*, DESY Theory Workshop, Hamburg, Germany, 28 September 2011 (talk).
– *Gauge invariant cosmological perturbations*, DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (talk).
– *Gauge invariant cosmological perturbations*, Amsterdam Particle Physics Symposium (APPS), Amsterdam, the Netherlands, 2 December 2011 (talk).

Wever, C.S.P. (UU)
– *Pair production of squarks and gluinos at hadron colliders*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).

Wouters, B.M. (UvA)
– *D-brane interactions at finite temperature*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

Yin, Y. (RUG)
– *Scalar potential and the embedding tensor formalism*, DRSTP Postgraduate Course, Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011 (talk).
– DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (attended).
– Modave Summer School, Mathematical Physics, Belgium, 28 August-3 September 2011 (attended).
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
– *3D higher spin fields in analogy to 3D massive gravity*, 28th Nordic Network Meet-

ing, Stockholm, Sweden, 1 December 2011 (talk).

4.7 Scientific and educational activities of PhD students (theme 2)

Akhmerov, A.R. (UL)
- *Analogue of gravitational lensing in a topological insulator*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).
- *Majorana interferometry: how to split an electron*, Seminar, This Week's Discoveries, Leiden University, the Netherlands, 17 May 2011 (talk).
- *Superconducting charge qubit for parity-protected computation with Majorana fermions*, SSQIP Work Meeting, TU Delft, Netherlands, 28 May 2011 (talk).
- Workshop, Topological Phases of Matter, ICTP, Trieste, Italy, 27 June-8 July 2011 (attended).
- *Detecting and using Majorana fermions in superconductors*, Condensed Matter Theory Seminar, Basel University, Switzerland, 3 August 2011 (talk).
- *Detecting and using Majorana fermions in superconductors*, International Conference, Superconductor Hybrids: from Conventional to Exotic, Villard de Lans, France, 8 September 2011 (talk).
- *Detecting and using Majorana fermions in superconductors*, Condensed Matter Theory Seminar, ETH Zurich, Switzerland, 12 September 2011 (talk).
- *Majorana fermions and their use for quantum computation*, Joan van der Waals Colloquium, Leiden University, the Netherlands, 14 October 2011 (talk).
- *Scattering theory of topological insulators*, CMT Seminar, Harvard University, Boston, USA, 10 November 2011 (talk).
- *Scattering theory of topological insulators*, KITP Workshop, Topological Insulators and Superconductors, UCSB, Santa Barbara, California, USA, 21 November-9 December 2011 (talk).
- *Scattering theory of topological insulators*, IQOQI Seminar, Innsbruck University, Austria, 19 December 2011 (talk).

Akhukov, M.A. (RU)
- *Folded graphene*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- Russia and Hamburg, 27-31 July 2011 and 17-19 November 2011 (work visit).
- University of Hamburg, Germany, 17-19 November 2011 (work visit).
- FOM Young Scientists' Day 2011, Amsterdam, the Netherlands, 2 December 2011 (attended).

Armaitis, J. (UU)
- *Polarons in extremely imbalanced Fermi mixtures*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *Polarons in extremely imbalanced Fermi mixtures*, INTERCAN PreDoc School Cold Gases with Long Range Interactions, les Houches, France, 18-30 September

2011 (poster).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- NewSpin2, College Station, Texas, USA, 12-17 December 2011 (attended).

Baarsma, J.E. (UU)
- *Supersolid phases in imbalanced atomic Fermi gases*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- *Supersolid phases in an imbalanced Fermi mixture*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).
- *Supersolid phases in an imbalanced Fermi mixture*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *Supersolid phases in imbalanced atomic Fermi gases*, Disordered Systems: From Condensed-Matter Physics to Ultracold Atomic Gases, PhD school, Cargese, France, 30 May-10 June 2011 (poster).
- *Supersolid phases in imbalanced atomic Fermi gases*, BEC 2011 Conference, Sant Feliu, Spain, 10-16 September 2011 (poster).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- *Supersolid phases in imbalanced atomic Fermi gases*, Newspin2 Workshop and Conference, College Station, USA, 11-18 December 2011 (poster.)

Beekman, A.J. (UL)
- Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (attended).
- *Type II Josephson effect*, Conference, 100th Anniversary of Superconductivity: Hot Topics and Future Directions, Lorentz Center, Leiden, the Netherlands, 4-8 April 2011 (poster).
- *Type II Josephson effect*, Conference, Unconventional Superconductivity, University of Minnesota, Minneapolis, USA, 22-24 April 2011 (poster).
- *Type II Josephson effect*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- Conference, Science Communicated, Casimir Research School, Delft, the Netherlands, 26 May 2011 (attended).
- *Type-II Mott insulators: current carrying vortex lines*, DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (talk).

Belli, S. (UU)
- *Heterogeneous dynamics in columnar liquid crystals*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- *Effect of polydispersity on the stability of the biaxial phase*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).
- *Effect of polydispersity on the stability of the biaxial nematic phase*, NWO Meeting on Chemistry Related to Physics and Materials Sciences, Veldhoven, the Netherlands, 14-15 March 2011 (poster).
- FOM Workshop Taking Charge of your PhD Project, Utrecht, the Netherlands, 14-28 April 2011 (attended).
- *Polydispersity stabilizes biaxial nematic LCs*, SFB-TR6 Young Researchers Meet-

ing, Utrecht, the Netherlands, 18-19 April 2011 (talk).
- *How something nasty as polydispersity stabilizes the biaxial nematic phase*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- Henk Lekkerkerker Symposium, Amsterdam, the Netherlands 10 June 2011 (attended).
- *Polydispersity stabilizes biaxial nematic LCs*, 8th Liquid Matter Conference, Vienna, Italy, 6-10 September 2011 (talk).
- FOM Workshop Write it Right, Utrecht, the Netherlands, 21-22 September 2011 (attended).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- *Depletion-induced biaxial nematic states of boardlike particles*, Dutch Soft Matter meeting, Eindhoven, the Netherlands, 7 November 2011 (talk).
- *Depletion-induced biaxial nematic states of boardlike particles*, CHAINS (CHemistry as An INnovating Science), 28-20 November 2011 (poster).

Beugeling, W. (UU)

- *Ultracold atoms in a honeycomb lattice under abelian and nonabelian gauge fields*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- National Seminar Condensed Matter Physics, Nijmegen, the Netherlands, 29 April 2011 (attended).
- *Spin-imbalanced topological phases and chiral Rashba states in a fermionic lattice*, Laboratoire de Physique des Solides, Université Paris Sud, Orsay, France, 16-17 May 2011 (talk).
- *Spin-imbalanced topological phases and chiral Rashba states in a fermionic lattice*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *Spin-imbalanced topological phases and chiral Rashba states in a fermionic lattice*, ICTP School/Workshop Topological Aspects of Condensed Matter Physics, Trieste, Italy, 27 June-8 July 2011 (poster).
- *Spin-imbalanced topological phases and chiral Rashba states in a fermionic lattice*, NSPM School/Workshop, Quantum Phenomena in Graphene, other Low-Dimensional Materials, and Optical Lattices, Erice, Sicily, Italy, 26 July-6 August 2011 (poster).
- *Spin-imbalanced topological phases and chiral Rashba states in a fermionic lattice*, Graphene Meeting, Delft, the Netherlands, 14 September 2011 (poster).
- National Seminar Condensed Matter Physics, Nijmegen, the Netherlands, 7 October 2011 (attended).
- *Topological phases in 2D systems*, Seminar Planet, Institute for Theoretical Physics, Utrecht, the Netherlands, 25 October 2011 (talk).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

Broedersz, C.P. (VUA)

- *Cross-linked governed dynamics in biopolymer networks*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).

– *Universal mechanical behavior in sub-isostatic filamentous networks*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).

Čubrović, M. (UL)

– *Geometry encoding for statistics: from Fermi liquids to Cooper pairing*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
– *Strongly correlated electrons from AdS/CFT*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).
– *Electron-electron and electron-hole pairing from AdS/CFT correspondence*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– *In search for the ground state of finite density fermions: from electron stars to Dirac hair*, Black Hole Answers for Condensed Matter Questions, Leiden, the Netherlands, 14-17 June 2011 (talk).
– Conference, Hot Nuclei, Cold Materials and Black Holes: Applied Gauge/Gravity Duality, ICTP, Trieste, Italy, 15-26 August 2011 (attended).

Dahlhaus, J. (UL)

– *Analogue of gravitational lensing in a topological insulator*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).
– *Transport signatures of Majorana bound states in disordered superconducting nanowires*, DPG Spring Meeting, Dresden, Germany, 14-18 March 2011 (talk).
– *Transport signatures of Majorana bound states in disordered superconducting nanowires*, Research Seminar, Correlated Quantum Systems, Heidelberg, Germany, 16 May 2011 (talk).
– *Quantum Hall effect in a one-dimensional dynamical system*, Workshop and School, Topological Aspects of Condensed Matter Physics, Trieste, Italy, 27 June-8 July 2011 (poster).
– *Quantum Hall effect in a one-dimensional dynamical system*, School, Frontiers of Condensed Matter, Les Houches, France, 5-16 September 2011 (poster).

De Nardis, J. (UvA)

– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

Diederix, J.M. (UU)

– *Imbalanced and trapped ultracold fermions*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).
– DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (attended).

Di Liberto, M.F. (UU)

– *Finite-momentum Bose-Einstein condensates in shaken 2D square optical lattices*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– *Finite-momentum Bose-Einstein condensates in shaken two-dimensional square optical lattices*, Summer School and Workshop Quantum Phenomena in Graphene, other Low Dimensional Materials and Optical Lattices, Erice, Italy, 26 July7 August 2011 (poster).

– *Spin-imbalanced topological phases and chiral Rashba states in a fermionic lattice*, Graphene Meeting, Delft, the Netherlands. 14 September 2011 (poster).
– National Seminar Condensed Matter, Utrecht, the Netherlands, 7 October 2011 (attended).
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

Eliëns, I.S. (UvA)
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

Fokkema, T.B. (UU)
– *AdS/CFT correlation functions through supergravity*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

Haaker, S.M. (UvA)
– *Uniform non-abelian gauge potentials: spectrum and flux insertion*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
– *Particles in non-Abelian gauge potentials: adiabatically inserting non-abelian flux*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).
– *Particles in a perpendicular magnetic field: non-abelian gauge fields*, DRSTP Symposium Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– Symposium, Topological Quantum Computation, Stockholm, Sweden, 4-5 June 2011 (talk).
– Workshop and School, Topological Aspects of Condensed Matter Physics, ICTP, Trieste, Italy, 27 June-8 July 2011 (attended).
– Seminar, Quantum Information and Condensed Matter Physics, Maynooth, Ireland, 5-9 September 2011 (talk).
– *Particles in non-abelian gauge fields: inserting non-abelian flux into a quantum Hall droplet*, DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (talk).
– Workshop, IHP, Paris, France, 31 October-11 November 2011 (attended).

Jacobs, V. (UU)
– *Kubo formalism for spin drag in an atomic Fermi gas*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
– *AdS/CFT correspondence in condensed matter: from black holes to ARPES?*, BEC Talk, Utrecht, the Netherlands, 11 November 2011 (talk).

Koning, V. (UL)
– *Frustrated nematic order in spherical geometries*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).

Lanzani, G. (UL)
– *Out of register: how DNA determines the chromatin fiber geometry*, Physics of the Genome, Delft, the Netherlands, 3 February 2011 (talk).
– DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (attended).
– *Out of register: how DNA determines the chromatin fiber geometry*, Leiden Uni-

versity, for the visit by an international committee, the Netherlands, 30 June 2011 (poster).
– FOM Young Scientists' Day 2011, Amsterdam, the Netherlands, 2 December 2011 (attended).

Lucassen, M.E. (UU)
– *Spin motive forces due to a vortex domain wall*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
– Another Spin in the Wall Symposium, Eindhoven, the Netherlands, 27 January 2011 (attended).
– Spin Caloritronics III Workshop, Leiden, the Netherlands, 9-13 May 2011 (attended).
– *Spin motive forces due to a vortex domain wall*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– FOM Spin Programme Meeting, Nijmegen, the Netherlands, 20 June 2011 (attended).
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
– *Spin-transfer mechanism for magnon-drag thermopower*, Spin Meeting, Utrecht, the Netherlands, 25 November 2011 (talk).

Mi, S. (UL)
– DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

Mink, M.P. (UU)
– *Probing the topological exciton condensate via coulomb drag*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
– *Probing the topological exciton condensate via Coulomb drag*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).
– *Probing the topological exciton condensate via Coulomb drag*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– *Probing the topological exciton condensate via Coulomb drag*, Conference on Quantum Phenomena in Graphene, other Low-Dimensional Materials, and Optical Lattices, Erice, Italy, 5 August 2011 (poster).
– *Probing the topological exciton condensate via Coulomb drag*, NewSpin2 Conference, College Station, USA, 16 December 2011 (poster).

Mossel, J.J. (UvA)
– *Non-equilibrium dynamics and correlation functions of the 1D Bose gas*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).
– *Non-equilibrium dynamics and correlation functions of the 1D Bose gas*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– *Interaction quench of the 1D Bose gas*, Workshop, Integrability and its Breaking, Trieste, Italy, 16 May 2011 (poster).
– Workshop, Correlation Functions of Quantum Integrable Models, Institut de Mathématiques de Bourgogne, Dijon, France, 7-9 September 2011 (attended).
– *Bethe Ansatz solvable models out-of-equilibrium*, Seminar, Dijon, France, 8 Septem-

ber 2011 (talk).

Overbosch, B.J. (UL)

– *Superconducting transition in quantum critical metals*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).

Panfil, M. (UvA)

– *Correlations in the 1D Bose gas*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).
– *Temperature correlations in the 1D Bose gas*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
– Workshop, Integrability and its Breaking in Strongly Correlated and Disorderd Systems, International Centre for Theoretical Physics, Trieste, Italy, 23-27 May 2011 (attended).
– Summer School, Disordered Systems: From Condensed-Matter Physics to Ultracold Atomic Gases, Cargese, France, 30 May-11 June 2011 (attended).

Pikulin, D. (UL)

– *Topological properties of superconducting scattering matrices*, Conference, Quantum Mesoscopic Physics, La Thuile, Italy, 13-20 March 2011 (poster).
– *Influence of topology on transport properties of superconducting junctions*, Joint Delft-Keio Workshop, Delft, the Netherlands, 21-22 November 2011 (talk).

Pinzani Fokeeva, N. (UvA)

– VII Avogadro Meeting, Strings, Supergravity and Gauge Theories, The Galileo Galilei Institute for Theoretical Physics, Arcetri, Florence, Italy, 20-22 December 2011 (attended).

Rademaker, L. (UL)

– *Exciton condensation and flux quantization in strongly correlated oxide materials*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
– *The motion of a single exciton in a bilayer quantum antiferromagnet*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).
– *How a neutral and massless superfluid can still exhibit flux quantization*, 100th Anniversary of Superconductivity: Hot Topics and Future Directions, Lorentz Workshop, Leiden, the Netherlands, 4-8 April 2011 (poster).
– DRSTP National Seminar, Condensed Matter Physics, Nijmegen, the Netherlands, 29 April 2011 (attended).
– *Emergent Ising confinement of excitons in strongly correlated bilayers*, Presentation in the group of professor Millis, Columbia University, New York, USA, 16 May 2011 (talk).
– Biannual Casimir Symposium, Science Communicated!, Delft, the Netherlands, 26 May 2011 (attended).
– Lorentz Workshop, Black Hole Answers for Condensed Matter Questions, Leiden, the Netherlands, 14-17 June 2011 (attended).
– *Dynamical frustration of interlayer excitons in bilayer quantum antiferromagnets*, NPSM 2011 Workshop, Quantum Phenomena in Graphene, other Low-Dimensional

Materials, and Optical Lattices, Erice, Italy, 4-7 August 2011 (poster).
- *Frustrated interlayer excitons in antiferromagnets*, BEC Meeting Presentation in the group of H.T.C. Stoof, R.A. Duine and C. de Morais Smith, Utrecht, the Netherlands, 9 September 2011 (talk).
- *Dynamical frustration of interlayer excitons in bilayer quantum antiferromagnets*, Conference, Optics of Excitons in Confined Systems, Paris, France, 12-16 September 2011 (poster).
- DRSTP National Seminar, Condensed Matter Physics, Utrecht, the Netherlands, 7 October 2011 (attended).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended; co-organizer).
- Different Ehrenfest colloquia, Leiden, the Netherlands, January-November 2011 (attended 8 colloquia).

Romers, J.C. (UvA)
- *Charged spin textures over the Moore-Read fractional quantum Hall state*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- *Charged spin textures in fractional quantum Hall states*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- *The modular S-matrix as an order parameter for topological phase transitions*, Workshop and Summer School, Topological Aspects of Condensed Matter Physics, ICTP, Trieste, Italy, 27 June-8 July 2011 (poster).
- *The modular S-matrix as an order parameter for topological phase transitions*, Workshop, University of Maynooth, County Kildare, Ireland, UK, September 2011 (talk).
- *The modular S-matrix as an order parameter for topological phase transitions*, Workshop, Institut Henri Poincare, Paris, France, November 2011 (talk).

She, J.-H. (UL)
- *Superconducting transition in quantum critical metals*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).

Swaving, A.C. (UU)
- DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (attended).

Tieleman, O. (UU)
- *Supersolid phases of dipolar bosons with a staggered flux*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- *s+p-orbital superfluid bosons in a 2D optical superlattice*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).

Troppenz, T. (UU)
- *Monte Carlo simulations of hard parallel polarizable colloidal rods in an external electric field*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).
- *Monte Carlo simulations of hard parallel sperocylinders in electric fields*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).

Upadhyaya, N. (UL)
- *Quantum buckling*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).

van der Bijl, E. (UU)
- *Spin transfer torques and spin pumping in strongly spin-orbit coupled systems*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- *Spin-orbit coupling in spintronics*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).
- *Spin transfer torques and spin pumping in strongly spin-orbit coupled systems*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended; co-organizer).
- FOM-Spintronics Meeting, Utrecht, the Netherlands, 26 November 2011 (organizing committee).
- *Anomalous Hall conductivity from the dipole mode of spin-orbit-coupled cold-atom systems*, NewSpin2, College Station, Texas, USA, 12-17 December 2011 (poster).

van Driel, H.J. (UU)
- *Spin drag Hall effect in a rotating Bose mixture*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- *Spin caloritronics in Bose gases*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).
- NewSpin 2, College Station, Texas, USA, 11-18 December 2011 (attended).
- *Coupling of spin and heat current in low dimensional Bose gases*, PLaneT Talk, Utrecht, the Netherlands, 20 December 2011 (talk).

van Gelderen, R. (UU)
- *Band ferromagnetism in trilayer graphene*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- *Spin-orbit coupling in spintronics*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).
- Condensed Matter Meeting, Leiden, the Netherlands, 29 April 2011 (attended).
- *Spin-density-wave instability in graphene doped near the van Hove singularity*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- International School of Solid State Physics, Erice, Italy, 26 July-7 August 2011 (attended).
- *Spin-density-wave instability in graphene doped near the van Hove singularity*, Graphene Day, Delft, the Netherlands, 14 September 2011 (talk).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

van Heck, B. (UL)
- Workshop and Summer School, Topological Aspects of Condensed Matter Physics, ICTP, Trieste, Italy, 24 June-9 July 2011 (attended).
- Summer School, The Frontiers of Condensed Matter, Ecole de Physique des Houches, Les Houches, France, 4-16 September 2011 (attended).
- *Fractional Josephson effect of Majorana fermions in a DC squid*, SSQIP Meeting, TU Delft, the Netherlands, 27 October 2011 (talk).
- *Josephson junction arrays with Majorana fermions*, Physikzentrum, RWTH, Aachen, Germany, 3 November 2011 (talk).
- *Braiding Majorana fermions in Josephson junction arrays*, SSQIP Meeting, TU Delft, the Netherlands, 15 December 2011 (talk).

van Heugten, J.J.R.M. (UU)
- *Color superconductivity*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (poster).
- Color superconductivity DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- DRSTP PhD Day, Utrecht, the Netherlands, 14 October 2011 (attended).

van Ostaay, J. (UL)
- Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (attended).
- *Spin-triplet supercurrent carried by Andreev-Rashba edge states*, DRSTP Postgraduate Course, Statistical Physics and Theory of Condensed Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011 (talk).
- *Spin-triplet supercurrent carried by quantum Hall edge states through a Josephson junction*, International School, Strongly Correlated Electronic Systems, beyond Fermi Liquid Theory, Les Houches, France, 11-21 April 2011 (poster).
- *Spin-triplet supercurrent carried by quantum Hall edge states through a Josephson junction*, DRSTP Symposium, Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011 (poster).
- Science Communicated! Casimir Symposium, Delft, the Netherlands, 26 May 2011 (attended).
- *Spin-triplet supercurrent carried by quantum Hall edge states through a Josephson junction*, NanoCTM Annual Meeting, Nanoelectronics beyond the Roadmap, Keszthely, Hungary, 13-17 June 2011 (poster).
- *Dirac boundary condition at the reconstructed zigzag edge of graphene*, Workshop, Quantum Macroscopic Phenomena in Correlated Electron Systems, Moscow, Russia, 11-12 October 2011 (talk).

Woldhuis, E.L. (UL)
- *Flow near the jamming transition*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011 (talk).

5 | Scientific staff (per 31-12-2011)

Below an overview is given of the permanent and temporary staff of the DRSTP on 31 December 2011. Also the associate members are listed. PhD students are listed in Chapter 4 (Section 4.4).
Theme 1 refers to particle physics, cosmology, quantum gravity and string theory and theme 2 to quantum matter, quantum information, soft condensed matter and biophysics.

