42nd International Conference on Quantum Probability, and Infinite Dimensional Analysis (QP-42)

January 17-20, 2022

Confirmed Speakers and Title & Abstract of talks

List of Confirmed speakers (updated to January 13, 2022)

1. L. Accardi, Centro Vito Volterra, Rome, Italy
2. D. Beltita, Institute of Mathematics, Bucharest, Romania
3. M. Bozejko, Instytut Matematyczny, Poland
4. P. Chakraborty, Universite; de Franche-Comte, Besancon, France
5. V. Crismale, Universitadegli Studi di Bari Aldo Moro, Bari, Italy
6. R. Devendra, IIT Madras, Chennai, India
7. A R Usha Devi, Bangalore University, Bangalore, India
8. Dauda Dikko, Univ. of Ibadan, Nigeria
9. Wiktor Ejsmont, Technical University, Wroclaw, Poland
10. Franco Fagnola, Polytechnic University of Milan, Italy
11. S. Fillippov, Steklov Mathematical Institute, Russia
12. Uwe Franz, Universite de Franche-Comte, Besancon, France
13. James Fullwood, Shanghai Jiao Tong University, China
14. Malte Gerhold, Institutfur Mathematik und Informatik, Greifswald, Germany
15. Federico Girotti, University of Nottingham, UK
16. Debashish Goswami, Indian Statistical Institute, Kolkata, India
17. Robin Hillier, Lancaster University, UK
18. Un Cig Ji, Chungbuk National University, South Korea
19. Manish Kumar, IIT Madras, Chennai, India
20. S. V. Kozyrev, Steklov Mathematical Institute, Moscow
21. Daniel Markiewicz, Ben Gurion University of the Negev, Be'er Sheva, Israel
22. Carlos Mora, Universidad de Concepcion, Chile
23. F. Mukhamedov, United Arab Emirates University, U.A.E.
24. E. A. Oluwafemi, Obafemi Awolowo University, Ile-Ife, Nigeria
25. Nazife Erkursun Ozcan, Hacettepe University, Turkey
26. Arthur Parzygnat, Institut des Hautes Etudes Scientifiques, France
27. R. Quezada, Universidad Autonoma Metropolitana-Iztapalapa, Mexico

City, Mexico
28. M. Saburov, Ameircan University of Middle East, Kuwait
29. Amber Sengupta, University of Connecticut, Connecticut, U S A
30. K B Sinha, JNCASR, Bangalore, India
31. Aurel Stan, Ohio State University, USA
32. Vijaya Kumar U., Indian Institute of Science, Bangalore, India
33. V. Umanita, Universitadegli Studi di Genova, Genoa, Italy
34. N. Watanabe, Tokyo University of Science, Tokyo, Japan
35. Janusz Wysoczanski, Instytut Matematyczny, Wroclaw, Poland

Title and abstract of talks

---

1. Speaker: L. Accardi

Title: Fermions from classical probability.

Abstract: The case study of Fermions and the attempt to deduce their structure from classical probability opens new ways for classical probability. In particular for the notion of 'coupling' of probability measures. This idea will be illustrated with some examples.

---

2. Speaker: D. Beltita

Title: Transformation groupoids in W^*-algebras

Abstract: The set of all partial isometries in a W^*-algebra has the structure of an infinite-dimensional Lie groupoid. Its groupoid actions play a key role in widely differing areas such as the standard form of a W^*-algebra and the study of norm closures of unitary orbits of normal operators. We discuss geometric properties of the corresponding groupoid orbits, which have natural structures of smooth manifolds modeled on Banach spaces and encode specific features of the W^*-algebra under consideration. This presentation is based on joint papers with Anatol Odzijewicz and with Gabriel Larotonda.

---

3. Speaker: Marek Bozejko

Title: Quasi-multiplicative positive definite functions on Coxeter(Weyl) groups with some applications to generalized CCR relations of type B and operator-valued Khntchine inequality on all Coxeter groups.

Abstract: The Plan of my talk is as follows:

1. Quasi-multiplicative positive definite functions $P : W$ into C, on Coxeter group (W, S), with respect some classes of length functions L on W, i.e.:

$$P(xy) = P(x)P(y), \text{ if } L(xy) = L(x) + L(y).$$

2. Main examples of length functions - $L_1(x) = |x|$ - classical length functions. depending on S,

$L_2(x) = ||x||$ - the block length functions.

