

EDUCATION

Louisiana State University, Baton Rouge, LA, USA

2017–PRESENT

PhD Physics

Research

- Advisor: [Mark M. Wilde](#).
- Research interests: Quantum computing and quantum machine learning, quantum information theory, quantum communication.

Coursework – Selected courses:

- Quantum Information Theory
- Quantum Optics
- Theory of Quantum Computation

University of Waterloo, Waterloo, ON, Canada

2014–2016

MSc Physics (Quantum Information)

Research

- Thesis title: *Symmetric Extendability of Quantum States and the Extreme Limits of Quantum Key Distribution*
- Advisor: Norbert Lütkenhaus
- Committee: Norbert Lütkenhaus, Daniel Gottesman, Thomas Jennewein

Coursework – Selected courses:

- Implementations of Quantum Information Processing
- Implementations of Quantum Communication
- Theory of Quantum Information
- Applied Functional Analysis
- Open Quantum Systems

University of Waterloo, Waterloo, ON, Canada

2009–2014

BSc Honours Mathematical Physics (Co-operative), Astrophysics Specialization, Pure Mathematics Minor

- Graduated on the Dean's Honours List.
- Two research assistantships.
- Two co-op teaching experiences.

RESEARCH

Graduate Research Assistant, Department of Physics and Astronomy, Baton Rouge, LA, USA

2018–PRESENT

Quantum Science and Technologies Group, Hearne Institute for Theoretical Physics. Supervisor: Mark M. Wilde. (PhD Research)

- Performing research in quantum Shannon theory, quantum computing, and the theory of quantum networks.
- Peer-reviewed publications to date: [3], [4].

Quantum Computing Summer School Fellow, Los Alamos National Laboratory, Los Alamos, NM, USA SUMMER 2018

Theoretical Division. Supervisor: Patrick Coles. (Summer fellowship)

- Used Rigetti's and IBM's quantum computers to design and implement quantum algorithms for compiling quantum software. Work resulted in the pre-print (1).
- The work (1) was featured on Rigetti's website.

Graduate Research Assistant, Institute for Quantum Computing, Waterloo, ON, Canada 2014–2016

Optical Quantum Communications Theory Group. Supervisor: Norbert Lütkenhaus. (MSc Research)

- Developed a new framework based on symmetric extendability for analyzing quantum key distribution (QKD) protocols with two-way communication.
- Applied the new framework to two well-known QKD protocols to make progress on a long-standing open problem about successful key distribution with two-way communication.
- Work resulted in the peer-reviewed article [2].

Undergraduate Research Assistant, Institute for Quantum Computing, Waterloo, ON, Canada SUMMER 2014

Supervisor: Robert König. (NSERC Undergraduate Student Research Award.)

- Project Title: *Capacities of Fermionic Channels.*
- Studied Fermionic Gaussian channels in order to prove the Fermionic analogue of the Gaussian optimization and minimum output entropy conjectures for Bosonic Gaussian channels.

PUBLICATIONS (GOOGLE SCHOLAR PAGE) (PAPERS ON ARXIV)

PEER-REVIEWED ARTICLES

- [4] Siddhartha Das, **Sumeet Khatri**, Jonathan P. Dowling. “Robust quantum network architectures and topologies for entanglement distribution”. *Physical Review A* 97, 012335 (2018).
- [3] Siddhartha Das, **Sumeet Khatri**, George Siopsis, Mark M. Wilde. “Fundamental limits on quantum dynamics based on entropy change”. *Journal of Mathematical Physics* 59, 012205 (2018).
- [2] **Sumeet Khatri**, Norbert Lütkenhaus. “Numerical evidence for bound secrecy from two-way postprocessing in quantum key distribution”. *Physical Review A* 95, 042320 (2017).
- [1] Paul J. L. Charlton, Michael J. Husdon, Michael L. Balogh, **Sumeet Khatri**. “The dependence of halo mass on galaxy size at fixed stellar mass using weak lensing”. *Monthly Notices of the Royal Astronomical Society*, 472(2), 2367-2387 (2017).

PRE-PRINT ARTICLES

- (1) **Sumeet Khatri**, Ryan LaRose, Alexander Poremba, Lukasz Cincio, Andrew T. Sornborger, Patrick J. Coles. “Quantum-assisted quantum compiling”. arXiv:1807.00800, July 2018.

PRESENTATIONS (PRESENTING AUTHOR INDICATED BY *)

POSTERS

- [6] Siddhartha Das*, **Sumeet Khatri***, Jonathan P. Dowling. “Robust Quantum Network Architectures and Topologies for Entanglement Distribution”. *International Conference on Quantum Communication, Measurement and Computing (QCMC)* (Baton Rouge, USA, 2018). (Based on [4].)