5.1 Permanent staff

University of Amsterdam (UvA)	**theme**
dr. S. Ando	1
prof. dr. F.A. Bais (emer. 2010)	1
dr. G.F. Bertone	1
prof. dr. H.W. Capel (emer. prior to 2007)	2
dr. J.-S. Caux	2
prof. dr. J. de Boer	1
prof. dr. R.H. Dijkgraaf	1
prof. dr. J.H. Koch (emer. 2009)	1
prof. dr. E.L.M.P. Laenen	1
prof. dr. B. Nienhuis	2
dr. Th.M. Nieuwenhuizen	2
prof. dr. A.M.M. Pruisken	2
prof. dr. K. Schoutens	2
prof. dr. K. Skenderis	1
prof. dr. J. Smit (emer. 2008)	1
dr. L.G. Suttorp (emer. prior to 2007)	2
dr. M.M. Taylor	1
dr. A.M. Turner	1
dr. L.J. van den Horn (emer. 2008)	1
dr. J.P. van der Schaar	1
dr. W.A. van Leeuwen (emer. 2008)	2
prof. dr. E.P. Verlinde	1

Vrije Universiteit Amsterdam (VUA)	**theme**
dr. K. Allaart (emer. 2008)	2
dr. B.L.G. Bakker (emer. 2009)	1
prof. dr. F.C. MacKintosh	2
prof. dr. P.J.G. Mulders	1
prof. dr. T.D. Visser	2
prof. dr. P.R. ten Wolde	2

University of Groningen (RUG)	**theme**
prof. dr. E.A. Bergshoeff	1
prof. dr. D. Boer	1
prof. dr. M. de Roo (emer. 2011)	1
prof. dr. E. Pallante	1
prof. dr. R.G.E. Timmermans	1
prof. dr. A.C.D. van Enter	2

Leiden University (UL)	**theme**
prof. dr. A. Achúcarro	1
prof. dr. G.T. Barkema	2
prof. dr. C.W.J. Beenakker	2
prof. dr. H.W.J. Blöte (emer. 2008)	2
dr. A. Boyarsky	1
dr. P.J.H. Denteneer	2
dr. D. Garlaschelli	2
prof. dr. G. Nienhuis (emer. 2010)	2
dr. A. Parnachev	1
dr. K.E. Schalm	1
prof. dr. H. Schiessel	2
prof. dr. J.W. van Holten	1
prof. dr. J.M.J. van Leeuwen (emer. prior to 2007)	2
dr. V. Vitelli	2
prof. dr. J. Zaanen	2

Radboud University Nijmegen (RU)	**theme**
dr. W.J.P. Beenakker	1
prof. dr. A. Fasolino	2
prof. dr. M.I. Katsnelson	2
prof. dr. R.H.P. Kleiss	1
prof. dr. H.J.F. Knops (emer. 2005)	2
dr. T.A. Rijken (emer. 2007)	1
prof. dr. A.N.J.J. Schellekens	1

Utrecht University (UU)	**theme**
dr. G.E. Arutyunov	1
prof. dr. G.T. Barkema	2
prof. dr. B. de Wit (emer. 2010)	1
dr. R.A. Duine	2
prof. dr. M.H. Ernst (emer. prior to 2007)	2
prof. dr. E.L.M.P. Laenen	1
prof. dr. R. Loll	1
prof. dr. C. Morais Smith	2
dr. T. Prokopec	1
prof. dr. Th.W. Ruijgrok (emer. prior to 2007)	1, 2
prof. dr. J. Smit (emer. 2008)	1
prof. dr. ir. H.T.C. Stoof	2
prof. dr. G. 't Hooft	1
prof. dr. H. van Beijeren (emer. 2008)	2
prof. dr. P.P.A.M. van der Schoot	2
prof. dr. N.G. van Kampen (emer. prior to 2007)	2
dr. R.H.H.G. van Roij	2
dr. S.J.G. Vandoren	1

Nikhef Theory Group (Nikhef)	**theme**
dr. R. Fleischer	1
prof. dr. J.H. Koch (emer. 2009)	1
prof. dr. E.L.M.P. Laenen	1
prof. dr. A.N.J.J. Schellekens	1
prof. dr. J.-W. van Holten	1
dr. J.A.M. Vermaseren	1

5.2 Temporary staff

University of Amsterdam (UvA)	**theme**
dr. G.P. Brandino	2
dr. G. Chirco	1
dr. B.D. Chowdhury	1
dr. A.S. de Wijn	2
dr. M.P. Heller	1
dr. J.I. Jottar	1
dr. K.Y. Kim	1
dr. B.S. Pozsgai	2
dr. M. Snoek	2

Vrije Universiteit Amsterdam (VUA)	**theme**
dr. M. Dennison	2
dr. A. Sharma	1
dr. M. Sheinman	2

University of Groningen (RUG)	**theme**
dr. J.A. Guarino	1
dr. J.C. Myers	1
dr. D. Roest	1
dr. J. Rosseel	1
dr. E.I. Zavala Carrasco	1

Leiden University (UL)	**theme**
dr. A.R. Akhmerov	2
dr. M. Burello	2
dr. T.P. Choy	2
dr. J. Edge	2
dr. L. Gomez	2
dr. V. Juricic	2
dr. D. Kosenko	1
dr. Y. Liu	2
dr. Y.W. Sun	2
dr. S. Ulrich	2
dr. M. Wimmer	2
dr. K. Wu	2

Radboud University Nijmegen (RU)	**theme**
dr. J. Laamanen	1

Utrecht University (UU)	**theme**
dr. N. Banerjee	1
dr. J. Behrend	1
dr. A.H. Bezett	2
dr. P. Falgari	1
dr. S. Gryb	1
dr. R.K. Gupta	1
dr. I. Khavkine	1
dr. A. Kreienbuehl	1
dr. S.-P. Miao	1
dr. O. Ohlsson-Sax	1
dr. S. Murthy	1
dr. E. Plauschinn	1
dr. B. Sahoo	1
dr. D. Sloan	1
dr. R. Suzuki	1
dr. L.J. Tarrio	1
dr. O. Varela	1
dr. C.H. Wong	2
dr. S. Yin	2

Nikhef Theory Group (Nikhef)	**theme**
dr. P. Artoisenet	1
dr. M. Aybat	1
dr. D.P. George	1
dr. J. Kuipers	1
dr. M. Maio	1
dr. M. Postma	1

5.3 Associate members

	theme
prof. dr. ir. H. Dekker (UvA) (emer. prior to 2007)	2
prof. dr. H.A. de Raedt (RUG)	2
prof. dr. L.-F. Feiner (Philips)	2
dr. B.J. Hoenders (RUG) (emer. 2010)	2
dr. ir. L.P.J. Kamp (TU/e)	2
prof. dr. J. Knoester (RUG)	2
prof. dr. D. Lohse (UT)	2
prof. dr. M.V. Mostovoy (RUG)	2
Theoretical and Polymer Physics Group (TU/e)	2
prof. dr. P.J. van Baal (UL)	1

6 | Academic publications

This chapter presents an overview of publications in refereed journals published in 2011. The publications belonging to theme 1 and theme 2 are given separately. Within each theme the publications are ordered according to university. Occasionally publications may be listed twice, as is the case when staff members are affiliated with more than one university. Publications by associate members are not included. Professional publications are listed in Chapter 8.

6.1 Theme 1

University of Amsterdam

- Arsiwalla, X., de Boer, J., Papadodimas, K. and Verlinde, E., *Degenerate stars and gravitational collapse in AdS/CFT*, JHEP 1101 (2011) 144.
- Balasubramanian, V., Bernamonti, A., de Boer, J., Copland, N., Craps, B., Keski-Vakkuri, E., Müller, B., Schäfer, A., Shigemori, M. and Staessens, W., *Thermalization of strongly coupled field theories*, Phys. Rev. Lett. 106 (2011) 191601.
- Balasubramanian, V., Bernamonti, A., de Boer, J., Copland, N., Craps, B., Keski-Vakkuri, E., Müller, B., Schäfer, A., Shigemori, M. and Staessens, W., *Holographic thermalization*, Phys. Rev. D 84 (2011) 026010.
- Beenakker, W., Brensing, S., Kramer, M., Kulesza, A., Laenen, E., Motyka, L. and Niessen, I., *Squark and gluino hadroproduction*, Int. J. Mod. Phys. A 26 (2011) 2637-2664.
- Bena, I., de Boer, J., Shigemori, M. and Warner, N.P., *Double, double supertube bubble*, JHEP 1110 (2011) 116.
- Booth, I., Heller, M.P. and Spalinski, M., *Black brane entropy and hydrodynamics*, Phys. Rev. D 83 (2011) 061901.
- Booth, I., Heller, M.P., Plewa, G. and Spalinski, M., *On the apparent horizon in fluid-gravity duality*, Phys. Rev. D 83 (2011) 106005.
- Caldeira Costa, R.N. and Taylor, M., *Holography for chiral scale-invariant models*, JHEP 1102 (2011) 082.
- Compere, G., McFadden, P., Skenderis, K. and Taylor, M., *The holographic fluid dual to vacuum Einstein gravity*, JHEP 1107 (2011) 050.
- de Boer, J., Kulaxizi, M. and Parnachev, A., *Holographic entanglement entropy in lovelock gravities*, JHEP 1107 (2011) 109.
- de Boer, J., Sheikh-Jabbari, M.M. and Simon, J., *Near horizon limits of massless*

BTZ and their CFT duals, Class. Quant. Grav. 28 (2011) 175012.
– Easther, R., Flauger, R., McFadden, P. and Skenderis, K., *Constraining holographic inflation with WMAP*, JCAP 1109 (2011) 030.
– Guica, M., Skenderis, K., Taylor, M. and van Rees, B.C., *Holography for Schrodinger backgrounds*, JHEP 1102 (2011) 056.
– McFadden, P. and Skenderis, K., *Holographic non-gaussianity*, JCAP 1105 (2011) 013.
– McFadden, P. and Skenderis, K., *Cosmological 3-point correlators from holography*, JCAP 1106 (2011) 030.
– Meerburg, P.D. and van der Schaar, J.P., *Minimal cut-off vacuum state constraints from CMB bispectrum statistics*, Phys. Rev. D 83 (2011) 043520.
– Skenderis, K. and van Rees, B.C., *Holography and wormholes in 2+1 dimensions*, Comm. Math. Phys. 301 (2011) 583-626.
– Verlinde, E.P., *On the origin of gravity and the laws of Newton*, JHEP 1104 (2011) 029.

Vrije Universiteit Amsterdam

– Badalian, A.M. and Bakker, B.L.G., *Higher excitations of the D and D(s) mesons*, Phys. Rev. D 84 (3) (2011) 034006.
– Badalian, A.M., Bakker, B.L.G. and Danilkin, I.V., *The hyperfine splittings in heavy-light mesons and quarkonia*, Phys. Atom. Nucl. 74 (4) (2011) 631-642.
– Bakker, B.L.G. and Ji, C.R., *Issues in the GPD formulation of DVCS*, Few-Body Sys. 50 (1-4) (2011) 363-365.
– Bakker, B.L.G., *Light-front singularities*, Few-Body Sys. 49 (1-4) (2011) 177-181.
– Bakker, B.L.G. and Ji, C.R., *Spin filter in deeply virtual Compton scattering amplitudes*, Phys. Rev. D 83 (9) (2011) 091502.
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– Gamberg, L.P., Mukherjee, A.B. and Mulders, P.J.G., *Model independent analysis of gluconic pole matrix elements and universality of transverse-momentum-dependent fragmentation functions*, Phys. Rev. D 83 (7) (2011) 071503.

University of Groningen

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– Aprile, F., Roest, D. and Russo, J.G., *Holographic superconductors from gauged supergravity*, JHEP 1106 (2011) 040 (hep-th/11044473).
– Barranco, A., Pallante, E. and Russo, J.G., $N = 1$ *SQCD-like theories with* N_f *massive flavors from AdS/CFT and beta functions*, JHEP 1109 (2011) 086 (hep-th/11074002).
– Bergshoeff, E.A., Hohm, O., Rosseel, J., Sezgin, E. and Townsend, P.K., *More on massive 3D supergravity*, Class. Quant. Grav. 28 (2011) 015002.
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– Gubankova, E., Brill, J., Cubrovic, M., Schalm, K., Schijven, P. and Zaanen, J., *Holographic fermions in external magnetic fields*, Phys. Rev. D 84 (2011) 106003.
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– Koekoek, G. and van Holten J.-W., *Geodesic deviations: modeling extreme massratio systems and their gravitational waves*, Class. Quant. Grav. 28 (2011) 225022.
– Koekoek, G. and van Holten, J.-W., *Epicycles and Poincaré resonances in general relativity*, Phys. Rev. D 83 (2011) 064041.
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- Kleiss, R. and van den Oord, G., *CAMORRA: a C++ library for recursive computation of particle scattering amplitudes*, Comp. Phys. Comm. 182 (2011) 435-447.
- Maio, M. and Schellekens, A.N., *Permutation orbifold of $N = 2$ supersymmetric minimal models*, Nucl. Phys. B 845 (2011) 212-245.
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Utrecht University

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- Ambjørn, J., Jordan, S., Jurkiewicz, J. and Loll, R., *A second-order phase transition in CDT*, Phys. Rev. Lett. 107 (2011) 211303 (hep-th/11083932).
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Nikhef Theory Group

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- Aybat, S.M. and Rogers T.C., *Transverse momentum dependent parton distribution and fragmentation functions with QCD evolution*, Phys. Rev. D 83 (2011) 114042.
- Beenakker, W., Brensing, S., Kramer, M., Kulesza, A., Laenen, E., Motyka, L. and Niessen, I., *Squark and gluino hadroproduction*, Int. J. Mod. Phys. A 26 (2011) 2637-2664.
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335 (2011) 012030.
– de Adelhart Toorop, R., et al., *Constraining flavour symmetries at the EW scale I: the A4 Higgs potential*, JHEP 1103 (2011) 035.
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7 | Scientific activities

This chapter contains an overview of (international) conference talks, seminars, symposia, colloquia, meetings, workshops, lecture courses given at schools and universities and poster presentations of staff members and postdoctoral fellows. A list of public lectures can be found in Chapter 8 (Section 8.2)
An overview of the presentations of PhD students is given in Chapter 4 (Sections 4.5 and 4.6).

7.1 Theme 1

University of Amsterdam
- Bais, F.A., *De zwaartekracht; van Kepler tot supersnaren*, Studium Generale, Maastricht, the Netherlands, 13 January 2011.
- Bais, F.A., *In praise of science*, Comenius Course, University of Cambridge, UK, 26 January 2011.
- Bais, F.A., *Topological symmetry breaking*, Department of Mathematical Physics, Irish National University, Maynooth, Ireland, 4 April 2011.
- Bais, F.A., *De schoonheid van vergelijkingen*, Symposium, Schoonheid in de Wetenschap, Boerhave Museum, Leiden, the Netherlands, 13 May 2011.
- Bais, F.A., *Keerpunten in de natuurwetenschappen*, Comenius Leergang, Kasteel Warnsborn, Arnhem, the Netherlands, 19 May 2011.
- Bais, F.A., *Topological symmetry breaking, and boundary/interface CFT*, International Workshop, Topological Quantum Computing, Moorea, French Polynesia, 23 May 2011.
- Bais, F.A., *Topological symmetry breaking and boundary degrees of freedom*, CMT Lunch Seminar, University of Amsterdam, the Netherlands, 15 June 2011.
- Bais, F.A., *Macht van het modelmatifg denken in de Natuurwetenschappen*, KNAW Symposium, Modeleren in de Wetenschap, KNAW, Amsterdam, the Netherlands, 20 June 2011.
- Bais, F.A., *Topological order and its breaking*, Physics Colloquim, Nankai University, Tsianjin, China, 23 August 2011.
- Bais, F.A., *Topological order and quantumsymmetry*, Institute for Theoretical Physics, Chinese Academy of Science, Beijing, China, 25 August 2011.
- Bais, F.A., *Topological symmetry breaking*, Workshop, Topological Insulators, Kavli Institute for Theoretical Physics China, Beijing, 26 August 2011.

- Bais, F.A., *Topological symmetry breaking and boundary/interface CFT's*, Workshop, Topological Computation and Insulators, Irish National University, Maynooth, Ireland, 6 September 2011.
- Bais, F.A., *In praise of science*, Royal Irish Academy of Sciences, Dublin, Ireland, 7 September 2011.
- Bais, F.A., *Touching tomorrow's world with today's science*, SFI/Comenius Workshop, Leusden, the Netherlands, 8 September 2011.
- Bais, F.A., *Keerpunten in de natuurwetenschap*, Studium Generale, Maastricht University, the Netherlands, 17 November 2011.
- Bais, F.A., Dr. Joost Slingerland, National University of Ireland, Maynooth, Ireland, 3-8 April 2011 (work visit).
- Bais, F.A., *Workshop on topological order and quantum computation*, Microsoft Research, Richard B. Gump South Pacific Research Station, Moorea, French Polynesia, 22-29 May 2011.
- Bais, F.A., Research program entitled: *Topological insulator and topological superconductor*, Kavli Institute for Theoretical Physics China (KITPC), Beijing, 9-22 August 2011.
- Bais, F.A., Maynooth Workshop, Topological Computing, Maynooth, National University of Ireland, Maynooth, Ireland, 5-9 September 2011.
- Bais, F.A., SFI/Comenius Workshop, Complexity Science, Santa Fe Institute, New Mexico, USA, 18-25 September 2011.
- Chowdhury, B.D., *Moulting black holes*, International Conference, Paris, France, 16 November 2011.
- de Boer, J., *Topics in AdS-CFT*, Four Minicourses, DRSTP Postgraduate Course Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011.
- de Boer, J., *Holography, entanglement, and thermalization*, Conference, Great Lakes Strings 2011, Chicago, USA, 30 April 2011.
- de Boer, J., *Holography, entanglement and thermalization*, Workshop, Gauge Theories, Strings and Geometry, Brussels, Belgium, 20 May 2011.
- de Boer, J., *Some recent results on microstate geometries*, IPMU, Tokyo, Japan, 31 May 2011.
- de Boer, J., *Holography, entanglement and thermalization*, NBI, Copenhagen, Denmark, 9 June 2011.
- de Boer, J., *Introduction to AdS/CFT*, Series of Lectures, Les Houches Summer School, Theoretical Physics to Face the Challenge of LHC, Houches, France, 8-10 August 2011.
- de Boer, J., *Some lessons from AdS/CFT*, ESF Exploratory Workshop, Gravity as Thermodynamics: Towards the Microscopic Origin of Geometry, Trieste, Italy, 5 September 2011.
- de Boer, J., *String theory and black holes*, 17th European Workshop, String Theory, Padova, Italy, 8 September 2011.
- de Boer, J., Comments on Extremal Black Holes talk, Workshop, String Theory, Holography and Beyond, Seoul, Korea, 22 September 2011.
- de Boer, J., *Black holes in string theory*, Nikhef Theory Group, Amsterdam, the

Netherlands, 13 October 2011.
- de Boer, J., *Holography and black holes*, Colloquium, TSU Andronikahvili Institute of Physics, Tbilisi, Georgia, USA, 28 October 2011.
- de Boer, J., *Supersymmetric solutions and their entropy*, Workshop, The Supersymmetric, the Extremal and the Ugly - Solutions in String Theory, Saclay, France, 15 November 2011.
- de Boer, J., *Lifshitz vs Lifshitz*, Paris Meeting, Holography at Finite Density, APC, Paris, France, 17 November 2011.
- de Boer, J., *Extremal black holes in string theory*, ICTP, Trieste, Italy, 14 December 2011.
- Heller, M.P., *Cold nuclear matter in $Nf = 1$ holographic QCD*, Warsaw, Poland, 19 December 2011.
- Heller, M.P., *The characteristics of thermalization of boost-invariant plasma from holography*, Heraklion, Greece, 22 November 2011.
- Heller, M.P., *Black brane entropy and hydrodynamics*, Barcelona, Spain, 29 September 2011.
- Heller, M.P., *The characteristics of thermalization of boost-invariant plasma from holography*, Barcelona, Spain, 29 September 2011.
- Heller, M.P., *The characteristics of thermalization of boost-invariant plasma from holography*, Copenhagen, Denmark, 10 August 2011.
- Heller, M.P., *Gauge-gravity duality and near-equilibrium entropy production*, Warsaw, Poland, 19 April 2011.
- Heller, M.P., *Gauge-gravity duality and near-equilibrium entropy production*, Cracow, Poland, 18 April 2011.
- Heller, M.P., *Black brane entropy and hydrodynamics*, Copenhagen, Denmark, 3 February 2011.
- Heller, M.P., *The characteristics of thermalization of boost-invariant plasma from holography*, EPS-HEP Conference, String Theory Parallel Session, Grenoble, France, 23 July 2011.
- McFadden, P., *Inflationary cosmology: a holographic perspective*, International Workshop, Strong Gravity and Holographic Cosmology, University of Amsterdam, the Netherlands, 8 November 2011.
- McFadden, P., *Cosmological 3-point functions from holography*, Seminar, Syracuse University, New York, USA, 31 October 2011.
- McFadden, P., *The holographic fluid dual to vacuum Einstein gravity*, Seminar, Perimeter Institute, Waterloo, Ontario, Canada, 27 September 2011.
- McFadden, P., *Inflationary cosmology: a holographic perspective*, Sixth Aegean Summer School, Quantum Gravity and Quantum Cosmology, Naxos, Greece, 17 September 2011.
- McFadden, P., *Inflationary cosmology: a holographic perspective*, International Conference, Challenges for Early Universe Cosmology, Perimeter Institute, Waterloo, Ontario, Canada, 14 July 2011.
- McFadden, P., *The holographic fluid dual to vacuum Einstein gravity*, CERN, Theory Division, Genève, Switzerland, 31 May 2011.

- McFadden, P., *Holographic non-Gaussianity*, ICTP, Trieste, Italy, 3 March 2011.
- Skenderis, K., *Holographic inflation confronts data*, Conference, Great Lakes Strings 2011, Chicago, USA, 29 April-1 May 2011.
- Skenderis, K., *Holographic inflation confronts data*, Workshop, Gauge Theories, Strings and Geometry, International Solvay Institute, Brussels, Belgium, 18-20 May 2011.
- Skenderis, K., *The holographic fluid dual to vacuum Einstein gravity*, 6th Regional Meeting, String Theory, Milos, Greece, 19-26 June 2011.
- Skenderis, K., *Holographic inflation: an update*, University of Crete, Heraklion, Greece, 14 October 2011.
- Skenderis, K., *Holography from generalized dimensional reduction*, Paris Meeting, Holography at Finite Density, 16-18 November 2011.
- Skenderis, K., *The holographic universe*, University of Nottingham, UK, 9 December 2011.
- Skenderis, K., *Holographic models of inflation*, Conference, Miami 2011, 15-20 December 2011.
- Taylor, M., *Non-relativistic holography*, Conference, AdS/CFT and Condensed Matter, Imperial College, London, UK, 10-11 January 2011.
- Taylor, M., *Schrödinger holography*, University of Edinburgh, Scotland, UK, 23 February 2011.
- Taylor, M., *A holographic view of the universe*, University of Groningen, the Netherlands, 15 March 2011.
- Taylor, M., *A holographic view of the universe*, Utrecht University, the Netherlands, 23 March 2011.
- Taylor, M., *Recent progress in holography*, National Theory Seminar, Nikhef, Amsterdam, the Netherlands, 25 March 2011.
- Taylor, M., *The holographic fluid dual to vacuum Einstein gravity*, PASCOS 2011, Cambridge, UK, 3-8 July 2011.
- Taylor, M., *The holographic fluid dual to vacuum Einstein gravity*, University of Crete, Heraklion, Greece, 18 October 2011.
- Taylor, M., *The holographic fluid dual to vacuum Einstein gravity*, Conference, Miami, Florida, USA, 15-20 December 2011.
- van der Schaar, J.P., *Constraints on excited states in effective field theories of inflation*, Arizona State University, Arizona, USA, 26 October 2011.
- Verlinde, E.P., *Paradigm shift: strings, black holes, gravity and dark matters*, POTUS-meeting, California Institute of Technology, USA, 8 January 2011.
- Verlinde, E.P., *The lost phase space of the universe*, Theory Seminar, Caltech, California, USA, 4 February 2011.
- Verlinde, E.P., *On the origin of gravity, dark energy and matter*, CERN-PH Seminar, Genève, Switzerland, 28 April 2011.
- Verlinde, E.P., *Gravity*, Conference, Holographic Cosmology, Perimeter Institute, Ontario, Canada, June 2011.
- Verlinde, E.P., *Progress on emerging gravity*, Theory Seminar, KITP, California, USA, March 2011.

- Verlinde, E.P., *On the origin of gravity*, Colloquium, Astronomy Department, University of Amsterdam, the Netherlands, March 2011.
- Verlinde, E.P., *The hidden phase space of our universe strings*, Uppsala University, Sweden, June 2011.
- Verlinde, E.P., *The common origins of gravity*, Dark Energy and Dark Matter Seminaire du Campus Parisien Colloquium, France, 14 October 2011.
- Verlinde, E.P., *The origin of gravity*, 25th Solvay-Meeting, Brussels, Belgium, 22 October 2011.
- Verlinde, E.P., *Dark matter, dark energy and the emergence of gravity*, Sommerfeld Theory Colloquium, University of Munich, Germany, 16 November 2011.
- Verlinde, E.P., *Emergent gravity*, Lecture Series, Jerusalem Winter School for Theoretical Physics, Israel, 27-31 December 2011.

Vrije Universiteit Amsterdam

- Mulders, P.J., *Universality of TMDs*, Workshop, Opportunities for Drell-Yan Physics, RHIC, Brookhaven National Laboratory, USA, 11 May 2011.
- Mulders, P.J., *Transverse momenta of partons in high-energy scattering processes*, 2011 Enrico Fermi School, Course CLXXX Three-Dimensional Partonic Structure of the Nucleon, Varenna, Italy, 28 June-8 July 2011.
- Mulders, P.J., *The three-dimensional partonic structure of the nucleon*, Rapporteur Talk, Thomas Jefferson National Accelerator Facility, Newport News, USA, 22 August 2011.
- Mulders, P.J., *Theoretical aspects of TMDs*, Conference, Partons in Nucleons and Nuclei (PINAN), Marrakech, Morocco, 26-30 September 2011.
- Rogers, T.C., *Gauge-links and TMD factorization*, Workshop, Opportunities for Drell-Yan Physics at RHIC, Brookhaven National Laboratory, USA, 11 May 2011.
- Rogers, T.C., *TMD factorization, factorization breaking, and evolution*, 19th International Workshop, Deep Inelastic Scattering in Newport News, Virginia, USA, 13 April 2011.

