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 [Program](#)

**Full Program** | [Sunday](#) | [Monday](#) | [Tuesday](#) | [Wednesday](#) | [Thursday](#) | [Friday](#) | [Saturday](#)

Times in program corresponds to [Prague time zone](#) (UTC/GMT +2 hours).

## Sunday, 31 July 2022

**17:00 - 21:00** Registration and welcome refreshment

**Location:** **Pyramida Hotel - lobby**

## Monday, 1 August 2022

**07:50 - 8:20** **Opening address**

**Location:** **Pyramida Hotel Lecture Hall A**

*chairperson:* [Václav Špička](#)

**08:20 - 9:50** **1 session: Nonequilibrium physics and thermodynamics**

**Location:** **Pyramida Hotel Lecture Hall A**

*chairperson:* [Joachim Ankerhold](#)

08:20 - 08:50 [Maciej Andrzej Lewenstein](#)

[To thermalize or not to thermalize, that is the question](#)

08:50 - 09:20 [Jianshu Cao](#)

[Symmetry in non-equilibrium quantum processes](#)

09:20 - 09:50 [Raffaele Salvia](#), [Martí Perarnau-Llobet](#), [Géraldine Haack](#), [Nicolas Brunner](#), and [Stefan Nimmrichter](#)

[Quantum advantage in the charging of batteries by repeated interactions](#)

**09:50 - 10:10** **Coffee break**

**10:10 - 12:10** **2 session: General physics, gravitation**

**Location:** **Pyramida Hotel Lecture Hall A**

*chairperson:* [Wolfgang Schleich](#)

10:10 - 10:40 [Eve Bodnia](#), [Vlad Isenbaev](#), [Kellan Colburn](#), [Joe Swearingin](#), and [Dirk Bouwmeester](#)

[Conformal cyclic cosmology signatures and anomalies of the CMB sky](#)

10:40 - 11:10 [Petr Hořava](#)

[Non-equilibrium string theory and the Schwinger-Keldysh time contour](#)

11:10 - 11:40 [Hartmut Abele](#)

[Gravity resonance spectroscopy, and a search for Lorentz violation, beyond-Riemann and entropic gravity](#)

11:40 - 12:10 [Ron Folman](#)

[Realization of a complete Stern-Gerlach interferometer: Towards a test of quantum gravity](#)

**12:10 - 13:00** **Lunch**

**13:00 - 15:10** **3 session - A parallel: Quantum thermodynamics**

**Location:** **Pyramida Hotel Lecture Hall A**

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Venue (how to get there)
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**Detailed program**

Talks

Posters

GDPR

chairperson: [Stefan Nimmrichter](#)

- 13:00 - 13:30 [Vlatko Vedral](#) ([online](#))  
[Quantum cooling activated by coherently-controlled thermalisation](#)
- 13:30 - 14:00 [Andreas Wacker](#) ([online](#))  
[Non-resonant transitions: Insights from quantum-thermodynamics](#)
- 14:00 - 14:30 [Konstantin Dorfman](#) and [Qutubuddin Md](#) ([online](#))  
[Quantum heat engine perspective on controlling optical measurements with quantum light](#)
- 14:30 - 14:50 [David Edward Bruschi](#)  
[Quantum thermodynamics of localized relativistic quantum systems](#)
- 14:50 - 15:10 [Ilana Bogod](#) and [Saar Rahav](#)  
[Singular optimal solutions of stochastic pumps](#)
- 

**13:00 - 15:10 3 session - B parallel: Quantum transport**

**Location: Pyramida Hotel Lecture Hall B**

chairperson: [James Freericks](#)

- 13:00 - 13:30 [Meng Xu](#), [Jürgen Thomas Stockburger](#), [Malte Krug](#), and [Joachim Ankerhold](#)  
[The different guises of hierarchical equations of motion](#)
- 13:30 - 14:00 [Michael Thoss](#)  
[Simulation of quantum transport using the hierarchical equations of motion method](#)
- 14:00 - 14:30 [Doron Cohen](#)  
[Breakdown of adiabaticity in the quasi-static limit](#)
- 14:30 - 14:50 [Andre Erpenbeck](#), [Emanuel Gull](#), and [Guy Cohen](#)  
[Steady state formulation of inchworm Quantum Monte Carlo](#)
- 14:50 - 15:10 [Michael Knap](#) ([online](#))  
[Probing finite-temperature observables in quantum simulators with short-time dynamics](#)
- 

