

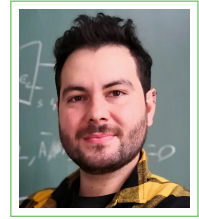
Marco Túlio Quintino

Curriculum Vitae

Associate Professor
Sorbonne Université – LIP6
Paris, France

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🌐 mtcq.github.io



Last update: October 11, 2024

Research Interests

Quantum information and quantum computation, quantum correlations, causality in quantum theory, higher-order quantum operations, Bell nonlocality, EPR steering, entanglement, measurement incompatibility, quantum discrimination tasks, and Semidefinite Programming.

Employment

- Sep 2022 – **Associate Professor (Maître de Conf.)**, Sorbonne Université, Paris, France
now Member of the [Quantum Information](#) team at [LIP6](#)
- Mar 2021 – **Postdoctoral researcher**, IQOQI Vienna, Vienna, Austria
Aug 2022 Postdoctoral Researcher at the group of [Prof. Časlav Brukner](#)
Funding: [ESQ postdoc fellowship](#)
- Jun 2020 – **Postdoctoral researcher**, University of Vienna, Vienna, Austria
Mar 2021 Postdoctoral Researcher at the group of [Prof. Časlav Brukner](#)
Funding: [Austrian Science Fund \(FWF\)](#) through the [SFB project BeyondC](#)
- Mar 2019 – **Postdoctoral researcher**, The University of Tokyo, Tokyo, Japan
May 2020 Postdoctoral Researcher at the group of [Prof. Mio Murao](#)
Funding: [Q-LEAP project of the MEXT Japan](#)
- Nov 2016 – **Postdoctoral researcher**, The University of Tokyo, Tokyo, Japan
Nov 2018 Postdoctoral Researcher at the group of [Prof. Mio Murao](#)
Funding: [JSPS postdoc fellowship](#)

Education

- Oct 2012 – **PhD in Physics**, Université de Genève, Geneva, Switzerland
Sep 2016 Thesis: [Quantum entanglement and measurement incompatibility as resources for nonlocality](#)
Defence date: 09 Sep 2016
Supervisor: [Nicolas Brunner](#)
Funding: [SNF](#), Switzerland
- Aug 2010 – **MSc in Physics**, UFMG, Belo Horizonte, Brazil
Sep 2012 Thesis: [Black box correlations: locality, noncontextuality, and convex polytopes](#)
Defence date: 12 Sep 2012
Supervisor: [Marcelo Terra Cunha](#)
co-supervisor: [Daniel Cavalcanti](#)
Funding: [CAPES](#), Brazil

Feb 2007– **BSc in Physics**, *UFMG*, Belo Horizonte, Brazil
Aug 2010 Monograph: *Não-localidade como recurso para comunicação*
Supervisor: *Marcelo Terra Cunha*
Funding: *CNPq*, Brazil

Grants and awards

2024 **Research grant**, Tremplins nouveaux entrants & nouvelles entrantes, France
2023 **Funding for PhD student**, QuantEdu France (via *PCQT*), France
2020 **Postdoc research fellowship**, *ESQ Postdoc Fellowship Program*, Austria/EU
2016 **Grant-In-Aid for Scientific Research**, *KAKENHI*, Japan
2016 **Postdoc research fellowship**, *JSPS Postdoc Fellowship*, Japan
2012 **Master's's research stipend**, *CAPES Master's's Stipend*, Brazil

Languages

Portuguese (native), English (fluent), French (fluent), Spanish (advanced), Japanese (intermediate)
Matlab (fluent), Mathematica (fluent), Julia (elementary), Python (elementary), Bash (elementary)
I use GitHub (<https://github.com/mtcq>) to share relevant computational code I develop.

Publications

Summary: 45 peer-reviewed journal publications, which include 12 Phys. Rev. Lett., 2 Nat Commun, 1 J. Math. Phys., 1 IEEE Trans. Inf. Theory, and 11 Quantum.

- More than 85 different co-authors.
- *Google Scholar* counts over 2500 citations, 7 papers with more than 100 citations, h-index of 24, and i10-index of 33 (as of October 2024).
- All my scientific papers are available at *arXiv* and at my *personal website*.
- All publications after I have moved to France may also be found at *HAL*.
- **A list with all my publications can be found at the end of this CV.**

Responsibilities

- Co-head (responsible adjoint) of the *Quantum Information master program of Sorbonne University*.

Research supervision

Worked in close relation with several students (undergrad, master, and PhD) with different backgrounds at various institutions.

