International conference on mathematics:

Conformal Invariance, Discrete Holomorphicity and Integrability

http://wiki.helsinki.fi/display/mathphys/cidhi2012

Antti Kemppainen and Kalle Kytölä

University of Helsinki
Department of Mathematics and Statistics

Summary.

A one week conference on mathematical physics with the title *Conformal Invariance, Discrete Holomorphicity and Integrability* was organized in Helsinki June 10-16, 2012. The speakers were leading mathematicians and theoretical physicists working in the topics of conformal invariance, Schramm-Loewner Evolutions (SLE) and random geometry, conformal field theory (CFT), quantum gravity, scaling limits of lattice models of statistical mechanics, and integrability in statistical mechanics.

The above mentioned topics comprise a currently active field of research both in mathematics and in theoretical physics. Many important lattice models of statistical mechanics are exactly solvable or integrable. At the critical point of a continuous phase transition these models are expected to have conformally invariant scaling limits. The physics research of these systems has been very active since 1980's: conformal field theory is used to describe the scaling limit and exact solution of the lattice model is often based on the integrable structure in the form of commuting transfer matrices obtained from solutions to the Yang-Baxter equations. Among the many exact predictions of physics research, some have remained beyond the reach of rigorous mathematical treatment. They are now becoming more accessible with the new techniques of conformally invariant random geometry, especially the random curves known as Schramm–Loewner Evolutions (SLE). A key advance is the use of discrete harmonic or discrete holomorphic observables of the lattice models for proving existence and conformal invariance of scaling limits. The purpose of the meeting was to bring together mathematical physicists with expertise in probability theory, analysis, integrable systems, combinatorics and representation theory, in order to advance further the discrete holomorphicity method, its relation to integrability and conformal field theory and related topics.

In the conference, leading researchers of mathematics and theoretical physics were invited to communicate their new results and to exchange ideas for future advance in the field. The invited speakers included both senior experts of the field and prominent young researchers who have made significant contributions. The conference was open to anyone, and we financially supported also the participation of selected graduate students and postdoctoral researchers of the relevant fields. The primary sources of funding were European Science Foundation's research networking programme "Random Geometry of Large Interacting Systems and Statistical Physics" (RGLIS), the NordForsk network grant "Random Geometry", the University of Helsinki and the Department of Mathematics and Statistics, the Academy of Finland and The Finnish Centre of Excellence in Analysis and Dynamics Research, The Magnus Ehrnrooth foundation of the Finnish Society of Sciences and Letters, and the Finnish Academy of Science and Letters.

Members of the scientific advisory committee for the conference were John Cardy (University of Oxford), Philippe Di Francesco (CEA Saclay), Stanislav Smirnov (University of Geneva and St. Petersburg State University) and Wendelin Werner (University of Paris-Sud and ENS).

Description of the scientific content of and discussion at the event.

The main scientific content of the conference was 29 presentations given by invited speakers. In addition, facilities were provided for collaboration between participants, and such collaboration and discussions were encouraged.

The topics of the presentations are listed below, and some conclusions of the discussion are considered in more detail in the section "Assessment of the results and impact of the event on the future directions of the field".

Titles and abstracts.

Denis Bernard (Ecole Normale Supérieure / CNRS), *A detour into wave function collapses from Brownian motions*

Jérémie Bouttier (CEA Saclay, Institut de physique théorique), *The nested loop approach to the O(n) model on random maps*

We consider the $O(n)$ loop model on random planar maps (i.e. graphs embedded in the sphere). We explain how an elementary combinatorial decomposition, which consists in cutting the maps along the outermost loops, allows to relate the $O(n)$ model to the simpler problem of counting maps with controlled face degrees. This translates into a functional relation for the "resolvent" of the model, which is exactly solvable in several interesting cases. We then look for critical points of the model: our construction shows that at the so-called non-generic critical points, the $O(n)$ model is related to the "stable" maps introduced by Le Gall and Miermont.

Luigi Cantini (Université Cergy-Pontoise), *A one-parameter refinement of the Razumov-Stroganov correspondence*

In 2001 Razumov and Stroganov conjectured that the (properly normalized) components of the ground state of the dense O(1) loop model on a semi-infinite cylinder enumerate fully-packed loop (FPL) configurations on the square, with alternating boundary conditions, refined according to the link pattern for the boundary points. This conjecture has arisen a lot of interest both in the physics and in the mathematics community. In this talk, after reviewing the main background, I shall discuss a stronger (but easier to prove!) version of the correspondence: on the 'dense O(1) side', the ground state of Hamiltonian H of the loop model is replaced by the one of the Scattering Matrix S(t); on the 'FPL side', one considers the refinement according to the position of the unique straight tile on the last row.