**13:00 - 15:10 3 session - C parallel: Spin dynamics**

**Location: Pyramida Hotel Lecture Hall C**

chairperson: [Branislav Nikolic](#)

- 13:00 - 13:30 [Gergely Zaránd](#), [Miklós Werner](#), [Pascu Moca](#), [Örs Legeza](#), [Balázs Dóra](#), and [Márton Kormos](#)  
[Dynamics of negative temperature hadron formation in repulsive SU\(n\) Hubbard models](#)
- 13:30 - 14:00 [Peter Schmitteckert](#)  
[Automated generation of spin-bath Hamiltonians for a wide range of interacting systems](#)
- 14:00 - 14:30 [Thore Posske](#) and [Michael Thorwart](#)  
[The power of the boundary: Creating quantum spin helices, quantum skyrmions, and measuring one-dimensional topological superconductivity without relying on Majorana modes](#)
- 14:30 - 14:50 [Aires Ferreira](#)  
[Emergent spin-orbit phenomena in designer 2D van der Waals materials](#)
- 14:50 - 15:10 [Emil Viñas Boström](#), [Angel Rubio](#), and [Claudio Verdozzi](#) ([online](#))  
[Microscopic theory of ultrafast optical skyrmion excitation in magnetic thin films](#)
- 

**15:10 - 15:30 Coffee break**

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**15:30 - 18:00 4 session: Foundations of quantum physics**

**Location: Pyramida Hotel Lecture Hall A**

chairperson: [Howard Wiseman](#)

- 15:30 - 16:00 [Ana María Cetto](#) and [Luis de la Peña](#) ([online](#))  
[The quantization of radiation: role of the vacuum field](#)
- 16:00 - 16:30 [Wolfgang Schleich](#)  
[The Riemann zeta function and quantum mechanics](#)
- 16:30 - 17:00 [Yaroslav Herasymenko](#), [Igor Gornyi](#), and [Yuval Gefen](#)  
[Passive vs. active quantum steering](#)
- 17:00 - 17:30 [Juan Ramón Muñoz de Nova](#) and [Yoav Afik](#)  
[Quantum information with top quarks at the LHC](#)
- 17:30 - 18:00 [Gregor Weihs](#), [Julian Münzberg](#), [Franz Draxl](#), [Yusuf Karli](#), [Robert Keil](#), [Christoph Dittel](#), [Gabriel Dufour](#), [Andreas Buchleitner](#), [Alexander Szameit](#), [Saimon Filipe Covre da Silva](#),

18:00 - 19:00 **Free time and transfer to Wallenstein Palace**

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19:00 - 22:00 **Welcome party**

**Location: Wallenstein Palace and its Garden**

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19:00 - 19:30 Opening

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19:30 - 22:00 Welcome party in the Wallenstein Palace Garden

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## Tuesday, 2 August 2022

07:50 - 9:50 **1 session: Physics of superfluids**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Thomas Gasenzer*

- 07:50 - 08:20 Vanderlei Salvador Bagnato  
[Production and characterization of a far from equilibrium BEC: turbulence and universality](#)
- 08:20 - 08:50 [Fernando Sols](#), Jesús Mateos, Greg Pieplow, and Charles E. Creffield  
[Superfluidity from correlations in driven boson systems](#)
- 08:50 - 09:20 Nir Navon  
[Ultracold Fermi gases in a box](#)
- 09:20 - 09:50 Frédéric Chevy  
[Fermi gases in quantum wires](#)
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09:50 - 10:10 **Coffee break**

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10:10 - 12:10 **2 session: Thermodynamics, molecular machines**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Jürgen Stockburger*

- 10:10 - 10:40 Andrew N. Jordan  
[Quantum engines based on entanglement and continuous measurement](#)
- 10:40 - 11:10 Jens Eisert  
[Quantum field thermal machines](#)
- 11:10 - 11:40 [Jennifer Koch](#), Keerthy Menon, Eloisa Cuestas, Thomas Fogarty, Sian Barbosa, Eric Lutz, Thomas Busch, and Artur Widera  
[Many-body effects in quantum engines](#)
- 11:40 - 12:10 Liliana Arrachea  
[Energy dynamics, heat production and heat-work conversion with qubits](#)
- 

12:10 - 13:00 **Lunch**

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13:00 - 15:10 **3 session - A parallel: Many body physics, quantum transport**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Gert-Ludwig Ingold*