3. Type A and B Fock spaces related to positive definite functions of the form: $P(x) = q^{L(x)}$.

4. Generalized CCR relations and relations with Meixner-Pollaczek measures and polynomials.

5.Operator version of Khinchine inequality with coefficients from the Schatten class S_p.$1 < p < \infty$.

---

4. Speaker: Purbayan Chakraborty

Title: Nice error basis and study of quantum maps.

Abstract: A nice error basis is a convenient orthonormal basis of M_n which comes from a projective representation of a group G. We can use this basis to study the relation between a kernel K on $G \times G$ and positive or completely positive(CP) maps. Furthermore we can characterize semigroups of CP maps and k-positive maps in terms of its generator.

---

5. Speaker: Vitonofrio Crismale

Title: Symmetric states on quasi-local algebras and product states on infinite

$\mathbb{Z}_2$-graded tensor product of C^*-algebras

Abstract: We present local actions of $\mathbb{P}_\mathbb{N}$, the group of finite permutations on $\mathbb{N}$, on quasi-local algebras, showing that the invariant (or equivalently symmetric) states are automatically even, whereas extreme invariant states are strongly clustering. We also illustrate how the tail algebras of invariant states obey a form of the Hewitt and Savage theorem, in that they coincide with the fixed-point von Neumann algebra.
Infinite graded tensor products of C^*-algebras, which include the CAR algebra, are then addressed as particular examples of quasi-local algebras acted upon $\mathbb{P}_\mathbb{N}$ in a natural way. We characterize extreme invariant states as infinite products of a single even state, thus establishing a de Finetti theorem. Finally, if time permits, we will see that a twisted version of the tensor product commutation theorem allows us to get that infinite products of factorial even states are factorial.
This is a joint work with Stefano Rossi and Paola Zurlo.

---

6. Speaker: R. Devendra

Title: Mapping cone of k-entanglement breaking maps.

Abstract: The class of k-entanglement breaking maps was introduced by Christandl et al. (Ann. Henri Poincare, 20(7):2295-2322, 2019). In this talk, we discuss many characterizations for a k-positive map to be a k-entanglement breaking map. We prove that the set of all k-entanglement breaking maps forms an untypical mapping cone. Also, we discuss some examples of k-entanglement breaking maps. As an application of our study, we characterize the completely positive maps that reduce Schmidt number strictly on taking composition with another completely positive map. Finally, we provide a majorization result for the k-entanglement breaking maps.

---

7. Speaker: A R Usha Devi

Title: Sandwiched relative α-entropy of two n-mode gaussian states.

Abstract: Sandwiched relative α-entropy $\widetilde{D}_\alpha(\rho||\sigma)$ of two quantum states

ρ, σ, introduced concurrently by Wilde et. al. (Commun. Math. Phys. **331** (2014)) and Müller Lennert et. al.(J. Math. Phys. **54** (2013)) is viewed as a non-commutative generalization of the Petz–Rényi relative entropy $D_\alpha(\rho||\sigma)$ (Rep. Math. Phys., **23** (1986), pp. 57–65). It plays a prominent role in quantum information theory, finding applications in characterizing error exponents and strong converse exponents for quantum hypothesis testing and quantum communication theory. In this talk I will discuss a formula for the sandwiched relative α-entropy $\widetilde{D}_\alpha(\rho||\sigma)$ for $0 < \alpha < 1$, of two n-mode gaussian states ρ, σ in the boson Fock space $\Gamma(\mathbb{C}^n)$ (K. R. Parthasarathy, arXiv:2109.04062(quant-ph)). This computation is facilitated by the $\mathcal{E}_2$-parametrization of gaussian states in $\Gamma(\mathbb{C}^n)$ proposed by John and Parthasarathy (J. Math. Phys. **62** (2021), 022102).

---

8. Speaker: Dikko, D.A

Title: On existence of solution and a selection results for a class of Quantum Stochastic Differential Inclusions (QSDI)

Abstract: We employ recent topological structure in a locally convex space which are operator valued, to establish a general framework for a class of Quantum Stochastic Differential Inclusions (QSDI). We state some of the regularity results used in establishing its regularity property and prove an existence theorem. We also establish selection results for this class of QSDI. These results are valid within the framework of the Hudson and Parthasarathy formulation of Quantum Stochastic Calculus (QSC).