John Cardy (University of Oxford), *Holomorphic parafermions on the lattice and in conformal field theory*

Dmitry Chelkak (Steklov Institute and St. Petersburg State University), *Conformal invariance of spin correlations in the planar Ising model*

We rigorously prove existence and conformal covariance of scaling limits of spin correlations in the critical Ising model (defined on square grid approximations of a simply connected planar domain). This solves a number of conjectures coming from physical and mathematical literatures. The proof is based on convergence results for discrete holomorphic spinor observables which allow us to compute the logarithmic derivatives of those correlations with respect to positions of points, and relate the correlations for various boundary conditions to each other. Based on a joint work with Clement Hongler and Konstantin Izyurov (arXiv:1202.2838 and arXiv:1105.5709).

Béatrice de Tilière (University Pierre et Marie Curie - Paris 6), *Mappings of the 2-dimensionl Ising model*

We shall present two mappings of two independent Ising models on a graph. The first one holds at criticality and is a mapping to critical trees. The second one is done in collaboration with Cédric Boutillier. It is a mapping of XOR-loops to loops of quadri-tilings, a bipartite dimer model.

Hugo Duminil-Copin (University of Geneva), *Crossing probabilities in the study of critical lattice models*

We will describe several theorems dealing with crossing probabilities for rectangles in critical percolation, Ising and random cluster models. These theorems provide lower and upper bounds for crossing probabilities in divers context. We will discuss the relevance of boundary conditions, of the shape of domains for which bounds are available, etc. In particular, we will explain which applications follow from theorems dealing with specific boundary conditions only (such as wired, free, periodic, free/wired/free/wired) and which applications require results uniform in boundary conditions. At the end, we will describe why extending bounds on crossing probabilities to arbitrary topological rectangles is crucial to the study of arm-exponents and scaling limits in the case of the Ising model.

This talk is based partly on joint work with P. Nolin, C. Hongler and D. Chelkak.

Bertrand Duplantier (CEA Saclay, Institut de physique théorique), *SLE, KPZ and Liouville Quantum Gravity*

When two boundary arcs of a Liouville quantum gravity random surface are conformally welded to each other (in a boundary quantum-length-preserving way) the resulting interface is a random curve described by the Schramm-Loewner evolution (SLE).

This allows to develop a theory of quantum fractal measures (consistent with the Knizhnik-Polyakov-Zamolochikov relation) and to analyze their evolution under conformal welding maps related to SLE. As an application, one can construct quantum length and boundary intersection measures on the SLE curve itself. (Joint work with Scott Sheffield, MIT.)

Paul Fendley (University of Virginia), *Discrete holomorphicity from topology*

Two-dimensional critical integrable models have long been known to be intimately connected to three-dimensional topology. For example, knot and link invariants such as the Jones polynomial can be obtained as a certain limit of Boltzmann weights satisfying the (non-linear) Yang-Baxter equation. Recently, Cardy and collaborators have shown that such Boltzmann weights often can be obtained from a set of linear relations ensuring that certain operators are discretely holomorphic. I explain how discrete holomorphicity naturally arises by defining these operators in terms of three-dimensional link invariants. This allows the results of Smirnov and Cardy et al to be extended both to lattice height models, and to new hierarchies of integrable models (e.g. those associated with the Birman-Wenzl-Murakami algebras). It also provides a direct connection between integrability and conformal field theory.

Emmanuel Guitter (CEA Saclay, Institut de physique théorique), *Distance statistics in random maps*

I will review a number of exact results for the statistics of distances in random maps. These include explicit formulas for distance-dependent one-, two-, and three-point functions in various geometries (planar maps, toroidal maps, maps with a boundary) both at the discrete level and in the continuous scaling limit of large random maps. I will also discuss the bijective method that led to these results.

Anthony Guttmann (University of Melbourne), *A generalised identity for self-avoiding walks on the honeycomb lattice*

A recently proved identity by Duminil-Copin and Smirnov connecting certain SAW generating functions at their radii of convergence is extended in three ways. Firstly by including surface interactions, allowing exact values for critical surface fugacities to be proved. Secondly, by varying the geometry, giving rise to critical exponent inequalities, and thirdly, by generalising the identity away from the critical temperature, thereby allowing exponent relations connecting the winding distribution to surface critical exponents.