- 13:00 - 13:30 [Sergey N. Shevchenko](#), Oleh V. Ivakhnenko, and Franco Nori ([online](#))  
[Quantum control via Landau-Zener-Stuckelberg-Majorana transitions](#)
- 13:30 - 14:00 Akimitsu Kirikoshi and [Takafumi Kita](#) ([online](#))  
[Asymmetry of critical exponents above and below second-order transitions with continuous symmetries](#)
- 14:00 - 14:30 Alexander G. Bauer, Benedikt Scharf, Laurens W. Molenkamp, Ewelina M. Hankiewicz,

and [Björn Sothmann](#)

[Quantized phase-coherent heat transport of counterpropagating Majorana modes](#)

14:30 - 14:50 [Graham Kells](#), [Dganit Meidan](#), and [Alessandro Romito](#)  
[Measurement-induced topological transition in a free fermion model](#)

14:50 - 15:10 [Llorenç Serra](#)  
[Trivial and topological confinements in bilayer graphene](#)

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**13:00 - 15:10 3 session - B parallel: Molecular junctions**

**Location: Pyramida Hotel Lecture Hall B**

*chairperson:* [Jaroslav Fabian](#)

13:00 - 13:30 [Oren Tal](#)  
[Quantum flicker noise demonstrated in molecular junctions](#)

13:30 - 14:00 [Francesco M. D. Pellegrino](#), [Giuseppe Falci](#), and [Elisabetta Paladino](#)  
[Supercurrent noise in short ballistic graphene Josephson junctions](#)

14:00 - 14:30 [Gianmichele Blasi](#), [Fabio Taddei](#), [Liliana Arrachea](#), [Matteo Carrega](#), and [Alessandro Braggio](#)  
[Nonlocal thermoelectricity in topological Josephson junctions](#)

14:30 - 14:50 [Olivier Maillet](#), [Diego Subero](#), [Dmitry Golubev](#), and [Jukka Pekola](#)  
[Anomalous photonic heat transport across a Josephson junction in a highly dissipative environment](#)

14:50 - 15:10 [Jerome Rech](#), [Giacomo Rebola](#), [Thibaut Jonckheere](#), [Dario Ferraro](#), [Benoit Grémaud](#), [Maura Sassetti](#), and [Thierry Martin](#)  
[Delta-T noise in quantum Hall junctions](#)

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**13:00 - 15:10 3 session - C parallel: Quantum transport, superconductivity**

**Location: Pyramida Hotel Lecture Hall C**

*chairperson:* [Eugene Sukhorukov](#)

13:00 - 13:30 [Vivien Perrin](#), [Marcello Civelli](#), and [Pascal Simon](#)  
[Shot noise in superconducting sub gap states](#)

13:30 - 14:00 [Christian Kohlfürst](#), [Friedemann Queisser](#), and [Ralf Schützhold](#)  
[Dynamically assisted tunneling in the impulse regime](#)

14:00 - 14:30 [Ambroise Peugeot](#), [Gerbold Ménard](#), [Iouri Moukharski](#), [Carles Altimiras](#), [Denis Vion](#), [Daniel Esteve](#), [Ciprian Padurariu](#), [Björn Kubala](#), [Joachim Ankerhold](#), and [Fabien Portier](#)  
[Entangled beams and photon multiplets from a dc-biased superconducting circuit](#)

14:30 - 14:50 [Thibaut Jonckheere](#), [Jérôme Rech](#), [Benoît Grémaud](#), and [Thierry Martin](#)  
[Anyonic statistics revealed by the Hong-Ou-Mandel dip for fractional excitations](#)

14:50 - 15:10 [Marios Kounalakis](#), [Gerrit E. W. Bauer](#), and [Yaroslav M. Blanter](#) (online)  
[Analog quantum control of magnonic cat states on-a-chip by a superconducting qubit](#)

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**15:10 - 15:30 Coffee break**

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**15:30 - 17:30 4 session - A parallel: Many body physics**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson:* [Fernando Sols](#)

15:30 - 16:00 [Stephanie M Reimann](#) (online)  
[Droplet-superfluid compounds in binary bosonic mixtures](#)

16:00 - 16:30 [Yoram Alhassid](#), [Shasta Ramachandran](#), and [Scott Jensen](#) (online)  
[Cold atomic Fermi gases in two dimensions: superfluidity and pseudogap effects in the strongly interacting regime](#)

16:30 - 17:00 [Alexandre Zagoskin](#) (online)  
[Towards qualitative theory of large quantum coherent structures](#)