University of Groningen

- Bergshoeff, E.A., *Branes, supergravity and T-duality*, Conference, Iberian Strings 2011, Valencia, Spain, February 2011.
- Bergshoeff, E.A. *Surprises with gravity in three and four dimensions*, London, UK, March 2011.
- Bergshoeff, E.A., *Modes of log gravity*, 27th Nordic Network Meeting, Strings, Fields and Branes, Copenhagen, Denmark, March 2011.
- Bergshoeff, E.A., *Supersymmetric solitons*, New York University, USA, June 2011.
- Bergshoeff, E.A., *Dual doubled geometry*, Conference, String-Math 2011, Philadelphia, USA, June 2011.
- Bergshoeff, E.A., *New results on supersymmetric solitons in string theory*, Brussels, Belgium, June 2011.
- Bergshoeff, E.A., *Branes, duality and doubled geometry*, International Workshop, Supersymmetries and Quantum Symmetries (SQS-2011), Dubna, Russia, July 2011.

- Bergshoeff, E.A., *Wrapping branes and T-duality*, Conference, Istanbul 2011: Strings, Branes and Supergravity, Istanbul, Turkey, August 2011.
- Bergshoeff, E.A., *Wrapping branes and T-duality*, 7th International Conference, Quantum Theory and Symmetries (QTS-7), Prague, Czech Republic, August 2011.
- Bergshoeff, E.A., *Branes and wrapping rules*, XVII European Workshop, String Theory 2011, Padua, Italy, September 2011.
- Bergshoeff, E.A., *Massive gravity*, Sixth Aegean Summer School, Quantum Gravity and Cosmology, Naxos, Greece, September 2011.
- Bergshoeff, E.A., *Branes and monopoles*, Madrid, Spain, October 2011.
- Bergshoeff, E.A., *Branes and monopoles*, Barcelona, Spain, November 2011.
- Bergshoeff, E.A., *Branes and monopoles*, Kings College, London, UK, November 2011.
- Bergshoeff, E.A., *New massive dual gravity: beyond 3D*, Conference, Elementary Particles, Astrophysics, and Cosmology Miami 2011, USA, December 2011.
- Boer, D., *Measuring W-W'mixing with spin asymmetries at RHIC*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Boer, D., *Evolving gluons: the Froissart bound, color glass, and linear polarization*, DRSTP Symposium Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011.
- Guarino, A., *Dualities and the landscape of extended supergravity*, Department of Physics and Astronomy, Uppsala University, Sweden, 14 December 2011.
- Guarino, A., *Gaugings, fluxes and moduli fixing in (half-) maximal supergravity*, Institute for Theoretical Physics, Bern, Switzerland, 29 November 2011.
- Guarino, A., *Flux vacua from gauged supergravities*, Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Potsdam, Germany, 22 November 2011.
- Guarino, A., *Towards disentangling the landscape of extended supergravities*, Seminar, Arnold Sommerfeld Center for Theoretical Physics, Munich, Germany, 12 October 2011.
- Guarino, A., *Connecting vacua of half-maximal supergravities: a type IIA example*, 27th Nordic Network Meeting, Strings, Fields and Branes, Copenhagen, Denmark, 24-26 March 2011.
- Guarino, A., *De Sitter universes from string theory*, Kapteyn Astronomical Institute, University of Groningen, the Netherlands, 3 March 2011.
- Myers, J.C., *QCD and SQCD at non-zero chemical potential*, Workshop, Large N Gauge Theories, Galileo Galilei Institute, Arcetri, Florence, Italy, 18 May 2011.
- Myers, J.C., *Phase diagram of QCD-based theories with chemical potential in a small volume*, Syracuse University, New York, USA, 12 December 2011.
- Myers, J.C., *Phase diagram of QCD-based theories with chemical potential in a small volume*, Washington University, St. Louis, Missouri, USA, 14 December 2011.
- Pallante, E., *Physics on the lattice with dynamical light and charm quarks*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Pallante, E., *Conformality in gauge theories*, Physics@FOM, Veldhoven, the Neth-

erlands, 18-19 January 2011.
- Pallante, E., *On the spectrum of many-flavor QCD*, XXIX International Symposium, Lattice Field Theory, Lattice 2011, Squaw Valley, Lake Tahoe, California, USA, 10-16 July 2011.
- Pallante, E., *Lattice studies of technicolor candidate theories*, Strong NET Workshop, Trento, Italy, 5 October 2011.
- Roest, D., *Metastable SUSY breaking in supergravity and string theory*, PASCOS, Cambridge, UK, 5 July 2011.
- Roest, D., *Metastable SUSY breaking in extended supergravity*, Saclay, Paris, France, 17 June 2011.
- Roest, D., *Strings and cosmology*, 14th Symposium, Astroparticle Physics, Groningen, the Netherlands, 19 April 2011.
- Roest, D., *Metastable SUSY breaking in extended supergravity*, University of Uppsala, Sweden, 5 April 2011.
- Roest, D., *Metastable SUSY breaking in extended supergravity*, University of Utrecht, the Netherlands, 21 January 2011.
- Roest, D., *Metastable SUSY breaking in extended supergravity*, Seminar, University of Milano, Italy, 12 January 2011.
- Roest, D., *Metastable SUSY breaking in extended supergravity*, University of Torino, Italy, 11 January 2011.
- Roest, D., *Modern cosmology: a challenge for fundamental physics*, Mathematics Colloquium, University of Groningen, the Netherlands, 25 January 2011.
- Rosseel, J., *Massive and critical (super)gravities in d >= 3*, KU Leuven, Belgium, 9 March 2011.
- Rosseel, J., *Massive and critical gravities in d >= 3*, LMU Munich, Germany, 16 June 2011.
- Rosseel, J., *Massive and critical gravities in d >= 3*, Uppsala University, Sweden, 4 May 2011.
- Rosseel, J., *Massive and critical gravities in d >= 3*, Saclay, Paris, France, 10 June 2011.
- Rosseel, J., *Critical gravities in d >= 3*, Workshop, SQS 2011, Dubna, Russia, 18 July 2011.
- Rosseel, J., *The critical gravity/log CFT correspondence*, University of Groningen, the Netherlands, 23 June 2011.

Leiden University

- Achúcarro, A., *Heavy physics from the cosmic microwave background*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Achúcarro, A., *Supergravity and inflationary cosmology*, COSMO-11, Oporto, Portugal, 22-26 August 2011.
- Achúcarro, A., *Topology in the sky: cosmic strings and other "defects"*, Mini Symposium, Solitons, Strings and Black Holes, XXXI Dynamics Days Europe, Oldenburg, Germany, 12-16 September 2011.
- Achúcarro, A., *Topology in the sky: cosmic strings and other "defects"*, Algebro-

Geometric Methods in Gauge Theory and General Relativity, Delmenhorst, Germany, 12-16 September 2011.
- Achúcarro, A., *Ultra-high speed collision and reconnection of Abelian Higgs strings in the deep type-II regime*, PASCOS 2011, Cambridge, UK, 3-8 July 2011.
- Boyarsky, A., *Can a complete theory of particle physics be testable with present experimental techniques?*, Colloquium Erenfestii, Leiden, the Netherlands, 30 March 2011.
- Boyarsky, A., *New physics without new energy scale: experimental bounds, recent progress and predictions*, Conference, Particle Physics and Cosmology (PPC), CERN, Switzerland, 16 June 2011.
- Boyarsky, A., *Cosmological magnetic fields and lepton asymmetry*, Workshop, Baryogenesis and First Order Phase Transitions, Leiden, the Netherlands, 6 September 2011.
- Boyarsky, A., et al., *An integrated socio-technical crowd sourcing platform for accelerating returns in eScience*, 10th International Semantic Web Conference, Bonn, Germany, published in ICWC-2011, Demo papers ("Best demo paper" award), 23-27 October 2011.
- Boyarsky, A., Cudré-Mauroux, P., Demartini, G., Ruchayskiy, O. and Aberer, K., *ScienceWISE: A web-based interactive semantic platform for scientific collaboration*, 10th International Semantic Web Conference, Bonn, Germany, published in ICWC-2011, Outrageous Ideas papers ("Second best paper" award), 23-27 October 2011.
- Jackson, M.G., *Effective field theory in inflation*, Calán Astronomy Seminar, University of Chile, Santiago, January 2011.
- Jackson, M.G., *Effective field theory in inflation*, Cosmology Seminar, Pontificia Universidad Católica de Santiago, Chile, January 2011.
- Jackson, M.G., *Effective field theory in inflation*, Observatory of Paris, Meudon, France, March 2011.
- Jackson, M.G., *Effective field theory in inflation*, Cosmology Seminar, Perimeter Institute, Waterloo, Ontario, Canada, May 2011.
- Jackson, M.G., *Effective field theory in inflation*, Arizona State University, Tempe, Arizona, USA, May 2011.
- Jackson, M.G., *Effective field theory in inflation*, Fermilab Theory Blackboard Seminar, Batavia, Illinois, USA, June 2011.
- Jackson, M.G., *Effective field theory in inflation*, PASCOS 2011, Parallel Session, Cambridge, UK, July 2011.
- Jackson, M.G., *Effective field theory in inflation*, Theory Seminar, Stanford University, Palo Alto, California, USA, July 2011.
- Parnachev, A., *Holography from the tachyon*, Novosibirsk, Russia, March 2011.
- Parnachev, A., *Holography from the tachyon*, Perugia, Italy, May 2011.
- Parnachev, A., *Holography from the tachyon*, GGI, Florence, Italy, May 2011.
- Parnachev, A., *Holography from the tachyon*, Milos, Greece, June 2011.
- Parnachev, A., *Holography from the tachyon*, Trieste, Italy, August 2011.
- Parnachev, A., *Holography from the tachyon*, KITP Santa Barbara, California,

USA, September 2011.
- Parnachev, A., *Holography from the tachyon*, Imperial College, London, UK, October 2011.
- Schalm, K.E., *Inflation in a time of crisis*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Schalm, K.E., *Observing strings in a realistic inflationary background*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Schalm, K.E., *Geometry encoding for statistics: from Fermi liquids to Cooper pairing*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Schalm, K.E., *Fermion spectral functions and AdS/CFT*, International Workshop, AdS/CFT and Condensed Matter, Imperial College, London, UK, January 2011.
- Schalm, K.E., *A new approach to strongly coupled fermions: quantum criticality and anti-de Sitter string theory*, Seminar, HK-IAS, Hong Kong, China, March 2011.
- Schalm, K.E., *A new approach to strongly coupled Fermi systems: quantum criticality from anti-de-Sitter string theory*, Lecture Series, Goteborg, Sweden, March 2011.
- Schalm, K.E., *AdS-CFT correspondence and superconductivity I*, International Workshop, 100 years of Superconductivity, Leiden, the Netherlands, April 2011.
- Schalm, K.E., *Fermionic quantum criticality from AdS string theory*, Seminar, Universitat de Barcelona, Spain, May 2011.
- Schalm, K.E., *Constructing a Wilsonian cosmological effective action*, Conference, Cosmology since Einstein, HK-IAS, Hong Kong, China, June 2011.
- Schalm, K.E., *Towards a holographic description of the Fermi liquid*, Conference, Cold Materials, Hot Nuclei, and Black Holes, ICTP, Trieste, Italy, August 2011.
- Schalm, K.E., *Towards a holographic Fermi liquid*, Seminar, Holographic Duality and Condensed Matter Physics, KITP, Santa Barbara, USA, November 2011.
- Schalm, K.E., *On Holographic Fermi liquids and exciton-driven phase transitions*, Paris Meeting, Holography at Finite Density, APC, Paris, France, November 2011.
- Vitelli, V., *The fate of the sonic vacuum*, DRSTP Symposium Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011.

Radboud University Nijmegen

- Beenakker, W.J.P., *How much SUSY are we looking for?*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Beenakker, W.J.P., *Physics and astronomy in Nijmegen*, Kavli Institute for Theoretical Physics China (KITPC), Beijing, China, 26 October 2011.
- Beenakker, W.J.P., *Physics and astronomy in Nijmegen*, School of Material Science and Engineering, Shanghai University, China, 1 November 2011.
- Beenakker, W.J.P., *Physics and astronomy in Nijmegen*, Department of Physics, Shanghai University, China, 1 November 2011.
- Beenakker, W.J.P., *Physics and astronomy in Nijmegen*, Shanghai Institute of Applied Physics (SINAP), Shanghai, China, 4 November 2011.
- Laamanen, J.A., *Stop NLSP in CMSSM*, University of Helsinki and Helsinki Institute of Physics, Sweden, 3 November 2011.

Utrecht University

- Arutyunov, G.E., *Some aspects of the mirror TBA*, Physics Mathematics Summer Institute, Double Affine Hecke Algebras, the Langlands Program, Affine Flag Varieties, Conformal Field Theory, Super Yang-Mills Theory, Luminy-Cargese, France, 20 June-16 July 2011.
- Arutyunov, G.E., *The mirror TBA*, 35th Johns Hopkins Workshop, AdS/CFT and its Applications, Budapest, Hungary, 22-24 June 2011.
- Arutyunov, G.E., *The mirror TBA*, International Conference, Recent Advances in Quantum Field and String Theory, Tbilisi, Georgia, 26-30 September 2011.
- Arutyunov, G.E., *The mirror TBA*, Theoretical Physics Colloquium, ETH, Zurich, Switzerland, 23 November 2011.
- Arzano, M., *Anatomy of a deformed symmetry: field quantization on curved momentum space*, Workshop, Relative Locality, Sapienza University of Rome, Italy, 14 April 2011.
- Arzano, M., *Quantum fields on curved momentum space*, XXIX Max Born Symposium, Wroclaw, Poland, 29 June 2011.
- Arzano, M., *Quantum fields on curved momentum space*, Sixth Aegean Summer School, Quantum Gravity and Quantum Cosmology, Naxos, Greece, 12 September 2011.
- Behrend, J.C., *Recent developments in the covariant averaging approach*, Kosmologietag, IBZ, Bielefeld University, Germany, 5-6 May 2011.
- Behrend, J.C., *On the possibility of a Poincare gauge theory as an averaged theory of gravity*, Cosmo 11, International Conference, Particle Physics and Cosmology, Porto, Portugal, 22-26 August 2011.
- Behrend, J.C., *Backreaction: where do we stand?*, Institut d'Astrophysique de Paris, France, "Einstein-Cartan Theory and Averaging", 22-23 November 2011.
- de Wit, B., *Lessons learned from BPS black holes*, Indian Strings Meeting 2011, Puri, India, 6 January 2011.
- de Wit, B., *Elementary particles, strings and black holes*, Indian Strings Meeting 2011, Institute of Physics & National Institute of Science Education and Research, Bhubaneswar, India, 7 January 2011.
- de Wit, B., *BPS near-horizon geometry of 5D black holes and rings*, Indian Institute of Science, Bangalore, India, 18 January 2011.
- de Wit, B., *Elementary particles, strings and black holes*, Colloquium, Indian Institute of Scienc, Bangalore, India, 20 January 2011.
- de Wit, B., *Lessons learned from BPS black holes* ,Seminar, Swieca/DRSTP School, Campos do Jordão/Sao Paulo, Brazil, 7 February 2011.
- de Wit, B., *Elementary particles, strings and black holes*, Colloquium, School of Physical Sciences, Jawaharlal Nehru University, New Delhi, India, 21 February 2011.
- de Wit, B., *BPS near-horizon geometry of 5D black holes and rings*, QFT 2011 Conference, Indian Institute of Science Education and Research, Pune, India, 23 February 2011.
- de Wit, B., *Lessons learned from BPS black holes*, University of Rome, Tor Vergata,

Italy, 11 March 2011.
- de Wit, B., *BPS near-horizon geometry of 5D black holes and rings*, Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France, 13 April 2011.
- de Wit, B., *Deformations of special geometry: in search of the topological string*, Symposium, Three String Generations at IHÉS, Bures-sur-Yvette, France, 17 May 2011.
- de Wit, B., *On black hole entropy*, DRSTP 9th Biennial Symposium 'Trends in Theory', Dalfsen, the Netherlands, 20 May 2011.
- de Wit, B., *Elementary particles, strings and black holes*, Raman Research Institute, Bangalore, India, 28 October 2011.
- de Wit, B., *BPS near-horizon geometry of 5D spinning black holes and the 4D/5D connection*, Harish Chandra Research Institute, Allahabad, India, 2 November 2011.
- de Wit, B., *BPS near-horizon geometry of 5D spinning black holes and the 4D/5D connection*, Workshop, Geometry of Strings and Fields, Nordita, Stockholm, Sweden, 15 November 2011.
- Falgari, P., *Threshold resummation of heavy coloured particle cross section*, Strong Interactions: from Method to Structures, Bad Honnef, Germany, 12-16 February 2011.
- Falgari, P., *Soft and Coulomb resummation for heavy coloured particle production*, Theory Centre Meeting, Nikhef, Amsterdam, the Netherlands, 18 February 2011.
- Falgari, P., *Soft and Coulomb-gluon resummation in pair production of heavy coloured particles*, Seminar, Edinburgh, UK, 6 April 2011.
- Falgari, P., *Off-shell and non-factorizable effects in single-top hadroproduction*, Seminar, Mainz, Germany, 14 June 2011.
- Falgari, P., *Recent results of ttbar cross section at NNLO/NNLL*, TH-LPCC Summer Institute, CERN, Geneva, Switzerland, 1-13 August 2011.
- Falgari, P., *The top-pair total cross section at NNLL order*, 10th International Symposium on Radiative Corrections (RADCOR11), Mamallapuram, India, 27 September 2011.
- Falgari, P., *Precise theoretical predictions of the ttbar total cross section at hadron colliders*, Seminar, Bangalore, India, 4 October 2011.
- Falgari, P., *Recent new results for ttbar threshold resummation and off-shell single-top production*, Amsterdam Particle Physics Symposium (APPS11), Amsterdam, the Netherlands, 1 December 2011.
- Falgari, P., *NNLL predictions for ttbar total cross section at hadron colliders*, Seminar, Nikhef, Amsterdam, the Netherlands, 8 December 2011.
- Gupta, R.K., *Logarithmic correction to N=2 black hole entropy: an infrared window into the microstate*, ITP, Utrecht University, the Netherlands, 15 September 2011.
- Gryb, S., *Shape dynamics: the conformal backbone of general relativity*, Quantum Gravity Colloquium 6, FAU Erlangen-Nurnberg, Germany, 5 October 2011.
- Gryb, S., *Shape dynamics: the conformal backbone of general relativity*, Grafiti no. 226, ITP, Utrecht, the Netherlands, 10 October 2011.
- Khavkine, I., *Mathematical aspects of classical and quantum gauge theories*, Lec-

tures, Seminar Derived Differential Geometry, Department of Mathematics, Utrecht University, the Netherlands, June 2011.
- Khavkine, I., *Time delay observable in classical and quantum geometries*, Seminar, AEI, Golm, Germany, 16 June 2011.
- Khavkine, I., *Characteristic geometry and causality in locally covariant field theory*, Quist Seminar, ITP, Utrecht University, the Netherlands, 8 September 2011.
- Khavkine, I., *Characteristic geometry and causality in locally covariant field theory*, Modern Trends in AQFT Workshop, University of Pavia, Italy, 14 September 2011.
- Khavkine, I., *Time delay observable in classical and quantum geometries*, Seminar, Department of Fundamental Physics, University of Barcelona, Spain, 1 December 2011.
- Khavkine, I., *Time delay observable in classical and quantum geometries*, Quist Seminar, ITP, Utrecht University, the Netherlands, 5 December 2011.
- Koivisto, T.S., *New approaches to gravity theories*, Seminar, Centro de Astronomia e Astrofysica da Universidade de Lisboa, Lisabon, Portugal, 17 February 2011.
- Koivisto, T.S., *C-theories of gravitation*, Seminar, Departamento de Fysica Teoretica, Universidad Complutense, Madrid, Spain, 10 March 2011.
- Koivisto, T.S., *C-theories of gravitation*, Seminar, El Instituto de Estructura de la Materia, Valencia, Spain, 14 March 2011.
- Koivisto, T.S., *Unifying Einstein and Palatini gravities*, Grafiti no. 217, ITP, Utrecht University, the Netherlands, 4 April 2011.
- Koivisto, T.S., *Anisotropies in dark energy*, Colloquim, Institutt for Teoretisk Astrofysikk, Oslo, Norway, 1 June 2011.
- Koivisto, T.S., *Intro to my research*, Astronomy Centre, Sussex, UK, 21 June 2011.
- Koivisto, T.S., *Nonmetricity in cosmology*, Annual International Conference, Particle Physics and Cosmology - COSMO 11, Porto, Portugal, 22 August 2011.
- Loll, R., *New 'best hope' for quantum gravity?*, Colloquium, Perimeter Institute, Waterloo, Canada, 9 February 2011.
- Loll, R., *New 'best hope' for quantum gravity?*, Theory Seminar, Nikhef, Amsterdam, the Netherlands, 24 March 2011.
- Loll, R., *Causal dynamical triangulation - a gateway to quantum gravity*, Conference, Spring Meeting of the DPG (Deutsche Physikalische Gesellschaft), Karlsruhe, Germany, 30 March 2011.
- Loll, R., *Nonperturbative highlights on quantum gravity from causal dynamical triangulation*, Conference, Loops '11, Madrid, Spain, 26 May 2011.
- Loll, R., *Searching for the quantum origins of space and time*, Colloquium, Heriot-Watt University, Edinburgh, UK, 1 June 2011.
- Loll, R., *Nonperturbative highlights on quantum gravity from CDT*, Conference, Quantum Theory and Gravitation, ETH Zurich, Switzerland, 22 June 2011.
- Loll, R., *Quantum gravity at the Planck scale: getting a handle on 'spacetime foam'*, Workshop, Waves and Quantum Fields on Fractals, Technion, Israel, 29 June 2011.
- Loll, R., *Probing the Planckian structure of spacetime*, 8th Ladyzhenskaya Lecture in the Mathematical Sciences, Leipzig, Germany, 9 November 2011.
- Loll, R., *Probing the Planckian structure of spacetime*, 5th AFI Christmas Col-

loquium, Innsbruck, Austria, 2 December 2011.
- Murthy, S., *Quantum black holes, wall-crossing and mock modular forms*, Lecture series, Department of Mathematics, Utrecht University, the Netherlands, October-November 2011.
- Murthy, S., *Exact quantum entropy of black holes: from Bekenstein-Hawking to AdS2 functional integrals*, String Theory Seminar, Utrecht University, the Netherlands, 11 November 2011.
- Murthy, S., *Localization and exact holography*, CERN Theory Seminar, Geneva, Switzerland, 13 December 2011.
- Olsson-Sax, O., *Integrable spin-chains from AdS3/CFT2*, String Seminar, ITP, Utrecht University, the Netherlands, 28 October 2011.
- Plauschinn, E., *Nonassociative gravity in string theory?*, Amsterdam String Theory Seminar, the Netherlands, 25 January 2011.
- Plauschinn, E., *Nonassociative gravity in string theory?*, XXIII Workshop, Beyond the Standard Model, Bad Honnef, Germany, 14 March 2011.
- Plauschinn, E., *Nongeometric fluxes, asymmetric strings and nonassociative geometry*, String Phenomenology Conference, Madison, USA, 23 August 2011.
- Plauschinn, E., *Nongeometric fluxes, asymmetric strings and nonassociative geometry*, Workshop, Noncommutative Field Theory and Gravity, Corfu, Greece, 9 September 2011.
- Plauschinn, E., *Nongeometric fluxes, asymmetric strings and nonassociative geometry*, Lisbon String Theory Seminar, Portugal, 14 November 2011.
- Prokopec, T., *Decoherence in QFT*, University of Zagreb, Croatia, 17 March 2011.
- Prokopec, T., *Decoherence in quantum field theory*, ITP, Heidelberg University, Germany, 24 March 2011.
- Prokopec, T., *On decoherence*, ITP, Utrecht University, the Netherlands, 18 May 2011.
- Prokopec, T., *On quantum backreaction in cosmology*, CEA, Saclay, France, 2 November 2011.
- Sahoo, B., *Topologically massive higher spin gravity*, String Seminar, Utrecht University, the Netherlands, 21 October 2011.
- Sloan, D., *LQC and the WMAP 7 Year Data*, Loops'11 Conference, Madrid, Spain, 27 May 2011.
- Sloan, D., *Advanced topics in relativity*, Warsaw University, Poland, 5 June 2011.
- Sloan, D., *The a priori probability of inflation in loop quantum cosmology*, Warsaw University, Poland, 7 June 2011.
- Suzuki, R., *Hybrid NLIE for the Mirror AdS_5xS^5*, Seminar, National Taiwan University, Taipei, Taiwan, 25 February 2011.
- Suzuki, R., *Hybrid NLIE for the Mirror AdS_5xS^5*, Seminar, Shizuoka University, 7 March 2011, Shizuoka, Japan Seminar, Yukawa Institute for Theoretical Physics, 2 March 2011, Kyoto, Japan, 2 March 2011.
- 't Hooft, G., *Black hole complementarity and the hierarchy problem*, Colloquium, Universidad Autonoma de Madrid-Cantoblanco, Spain, 16 February 2011.
- 't Hooft, G., *The hierarchy problem*, Colloquium, University of Amsterdam, the