Christian Hagendorf (University of Geneva), *Spin chains and dynamical lattice supersymmetry*

The topic of this talk is the connection between spin chains/vertex models and dynamical supersymmetry on the lattice. The corresponding supercharges in the lattice models act non-locally and change the number of sites. The simplest example is the spin-1/2 XXZ chain/six-vertex model with periodic boundary conditions at the combinatorial point, which possesses an N=(2,2) supersymmetry on the lattice. I will explain the representations of the lattice supersymmetry algebra for models with arbitrary spin, and show how to construct the lattice equivalents of the minimal series of N=(2,2) superconformal theories. Furthermore I will discuss in detail the Fateev-Zamolodchikov spin chain, and present some evidence that its ground states, the supersymmetry singlets, are related to the weighted enumeration of alternating sign matrices.

Clément Hongler (Columbia University), *Conformal Invariance of Ising Interfaces*

We consider the interfaces that arise in the critical Ising model in various setups. We will discuss their scaling limits in terms of SLE processes and variants, and also the recent tools introduced to investigate these questions (crossing probabilities and martingale observables).

Yacine Ikhlef (University of Geneva), *Discretely holomorphic parafermions and integrable boundary conditions*

In two-dimensional statistical models possessing a discretely holomorphic parafermion, we introduce a modified discrete Cauchy-Riemann equation on the boundary of the domain, and we show that the solution of this equation yields integrable boundary Boltzmann weights. This approach is applied to (i) the square-lattice O(n) loop model, where the exact locations of the special and ordinary transitions are recovered, and (ii) the Fateev-Zamolodchikov Z_N spin model, where a new rotation-invariant, integrable boundary condition is discovered for generic N.

Konstantin Izyurov (St. Petersburg State University, Chebyshev Laboratory), *Ising interfaces and SLE(3) in multiply connected domains*

We prove a general theorem on convergence of multiple Ising interfaces in finitely connected domains to SLE(3) variants. Explicit examples include multiple SLE(3) in simply-connected domains, corresponding to alternating +/- boundary conditions, radial SLE(3) arising in the Ising model with a disorder insertion, and annulus SLE(3). In general, the limiting law on curves can be described in terms of scaling limits of corresponding Ising partition functions, or in terms of solutions to a Riemann boundary value problem.

Jesper Jacobsen (Ecole Normale Supérieure), *Exact critical manifolds from graph polynomials*

Any two-dimensional infinite regular lattice G can be produced by tiling the plane with a finite subgraph B of G; we call B a basis of G. We introduce a two-parameter graph polynomial $P_B(q,v)$ that depends on B and its embedding in G. The algebraic curve $P_B(q,v) = 0$ is shown to provide an approximation to the critical manifold of the q-state Potts model, with coupling $v = exp(K) - 1$, defined on G. For larger bases B the approximations become increasingly accurate, and we conjecture that $P_B(q,v) = 0$ provides the exact critical manifold in the limit of infinite B. Furthermore, for some lattices G, or for the Ising model ($q = 2$) on any G, $P_B(q,v)$ factorises for any choice of B: the zero set of the recurrent factor then provides the exact critical manifold. In this sense, the computation of $P_B(q,v)$ can be used to detect exact solvability of the Potts model on G. We have also obtained similar results for site percolation.

Kurt Johansson (KTH Royal Institute of Technology), *Continuum scaling limits in random tilings*

Scaling limits close to the boundary between a frozen and liquid region in random tiling models of certain planar regions give rise to limiting processes that also arise in random matrix theory. The basic limiting process is the Airy process which also occurs in random growth models. I will discuss this example and also a new scaling limit called the tacnode.

Richard Kenyon (Brown University), *Conformal Invariance of double-dimer paths*

Using an extension to quaternionic variables of the standard methods of Kasteleyn, we prove the conformal invariance of the double-dimer loops on the square grid. Similar methods apply to the loops in the “cycle-rooted spanning tree" model.

Ivan Kostov (CEA Saclay, Institut de physique théorique), *O(n) loops in complex magnetic field*

The $O(n)$ loop model on planar graphs is solved in presence of constant magnetic field H. In this case the geometrical expansion involves (self and mutually avoiding) loops with fugacity n and open lines with fugacity H^2. An equation for the universal part of the specific free energy is derived using the correspondence with a matrix model. The specific free energy has a pair of Yang-Lee edges on the high-temperature sheet and a Langer type branch cut on the low-temperature sheet at $H = 0$. The exponent of the Langer type singularity is compatible with a conjecture by A. and Al. Zamolodchikov about the decay rate of the metastable vacuum in presence of Liouville gravity.

Gregory Lawler (University of Chicago), *Recent Results on SLE*

I will discuss a number of recent results about SLE paths that I have obtained in collaboration with a number of collaborators. The main themes will be natural parametrization and SLE in multiply connected domains.