17:00 - 17:30 [Radim Filip](#)  
[Quantum non-Gaussian optics and mechanics](#)

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**15:30 - 17:30 4 session - B parallel: Physics of quantum information**

**Location: Pyramida Hotel Lecture Hall B**

*chairperson:* [Giuseppe Falci](#)

15:30 - 16:00 [Erik Fitzke](#), [Maximilian Tippmann](#), and [Thomas Walther](#)

- 16:00 - 16:30 [Yasuhiro Utsumi](#), Yasuchika Ito, Dmitry Golubev, and Ferdinand Peper  
[Computation time and thermodynamic uncertainty relation of Brownian circuits](#)
- 16:30 - 17:00 Martin Ringbauer  
[Quantum computing and simulation with high-dimensional systems](#)
- 17:00 - 17:30 [Wister Wei Huang](#), Chuyao Tong, Lisa Maria Gächter, Rebekka Garreis, Annika Kurzmann, Jonas Daniel Gerber, Max Josef Ruckriegel, Benedikt Kratochwil, Folkert Kornelis de Vries, Kenji Watanabe, Takashi Taniguchi, Thomas Ihn, and Klaus Ensslin  
[Quantum information processing with graphene quantum dots](#)
- 

**15:30 - 17:30 4 session - C parallel: General physics, quantum structures**

**Location:** Pyramida Hotel Lecture Hall C

*chairperson:* [Peter Schmitteckert](#)

- 15:30 - 16:00 Joseph Maciejko ([online](#))  
[Hyperbolic band theory](#)
- 16:00 - 16:30 Rémi Lefevre, Krissia de Zawadzki, and [Grégoire Lthier](#)  
[Many body density of states of a system of spinless fermions](#)
- 16:30 - 17:00 [Parveen Kumar](#), Kyrylo Snizhko, Yuval Gefen, and Bernd Rosenow  
[Optimized steering: Quantum state engineering and exceptional points](#)
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**17:30 - 19:20 Poster session and refreshment**

**Location:** Pyramida Hotel - first floor

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**19:20 - 20:00 Free time**

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**20:00 - 22:00 Jazz concert**

**Location:** Pyramida Hotel Lecture Hall A

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## Wednesday, 3 August 2022

**07:50 - 9:50 1 session: Light - matter interactions**

**Location:** Pyramida Hotel Lecture Hall A

*chairperson:* [Yuri Rostovtsev](#)

- 07:50 - 08:20 Franco Nori ([online](#))  
[Quantum optics with giant atoms: Decoherence-free interaction between giant atoms in waveguide quantum electrodynamics.](#)
- 08:20 - 08:50 Ortwin Hess ([online](#))  
[Nanoplasmonics as enabler of room-temperature quantum nanophotonics](#)
- 08:50 - 09:20 Ruben Pompe, Matthias Hensen, Matthew Otten, Stephen K Gray, and [Walter Pfeiffer](#)  
[Emergent functionality in quantum plasmonics](#)
- 09:20 - 09:50 Norbert Kroo  
[Some applications of high field nanoplasmonics](#)
- 

**09:50 - 10:10 Coffee break**

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**10:10 - 12:10 2 session: Quantum thermodynamics**

**Location:** Pyramida Hotel Lecture Hall A

*chairperson:* [Andrew Jordan](#)

- 10:10 - 10:40 Tapio Ala-Nissilä  
[Trajectory-based approach to quantum thermodynamics for general quantum systems](#)
- 10:40 - 11:10 Gabriel Artur Weiderpass and [Amir Ordacgi Caldeira](#)  
[Von Neumann entropy and entropy production of a damped harmonic oscillator](#)
- 11:10 - 11:40 [J. Miguel Rubi](#) and Rodrigo de Miguel  
[Negative thermophoresis in the strong coupling regime](#)

12:10 - 13:00 **Lunch**

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13:00 - 14:40 **3 session - A parallel: General physics, biophysics**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Lev Mourokh*

- 13:00 - 13:30 Warwick P. Bowen, Catxere A. Casacio, Lars S. Madsen, Alex Terrasson, Muhammad Waleed, Kai Barnscheidt, Boris Hage, and Michael A. Taylor ([online](#))  
[Absolute quantum advantage in imaging: biological microscopy beyond the quantum limit](#)
- 13:30 - 14:00 Suzy Lidström and Roland E. Allen  
[Consciousness as coherent excitation of a hybrid quantum field](#)
- 14:00 - 14:20 Jiří J. Mareš, Václav Špička, and Pavel Hubík  
[On physical processes controlling biological neural networks](#)
- 14:20 - 14:40 Peter D. Keefe  
[The first order phase transition of Type I superconductors: Bardeen hysteresis explained](#)
- 

