Book of Abstracts

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Stochastic and Analytic Methods in Mathematical Physics

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Organizers

The XII International Conference "*Stochastic and Analytic Methods in Mathematical Physics*" is organized by

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Mathematical Statistical Physics in Armenia

Mathematical physics, particularly mathematical statistical physics, has been one of the major research areas at the Institute of Mathematics of the National Academy of Sciences of Armenia since its founding.

To date, the Institute of Mathematics has organized eleven international conferences on stochastic and analytic methods in mathematical physics. The principal organizers have been Boris Nahapetian and Suren Poghosyan, with contributions from Viktor Arzumanyan. The first conference took place in 1982 in Tsaghkadzor, drawing internationally renowned scientists such as Roland L. Dobrushin, Robert A. Minlos, Vadim A. Malyshev, and Yakov G. Sinai. Their active participation played a significant role in establishing the conference as an internationally recognized scientific forum.

Subsequent conferences have continued to attract distinguished researchers from around the world. Notable participants include Salvador Miracle-Sole, Sergio Albeverio, Gianfausto Dell'Antonio, Alexander M. Polyakov, Anatoly M. Vershik, and many others. The conference has also hosted Bruno Nachtergaele and Claude-Alain Pillet, editors-in-chief of the leading journals in mathematical physics, *Journal of Mathematical Physics* and *Annales Henri Poincaré*. The conference has benefited greatly from the consistent support and participation of Carlo Boldrighini, Hans Zessin, Valentin Zagrebnov, Elena Zhizhina, and Daniel Ueltschi, who have attended nearly every meeting. Special recognition should be given to Sylvie Roelly for organizing the publication of the proceedings of the XI International Conference, Stochastic and Analytic Methods in Mathematical Physics (Potsdam University Press, 2020).

Over the years, the conference series has covered a broad spectrum of topics in mathematical physics, serving as a platform for the exchange of ideas, the dissemination of recent advances, and the development of new scientific collaborations. It has made a valuable contribution to the development of mathematical physics in Armenia and to the strengthening of international scientific cooperation. The scientific program encompasses, but is not limited to, classical and quantum statistical physics, dynamical systems, stochastic analysis, and partial differential equations.

The present meeting marks the twelfth conference in this series and is devoted to contemporary problems in mathematical physics. The conference is organized in collaboration with Yerevan State University and is sponsored by the International Association of Mathematical Physics, the Research Mathematics Fund (Armenia), and the Higher Education and Science Committee of the Ministry of Education, Science, Culture and Sports of the Republic of Armenia.

We warmly welcome all participants and hope that the conference will inspire stimulating scientific discussions, foster fruitful collaborations, and offer an enjoyable stay in Armenia.

Local Organizing Committee

Abstracts

Numerical Algorithms for Partially Segregated Elliptic Systems

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We develop numerical methods for elliptic systems governed by a ternary partial-segregation constraint, in which three nonnegative components are required to have a vanishing pointwise product throughout the domain. This condition forces at least one component to vanish at every spatial location while still permitting coexistence of the other two components, and therefore produces a highly nonconvex admissible set. We propose two complementary computational frameworks. The first is a strong-competition penalty method solved by a relaxed Picard iteration and a sequential semi-implicit variant, combined with continuation in the penalty parameter. For this formulation, we establish existence of penalized minimizers and weak solutions for every fixed penalty parameter, monotone bracketing properties for the fixed-point iteration, geometric convergence under an explicit contraction condition, and interior exponential estimates in regions of uniformly positive competition. The second framework

is a projected-gradient method, based on an explicit pointwise projection onto the ternary partial-segregation set. Numerical experiments for several discrete boundary configurations illustrate the qualitative partially segregated patterns produced by the two methods.

This is a joint work with F. Bozorgnia, V. Kungurtsev and J. Valdman.

Inversion of the Two-Data Funk Transform

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It is known that the Funk transform (FT) is invertible in the class of even (symmetric) continuous functions defined on the unit 2-sphere $\mathbf{S}^2$.

For the reconstruction of f from $C^1(\mathbf{S}^2)$ (which can be non-even), an additional condition is found, which is a weighted Funk transform (to reconstruct an odd function), and the injectivity of the so-called two data Funk transform is considered. The transform consists of the classical FT and the weighted FT. An iterative inversion formula of the transform is presented (see [1]).