Zhongyang Li (University of Cambridge), *Critical Temperature of Periodic Ising Models*

A periodic Ising model has interactions which are invariant under translations of a full-rank sublattice $\mathfrak{L}$ of $\mathbb{Z}^2$. We prove an exact, quantitative characterization of the critical temperature, defined as the supremum of temperatures for which the spontaneous magnetization is strictly positive. For the ferromagnetic model, the critical temperature is the solution of a certain algebraic equation, resulting from the condition that the spectral curve of the corresponding dimer model on the Fisher graph has a real zero on the unit torus. With our technique we provide a simple proof for the exponential decay of spin-spin correlations above the critical temperature, as well as the exponential decay of the edge-edge correlations for all non-critical edge weights of the corresponding dimer model on periodic Fisher graphs.

Ioan Manolescu (University of Cambridge), *Bond Percolation on Isoradial Graphs*

The star-triangle transformation is used to obtain an equivalence extending over a set bond percolation models on isoradial graphs. Amongst the consequences are box-crossing (RSW) inequalities and the universality of alternating arms exponents (assuming they exist) for such models, under some conditions. In particular this implies criticality for these models. The work is joint with Geoffrey Grimmett.

Pekka Nieminen (University of Helsinki), *Gaussian free field and Hadamard's variational formula*

We revisit the classical variational formula due to Hadamard and interpret it in terms of a natural integral operator. We use this operator to provide a construction of the Gaussian free field on a planar domain. Joint work with Haakan Hedenmalm (KTH, Stockholm).

Bernard Nienhuis (University of Amsterdam), *Elliptic Bethe Ansatz for itinerant fermions on a chain*

Recently Fendley and Schoutens presented a simple construction of a super-symmetric (SUSY) Hamiltonian for interacting fermions on a lattice. A simple one-dimensional example is equivalent to the XXZ spin chain, and can be solved with the Bethe Ansatz. The construction of the SUSY is sufficiently general that it allows for spatial variation of the parameters. We show that with periodic spatial variation with period three, the model still admits a Bethe Ansatz, now with an elliptic parametrization.

Eero Saksman (University of Helsinki), *An application of stochastic games to PDE:s*

We give a simple proof of Harnack's inequality for p-harmonic functions via stochastic games. The talk is based on joint work with Hannes Luiro and Mikko Parviainen (University of Jyväskylä)

Hubert Saleur (CEA Saclay, Institut de physique théorique), *Edge states in the spin quantum Hall effect*

The absolute (that is, not modulo 2π) value of the topological angle in conformal sigma models affects the properties of the boundary conformal field theory. It corresponds physically to the presence of extra edge states. This problem in class C (spin quantum Hall) can be mapped on to a geometrical problem which is like percolation in the bulk, but with extra life on the boundary. Transport properties are modified in consequence, and non trivial (in fact, irrational) new exponents obtained. These can be observed in simulations on Chalker Coddington like network models, and hopefully experimentally some day. In this talk, I will discuss both the physics underlying the problem, and the technical aspects underlying its solution.

Jacob Simmons (Maine Maritime Academy), *Six-point CFT correlation functions with applications to critical loop models*

Well discuss correlation functions in conformal field theories with applications to critical loop models. Our major result is a chiral six-point function that gives the density of clusters in the presence of a 4SLE process, or alternately corresponds to a set of bulk parity operators near a boundary with dipolar and fixed boundary conditions. Well explicitly describe applications in percolation and self-avoiding loop models, both theories with zero central charge, placing emphasis on the logarithmic aspects of these theories.

Christian Webb (University of Helsinki), *An overview of recent results concerning low temperature Gibbs measures for logartihmically correlated Gaussian fields*

We give a brief overview of some current results concerning the low temperature behavior of Gibbs measures for which the Hamiltonian is a Gaussian field with logarithmic correlations on a discretization of $\mathbb{R}^n$.
We discuss recent results by Madaule; Aidekon and Shi; Webb; Barral, Rhodes and Vargas which imply that for a hierarchical field (i.e. the case of multiplicative cascades) even below the critical temperature the Gibbs measures have a continuum limit and can be described explicitly.
We also discuss work by Arguin and Zindy concerning the replica overlap for a certain Gaussian field with translation invariant logarithmic correlations. Their results suggest that the atomic structure of the low temperature Gibbs measures for models with Hamiltonians similar to the Gaussian free field should be very similar to the hierarchical case.
Finally we discuss work by Bolthausen, Deuschel and Zeitouni and Bramson and Zeitouni about the tightness of the maximum of the discrete two-dimensional Gaussian free field. Their results can be seen as the first step in proving existence of a continuum limit of the low temperature Gibbs measure and they suggest similar behavior as in the hierarchical case.