13:00 - 14:40 **3 session - B parallel: Hall effect**

**Location: Pyramida Hotel Lecture Hall B**

*chairperson: Branislav Nikolic*

- 13:00 - 13:30 Andreas Bock Michelsen, Patrik Recher, Bernd Braunecker, and Thomas L Schmidt  
[Supercurrent-enabled Andreev reflection in a chiral quantum Hall edge state](#)
- 13:30 - 14:00 Pavel Středa and Karel Výborný  
[Anomalous Hall conductivity and quantum friction](#)
- 14:00 - 14:20 David F. Mross  
[The fractional quantum Hall state at  \$\nu=5/2\$ : Recent insights from theory and experiment](#)
- 14:20 - 14:40 Jiří J. Mareš, Václav Špička, and Pavel Hubík  
[Hidden momentum and Hall effect](#)
- 

13:00 - 14:40 **3 session - C parallel: General physics**

**Location: Pyramida Hotel Lecture Hall C**

*chairperson: Shmuel Gurvitz*

- 13:00 - 13:30 Chiara Marletto, Vlatko Vedral, Laura Tamara Knoll, Fabrizio Piacentini, Ettore Bernardi, Enrico Rebufello, Alessio Avella, Marco Gramagna, Ivo Pietro Degiovanni, and Marco Genovese  
[Emergence of constructor-based irreversibility in quantum systems](#)
- 13:30 - 14:00 Ofer Biham, Ido Tishby, and Eytan Katzav  
[The life cycle of random walks on random regular graphs](#)
- 14:00 - 14:20 Eytan Katzav, Ido Tishby, Barak Budnick, and Ofer Biham  
[Convergence of contracting networks towards an asymptotic maximum-entropy structure](#)
- 14:20 - 14:40 Satoshi Ejima, Florian Lange, and Holger Fehske  
[Photoinduced pairing states in pumped excitonic insulators](#)
- 

14:40 - 15:00 **Coffee break**

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15:00 - 17:10 **4 session - A parallel: Quantum optics**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Wolfgang Schleich*

- 15:00 - 15:30 Yuri Rostovtsev  
[Room-temperature tunable masers based on the weakly aligned molecules](#)
- 15:30 - 16:00 Marlan Scully ([online](#))  
[Of Bose condensates, squeezed light and black holes](#)
- 16:00 - 16:30 Xiwen Zhang, Yuri Shvyd'ko, and Olga Kocharovskaya ([online](#))  
[Nuclear ensembles with controllable inhomogeneous broadening for nuclear quantum](#)

- 16:30 - 16:50 Jeffrey G. Lee, Matthias Zimmermann, Maxim A. Efremov, Wolfgang P. Schleich, and [Frank A. Narducci](#) (online)  
[A T-cubed atom interferometer](#)
- 16:50 - 17:10 Anil K Patnaik (online)  
[Tabletop mixed radiation source from liquid target via extreme light interactions](#)
- 

**15:00 - 17:10 4 session - B parallel: Quantum transport**

**Location:** **Pyramida Hotel Lecture Hall B**

*chairperson:* [James Freericks](#)

- 15:00 - 15:30 Riku Tuovinen  
[Time-linear non-equilibrium Green's function approach to correlated quantum transport](#)
- 15:30 - 16:00 Michael Ridley (online)  
[Quantum probability from causal structure](#)
- 16:00 - 16:30 Hao Lin, Hossein Mahzoon, Arnau Rios, and [Pawel Danielewicz](#)  
[Slabs of correlated nucleons with nonequilibrium Green's functions](#)
- 16:30 - 16:50 Michael Galperin  
[Green's function methods for single molecule junctions](#)
- 16:50 - 17:10 Ivan Rungger  
[Quantum computing algorithms for Green's functions in materials science](#)
- 

**15:00 - 17:10 4 session - C parallel: Quantum physics and gravitation**

**Location:** **Pyramida Hotel Lecture Hall C**

*chairperson:* [Dirk Bouwmeester](#)