Also, we consider general weighted Funk transforms on the unit 2-sphere $\mathbf{S}^2$ where weights are given as finite Fourier series in angle variable. We study the injectivity of the transform depending on the weight. Using the consistency method, we obtain an injectivity condition for different classes of functions. The approach can give an inversion formula for some weights.

Such inversions have theoretical significance in convexity theory, integral geometry, and spherical tomography.

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Existence of Classical Solutions for Mean–Field Games with Kantorovich–Potential Coupling

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We consider a class of second-order mean-field game systems in which the interaction between populations is described through the Wasserstein distance. The corresponding first variation of the squared Wasserstein distance with respect to the population measure is expressed in terms of a Kantorovich potential, leading to a nonlocal coupling in the Hamilton–Jacobi–Bellman equation. The model is motivated by a large-scale attackerdefender problem, where the effectiveness of the defender population depends on its spatial distribution relative to the attackers.

Under suitable positivity, boundedness, spatial regularity, and temporal Hölder-continuity assumptions on the population densities, we establish the local-in-time existence of a classical solution. The proof relies on regularity and stability estimates for Kantorovich potentials, Caffarelli-type optimal transport regularity, parabolic Schauder estimates, maximum-principle bounds for the density, and the Schauder fixed-point theorem. These results provide a rigorous analytical foundation for mean-field game models whose couplings arise naturally from optimal transport and population-level interaction mechanisms.

This is a joint work with Avetik Arakelyan, Davit Alaverdyan, Naira Hovakimyan, and Isaac Kaminer.

Stochastic Models, Free Boundaries, and Numerical Methods in Financial Bubble Analysis

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Speculative bubbles arise from investor disagreement and limits to arbitrage, where market prices may exceed fundamental values due to the option to resell assets to more optimistic investors. We extend the Berestycki–Monneau–Scheinkman model by allowing investor disagreement to evolve through Lévy jump processes, capturing sudden changes in market sentiment and financial shocks. Using optimal stopping theory and Itô–Lévy calculus, we derive a non-local partial integro-differential equation with a moving obstacle for the bubble premium. We develop a viscosity solution framework, establish comparison and uniqueness results, and construct a finite difference scheme based on the Barles–Souganidis theory. Numerical experiments for several finite- and infinite-activity Lévy models illustrate the impact of jumps on bubble dynamics and optimal trading strategies.

Complex Spin Systems

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I will introduce a model of complex-valued spins that occupies a middle ground between classical spin systems and quantum spin systems: For example, the partition function is still the integral of a measure instead of the trace of a matrix, but the measure is complex. An interesting aspect of complex spin systems is that they are equivalent to many graphical models that have been studied in their own right, such as the double dimer model or the loop $O(N)$ model. Since quantum spin systems can be shown to fulfil reflection positivity estimates in fair generality, they can be used to derive long range order in some graphical models where this has so far not been known. I will give an overview over the things we can achieve, and also point out where we are currently stuck.

The Li–Sinai Approach to the Global Regularity Problem (GRP) for the Incompressible 3-D Navier–Stokes Equations and its Consequences

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In 2008 Li and Sinai gave an example of a complex solutions of the 3-D Incompressible Navier–Stokes (NS) Equations that becomes singular at a finite time (blow-up). The main idea is the choice of the support of the initial data in Fourier k-space, which is pushed to high $|k|$ values by the convolution mechanism. Theoretical analysis and computer simulations show that this type of blow-up is present for a large class of in initial data, and also for other equations. We also discuss the results, by computer simulation, for real (physical) NS-flows suggested by the complex blow-up, which show some very interesting features.

On the Energy-Probability Relationship in Statistical Physics of Infinite-Volume Systems

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In this talk we present a relatively simple solution to Dobrushin's problem of description of specifications by means of one-point probability distributions (with infinite boundary conditions), obtained within the framework of a recently developed approach to the mathematical foundations of statistical physics of infinite-volume systems. This approach is based on a direct relationship between probability and the newly introduced notion of transition energy.

Besides providing a simple solution to Dobrushin's problem, this approach allows us to give a proper mathematical definition of the Hamiltonian (without invoking the notion of interaction potential), to propose a justification of the Gibbs formula for infinite-volume systems and to answer the problem posed by D. Ruelle concerning how broad the class of specifications which can be represented in Gibbsian form is.

The talk is based on joint work with B.S. Nahapetian.