Paul Zinn-Justin (Universite Pierre et Marie Curie - Paris 6), *Exact ground states of spin chains from quantum Knizhnik–Zamolodchikov equation*

Assessment of the results and impact of the event on the future directions of the field.

In the following paragraphs we take a look back to see how well the conference met the goals set for it, and how it is likely to impact the field. We assess the success in financial and organizational matters, specific goals set for the scientific content, impacts on different scientific communities, and wider impact on the future of the research in the field.

We obtained a significant amount of grants for the conference, totalling over 60 000 euros, and this was enough to successfully convene and organize a meeting of very high level. The sponsoring organizations were European Science Foundation's research networking programme "Random Geometry of Large Interacting Systems and Statistical Physics" (RGLIS), the NordForsk network grant "Random Geometry", the University of Helsinki and the Department of Mathematics and Statistics, the Academy of Finland and The Finnish Centre of Excellence in Analysis and Dynamics Research, The Magnus Ehrnrooth foundation of the Finnish Society of Sciences and Letters, and the Finnish Academy of Science and Letters.

In the conference, there were 90 registered participants representing 34 universities or research institutions from 15 countries. The number of participants thus exceeded the originally planned size of the event by 50%. The facilities for the scientific program of the meeting were provided by the University of Helsinki, and we were able to switch to lecture halls more adapted to the larger than expected audience.

The timeliness and relevance of the topic was reflected among other thigs by the fact that among the internationally very highly regarded researchers that were invited, a vast majority accepted the invitation to participate in the conference. This was a key factor in the high scientific quality of the programme of the meeting. The scientific advisory board members, John Cardy (University of Oxford), Philippe Di Francesco (CEA Saclay), Stanislav Smirnov (University of Geneva and St. Petersburg State University) and Wendelin Werner (University of Paris-Sud and ENS), suggested several improvements to the program and the list of invited participants and the selection of topics at the preparatory stage of the conference, again greatly contributing to the quality of the programme.

A major aim of the conference was to bring together mathematicians and theoretical physicists to exchange ideas and share the newest results. Approximately a half of the speakers came from each of the two disciplines. The common topics of interest enabled a very fruitful cross-disciplinary communication of ideas, both by means of presentations and informal discussions. It is important that the scientific communities of the two disciplines continue to interact in such ways.

While many of the speakers of the conference are long recognized experts of their respective fields, we also invited many prominent young researchers to present their important recent discoveries. Moreover, the participation of 7 graduate students or post-docs was financially supported. Among the 90 participants, some 30 were from the universities in the Helsinki region, including three who gave presentations in the conference: one professor and two PhD students. This shows the interest of the local scientific community to the internationally active field of research. We are therefore confident that the conference contributed to future of science in the form of providing opportunities for the younger generation of researchers, and that it gave a stimulus to the Finnish research in mathematics and theoretical physics.

The presentations featured many significant new results and suggested many important research problems to be tackled in the future. The participants of the conference were keen to discuss these with each other and to start working towards further advancing the field.

The results presented included a solution of the $O(n)$ model on random planar maps, an extension of the recent proof of Razumov–Stroganov conjecture, the proof of conformal invariance of spin correlations in Ising model by holomorphic observables, extensions of the recent results on self-avoiding walk and results on spin chains and supersymmetry. As examples of the open problems and future directions proposed, John Cardy and Paul Fendley both stressed the importance of finding connection between discrete holomorphic observables and integrability, the latter made also a connection to knot invariants and topological quantum field theory. Jesper Jacobsen presented interesting observations and intriguing conjectures about his new method for obtaining the critical manifold of Potts model through edge contraction and deletion. He suggested further study to connect that method to integrability and discrete holomorphicity.

In the following paragraphs we highlight the relation of our event to other current activities in the field: a special issue of Journal of Physics A, "St. Petersburg School in Probability and Statistical Physics" and Simons Center program "Conformal Geometry".

A member of the staff of "Journal of Physics A: Mathematical and Theoretical" was present in the conference to tell about a future special issue and discuss publishing and refereeing in general with our participants. Journal of

Physics A is going to publish a special issue to celebrate Fred Wu's 80th birthday. The topics of this issue are very closely related to our conference and including integrability and discrete holomorphicity.

Immediately after our meeting, "St. Petersburg School in Probability and Statistical Physics" organized by Dmitry Chelkak, Vladas Sidoravicius, Stanislav Smirnov and Vladislav Vysotsky took place in St. Petersburg, just 3.5 hours by train from Helsinki. There was some coordination between these events and we were happy to see that many of the participants from our conference also attended the St. Petersburg summer school. The topic of that school was very close to our conference with slightly more emphasis on mathematics and probability.