- 15:00 - 15:30 Vasilis Fragkos, [Michael Kopp](#), and Igor Pikovski  
[Lessons on quantum gravity from gravitationally induced entanglement](#)
- 15:30 - 16:00 Roland E Allen  
[Origin of the Bekenstein-Hawking entropy, Einstein-Hilbert action, and a dark matter particle that should be detected in the next 2-5 years](#)
- 16:00 - 16:30 Giorgio Torrieri  
[The equivalence principle and inertial-gravitational decoherence](#)
- 16:30 - 16:50 Theo M. Nieuwenhuizen  
[Exact solutions for black holes with a smooth quantum core](#)
- 16:50 - 17:10 [Matthias Zimmermann](#), Freyja Ullinger, and Wolfgang P. Schleich  
[Hawking radiation, the logarithmic phase singularity, and the inverted harmonic oscillator](#)
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**17:10 - 19:00 Free time and transfer to St. Vitus Cathedral**

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**19:00 - 20:30 Concert of classical music**

**Location:** **Prague Castle - St. Vitus Cathedral and live on internet**

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## Thursday, 4 August 2022

**07:50 - 9:50 1 session: General physics, light - matter interactions**

**Location:** **Pyramida Hotel Lecture Hall A**

*chairperson:* [Elisabetta Paladino](#)

- 07:50 - 08:20 Christoph Bruder  
[Quantum synchronization](#)
- 08:20 - 08:50 Björn Kubala, Ciprian Padurariu, Ambroise Peugeot, Gerbold Menard, Denis Vion, Daniel Esteve, Fabien Portier, and [Joachim Ankerhold](#)  
[Bright sources for quantum microwaves by dc-biased superconducting circuits](#)
- 08:50 - 09:20 Vincenzo Macrì  
[Virtual and real dynamical Casimir effects in optomechanical systems](#)
- 09:20 - 09:50 [Eliahu Cohen](#) and Ismael Lucas de Paiva  
[Quantum clocks: time-energy uncertainty relations and the emergence of non-unitarity](#)
-

09:50 - 10:10 **Coffee break**

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10:10 - 12:10 **2 session: Quantum transport, spin systems**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Wolfgang Belzig*

10:10 - 10:40 Christian D. Gattli, Imen Taktak, Jayshankar Nath, Maelle Kapfer, Preden Roulleau, Matteo Acciai, Janine Splettstoesser, Ian Farrer, and David Ritchie  
[Two-particle time-domain interferometry in the fractional quantum Hall effect regime](#)

10:40 - 11:10 Jan van Ruitenbeek and Ferdinand Evers  
[On the problem of chirality-induced spin selectivity \(CISS\)](#)

11:10 - 11:40 E.K.U. Gross ([online](#))  
[Non-linear spin dynamics, the OISTR effect, and the birth of atto-magnetism](#)

11:40 - 12:10 Shmuel Gurvitz, Matteo Zendra, Luca Celardo, and Fausto Borgonovi  
[Non-standard Hubbard model and two-electron pairing](#)

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12:10 - 13:00 **Lunch**

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13:00 - 14:30 **3 session: Light - matter interactions**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Christoph Bruder*

13:00 - 13:30 Luigi Giannelli, Elisabetta Paladino, Miroslav Grajcar, George Sorin Paraoanu, and Giuseppe Falci  
[Detection of virtual photons in ultrastrongly coupled quantum systems](#)

13:30 - 14:00 Omar Di Stefano  
[Gauge principle and gauge invariance issues in the ultrastrong coupling regime](#)

14:00 - 14:30 Roberto Stassi, Mauro Cirio, Ken Funo, Neill Lambert, Jorge Puebla, and Franco Nori  
[Unveiling and veiling an entangled light-matter quantum state from the vacuum](#)

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14:30 - 14:50 **Coffee break**

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14:50 - 16:20 **4 session: Quantum optics, General physics**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Vincenzo Macri*

14:50 - 15:20 Alistair James Brash  
[Quantum optics in the solid state](#)

15:20 - 15:50 Evgenii Narimanov and Emroz Khan  
[Ghost exchange: Ferromagnetic-antiferromagnetic phase transition in linear optics of non-magnetic dielectrics](#)

15:50 - 16:20 Sai Ramakrishna and Tamar Seideman ([online](#))  
[Insights from high harmonic generation. Toy models](#)

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16:20 - 17:00 **Free time**

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17:00 - 22:00 **Evening session: Public lectures of Guy Consolmagno, Harrison Schmitt and concert**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Václav Špička*

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17:00 - 17:15 Music introduction and opening address

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17:15 - 18:30 Public lecture