One-Sided Versus Two-Sided Continuity. Two Examples and the Role of Entropic Repulsion

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We compare g-measures, aka Doeblin measures, which have one-sided continuous conditional probabilities with Gibbs measures which have two-sided continuous conditional probabilities. We show by discussing two examples, namely low-temperature Gibbs measures for Dyson models, and the Schonmann projection, the one-dimensional marginal of the two-dimensional Ising model, that neither property implies the other one. Both examples can be understood with help of the concept of entropic repulsion.

This is a joint work with R. Bissacot, E. Endo and A. Le Ny, and with S.B. Shlosman.

Effects of Time Asymmetry in Quantum Graphs

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The topic of the talk are the ways in which violations of time-reversal invariance in quantum graphs coming from the choice of the vertex coupling conditions can be manifested in spectral properties. We focus on two particular situations. One is of spectral geometry type; we ask about the topology of a finite graph with a particular vertex coupling of the indicated type which optimizes the eigenvalues. The other is related to quantum chaos: we demonstrate an example of a graph the properties of which, both in the eigenvalue spacing distribution and the form factor, differ from what is expected in this situation.

The results come from a common work with Ram Band, Divya Goel, Jonathan Rohleder and Aviya Strauss.

The Quartic Interaction in the Theory of Relativistic and Non-Relativistic Bosons. A Long Story of Successes and Drawbacks

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In the second half of the last century, the construction of a scalar quantum field for bosons interacting via polynomial interaction was considered as the simplest case of relativistic quantum field theory satisfying the Wightman axioms. While the existence of this field was proven in two and three spacetime dimension, the four dimensional case remained unresolved. As a result, the majority of the community of mathematical physicists involved in this field concluded that it was not possible to construct a non-trivial theory of this kind. However, the formal non-relativistic limit of this theory, namely the theory of $N > 2$ non relativistic bosons interacting via zero range interaction, also suffers from the same ultraviolet pathology in three spatial dimensions. Recent results in the theory of many quantum boson systems have shed light on possible solutions to these pathologies.

Floquet Theory of the Modulated LC Circuit: A Continued-Fraction and Krein–Theoretic Study

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A lossless LC circuit with harmonically modulated capacitance reduces exactly to an Ince equation, whose algebraic structure governs the parametric stability of the circuit. This talk examines that structure through three classical machineries — a universal entire-function expansion of the Hill discriminant, Cambi's continued-fraction method, and the Yakubovich–Starzhinskii exponent-matrix series — each of which exposes a different face of the same object, with Krein signature theory supplying the unifying explanation. Three results emerge. First, an exact structural dichotomy: only odd resonances open instability tongues, while even tongues have identically zero width, forced by the Ince symmetry via Krein signatures. Second, closed-form boundary asymptotics: the continued fraction, which Cambi evaluated numerically, is resolved in closed form, giving exact rational center shifts and tongue widths to all orders. Third, a constructive, harmonic-by-harmonic description of the periodic Floquet factor. The stability boundaries are exceptional points of degeneracy whose square-root sensitivity motivates a modulated-LC hypersensor.

Asymptotic Variance of Second Order Statistics of Point Processes

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We investigate statistical properties of certain stationary point processes, including determinantal processes with projection kernels and Gibbs point processes with superstable pair interactions. These are examples of hyperuniform and non-hyperuniform stationary point processes, respectively. We are interested in the variances of their second order statistics within a ball around the origin, and we study the asymptotic growth of this variance as the radius of the ball goes to infinity For Gibbs processes with superstable interactions these results have an interesting application to the so-called inverse Henderson problem of statistical mechanics.

This is a joint work with Martin Hanke.

Adiabatic Charge Pumps and Galilei Covariance

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The Thouless theory of quantum pumps establishes quantized transport per cycle and determines the conditions for that. When the description is shifted to a moving frame, as prompted by recent experiments on ultracold gases, transported and existing charges mix. Their transformation is encoded in Galilean space and time, but underlying it is one of vector bundles that may be described in a number of ways, that may or may not rely on Bloch theory. In one of them, the transformation mixes strong and weak topological indices of a bundle on a 2-torus; in another one, a 3-torus is at center stage. As a further alternative, the covariance is placed in the context of the Landauer–Büttiker formalism.

This is a joint work with T. Esslinger and F. Santi.

