Curriculum Vitae

Personal Data

Name	Kam To Billy Sievers (formerly KTB Chan).
Residence	Hamilton, Ontario, Canada.
Nationality	Citizen of Canada, Hong Kong SAR (China), and Thailand.
Email Address	sieversktb@mcmaster.ca or ktbsievers@gmail.com.

Education

(2027)	**Doctor of Philosophy, Dept. of Physics and Astronomy**, McMaster University.
2023	**Master of Science in Physics**, Memorial University of Newfoundland, GPA: 4.0/4.0 .
2020	**Bachelor of Science (First Class Honours) in Physics.**, University of Calgary, GPA: 3.6/4.0 .

Research Interests

Quantum gravity, black holes, black hole thermodynamics, black hole mergers (numerical simulations and analytical approximations), AdS/CFT correspondence, numerical spectral analysis, finite difference techniques, Monte-Carlo techniques.

Publications

[1] R. A. Hennigar, H. K. Kunduri, K. T. B. Sievers, Y. Wang, "Spectrum of the Laplacian on the Page metric", J. Phys. A **58**, 405204 (2025).

[2] K. T. B. Sievers, L. Newhook, S. Muth, I. Booth, R. A. Hennigar, H. K. Kunduri, "Marginally Outer Trapped Tori in Black Hole Spacetimes", Phys. Rev. D **109**, 124023 (2024).

[3] I. Booth, K. T. B. Chan, R. A. Hennigar, H. K. Kunduri, and S. Muth, "Exotic marginally outer trapped surfaces in rotating spacetimes of any dimension", Class. Quant. Grav. **40**, 095010 (2023).

[4] R. A. Hennigar, K. T. B. Chan, L. Newhook, and I. Booth, "Interior marginally outer trapped surfaces of spherically symmetric black holes", Phys. Rev. D **105**, 044024 (2022).

Scholarships & Academic Awards

2023 – 2026	**NSERC PGS-D Award**, held at McMaster University, **$40 000 CAD** per year.
2023 – 2027	**Graduate & Research Scholarship**, McMaster University, monetary value adjusted for NSERC PGS-D award.
2021 – 2022	**Fellow of the School of Graduate Studies**, Memorial University, awarded to the top 10% of graduate students on academic merit.
2020 – 2022	**SGS Baseline Funding**, Memorial University, **$6 500 CAD** per year.
2016 – 2020	**International Entrance Scholarship**, University of Calgary, **$15 000 CAD** per year. awarded to two incoming international undergraduate students on academic merit.

Research Experience

2023 – current	**Graduate Research Assistant**, Theoretical Physics Group, McMaster University. Supervisor: Dr. Hari Kunduri.
2020 – 2023	**Graduate Research Assistant**, Gravity Group, Memorial University. Supervisor: Dr. Ivan Booth. Associates and Mentors: Dr. Robie A. Hennigar, Dr. Hari Kunduri.
2019 – 2020	**Undergraduate Honours student**, University of Calgary. Supervisor: Dr. Sean Stotyn, University of Calgary.

Students Mentored

Students were funded and entrusted to by Dr. Hari Kunduri[1] at McMaster University and Dr. Ivan Booth[2] at Memorial University.

- **Yiqing (Mia) Wang** (B.Sc. Mathematics and Physics, 2025)[1] – summer student 2024, manuscript published [1].
- **Zachary K. Hoyles** (B.Sc. Physics, 2023)[2] – summer student 2022.
- **Lucy Newhook** (B.Sc. Physics, 2022)[2] – summer student 2021 & 2022, honours thesis 2021 – 2022, manuscript published [2, 4].

Computer Skills

Python:	Computational Physics courses have covered the implementation of numerical methods and data handling in Jupyter notebooks. Notable topics include machine learning, finite difference methods, discrete Fourier analysis, and Monte-Carlo techniques. These skills were vital assets in the development of [1-4].
Others:	Mathematica 13 (RGTensor), Maple 2021 (GRTensorIII), LaTeX, Java.

Affiliations, Leadership, and Community Service

McMaster Astronomy & Physics Graduate Student Association (MAPSA),
Chair (2025 – current) – this is the elected head position of the organization,
Representative for Theoretical Physics Students (2023 – current).