In the spring 2013, the Simons Center at Stony Brook University is hosting a program "Conformal Geometry" organized by Ilia Binder, John Cardy, Andrei Okounkov, and Paul Wiegmann. The topics of that event are closely related to our conference and has also emphasis on the interaction between mathematics and physics. The program was advertized to the participants of our conference.

Overall, we consider the conference a definite success. The scientific quality of the presentations was very high, the participants were keen to interact both within and across their own disciplines, the meeting has all chances to affect positively the new generation of researchers as well as local and Nordic researchers, and together with the other related activities it is likely to have a significant impact on the future research.

Annexes: programme of the meeting and full list of speakers and participants.

Programme of the meeting.

Monday, June 11.

09:00 – 10:00	registration + coffee
10:00 – 10:20	opening
10:20 – 11:10	Emmanuel Guitter: *Distance statistics in random maps*
11:10 – 11:25	break
11:25 – 12:15	Kurt Johansson: *Continuum scaling limits in random tilings*
12:15 – 14:00	lunch break
14:00 – 14:50	Hugo Duminil-Copin: *Crossing probabilities in the study of critical lattice models*
14:50 – 15:30	coffee break
15:30 – 16:20	Pekka Nieminen: *Gaussian free field and Hadamard's variational formula*
16:25 – 17:15	Bernard Nienhuis: *Elliptic Bethe Ansatz for itinerant fermions on a chain*
17:15 –	welcoming event

Tuesday, June 12.

09:00 – 09:50	Bertrand Duplantier: *SLE, KPZ and Liouville Quantum Gravity*
09:50 – 10:30	coffee break
10:30 – 11:20	Eero Saksman: *An application of stochastic games to PDE:s*
11:25 – 12:15	Clément Hongler: *Conformal Invariance of Ising Interfaces*
12:15 – 14:00	lunch break
14:00 – 14:50	John Cardy: *Holomorphic parafermions on the lattice and in conformal field theory*
14:50 – 15:30	coffee break
15:30 – 16:20	Béatrice de Tilière: *Mappings of the 2-dimensional Ising model*
16:25 – 17:15	Luigi Cantini: *A one-parameter refinement of the Razumov-Stroganov correspondence*

Wednesday, June 13.

09:00 – 09:50	Zhongyang Li: *Critical Temperature of Periodic Ising Models*
09:50 – 10:30	coffee break
10:30 – 11:20	Dmitry Chelkak: *Conformal invariance of spin correlations in the planar Ising model*
11:25 – 12:15	Hubert Saleur: *Edge states in the spin quantum Hall effect*

Thursday, June 14.

09:00 – 09:50	Paul Zinn-Justin: *Exact ground states of spin chains from quantum Knizhnik–Zamolodchikov equation*
09:50 – 10:30	coffee break
10:30 – 11:20	Anthony Guttmann: *A generalised identity for self-avoiding walks on the honeycomb lattice*
11:25 – 12:15	Jesper Jacobsen: *Exact critical manifolds from graph polynomials*
12:15 – 14:00	lunch break
14:00 – 14:50	Ioan Manolescu: *Bond Percolation on Isoradial Graphs*
14:50 – 15:30	coffee break
15:30 – 16:20	Paul Fendley: *Discrete holomorphicity from topology*
16:25 – 17:15	Denis Bernard: *A detour into wave function collapses from Brownian motions*
19:00 –	conference dinner

Friday, June 15.

09:00 – 09:50	Yacine Ikhlef: *Discretely holomorphic parafermions and integrable boundary conditions*
09:50 – 10:30	coffee break
10:30 – 11:20	Jacob Simmons: *Six-point CFT correlation functions with applications to critical loop models*
11:25 – 12:15	Richard Kenyon: *Conformal Invariance of double-dimer paths*
12:15 – 14:00	lunch break
14:00 – 14:50	Jérémie Bouttier: *The nested loop approach to the O(n) model on random maps*
14:50 – 15:30	coffee break

15:30 – 16:20 Christian Webb: *An overview of recent results concerning low temperature Gibbs measures for logartihmically correlated Gaussian fields*
16:25 – 17:15 Ivan Kostov: *O(n) loops in complex magnetic field*

Saturday, June 16.

09:00 – 09:50 Christian Hagendorf: *Spin chains and dynamical lattice supersymmetry*
09:50 – 10:30 coffee break
10:30 – 11:20 Konstantin Izyurov: *Ising interfaces and SLE(3) in multiply connected domains*
11:25 – 12:15 Gregory Lawler: *Recent Results on SLE*

Full list of speakers.