Gibbs Scheme in the Theory of Random Fields

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Mathematical statistical physics can be considered from two points of view — physical and probabilistic. In the course of its initial development, the DLR definition of a Gibbs random field was taken as a basis, which led to the dominance of the physical point of view in the construction of the theory. As a result, mathematical statistical physics, despite the rigour of its results, acquired a structure characteristic of physical theories.

At the same time, the probabilistic point of view was not properly developed. The reason is clear: at that time, a purely probabilistic definition of a Gibbs random field based on its intrinsic characteristics, namely, the properties of its finite-dimensional distributions, had not yet been formulated. It should be noted that, in the absence of such a definition, many problems arising in mathematical statistical physics — which are, in fact, probabilistic in nature — had to be solved on the basis of the DLR definition. This often led to rather cumbersome constructions.

The first attempt to give a purely probabilistic definition of a Gibbs random field was made in [1]. However, the proposed definition had certain limitations.

In this talk, an improved version of the purely probabilistic definition (or simply the Pr-definition) of a Gibbs random field will be presented. According to this definition, a positive random field is called Gibbsian if its conditional distributions are positive and uniformly continuous with respect to almost all boundary conditions. The Pr-definition reveals the probabilistic meaning of the class of Gibbs random fields as a uniform extension of the class of

Markov random fields and makes it possible to give its theory a structure consistent with that of the theory of random processes.

During the talk, an outline of the probabilistic theory of Gibbs random fields will be presented. It will be shown that the results of mathematical statistical physics are embedded in the developing theory of Gibbs random fields as an important, if not the most important, part of the theory. The range of problems that are more naturally solved using the proposed Pr-definition will also be described.

The talk is based on the joint work [2] with Boris S. Nahapetian. The work was supported by the Science Committee of the Republic of Armenia in the frames of the research project 21AG-1A045.

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The Free Energy of the Interacting Bose Gas: A Variational Description with Loops and Interlacements

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We consider the interacting Bose gas in the thermodynamic limit at positive temperature with particle density $\sim \rho \in (0, \infty)$. We follow a path-integral approach and use a description in terms of the *Brownian loop soup*, a Poisson point process consisting of Brownian loops. We derive a variational formula for the limiting free energy with explicit control on the particle densities in the short and in the long loops. The latter are presumed to play the role of the condensate, according to Feynman's famous, vague suggestion from 1953, and they turn into *random interlacements* (bi-infinite, locally finite random processes in $\mathbb{R}^d$) in our formula.

Our formula ranges over the set of all stationary point processes with loops and with interlacements, having each a given particle density, and minimizing the sum of the interaction energy and a characteristic entropy term. The latter is a new kind of a *specific relative entropy density* with respect to the reference process of loops, together with an independent Markov kernel describing collections of path shreds in large boxes. Our proof tool box is based on large-deviation theory and random point-process theory.

Local Groups and Related Algebraic Constructions

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In the talk we consider a local group which is the set with two group operations, taking the inverse is defined for all elements and the multiplication is partially defined and satisfies the local associativity condition. We will show that such objects naturally appears in the theory of semigroup algebras. In turn, for local groups we can define such standard C^*-algebraic constructions as $*$-representation, regular representation and the respective reduced C^*-algebra, and some specific constructions due the structure of a local group.

Duality of Energy and Probability in Models of Statistical Physics

Boris S. Nahapetian

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It is well-known that the Gibbs formula (which establishes a relationship between probability and energy) is the basis of statistical physics. Much attention has been paid to the justification of the Gibbs formula using physical reasoning. In [1], it was shown that the Gibbs formula can have a purely mathematical justification for both finite and infinite systems. This became possible thanks to the introduced concept of transition energy field.

In this talk, we will show that there is a deeper relationship between energy and probability, namely, energy and probability are dual concepts (see [2]). Duality is the principle according to which any true statement of one theory corresponds to a true statement in the dual theory. Here, we will show how this principle can be applied to some problems of mathematical statical physics and probability theory.

This is a joint work with Linda Khachatryan.

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Homogenization of Convolution Type Equations in Periodic Randomly Evolving Environments

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The talk will focus on homogenization problems for convolution type parabolic equations with integrable kernels whose coefficients are rapidly oscillating functions periodic in the spatial variables and random stationary in time. Assuming the diffusive scaling of the coefficients, we obtain the effective problem and prove the convergence. In the case of a deterministic limit we study the higher order approximations of solutions.