Netherlands, 25 February 2011.
- 't Hooft, G., *Naturalness*, Lecture, Meeting on Particle Physics and Philosophy, Epistemology of the LHC, Wuppertal, Germany, 18 March 2011.
- 't Hooft, G., *The extremes in physics*, Grande Conference Grand Public: ENS Paris, France, 10 May 2011.
- 't Hooft, G., *Conformal symmetry in quantum gravity*, Seminaire du LPTENS, Paris, France, 13 May 2011.
- 't Hooft, G., *The quantum dispute*, Lecture, Lomonosov Medal, Moscow, 17 May 2011.
- 't Hooft, G., *A class of elementary particle models without any adjustable real parameters*, Lecture, Steklov Institute, Moscow, 18 May 2011.
- 't Hooft, G., *Fundamental Constants, the Hierarchy of Large Numbers, and what do Black Holes have to do with this?*, Symposium VU Amsterdam, Kickoff meeting FOM research program on Broken Mirrors and Drifting Constants, 6 June 2011.
- Tarrio Barreiro, L.J., *Effects of dynamic flavor in holographic quark-gluon plasmas*, Groningen, the Netherlands, 17 February 2011.
- Tarrio Barreiro, L.J., *Effects of dynamic flavor in holographic quark-gluon plasmas*, Paris, France, 31 March 2011.
- Tarrio Barreiro, L.J., *The open string paradigm in AdS-CFT*, Trieste, Italy, 11 May 2011.
- Tarrio Barreiro, L.J., *Charged black holes in asymptotically Lifshitz spacetimes*, Santiago de Compostela, Spain, 18 May 2011.
- Tarrio Barreiro, L.J., - *Black holes in Lifshitz spacetimes*, Padova, XVII European Workshop, String Theory 2011, Italy, 8 September 2011.
- Vandoren, S.J.G., *BPS black holes in AdS_4*, Conference, Seminar String Theory, Puri, India, 4-9 January 2011.
- Vandoren, S.J.G., *Static supersymmetric black holes in AdS_4 with spherical symmetry*, Leuven-Brussels, ULB, Belgium, 16 February 2011.
- Vandoren, S.J.G., *Phase diagrams and thermodynamics of Lifshitz black holes*, Seminar, Solvay Meeting, Brussels, Belgium, 20 May 2011.
- Vandoren, S.J.G., *Black holes and black branes in Lifshitz spacetimes*, Seminar, Niels Bohr Institute, Copenhagen, Denmark, 9 June 2011.
- Vandoren, S.J.G., *Quaternion-Kähler manifolds from the variation of Hodge structures*, Conference Geometric Structures in Mathematical Physics, Varna, Bulgaria, 20 September 2011.
- Vandoren, S.J.G., *Five-dimensional gauge theory and compactification on a torus*, Nordita Workshop, Stockholm, Sweden, 16 November 2011.
- Vandoren, S.J.G., *Five-dimensional gauge theory and compactification on a torus*, Simons Center, Stony Brook, New York, USA, 5 December 2011.
- Varela-Rizo, O., *New top-down scale-invariant supergravity solutions*, String Seminar, Utrecht University, the Netherlands, 26 October 2011.
- 't Hooft, G., *CP violation, an odd corner of quantum field theory*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.

Nikhef Theory Group

- Artoisenet, P.A., *Matrix element methods for discovery at the LHC*, MadGraph Meeting 2011, Academia Belgica Roma, Italy, 20 September 2011.
- Aybat, M., *Living between two singularities*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Fleischer, R., *Precision physics with B-mesons: new probes for new Physics in the LHC era*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Fleischer, R., *Precision B physics in the LHC era*, University of Cambridge, Cavendish Laboratory, UK, 8 March 2011.
- Fleischer, R., *In pursuit of new physics with B decays*, Moriond 2011, QCD and High Energy Interactions, La Thuile, Italy, 22 March 2011.
- Fleischer, R., *B-physics probes for new physics in the LHC era*, Portorož 2011: The Role of Heavy Fermions in Fundamental Physics, Portorož, Slovenia, 12 April 2011.
- Fleischer, R., *Precision physics with beta mesons: new probes for new physics in the LHC era*, DRSTP Symposium Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011.
- Fleischer, R., *Searching for new physics through B-meson decays at the LHC*, Baryogenesis and First Order Phase Transitions in the Early Universe, Lorentz Center, Leiden, the Netherlands, 1 September 2011.
- Fleischer, R., *B physics in the LHC era: status and perspectives*, UK HEP Forum 2011, Physics at the LHC, Abingdon, UK, 8 September 2011.
- Fleischer, R., *Penguin uncertainties in ϕ_s and effective B_s lifetime measurements*, Workshop, Implications of LHCb Measurements and Future Prospects, CERN, Geneva, Switzerland, 10 November 2011.
- George, D.P., *Living between two singularities*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- George, D.P., *Model building and Lie point symmetries*, MPIK Heidelberg, Germany, 25 May 2011.
- George, D.P., *A systematic approach to model building*, PASCOS 2011, Cambridge, UK, 5 July 2011.
- George, D.P., *Model building using Lie-point symmetries*, CERN LPCC Summer Institute, Geneva, Switzerland, 18 August 2011.
- George, D.P., *Model building using Lie-point symmetries*, University of Zurich, Switzerland, 11 October 2011.
- Kuipers, J., *Polynomial algebra in form 4*, ACAT 2011, London, UK, 6 September 2011.
- Laenen, E.L.M.P., *How much SUSY are we looking for?*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Laenen, E.L.M.P., *All-order aspects of QCD*, Mini courses with ten lectures and four problem sessions, DRSTP Postgraduate Course Theoretical High Energy Physics (THEP), São Paulo, Brazil, 6-18 February 2011.
- Laenen, E.L.M.P., *Next-to-eikonal exponentiation*, Joint Seminar, ETH & University of Zurich, Switzerland, 22 March 2011.

- Laenen, E.L.M.P., *Heavy flavour production, some issues, some results*, Beauty 2011, Amsterdam, the Netherlands, 4 April 2011.
- Laenen, E.L.M.P., *Next-to-eikonal exponentiation*, Academica Sinica, Taipei, Taiwan, 1 June 2011.
- Laenen, E.L.M.P., *Some recent developments in QCD resummation for the LLC*, Workshop, 9th Particle Physics Phenomenology (PPP9), National Central University (NCU), Chungli (aka Jhongli), Taiwan, 4 June 2011.
- Laenen, E.L.M.P., *Top physics: theoretical aspects*, Physics at the LHC 2011, Perugia, Italy, 9 June 2011.
- Laenen, E.L.M.P., *Top physics: theoretical aspects*, Aspects of Top Physics, Torino, Italy, 12 July 2011.
- Laenen, E.L.M.P., *Top quark theory*, Lepton-Photon 2011, Tata Institute for Fundamental Research, Mumbai, India, 23 August 2011.
- Laenen, E.L.M.P., *Particle physics, the standard model, and more?*, Mumbai University, India, 26 August 2011.
- Laenen, E.L.M.P., *Next-to-eikonal exponentiation*, Workshop, Quarks, Hadrons and LHC, IIT Bombay, Mumbai, India, 29 August 2011.
- Laenen, E.L.M.P., *Top quark news*, Workshop, Lorentz Center, Baryogenesis, Leiden, the Netherlands, 2 September 2011.
- Laenen, E.L.M.P., *Top quark news*, IISc Bangalore, India, 18 October 2011.
- Laenen, E.L.M.P., *Next-to-eikonal exponentiation in QCD and QED*, IMSc, Chennai, India, 24 October 2011.
- Laenen, E.L.M.P., *Standard model theory for the LHC*, IIT Madras, Chennai, India, 25 October 2011.
- Laenen, E.L.M.P., *Basics of resummation*, IISc Bangalore, India, 31 October 2011.
- Laenen, E.L.M.P., *Threshold resummation for squark/gluino hadroproduction*, Bethe Forum on LHC, Dark Matter and Unification, Bonn, Germany, 19 November 2011.
- Schellekens, A.N., *Heterotic strings revisited*, Universidad Autonoma, Madrid, Spain, 4 March 2011.
- Schellekens, A.N., *The standard model, the anthropic principle and the string theory landscape*, Quantum Universe Workshop, Groningen, the Netherlands, 20 April 2011.
- Schellekens, A.N., *Conformal field theory with applications to string phenomenology*, Nordita Workshop, String Phenomenology, Stockholm, Sweden, 30 May 2011.
- Schellekens, A.N., *Anomalies, characters and strings*, Nordita Theory Colloquium, Stockholm, Sweden, 8 June 2011.
- Schellekens, A.N., *Electric charge quantization in string theory*, CSIC, Madrid, Spain, 21 June 2011.
- Schellekens, A.N., *The Kreuzer bi-homomorphism*, Memorial Conference for Max Kreuzer, Vienna, Austria, 27 June 2011.
- Schellekens, A.N., *RCFT constructions of heterotic strings*, StringVac11, Busan, South Korea, 5 September 2011.
- van Holten, J.-W., *The gravitational field of a light wave*, ITF, Utrecht University, the Netherlands, 7 March 2011.

– van Holten, J.-W., *Gravitatiegolven*, Leiden University, the Netherlands, 21 September 2011.
– van Holten, J.-W., *Superluminal neutrinos*, Leiden University, the Netherlands, 27 September 2011.

7.2 Theme 2

University of Amsterdam

- Caux, J.-S., *Non-equilibrium dynamics and correlation functions of the 1D Bose gas*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Caux, J.-S., *Strong correlations: a goldmine in a minefield*, FNWI Faculty Colloquium, University of Amsterdam, 7 March 2011.
- Caux, J.-S., *Dynamics in one dimension: integrability in and out of equilibrium*, 15th Annual UK Meeting on Integrable Models, Conformal Field Theory and Related Topics, City University, London, UK, 15-16 April 2011.
- Caux, J.-S., *Dynamics in one dimension: integrability in and out of equilibrium*, Theoretical Physics Seminar, Aachen, Germany, 10 May 2011.
- Caux, J.-S., *Dynamics in one dimension: integrability in and out of equilibrium*, Workshop, Integrability and its Breaking in Strongly Correlated and Disordered Systems, ICTP, Trieste, Italy, 27 May 2011.
- Caux, J.-S., *Dynamics in one dimension: integrability in and out of equilibrium*, Theoretical Physics Seminar, LPTHE, Paris, France, 7 July 2011.
- Caux, J.-S., *In and out of equilibrium dynamics in one dimension: from theory to experiment*, Theoretical Physics Seminar, Physics by the Lake Summer School, St-Bees, Cumbria, UK, 27 July 2011.
- Caux, J.-S., *Quenches in integrable systems*, Workshop, Quantum Quenches and Strongly Correlated Physics, Montauk, New York, USA, 7 September 2011.
- Caux, J.-S., *One-d quantum dynamics beyond the low-energy approximation*, Workshop, Charge and Heat Dynamics in Nano-Systems, Laboratoire de Physique des Solides, Orsay, France, 11 October 2011.
- Caux, J.-S., *Exact Luttinger correlation prefactors from integrability*, Workshop, CFT, Topology and Information, Institute Henri Poincaré, Paris, France, 3 November 2011.
- Caux, J.-S., *A tour of Luttinger liquid theory: past, present and future*, Kick-off Meeting, FOM Program The Singulary Physics of 1D Electrons, Twente, the Netherlands, 11 November 2011.
- Caux, J.-S., *One-d physics in the real world*, General Physics Colloquium, Paul Scherrer Institute, Villigen, Switzerland, 18 November 2011.
- Estienne, B., *Fonctions d'ondes de quasi-trou dans l'effet Hall quantique fractionnaire: des theories conformes W a l'hamiltonien de Calogero-Sutherland*, IPhT, Saclay, France, 32 January 2011.
- Estienne, B., *Fonctions d'ondes de quasi-trou dans l'effet Hall quantique fractionnaire: des theories conformes W a l'hamiltonien de Calogero-Sutherland*, LPTHE, Jussieu, France, 9 March 2011.
- Nienhuis, B., *Investigation of thermodynamical properties of the hard-sphere system from the free volume theory*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Nienhuis, B., *Self assembly of virus capsids*, The Royal Netherlands Academy of

Arts and Sciences (KNAW), Amsterdam, the Netherlands, 24 November 2011.
- Nienhuis, B., *An unorthodox Bethe Ansatz in a model for granular matter*, Group Meeting, University of Amsterdam, the Netherlands, 14 December 2011.
- Nieuwenhuizen, T.M., *Galactic dark matter and mysterious transient radio events*, Argelander Institut für Astronomie, Bonn, Germany, 5 January 2011.
- Nieuwenhuizen, T.M., *The two bright faces of dark matter*, Condensed Matter Group, ITFA, University of Amsterdam, the Netherlands, 5 January 2011.
- Nieuwenhuizen, T.M., *Elucidating the quantum measurement problem*, Center for Cosmology and Particle Physics, New York University, USA, 2 February 2011.
- Nieuwenhuizen, T.M., *Gravitational hydrodynamics as a universal toolbox*, Center for Cosmology and Particle Physics, New York University, USA, 1 April 2011.
- Nieuwenhuizen, T.M., *Elucidating the quantum measurement problem*, Queens College, New York, USA, 4 April 2011.
- Nieuwenhuizen, T.M., *Elucidating the quantum measurement problem*, Perimeter Institute, Waterloo, Ontario, Canada, 12 April 2011.
- Nieuwenhuizen, T.M., *The star formation problem: a view from gravitational hydrodynamics*, Harvard Center for Astrophysics, Cambridge, Massachusetts, USA, 27 April 2011.
- Nieuwenhuizen, T.M., *Elucidating the quantum measurement problem*, Physics Department, Boston University, Massachusetts, USA, 29 April 2011.
- Nieuwenhuizen, T.M., *Dynamics in a model for quantum measurements and insights in the quantum measurement problem*, Conference, Foundations of Probability and Physics-6, Lineus University, Vaxjo, Sweden, 16 June 2011.
- Nieuwenhuizen, T.M., *Dynamics in a model for quantum measurements and insights in the quantum measurement problem*, Conference, Frontiers of Quantum and Mesoscopic Thermodynamics 2011 (FQMT11) Prague, Czech Republic, 25 July 2011.
- Nieuwenhuizen, T.M., *Donkere materie: word je daar koud of warm van?*, Open Day, University of Amsterdam, the Netherlands, 8 October 2011.
- Nieuwenhuizen, T.M., *Dynamics in a model for quantum measurements and insights in the quantum measurement problem*, Workshop, SMQS-IP2011, Jülich, Germany, 18 October 2011.
- Nieuwenhuizen, T.M., *Elements of a sub-quantum theory: bits and pieces*, Heinz von Foerster Congress, Emergent Quantum Mechanics, Vienna, Austria, 18 November 2011.
- Nieuwenhuizen, T.M., *Dynamics in a model for quantum measurements and insights in the quantum measurement problem*, Atom Institute, Vienna, Austria, 15 November 2011.
- Palacios, G.L.E.G., *Conductance through a topological defect*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Poszgai, B.S., *Mean values of local operators in integrable models: the generalized LeClair-Mussardo formula*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Poszgai, B.S., *Boundary free energy in open XXZ spin chains*, Amsterdam, the

Netherlands, 23 March 2011.
- Poszgai, B.S., *Local correlations in the 1D Bose gas from a scaling limit of the XXZ chain*, 8th Bologna Workshop, CFT and Integrable Models, Bologna, Italy, 12-15 September 2011.
- Poszgai, B.S., *Local correlations in the 1D Bose gas*, Amsterdam, the Netherlands, 5 October 2011.
- Schoutens, K., *Topological quantum registers*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Schoutens, K., *Uniform non-abelian gauge potentials: spectrum and flux insertion*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Schoutens, K., *Charged spin textures over the Moore-Read fractional quantum Hall state*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Schoutens, K., *Charged spin textures over the Moore-Read quantum Hall state*, Theory Seminar, Service de Physique Théorique, Saclay, France, 5 April 2011.
- Schoutens, K., *Particles in non-abelian gauge potentials*, Workshop, Topological Aspects of Condensed Matter Physics, Trieste, Italy, 5 July 2011.
- Schoutens, K., *Materials for topological quantum computation*, E-MRS Fall Meeting, Warsaw, Poland, 20 September 2011.
- Schoutens, K., *Non-Abelian spin-textures*, Conference, Topology and information within the workshop on Advanced Conformal Field Theory and Applications (ACFTA), Institut Henri Poincaré, Paris, France, 2-4 November 2011.
- Snoek, M., *Rigorous mean-field dynamics of lattice bosons: quenches from the Mott insulator*, Seminar, Amsterdam, the Netherlands, 2 February 2011.
- Snoek, M., *Rigorous mean-field dynamics of lattice bosons: quenches from the Mott insulator*, Amsterdam Quantum Collective, the Netherlands, 18 May 2011.
- Snoek, M., *Rigorous mean-field dynamics of lattice bosons: quenches from the Mott insulator*, Institut für Theoretische Physik, Frankfurt am Main, Germany, 17 June 2011.
- Snoek, M., *Rigorous mean-field dynamics of lattice bosons: quenches from the Mott insulator*, Cambridge, UK, 1 September 2011.
- Snoek, M., *Rigorous mean-field dynamics of lattice bosons: quenches from the Mott insulator*, Seminar, Hamburg, Germany, 12 December 2011.
- Turner, A.M., *Multiplets in the entanglement spectrum*, National Conference, Utrecht, the Netherlands, 7 October 2011.

Vrije Universiteit Amsterdam

- Das, M., *Physics of soft and biological composites*, Soft Matter, Interfaces and Fluidics Group, University of Twente, Enschede, the Netherlands, January 2011.
- Das, M., *Mechanics and force transmission in the cell cytoskeleton*, Stanford University, California, USA, February 2011.
- Das, M., *Mechanics and force transmission in the cell cytoskeleton*, Arizona State University, Tempe, USA, February 2011.
- Das, M., *Mechanics and force transmission in the cell cytoskeleton*, Syracuse University, New York, USA, February 2011.

- Das, M., *Mechanics and force transmission in the cell cytoskeleton*, Rochester Institute of Technology, Rochester, New York, USA, April 2011.
- Das, M., *Physics of soft and biological composites*, Soft Matter Meeting, Utrecht, the Netherlands, May 2011.
- Depken, M., *Better safe than sorry: how paranoid polymerases ensure efficient transcription*, TU Delft, the Netherlands, 14 June 2011.
- Depken, M., *Cross-link governed dynamics of biopolymer networks*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- MacKintosh, F.C., *Active fluctuations and self-organization in cytoskeletal networks*, Mechanobiology Colloquium, National University of Singapore, 16 March 2011.
- MacKintosh, F.C., *Control of semi-flexible polymer networks by architecture and dynamic cross-linking*, APS March Meeting, Dallas, Texas, USA, 24 March 2011.
- MacKintosh, F.C., *Motors vs effective temperature in cytoskeletal network dynamics*, KITP, UCSB, Santa Barbara, California, USA, 8 June 2011.
- MacKintosh, F.C., *Active fluctuations, mechanical integrity and self-organization in cytoskeletal networks*, Mathematical Biology of the Cell: Cytoskeleton and Motility Workshop, Banff International Research School, Alberta, Canada, 4 August 2011.
- MacKintosh, F.C., *Control of biopolymer network elasticity through architecture and molecular-motor activity*, 8th Liquid Matter Conference, Vienna, Austria, 9 September 2011.
- MacKintosh, F.C., *Physics of fiber and cytoskeletal networks: criticality, mechanical integrity and motor activity*, Seminar, Center for Nonlinear Dynamics, University of Texas, Austin, USA, 31 October 2011.
- MacKintosh, F.C., *Active fluctuations, mechanical integrity and self-organization in cytoskeletal networks*, International Symposium on Mechanobiology (5TH SICBM), Shanghai, China, 6 November 2011.
- Visser, T.D., *Phase anomaly and phase singularities of the field in the focal region of high-numerical aperture systems*, Annual Meeting, Optical Society of America, San Jose, California, USA, 20 October 2011.
- Visser, T.D., *The Pancharatnam-Berry phase for non-cyclic polarization changes*, Annual Meeting, Optical Society of America, San Jose, California, USA, 20 October 2011.

University of Groningen

- van Enter, A.C.D., *Bootstrap percolation, the role of anisotropy. Questions, some answers and applications*, Lorentz Center Leiden, the Netherlands, 7 July 2011.
- van Enter, A.C.D., *Three questions from dynamical systems and their (lack of) progress*, BIRS Workshop, Almost Periodic Order, Banff, Alberta, Canada, 26 September 2011.
- van Enter, A.C.D., *Bootstrap percolation, the role of anisotropy. Questions, some answers and applications*, Mini Workshop, Mathematical Institute Leiden, the Netherlands, 13 December 2011.

