

Fifteenth Biennial Quantum Structures 2022 International Quantum Structures Association

Tropea, Calabria (Italy), June 27-July 02, 2022



Dedicated to the Memory of the Past Presidents of the IQSA:

Peter Mittelstaedt, David J. Foulis, Paul Busch, Jaroslaw Pykacz

Quantum Structures 2022 Tropea is a major international conference integrating all fields of quantum mechanics and its applications, with an interdisciplinary and foundational perspective. Owing to its character, the objective of the conference is to encourage communication between researchers throughout the world. Everything will take place in the splendid setting of Tropea.

Local Organizing Committee:

Roberto Beneduci, University of Calabria (Italy)
Fabio Bagarello, University of Palermo (Italy)
Maria Luisa Dalla Chiara, University of Firenze (Italy)
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Giuseppe Sergioli, University of Cagliari (Italy)
Carmelo Scuro, University of Calabria (Italy)
Sandro Sozzo, University of Leicester (UK)



Programming Committee:

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Giuseppe Sergioli, University of Cagliari (Italy)
Miklos Redei, London School of Economics and Political Science (UK)
Karl Svozil, Technical University Vienna (Austria)
Ekaterina Turilova, Kazan State University (Russia)

Special Events:

Piano Concert dedicated to the Memory of Giuliano Toraldo di Francia
Music Session dedicated to the memory of Beloslav Riečan

Sponsors:



For more information visit: <https://indico2.conference4me.psnr.pl/event/24/>



Sun 26/6

19:00

Registration

Hotel Tropis Tropea, Calabria, Italy

19:00 - 20:00

20:00

21:00





Registration

Hotel Tropis Tropea, Calabria, Italy

21:30 - 22:30

22:00

Mon 27/6

08:00	Registration		
	<i>Hotel Tropis Tropea, Calabria, Italy</i>		08:00 - 09:00
09:00	Opening		
	<i>Hotel Tropis Tropea, Calabria, Italy</i>		09:00 - 09:30
	History of Kochen-Specker theorems	<i>Mirko Navara</i>	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>		09:30 - 10:00
10:00	Zygmunt Zawirski: the forgotten forefather of quantum logic	<i>Elżbieta Drozdowska</i>	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>		10:00 - 10:30
	Methodological Criteria for the Interpretation of Quantum Mechanics	<i>Paolo Rocchi</i>	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>		10:30 - 11:00
11:00	Coffee Break		
	<i>Hotel Tropis Tropea, Calabria, Italy</i>		11:00 - 11:20
	THE THEORY OF QUANTUM STATISTICAL COMPARISONS: WHERE DO WE STAND?		
	<i>Francesco Buscemi (Invited Speaker)</i>		
12:00	A LOGICO-EPISTEMIC INVESTIGATION OF FRAUCHIGER AND RENNER'S PARADOX	<i>Vincenzo Fano (Invited Speaker)</i>	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>		11:50 - 12:20
	Spectral resolutions in effect algebras	<i>Anna Jenčová</i>	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>		12:20 - 12:50
12:00	On the condition of settings independence	<i>Tomasz Placek</i>	

13:00

Hotel Tropis Tropea, Calabria, Italy

12:50 - 13:20


Lunch Break

14:00

13:20 - 15:00

15:00

Extending Kolmogorov's axioms for a generalized probability theory on collections of contexts

Karl Svoboda 

Hotel Tropis Tropea, Calabria, Italy

15:00 - 15:30

Quantizing partially ordered structures

Bert Lindenhovius

Hotel Tropis Tropea, Calabria, Italy

15:30 - 16:00

16:00

On divisible extension of probability

Martin Papčo 

Hotel Tropis Tropea, Calabria, Italy

16:00 - 16:30

Coffee Break

Hotel Tropis Tropea, Calabria, Italy

16:30 - 16:50

17:00

A Quantum-Classical Isomorphic Interpretation of Quantum Foundations

Russell Thompson

Hotel Tropis Tropea, Calabria, Italy

16:50 - 17:20

On the Various Ways of Quantum Implementation of the Modular Exponentiation Function for Shor's Factorization 

Dr Jiří Tomčala

18:00

19:00

Welcome Drink

20:00

Hotel Tropis Tropea, Calabria, Italy

19:30 - 21:00

21:00

Tue 28/6

08:00

Registration

Hotel Tropis Tropea, Calabria, Italy

08:30 - 08:59

Chair of the Session: Jean Pierre Gazeau

Hotel Tropis Tropea, Calabria, Italy

08:59 - 09:00

09:00






DEVELOPMENTS IN QUANTUM FIELD THEORY, MODELING THE BRAIN


Giuseppe Vitiello (Invited Speaker)