Construction, Gibbsian Character and Uniqueness of Limiting Gibbs Processes

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We consider a pair potential Φ on a general underlying space X equipped with locally finite diffuse measure ϱ. Under natural sufficiently general conditions on Φ we present two constructions of the limiting Gibbs process G for (Φ, ϱ) with empty boundary conditions. The first approach uses the method of moments and shows that the function r, which is defined via the so-called Ursell kernel, is the correlation function of G. The second is based on the cluster expansion method and gives a useful representation of the Laplace transform of G which allows us to prove that G is a Gibbs process in the sense of Dobrushin, Lanford and Ruelle. This result holds for stable, regular potentials, which contain classical Lennard–Jones-type potentials. Finally, we establish the uniqueness of G as the Gibbs process for hard-core potentials Φ which in particular contain Lennard–Jones-type potentials with hard-core.

We use the classical method of Kirkwood–Salsburg equations, where a central role is played by a generalization of Ruelle's estimate for correlation functions.

This is a joint work with Hans Zessin.

Effective Field and Particle Counting in Mean Field Thermal Bose Gases

Blazej Ruba

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A recent work of Deuchert, Nam, Napirkowski has established an approximation of the Gibbs state of Bose gases with mean-field scaled interactions and temperatures of the order of the critical temperaure of the BEC phase transition.

The effective state is constructed from a one-mode ϕ^4 integral governing the condensate, coupled with a temperature-dependent Bogoliubov Hamiltonian for non-zero momentum particles. In this talk, I will discuss a semiclassical interpretation of this state via a classical random field. I will present results for probability distributions of particle numbers, localized in either momentum or position space, expressed and proved using the effective field theory.

Rayleigh-Schrödinger Perturbation Theory for Nonlinear Schrödinger Equations

Andrea Sacchetti

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We consider a nonlinear perturbation of a time-independent linear Schrödinger equation with isolated simple eigenvalues. It is proved that the associated Rayleigh–Schrödinger power series is convergent when the parameter representing the intensity of the nonlinear term is less in absolute value than a threshold value, and it gives a stationary solution to the nonlinear Schrödinger equation. This result is applied to simple models.

Analytical Investigation of the Efficiency of 3D Wave Energy Converter

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An original 3D analytical solution was derived to describe the problem of the interaction of water waves with an oscillating wave energy converter. The derived analytical solution was applied to determine the efficiency of a device. The analysis shows that the power captured by the wave energy converter cannot exceed 50 %. The derived analytical solution may be applied to optimize the parameters of a device.

A Simple Mathematical Model for EPR Argument

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As is widely recognised, the paper by Einstein, Podolski and Rosen (EPR) in 1935 has been of fundamental importance both in the debate on the foundations of Quantum Mechanics and in the concrete developments of quantum theory and its applications. In the seminar we briefly recall the content of the paper and then we introduce and discuss a simple mathematical model where the EPR argument can be illustrated in a quantitative and rigorous way.

This is a joint work with R. Adami and L. Barletti.

Multi-Modal Approximation for 2D Regular Shock-Wave Reflection

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Strong shock interactions in rarefied and transition-regime gases exhibit highly non-Maxwellian velocity distributions and flow regions where classical Rankine–Hugoniot matching is not sufficient to describe the local structure. A convenient reduced description is provided by multi-modal (multi-Maxwellian) closures in the spirit of Mott-Smith, where the distribution function is approximated by a weighted sum of equilibrium modes associated with far-field states [1]. Building on this idea, we construct a fully two-dimensional Mott-Smith-type solution for steady regular reflection (RR) of an oblique shock from a symmetry plane by representing the local distribution function as a superposition of four Maxwellians corresponding to the four uniform zones of the inviscid RR pattern, with spatially varying weights $n_i(x, y)$. The weights are obtained from conservation laws supplemented by additional moment relations (restricted here to moments not higher than second order in molecular velocity) and enforced in a two-stage procedure: first, a boundary solution is computed along the symmetry line, and then it is extended to the full two-dimensional domain while preserving consistency on $y = 0$. The resulting modal solution reproduces the correct overall viscous RR pattern and shock angles over a wide range of incident-shock strengths (normal Mach number $M_n = 4 \ldots 10$) and, importantly, captures the qualitative multi-extrema structure of non-equilibrium velocity distributions by combining several simple modes. Validation against high-fidelity DSMC data demonstrates that the approach provides a satisfactory qualitative prediction of density and temperature fields and a surprisingly good representation of the distribution function itself, while quantitative discrepancies remain in shock thickness and in the near-axis wake features downstream of the reflection point, indicating that higher-order moment information may be required for accurate prediction of subtle post-interaction relaxation effects [2,3].