---

9. Speaker: Wiktor Ejsmont

Title: A cyclic Fock space of type B

Abstract: I will present a joint work with Marek Bozejko, Maciej Dolega and Swiatoslaw R. Gal.

I introduce a two-parameter function on the infinite hyperoctahedral group, which is a bivariate refinement of the reflection length keeping track of the long and the short reflections separately. I provide a complete characteriza-

tion of the parameters when the signed reflection function is positive definite.

I apply our characterization to construct a cyclic Fock space of type B which generalizes the one-parameter construction in type A found previously by Bozejko and Guta. I also present a new cyclic Gaussian operator of type B and we relate its moments with the Askey–Wilson–Kerov distribution by using the notion of cycles on pair-partitions.

---

10. Speaker: F. Fagnola

Title: The Decoherence-free Subalgebra of Gaussian Quantum Markov Semigroup

Abstract: We present a method for finding the decoherence-subalgebra $\mathcal{N}(\mathcal{T})$ of a Gaussian quantum Markov semigroup on the von Neumann algebra $\mathcal{B}(\Gamma(\mathbb{C}^d))$ of all bounded operator on the Fock space $\Gamma(\mathbb{C}^d)$ on $\mathbb{C}^d$. We show that $\mathcal{N}(\mathcal{T})$ is a type I von Neumann algebra $L^\infty(\mathbb{R}^{d_c};\mathbb{C})\overline{\otimes}\mathcal{B}(\Gamma(\mathbb{C}^{d_f}))$ determined, up to unitary equivalence, by two natural numbers $d_c, d_f \leq d$ dependent on the symplectic structure on a subspace of a real subspace of $\mathbb{C}^d$ determined by Kraus operators of the generator and their iterated commutators with the Hamiltonian. We illustrate the result by some applications and examples. The talk is based on the joint work with J. Agredo and D. Poletti `arXiv:2112.13781`.

---

11. Speaker: Sergei Filippov

Title: Markovian embedding for non-Markovian quantum collision models with correlated environment.

Abstract: Quantum collision model describes an open quantum system interacting sequentially with individual subenvironments. The system dynamics is known to be Markovian if all the subenvironments are initially identical and there are no correlations among them. Here we consider a case of the correlated environment, which leads to a strictly non-Markovian (positive indivisible) system dynamics. Representing the environment in terms of the tensor network called matrix product state, we find a natural Markovian em-

bedding for the system dynamics and derive a master equation. The results are illustrated by physical models of the spin transport through a chain of correlated atoms and a two-level system interacting with a correlated light.

---

12. Speaker: Uwe Franz

Title: On Gaussian Lévy processes

Abstract: I will recall and motivate the notion of Gaussian generating functionals and convolution semigroups of Gaussian states on involutive bialgebras introduced by Michael Schürmann in 1990. Then I will the Gaussian part of a compact quantum group as the smallest quantum subgroup which supports all Gaussian states. It turns out that the Gaussian part is always contained in the maximal Kac subgroup. I will discuss the Gaussian parts of commutative and cocommutative compact quantum groups and close with several open questions. Based on joint work with Amaury Freslon and Adam Skalski.

---

13. Speaker: J. Fullwood

Title: On a Quantum Entropic Bayes' Rule

Abstract: Given a pair of random variables (X,Y), the entropic Bayes' rule states that

$$H(X|Y) + H(Y) = H(Y|X) + H(X),$$

where $H(*|*)$ and $H(*)$ denote the conditional and Shannon entropies respectively. In this talk, we use quasi-probability distributions to define a quantum generalization of conditional entropy starting from the datum of a quantum channel and an initial state to be sent through the channel, and show that it satisfies a quantum analogue of the entropic Bayes' rule. We also show how such an intrinsic conditional entropy yields natural quantum analogues of other classical information measures, such as mutual information and joint entropy. This talk is based on joint work with Arthur Parzygnat.

---

14. Speaker: M. Gerhold

Title: Towards a classification of multi-faced independences.

Abstract: Multi-faced independences are independences for n-tuples of noncommutative random variables of fixed size n. Of course, an n-tuple of noncommutative random variables is itself a noncommutative random variable, but the non-uniqueness of independence leads to even more possibilities when restricting to a fixed tuple size. Indeed, Voiculescu's bifreeness is not the same as freeness and this was the first example of a nontrivial two-faced independence.

