

# CURRICULUM VITAE

PETER J. BROWN

## PERSONAL INFORMATION

---

EMAIL: [firstname.lastname@telecom-paris.fr](mailto:firstname.lastname@telecom-paris.fr)  
SCHOLAR: [Publications/preprints](#)  
ORCID ID: [0000-0001-9593-0136](#)  
GITHUB: [peterjbrown519](#)  
WEBSITE: [peterjbrown519.github.io](#)

## RESEARCH POSITIONS

---

DEC. 2021 - PRESENT Associate Professor, IQA group - Télécom Paris, France.  
DEC. 2019 - DEC. 2021 Postdoctoral researcher, ENS de Lyon, France.  
Supervisor: Prof. Omar Fawzi.  
MAY 2019 - NOV. 2019 Research Associate in Quantum Information Theory, University of York, UK.  
Supervisor: Dr. Roger Colbeck.

## EDUCATION

---

OCT. 2015 - MAY 2019 PhD in MATHEMATICS, University of York, UK.  
Thesis title: On constructions of quantum-secure device-independent randomness expansion protocols.  
Supervisor: Dr. Roger Colbeck.  
OCT. 2011 - JULY 2015 MMath degree in MATHEMATICS, University of York, UK.  
Thesis title: Negative energy densities in quantum field theory  
Supervisor: Prof. Christopher Fewster.  
Award: First Class  
SEP. 2009 - AUG. 2011 A-Levels, Sunderland College, UK.  
Subjects: Mathematics, Further Mathematics, Biology.  
Grades: A\*, A, A.

## PUBLICATIONS AND PREPRINTS

---

- P. Brown, H. Fawzi and O. Fawzi, DEVICE-INDEPENDENT LOWER BOUNDS ON THE CONDITIONAL VON NEUMANN ENTROPY. (2021) ([arXiv](#))
- W-Z. Liu, M-H. Li, S. Ragy, S-R. Zhao, B. Bai, Y. Liu, P. Brown, J. Zhang, R. Colbeck, J. Fan, Q. Zhang and J-W. Pan, DEVICE-INDEPENDENT RANDOMNESS EXPANSION AGAINST QUANTUM SIDE INFORMATION. Nature Physics 17.4 (2021) ([Journal](#) / [arXiv](#))
- A. Denys, P. Brown and A. Leverrier, EXPLICIT ASYMPTOTIC SECRET KEY RATE OF CONTINUOUS-VARIABLE QUANTUM KEY DISTRIBUTION WITH AN ARBITRARY MODULATION. (2021) ([arXiv](#))
- P. Brown, H. Fawzi and O. Fawzi, COMPUTING CONDITIONAL ENTROPIES FOR QUANTUM CORRELATIONS. Nature communications 12.1 (2021) ([Journal](#) / [arXiv](#))
- P.J. Brown and R. Colbeck, ARBITRARILY MANY INDEPENDENT OBSERVERS CAN SHARE THE NON-LOCALITY OF A SINGLE MAXIMALLY ENTANGLED QUBIT PAIR. Physical Review Letters 125.9 (2020) ([Journal](#) / [arXiv](#))
- P.J. Brown, S. Ragy and R. Colbeck, A FRAMEWORK FOR QUANTUM-SECURE DEVICE-INDEPENDENT RANDOMNESS EXPANSION. IEEE Transactions on Information Theory, 66.5 (2020) ([Journal](#) / [arXiv](#))

- P.J. Brown, C.J. Fewster and EA. Kontou, CLASSICAL AND QUANTUM STRONG ENERGY INEQUALITIES AND THE HAWKING SINGULARITY THEOREM. To appear in 15th Marcel Grossmann conference proceedings (2019). (arXiv)
- P.J. Brown, C.J. Fewster and EA. Kontou, A SINGULARITY THEOREM FOR EINSTEIN-KLEIN-GORDON THEORY. Gen Relativ Gravit (2018) 50: 121. (Journal / arXiv)

## TALKS AND SEMINARS

---

### INVITED TALKS AND SEMINARS:

- AUG. 2021 – eDICT workshop on device-independent cryptography – ETH Zurich  
Title: Computing rates of device-independent protocols
- OCT. 2020 – Düsseldorf Quantum Info online Seminars – Heinrich Heine University Düsseldorf  
Title: Computing rates of device-independent protocols