Denis Bernard: A detour into wave function collapses from Brownian motions
Jérémie Bouttier: The nested loop approach to the O(n) model on random maps
Luigi Cantini: A one-parameter refinement of the Razumov-Stroganov correspondence
John Cardy: Holomorphic parafermions on the lattice and in conformal field theory
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Bertrand Duplantier: SLE, KPZ and Liouville Quantum Gravity
Paul Fendley: Discrete holomorphicity from topology
Emmanuel Guitter: Distance statistics in random maps
Anthony Guttmann: A generalised identity for self-avoiding walks on the honeycomb lattice
Christian Hagendorf: Spin chains and dynamical lattice supersymmetry
Clément Hongler: Conformal Invariance of Ising Interfaces
Yacine Ikhlef: Discretely holomorphic parafermions and integrable boundary conditions
Konstantin Izyurov: Ising interfaces and SLE(3) in multiply connected domains
Jesper Jacobsen: Exact critical manifolds from graph polynomials
Kurt Johansson: Continuum scaling limits in random tilings
Richard Kenyon: Conformal Invariance of double-dimer paths
Ivan Kostov: O(n) loops in complex magnetic field
Gregory Lawler: Recent Results on SLE
Zhongyang Li: Critical Temperature of Periodic Ising Models
Ioan Manolescu: Bond Percolation on Isoradial Graphs
Pekka Nieminen: Gaussian free field and Hadamard's variational formula
Bernard Nienhuis: Elliptic Bethe Ansatz for itinerant fermions on a chain
Eero Saksman: An application of stochastic games to PDE:s
Hubert Saleur: Edge states in the spin quantum Hall effect
Jacob Simmons: Six-point CFT correlation functions with applications to critical loop models
Christian Webb: An overview of recent results concerning low temperature Gibbs measures for logartihmically correlated Gaussian fields
Paul Zinn-Justin: Exact ground states of spin chains from quantum Knizhnik–Zamolodchikov equation

Full list of participants.

ANTONOV, Nikolai	Saint Petersburg State University Department of Theoretic	Russian Federation
ASTALA, Kari	University of Helsinki Mathematics and Statistics	Finland
BATCHELOR, Murray	Australian National University Mathematics	Australia
BAUER, Michel	CEA Saclay Institut de physique théorique	France
BERNARD, Denis	ENS/CNRS Lab. de Physique Theorique	France
BISSI, Agnese	Niels Bohr Insitiute	Denmark
BOUTTIER, Jérémie	Commissariat à l'énergie atomique et aux énergies alterna	France
BRETT, Steven	IOP Publishing Journal of Physics A: Mathematical and The	United Kingdom
CANTINI, Luigi	Université Cergy-Pontoise LPTM	France
CARDY, John	Oxford Theoretical Physics	United Kingdom
CHELKAK, Dmitry	St Petersburg Dept Steklov Institute RAS Math Analysis	Russia
CLARK, Jeremy Thane	University of Helsinki Mathematics	Finland
DE TILIÈRE, Béatrice	University Pierre et Marie Curie, Paris Laboratoire de Pr	France