In this talk we will take a closer look at the representation theoretic approach to multi-faced independences, which underlies bifree, free-boolean, or monotone-antimonotone (=type II bimonotone) independence. We present axioms for universal products of representations which assure that they induce well behaved independences, and which we hope could be general enough to capture all multi-faced independences in the sense of Manzel and Schurmann whose underlying universal product of linear functionals is positive, i.e. all positive independences. By restricting to the tensor product or the free product as representation space for the product representation, we define subclasses of multi-faced independences which we can completely classify. In this classification we find all known examples of positive independences. Furthermore, in contrast to the single-faced situation, where by Muraki's theorem there are only five positive independences, we surprisingly find continuous families of positive two-faced independences. These include two-faced deformations of tensor, free, and bifree independence.

The talk will be based on joint work with Takahiro Hasebe and Michael Ulrich, in particular the recent preprint arXiv:2111.07649.

---

15. Speaker: Federico Girotti

Title: On a generalized Central Limit Theorem and Large Deviations for Homogeneous Open Quantum Walks.

Abstract: Homogeneous Open Quantum Walks (HOQWs) consist in a quantum generalization of classical random walks on a lattice (for example $\mathbb{Z}^d$)

where the steps of the walker also depend on some internal degrees of freedom; conversely to (unitary) quantum walks, HOQWs take place in an open environment. The position pro- cess associated to an HOQW has been the object of an intensive study in the last years and, among the other results, a strong law of large numbers, a central limit theorem and a large deviation principle have been proved under some assumptions on the model. Using a quantum generalization of absorption probabilities that we recently introduced, we are able to generalize the existing limit type results and give more explicit expressions for the involved asymptotic quantities, dropping any additional condition on the walk. Further, we can provide lower and upper bounds for the probability of large deviations. The talk is based on a joint work with Raffaella Carbone and Anderson M. Hernandez.

---

17. Speaker: Robin Hillier

Title: Control of quantum noise by dynamical decoupling and the role of dilations

Abstract: We recall the method of dynamical decoupling, a common tool used to suppress decoherence in quantum systems. We explain some of its mathematical features and some criteria as to when dynamical decoupling for a given quantum system works. The main purpose of this talk is then to show that every finite-dimensional quantum system with Markovian (i.e., GKLS-generated) time evolution has an (autonomous unitary) dilation which can be dynamically decoupled and that it also has an (autonomous unitary) dilation which cannot be dynamically decoupled; this highlights the role of dilations in the control of quantum noise and poses the question which dilation is the physically correct one.

---

18. Speaker: Un Cig Ji

Title: Quantum Extension of Transformations on White Noise Functionals

Abstract: In this talk, we introduce a new class of transformations involving the generalized Fourier-Gauss and Weyl operators acting on the space of test white noise functionals, and by taking their adjoints, we have a new class

of transformations acting on the space of generalized white noise functionals which involve the generalized Fourier-Mehler transforms and Weyl operators. We characterize all differentiable one-parameter semigroups induced by the transformations with their infinitesimal generators and we study their quantum extensions which becomes quantum dynamical semigroups. In particular, the quantum dynamical semigroups induced by the Weyl operators become quantum Markovian semigroups.

---

19. Speaker: Manish Kumar

Title: C*-extreme maps and nests

Abstract: We study the C*-extremal points of the C*-convex set consisting of unital completely positive maps on a unital C*-algebra taking values in B(H). We will present a connection between such maps and a certain factorization property of some associated (non-selfadjoint) algebras. We will particularly see the role of nests of subspaces and corresponding nest algebras in our analysis of the C*-extemal points. This is joint work with Prof. B.V. Rajarama Bhat.

---

20. Speaker: S. Kozyrev

Title: Landau-Zener formula and non-secular transitions

Abstract: The relationship between the Landau-Zener model (which describes transitions between energy levels for a time-dependent Hamiltonian) and non-secular master equations is discussed. This approach allows to describe the widely discussed in the literature on quantum photosynthesis resonance of the energy of the vibron and the difference of exciton energies for transitions between exciton states coupled to the vibron.

---

21. Speaker: Daniel Markiewicz

Title: E_0-semigroups and boundary weight maps, the infinite dimensional case.