Leiden University

- Beenakker, C.W.J., *Majorana fermions in topological insulators*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Beenakker, C.W.J., *Analogue of gravitational lensing in a topolocial insulator*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Beenakker, C.W.J., *Quantized conductance at the Majorana phase transition in a disordered superconducting wire*, Banff International Research Station Workshop, Topological Insulators and Superconductors, Banff, Alberta, Canada, 7-11 February 2011.
- Beenakker, C.W.J., *Majorana fermions in topological insulators*, ETH Zürich, Switzerland, 23 March 2011.
- Beenakker, C.W.J., *Quantum Goos-Hänchen effect in graphene*, Lorentz Center Workshop, Beam Shifts: Analogies between Light and Matter Waves, Leiden, the Netherlands, 28 March-1 April 2011.
- Beenakker, C.W.J., *Majorana fermions in topological insulators*, Université Joseph Fourier, Grenoble, France, 19 April 2011.
- Beenakker, C.W.J., *The search for Majorana fermions in topological superconductors*, Abdus Salam International Centre for Theoretical Physics, Trieste, Italy, 5 May 2011.
- Beenakker, C.W.J., *The search for Majorana fermions in topological superconductors*, DRSTP Symposium Trends in Theory 2011, Dalfsen, the Netherlands, 19-20 May 2011.
- Beenakker, C.W.J., *Scattering theory of topological superconductors*, Workshop, Nanoelectronics beyond the Roadmap, Keszthely, Hungary, 13-17 June 2011.
- Beenakker, C.W.J., *Transport signatures of Majorana fermions*, KITPC Program, Topological Insulators and Topological Superconductors, Beijing, China, 9 August 2011.
- Beenakker, C.W.J., *Thermodynamic stability of the 4π-periodic Josephson effect*, LT26 Satellite Conference, Topological Insulators and Superconductors, Beijing, China, 18-21 August 2011.
- Beenakker, C.W.J., *Majorana fermions in topological superconductors*, Aarhus Universitet, Denmark, 5 October 2011.
- Beenakker, C.W.J., *Majorana fermions in topological superconductors*, Universität Bielefeld, Germany, 17 October 2011.
- Beenakker, C.W.J., *Scattering theory of topological insulators*, International Workshop, Novel Quantum States in Condensed Matter, Kyoto, Japan, 14-18 November 2011.
- Beenakker, C.W.J., *Hybrid topological/superconducting qubits*, Microsoft Station Q Meeting, Santa Barbara, California, USA, 2-4 December 2011.
- Garlaschelli, D., *Information theory and statistical Mechanics of Networks*, Workshop, Network Theory and Complexity, University of Siena, Italy, 9-14 February 2011.
- Garlaschelli, D., *Complex networks: properties, models and applications to economics*, DRSTP Postgraduate Course Statistical Physics and Theory of Condensed

Matter (SPTCM), Driebergen, the Netherlands, 7-18 March 2011.
- Garlaschelli, D., *Adaptive and spatially embedded networks*, International Workshop, Networks Constrained to Change, Green Templeton College, University of Oxford, UK, 23 March 2011.
- Garlaschelli, D., *Do we need to count them all? An information-theoretic approach to complex networks*, Casimir Symposium, University of Delft, the Netherlands, 26 May 2011.
- Garlaschelli, D., *Networks with local constraints: Fermi-Dirac, Bose-Einstein, and generalized distributions*, Joan van der Waals Colloquium, University of Leiden, the Netherlands, 27 May 2011.
- Garlaschelli, D., *Statistical physics and economic networks*, This Week's Discoveries, Leiden University, the Netherlands, 7 June 2011.
- Garlaschelli, D., *Interdisciplinary challenges: complex networks and econophysics*, Seminar, European Space Agency (ESA/ESTEC), Noordwijk, the Netherlands, 10 June 2011.
- Garlaschelli, D., *Analytical method to detect patterns in real networks and applications to economics*, International Conference on Statistical Physics (Sigma Phi 2011), Cyprus, Greece, July 2011.
- Garlaschelli, D., *Econophysics: an interdisciplinary challenge*, Alumni Day, Leiden University, the Netherlands, 8 October 2011.
- Garlaschelli, D., *Analytical maximum-likelihood method to detect patterns in real networks*, Seminar, Institute for Complex Adaptive Matter, Eindhoven University of Technology, the Netherlands, 11 November 2011.
- Gomez, L.R., *Shock waves in jammed solids*, March Meeting, American Physical Society, Dallas, Texas, USA, March 2011.
- Hilgenkamp, H., *Flux quantization driving fractional flux quanta generation*, Special Session, 50 Years of Flux Quantization, DPG Frühjahrstagung, Dresden, Germany, 15 March 2011.
- Hilgenkamp, H., *Applications of superconductivity; how Kamerlingh Onnes' fundamental research has lead to applications of great societal relevance*, NNV Physics Day, Amsterdam, the Netherlands, 14 April 2011.
- Hilgenkamp, H., *Special effects at complex oxide interfaces*, Biannual Vlieland Meeting, Zernike Institute, University of Groningen, the Netherlands, 15 May 2011.
- Hilgenkamp, H., *Special effects at complex oxide interfaces*, Van der Waals-Zeeman Colloquium and Colloquium Institute for Theoretical Physics, University of Amsterdam, the Netherlands, 19 May 2011.
- Hilgenkamp, H., *Interfacing two - fundamentally different (?) - condensates; Hybrid high-Tc vs. low-Tc Josephson structures*, Royal Society Workshop, Superconductivity at Oxide Interfaces, Chicheley, Buckinghamshire, UK, 14 September 2011.
- Hilgenkamp, H., *High mobility $LaAlO_3/SrTiO_3$ interfaces; fabrication, transport properties and quantum oscillations*, TRR-80 Workshop Functionality from Heterostructures, Obergurgl, Austria, 10 October 2011.
- Juricic, V., *Quantum criticality in graphene*, Laboratoire de Physique des Solides,

Universite Paris-Sud, Paris, France, January 2011.
- Juricic, V., *Conductivity of Coulomb interacting massless Dirac particles in graphene*, March Meeting, American Physical Society, Dallas, USA, March 2011.
- Juricic, V., *Quantum criticality in graphene*, XVIII Symposium, Condensed Matter Physics, Belgrade, Serbia, April 2011.
- Juricic, V., *Dislocations-translating the tenfold way*, E-MRS 2011 Fall Meeting, Warsaw, Poland, September 2011.
- Medvedyeva, M.V., *Hartman effect and spin precession in graphene*, Workshop, Nanoelectronics beyond the Roadmap, Keszthely, Hungary, 13-17 June 2011.
- Schiessel, H., *Euler's elasticas and their applications to DNA, nucleosomes and chromatin fibers*, International Symposium, Physicochemical Field of Genetic Activities, Awaji Island, Japan, 24-26 January 2011.
- Schiessel, H., *Euler's elasticas and their applications to DNA, nucleosomes and chromatin fibers*, KITP Conference, Soft Matter Physics Approaches to Biology, Santa Barbara, California, USA, 23-27 May 2011.
- Schiessel, H., *Breathing, sliding, proofreading: on how to access packed DNA*, Lorentz Workshop, Fluctuations and Response in Active Material: from Driven Granular Systems to Swarming Bacteria, Leiden, the Netherlands, 20-24 June 2011.
- Schiessel, H., *Euler's elasticas and their applications to DNA, nucleosomes and chromatin fibers*, Biophysics Society Meeting, Dynamic DNA Packaging across Kingdoms: Chromatin and Beyond, Pacific Grove, California, USA, 5-8 July 2011.
- Schiessel, H., *Euler's elasticas and their applications to DNA, nucleosomes and chromatin fibers*, Cell Physics Days 2011, Strasbourg, France, 7-8 November 2011.
- Wimmer, M., *Dirac boundary conditions at the reconstructed zigzag edge*, Group Seminar, Complex Quantum Systems, Universität Regensburg, Germany, 24 October 2011.
- Wimmer, M., *Majorana fermions in topological superconductors*, International Doctoral Training Session, Frontiers in Condensed Matter, Les Houches, France, 11-16 September 2011.
- Wimmer, M., *Majorana fermions in nanowires*, Condensed Matter Seminar, Max-Planck Institute for Complex Systems, Dresden, Germany, 18 April 2011.
- Wimmer, M., *How to detect Majorana fermions in nanowires*, 7th Capri Spring School, Transport in Nanostructures, Capri, Italy, 10-17 April 2011.
- Wimmer, M., *Majorana-fermionen in nanodrähten*, Universität Duisburg-Essen, Duisburg, Germany, 23 March 2011.
- Wimmer, M., *Majorana fermions in nanowires*, DPG Spring Meeting, Dresden, Germany, 13-18 March 2011.
- Zaanen, J., *Fractal nodal surfaces and fermionic quantum criticality*, Workshop, AdS/CFT Correspondence and Condensed Matter, London, UK, 9-11 January 2011.
- Zaanen, J., *Quantum criticality, high Tc superconductivity and the AdS/CFT correspondence of string theory*, Sommerfeld Colloquium, Ludwig Maximillian Universität, Munich, Germany, 18-19 January 2011.
- Zaanen, J., *Superconducting transition in quantum critical metals*, Physics@FOM,

Veldhoven, the Netherlands, 18-19 January 2011.
- Zaanen, J., *A new Curie-Weiss metal state and its application to thermoelectrics*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Zaanen, J., *Exciton condensation and flux quantization in strongly correlated oxide materials*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Zaanen, J., *Geometry encoding for statistics: from Fermi liquids to Cooper pairing*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Zaanen, J., *The ultimate sanity check: the holographic Fermi liquid*, Conference, Strongly Correlated Systems & Gauge Gravity Duality, Aspen Center for Physics, Colorado, USA, 31 January-5 February 2011.
- Zaanen, J., *String theory and the mysterious quantum matter of condensed matter physics*, Physics Colloquium, Leuven, Belgium, 23 February 2011.
- Zaanen, J., *String Theory and the mysterious quantum matter of condensed matter physics*, Physics Colloquium, Groningen, the Netherlands, 3 March 2011.
- Zaanen, J., *String theory and the mysterious quantum matter of condensed matter physics*, Physics Colloquium, University of Crete, Greece, 24 March 2011.
- Zaanen, J., *Mott collapse, statistical quantum criticality and high Tc superconductivity*, Seminar, University of Crete, Greece, 25 March 2011.
- Zaanen, J., Workshop Summary, Lorentz Center, 100th Anniversary of Superconductivity: Hot Topics and Future Directions, Leiden, the Netherlands, 4-8 April 2011.
- Zaanen, J., *High Tc superconductivity and the hair of the black hole*, Conference, Fysica 2011, Amsterdam, the Netherlands, 15 April 2011.
- Zaanen, J., *Observing the origin of superconductivity in quantum critical metals*, Workshop, Unconventional Superconductivity, Minneapolis, USA, 22-24 April 2011.
- Zaanen, J., *Observing the origin of superconductivity in quantum critical metals*, Workshop, Superconductivity: 100 Years Young, International Institute of Physics-UFRN, Natal, Brazil, 17-30 May 2011.
- Zaanen, J., Workshop Summary, Lorentz Center, Black Hole Answers to Condensed Matter Questions, Leiden, the Netherlands, 14-17 June 2011.
- Zaanen, J., *Neutron scattering and superconductivity research in the 21th century*, Belgian Dutch Workshop, Synchotron and Neutron, Syneww 2011, Amsterdam, the Netherlands, 22 June 2011.
- Zaanen, J., *Pnictide superconductors: where are the orbitals?*, Summer Program, A New Century of Superconductivity: Iron Pnictides and Beyond, Aspen Center of Physics, Colorado, USA, 26 June-10 July 2011.
- Zaanen, J., *From BCS to string theory: how to observe the cause of high Tc superconductivity*, Stripes 2011, Rome, Italy, 10-16 July 2011.
- Zaanen, J., *Fermionic quantum criticality and the AdS/CFT correspondence of string theory*, Workshop, Strongly Correlated Systems, Cooperativity and Valence-Bond Theory, Universidade Da Coruna, Spain, 23-25 July 2011.
- Zaanen, J., *The insulator posing as a superconductor: the type II Bose-Mott insulator*, Seminar, Nanjing University, China, 24 August 2011.
- Zaanen, J., *String theory and the mysterious quantum matter of condensed matter*

physics, Physics Colloquium, Nanjing University, China, 25 August 2011.
- Zaanen, J., *Quantum criticality and the AdS/CFT correspondence of string theory*, National Conference, Novel Superconductivity in Taiwan, National Cheng Kung University, Tainan, Taiwan, 4-9 August 2011.
- Zaanen, J., *Fermionic quantum criticality and the AdS/CFT correspondence of string theory*, International Conference, Low Temperature Physics (LT26), Chinese Academy of Science, Beijing, China, 10-17 August 2011.
- Zaanen, J., *The hidden translations: the topological status of dislocations intopological band insulators*, Conference, Topological Insulators and Superconductors, Tsinghua University, Beijing, China, 18-21 August 2011.
- Zaanen, J., *Testing AdS/CMT in the laboratory: the holographic superconductor*, Conference, Holographic Duality and Condensed Matter Physics, Program AdS/CMT, The Kavli Institute for Theoretical Physics, University of California, Santa Barbara, USA, 22 September 2011.
- Zaanen, J., *Observing the origin of superconductivity in quantum critical metals*, Paris Meeting, Holography at Finite Density, University of Paris, France, 15-19 November 2011.
- Zaanen, J., *Observing the origin of superconductivity in quantum critical metals*, 34th International Workshop, Condensed Matter Theories, CMT34, Pohang, Korea, 7-11 November 2011.
- Zaanen, J., *Quantum criticality, high Tc superconductivity and the the AdS/CFT correspondence of string theory*, Michaelmas Term Colloquium, University of Oxford, UK, 25 November 2011.
- Zaanen, J., *Quantum criticality, high Tc superconductivity and the AdS/CFT correspondence of string theory*, Solvay Colloquium, Brussels, Belgium, 13 December 2011.
- Zaanen, J., *Observing holographic superconductivity in the laboratory*, Physics Seminar, Universite Libre de Bruxelles, Brussels, Belgium, 14 December 2011.

Radboud University Nijmegen

- Fasolino, A., *Folded graphene*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Fasolino, A., *Anharmonic flexural phonons in graphene*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Fasolino, A., *The extra ordinary properties of graphene*, Lectio Magistralis, Opening Doctorate Academic Year, Universita di Modena, Italy, 19 March 2011.
- Fasolino, A., *Grafeen, nobel materiaal*, Science café, Nijmegen, the Netherlands, 6 June 2011.
- Fasolino, A., *Classical atomistic simulations of polymorphic carbon*, Monami Workshop, Uppsala, Sweden, 10 June 2011.
- Fasolino, A., *Low friction and rotational dynamics of crystalline flakes in solid lubrication*, Joint ICTP-FANAS Conference, Trends in Nanotribology, Trieste, Italy, 12-16 September 2011.
- Katsnelson, M.I., *Folded graphene*, Physics@FOM, Veldhoven, the Netherlands,

18-19 January 2011.
- Katsnelson, M.I., *Anharmonic flexural phonons in graphene*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Katsnelson, M.I., *Graphene: CERN on the desk*, Schuster Colloquium and Discussion of Joint Research Projects, Manchester University, UK, 10-19 February 2011.
- Katsnelson, M.I., *Electronic properties of novel materials*, Austrian Institute of Science and Technology, Kirchberg and Vienna, Austria, 1-6 March 2011.
- Katsnelson, M.I., *Graphene: CERN on the desk*, Lectures, Graphene, Institute Quantum Materials Science, Ekaterinburg, Russia, 10-21 March 2011.
- Katsnelson, M.I., *Graphene: CERN on the desk*, Plenary Lecture, Fysica 2011, Annual Meeting of Dutch Physical Society, Amsterdam, the Netherlands, April 2011.
- Katsnelson, M.I., *Graphene: CERN on the desk*, Plenary Lecture, GraphITA, L'Aquila, Italy, 15-19 May 2011.
- Katsnelson, M.I., *Graphene: CERN on the desk*, Colloquium, IST Austria and Seminar University of Vienna, Austria, 23-26 May 2011.
- Katsnelson, M.I., *Topological defects in metals and carbon materials*, Workshop, Institute Quantum Materials Science, Ekaterinburg, Russia, 6-10 June 2011.
- Katsnelson, M.I., *Graphene: CERN on the desk*, Symposium, The Arrow of Time, Nijmegen, the Netherlands, July 2011.
- Katsnelson, M.I., *Graphene: CERN on the desk*, Plenary Lecture, 13th International Conference, Formation of Semiconductor Interfaces, Prague, Czech Republic, 3-8 July 2011.
- Katsnelson, M.I., *Graphene: CERN on the desk*, Fifth Stig Lundqvist Conference, Advancing Frontiers of Condensed Matter Physics, Trieste, Italy, 11-15 July 2011.
- Katsnelson, M.I., *Graphene: CERN on the desk*, Workshop, Quantum Field Theory Aspects of Condensed Matter Physics, Rome, Italy, 6-9 September 2011.
- Katsnelson, M.I., *Itinerant-electron magnetism*, CECAM Workshop, Perspectives and Challenges of Many-Particle Physics, Bremen, Germany, 19-23 September 2011.
- Katsnelson, M.I., *Graphene as a prototype membrane: ripples, puddles and strain engineering*, IMM Colloquium Nijmegen, the Netherlands, 27 September 2011.
- Katsnelson, M.I., *Graphene as a prototype membrame: ripples, puddles and strain engineering*, Colloquium, University of Hamburg, Germany, November 2011.
- Katsnelson, M.I., *Graphene: CERN on the desk*, International Symposium, Frontiers in Quantum Photon Science, Hamburg, Germany, November 2011.
- Fasolino, A., *Structure and thermodynamic of graphene from atomistic simulations*, ACCM Symposium, Amsterdam, the Netherlands, 18 November 2011.
- Katsnelson, M.I., *Interplay of Kondo effect and interspin interactions*, Workshop, Spin Dynamics and Kondo Effect in STM, Hamburg, Germany, December 2011.
- Roldan Toro, R., Fasolino, A. and Katsnelson, M.I., *Anharmonic flexural phonons in graphene*, Physics@FOM Veldhoven 2011, the Netherlands, 18-19 January 2011.

Utrecht University

- Barkema, G.T., *Anomalous dynamics of polymers*, Physics Colloquium, University of Eindhoven, the Netherlands, 7 March 2011.
- Barkema, G.T., *(Un)anomalous dynamics*, Oostduinkerke, Belgium, 27 May 2011.
- Barkema, G.T., *(Un)anomalous dynamics*, Theoretical Physics Colloquium, Utrecht, the Netherlands, 1 June 2011.
- Barkema, G.T., *(Un)anomalous dynamics*, Colloquium, Mathematical Institute, Utrecht, the Netherlands, 20 October 2011.
- Bezett, A.H., *Spin drag across the phase transition of a Spinor Bose gas*, Poster presentation, FINESS 2011, Heidelberg, Germany, authors Alice Bezett, Henk Stoof, Rembert Duine, 18-21 September 2011.
- Bezett, A.H., *Spin drag across the phase transition of a Spinor Bose gas*, Poster presentation, NewSpin2 2011, Texas, USA, authors Alice Bezett, Jogundas Armaitis, Henk Stoof, Rembert Duine, 12-17 December 2011.
- Duine, R.A., *Spin drag Hall effect in a rotating Bose mixture*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Duine, R.A., *Probing the topolocial exciton condensate via Coulomb drag*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Duine, R.A., *Spin transfer torques and spin pumping in strongly spin-orbit coupled systems*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Duine, R.A., *Spin motive forces due to a vortex domain wall*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Hatlo, M.M., *Ion dynamics in a two-phase oil-water mixture driven by an external electric field*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Morais Smith, C., *Artificial staggered magnetic fields for cold atoms in optical lattices*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Morais Smith, C., *Supersolid phases of dipolar bosons with a staggered flux*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Morais Smith, C., *Ultracold atoms in a honeycomb lattice under abelian and non-abelian gauge fields*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Morais Smith, C., *Band ferromagnetism in trilayer graphene*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Morais Smith, C., *Staggered magnetic fields in optical lattices*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Morais Smith, C., *Staggered gauge fields in optical lattices*, Colloquium, Free-University Berlin, Germany, 14 February 2011.
- Morais Smith, C., *Artificial staggered magnetic field for ultracold atoms in optical lattices*, March Meeting 2011, Dallas, Texas, USA, 21-25 March 2011.
- Morais Smith, C., *Time-dependent Bose-Hubbard model*, Workshop, Noise in Non-Equilibrium Systems: from Physics to Biology, MPIPKS Dresden, Germany, 1-14 April 2011.
- Morais Smith, C., *Will cold atomic systems help us to understand high-Tc superconductivity?*, Seminar, Theoretical Physics Institute, EPFL, Lausanne, Switzerland,

25 May 2011.
- Morais Smith, C., *Topological phases with ultracold atoms*, Blackboard Talk, Aspen Centre of Physics, Colorado, USA, 14 June 2011.
- Morais Smith, C., *Topological phases and phase transitions in honeycomb fermionic lattices: spin-imbalanced QHE, spin textures and merging of Dirac points*, Fifth Lundqvist Conference, Topological Insulators, ICTP Trieste, Italy, 12 July 2011.
- Morais Smith, C., *Ultracold atoms in optical lattices as cond-mat emulators*, Colloquium, LPTMC, Orsay, France, 15 September 2011.
- Morais Smith, C., *Ultracold atoms in optical lattices as cond-mat emulators*, Colloquium, Jussieu, Paris, France, 16 September 2011.
- Morais Smith, C., *Modeling graphene and high-Tc superconductors with cold gases*, CECAM Workshop, Modeling Materials through Cold Gases, ETH Zurich, Switzerland, 9-11 November 2011.
- Morais Smith, C., *Ultracold atoms in 2D optical lattices: shaken or stirred?*, Hamburg, Germany, 8 December 2011.
- Stoof, H.T.C., *Spin drag Hall effect in a rotating Bose mixture*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Stoof, H.T.C., *Supersolid phases in imbalanced atomic Fermi gases*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- Stoof, H.T.C., *Probing the topolocial exciton condensate via Coulomb drag*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- van der Schoot, P.P.A.M., *Competing elastic and surface forces in nematic liquid crystals under soft confinement*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- van der Schoot, P.P.A.M., *To jump or not to jump: in-line diffusion in lyotropic columnar liquid crystals*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- van der Schoot, P.P.A.M., *Branching of RNA and the stability of simple viruses*, KITP Program Biological Frontiers of Polymer and Soft Matter Physics, Santa Barbara, USA, 3 May 2011.
- van der Schoot, P.P.A.M., *Influence of the topology of single-stranded RNA on in vitro virus assembly*, Conference, Soft Matter Physics Approaches to Biology, Santa Barbara, USA, 24 May 2011.
- van der Schoot, P.P.A.M., *Influence of ssRNA topology on virus assembly*, Conference, Physical Virology, Ventura, California, USA, 18 January 2011.
- van der Schoot, P.P.A.M., *Tactoids large and small*, Seminar, Department of Mathematics, University of Bristol, UK, 10 March 2011.
- van der Schoot, P.P.A.M., *Alignment of carbon nanotubes in nematic liquid crystals*, Seminar, Centre de Recherche Paul Pascal, Bordeaux, France, 6 January 2011.
- van der Schoot, P.P.A.M., *Physical regulation of the in vitro assembly of simple viruses*, Bioquant Seminar, University of Heidelberg, Germany, 6 December 2011.
- van der Schoot, P.P.A.M., *Continuum percolation of nanotubes in external fields*, COST Meeting Composites of Nanotubes and Polymers: Joining Theoretical Modeling with Experimental Investigations, Ljubljana, Slovenia, 8-9 December 2011.

- van der Schoot, P.P.A.M., *Topology of RNA and virus assembly*, Annual Dutch Meeting, Cellular and Molecular Biology, Veldhoven, the Netherlands, 4 October 2011.
- van der Schoot, P.P.A.M., *Influence of the topology of single-stranded RNA on in vitro virus assembly*, Poster presentation, Conference Soft Matter Physics Approaches to Biology, Santa Barbara, USA, 24 May 2011.
- van der Schoot, P.P.A.M., *Influence of ssRNA topology on virus assembly*, Poster presentation, Gordon Conference on Physical Virology, Ventura, California, USA, 18 January 2011.
- van Roij, R.H.H.G., *Triangular-tessellation based numerical techniques and their applications: interfacial adsorption and crystal-structure prediction of anisotropic colloids*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- van Roij, R.H.H.G., *Polarizability and Van der Waals interactions of nanoparticles: geometry and non-additivity*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- van Roij, R.H.H.G., *Heterogeneous dynamics in columnar liquid crystals*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- van Roij, R.H.H.G., *Ion dynamics in a two-phase oil-water mixture driven by an external electric field*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- van Roij, R.H.H.G., *Demixing and stretching in suspensions of semi-flexible colloidal rods*, Physics@FOM, Veldhoven, the Netherlands, 18-19 January 2011.
- van Roij, R.H.H.G., *Harvesting blue energy from mixing river- and sea water*, Julich Soft Matter Days 2011, Bonn, Germany, 17 November 2011.
- van Roij, R.H.H.G., *Harvesting blue energy from mixing river and sea water*, Theoretical Physics Colloquium, Utrecht, the Netherlands, 29 June 2011.
- van Roij, R.H.H.G., *Electric double layers in aqueous solvents: thermodynamic cycles, blue energy and desalination*, Physics Colloquium, Northwestern University, Evanston, USA, 24 May 2011.
- van Roij, R.H.H.G., *Liquid crystals in colloidal mixtures: how flexible needles become obese and biaxial rods schizophrenic*, Research Seminar, Brandeis University, Cambridge, USA , 20 May 2011.
- van Roij, R.H.H.G., *Extracting blue energy from cyclically (dis)charging porous electrodes in sea and river water*, Soft Matter and Nanoseminar, Utrecht, the Netherlands, 14 April 2011.
- van Roij, R.H.H.G., *Introductory remarks on the analogy between (dis)charging and (de)compression cycles*, Seminar, Wetsus, Leeuwarden, the Netherlands, 7 April 2011.
- van Roij, R.H.H.G., *Extracting blue energy from cyclically (dis)charging porous electrodes in sea- and river water*, National NWO-CW (Chemistry) Meeting, Veldhoven, the Netherlands, 14 March 2011.
- van Roij, R.H.H.G., *Spintronics with cold atoms*, Winter School, *NewSpin2: spin physics and topological effects in cold atoms*, Conference, Condensed Matter, and Beyond, College Station, Texas, USA, 12 December 2011.