DUMINIL-COPIN, Hugo	Geneve mathematiques	Switzerland
DUPLANTIER, Bertrand	IPhT CEA/Saclay IPhT	France
DURHUUS, Bergfinnur	University of Copenhagen Department of Mathematics	Denmark
ELORANTA, Kari	Aalto University Mathematics	Finland
FANG, Chun	University of Helsinki Department of Mathematics and Stat	Helsinki
FENDLEY, Paul	University of Virginia	USA‘
GAINUTDINOV, Azat	Institut de Physique Théorique, CEA/Saclay Mathematical P	France
GASBARRA, Dario	University of Helsinki Department of mathematics and stat	Suomi
GLAZMAN, Alexander	University of Geneva, Chebyshev Laboratory, PDMI Mathemat	Russia
GUITTER, Emmanuel	Commissariat à l’énergie atomique et aux énergies alterna	France
GUTTMANN, Anthony (Tony)	University of Melbourne Mathematics and Statistics	Australia
GYLLENBERG, Mats	University of Helsinki	Finland
HAGENDORF, Christian	Universite de Geneve Section de Mathematiques	Switzerland
HAIMI, Antti	Royal Institute of Technology Institute of Mathematics	Sweden
HAMMOND, Alan	Oxford Statistics	United Kingdom
HAO, Wu	Universite Paris-sud Math	France
HEDENMALM, Haakan	KTH Royal Institute of Technology Mathematics	SWEDEN
HONGLER, Clement	Columbia University Mathematics	USA
HYNEK, Mariusz	KTH Royal Institute of Technolody Mathematics	Sweden
IKHLEF, Yacine	University of Geneva Mathematics	Switzerland
IZYUROV, Konstantin	St. Petersburg State University Chebyshev Laboratory	Russia
JACOBSEN, Jesper	Ecole Normale Superieure Laboratoire de Physique Theoriqu	France
JOHANSSON, Kurt	KTH Royal Institute of Technology Department of Mathemati	Sweden
JOKELA, Niko	Universidade de Santiago de Compostela Departamento de Fi	Spain
JONSSON, Thordur	University of Iceland	Iceland
KEMPPAINEN, Antti	University of Helsinki Department of Mathematics and Stat	Finland
KENYON, Richard	Brown University Math	USA
KESKI-VAKKURI, Esko	University of Helsinki Physics	Finland
KHANAMIRYAN, Marianna	Aalto Unoversity Department of Mathematics and Systems An	Finland
KHRISTOFOROV, Mikhail	SPbSU Chebyshev Lab	Russia
KOSTOV, Ivan	C.E.A. Saclay IPhT	France
KOZDRON, Michael	University of Regina Mathematics & Statistics	Canada
KUPIAINEN, Antti	HU	Finland
KYTÖLÄ, Kalle	University of Helsinki Department of Mathematics and Stat	Finland
LAWLER, Gregory	University of Chicago Department of Mathematics	Chicago, IL 60637
LEE, Eunghyun	University of Helsinki Mathematics and Statistics	Finland
LI, Zhongyang	University of Cambridge Statistical Laboratory	United Kingdom
LIIMATAINEN, Tony	Aalto uni Department of Mathematics	Finland
LOIKKANEN, Juha	University of Helsinki Department of Mathematics	Finland
LUKKARINEN, Jani	University of Helsinki Department of Mathematics and Stat	FINLAND
MANOLESCU, Ioan	University of Cambridge Statslab	UK
MAYS, Anthony	University of Melbourne Mathematics and Statistics	Australia
MEI, Peng	University of Helsinki	Finland
MELDO, Satu-Maija	University of Helsinki	Finland
MIIHKINEN, Santeri	University of Helsinki Department of Mathematics and Stat	Finland
MONTONEN, Claus	Helsinki Institute of Physics	Finland
MOZOLYAKO, Pavel	Chebyshev lab, Saint-Petersburg State University	Russia
MURATORE-GINANNESCHI, Paolo	University of Helsinki Mathematics and Statistics	Finland
NGO, Hoa	University of Helsinki	Finland
NIEMINEN, Pekka	University of Helsinki Department of Mathematics and Stat	Finland
NIENHUIS, Bernard	University of Amsterdam Institute for Theoretical Physics	Netherlands
NIKULA, Miika	University of Helsinki Department of Mathematics and Stat	Finland
NISSINEN, Jaakko	University of Oslo Department of physics	Norway
NOLIN, Pierre	ETH Zürich Mathematics	Switzerland
PACHOL, Anna	University of Iceland Science Institute	Iceland
PAKKANEN, Mikko	Aarhus University Department of Economics and Business	Denmark
PELTOLA, Eveliina	University of Helsinki Department of Mathematics and Stat	Finland
PIIROINEN, Petteri	University of Helsinki The Department of Mathematics and	Finland
PONSAING, Anita	University of Geneva Mathematics	Switzerland
PRAUSE, Istvan	University of Helsinki	Finland
QUACH, Tri	Aalto University Department of Mathematics and Systems An	Finland
RAJABPOUR, Mohammad Ali	SISSA	Italy
RASILA, Antti	Aalto University	Finland
SAKSMAN, Eero	University of Helsinki Department of Mathematics and Stat	Finland

SALEUR, Hubert	CEA Saclay, France IPhT	France
SIMMONS, Jacob	Maine Maritime Academy Department of Arts and Sciences	United States
SUOMALA, Ville	University of Oulu	Finland
TROPIN, Nikolay	Saint-Petersburg State University Chebyshev Laboratory	RUSSIA
TUISKU, Petri	Helsinki University Department of mathematics and statist	Finland
TYLLI, Hans-Olav	University of Helsinki Department of Mathematics	Finland
VALLIER, Thomas	Helsinki Mathematics	Finland
VASSEUR, Romain	CEA Saclay Institut de Physique Théorique	France
VERNIER, Eric	LPT ENS Paris/ IPhT CEA Saclay Theoretical Physics	France
WATSON, Samuel	Massachusetts Institute of Technology Mathematics	USA
WEBB, Christian	University of Helsinki Department of Mathematics	Finland
ZAHABI, Seyedali	University of Helsinki Mathematics	Finland
ZINN-JUSTIN, Paul	Universite Pierre et Marie Curie - Paris 6 LPTHE	France