McMaster Squash Team, *Player & Equipment Manager* (2025 – current).

Classical and Quantum Gravity (CQG), *Referee* (2023 – current).

Canadian Association of Physicists, *Graduate-student member* (2021 – current).

Rothney Astrophysical Observatory, University of Calgary,
Volunteer (2016 – 2020, 2022 – 2023) – telescope operator during open-house nights.

Dept. of Physics and Astronomy, University of Calgary,
Volunteer (2016 – 2019) – involved yearly in the department's outreach event *Rollercoasterology*,
Club executive – VP Events (2017 – 2018) of the Physics & Astronomy Students' Association (PASA).

Employment History

2023 – current	**Graduate Teaching Assistant**, Employer: Dept. of Physics and Astronomy, McMaster University.
2024 – current	**Sole Proprietor**, Billy's Squash Shop, Hamilton ON.
2020 – 2022	**Graduate Teaching Assistant**, Employer: Dept. of Physics and Physical Oceanography, Memorial University.
2022 – 2023; 2017 – 2020	**Tutor, Instructor and Instructors' Team-Lead**, Employer: MathPro Learning Centre, Calgary AB. Description: Employed for one-on-one tutoring of high school mathematics and physics, developed and managed an extracurricular coding program.
2020	**Undergraduate Teaching Assistant**, Employer: Dept. of Physics and Astronomy, University of Calgary.

Travel

Spain: Hosted by Dr. Robie A. Hennigar at the Institut de Ciències del Cosmos, University of Barcelona, I was invited to give a seminar talk on the results of [4].

Czech Republic: Hosted by Dr. David Kubiznak at the Institute of Theoretical Physics, Charles University, I was invited to give a seminar talk on the results of [4].

Germany: Hosted by Dr. Daniel Pook-Kolb at the Max Plank Institute for Gravitational Physics, AEI Hannover, I was invited to give a seminar talk on the results of [4].

Languages

Fluent in English, basic knowledge of Cantonese and Thai.

Conference, Symposium, & Seminar Presentations

Year	
2025	Title: Spectrum of the Laplacian on the Page Metric Type: Conference talk (∼15mins) at **Theory Canada 17**, University of Regina, Canada.
2024	Title: MOTSs in Kruskal-Schwarzschild-AdS spacetimes Type: Poster at **50 Years of Horndeski Gravity**, Perimeter Insitute, Canada. Type: Conference talk (∼15mins) at **Theory Canada 16**, Institute for Quantum Computing (University of Waterloo), Canada. at **Canadian Association of Physicists Congress 2024**, Western University, Canada.
2023	Title: Self-intersecting surfaces in rotating black holes Type: Conference talk (∼15mins) at **Graduate Research Symposium** (3-minute presentation), McMaster University, Canada. at **8th Annual PHAS symposium**, University of Calgary, Canada. at **Theory Canada 15**, Mount Allison University, Canada. at **Canadian Association of Physicists Congress 2023**, UNB, Canada.
2022	Title: Self-intersecting marginally outer trapped surfaces in black holes Type: Seminar (∼1 hr) at **Max Plank Institute for Gravitational Physics Seminar**, AEI Hannover, Germany. at **Relativity Seminar of the Institute of Theoretical Physics**, recording available (link), Charles University, Czech Republic. at **Institut de Ciències del Cosmos**, University of Barcelona, Spain. at **Dept. of Physics and Physical Oceanography M.Sc. Seminar**, Memorial University, Canada. Type: Conference Talk (∼15 mins) at **Canadian-Cuban-American-Mexican 2022 Conference**. Awarded: Feedback award. at **Canadian Association of Physicists Congress 2022**, McMaster University, Canada. at **Atlantic General Relativity Meeting 2022**, Memorial University, Canada. Awarded: B.Sc./M.Sc. Student Talk – 2nd Place.
2021	Title: The many MOTS of the Schwarzschild spacetime Type: Conference Talk (∼15 mins) at **Canadian Association of Physicists Virtual Congress 2021**, Canada. at **Atlantic General Relativity Meeting 2021 (online)**, Bishop's University, Canada. at **Canadian Student & Postdoc Conference on Gravity**, Memorial University, Canada. Awarded: Best M.Sc. Student Talk – 1st Place.