- van Roij, R.H.H.G., *Current-driven domain walls at nonzero temperature*, Magnetism Seminar,LPS, Paris, France, 6 October 2011.
- van Roij, R.H.H.G., *Spin currents and spin drag in atomic Bose gases*, Colloquium, University of Chile, Santiago, Chile, 2 September 2011.
- van Roij, R.H.H.G., *Current-driven domain-wall motion*, FOM SPIN Programme Meeting, Nijmegen, the Netherlands, 20 June 2011.
- van Roij, R.H.H.G., *Novel methods and new materials for current-induced magnetization dynamics*, SFB Colloquium, Hamburg, Germany, 31 May 2011.
- van Roij, R.H.H.G., *Spin caloritronics with cold atom*, Workshop, Spin Caloritronics III, Lorentz Center, Leiden, the Netherlands, 12 May 2011.
- van Roij, R.H.H.G., *Theory of spin transport in semiconductors, ferromagnets, and cold-atom systems*, APS March Meeting, Pre-Meeting Spintronics Tutorial, Dallas, USA, 20 March 2011.
- van Roij, R.H.H.G., *Novel mechanisms and new materials for current-driven magnetization dynamics*, Another Spin in the Wall Symposium, Eindhoven, the Netherlands, 27 January 2011.

8 | Science-related activities

This chapter presents an overview of the science-related activities of DRSTP staff members and postdoctoral fellows. Here we list publications about or related to physics in a variety of printed media in Section 8.1 and public lectures are given in Section 8.2. All other outreach activities such as forum discussions, television interviews, personal columns in newspapers etc. are listed in the paragraph 'other contributions' (Section 8.3). Science-related activities of PhD students can be found in Chapter 4 (Sections 4.5 and 4.6).

8.1 Physics-related publications

- Banerjee, S., Gupta, R.K., Mandal, I. and Sen, A., *Logarithmic corrections to $N = 4$ and $N = 8$ black hole entropy: a one loop test of quantum gravity* (hep-th/11060080).
- Boer, D., Brodsky, S.J., Mulders, P.J.G. and Pisano, C., *Accessing the distribution of linearly polarized gluons in unpolarized hadrons*, in XIX International Workshop on Deep Inelastic Scattering and Related Subjects (DIS 2011), Newport News, VA, USA, 11-15 April 2011.
- Boer, D., Brodsky, S.J., Mulders, P.J.G. and Pisano, C., *Probing the linear polarization of gluons in unpolarized hadrons at EIC*, International Workshop Gluons and the Quark Sea at High Energies: Distributions, Polarization, Tomography (SLAC-PUB-14359) (2011).
- Duine, R.A., *De magie van meerdere deeltjes* (in Dutch), Utrecht University Museum, Utrecht, the Netherlands, 30 January 2011.
- Garlaschelli, D., *Een bank als aardbeving bekijken: econofysica beschouwt financiële systemen als natuurverschijnselen*, NRC Handelsblad, page 16, 14 April 2011.
- Garlaschelli, D. and Denteneer, P., *Econophysics: understanding economic complexity*, "Eureka!" Magazine (Leiden University), Number 33, June 2011.
- Garlaschelli, D. and Denteneer, P., *Econophysics: inzicht in economische complexiteit*, "Nederlands Tijschrift voor Natuurkunde", Jaargang 77, Number 11, November 2011.
- McFadden, P. and Skenderis, K., *Observational signatures of holographic models of inflation*, Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity, edited by Thibault Damour, Robert T. Jantzen and Remo Ruffini, ISBN 978-981-4374-51-4. Singapore: World Scientific, 2012, p. 2315.
- Mulders, P.J.G. and Rogers, T.C., *Gauge links, TMD factorization and TMD-factorization breaking*, in *Gluons and the quark sea at high energies: distributions, polarization, tomography*, Editors: D. Boer, M. Diehl, R. Milner, R. Venugopa-

lan, W. Vogelsang, Brookhaven National Laboratory; Institute of Nuclear Theory, University of Washington; Thomas Jefferson National Accelerator Facility, ISBN: BNL-96164-2011, INT-PUB-11-034, JLAB-THY-11-1373, 2011 (book chapter).
- Schoutens, K., *Rethinking fundamental questions*, Public Service Review: European Science & Technology: issue 10, March 2011.
- 't Hooft, G. en Vandoren, S.J.G., *Tijd in machten van tien*, Uitgeverij Veen Magazines, ISBN 9085712432, August 2011.
- van der Schoot, P.P.A.M., *Ontwikkelt vervanger voor zeldzaam indium*, Article on popular science website Kennislink, Kennislink, 14 April 2011.
- Vandoren, S.J.G., *Neutrino's sneller dan het licht?*, Artikel in Vakidioot, Studentenblad Wis- en Natuurkunde, October 2011.
- van Roij, R.H.H.G., *Energie uit zoet en zout water & zoet water uit energie en zout water*, Bessensap (NWO's platform to stimulate contacts between scientists and journalists), The Hague, 6 June 2011.

8.2 Public lectures

- Bais, F.A., *In praise of science*, Comenius Course, University of Cambridge, UK, 14 September 2011.
- Bais, F.A., *Einsteins relativiteit*, Gemeentelijk Gymnasium, Hilversum, the Netherlands, 8 November 2011.
- Bais, F.A., *Keerpunten in de fysica*, Four Lectures, HOVO, Roermond, the Netherlands, fall semester, 2011.
- Bais, F.A., *Keerpunten*, Lecture, Comenius leergang, Kasteel Warnsborn, Arnhem, the Netherlands, 24 November 2011.
- Beenakker, C.W.J., *Nobelprijs 2010 in het licht van Einstein*, Symposium, De Verjaardag van Einstein, Leiden, the Netherlands, 14 March 2011.
- Beenakker, C.W.J., *Chaotische elektronen*, Symposium, CHAOS, Radboud University Nijmegen, the Netherlands, 29 April 2011.
- Beenakker, C.W.J., *Mr. Nobody en de quantumfysica*, Leids Film Festival, Leiden, the Netherlands, 29 October 2011.
- Beenakker, C.W.J., *Zin en onzin over tijdreizen*, SPUI25, Amsterdam, the Netherlands, 2 November 2011.
- Beenakker, C.W.J., *Terug naar de toekomst - reizen in tijden van neutrino's*, Kennis Café, Amsterdam, the Netherlands, 12 December 2011.
- Bergshoeff, E.A., *Academisch?*, Lecture, Openings Symposium FWN, Exploring Excellence, Groningen, the Netherlands, March 2011.
- Bergshoeff, E.A., *Over tijd en ruimte*, Lecture, Natuurkunde Olympiade, Groningen, the Netherlands, April 2011.
- Bergshoeff, E.A., *Groot en klein*, Lecture, Faculty Introduction Day, Groningen, the Netherlands, August 2011.
- Bergshoeff, E.A., *Sneller dan het licht: droom of werkelijkheid?*, Lecture, Studium Generale, Groningen, the Netherlands, November 2011.
- Bergshoeff, E.A., *De wonderlijke wereld van de quantummechanica*, Lecture, in

het kader van studiestijgers, bijeenkomst betavakvernieuwing voor VO-docenten natuurkunde, the Netherlands, November 2011.
- Bergshoeff, E.A., *Sneller dan het licht: droom of werkelijkheid?*, Lecture, Publiekssterrenwacht Phoenix, Lochem, the Netherlands, December 2011.
- Blöte, H.W.J., *Jouke Heringa: an anthology of his contributions to research in physics*, Symposium on the occasion of the retirement of J.R. Heringa, Reactor Institute Delft, Delft University of Technology, 30 September 2011.
- de Boer, J., *Time, space and gravity*, Lecture, Annual SRON Meeting, Dalfsen, the Netherlands, 6 June 2011.
- de Boer, J., *Antimatter*, Introduction, antimatter theme evening Biosfeer Student Organization, Amsterdam, the Netherlands, 12 September 2011.
- Kleiss, R.H.P., *Zwaartekracht ontkracht*, Science Café Nijmegen, the Netherlands, 14 March 2011.
- Laenen, E.L.M.P., *Particle physics, the standard model, and more?*, Mumbai University, India, 26 August 2011.
- Loll, R., Popular lecture "Quantum gravity and the nature of time", Studium Generale, Maastricht University, 17 January 2011.
- Loll, R., Popular lecture "Was there a 'time' before the Big Bang?", Studium Generale, Utrecht University, 2 March 2011.
- Loll, R., Two popular lectures "No escape from gravity" at Universiteitsmuseum Utrecht, 20 March 2011.
- Morais Smith, C., *The cool world of ultracold particles*, Physics Exposition: Master the Universe, Utrecht University Museum, the Netherlands, 20 February 2011.
- Morais Smith, C., *100 years of superconductivity*, Summer School for Secondary level students, University College Utrecht, the Netherlands, 4 July 2011.
- Nienhuis, B., *Virussen een wonder van symmetrie*, Lecture, Viva Fysica, Amsterdam, the Netherlands, 28 January 2011.
- Pallante, E., *Supersnelle deeltjes en supersnelle computer*, Open Day, Oktober Kennismaand, Groningen, the Netherlands, 30 October 2011.
- Pallante, E., *Particles, neutrinos, and the speed of light*, College Series, Honours College, University of Groningen, the Netherlands, 14 November 2011.
- Schoutens, K., *Quantumwereld*, Lectures, Comeniusleergangen, Arnhem, 19 May; 16 June; 25 November 2011.
- Schoutens, K., *Quantum ICT, over quantummechanica en computers*, Lecture, Wetenschapsdag Don Bosco College Volendam, the Netherlands, 6 January 2011.
- Schoutens, K., *Het experiment van Davisson en Germer*, Lecture, Viva Fysica! 2011, University of Amsterdam, the Netherlands, 28 January 2011.
- Schoutens, K., Two lectures, Stedelijk Gymnasium Haarlem, group 6 VWO, 29 March; 12 April 2011.
- 't Hooft, G., Lectures (2x) *De Theorie van Alles, of: Zijn de natuurwetten tot een enkel systeem te reduceren?*, Universiteitsmuseum Utrecht, 16 January 2011.
- 't Hooft, G., Lezing, Physics@FOM, Koningshof, Veldhoven, *CP Violation, and odd corner of quantum field theory*, 18 January 2011.
- 't Hooft, G., *Quantization of relativistic scalar particles*, Lecture [Adv undergrads,

masters, grads], University of Groningen, the Netherlands, 2 March 2011.
- 't Hooft, G., *Black holes and quantum mechanics*, Lecture [masters, grads], University of Groningen, the Netherlands, 3 March 2011.
- 't Hooft, G., *Adding gravity to the Standard Model*, Lecture [Adv course], University of Groningen, the Netherlands, 7 March 2011.
- 't Hooft, G., *De extremen in de wereld van de natuurkunde*, Lecture, University of Groningen, the Netherlands, 10 March 2011.
- 't Hooft, G., *Science fiction vs echte natuurkunde: de kunst van de wetenschapsbeoefening*, Lezing, Jubileumsymposium over Blik op Oneindig, Vereniging Gemma Frisius, afd Friesland vd Kon. Ned. Ver. v. Weer- en Sterrenkunde, 26 March 2011.
- 't Hooft, G., *The large Hadron collider*, Themadiner met Utrecht-Alumninetwerk te Den Haag, Brasserie Berlage, 14 April 2011.
- 't Hooft, G., Erice Summerschool on Subnuclear Physics, lectures on *The negative ? function: from the standard model to quantum gravity*, 25 June-2 July 2011.
- 't Hooft, G., Natal, Brazil, 2 lectures *Space, Time and Quantum Gravity*, 7-15 June 2011.
- 't Hooft, G., Les Houches, Summer Institute, *Spontaneous Breakdown of Local Conformal Invariance in Quantum Gravity*, 5 August 2011.
- 't Hooft, G., Praha. 7th Int. Conf Quantum Theory and Symmetries, Lezing *Spontaneous Breakdown of Conformal Symmetry, and its Consequences*, 11-13 August 2011.
- 't Hooft, G., Copenhagen. 70e verjaardag H.-B. Nielsen, Lezing, *Spontaneous Conformal Symmetry Breaking, the Black Hole Information Problem and Elementary Particle Interactions*, 25 August 2011.
- 't Hooft, G., colloquium CERN, Geneve, *Three problems in Quantum Gravity: Black Hole Information Loss, infinite Lorentz Boosts, and the Hierarchy Problem*, 7 September 2011.
- 't Hooft, G., CERN, Geneve, seminar *Spontaneous Conformal Symmetry Breaking, the Black Hole Information Problem, and Elementary Particle Interactions*, 8 September 2011.
- 't Hooft, G., Maiani 70 Symposium, *On the freely adjustable parameters of the Standard Model*, 21 and 22 September 2011.
- 't Hooft, G., lezing *The Extremes in the World of Physics*, Univ. Wenen, 11 October 2011.
- 't Hooft, G., lezing *The Higgs Particle*, Vienna Univ. Technology, Karlsplatz, 12 October 2011.
- 't Hooft, G., *Black Hole Complementarity and the Hierarchy Problem*, lezing, Univ. Vienna, 12 October 2011.
- 't Hooft, G., Madrid, Fundacion BBVA, progr Science of the Cosmos, Science in the Cosmos Voordracht: *The Large Hadron Collider, the Higgs Particle, and where we stand now*, 14 November 2011.
- 't Hooft, G., 4 lezingen: 28 November 2011: "The Higgs particle. Exploring New Grounds with the Large Hadron Collider",; 29 November 2011: "Black Holes in

Elementary Particle Physics"; 30 November 2011: "The Standard Model of Elementary Particles"; 1 December 2011: "Conformal Symmetry in Gravity".
- van Holten, J.W., *Elementaire deeltjes*, Leiden University, the Netherlands, 4 February 2011.
- van Holten, J.W., *Supersnelle neutrinos, tijdreizen en causaliteit*, KNAW, Amsterdam, the Netherlands, 24 October 2011.
- van Roij, R.H.H.G., *Extremely fluctuating: colloids, nanoparticles, and droplets in liquids*, lecture for prospective (international) students, University College Utrecht, 30 June 2011.
- Verlinde, E.P., *Het ontstaan van de zwaartekracht*, Studium Generale, University of Maastricht, the Netherlands, 20 January 2011.
- Verlinde, E.P., *A nieuwe kijk op de zwaartekracht en het ontstaan van de kosmos*, Studium Generale, University of Eindhoven, the Netherlands, 26 October 2011.
- Verlinde, E.P., *A nieuwe kijk op de zwaartekracht en het ontstaan van de kosmos*, Gent, Belgium, November 2011.
- Zaanen, J., *Snaartheorie in de echte wereld*, Lezing Science Café, Nijmegen, the Netherlands, 14 February 2011.
- Zaanen, J., *Het heelal in een korreltje roest*, Lecture, Koninklijke Maatschappij voor de Natuurkunde Diligentia, Den Haag, the Netherlands, 21 February 2011.
- Zaanen, J., *Quantum criticality, high Tc superconductivity and the AdS/CFT correspondence of string theory*, Colloquium Marie Curie, Nijmegen, the Netherlands, 14 March, 2011.
- Zaanen, J., *Superconductivity in the 21-th century*, Lecture, Centennial Festivity "100 Years of Superconductivity", Museum Boerhaave and Leiden University, the Netherlands, 8 April 2011.

8.3 Other contributions

- Achúcarro, A., organizer of the lecture series "Science of the Cosmos, Science in the Cosmos" for the BBVA Foundation (Fundación Banco Bilbao Vizcaya Argentaria), with half a dozen high profile speakers in 2011. The series will appear on DVD in 2012. Includes media coverage on Spanish TV, radio, and press conferences.
- Bais, F.A., *Hoe? Zo!*, Interviews, Radio 5, 17 June 2011 and 22 August 2011.
- Bais, F.A., Interview session, Chinese Journalist visiting the Netherlands, Hotel American, Amsterdam, the Netherlands, 22 June 2011.
- Bais, F.A., Interview session on translation of my books, Beijing International Book Fair, China, 31 August 2011.
- Bais, F.A., Signing ceremony with Nankin University Press, BIBF, Beijing, China, 1 September 2011.
- Bais, F.A., *The importance of curiosity*, Book related presentation, UCCA Cultural Center, Beijing, China, 6 September 2011.
- Bais, F.A., Brief motivational intro, Kick-off meeting 'Lecturer of the Year', Amsterdam, the Netherlands, 20 October 2011.
- Bais, F.A., Interview on changing of global time keeping conventions, De Gids,

Vara, Radio 1, the Netherlands, 17 November 2011.
- Bais, F.A., Very short introductions, Competition for Students of Amsterdam region, Spui 25, the Netherlands, President of Jury, 25 November 2011.
- Bergshoeff, E.A., Radio interview voor HoeZo? Radio, te beluisteren op `http://player.omroep.nl/?aflID=12375467`, Amsterdam, April 2011.
- Bergshoeff, E.A., *Excellence in research*, korte presentatie gegeven ter gelegenheid van het delegatie bezoek van Argentinie, Groningen, the Netherlands, September 2011.
- Bergshoeff, E.A., *Op zoek naar verborgen dimensies*, populaire lezing gegeven voor het bestuur/directie en managementteam van de Rabobank, Grijpskerk, the Netherlands, September 2011.
- Caux, J.-S., *Quantum cryptografie en quantum computers*, proefcollege natuurkunde (for prospective physics students), University of Amsterdam, the Netherlands, 11 April 2011; 8 December 2011.
- Kleiss, R.H.P., Radio wetenschap24 Hoe?Zo!, Botsende deeltjes, 3 January 2011.
- Loll, R., TV appearance in "Are there more than three dimensions?", part of the US-American series "Through the Wormhole, with Morgan Freeman", Science Channel, 27 June 2011.
- Laenen, E.L.M.P., Over mogelijke 5e natuurkracht, Radio 1 Journaal, the Netherlands, 8 April 2011.
- Laenen, E.L.M.P., Interview, Volkskrant, the Netherlands, 16 April 2011.
- Schoutens, K., *Fantastische werkelijkheid*, briefwisseling met Michiel Jol, uitgegeven in 'Onze Tijd - Wat is waar?', onder auspici en van De Nationale Denktank en de Koninklijke Hollandsche Maatschappij der Wetenschappen, April 2011.
- Skenderis, K., Interview, Journal New Scientist in *Hologram revolution: The theory changing all physics from pre-big bang physics to the origins of mass, there may be no limit to holography's reach*, 13 July 2011 by Jessica Griggs, Magazine issue 2821.
- 't Hooft, G., Petitie aangeboden aan College van Bestuur namens de Vakgroep Natuurkunde betreffende de bezuinigingen, Utrecht, 3 January 2011.
- 't Hooft, G., Interview Illuster, 11 January 2011.
- 't Hooft, G., Labyrinth tv opnamen over maankolonie, 10 February 2011.
- 't Hooft, G., Interview Hoezo? Radio Amsterdam, 11 February 2011.
- 't Hooft, G., Scientific Policy Committee meeting, CERN, Geneve, 14 and 15 March 2011.
- 't Hooft, G., Natal, Brazilie. Int. Adv. Committee meeting voor Int. Inst. Physics IIP-UFRN; tevens onderhoud met Governor Rosalba Ciarlini van de provincie Natal, 4 and 5 March 2011.
- 't Hooft, G., Prijsuitreiking namens Jury voor Profielwerkstukken van VHO leerlingen ihkv tentoonstelling "Master the Universe", Universiteitsmuseum Utrecht, 15 April 2011.
- 't Hooft, G., *A thin sheet of reality: the universe as a hologram*, Plenary Discussion, New York World Science Festival, 3 June 2011.
- 't Hooft, G., *Is reality digital or analogue*, Fundamental Questions Institute FQXi,

Discussion, New York, USA, 4 June 2011.
- 't Hooft, G., Scientific Policy Committee meeting CERN, Geneve, Switzerland, 20 and 21 June 2011.
- 't Hooft, G., Lunch talk Utrecht Summerschool: *From the Standard Model to Quantum Gravity*, 17 August 2011.
- 't Hooft, G., Boekpresentatie boek *Tijd in machten van tien*, met Stefan Vandoren (Van Veen uitgevers). Uitreiking 1e exemplaar aan Wubbo Ockels, 19 August 2011.
- 't Hooft, G., Opnames voor *Through the Wormhole* over thema Is Nothing Something?, 1 October 2011.
- 't Hooft, G., uitzending VPRO Labyrint over Nobelprijzen, 9 October 2011.
- 't Hooft, G., 18-23/10: deelname aan Solvay Conf. on "The Theory of the Quantum World", Hotel Metropole, City Hall, Brussel: 2 korte bijdragen, 19 en 22 okt; 23 okt: Panel discussion over "The future of Physics".
- 't Hooft, G., Bloomington, Indiana (USA). 21st Public Joseph and Sophia Konopinski Memorial Lecture in Physics: *Challenges for the Standard Model of the Elementary Particles*, 31 October 2011.
- 't Hooft, G., Storrs, Connecticut, (USA) 14th Katzenstein Distinguished Lecture: "Black Holes, Quantum Mechanics and Conformal Symmetry", 4 November 2011.
- 't Hooft, G., Wenen, Heinz von Foerster 100 meeting over Self-Organization and Emergence, Keynote Speech: *Quantum mechanics from classical logic*, 10-13 November 2011.
- 't Hooft, G., Interview El Information (Journal); Press Conf., 14 November 2011.
- 't Hooft, G., Symposium tgv 65 verjaardag. Geertekerk, 17 November 2011.
- 't Hooft, G., Interview Radioprogr. Labyrint VPRO met St.Vandoren over Tijd in Machten van 10, Mediapark, Hilversum, 20 November 2011.
- 't Hooft, G., Harderwijk Science Cafe De Oude Drukkerij, lezing *De Large Hadron Collider, Minuscule Deeltjes botsen met gigantische gevolgen*, Hamburg, Carl Friedrich von Weizsacker Lectures 2011, 24 November 2011.
- 't Hooft, G., Scient. Pol. Comm. CERN, Geneve, 12-14 December 2011.
- 't Hooft, G., Interview on line Spinoza TV, over de Spinozaprijzen, 21 December 2011.
- van der Schoot, P.P.A.M., Fysica van Virussen, Eindhoven, evening seminar Annual Meeting of the Vereniging Eindhovense Natuurkundig Ingenieurs, 16 March 2011.
- van der Schoot, P.P.A.M., ontwikkelt nieuw materiaal beeldscherm, presentation in Dutch national newspaper Telegraaf 11 April 2011.
- van der Schoot, P.P.A.M. en Koning, C., Vervangend materiaal voor zeldzaam metaal met een extra bonus, Radio interview on Dutch public radio NTR, popular science programme Hoe?Zo!, 3 November 2011.
- van der Schoot, P.P.A.M., *Googelen op een groen beeldscherm*, interview Dutch financial newspaper Financieele Dagblad, Financieele Dagblad, 12 November 2011.
- van der Schoot, P.P.A.M. en Koning, C., Vervangend materiaal voor zeldzaam metaal met een extra bonus, Video presentation, Ridderzaal, The Hague, Avond van de Wetenschap, 24 November 2011.

- Vandoren, S.J.G., Debatprogramma “Cover Discoveries”, panel discussie tussen pers en wetenschappers, met medewerking van NRC en Volkskrant, AUC Amsterdam, 8 November 2011.
- Vandoren, S.J.G., VPRO Radio uitzending “Labyrinth” rond het onderwerp “Tijd”, naar aanleiding van het boek “Tijd in machten van tien”, G. ’t Hooft en S. Vandoren, 20 November 2011.
- Vandoren, S.J.G., *Speciale relativiteitstheorie*, voordracht voor de Woudschoten Natuurkunde Didactiek Conferentie, 17 December 2011.
- Verlinde, E.P., TV show interview, De Wereld Draait Door, the Netherlands, 2011.
- Verlinde, E.P., Radio-interview, Hoezo Radio, the Netherlands, 20 August 2011.
- Verlinde, E.P., Radio-interview, BNR-radio, the Netherlands, 12 August 2011.
- Verlinde, E.P., Interview voor Natuur, Wetenschap en Techniek, the Netherlands, 2011.

9 Research funding

Below an overview is presented of funding organizations that financially supported the research of the DRSTP in 2011. Regular university funding is not listed.