Hotel Tropis Tropea, Calabria, Italy

09:00 - 09:30

	<i>Hotel Tropis Tropea, Calabria, Italy</i>	09:00 - 09:30
	Quantum-like approach to complex systems, and the role of ladder operators. A review	<i>Fabio Bagarello</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	09:30 - 10:00
10:00	Traffic models and traffic-jam transition in quantum (N+1)-level systems	<i>Andrea Nava</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	10:00 - 10:30
	Representing Decisions Under Uncertainty in Hilbert Space: Foundations and Applications	<i>Sandro Sozzo</i> 
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	10:30 - 11:00
11:00	Coffee Break	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:00 - 11:19
	Chair of the Session: Sandro Sozzo	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:19 - 11:20
	International interaction game revisited: Quantum take on militarized interstate disputes	<i>Jakub Tesar</i> 
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:20 - 11:50
	Operatorial models for competition and cooperation: (H, p)-induced dynamics	<i>Francesco Oliveri</i> 
12:00	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:50 - 12:20
	A QUANTUM APPROACH TO PATTERN RECOGNITION AND TO MACHINE LEARNING. PART I	<i>Dalla Chiara Maria Luisa</i> 
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	12:20 - 12:50
	A QUANTUM APPROACH TO PATTERN RECOGNITION AND TO MACHINE LEARNING. PART II	<i>Giuseppe Sergioli</i> 
13:00	<i>Hotel Tropis Tropea, Calabria, Italy</i>	12:50 - 13:20
	Lunch Break	
14:00		

15:00		13:20 - 15:09
	Chair of the session: Martin Papco	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	15:09 - 15:10
	The logic of orthomodular posets of finite height	<i>Ivan Chajda</i> 15:10 - 15:40
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	
	Reflectors to quantales	<i>Jan Paseka</i>
16:00	<i>Hotel Tropis Tropea, Calabria, Italy</i>	15:40 - 16:10
	Distributivity-like properties and associativity in generalized effect algebras	<i>Josef Tkadlec</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	16:10 - 16:40
	Coffee Break	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	16:40 - 17:00
17:00	Population dynamics based on ladder operators	<i>Gargano Francesco</i> 
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	17:00 - 17:30
	Macroscopic Quantum Analogs	<i>Giuseppe Pucci</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	17:30 - 18:00
18:00		

Wed 29/6

	Registration	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	08:30 - 08:59
	Chair of the session: Paolo Perinotti	
09:00	Any Physical Theory of Nature Must Be Boundlessly Multipartite Nonlocal	<i>Marc-Olivier Renou (Invited Speaker)</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	09:00 - 09:30
	Measurement disturbance and conservation laws in quantum mechanics	<i>M. Hamed Mohammady</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	09:30 - 10:00
10:00	Subreducts and Subvarieties of PBZ*-lattices	<i>Claudia Muresan</i> 
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	10:00 - 10:30
	Optimal interferometry and Bell-nonclassicality with a single photon state	<i>Antonio Mandarino</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	10:30 - 11:00
11:00	Coffee Break	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:00 - 11:20
	Causal and compositional structure of higher order quantum maps	<i>Alessandro Bisio</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:20 - 11:50
12:00	Optimal measurement in the quantum statistical decision theory	<i>Rafał Wieczorek</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:50 - 12:20
	Emergent joint measurability through quantum decoherence	<i>Jukka Kiukas (Invited speaker)</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	12:20 - 12:50
13:00	Lunch Break	

14:00

12:50 - 14:50

IQSA Assembly

15:00

16:00

17:00

Hotel Tropis Tropea, Calabria, Italy

14:50 - 17:20

18:00

BIRKHOFF-VON NEUMANN PRIZE: Opening

Palazzo Santa Chiara, Tropea

18:30 - 18:40

BIRKHOFF-VON NEUMANN PRIZE Lecture by Jamie Vicary

Palazzo Santa Chiara, Tropea

18:40 - 19:10

The Geometry of Quantum Structures

Vicary Jamie

18:40 - 19:00

19:00

20:00

21:00

Social Dinner

22:00

Restaurant 3NODI, Tropea

21:00 - 01:00

Thu 30/6

08:00

Registration

Hotel Tropis Tropea, Calabria, Italy

08:30 - 08:59

Chair of the session: Emanuel Chetcuti

Hotel Tropis Tropea, Calabria, Italy

08:59 - 09:00

09:00

QUANTUM MODELS A' LA GABOR FOR SPACE-TIME METRIC

Jean Pierre Gazeau (Invited Speaker)