17:15 - 18:15 **Guy J. Consolmagno**  
[Astronomy, God, and the Search for Elegance](#)

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18:15 - 18:30 Discussion after the lecture of Guy Consolmagno

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18:30 - 18:45 **Coffee break**

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18:45 - 20:00 Public lecture

18:45 - 19:45 **Harrison H Schmitt**  
**From Coyotes to Moonbeams**

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19:45 - 20:00 Discussion after the lecture of Harrison Schmitt

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20:00 - 20:30 **Coffee break**

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20:30 - 22:00 **Concert of classical music**

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## Friday, 5 August 2022

07:50 - 9:50 **1 session: General physics, biophysics**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Peter McClintock*

07:50 - 08:20 Cristiane de Morais Smith

[Time glasses, imaginary time crystals, and all that](#)

08:20 - 08:50 Lev Mourkh

[Physical models of mitochondrial proton-pumping complexes](#)

08:50 - 09:20 Yutaka Shikano

[Quantum computer health check via quantum random number generation](#)

09:20 - 09:50 Karl John Friston ([online](#))

[Me and my Markov blanket](#)

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09:50 - 10:10 **Coffee break**

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10:10 - 12:10 **2 session - A parallel: Quantum transport, spin dynamics**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Friedemann Queisser*

10:10 - 10:40 Artur Soriani, Pierre Nazé, Marcus V. S. Bonança, Bartłomiej Gardas, and [Sebastian Deffner](#) ([online](#))

[Assessing nonequilibrium excitations in quantum annealers](#)

10:40 - 11:10 Mohamad Niknam, Talia Lezama, David Cory, and [Lea F. Santos](#)

[Experimental detection of the correlation Renyi entropy in the central spin model](#)

11:10 - 11:40 Jaroslav Fabian

[Spintronics with van der Waals heterostructures](#)

11:40 - 12:10 Branislav Nikolic

[What is quantum spin torque: Spintronics meets nonequilibrium strongly correlated and long-range entangled quantum matter](#)

---

10:10 - 12:10 **2 session - B parallel: Foundations of quantum physics**

**Location: Pyramida Hotel Lecture Hall B**

*chairperson: Howard Wiseman*

10:10 - 10:40 Wenlei Zhang, Jacob M. Leamer, Ravi K. Saripalli, Nicholas J. Savino, Ryan T. Glasser, and [Denys I. Bondar](#) ([online](#))

[Experimental classical optical analogues of open quantum systems: Quantum discord, violation of the Leggett-Garg inequality, and decoherence enhanced tunneling](#)

10:40 - 11:10 [Georgi Gary Rozenman](#), Freyja Ullinger, Matthias Zimmermann, Maxim A. Efremov,

Wolfgang P. Schleich, Lev Shemer, and Ady Arie  
[Emulating black holes using surface gravity waves](#)

- 11:10 - 11:40 Enrico Rebufello, [Fabrizio Piacentini](#), Alessio Avella, Muriel Aparecida de Souza, Marco Gramegna, Jan Dziewior, Eliahu Cohen, Lev Vaidman, Rudi Lussana, Federica Villa, Alberto Tosi, Franco Zappa, Ivo Pietro Degiovanni, and Marco Genovese  
[Extracting \(anomalous\) weak values by detecting a single photon](#)
- 11:40 - 12:10 Ehtibar Dzhafarov  
[A general proof that context-independent mapping \(or local causality\) and free choice are equivalent](#)
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**10:10 - 12:10 2 session - C parallel: Foundations of quantum physics, transport theory**

**Location: Pyramida Hotel Lecture Hall C**

*chairperson: Jerome Rech*

- 10:10 - 10:40 John Goold  
[Taking the temperature of a pure quantum state](#)
- 10:40 - 11:10 [Jakub Spiechowicz](#) and Jerzy Łuczka  
[Arcsine law and multistable Brownian dynamics in a tilted periodic potential](#)
- 11:10 - 11:40 [Eugene Sukhorukov](#) and Florian Stabler  
[Transmission line approach to transport of heat in chiral and drift-diffusion systems with dissipation](#)
- 11:40 - 12:10 [Sungguen Ryu](#), Rosa López, Llorenç Serra, and David Sanchez  
[Photoassisted chiral transport beyond the Carnot limit](#)
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**12:10 - 13:00 Lunch**

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**13:00 - 15:00 3 session: Space exploration**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Wolfgang Schleich*