- [5] Siddhartha Das*, Sumeet Khatri*, George Siopsis, Mark M. Wilde. “*Fundamental limits on quantum dynamics based on entropy change*”. International Conference on Quantum Communication, Measurement and Computing (QCMC) (Baton Rouge, USA, 2018). (Based on [3].)
- [4] Siddhartha Das, Sumeet Khatri*, Jonathan P. Dowling. “*Robust Quantum Network Architectures and Topologies for Entanglement Distribution*”. 2nd Workshop for Quantum Repeaters and Networks (Seefeld, Austria, 2017). (Based on [4].)
- [3] Sumeet Khatri*, Norbert Lütkenhaus. “*Numerical Evidence for Bound Secrecy from Two-Way Post-Processing in Quantum Key Distribution*”. 7th International Conference on Quantum Cryptography (QCrypt) (Cambridge, UK, 2017). (Based on [2].)
- [2] Sumeet Khatri*, Norbert Lütkenhaus. “*Symmetric Extendability of Quantum States and the Extreme Limits of Quantum Key Distribution*”. Southwest Quantum Information and Technology (SQuInT) (Baton Rouge, USA, 2017). (Based on [2].)
- [1] Sumeet Khatri*, Norbert Lütkenhaus. “*Symmetric Extendability of Quantum States and the Extreme Limits of Quantum Key Distribution*”. International Conference on Quantum Communication, Measurement and Computing (QCMC) (Singapore, 2016).

CONTRIBUTED TALKS

- [4] Siddhartha Das, Sumeet Khatri*, Jonathan P. Dowling. “*Robust Quantum Network Architectures and Topologies for Entanglement Distribution*”. Southeast Quantum Computing Workshop (Athens, USA, 2018). (Based on [4].)
- [3] Siddhartha Das*, Sumeet Khatri, Jonathan P. Dowling. “*Robust Quantum Network Architectures and Topologies for Entanglement Distribution*”. Southwest Quantum Information and Technology (SQuInT) (Santa Fe, USA, 2018). (Based on [4].)
- [2] Siddhartha Das, Sumeet Khatri*, George Siopsis, Mark M. Wilde. “*Fundamental Limits on Quantum Dynamics Based on Entropy Change*”. Conference on Quantum Information and Quantum Control VII (CQIQC-VII) (Toronto, Canada, 2017). (Based on [3].)
- [1] Sumeet Khatri, Norbert Lütkenhaus. “*Symmetric Extendability of Quantum States, Bound Secrecy, and the Extreme Limits of Quantum Key Distribution*”. APS March Meeting (New Orleans, USA, 2017). (Based on [2].)

ACADEMIC SERVICE

- Reviewer for:
 - IEEE Transactions on Information Theory.
 - Quantum Information Processing.
 - Reviews in Mathematical Physics.
 - New Journal of Physics.

TEACHING

Graduate Teaching Assistant

2017–2018

Department of Physics and Astronomy, Louisiana State University, Baton Rouge, LA, USA

- Supervised two sections of the second-year physics laboratory course.
- Graded homework assignments for the graduate-level statistical mechanics course.
- Graded homework assignments for the fourth-year undergraduate electromagnetism course.

Fundamentals of University Teaching Certificate

Teaching training program for graduate students at the Centre for Teaching Excellence, University of Waterloo, Waterloo, ON, Canada

- Program consists of six workshops and three 15-minute teaching sessions.
- Selected workshops: Effective lesson plans, creating memorable lectures, teaching with confidence.

Laboratory Teaching Assistant

2014–2015

Department of Physics and Astronomy, University of Waterloo, Waterloo, ON, Canada

- Supervised three sections of the first-year mechanics laboratory course for Biology and Chemistry majors in the Fall 2014 and Fall 2015 terms.
- Graded students' lab reports.

Math & Physics Learning Assistant, Sheridan College, Brampton, ON, Canada

WINTER 2012

Four-month co-op employment.

- Conducted weekly tutorials for four sections of the first-semester Math course for engineering students.
- Prepared and graded weekly quizzes administered during the tutorial.
- Conducted appointments and drop-in sessions at the Learning Centre to assist students with Math and Physics questions ranging from first- to fourth-semester courses.

AWARDS

Title	Value	Duration
NSERC Postgraduate Scholarship—Doctoral	\$21,000/year	2018–2021
Quantum Computing Summer School Fellowship (LANL)	\$12,200 (USD)	Summer 2018
Ontario Graduate Scholarship	\$15,000	2015–2016
NSERC Canada Graduate Scholarship—Master's	\$17,500	2014–2015
President's Graduate Scholarship	\$10,000/year	2014–2016
Marie Curie Award	\$4,525/year	2014–2016
NSERC Undergraduate Student Research Award ($\times 2$)	\$4,500	2012, 2014

TECHNICAL SKILLS

Programming Languages	Python, Matlab/Octave, \LaTeX
Software	Matlab/Octave, Maple, Mathematica
Quantum Computing Packages	pyQuil (Rigetti), Qiskit (IBM)