As a step towards gases with internal degrees of freedom, we also implement and assess the applicability of a trimodal extension originally developed in [4] for rotationally excited shock structures, where an additional intermediate equilibrium mode is introduced to model relaxation and energy transfer between translational and rotational motions. Within this framework, the internal-energy nonequilibrium is represented by allowing distinct temperatures (or energies) for translational and rotational subsystems and by incorporating a parameterization of inter-mode energy conversion; the trimodal closure thereby provides a minimal, analytically tractable analogue of internal-mode relaxation while preserving the core modal philosophy. In our implementation, the Haight–Lundgren-type trimodal model is treated as a building block for benchmarking internal-energy closures: we investigate regimes where a small number of modes can reproduce the macroscopic shock profiles and relaxation trends, and we delineate situations in which a richer description (additional modes, higher-order moments, or kinetic reference) is necessary. Overall, the multi-modal methodology offers a unified reduced-order viewpoint on both regular shock reflection and internal-energy relaxation, supporting systematic validation of non-equilibrium models against DSMC and guiding the design of computationally efficient closures for strong-shock problems.

This is a joint work with Ye.A. Bondar.

The study was supported by the Russian Science Foundation (Grant No. 22-71-10045-P).

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Geometric Inequalities for Quantum Spin Systems

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I will review certain correlation inequalities in classical and quantum spin systems that involve the geometry of the lattices or graphs. These inequalities were first proposed by Simon and Lieb (and Aizenman, Rivasseau), and by Messager and Miracle-Solé.

I will discuss their validity in quantum spin systems.

This is a joint work with Heeney, Lis, Ryan, and with Saksida, Sohinger.

Asymptotics in Loop Percolation

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Markovian loop percolation is a lattice model arising as a high-temperature limit of the Bose gas, with close connections to the Gaussian free field. Despite its simple formulation, its connectivity properties remain poorly understood. In this talk, I will present results in high dimensions on the one-arm exponent and on the subcritical model conditioned to exhibit a long connection.

About Nonlinear Affine Semigroups on Hilbert Space

Valentin Zagrebnov

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This lecture presents some results about the *operator-norm* Trotter product formula approximation of *nonlinear affine* semigroups on Hilbert space $\mathcal{H}$. The important step, which ensures the operator-norm convergence, is based on the theorem [Dhz. Rogava (1993) and ITTZ-Theorem (2001), see reference] about operator-norm convergence of the Trotter product formula for self-adjoint linear C_0-semigroups on $\mathcal{H}$.

References

[1] V.A. Zagrebnov, H. Neidhardt, T. Ichinose, *Trotter–Kato Product Formulæ.* Springer Nature Switzerland AG, Birkhäuser, 2024

Some Remarks on Quantum Gases

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The aim is to present examples of quantum gases, particularly a version of Jean Ginibre based on his model from his Les Houches Lectures in 1970. I indicate its Gibbsian character as well as a construction of the limiting Gibbs process with empty boundary conditions.

High Contrast Periodic Diffusion and Sticky Brownian Motion

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We consider the homogenization problem for the diffusion operators in high-contrast periodic media:

$$A_\varepsilon u^\varepsilon(x) = div(a^\varepsilon(x)\nabla u^\varepsilon)$$

with

$$a^\varepsilon(x) = \begin{cases} 1, & \text{if } x \in Y^\sharp \\ \varepsilon^2, & \text{if } x \in G^\sharp, \end{cases}$$

$G \cup Y = \mathbb{T}^d$.

To describe the limit of A_ε under the diffusion scaling, we introduced in [1] an extended space, where the spatial component of the process is complemented by a component that describes the position within the period $\mathbb{T}^d$. We then investigated the scaling limit as $\varepsilon \to 0$ of the corresponding Markov processes on this extended space.

In my talk, I will present new results on the relationship between the limit process associated with diffusion in high-contrast periodic media and "sticky" Brownian motion in G with a special behaviour at the boundary.

References

[1] A. Piatnitski, S. Pirogov, E. Zhizhina, Limit behaviour of diffusion in high-contrast media and related Markov semigroups. Applicable Analysis, 98 (1-2), 2019, pp. 217–231