9.1 Personal grants

University grants
- GRavitation and AstroParticle Physics Amsterdam (GRAPPA) UvA
- *The phases of gauge theories with many flavours*, NCF-grant for computing time (E. Pallante) (RUG)
- De Sitter-leerstoel, E.A. Bergshoeff (RUG) (2009)

KNAW
- Academy professorship, G. 't Hooft (UU) (2005-2011)
- Academy professorship, E.A. Bergshoeff (RUG) (2010-2015)

NWO
- VIDI grant (2005) K. Peeters (UU) (2006-2011)
- VENI grant (2007) M. Das (VUA) (2007-2011)
- VIDI grant (2007) R.A. Duine (UU) (2008-2013)
- VICI grant (2007) C. Morais Smith (UU) (2008-2013)
- VIDI grant (2007) M. Postma (Nikhef) (2008-2013)
- VIDI grant (2007) D. Roest (RUG) (2008-2013)
- VICI grant (2008) K. Skenderis (UvA) (2009-2014)
- VENI grant (2008) P.L. McFadden (UvA) (2008-2011)
- VENI grant (2008) M. Snoek (UvA) (2009-2012)
- VENI grant (2009) S. Miao (UU) (2010-2013)
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- VICI grant (2010) S. Vandoren (UU) (2011-2016)
- VICI grant (2010) G. Arutyunov (UU) (2011-2016)
- VIDI grant (2011) A. Parnachev (UL) (2012-2016
- Spinoza Grant (2011) E.P. Verlinde

ERC
- ERC Advanced Investigator Grant, B.Q.P.J. de Wit (UU) *Supersymmetry: a window to non-perturbative physics* (2010-2015)
- ERC Advanced Investigator Grant, E.P. Verlinde (UvA) *Emergent gravity, string theory and the holographic principle* (2011-2016)
- ERC Starting grant, G. Bertone (UvA) *The moment of truth for WIMP dark matter* (2011-2016)
- ERC Starting grant, R.A. Duine (UU), *New frontiers in spintronics* (2008-2013)

EU Marie Curie fellowships
- P. Sulkowski (UvA) *Black holes - BPS - black holes, BPS states and topological string theory* (1 October 2009 - 30 September 2012)

Other fellowships
- R.N. Caldeira Costa (UvA) Portuguese Foundation for Science and Technology PhD, research fellowship (1 October 2008 - 1 October 2012)
- Th.M. Nieuwenhuizen (UvA) UvA-NYU exchange professorship, Center of Cosmology and Particle Physics NYU
- M. Taylor (UvA) FOM/v Stimuleringsprogramma, overbruggingsaanstelling (2009 - 2012)

9.2 FOM funding

- **FOM-A-20** (group leader E.P. Verlinde)
  String theory and quantum gravity (FOM program 57)
  01STQG01: Thermodynamics of strings, fluxes and branes (R.H. Dijkgraaf and J. de Boer)
  01STQG05: Persoonlijk materieel budget programmaleider
  A string theoretic approach to cosmology and quantum matter (FOM program 121)
  09CQ01: Dynamical aspects of black holes (J. de Boer, M. Taylor, E.P. Verlinde)
  09CQ02: Holography and cosmology (K. Skenderis, J.P. van der Schaar)
  09CQ09: Program management, workshops and guests (E.P. Verlinde)
  Projectruimte
  06PR2510: Cosmological vacua in string theory (R.H. Dijkgraaf and E.P. Verlinde)
  08PR2647: Topological computations for supersymmetric theories (J. de Boer)
  10PR2818: An entropic view on gravity and the cosmos (E.P. Verlinde)

- **FOM-A-25** (group leader K. Schoutens)
  Collective and cooperative statistical physical phenomena (FOM program 46)
  04CCSPP24: Collective behavior vs entanglement in atomic matter (K. Schoutens)
  Solid state quantum information processing (FOM program 73)
  08QIP07: Topological quantum computation in fractional quantum Hall effect devices (K. Schoutens)

10ODE02: New linear Luttinger liquid response functions (J.-S. Caux)
Projectruimte
08PR2566: Cracking the quantum quench (J.-S. Caux)
08PR2585: Topological quantum registers (K. Schoutens)
08PR2627: A new launch pad for renormalization (J.-S. Caux)

– **FOM-V-01** (group leader P.J.G. Mulders)
Theoretical particle physics in the era of the LHC (FOM program 104)
07TPP04: Theoretical particle physics in the era of the LHC (D. Boer and P.J.G. Mulders)
Projectruimte
04PR2302: Exposing the color glass condensate (D. Boer)
05PR2422: Time reversal odd phenomena in quantum chromodynamics (P.J.G. Mulders)
07PR2547: Color flow in hard hadronic scattering processes (P.J.G. Mulders)

– **FOM-V-13** (group leader F.C. MacKintosh)
Biomolecular physics (FOM program 60)
03BMP23: Micromechanics and active response of biopolymer networks (F.C. MacKintosh)
Material properties of biological assemblies (FOM program 90)
05BMPA04: Cytoskeletal/filamentous protein networks and assemblies (F.C. MacKintosh)
05BMPA06: Microrheology and non-equilibrium fluctuations of active cytoskeletal networks (F.C. MacKintosh/ G. Koenderink)
05BMPA10: Guest budget (F.C. MacKintosh)
05BMPA11: Personal budget, program leader (F.C. MacKintosh)
Rheophysics: connecting jamming and rheology (FOM program 102)
07CJR03: Modelling of non-affine deformations and flow (F.C. MacKintosh)
Projectruimte
07PR2680: Cell-inspired design of polymer networks with tailored mechanical properties (G.H. Koenderink/ F.C. MacKintosh)
Mechanosensing and mechanotansduction by cells (FOM program 117)
09MMC08: Force transmission in the extracellular matrix (F.C. MacKintosh)

– **FOM-V-16** (group leader T.D. Visser)
Singular plasmonics
07PLSM02: Singular plasmonics (T.D. Visser)

– **FOM-G-01** (group leader E.A. Bergshoeff)
Projectruimte jaarronde 2007
07PR2533: *Unfolding matter on Tera-scale computers* (E. Pallante)
Projectruimte jaarronde 2009
09PR27: *Massive gravity: the road to quantum gravity?* (E.A. Bergshoeff)

FOM-program: Theoretical particle physics in the era of the LHC
07TPP01: *CP violation with charm quarks at the LHC* (E. Pallante)
FOM-program: A string theoretic approach to cosmology and quantum matter
09CQ05: *Effective actions for string cosmology* (E.A. Bergshoeff)
FOM program (2011–2016) "Topological insulators" (C.W.J. Beenakker, J. Zaanen, with colleagues from Amsterdam, Delft, and Twente)
FOM projectruimte (2011–2016): "Topological phase transitions in insulators and superconductors" (C.W.J. Beenakker)
FOM projectruimte (2011–2016): "Twisting nucleosomes and segregating chromosomes: biophysics inside the cell nucleus" (H. Schiessel)
FOM projectruimte (2011–2016): "Gravity at a Kelvin: the generalized rigidity of the superconducting quantum nematic" (J. Zaanen)
NWO (2011–2015): Leiden de Sitter Cosmology program, , NWO Graduate Program, 800 keuro (A. Achúcarro with K. Kuijken)

– **FOM-N-01** (group leader R.H.P. Kleiss)
Theoretical particle physics in the era of the LHC (FOM program 104)
07TPP02: Higgs+SuSy (R.H.P. Kleiss, W. Beenakker)

– **FOM-U-01** (group leader G. 't Hooft)
Theoretical particle physics in the era of the LHC (FOM program 104)
07TPP03: Naturalness and fundamental vs composite scalars (G. 't Hooft)
Projectruimte
07PR2522: What curves the space-time at large scales? The quest for the origin of dark energy of the universe (T. Prokopec)
09PR2744: The 4D/5D connection for black holes and black rings (G. 't Hooft)

– **FOM-U-05** (group leader H.T.C. Stoof)
Projectruimte
08PR2587: Ultracold Fermi gases and neutron stars (H.T.C. Stoof)
10PR2783-2: Spin drag in Bose gases (H.T.C. Stoof/R.A. Duine/ P. van der Straten)

– **FOM-U-29** (group leader B. de Wit)
String theory and quantum gravity (FOM program 57)
01STQG02: New approaches to hypermultiplets/local field theory couplings of BPS states (B. de Wit)
A String Theoretic approach to cosmology an quantum matter (FOM program 121)
09CQ03: Fixed point CFT's for condensed matter systems (S.J.G. Vandoren)
09CQ04: Moduli stabilization and cosmological vacua (S.J.G. Vandoren)
Projectruimte
09PR2731: Statistical versus thermodynamic black hole entropy (B. de Wit)

– **FOM-U-31** (group leader R. van Roij)
Innovative physics for oil and gas (FOM/SHELL program 116)
08iPOG08: Electrokinetics and electroacoustics near oil-water interfaces in porous media (R. van Roij)
Projectruimte
07PR2592: Do smectic nuclei exist? (R. van Roij/M. Dijkstra)

– **FOM-U-34** (group leader R. Duine)
Controlling spin dynamics in magnetic nanostructures: combining fast time and short length scales for tomorrow's technology (FOM program 109)
80SPIN03: Theory domain walls (R. Duine)

– **FOM-U-35** (group leader R. Loll)
Projectruimte
08PR2578: A reality check for quantum cosmology (R. Loll)
10PR2765: Ironing out the quantum wrinkles of spacetime (R. Loll)

9.3 FOM-Nikhef

– **FOM program** (group leader E. Laenen)
Theoretical particle physics in the era of the LHC (FOM program 104)
07TPP06: Tools, methods and applications for new physics predictions for the LHC (J.-W. van Holten, E. Laenen, J.A.M. Vermaseren)

– **FOM program** (group leader J. van den Brand)
String theory and quantum gravity (FOM program 57)
01STGQG04: Conformal field theory (J.-W. van Holten)

– **FOM-Nikhef** (group leader J.A.M. Vermaseren)
Projectruimte
07PR2556: Precision phenomenology at the LHC (J.A.M. Vermaseren)

– **FOM-Nikhef** (group leader R. Fleischer)
Projectruimte
05PR2435: Exploring a new territory of the biophysics landscape at LHCb

9.4 EU-networks

– Study of Strongly Interacting Matter (HadronPhysics2)
  Duration: 2009-2012
  Netwerk coordinator: C. Guaraldo (Frascati)
  Scientist in charge for VUA: P.J.G. Mulders

– LHCPhenoNet (PITN-GA-2010-264564)
  Duration: from 01-01-2011 until 01-01-2015
  Network coordinator: Dr. G. Rodrigo (IFIC, Valencia, Spain)
  Scientist in charge for Nikhef: E. Laenen

9.5 Other

NWO
– NWO Top-talent: (T. van Dijk) (VUA)
– NWO Mozaiekbeurs C. Wever (2008-2012)
– NWO-STAR: (S. Taati), A.C.D. van Enter (RUG) and R. Fernandez (UU) (2010-2012)

STW
– VTF 7803 (T. Visser) (VUA): Using light better (T. Stegeman and S. Raghunathan)

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Appendix A
Mission statement

Objectives

The Dutch Research School of Theoretical Physics (DRSTP) is a cooperation between the theoretical physics groups of six Dutch universities and of the National Institute for Subatomic Physics (Nikhef) with the following purpose:

- to implement a joint programme of graduate education in theoretical physics that draws upon a dynamic research environment;
- to maintain and strengthen research in theoretical physics from a broad unifying perspective that exploits the interrelationships between different fields of theory;
- to strengthen, both in research and graduate education, connections with experimental physics, and other disciplines such as mathematics, computational science, astrophysics, earth science, physical chemistry and the life sciences.

The DRSTP is based on the conviction that a joint venture of all the moderately sized local theory groups, each with its own profile, offers added value for the achievement of these objectives. The DRSTP represents a sizable part of the national activity in theoretical physics, a field that has a strong tradition in the Netherlands. At present there exists no other organization that represents this field of research at the national level. The DRSTP welcomes further growth, for instance, by cooperation with institutions in neighboring countries that share these goals. Often its educational activities already attract students from neighboring countries and occasionally some of these activities are based on a close collaboration with partners abroad.

Mandate

The Governing Board of the DRSTP, which consists of representatives of the partners, is responsible for undertaking any suitable initiative to further its goals. The scientific director of the DRSTP is responsible for implementing the overall policy on behalf of the Board and for coordinating the DRSTP activities. The mandate to carry out these tasks is based on an official agreement between the boards of the participating partners, as a result of which the DRSTP has been accredited by the Royal Netherlands Academy of Arts and Sciences (KNAW) in June of 1994 and reaccredited in 1999, 2004 and 2010. The agreement guarantees means for a six year period in terms

of explicit staff commitments as well as graduate student positions. The DRSTP is assisted in its endeavor by an international Scientific Advisory Committee of distinguished scientists.

Research

Theoretical physics is based on universal principles. New concepts often have a much wider validity than in the field in which they are discovered, and methods developed in one field are sometimes very useful in another. Hence theoretical physics is characterized by unity in diversity.
The research fields of the DRSTP are highly diverse, ranging from the physics at the very smallest length scales to the large scale structure of space and time, and from the study of building blocks of matter to the intricacies of the many-body physics of condensed matter, be it quantum matter, soft matter or bio-matter.
The methods employed in these various fields make up the universal language of theoretical physics: formalisms such as the renormalization group and quantum field theory, and various concepts of statistical, computational and mathematical physics are universally applied and establish cross-talk among the research fields.
The research areas covered by the DRSTP can be grouped into the following broad and overlapping themes:

- Theme 1: Particle physics, cosmology, quantum gravity and string theory
- Theme 2: Quantum matter, quantum information, soft condensed matter and biophysics

The specific content of the research programme depends on the responsible project leaders, on their creativity as well as their initiative to obtain research funding from their home universities, the Dutch research councils of NWO, or from international sources such as European Union programmes.
The research programme is carried out under the responsibility of the Governing Board and the scientific director in accordance with the agreement. The Governing Board of the DRSTP safeguards the objectives of the Research School. It monitors the overall coherence and quality of the research programme. The Board discusses periodically whether the program remains on the forefront of international developments. The Scientific Advisory Committee plays an essential part in these matters.
The DRSTP is also accountable to the faculties of the participating partners. Therefore it reports regularly on past and planned activities, both in research and graduate education, on the basis of information presented in its yearly reports.

Graduate programme

The partners in the DRSTP offer a joint program of graduate education leading to a PhD. As part of the research training, under the supervision of a member scientist of the corresponding node, the Research School guarantees a wide range of educational opportunities for its PhD students. They consist of advanced courses, seminars and topical courses in the Netherlands, and international experience in the form of workshops, summer schools or extended research visits abroad.

The Governing Board of the DRSTP decides on admission and monitors the evaluation of progress with a prognosis of ultimate success after the first year. This takes place on the basis of an 'Education and Supervision Form' [opleiding- en begeleidingsplan (OBP)] between each individual PhD student and its supervisor(s), to be submitted to and approved by the Board upon admittance.
The Educational Board advises the Governing Board. It also assembles the content of the yearly programme of regular activities. Standard advanced courses are published in a nationwide survey. Special PhD courses are offered within the DRSTP, in quantum field theory, statistical physics and in theoretical condensed matter physics, or result from joint efforts with other research schools.

The input of graduate students in the school takes place in the form of a PhD Student Council that meets regularly with the scientific director and the chairman of the Governing Board and Educational Board (which also has one student member).
Individual members of the DRSTP play a pivotal role in helping to organize many summer schools and workshops, in the Netherlands as well as abroad, and in serving as teachers in all the activities that the DRSTP undertakes by itself or in cooperation with others.

Other responsibilities

The responsibilities of the DRSTP include:

- the promotion of a stimulating research environment in theoretical physics
- setting uniform standards of quality
- making educational supplements available tailored to individual research needs.

The Board also develops a wide range of activities in order to support an exciting research climate from fund-raising, e.g. for postdoctoral fellows, guest teachers or international mobility of DRSTP students, to the selection of visiting professors, for example on the Kramers (UU), Lorentz (UL) or Van der Waals (UvA) Chairs.

Appendix B
Selection and supervision procedure of PhD students

When a PhD research position opens up with one of the participating partners, there is usually an open round of applications. Important criteria in the selection procedure are the potential of the student for doing independent scientific research and the level and skills demonstrated in the Master's program.

Admission to the DRSTP requires the submission of an 'Education and Supervision Form' [opleiding- en begeleidingsplan (OBP)], containing a global description of educational activities with details provided for the first year. The plan also specifies how individual guidance will be provided under responsibility of the thesis advisor. The Research School safeguards a consistent implementation of the agreement, with uniform standards. The plan has to be submitted to the DRSTP Bureau. Formal admission is subject to approval by the Governing Board.

After one year the progress is evaluated, based on an interview with the thesis advisor and an independent second referee. The school safeguards this procedure without interfering with the responsibilities of the employer. Participation in the educational program is an explicit element of the evaluation: students are expected to attend at least two DRSTP postgraduate schools and the DRSTP symposium *'Trends in Theory'*. The outcome of the evaluation will reflect on whether the student will be able to complete the research program within the amount of time allotted. If the prognosis is negative, the student will be asked to leave the DRSTP. Such outcomes should be, and are, extremely rare provided proper care is given to the initial selection.

A student can appeal a negative evaluation with the Governing Board of the school; a decision will be reached within one month. If a student does leave the school before completing the PhD program, a diploma, specifying the student's accomplishments in the educational program, will be provided.

After the first year, throughout the duration of the PhD project, the progress will be closely monitored, for example by additional yearly evaluation interviews.

Appendix C
Postgraduate courses (AIO/OIO schools)

Theoretical High Energy Physics

Date:
6 - 18 February 2011

Location:
For the second time the school was organized in São Paulo, Brazil in collaboration with the Jorge André Swieca Summer School and the Instituto de Física Teórica (IFT/UNESP) at two locations: Campos do Jordão, São Paulo and the IFT building in Barra Funda. The first week of the DRSTP School overlapped with the second week of the Swieca Summer School.

Scientific organizers:
N. Berkovits (IFT/UNESP, São Paulo); J. de Boer (UvA); E. Laenen (Nikhef/UvA/UU)

Program first week:
45 minute seminars -
G. Burdman (USP-São Paulo): *New strong interactions at the TeV scale: the next generation*
B. de Wit (UU): *Lessons learned from BPS black holes*

Four minicourses of five 75 minute lectures -
J. de Boer (UvA): *Topics in AdS-CFT*
F. Halzen (Wisconsin): *Astroparticles and cosmology*
C. Quigg (FERMILAB): *Potential discoveries at the LHC*
E. Witten (IAS - Princeton): *A new look at the path integral of quantum mechanics*

Program second week:
Opening lecture -
E. Witten (IAS - Princeton): *String theory and the universe*

Mini courses with 10 lectures and 4 problem sessions -
E. Laenen (Nikhef/UvA/UU): *All-order aspects of QCD*
P. van Nieuwenhuizen (Stony Brook): *Renormalization of gauge theories*

Guest speaker Thursday evening -
G. Matsas (IFT/UNESP): *Low energy quantum effects in gravity*

Twenty-six students participated from the RUG (8), UU (8), UvA (5), RU (2), Nikhef (2) and UL (1).

Participants (26) and presentations (25) (15 minutes each):
Baggio, Marco (UvA): *1-loop determinants and black holes*
Borghese, Andrea (RUG): *Exploiting Susy breaking*
Bzowski, Adam (UvA): *Holography for cosmology*
Caldeira Costa, Ricardo (UvA): n.a.
de Haan, Sjoerd (RUG): *Non relativistic holography*
Franzen, Anne (UU): *Scalar wave equation in Kerr background*
Holsheimer, Kristian (UvA): *Dictionary for Lifshitz spacetime*
Hristov, Kiril (UU): *Static supersymmetric black holes in AdS_4*
Knegjens, Rob (Nikhef): *In pursuit of new physics with B_s mesons*
Lodato, Ivano (UU): *Applications of the Noether potential*
Malamos, Ioannis (RU): *Reduction of 1-loop amplitudes, arguments for 2-loops*
Merbis, Wout (RUG): *Holographic renormalization and new massive gravity*
Mooij, Sander (Nikhef): *Goldstone bosons in Higgs inflation*
Noordmans, Jacob (RUG/KVI): *Lorentz invariance on trial*
Nunes da Silva, Tiago (RUG): *Conformality in gauge theories*
Ortiz, Pablo (UL): *Multifield inflation*
Reker, Siebren (RUG): *Lattice QCD in the era of LHC*
Romanets, Olena (RUG/KVI): *Charmed and strange baryon resonances*
Sfondrini, Alessandro (UU): *The AdS/CFT conjecture and integrability*
Toldo, Chiara (UU): *Black holes in AdS_4 and the cosmic dyon*
van den Broek, Thijs (RU): *To commute ... or not to commute*
van der Schee, Wilke (UU): *Thermalisation time of the quark gluon plasma using AdS/CFT*
van Tongeren, Stijn (UU): *Twisted integrability*
Weenink, Jan (UU): *Gauge invariant cosmological perturbations and the quantum equivalence of frames*
Wouters, Bram (UvA): *D-brane interactions at finite temperature*
Yin, Yihao (RUG): *Scalar potential and the embedding tensor formalism*

Statistical Physics and Theory of Condensed Matter

Date:
7 - 18 March 2011

Location:
Hotel Bergse Bossen, Driebergen, the Netherlands

Scientific organizers:
R. Duine (UU); K. Storm (TU/e)

Lecturers:
S. Kokkelmans (TU/e): *Scattering theory and Feshbach resonances*
F. MacKintosh (VUA): *Linear response theory and the fluctuation dissipation theorem*
H. Stoof (UU): *Renormalization group theory*
B. Tighe (UL): *Soft matter near the jamming transition*

Evening speakers:
D. Garlaschelli (Pisa/UL): *Complex networks: properties, models and applications to economics*
K. Schalm (UL): *A new approach to strongly coupled criticality: string theory*
D. van Oosten (UU): *Noise correlations: quantum states of light and matter*
W. van Saarloos (FOM): *Do's, don'ts and don't knows - a career in theoretical physics*

Seventeen students participated, all of whom were from the Netherlands.

Participants (17) and presentations (15) of 15 minutes each:
Baarsma, Jildou (UU): *Supersolid phases in an imbalanced Fermi mixture*
Belli, Simone (UU): *Effect of polydispersity on the stability of the biaxial phase*
Cioroianu, Adrian (TU/e): *Non-affine collective modes and elasticity in 2D bond-bending networks*
Cubrovic, Mihailo (UL): *Strongly correlated electrons from AdS/CFT*
Haaker, Shanna (UvA): *Particles in non-Abelian gauge potentials: adiabatically inserting non-Abelian flux*
Koning, Vinzenz (UL): *Frustrated nematic order in spherical geometries*
Lanzani, Giovanni (UL): n.a.
Mink, Martijn (UU): *Probing the topological exciton condensate via Coulomb drag*
Novikova, Elizaveta (TU/e): *How does the cell probe the stiffness of the environment?*
Panfil, Milosz (UvA): *Correlations in the 1D Bose gas*
Rademaker, Louk (UL): *The motion of a single exciton in a bilayer quantum antiferromagnet*
Sheinman, Michael (VUA): *Non-linear elasticity and criticality*
Troppenz, Thomas (UU): n.a.

Upadhyaya, Nitin (UL): *Quantum buckling*
van der Bijl, Erik (UU): *Spin-orbit coupling in spintronics*
van Gelderen, Ralph (UU): *Spin-orbit coupling in spintronics*
van Ostaay, Jan (UL): *Spin-triplet supercurrent carried by Andreev-Rashba edge states*

Appendix D
Symposium Trends in Theory 2011

Date:
19 and 20 May 2011

Location:
Hotel Mooirivier, Dalfsen, the Netherlands

Organizers:
R. Kleiss (DRSTP Governing Board member; RU); R. Loll (DRSTP director, UU); I. Niessen (PhD Student Council member; (RU); K. Storm (chairman, program committee, TU/e); J. van Zee (DRSTP manager)

Lecturers:
Thursday, 19 May
J. van den Brand (Nikhef/VUA): *Gravity, the dynamics of spacetime*
L. Vandersypen (TUD): *Quantum control of electron and nuclear spins in semiconductor quantum dots*
D. Boer (RUG): *Evolving gluons: The Froissart bound, color glass, and linear polarization*
C. Beenakker (UL): *The search for Majorana fermions in topological superconductors*

Evening lecturer:
G. Farmelo (London): *Paul Dirac - the hidden life of the theoreticians' theoretician*

Friday, 20 May
V. Vitelli (UL): *The fate of the sonic vacuum*
M. Dogterom (AMOLF): *Using pushing and pulling forces to find the middle of a cell*
R. Fleischer (Nikhef): *Precision physics with B mesons: New probes for new physics in the LHC era*
B. de Wit (UU): *On black hole entropy*

Figure 11.1: Graham Farmelo delves into the hidden life of 'The Strangest Man' Paul Dirac (1902-1984) (ISBN: 0465022103).