Abstract: An E_0-semigroup of $B(H)$ is a particular kind of quantum Markov semigroup: it is a one parameter strongly continuous semigroup of unital $*$-endomorphisms of $B(H)$. This talk concerns the classification of E_0-semigroups up to cocycle conjugacy.

Robert T. Powers showed that every E_0-semigroup that possesses a strongly continuous intertwining semigroup of isometries arises (up to cocycle conjugacy) from a boundary weight map over K separable Hilbert space; in a certain sense, boundary weight maps are an adaptation of the concept of resolvents from classical semigroup theory to this context.

The case of q-pure boundary weight maps over K finite dimensional was classified completely in the paper: C. Jankowski, D. Markiewicz and R.T. Powers, "Classification of q-pure q-weight maps over finite dimensional Hilbert spaces", *J. Funct. Anal.* 277 (2019), no. 6, pp. 1763–1867.

In this talk we present some recent developments in joint work with C. Jankowski and R. T. Powers, showing that the situation for infinite dimensional K presents some new phenomena.

---

22. Speaker: Carlos Manuel Mora

Title: Numerical simulation of open quantum systems.

Abstract: We address theoretical problems arising from the numerical simulation of quantum trajectories. First, we present recent results on the weak convergence of an Euler-exponential scheme solving the non-linear stochastic Schrödinger equation. This yields a second weak order numerical method by using the Talay-Tubaru extrapolation procedure. Second, we introduce a quantum-trajectory method for solving stochastic quantum master equations with mixed initial states.

The talk is based on joint works with R. Biscay, J. Fernández. M. Muñoz.

---

24. Speaker: E. A. Oluwafemi

Title: Strongly continuous semigroup on decoherence-free subalgebra of quan-

tum Markov semigroup.

Abstract: In this work, we shall be concerned with strongly continuous semigroup on decoherence-free subalgebra of quantum Markov semigroup. A derivation for the infinitesimal generator of decoherence-free subalgebra was first established. The derivation was then used to establish a theorem for the characterization of a strongly continuous semigroup on decoherence-free subalgebra of quantum Markov semigroup.

---

25. Speaker: Nazife Erkurşun-Özcan

Title: Spectral conditions for uniform P-ergodicities of Markov operators

Abstract: It is well-known that to study main properties of Markov processes one reduces the investigation to examine limiting behavior of associated Markov operators. To investigate ergodic properties of Markov operators on abstract framework is convenient and important for the study of several properties of physical and probabilistic processes which covers the classical and quantum cases.

Therefore, a main goal of the talk is to explore asymptotic stability of Markov operators defined on abstract state spaces by means of a generalized Dobrushin ergodicity coefficient. Additionally, we are interested in the rate of convergence when a Markov operator T satisfies the uniform ergodicity. Moreover, we give Doeblin's conditions for the uniform ergodicity of Markov operators.

This talk is based on the joint paper with Farrukh Mukhamedov in (1)

(1) Erkurşun Özcan, N., Mukhamedov F., Spectral conditions for uniform P-ergodicities of Markov operators on abstract states space, Glasg. Math. J., 63 (2021), no.3, 682-696.

---

26. Speaker: Arthur Parzygnat

Title: Conditional expectations and Bayes' theorem

Abstract: It has been known for a long time that conditional expectations in non-commutative (NC) probability cannot be used with the same force as in classical probability theory do to their potential non-existence. A generalization of conditional expectation that exists in greater abundance is that of a Bayesian inverse, which has recently been defined in NC probability through categorical methods. We will review the recent NC Bayes' theorem and formulate it as an extension of a theorem due Accardi and Cecchini, which itself is a generalization of an important theorem by Takesaki on the relationship between conditional expectations and the Tomita-Takesaki modular group. This is based on joint work with Luca Giorgetti, Alessio Ranallo, and Benjamin Russo (https://arxiv.org/abs/2112.03129).

---

27. Speaker: Roberto Quezada

Title: Annihilation moments of quantum Gaussian states

Abstract: We will discuss a mathematically rigorous definition of moments of an unbounded observable with respect to a quantum state and provide a characterization of Gaussian states in terms of annihilation moments, i.e., moments of the Weyl generator $-\frac{1}{2i}(za^\dagger - \overline{z}a) = \mathrm{Im}(\overline{z}a)$, which we denote by $\sigma(z, a)$, along the lines of the underlying standard symplectic structure.

