

Christopher Thomas Chubb

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HIGHLIGHTS

- PhD and BSc. (Adv. Math) (Hons.) from University of Sydney
- Total of 10 papers, including 6 peer-reviewed journal articles, and 4 preprints, including:
 - Total citations of 104 and h-index of 4
 - Publications in [Nature Communications](#) and [Communications in Mathematical Physics](#)
 - A [JPA topical review](#) with 60 citations, selected for the [JPA Highlights of 2017](#), and in the top 10 most viewed JPA articles
 - 6 first-author papers, and 2 papers independent of doctoral supervisors
- Total of 19 talks (8 invited, 11 contributed) including:
 - QIP talks: 1
 - TQC talks: 3

EDUCATION

2015–present

Doctor of Philosophy

- University of Sydney, NSW, Australia
- Supervisors: A/Prof. Steven T. Flammia, Dr. Marco Tomamichel
- Auxiliary Supervisor: Prof. Andrew C. Doherty
- Australian Postgraduate Award Scholarship (2015–2018)
- University of Sydney Merit Award (2015–2018)
- Australian Institute for Nanoscale Science and Technology Postgraduate Scholarship (John Makepeace Bennett Gift) (2017–2018)

2011–2014

Bachelor of Science (Advanced Mathematics) (Honours)

- University of Sydney, NSW, Australia
- Majors: Physics and Mathematics
- First Class Honours with University Medal
- School of Physics Honours Scholarship (2014)
- Physics Foundation Scholarship No. 3 (2014)
- School of Physics Summer Vacation Scholarship (2014).
- Academic Merit Prize (2013, 2014)
- Dean's List of Academic Excellence (2011, 2012, 2013)
- Talented Student Program (2012, 2013)
- Mathematics Special Student Programs (2011)
- Chemistry Special Student Programs (2011)

2010/01

Australian Science Physics Olympiad Summer School

- Monash University, Victoria, Australia

THESES

- **Efficient approximation of degenerate ground states of gapped spin chains: The unfrustrated case**
Honours thesis, awarded first-class honours, supervised by Dr. Steven T. Flammia

PAPERS

Papers numbered by appearance on the arXiv

UNPUBLISHED PREPRINTS

- 10) **Tailoring surface codes for highly biased noise**
D.K. Tuckett, **C.T. Chubb**, S. Bravyi, S.D. Bartlett, and S.T. Flammia
[arXiv:1812.08186](#)
- 9) **Avoiding irreversibility: engineering resonant conversions of quantum resources**
K. Korzekwa, **C.T. Chubb**, and M. Tomamichel
[arXiv:1810.02366](#)
- 8) **Statistical mechanical models for quantum codes with correlated noise**
C.T. Chubb and S.T. Flammia
[arXiv:1809.10704](#)
- 7) **Moderate deviation analysis of majorisation-based resource interconversion**
C.T. Chubb, M. Tomamichel, and K. Korzekwa
[arXiv:1809.07778](#)

TOPICAL REVIEWS

- 2) **Hand-waving and Interpretive Dance: An Introductory Course on Tensor Networks**
J.C. Bridgeman and **C.T. Chubb**
Journal of Physics A: Mathematical and Theoretical **50**, 223001 (2017)
Highlights of 2017
[arXiv:1603.03039](#)

PEER-REVIEWED JOURNAL ARTICLES

- 6) **Energy cost of entanglement extraction in complex quantum systems**
C. Bény, **C.T. Chubb**, T. Farrelly, and T.J. Osborne
Nature Communications **9**, 3792 (2018)
[arXiv:1711.06658](#)
- 5) **Beyond the thermodynamic limit: finite-size corrections to state interconversion rates**
C.T. Chubb, M. Tomamichel, and K. Korzekwa
Quantum **2**, 108 (2018)
[arXiv:1711.01193](#)
- 4) **Moderate deviation analysis for classical communication over quantum channels**
C.T. Chubb, V.Y.F. Tan, and M. Tomamichel
Communications in Mathematical Physics **355**, 3 (2017)
[arXiv:1701.03114](#)
- 3) **Approximate symmetries of Hamiltonians**
C.T. Chubb and S.T. Flammia
Journal of Mathematical Physics **58**, 082202 (2017)
[arXiv:1608.02600](#)
- 1) **Computing the Degenerate Ground Space of Gapped Spin Chains in Polynomial Time**
C.T. Chubb and S.T. Flammia
Chicago Journal of Theoretical Computer Science **2016**, 9 (2016)
[arXiv:1502.06967](#)