Hotel Tropis Tropea, Calabria, Italy

09:00 - 09:30

Group-Covariant Stochastic Products and Quantum Convolution Algebras

Paolo Aniello (Invited Speaker)

	<i>Hotel Tropis Tropea, Calabria, Italy</i>	09:30 - 10:00
10:00	Quantum Reference Frames	<i>Dr Leon Loveridge (invited speaker)</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	10:00 - 10:30
	Coffee Break	
	Chair of the Session: Giuseppe Sergioli	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	10:49 - 10:50
11:00	Real-Valued Observables and Quantum Uncertainty	<i>Stan Gudder</i> 
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	10:50 - 11:20
	Fuzzy Observables, Fuzzy Sets and the Universal Markov Kernell	<i>Tommaso Gentile</i> 
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:20 - 11:50
12:00	Equilateral weights on subsets of R^n	<i>Emanuel Chetcuti</i> 
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:50 - 12:20
	Lunch Break	
13:00		12:20 - 13:30
14:00	Tourist Trip to Gerace https://www.comune.gerace.rc.it/eng/	
15:00		

16:00

17:00

18:00

19:00

20:00

Gerace, Calabria, Italy

13:30 - 20:30

21:00

Apericena

22:00

23:00

Hotel Tropis Tropea, Calabria, Italy

21:30 - 23:30

Fri 1/7

08:00

Chair of the session: Soroush Rafiee Rad

Hotel Tropis Tropea, Calabria, Italy

08:59 - 09:00



09:00


Homogeneous Effect Algebras and Observables vs Spectral Resolutions

Dominik Lachman

Hotel Tropis Tropea, Calabria, Italy

09:00 - 09:30

	Isomorphisms of spectral lattices and their sublattices	<i>Martin Bohata</i> 
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	09:30 - 10:00
10:00	Quantum logics that allow for a symmetric difference (a survey)	<i>Pavel Ptak</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	10:00 - 10:30
	Notes on the quantum logics that are symmetric-difference-closed	<i>Dominika Buresova</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	10:30 - 11:00
11:00	Coffee Break	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:00 - 11:19
	Chair of the Session: Martin Bohata	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:19 - 11:20
	A characterisation of orthomodular spaces by Sasaki maps	<i>Bert Lindenhovius</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:20 - 11:50
12:00	Strong subadditivity of quantum mechanical entropy for semifinite von Neumann algebras	<i>Hanna Podsedkowska</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	11:50 - 12:20
	Quantum relative quasi-entropies in semifinite von Neumann algebras	<i>Andrzej Łuczak</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	12:20 - 12:50
13:00	Monadic adjunctions for quantum logics	<i>Gejza Jenča</i> 
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	12:50 - 13:20
14:00	Lunch Break	

15:00		13:20 - 15:09
	Chair of the Session. Anna Jencova	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	15:09 - 15:10
	Logic meets Wigner's Friend (and their Friends)	<i>Alexandru Baltag, Sonja Smets</i> 
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	15:10 - 15:40
	Linear orthosets and Hermitian spaces	<i>Thomas Vetterlein</i>
16:00	<i>Hotel Tropis Tropea, Calabria, Italy</i>	15:40 - 16:10
	On lateral completions of MV-algebras and related algebras	<i>Jan Kühr</i>
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	16:10 - 16:40
	Coffee Break	
	<i>Hotel Tropis Tropea, Calabria, Italy</i>	16:40 - 17:00

17:00

18:00

19:00

20:00

21:00

Piano Concert dedicated to the Memory of Giuliano Toraldo di Francia: Opening

Palazzo Santa Chiara, Tropea

21:30 - 22:00

22:00

Piano Concert dedicated to the Memory of Giuliano Toraldo di Francia

Palazzo Santa Chiara, Tropea

22:00 - 23:00

23:00

Sat 2/7

09:00

Music session dedicated to the Memory of Beloslav Riečan: OPENING

Palazzo Santa Chiara

09:30 - 09:40

SIMILARITIES AND RECOGNITIONS IN MUSIC. A QUANTUM SEMANTIC APPROACH

Dalla Chiara, Negri et al.



Palazzo Santa Chiara

09:40 - 10:10

10:00

Palazzo Santa Chiara

09:40 - 10:10

A conceptual parallel between XX century music and quantum theory

Tomas Veloz et al.



Palazzo Santa Chiara

10:10 - 10:40

Musical Happening

11:00

12:00

13:00

14:00

15:00

16:00

Palazzo Santa Chiara, Tropea

10:40 - 16:40