Participants (117):
Andringa, R., MSc (RUG)
Armaitis, J., BSc (UU)
Aybat, M., dr. (Nikhef)
Baarsma, J., MSc (UU)
Baggio, M., MSc (UvA)
Beekman, A., drs. (UL)
Beenakker, C., prof. dr. (UL)
Beenakker, W., dr. (RU)
Belli, S., MSc (UU)
Bergshoeff, E., prof. dr. (RUG)
Beugeling, W., MSc (UU)
Bobbert, P., dr. (TU/e)
Boer, D., prof. dr. (RUG)
Bongaarts, P., dr. (UL)
Bosman, S., BSc (UvA)
Budd, T., MSc (UU)
Buffing, M., BSc (VUA)
Caldeira Costa, R., MSc (UvA)
Caux, J.-S., dr. (UvA)
Cubrovic, M., MSc (UL)
de Adelhart Toorop, R., MSc (Nikhef)

De Bruyn, K., BSc (Nikhef)
de Haan, S., MSc (RUG)
de Lange, P., BSc (UvA)
de Vries, J., MSc (RUG)
de Wit, B., prof. dr. (UU)
Dekens, W., BSc (RUG)
den Dunnen, W., MSc (VUA)
Denteneer, P., dr. (UL)
Di Liberto, M., MSc (UU)
Dibitetto, G., drs. (RUG)
Diederix, J., MSc (UU)
Dogterom, M., prof. dr. (AMOLF)
Ellenbroek, W., dr. (TU/e)
Falgari, P., dr. (UU)
Farmelo, G., prof. (London)
Fleischer, R., dr. (Nikhef)
Fokkema, T., BSc (UU)
Franzen, A., MSc (UU)
George, D., dr. (Nikhef)
Glavan, D., MSc (UU)
Godbole, R., prof. (Indian Institute of Science)
Haaker, S., MSc (UvA)
Hetzel, J., BSc (RU)
H ohn, P., MSc (UU)
Holsheimer, K., MSc (UvA)
Hristov, K., MSc (UU)
Jacobs, V., BSc (UU)
Jordan, S., MSc (UU)
Knegjens, R., MSc (Nikhef)
Koghee, S., BSc (UU)
Koksma, J., MSc (UU)
Korovin, Y., MSc (UvA)
La Rooij, A., BSc (UvA)
Laamanen, J., dr. (RU)
Laenen, E., prof. dr. (UvA/Nikhef/UU)
Lande, A., prof. dr. (RUG)
Lodato, I., MSc (UU)
Loll, R., prof. dr. (UU)
Lucassen, T., MSc (UU)
Maio, M., drs. (Nikhef)
Merbis, W., MSc (RUG)
Mesta, M., MSc (TU/e)
Mink, M., MSc (UU)
Mooij, S., MSc (Nikhef)

Morais Smith, C., prof. dr. (UU)
Mossel, J., MSc (UvA)
Mulders, P., prof. dr. (VUA)
Niessen, I., MSc (RU)
Noordmans, J., MSc (RUG)
Nunes da Silva, T., MSc (RUG)
Oberreuter, J., drs. (UvA)
Ortiz, P., MSc (UL/Nikhef)
Overbosch, B., dr. (UL)
Palacios, G., dr. (UvA)
Pallante, E., prof. dr. (RUG)
Panfil, M., MSc (UvA)
Postma, M., dr. (Nikhef)
Pozsgai, B., dr. (UvA)
Prokopec, T., dr. (UU)
Reijnders, K., BSc (RU)
Riccioni, F., dr. (Sapienza Univ. Rome)
Romers, J., MSc (UvA)
Schalm, K., dr. (UL)
Schoutens, K., prof. dr. (UvA)
Sfondrini, A., MSc (UU)
Smolic, M., MSc (UvA)
Snoek, M., dr. (UvA)
Storm, K., dr. (TU/e)
Swaving, A., drs. (UU)
Tieleman, O., MSc (UU)
Toldo, C., MSc (UU)
Troppenz, T., MSc (UU)
van Baal, P., prof. dr. (UL)
van de Meent, M., drs. (UU)
van den Brand, J., prof. dr. (Nikhef/VUA)
van den Broek, T., MSc (RU)
van der Aalst, T., MSc (UL)
van der Bijl, E., MSc (UU)
van der Schee, W., MSc (UU)
van Driel, H., MSc (UU)
van Gelderen, R., MSc (UU)
van Heugten, J., MSc (UU)
van Holten, J.-W., prof. dr. (Nikhef/UL)
van Ostaay, J., MSc (UL)
van Saarloos, W., prof. dr. (FOM)
van Tongeren, S., MSc (UU)
van Zalk, M., MSc (UU)
Vandersypen, L., prof. dr. (TU Delft)

Verlinde, E., prof. dr. (UvA)
Vitelli, V., dr. (UL)
Walk, W., dr. (SHELL)
Weenink, J., MSc (UU)
Wever, C., MSc (UU)
Yin, S., dr. (UU)
Yin, Y., MSc (RUG)
Zheng, S., BSc (UvA)

Poster presentations PhD students (62):
Andringa, Roel (RUG): *A new perspective on nonrelativistic gravity*
Armaitis, Jogundas (UU): *Polarons in extremely imbalanced Fermi mixtures*
Baarsma, Jildou (UU): *Supersolid phases in imbalanced atomic Fermi gases*
Beekman, Aron (UL): *Type-II Josephson effect*
Belli, Simone (UU): *How something nasty as polydispersity stabilizes the biaxial nematic phase*
Beugeling, Wouter (UU): *Spin-imbalanced topological phases and chiral Rashba states in a fermionic lattice*
Bosman, Sal (UvA): *Half-integer Hall response in topological insulators*
Budd, Timothy (UU): *CDT as a candidate quantum theory of gravity, but what gravity?*
Buffing, Maarten (VUA): *Transverse momenta of partons and color gauge invariance*
Caldeira Costa, Ricardo (UvA): *Aspects of non-relativistic holography*
Cubrovic, Mihailo (UL): *Electron-electron and electron-hole pairing from AdS/CFT correspondence*
de Adelhart Toorop, Reinier (Nikhef): *Explaining fermion masses by family symmetries*
De Bruyn, Kristof (Nikhef): *Penguin topologies in* $B_s^o \to J/\psi K_S$
Troppenz, Thomas (UU): *Monte Carlo simulations of hard parallel sperocylinders in electric fields*
de Lange, Paul (UvA): *Strings, matrices and emergent attractive forces*
de Vries, Jordy (RUG): *Probing CP-violation with hadronic electric dipole moments*
Den Dunnen, Wilco (VUA): *Bounding W-W' mixing with spin asymmetries at RHIC*
Dekens, Wouter (RUG): *Consequences of A4 family symmetry in left-right models*
Di Liberto, Marco (UU): *Finite-momentum Bose-Einstein condensates in shaken 2D square optical lattices*
Fokkema, Thessa (UU): *AdS/CFT correlation functions through supergravity*
Franzen, Anne (UU): *Scalar waves in Kerr background*
Haaker, Shanna (UvA): *Particles in a perpendicular magnetic field: non-abelian gauge fields*
Hetzel, Jamil (RU): *Probing the supersymmetry breaking mechanism using renormalisation group invariants*
H ohn, Philipp (UU): *Canonical simplicial gravity*
Hristov, Kiril (UU): *Supersymmetric solutions in N=2 D=4 gauged supergravity*

Jacobs, Vivian (UU): *Kubo formalism for spin drag in an atomic Fermi gas*
Jordan, Samo (UU): *Phase transitions of quantum geometry*
Knegjens, Rob (Nikhef): *In pursuit of new physics with B mesons*
Koksma, Jurjen (UU): *Decoherence in quantum field theory*
Koghee, Selma (UU): *Merging of Dirac points in the shaken honeycomb optical lattice*
Korovin, Yegor (UvA): *Wilson loops at strong coupling in real-time formalism*
Lodato, Ivano (UU): *Effect of supersymmetric higher-derivative terms on flat directions*
Lucassen, Ties (UU): *Spin motive forces due to a vortex domain wall*
Merbis, Wout (RUG): *The AdS/ logarithmic-CFT correspondence*
Mink, Martijn (UU): *Probing the topological exciton condensate via Coulomb drag*
Mooij, Sander (Nikhef): *Goldstone bosons in Higgs inflation*
Mossel, Jorn (UvA): *Non-equilibrium dynamics and correlation functions of the 1D Bose gas*
Niessen, Irene (RU): *Supersymmetry vs extra dimensions*
Noordmans, Jacob (RUG): *Testing Lorentz symmetry*
Nunes da Silva, Tiago (RUG): *Conformality in gauge theories*
Oberreuter, Johannes (UvA): *Multiple problems with multiple sectors in supergravity*
Ortiz, Pablo (UL): *Single field inflation consistent with supergravity*
Panfil, Milosz (UvA): *Temperature correlations in the 1D Bose gas*
Reijnders, Koen (RU): *Semiclassical theory of chiral tunneling*
Romers, Jesper (UvA): *Charged spin textures in fractional quantum Hall states*
Sfondrini, Alessandro (UU): *TBA and lifting of degeneracies for AdS5 X S5 strings*
Smolic, Milena (UvA): *Nonconformal branes and hydrodynamics*
Tieleman, Olivier (UU): *s+p-orbital superfluid bosons in a 2D optical superlattice*
Toldo, C. (UU): *Black holes in supergravity*
van de Meent, Maarten (UU): *Piecewise flat gravity in 3+1 dimensions*
van der Aalst, Ted (UL): *Observing strings in a realistic inflationary background*
van den Broek, Thijs (RU): *Noncommutative geometry, a new approach to supersymmetry?*
van der Bijl, Erik (UU): *Spin transfer torques and spin pumping in strongly spin-orbit coupled systems*
van der Schee,Wilke (UU): *Gravitational dual of a lead-lead collision*
van Driel, Hedwig (UU): *Spin caloritronics in Bose gases*
van Gelderen, Ralph (UU): *Spin-density-wave instabbility in graphene doped near the van Hove singularity*
van Heugten, Jasper (UU): *Color superconductivity*
van Ostaay, Jan (UL): *Spin-triplet supercurrent carried by quantum Hall edge states through a Josephson junction*
van Tongeren, Stijn (UU): *Mirror, mirror TBA - scaling dimensions are found what way!?*
Weenink, Jan (UU): *Gauge invariant cosmological perturbations & the quantum equivalence of frames*
Wever, Chris (UU): *Pair production of squarks and gluinos at hadron colliders*

Zheng, Stephan (UU): *New aspects of duality in topological gauge theory*

Shell poster award ceremony

On behalf of Shell, W. Walk awarded a poster prize of €500 to winner Anne Franzen (UU) for her poster entitled: *Scalar waves in Kerr background* (see following page, digital versio available at: `http://web.science.uu.nl/DRSTP/Conferences/Trends/2011/AnneFranzenPoster.pdf`).

The jury members consisted of C. Morais Smith (UU), W. Beenakker (RU) and W. Walk (Shell). Jury member W. Beenakker (RU) commented: *It was the complete package that convinced us (and various other people alike). She gave a very clear, enthousiastic oral presentation. Lots of thought had gone into the textual and graphical representation of her intrinsically difficult and rather technical research. Specific elements of the calculations and features of the results were reflected graphically on the poster, like boundary conditions between solutions being depicted on the boundaries of those poster segments where the solutions were explained. In addition, the appearance of the poster segments reflected properties of the solutions that these poster segments were referring to. The more I looked at the poster, the more structure and connections I detected!*

Runners-up were: Simone Belli (UU), Reinier de Adelhart Toorop (Nikhef), Jan Weenink (UU) and two Master's students Thessa Fokkema (UU) and Koen Reijnders (RU).

Appendix E
PhD Day

Date:
14 October 2011

Location:
Centre for Visual Arts [Centrum voor Beeldende Kunst], Plompetorengracht 4, Utrecht, the Netherlands

Organizers:
Members of the PhD Student Council

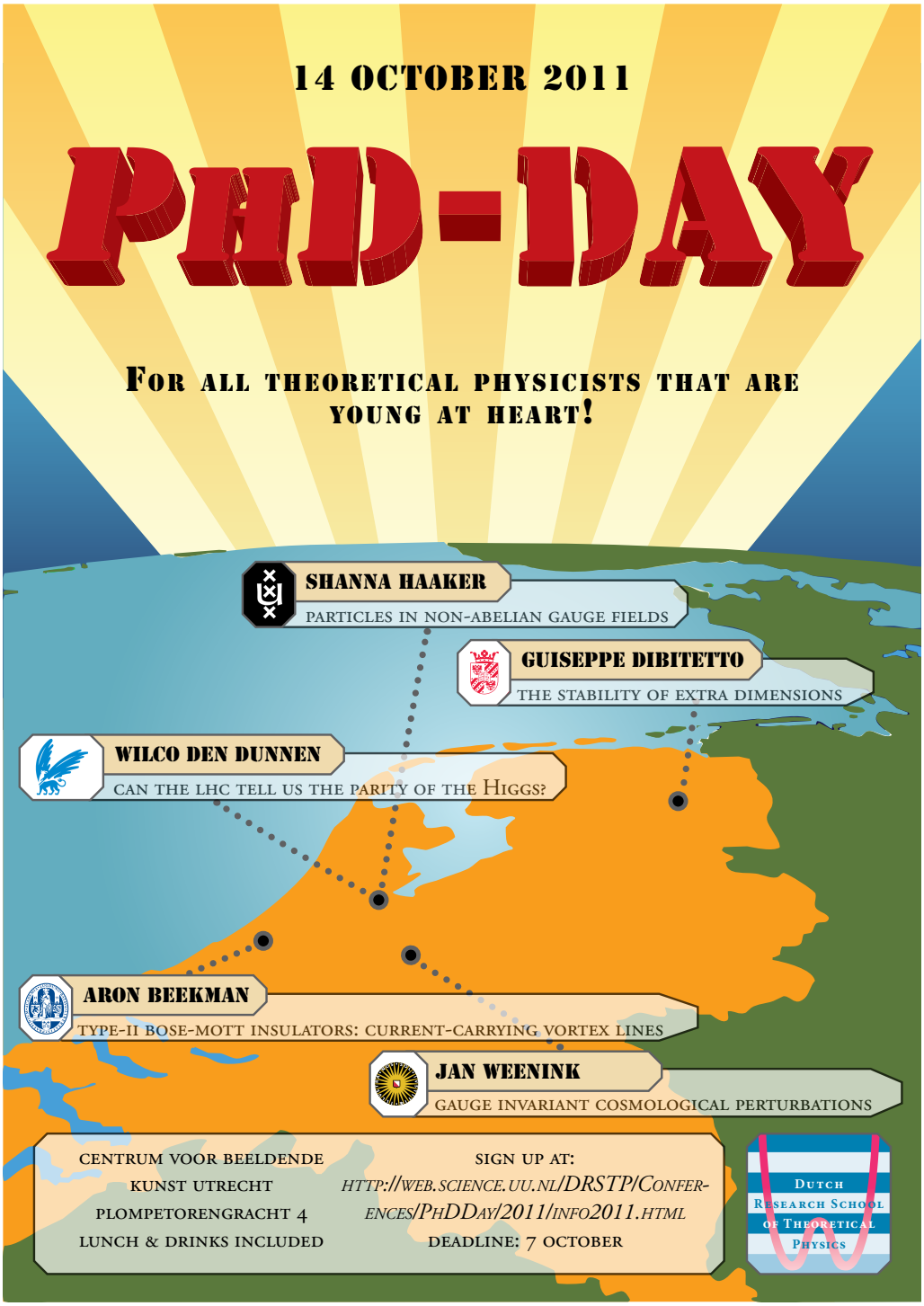
Lecturers (35 minutes each):
A. Beekman (UL): *Type-II Bose-Mott insulators: current-carrying vortex lines*
W. den Dunnen (VUA): *Can the LHC tell us the parity of the Higgs?*
G. Dibitetto (RUG): *The stability of extra dimensions*
S. Haaker (UvA): *Particles in non-Abelian gauge fields: inserting non-Abelian flux into a quantum Hall droplet*
J. Weenink (UU): *Gauge invariant cosmological perturbations*

External speaker and former PhD student at UU:
T. Janssen (Netherlands Cancer Institute, Amsterdam): *Working at the Dutch Cancer Institute*

Sixty-six people attended of which forty-nine were PhD students, fourteen were Master's students and three were postdocs.

Participants (66):
Akhukov, Mikhail (RU)
Andringa, Roel (RUG)
Armaitis, Jogundas (UU)
Atal Chomali, Vicente (UL)
Baarsma, Jildou (UU)
Baggio, Marco (UvA)
Bautista, Tresa (UvA)
Beekman, Aron (UL)
Belli, Simone (UU)
Beugeling, Wouter (UU)
Bezett, Alice (UU)
Bonga, Beatrice (UU)
Budd, Timothy (UU)
Buffing, Maarten (VUA)
D'Ambrosi, Giuseppe (Nikhef)
de Adelhart Toorop, Reinier (Nikhef)
De Bruyn, Kristof (Nikhef)
De Nardis, Jacopo (UvA)
den Dunnen, Wilco (VUA)
de Voogd, Marc (UL)
Dibitetto, Giuseppe (RUG)
Di Liberto, Marco (UU)
Eliens, Sebas (UvA)
Fokkema, Thessa (UvA)
Frings, Philipp (Nikhef/UvA)
Haaker, Shanna (UvA)
Holsheimer, Kristian (UvA)
Jacobs, Vivian (UU)
Knegjens, Rob (Nikhef)
Korovin, Yegor (UvA/KdVI)
Kuipers, Jan (Nikhef)
Lamers, Jules (UU)
Locht, Inka (RU)
Lucassen, Mathies (UU)
Malamos, Ioannis (RU)
Merbis, Wout (RUG)
Mi, Shuo (UL)
Noordmans, Jacob (RUG)
Oberreuter, Johannes (UvA)
Ortiz, Pablo (UL)
Rademaker, Louk (UL)
Rietkerk, Robbert (Nikhef/UU)
Sfondrini, Alessandro (UU)

Shvets, Oleksandr (RUG)
Slager, Robert-Jan (UL)
Smolic, Milena (UvA)
Sonneveld, Jory (UU/Nikhef)
Sprenger, Brigitte (UU)
ten Broeke, Guus (UvA)
Theeuwes, Vincent (RU)
Toldo, Chiara (UU)
van de Meent, Maarten (UU)
van den Broek, Thijs (RU)
van der Bijl, Erik (UU)
van der Schee, Wilke (UU)
van der Woerd, Ellen (UvA)
van Driel, Hedwig (UU)
van Gelderen, Ralph (UU)
van Heeringen, Linde (RU)
van Heijst, Tristan (UU)
van Heugten, Jasper (UU)
van Tongeren, Stijn (UU)
Weenink, Jan (UU)
Wouters, Bram (UvA)
Yin, Shaoyu (UU)
Yin, Yihao (RUG)


14 OCTOBER 2011
PhD-DAY
For all theoretical physicists that are young at heart!
SHANNA HAAKER
particles in non-abelian gauge fields
GUISEPPE DIBITETTO
the stability of extra dimensions
WILCO DEN DUNNEN
can the LHC tell us the parity of the Higgs?
ARON BEEKMAN
type-II Bose-Mott insulators: current-carrying vortex lines
JAN WEENINK
gauge invariant cosmological perturbations
centrum voor beeldende kunst utrecht
plompetorengracht 4
lunch & drinks included
sign up at:
http://web.science.uu.nl/DRSTP/Conferences/PhDDay/2011/info2011.html
deadline: 7 october
Dutch Research School of Theoretical Physics

Appendix F
National seminars

Condensed Matter Physics (CMP)

- **Date:**
  29 April 2011

  Location:
  Linneus building, Science Faculty, Radboud University Nijmegen, the Netherlands

  Scientific organizers:
  A. Fasolino (RU); M. Katsnelson (RU)

  Lectures:
  A. Kimel (RU): *Femtosecond magnetism and magnetization dynamics on a time-scale of the exchange interaction*
  A. Lichtenstein (Hamburg): *Strong electronic correlations in real materials*
  A. McCollam (RU): *A two-dimensional electron gas in insulating oxide heterostructures*
  C. Stampfer (J ulich/Aachen): *Graphene quantum devices*

- **Date:**
  7 October 2011

  Location:
  Utrecht University, the Netherlands

  Scientific organizers:
  C. Morais Smith (UU)

  Lectures:
  H.-P. Buechler (Stuttgart University): *Quantum critical behavior in driven and strongly interacting Rydberg gases*
  S.-W. Cheong (Rutgers University): *Multiferroic vortices: arrested Kosterlitz-Thouless order*
  A. Turner (UvA): *Multiplets in entanglement spectra*

Theoretical High Energy Physics (THEP)

- **Date:**
  25 March 2011

  Location:
  Nikhef-WCW, Amsterdam, the Netherlands

  Scientific organizers:
  A. Achúcarro (UL); D. Boer (VUA); J. de Boer (UvA)

  Lectures:
  R. Godbole (Indian Institute of Science, Bangalore): *Top-quark Polarisation as a probe of BSM physics and probes of top polarisation at hadronic colliders*
  H. Steinacker (Vienna): *Yang-Mills matrix models, gauge theory, and gravity*
  M. Taylor (UvA): *Recent progress in holography*
  R. Venugopalan (Brookhaven National Laboratory & Stony Brook): *Strong color fields in the little Bang: the Glasma, the Plasma and the approach to thermalization in heavy ion collisions*

- **Date:**
  25 November 2011

  Location:
  Nikhef-WCW, Amsterdam, the Netherlands

  Scientific organizers:
  A. Achúcarro (UL); D. Boer (VUA); J. de Boer (UvA)

  Lectures:
  G. Altarelli (CERN/Roma Tre): *Neutrino mass and mixing: lessons and challenges*
  M. Cirelli (CERN/Saclay): *Dark matter indirect detection: status circa 11/2011*
  E. Copeland (Nottingham): *Modeling dark energy, from quintessence to modifications of gravity*
  E. Shuryak (Stony Brook): *Hydrodynamics and jets in heavy ion collisions at RHIC/LHC*

Appendix G
Statistics

On 31 December 2011 one-hundred and three (103) PhD students were affiliated to the DRSTP. In 2011 thirty (31) PhD students joined the DRSTP.

Sixteen (16) PhD degrees were granted in 2011 (two to women). The average duration of their PhD research (from start of contract to PhD exam date) was 51,8 months (50,6 in 2010).

Statistics 2006-2011
PhDs (AIO/OIO) granted
1 January 2006 - 31 December 2011
(per theme)

	2006	2007	2008	2009	2010	2011	Total AIO + OIO
Theme 1	7	7	8	10	11	8	51
Theme 2	12	5	7	5	10	8	49
Total	19	12	15	15	21	16	98

PhD efficiency

In the period 1 January 2006 - 31 December 2011, 98 PhD degrees were granted. Of these students 77% finished their PhD research within four years and six months. The full distribution is as follows:

within 4 years:	43 (36%)
within 4 years and 6 months:	75 (77%)
within 5 years:	92 (94%)
more than 5 years:	6 (6%)

The fraction of PhD degrees granted to women in the period 1 January 2006 - 31 December 2011 is 9%.

To monitor the PhD efficiency at a slightly longer time scale, we also present some data for the period 1 January 2002 - 31 December 2011. In this period 205 PhD students have started their research work. At the end of this period (31 December 2011) 95 of them have graduated, one prematurely quit, and one sadly died. Of the remaining 108, 102 students have started their PhD research after 1 January 2008.

Employment following the PhD **2006-2011**		
	aantal	%
Postdoctoral positions in theoretical physics:		
the Netherlands	12	
EU	21	
USA	18	
Abroad elsewhere	7	
subtotal	58	59%
Positions in academia and in public (research) institutions not related to theoretical physics:		
Medical research position	3	
PhD position	1	
Other research position	6	
subtotal	10	10%
Positions in the government and in government related organizations:		
Ministry of Justice	0	
subtotal	0	0%
Positions in commercial companies:		
Energy	1	
Technology	10	
Finance	5	
ICT companies	3	
Consultancy	7	
subtotal	26	26%
Teaching positions:		
High school teacher	3	
subtotal	3	3%
Other:		
Unknown	1	
subtotal	1	1%
Total	**101**	