CONFERENCE PROCEEDINGS

- **Moderate deviation analysis for classical communication over quantum channels**
C.T. Chubb, V.Y.F. Tan, and M. Tomamichel
Proceedings of the 2017 IEEE International Symposium on Information Theory (ISIT), 1544–1548 (2017)

TALKS

INVITED

Statistical mechanical models for quantum codes with correlated noise

- 2018/10 University of New Mexico, NM, USA
- 2018/10 Université de Sherbrooke, QC, Canada
- 2018/11 Perimeter Institute, ON, Canada
- 2018/11 Yale University, CT, USA
- 2018/11 California Institute of Technology, CA, USA
- 2019/01 QuArC, Microsoft Research, WA, USA

Moderate deviation analysis for classical communication over quantum channels

- 2017/07 Freie Universität Berlin, Germany

Approximate symmetries of Hamiltonians

- 2017/07 California Institute of Technology, CA, USA
- 2016/11 Massachusetts Institute of Technology, MA, USA

CONTRIBUTED

* indicates a talk given by a co-author

Moderate deviation analysis of majorisation-based resource interconversion

- *2018/12 [AIP 2018](#), Perth, WA, Australia

Statistical mechanical models for quantum codes with correlated noise

- 2018/12 [AIP 2018](#), Perth, WA, Australia
- 2018/06 [TQC 2018](#), University of Technology Sydney, NSW, Australia

Beyond the thermodynamic limit: finite-size corrections to state interconversion rates

- *2018/09 [AQIS 2018](#), Nagoya University, Japan

Moderate deviation analysis of majorisation-based resource interconversion

- 2018/01 [QIP 2018](#), QuTech, Delft, The Netherlands
- 2017/07 [Beyond IID 2017](#), National University of Singapore, Singapore
- 2017/06 [ISIT 2017](#), Aachen, Germany
- 2017/06 [TQC 2017](#), Université Pierre-et-Marie-Curie, Paris, France

Approximate symmetries of Hamiltonians

- 2017/06 [TQC 2017](#), Université Pierre-et-Marie-Curie, Paris, France
- 2016/12 [AIP 2016](#), Brisbane, QLD, Australia

Polynomial-time ground state approximation of degenerate gapped spin chains

- 2014/12 [AIP 2014](#), Australian National University, Canberra, ACT, Australia

TEACHING

- 2017, 2018 **Senior Statistical Mechanics**
Computational lab tutor
- 2016, 2017 **Hand-waving and Interpretive Dance: An Introduction to Tensor Networks**
Informal seven lecture course presented with Jacob C. Bridgeman

STUDENTS SUPERVISED

- 2016 **Doriane Drolet**
Exchange student from Université de Sherbrooke

- 2016 **David M. Long**
Senior Project student
- 2016 **Eric Huang**
Talented Students Programme project student

REFEREEING

Journals:

- Quantum Information and Computing (QIC)
- Communications in Mathematical Physics (CMP)
- Journal of Mathematical Physics (JMP)
- IEEE Transactions on Information Theory (TIT)
- Quantum Journal

Conferences:

- Annual Conference on Quantum Information Processing (QIP)
- IEEE Symposium on Information Theory (ISIT)
- International Conference on Quantum Cryptography (QCrypt)
- International Conference on Information Technology and Science (ICITS)

MISCELLANEOUS

- Nationality: Australian
- Languages: English (mother tongue), German (ein bisschen)
- Erdős number: 4 (C.T. Chubb → S.T. Flammia → A.W. Harrow → M. Szegedy → P. Erdős)

REFERENCES

A/Prof. Steven T. Flammia

Centre for Engineered Quantum Systems, University of Sydney, NSW, Australia

Yale Quantum Institute, Yale University, New Haven, CT, USA

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Dr. Marco Tomamichel

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Prof. Stephen D. Bartlett

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