- Concluded the co-supervision of 3 PhD students
- Concluded the co-supervision of 3 master's theses
- Concluded the supervision of 4 master's internship projects
- Currently co-supervising 1 PhD student

PhD co-supervision

Oct 2023 – **PhD co-supervision**, *Sorbonne Université*, Paris, France

Now Student name: Vanessa Brzić
Main supervisor: Damian Markham
Project name: Higher-Order Quantum Operations: Foundations and Applications

Sept 2020 – **PhD co-supervision**, *University of Vienna*, Vienna, Austria

Aug 2022 Student name: Martin Renner
Main supervisor: Časlav Brukner
Thesis title: Quantifying the nonlocality of two-qubit states and quantum computation with indefinite causal structures
Publications: [7, 8]
Thesis approved by the jury, PhD to be defended on the 21/11/2024

Jun 2017 – **PhD co-supervision**, *UFMG*, Belo Horizonte, Brazil

Jan 2022 Student name: Marcello Nery
Main supervisor: Reinaldo Vienna
Publications: [16]
Thesis title: Non-classical common-cause and direct-cause
PhD defended on the 21/01/2022

Jan 2018 – **PhD co-supervision**, *The University of Tokyo*, Tokyo, Japan

Dec 2020 Student name: Qingxiuxiong Dong
Main supervisor: Mio Murao
Publications: [13, 18, 21, 22]
Thesis title: Quantum algorithms for higher-order quantum transformations of universal unitary operations
PhD defended on the 02/2020

Hosting PhD secondments

Mar 2024 – **PhD secondments**, *Sorbonne Université*, Paris, France

Avr 2024 Student name: Ties Ohst
Main supervisor: Otfried Gühne
Project title: Quantum memory in causally ordered processes of universal unitary operations

Master's thesis co-supervision

Jul 2018 – **MSc co-supervisor**, *The University of Tokyo*, Tokyo, Japan

Jul 2020 Student name: Wataru Yokojima
Main supervisor: Mio Murao
Publications: [20]
Thesis title: Consequences of preserving reversibility in quantum superchannels
MsC defended on the 02/2020

Jun 2017 – **MSc co-supervisor**, *The University of Tokyo*, Tokyo, Japan

Jan 2018 Student name: Qingxiuxiong Dong
Main supervisor: Mio Murao
Publications: [26]
Thesis title: Quantum implementability of maps and supermaps
MsC defended on the 02/2018

Aug 2015 – **MSc co-supervisor**, *UFMG*, Belo Horizonte, Brazil

Aug 2016 Student name: Jessica Bavaresco

Main supervisor: Marcelo Terra Cunha

Publications: [28]

Thesis title: When Bob Cannot Trust Alice. A Semi-Device-Independent Tale of Quantum Steering

MsC defended on the 04/08/2016

Master's internship supervision

Feb 2024 – **Master's internship supervisor**, *Sorbonne Université*, Paris, France

Feb 2024 Yuki Koizumi

Project name: Equivalence between unitary estimation and deterministic port-based teleportation

Jan 2024 – **Master's internship supervisor**, *Sorbonne Université*, Paris, France

Apr 2024 Shijun Zhang

Project name: Perfect discrimination of unitary operations when k calls are available

Apr 2023 – **Master's internship supervisor**, *Sorbonne Université*, Paris, France

Jun 2023 Shijun Zhang

Project name: Perfect discrimination of unitary operations when k calls are available

Apr 2023 – **Master's internship supervisor**, *Sorbonne Université*, Paris, France

Jun 2023 Charbel Eid

Project name: Optimal discrimination between quantum measurements and instruments

Apr 2023 – **Master's internship supervisor**, *Sorbonne Université*, Paris, France

Jun 2023 Ethan Obadia

Project name: Quantum channel discrimination with partially entangled states

Participation in examination board

I was a member of the jury (and a reporter) for 4 PhD defences and 2 MSc defences.

Members of PhD jury

23 Oct 2023 **Jury of PhD Thesis defence**, *Technical University of Denmark Department of Physics*, Copenhagen, Denmark

Student name: Carles Roch i Carceller

Thesis title: Quantum state discrimination with applications in contextuality and randomness certification

Supervisor: Johnatan Bohr Brask

12 Jun 2023 **Jury of PhD Thesis defence**, *Université libre de Bruxelles*, Brussels, Belgium

Student name: Jef Pauwels

Thesis title: Entanglement and quantum communication between partially characterized devices

Supervisor: Stefano Pironio

10 Mar 2023 **Jury of PhD Thesis defence**, *UNICAMP*, Campinas, Brazil

Student name: Carlos Humberto de Souza Vieira

Thesis title: Exploring the role of entanglement in sets of behaviors from prepare-and-measure scenarios

Supervisor: Marcelo Terra Cunha

- 03 Feb 2022 **Jury of PhD Thesis defence**, *UNICAMP*, Campinas, Brazil
Student name: Roberto Dobal Baldijão
Thesis title: Quantum Darwinism And Contextuality
Supervisor: Marcelo Terra Cunha
Members of MSc jury
- 31 Jan 2024 **Jury of MSc Thesis defence**, *UNICAMP*, Campinas, Brazil
Student name: Arthur Couto Rosa Dutra de Oliveira
Thesis title: Can KS-Contextuality Hide in a Crowd? Investigating state-independent contextuality in systems with multiple observers.
Supervisor: Marcelo Terra Cunha
- 09 Apr 2021 **Jury of MSc Thesis defence**, *UNICAMP*, Campinas, Brazil
Student name: Lucas da S. Pollyceno
Thesis title: Novos critérios para o princípio da causalidade de informação
Supervisor: Marcelo Terra Cunha
Participation on a comité de suivi individuel de thèse (CSI)
- 08 Oct 2024 **External member of the jury**, *Sorbonne University*, Paris, France
Student name: Youness Ayaita
Projet de thèse: Le raisonnement ampliatif
Supervisor: Anouk Barberousse
- 08 Jul 2024 **External member of the jury**, *Université Grenoble Alpes*, Grenoble, France
Student name: Pierre Pocreau
Projet de thèse: Implications of causal indefiniteness for quantum communication
Supervisor: Mehdi Mhalla
Co-Supervisor: Alastair Abbott
- 01 Jul 2024 **External member of the jury**, *Université Paris-Saclay Alpes*, Palaiseau, France
Student name: Octave Mestoudjian
Projet de thèse: Sous-systèmes généralisés en informatique quantique
Supervisor: Pablo Arrighi
Co-Supervisor: Augustin Vanrietvelde
- 21 Jun 2023 **External member of the jury**, *Université Grenoble Alpes*, Grenoble, France
Student name: Pierre Pocreau
Projet de thèse: Implications of causal indefiniteness for quantum communication
Supervisor: Mehdi Mhalla
Co-Supervisor: Alastair Abbott

Teaching summary

A detailed list of my teaching experience is presented at the end of this CV.

- More than 80h of course teaching
- More than 280h of tutorials
- Responsible for creating/reformulating the courses “Quantum Circuit and Logic Gates” and “QIIntro” from the [Quantum Information master program of Sorbonne University](#).

Brief description of recent teaching

Undergraduate level in computer science at Sorbonne Université:

- Mathématiques Discrètes (TD/TP, 2x)
- Introduction à la calculabilité et à la décidabilité (TD/TP 2x)

Master level in the quantum information master at Sorbonne Université:

- Quantum circuits and logic gates (Cours et TD, 2x)
- QIIntro (Cours et TD 1x)
- Quantum kinematics for CS (TD 1x)
- Théorie de Shannon classique et quantique (Cours et TD 2x)

Master level (outside of the quantum domain) at Sorbonne Université

- Analyse d'algorithmes et génération aléatoire (TD/TP, 1x)

Outreach and dissemination

During my JSPS postdoc in Japan, I have joined the **JSPS Science Dialogue Program**, a project where I presented my research in an accessible way to Japanese high-school students. I am also interested in popular science events.

- 21 Sep 2018 **JSPS Science Dialogue**, Nagano prefecture Suwa-Seiryō High School, Japan
What do you mean by random? Randomness, Quantum Mechanics, and Bell Non-locality
- 05 Dec 2017 **JSPS Science Dialogue**, Ibaraki prefecture Takezono High School, Japan
What do you mean by random? Randomness, Quantum Mechanics, and Bell Non-locality
- 07 Jan 2013 **Science Slam Berlin**, SO36, Berlin, Germany
Does God play dice? Genuine randomness in nature

Reviewing activities

Referee for the journals: Quantum, PRL, PRX, PRX Quantum, PRA, PRRResearch, J. Math. Phys, NJP, J. Phys. A, npj Quantum Information, Optica.

I have also refereed submissions for conferences such as QIP, TQC, and AQIS.

Scientific Conferences

- Organised 1 workshop
- Member of the program committee of 4 conferences
- Invited to present a talk in 5 conferences
- Talk accepted in 20 conferences
- Poster accepted in 15 conferences

Organisation

- Dec 2023 **Japanese-French Quantum Information 2023 Workshop**, Tokyo, Japan

Program Committee

- Sep 2024 **Causalworlds**, Waterloo, Canada
- Sep 2024 **AQIS24 Sapporo**, Sapporo, Japan
- Sep 2019 **YQIS2019**, Gdansk/Sopot, Poland
- Sep 2018 **YQIS2018**, Vienna, Austria

Invited Talk

- Apr 2022 **Tsirelson Memorial Workshop**, Vienna, Austria
Talk: Measurement incompatibility and Bell nonlocality: from 1985 to 2022

- Mar 2020 **The Order of Things (TOOT)**, Obergurgl, Austria
Conference cancelled due to COVID19 pandemic
- Jan 2020 **Quantum Information Structure of Spacetime (QISS) 2020**, Hong Kong
Talk: Reversing unknown quantum transformations: A universal quantum circuit for inverting general unitary operations
- Nov 2018 **Quantum Maiwar**, Brisbane, Australia
Talk: Semi-device-independent certification of indefinite causal order
- Oct 2017 **FQXi Workshop: Quantum Incompatibility**, Laach Lake, Germany
Talk: Genuine n-wise Measurement Incompatibility and Device Independent Certificates of Incompatibility
- Accepted Talks
- Aug 2023 **Asian Quantum Information Science 2024 (AQIS24)**, Sapporo, Japan
Talk: Simulating the quantum switch using causally ordered circuits requires at least an exponential overhead in query complexity
(presented by Satoshi Yoshida)
- Aug 2023 **Asian Quantum Information Science 2023 (AQIS2023)**, Seoul, South Korea
Talk: Simulating qubit correlations with classical communication
- Fev 2023 **Quantum Information Processing 2023 (QIP2023)**, Ghent, Belgium
Talk: Simulating qubit correlations with classical communication
(presented by Martin J. Renner)
- Sep 2021 **SFB BeyondC Autumn Workshop 2021**, Innsbruck, Austria
Talk: Universal protocols for transforming unitary quantum operations
- Jun 2021 **Quantum Physics and Logic 2021 (QPL2021)**, Gdańsk (Online), Poland
Talk: Success-or-draw: A strategy allowing repeat-until-success in quantum computation
- Jan 2020 **Quantum Information Processing 2020 (QIP2020)**, Shenzhen, China
Talk: Adaptive circuits exponentially outperforms parallel ones for universal unitary inversion
- Aug 2019 **Asian Quantum Information Science 2019 (AQIS2019)**, Seoul, South Korea
Talk: Semi-device-independent certification of indefinite causal order
- Sep 2018 **post AQIS18**, Nagoya, Japan
Talk: Reversing unknown quantum transformations
- Sep 2018 **Asian Quantum Information Science 2018 (AQIS2018)**, Nagoya, Japan
Talk: Reversing unknown quantum transformations
- Jul 2018 **Modern Topics in Quantum Information**, Natal, Brazil
Talk: Reversing unknown quantum transformations
- May 2017 **36th Quantum Information Technology Symposium (QIT36)**, Kyoto, Japan
Talk: Super-activation of quantum steering
- Mar 2016 **Quantum Networks (FQXi)**, Barcelona, Spain
Talk: Entangled States With Local Hidden Variable Model For Sequential Measurements
- Dec 2015 **Quantum Correlations, Contextuality and All That... Again**, Natal, Brazil
Talk: Algorithmic construction of local hidden variable models for entangled quantum states
- Aug 2015 **V Quantum Information School and Workshop**, Paraty, Brazil
Talk: Joint measurability, EPR steering, and Bell nonlocality

- Aug 2014 **Asian Quantum Information Science 2014 (AQIS2014)**, Kyoto, Japan
Talk: Joint measurability, EPR steering, and Bell nonlocality
- Dec 2013 **Quantum Correlations, Contextuality and All That**, Natal, Brazil
Talk: Measurement Incompatibility in Quantum Mechanics
- Aug 2013 **IV Quantum Information School and Workshop**, Paraty, Brazil
Talk: Genuine Hidden Quantum Nonlocality
- Jun 2012 **Workshop on Quantum Correlations**, Natal, Brazil
Talk: All noncontextuality inequalities for the n-cycle scenario
- Dez 2011 **III Encontro temático do INCT-IQ**, Natal, Brazil
Talk: From the detection loophole to the transmission loophole
- Aug 2011 **III Quantum Information School and Workshop**, Paraty, Brazil
Talk: Maximal CHSH violations with low efficiency photodetection and homodyne measurements
Poster presentation
- Sep 2021 **Time in quantum theory, ETH workshop**, Zurich (online), Switzerland
Poster: Universal quantum circuits for transforming unitary operations: exponential advantages with causality adaptive strategies and the power of indefinite causality
- Sep 2021 **Vienna Quantum Foundations Conference (VQF-CON 2021)**, Vienna, Austria
Poster: Universal quantum circuits for transforming unitary operations: exponential advantages with causality adaptive strategies and the power of indefinite causality
- Jun 2020 **Theory of Quantum Computation, Communication and Cryptography 2020 (TQC2020)**, Riga (online), Latvia
Poster: Adaptive circuits exponentially outperforms parallel ones for universal unitary inversion
- Dec 2019 **Topical Conference on Quantum Communication and Security 2019 (TCQC2019)**, Kyoto, Japan
Poster: Reversing unknown quantum transformations: A universal quantum circuit for inverting general unitary operations
- Aug 2019 **Asian Quantum Information Science 2019 (AQIS2019)**, Seoul, South Korea
Poster: Distributed sampling, quantum communication witnesses, and measurement incompatibility
- Apr 2018 **International Conference on challenges in Quantum Information Science (CQIS18)**, Tokyo, Japan
Poster: The Cost of Implementing Non-Completely Positive Linear Maps
- Jan 2014 **Quantum Information Processing 2014 (QIP2014)**, Barcelona, Spain
Poster: Genuine Hidden Quantum Nonlocality
- Aug 2013 **IV Quantum Information School and Workshop**, Paraty, Brazil
Poster: Realistic loophole-free Bell test with atom-photon entanglement
- Jan 2013 **Quantum Information Processing 2013 (QIP2013)**, Beijing, China
Poster: Towards a loophole-free Bell test with continuous variables systems
- May 2012 **TQC2012**, Tokyo, Japan
Poster: Perfect homodyne measurements implies CHSH violation with arbitrarily low photodetection efficiency

- Nov 2010 **XIX Semana da Iniciação Científica**, UFMG, Belo Horizonte, Brazil
Poster: Jogo do Quadrado Mágico; Pseudotelepatia Quântica
- Nov 2010 **V Simpósio Nacional / Jornadas de Iniciação Científica**, IMPA, RJ, Brazil
Poster: Não-localidade como recurso para comunicação
- Oct 2010 **WECIQ2010**, Petrópolis, Brazil
Poster: Jogo do Quadrado Mágico; Pseudotelepatia Quântica
- Oct 2009 **XVIII Semana da Iniciação Científica**, UFMG, Belo Horizonte, Brazil
Poster: Algoritmo de Grover – Selected to the top 8%
- Oct 2008 **XVII Semana da Iniciação Científica**, UFMG, Belo Horizonte, Brazil
Poster: Números Inteiros e Criptografia RSA

Participation

- Avr 2024 **QFoundations of Quantum Physics beyond Bell: Celebrating 60 years of Bell's theorem**, Les Diablerets, Switzerland
- Jun 2019 **Quantum Information (Benasque)**, Benasque, Spain
Workshop without formal talks
- Jun 2017 **Quantum Information (Benasque)**, Benasque, Spain
Workshop without formal talks
- Jun 2015 **Quantum Information (Benasque)**, Benasque, Spain
Workshop without formal talks
- Aug 2015 **V Quantum Information School and Workshop**, Paraty, Brazil
- Sep 2015 **Gisin's 60th birthday workshop**, Riederalp, Switzerland
- Jun 2013 **Quantum Information (Benasque)**, Benasque, Spain
Workshop without formal talks
- Aug 2013 **IV Quantum Information School**, Paraty, Brazil
- Jul 2012 **62nd Lindau Nobel Laureate Meeting dedicated to Physics**, Lindau, Germany
- Aug 2011 **III Quantum Information School and Workshop**, Paraty, Brazil
- Jul 2011 **28o Colóquio Brasileiro de Matemática**, IMPA, Rio de Janeiro, Brazil
- Aug 2010 **XIV Escola Brasileira de Probabilidade**, Búzios, Brazil
- Jul 2010 **Clay Mathematics Institute 2010 Summer School**, *Probability and Statistical Physics in Two and more Dimensions*, Búzios, Brazil

Academic visit seminars

- 08 Jul 2024 **Université Grenoble Alpes**, Grenoble, France
Talk: All incompatible measurements on qubits lead to multiparticle Bell nonlocality
Host: Alastair Abbott
- 25 Jun 2024 **University of Pisa**, Pisa, Italy
Talk: The relationship between measurement incompatibility and Bell nonlocality
Host: Costantino Budroni
- 24 Oct 2023 **Technical University of Denmark, QPIT**, Copenhagen, Denmark
Talk: Transforming and discriminating quantum operations using higher-order methods
Host: Johnatan Bohr Brask

- 16 Mar 2023 **Les Atelier du LKB, Laboratoire Kastler Brossel**, Paris, France
Talk: Parallel, sequential, and non-causal strategies for transforming unitary operations and discriminating quantum channel via a higher-order approach.
Host: Nancy Paul
- 10 Dec 2021 **University of Gdańsk**, Gdańsk, Poland
Talk: Transforming unitary operations via quantum circuits: Universal unitary inversion, transposition, and complex conjugation
Host: Michał Studziński
- 18 Mar 2021 **Quantin research group**, Warsaw (online), Poland
Talk: Universal protocols for transforming unitary quantum operations
Host: Michał Oszmaniec
- 05 Feb 2021 **Technical University of Denmark**, Copenhagen (online), Denmark
Talk: Reversing unknown quantum transformations: A universal protocol for inverting general unitary operations
Host: Jonatan Bohr Brask
- 10 Jul 2019 **Universitat Autònoma de Barcelona**, Barcelona, Spain
Talk: Reversing unknown quantum transformations: A universal protocol for inverting general unitary operations
Host: Andreas Winter
- 14 Feb 2019 **ICFO**, Barcelona, Spain
Talk: Reversing unknown quantum transformations: A universal protocol for inverting general unitary operations
Host: Antonio Ácin
- 12 Feb 2019 **GAP**, Geneva, Switzerland
Talk: Reversing unknown quantum transformations: A universal protocol for inverting general unitary operations
Host: Nicolas Brunner
- 24 Jan 2019 **IQOQI Vienna**, Vienna, Austria
Talk: Reversing unknown quantum transformations: A universal protocol for inverting general unitary operations
Host: Marcus Huber
- 16 Dec 2016 **The University of Tokyo**, Tokyo, Japan
Talk: Super-Activation of Quantum Steering
Host: Mio Murao
- 18 Nov 2016 **UFMG**, Belo Horizonte, Brazil
Talk: Super-Activation of Quantum Steering
Host: Marcelo Terra Cunha
- 18 Nov 2015 **University of Siegen**, Siegen, Germany
Talk: Inequivalence of Entanglement, Steering, and Bell Nonlocality For General Measurements
Host: Otfried Gühne
- 18 Aug 2015 **UFMG**, Belo Horizonte, Brazil
Talk: Inequivalence of Entanglement, Steering, and Bell Nonlocality For General Measurements
Host: Marcelo Terra Cunha

- 31 Jul 2015 **UFMG**, BH, Brazil
Talk: Joint Measurability, EPR Steering, and Bell Nonlocality
Host: Marcelo Terra Cunha
- 15 Jun 2015 **Waseda University**, Tokyo, Japan
Talk: Joint Measurability, EPR Steering, and Bell Nonlocality
Host: Kazuya Yuasa
- 26 May 2015 **PI**, Waterloo, Canada
Talk: Joint Measurability, EPR Steering, and Bell Nonlocality
Host: Matthew Pusey
- 09 Oct 2014 **ICFO**, Barcelona, Spain
Talk: Joint Measurability, EPR Steering, and Bell Nonlocality
Host: Antonio Ácin
- 05 Sep 2014 **KCIK**, Gdansk, Poland
Talk: Joint Measurability, EPR Steering, and Bell Nonlocality
Host: Michał Horodecki
- 25 Aug 2014 **The University of Tokyo**, Tokyo, Japan
Talk: Joint Measurability, EPR Steering, and Bell Nonlocality
Host: Mio Murao
- 03 Dec 2013 **UFMG**, Belo Horizonte, Brazil
Genuine Hidden Quantum Nonlocality
Host: Marcelo Terra Cunha
- 19 Jul 2012 **KCIK**, Gdansk, Poland
Talk: Characterization of the n-Cycle Noncontextual Polytope
Host: Michał Horodecki
- 11 Jul 2012 **ICFO**, Barcelona, Spain
Talk: Characterization of the n-Cycle Noncontextual Polytope
Host: Antonio Ácin

List of publications

Peer-reviewed publications

- [1] L. Villegas-Aguilar, E. Polino, F. Ghafari, M. T. Quintino, K. T. Laverick, I. R. Berkman, S. Rogge, L. K. Shalm, N. Tischler, E. G. Cavalcanti, S. Slussarenko, and G. J. Pryde. "Nonlocality activation in a photonic quantum network". *Nature Communications* **15**, 3112 3112 (2024).
- [2] P. Taranto, M. T. Quintino, M. Murao, and S. Milz. "Characterising the Hierarchy of Multi-time Quantum Processes with Classical Memory". *Quantum* **8** 1328 (2024).
- [3] M. Antesberger, M.T. Quintino, P. Walther, and L. A. Rozema. "Higher-Order Process Matrix Tomography of a Passively-Stable Quantum Switch". *PRX Quantum* **5**, 010325 010325 (2024).
- [4] S. Milz and M.T. Quintino. "Characterising transformations between quantum objects, 'completeness' of quantum properties, and transformations without a fixed causal order". *Quantum* **8** 1415 (2024).

- [5] T. Strömberg, P. Schiansky, R.W. Peterson, M.T. Quintino, and P. Walther. “Demonstration of a quantum SWITCH in a Sagnac configuration”. *Phys. Rev. Lett.* **131** 060803 (2023).
- [6] T. Strömberg, P. Schiansky, M.T. Quintino, M. Antesberger, L. A. Rozema, I. Agresti, Č. Brukner, and P. Walther. “Experimental superposition of a quantum evolution with its time reverse”. *Phys. Rev. Research* **6**, 023071 023071 (2024).
- [7] M.J. Renner and M.T. Quintino. “The minimal communication cost for simulating entangled qubits”. *Quantum* **7** 1149 (2023).
- [8] M.J. Renner, A. Tavakoli, and M.T. Quintino. “The classical cost of transmitting a qubit”. *Phys. Rev. Lett.* **130** 120801 (2023).
- [9] D. Ebler, M. Horodecki, M. Marciniak, T. Młynik, M.T. Quintino, and M. Studziński. “Optimal universal quantum circuits for unitary complex conjugation”. *IEEE Transactions on Information Theory* **69** 5069–5082 (2023).
- [10] E.-C. Boghiu, F. Hirsch, P.-S. Lin, M.T. Quintino, and J. Bowles. “Device-independent and semi-device-independent entanglement certification in broadcast Bell scenarios”. *SciPost Phys. Core* **6** 028 (2023).
- [11] M.T. Quintino and D. Ebler. “Deterministic transformations between unitary operations: Exponential advantage with adaptive quantum circuits and the power of indefinite causality”. *Quantum* **6** 679 (2022).
- [12] H.-Y. Ku, J. Kadlec, A. Cernoch, M.T. Quintino, W. Zhou, K. Lemr, N. Lambert, A. Miranowicz, S.-L. Chen, F. Nori, and Y.-N. Chen. “Quantifying Quantumness of Channels Without Entanglement”. *PRX Quantum* **3** 020338 (2022).
- [13] Qingxiuxiong Dong, Marco Túlio Quintino, Akihito Soeda, and Mio Murao. “The quantum switch is uniquely defined by its action on unitary operations”. *Quantum* **7** 1169 (2023).
- [14] J. Bavaresco, M. Murao, and M.T. Quintino. “Unitary channel discrimination beyond group structures: Advantages of sequential and indefinite-causal-order strategies”. *J. Math. Phys.* **63** 042203 (2022).
- [15] A. Sohbi, D. Markham, J. Kim, and M.T. Quintino. “Certifying dimension of quantum systems by sequential projective measurements”. *Quantum* **5** 472 (2021).
- [16] M. Nery, M.T. Quintino, P. A. Guérin, T. O. Maciel, and R. O. Vianna. “Simple and maximally robust processes with no classical common-cause or direct-cause explanation”. *Quantum* **5** 538 (2021).
- [17] J. Bavaresco, M. Murao, and M.T. Quintino. “Strict Hierarchy between Parallel, Sequential, and Indefinite-Causal-Order Strategies for Channel Discrimination”. *Phys. Rev. Lett.* **127** 200504 (2021).
- [18] Q. Dong, M.T. Quintino, A. Soeda, and M. Murao. “Success-or-Draw: A Strategy Allowing Repeat-Until-Success in Quantum Computation”. *Phys. Rev. Lett.* **126** 150504 (2021).
- [19] M. Araújo, F. Hirsch, and M.T. Quintino. “Bell nonlocality with a single shot”. *Quantum* **4** 353 (2020).
- [20] W. Yokojima, M.T. Quintino, A. Soeda, and M. Murao. “Consequences of preserving reversibility in quantum superchannels”. *Quantum* **5** 441 (2021).
- [21] M.T. Quintino, Q. Dong, A. Shimbo, A. Soeda, and M. Murao. “Probabilistic exact universal quantum circuits for transforming unitary operations”. *Phys. Rev. A* **100** 062339 (2019).

- [22] M.T. Quintino, Q. Dong, A. Shimbo, A. Soeda, and M. Murao. “Reversing Unknown Quantum Transformations: Universal Quantum Circuit for Inverting General Unitary Operations”. *Phys. Rev. Lett.* **123** 210502 (2019).
- [23] M.T. Quintino, C. Budroni, E. Woodhead, A. Cabello, and D. Cavalcanti. “Device-Independent Tests of Structures of Measurement Incompatibility”. *Phys. Rev. Lett.* **123** 180401 (2019).
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Teaching details

- 2024/2 **Lecture (4h), Tutorial (2h)**, *Sorbonne Université, Master's d'Informatique - Information Quantique (IQ)*, M2, Paris, France
MU5PYQ03 - QIT: Quantum Information Theory
- 2024/2 **Lecture (10h), Tutorial (8h)**, *Sorbonne Université, Master's d'Informatique - Information Quantique (IQ)*, M1, Paris, France
MU4INQ05 - Quantum circuits and logic gates
- 2024/2 **Tutorial (38.5h)**, *Sorbonne Université, Lincese d'Informatique*, L2, Paris, France
LU2IN005 - Mathématiques Discrètes
- 2024/1 **Lecture (2h)**, *4EU+ European University Alliance*, University of Copenhagen (online), Denmark
4EU+: Quantum Information and Quantum Many-Body Theory
- 2024/1 **Lecture (10h), Tutorial (6h)**, *Sorbonne Université, Master's d'Informatique - Information Quantique (IQ)*, M1, Paris, France
MU4INQ51 - QIIntro
- 2024/1 **Lecture (18h), Tutorial (6h)**, *Sorbonne Université, Master's Sciences, Technologies, Santé, M1.*, Paris, France
MU4PY223 - Théorie de Shannon classique et quantique
- 2024/1 **Tutorial (36.5h)**, *Sorbonne Université, Lincese d'Informatique*, L3, Paris, France
LU3IN030 - Introduction à la calculabilité et à la décidabilité
- 2023/2 **Lecture (4h), Tutorial (2h)**, *Sorbonne Université, Master's d'Informatique - Information Quantique (IQ)*, M2, Paris, France
MU5PYQ03 - QIT: Quantum Information Theory
- 2023/2 **Lecture (10h, Tutorial (6h))**, *Sorbonne Université, Master's d'Informatique - Information Quantique (IQ)*, M1, Paris, France
MU4INQ05 - Quantum circuits and logic gates
- 2023/2 **Tutorial (38.5h)**, *Sorbonne Université, Lincese d'Informatique*, L2, Paris, France
LU2IN005 - Mathématiques Discrètes
- 2023/1 **Lecture (15h), Tutorial (15h)**, *Sorbonne Université, Master's Sciences, Technologies, Santé, M1.*, Paris, France
MU4PY223 - Théorie de Shannon classique et quantique
- 2023/1 **Tutorial (36.5h)**, *Sorbonne Université, Lincese d'Informatique*, L3, Paris, France
LU3IN030 - Introduction à la calculabilité et à la décidabilité
- 2022/2 **Tutorial (36.5h)**, *Sorbonne Université, Lincese d'Informatique*, L2, Paris, France
LU2IN005 - Mathématiques Discrètes

- 2022/2 **Lecture (2h), Tutorial (16h)**, *Sorbonne Université, Master's d'Informatique - Information Quantique (IQ)*, M1., Paris, France
MU4INQ01 - Quantum kinematics for computer scientists
- 2022/2 **Tutorial (14h)**, *Sorbonne Université, Master's d'Informatique - Parcours Science et Technologie du Logiciel (STL)*, M2, Paris, France
MU5IN550 - Analyse d'algorithmes et génération aléatoire
- 2022/2 **Lecture (6h), Tutorial (4h)**, *Sorbonne Université, Master's d'Informatique - Information Quantique (IQ)*, M2, Paris, France
MU5PYQ03 - QIT: Quantum Information Theory
- 2021 **One lecture**, *Semana da Física 2021 – UNESP*, Caratinguetá (online), Brazil
Não-localidade de Bell: como o indeterminismo quântico permite correlações supra-clássicas
- 2019 **One lecture**, *The University of Tokyo*, Tokyo, Japan
What do you mean by random? Randomness, Quantum Mechanics, and Bell Non-locality – Undergraduate course in quantum technology
- 2016/1 **Teaching Assistant**, *Université de Genève*, Geneva, Switzerland
Quantum Information Theory – Master's Course
- 2015/2 **Teaching Assistant**, *Université de Genève*, Geneva, Switzerland
Méthodes mathématiques pour physiciens I – Undergraduate Course
- 2015/1 **Teaching Assistant**, *Université de Genève*, Geneva, Switzerland
Quantum Information Theory – Master's Course
- 2014/1 **Teaching Assistant**, *Université de Genève*, Geneva, Switzerland
Quantum Information Theory – Master's Course
- 2013/1 **Teaching Assistant**, *Université de Genève*, Geneva, Switzerland
Quantum Information Theory – Master's Course
- 2011/1 **Teaching Assistant**, *IMPA*, Rio de Janeiro, Brazil
Mecânica quântica para matemáticos em formação – 28o Colóquio Brasileiro de Matemática
- 2011 **One lecture**, *UFMG*, Belo Horizonte, Brazil
Comunicação via qubits – XXII Escola de Inverno
- 2010 **One lecture**, *UFMG*, Belo Horizonte, Brazil
Desigualdades de Bell, uma introdução a não-localidade quântica – Quantum Mechanics Graduate Course
- 2010 **One lecture**, *UFMG*, Belo Horizonte, Brazil
Desigualdades de Bell, uma introdução a não-localidade quântica – Quantum Mechanics Graduate Course