- 13:00 - 13:30 Harrison H Schmitt  
[50 Years and counting: Major science from Apollo 17 mission to Taurus-Littrow on the Moon](#)
- 13:30 - 14:00 Guy J. Consolmagno  
[What's surfacing about Bennu?](#)
- 14:00 - 14:30 Hansjörg Dittus  
[Quantum sensors - A necessity on modern spacecraft](#)
- 14:30 - 15:00 Ernst M Rasel  
[Twin lattice interferometry - a tool for gyros and gravitational-wave detection](#)
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**15:00 - 15:20 Coffee break**

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**15:20 - 16:20 4 session: Many body physics, magnetism**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Björn Sothmann*

- 15:20 - 15:50 Wolfgang Belzig  
[Quantum properties of squeezed magnons in ferro- and antiferromagnets](#)
- 15:50 - 16:20 [Thomas Vojta](#), Xuecheng Ye, and Rajesh Narayanan  
[Controlling the stripe order in a diluted frustrated magnet](#)
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**16:20 - 17:30 Free time and transfer to Strahov monastery**

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**17:30 - 23:00 Guided tour, conference dinner and concert**

**Location: Strahov Monastery**

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- 17:30 - 19:00** Guided tour through Strahov monastery
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19:00 - 19:20 Welcome

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19:20 - 20:30 First part of the conference dinner

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20:30 - 21:30 Concert of classical music in the Basilica of Assumption of Our Lady

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21:30 - 23:00 Second part of the conference dinner

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## Saturday, 6 August 2022

08:20 - 10:20 **1 session: Foundations of quantum physics**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Theo Nieuwenhuizen*

- 08:20 - 08:50 [Howard M. Wiseman](#), Eric G. Cavalcanti, and Eleanor G. Rieffel  
[Can a qubit be your friend? Why experimental metaphysics needs a quantum computer.](#)
- 08:50 - 09:20 James Freericks  
[How do we measure the momentum of a quantum particle](#)
- 09:20 - 09:50 Gerard Kennedy  
[Energetics of quantum vacuum friction](#)
- 09:50 - 10:20 [Federico Cerisola](#), Marco Berritta, Stefano Scali, Simon A.R. Horsley, James D. Cresser, and Janet Anders  
[Quantum-classical correspondence in spin-boson equilibrium states at arbitrary coupling](#)
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10:20 - 10:40 **Coffee break**

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10:40 - 12:10 **2 session: Physics of superfluids**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Ernst Rasel*

- 10:40 - 11:10 [Jeff Steinhauer](#), Murad Abuzarli, Tangui Aladjidi, Tom Bienaime, Clara Piekarski, Wei Liu, Elisabeth Giacobino, Alberto Bramati, and Quentin Glorieux ([online](#))  
[Analogue cosmological particle creation in an ultracold quantum fluid of light](#)
- 11:10 - 11:40 Philipp Heinen, Aleksandr N. Mikheev, Christian M. Schmied, Ido Siovitz, and [Thomas Gasenzer](#)  
[Instantons in far-from-equilibrium spinor gases](#)
- 11:40 - 12:10 Anthony M. Guenault, [Peter V. E. McClintock](#), Malcolm Poole, Roch Schanen, Viktor Tsepelin, Dmitri Zmeev, David Schmoranzner, and William F. Vinen  
[Quantum turbulence in superfluid He-4: creation, evolution and decay in novel geometries](#)
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12:10 - 13:00 **Lunch**

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13:00 - 15:00 **3 session: Thermodynamics and statistical physics**

**Location: Pyramida Hotel Lecture Hall A**

*chairperson: Jürgen Stockburger*

- 13:00 - 13:30 Rudolf Hilfer  
[Foundations of statistical mechanics for unstable interactions](#)
- 13:30 - 14:00 Jerzy Łuczka  
[Quantum counterpart of energy equipartition theorem - General case](#)
- 14:00 - 14:30 [Gert-Ludwig Ingold](#), Tanja Schoger, Benjamin Spreng, Paulo A. Maia Neto, and Serge Reynaud  
[Casimir interaction in colloidal and biophysical systems](#)
- 14:30 - 15:00 [Mario Arnolfo Ciampini](#) and Nikolai Kiesel  
[Spatiotemporal control of levitated nanoparticles for nonequilibrium thermodynamics](#)
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15:00 - 15:30 **Closing remarks**

**Location:** Pyramida Hotel Lecture Hall A

*chairperson:* Václav Špička

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