### CONTRIBUTED TALKS:

- APR. 2022 – 2SQRT2 TSIRELSON MEMORIAL WORKSHOP – IQOQI Vienna, Austria  
Title: Variational bounds on the relative entropy and their applications
- MAR. 2022 – QIP 2022 – Caltech, USA  
Title: Variational bounds on the relative entropy and their applications
- SEP. 2021 – BEYOND IID 9 (Online)  
Title: Device-independent lower bounds on the conditional von Neumann entropy
- AUG. 2021 – QCRYPT 2021 (Online)  
Title: Device-independent lower bounds on the conditional von Neumann entropy
- FEB. 2021 – QUANTUM INFORMATION DAYS 2020 (Online)  
Title: An unbounded number of independent observers can share the nonlocality of one half of a maximally entangled qubit pair
- JAN. 2021 – QIP 2021 (Online / Plenary talk)  
Title: New quantum Rényi divergences and their application to device-independent cryptography and quantum Shannon theory
- NOV. 2020 – Q-TURN 2020 (Online)  
Title: An unbounded number of independent observers can share the nonlocality of a single maximally entangled qubit pair
- JAN. 2019 – Northern Quantum Meeting IV – University of Leeds, UK  
Title: A framework for device-independent randomness expansion
- NOV. 2018 – Q-TURN – Universidade Federal de Santa Catarina, Brazil  
Title: A framework for device-independent randomness expansion
- JULY 2018 – QUANTUM ROUNDABOUT – University of Nottingham, UK  
Title: A framework for device-independent randomness expansion

## POSTER PRESENTATIONS:

- JUN. 2019 – SWISSMAP WORKSHOP - MATHEMATICAL PHYSICS MEETS QUANTUM INFORMATION  
Title: A framework for device-independent randomness expansion
- AUG. 2018 – QCRYPT 2018 – University of Science and Technology of China  
Title: A framework for device-independent randomness expansion
- AUG. 2018 – QuICC 2018 – University of York, UK  
Title: A framework for device-independent randomness expansion
- APR. 2018 – QCALL Secure Quantum Communications school – Universidad de Vigo, Spain  
Title: A framework for device-independent randomness expansion

## TEACHING EXPERIENCE

---

### SEMINARS

- 2019 – ALGEBRA undergraduate seminars (16 hours).
- CALCULUS undergraduate seminars (16 hours).
- 2018 – ALGEBRA undergraduate seminars (16 hours).
- APPLIED PROBABILITY undergraduate seminars (12 hours).
- CALCULUS undergraduate seminars - (16 hours).
- 2017 – APPLIED PROBABILITY undergraduate seminars (8 hours).
- GROUPS, RINGS AND FIELDS undergraduate seminars (8 hours).
- 2016 – CRYPTOGRAPHY undergraduate seminars (16 hours).

### STUDENT SUPERVISION

- APR. 2021 - JULY 2021      Mohamed Bassiouny (Master's internship)
- APR. 2020 - AUG. 2020      Uta Meyer (Master's internship / co-supervised with Omar Fawzi)

## ACADEMIC CITIZENSHIP

---

### OUTREACH

- 2019 – QUANTUM TECHNOLOGIES AMBASSADOR - conduct physics classes in local schools promoting the study of quantum theory. (sponsored by the UK Quantum Communications Hub)
- ROYAL INSTITUTE'S MASTERCLASS VOLUNTEER - helped with the running of sessions promoting mathematics to secondary school students.
- 2018 – STEM FAIR VOLUNTEER – Ran stall discussing cryptography at Sunderland College STEM event.
- 2017 – POSTGRADUATE SEMINAR ORGANISER – Organised and ran research seminars for postgraduate students within the mathematics department.

### REVIEWS

- Refereed papers for journals: NPJ Quantum Information; Physical Review Letters; Physical Review Research; Quantum.
- Refereed submissions for conferences: QCRYPT; QIP

## FUNDING AND AWARDS

---

- 2020 – Anand Ramachandran Memorial Prize for the best PhD thesis in the Department of Mathematics.
- 2017 – KM Stott Memorial Prize for excellence in PhD research, University of York.
- 2016 – Departmental postgraduate teaching prize.
- 2015 – WW Smith Fund - PhD (3 years).
- PB Kennedy Prize for outstanding performance in Mathematics Masters degree, University of York.

## COMPUTING SKILLS

---

- PROFICIENT: Python, Mathematica
- ADEQUATE: OS - Linux/Windows, HPC - SGE/SLURM, Matlab, C++.