---

29. Speaker: Ambar N. Sengupta

Title: The Large-N Limit of Laplacians and Polynomials on Spheres.

Abstract: This talk, based on joint work with Amy Peterson, presents results on the behavior of the Laplacian and its eigenfunctions for the sphere $S^{N-1}(\sqrt{N})$. We also discuss purely algebraic aspects of classical polynomials over spheres.

---

30. Speaker: K B Sinha

Title: Sufficient Statistic and Rao-Blackwell Theorem in Quantum Probability.

Abstract: In the decision-theoretic foundation of Classical Statistics, the idea and the concept of a sufficient statistic plays a central role. A parallel concept of a sufficient statistic in quantum probability is proposed here and as a consequence, various levels of "quantum Rao-Blackwell theorem" is proven.

---

31. Speaker: A Stan

Title: A study of random variables in terms of the number operator.

Abstract: Given a finite family of random variables, having finite moments of all orders, we can define their joint quantum operators: creation, preservation, and annihilation operators. To know these operators is equivalent to knowing the number operator, since all the quantum operators belong to the Lie algebra generated by the number operator and the multiplication operators by the given random variables. The number operator has a position-momentum decomposition whose terms consist of compositions of multiplication operators (position operators) and differentiation operators (momentum operators), in which all position operators are placed to the left of the momentum operators. We will focus our attention on random variables whose number operators consists of only two terms: one linear and one quadratic in the differentiation operators (re-scaled Gamma and Gaussian random variables), and on symmetric random variables whose number operators satisfy a quadratic equation in which the "constant" term is quadratic in the differentiation operators (random variables whose orthogonal polynomials are the Gegenbauer polynomials).

---

32. Speaker: Vijaya Kumar U

Title: The joint spectrum for a commuting pair of isometries.

Abstract: The study of a pair (V_1, V_2) of commuting isometries is a classical theme. We shine new light on it by using the defect operator

$$C(V_1, V_2) = I - V_1V_1^* - V_2V_2^* + V_1V_2V_2^*V_1^*.$$

We show that the joint spectrum of two commuting isometries can vary widely depending on various factors. It can range from being small (of mea-

sure zero or an analytic disc for example) to the full bidisc. En route, we discover a new model pair in the negative defect case.

---

33. Speaker: Veronica Umanita

Title: Covariant Quantum Markov Semigroups and their decoherence-free subalgebras.

Abstract: Given a QMS covariant with respect to a group representation, we study its action on subspaces preserved by the representation. Moreover, under suitable conditions, we investigate on the relationships between such subspaces and the structure of the decoherence-free sub-algebra, i.e. the biggest von Neumann algebra on which the semigroup acts as a *-automorphism.

---

34. Speaker: Noboru Watanabe

Title: On Tranmitted Complexity for Modified Compound States

Abstract: In 1989, Ohya propose a new concept, so-called Information Dynamics (ID), to investigate complex systems according to two kinds of view points. One is the dynamics of state change and another is measure of complexity. In ID, two complexities C^S and T^S are introduced. C^S is a measure for complexity of system itself, and T^S is a measure for dynamical change of states, which is called a transmitted complexity. An example of these complexities of ID is entropy for information transmission processes. The study of complexity is strongly related to the study of entropy theory for classical and quantum systems. The quantum entropy was introduced by von Neumann around 1932, which describes the amount of information of the quantum state itself. It was extended by Ohya for C*-systems before CNT entropy. The quantum relative entropy was first defined by Umegaki for σ-finite von Neumann algebras, which was extended by Araki and Uhlmann for general von Neumann algebras and *-algebras, respectively. By introducing a new notion, the so-called compound state, in 1983 Ohya succeeded to formulate the mutual entropy in a complete quantum mechanical system (i.e., input state, output state and channel are all quantum mechanical) describing the amount of information correctly transmitted through the quantum

channel.

In this talk, we briefly review the complexity for quantum dynamical systems. We introduce transmitted complexity by means of entropy functionals in order to treat the transmission processes consistently. We apply the general frames of quantum entropy for quantum dynamical systems. Finally, we define a transmitted complexity (mutual entropy) by means of the modify the compound states.

---

35. Speaker: Janusz Wysoczanski

Title: Joint Boolean and monotone numerical and spectral radii for d-tuples of operators

Abstract: