

Samuel S. Y. Wong

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Education

- 2020 – **PhD., Physics**, Stanford University, Stanford, CA.
present Advisor: Peter W. Graham.
- 2016 – 2020 **HBSc., Mathematics and Physics Specialist**, University of Toronto, Toronto, ON, Canada.
Beatrice Evelyn Rodgers Scholarship for top senior mathematics and physics specialist.
GPA: 3.96/4.00.
- 2012 – 2016 **Ontario Secondary School Diploma**, Markham District High School, Markham, ON, Canada.
Governor General's Academic Medal for top graduating student.
ACT: 36/36.

Research Experience

- Sep 2020 – **Research Assistant**, Stanford Institute for Theoretical Physics, Stanford University.
present
 - Supervisor: Peter W. Graham.
 - Proposed electron traps as dark-photon dark-matter detectors in the challenging milli-eV mass range [1].
 - Collaborated with experimentalists on a proof-of-principle demonstration.
 - Investigated novel methods to search for dark photon via Coulomb's law tests.
- May 2019 – **Research Assistant**, Department of Physics, University of Toronto.
Aug 2020
 - Supervisor: Erich Poppitz.
 - Studied color confinement in 4D supersymmetric $SU(N)$ Yang-Mills theory in compactified space.
 - Identified the spectrum of BPS domain walls and discovered magnetless solitons [3].
 - Large-scale computation of string tensions using the Niagara supercomputer [2].
- Sep 2018 – **Research Student**, Department of Physics, University of Toronto.
Apr 2019
 - Supervisor: Robert Orr.
 - Designed and built a laser system for measuring charge collection efficiency of radiation-damaged ITk detectors for the ATLAS experiment.
- May 2018 – **Research Assistant**, Department of Astronomy & Astrophysics, University of Toronto.
Aug 2018
 - Supervisor: Jo Bovy.
 - Employed machine-learning methods to study structure of the third integral using Gaia telescope data.
 - Contributor of galpy, a Python library for galactic dynamics.

Publications

Note that authors are ordered alphabetically in high energy physics.

- [1] Xing Fan, Gerald Gabrielse, Peter W. Graham, Roni Harnik, Thomas G. Myers, Harikrishnan Ramani, Benedict A. D. Sukra, **Samuel S. Y. Wong**, and Yawen Xiao, "**One-electron quantum cyclotron as a milli-eV dark-photon detector**," [arXiv:2208.06519 [hep-ex]].
- [2] Mathew W. Bub, Erich Poppitz, and **Samuel S. Y. Wong**, "**Confinement on $\mathbb{R}^3 \times \mathbb{S}^1$ and double-string collapse**," *JHEP* **01** (2021) 044, [arXiv:2010.04330 [hep-th]].
- [3] Andrew A. Cox, Erich Poppitz, and **Samuel S. Y. Wong**, "**Domain walls and deconfinement: a semiclassical picture of discrete anomaly inflow**," *JHEP* **12** (2019) 011, [arXiv:1909.10979 [hep-th]].

Presentations

Talks

- [T1] **"One-electron quantum cyclotron as a milli-eV dark-photon detector,"** SLAC Dark Matter Journal Club, SLAC National Accelerator Laboratory, Stanford University. September 8, 2022.
- [T2] **"Hidden-photon search with Coulomb's law tests,"** Wine & Cheese Seminars, Stanford Institute for Theoretical Physics, Stanford University. November 12, 2021.
- [T3] **"Domain walls and deconfinement: a semiclassical picture of discrete anomaly inflow,"** Theoretical High Energy Physics (THEP) Seminars, Department of Physics, University of Toronto. January 15, 2020.
- [T4] **"Domain walls and confinement: a new formula for the boundaries of BPS solitons,"** Canadian Undergraduate Physics Conference (CUPC) 2019, McGill University. November 8, 2019.
- [T5] **"The search for I_3 in Gaia,"** Summer Undergraduate Research Program (SURP), Department of Astronomy & Astrophysics, University of Toronto. August 22, 2018.

Posters

- [P1] **"One-electron quantum cyclotron as a milli-eV dark-photon detector,"** School on Table-Top Experiments for Fundamental Physics, Perimeter Institute for Theoretical Physics. September 20-21, 2022.
- [P2] **"Domain walls and confinement: a new formula for the boundaries of BPS solitons."** Undergraduate Research Fair 2019, Department of Physics, University of Toronto. September 26, 2019.

Awards and Honors

- 2021-2022 **Clark Fellowship**, Stanford Institute for Theoretical Physics, Stanford University.
- 2020 **The Beatrice Evelyn Rodgers Scholarship**, Department of Physics, University of Toronto.
- 2019 **George Luste (In Program) Scholarship**, Department of Physics, University of Toronto.
- 2018, 2019 **The Class of 1930 and Associates Scholarship in Mathematics and Physics**, Department of Physics, University of Toronto.
- 2018, 2019 **Undergraduate Student Research Awards (USRA)**, Natural Sciences and Engineering Research Council of Canada (NSERC).
- 2018 **The Coxeter Scholarship in Mathematics**, Department of Mathematics, University of Toronto.
- 2018 **New College Alumni Association In-Course Scholarship**, New College, University of Toronto.
- 2017 **George Luste Prize in First Year Physics**, Department of Physics, University of Toronto.
- 2016 **Silver Medal**, University Physics Competition.
- 2016 **University of Toronto Scholar**, University of Toronto.
- 2016 **Robert Bruce Scholarship**, New College, University of Toronto.
- 2016 **Governor General's Academic Medal**, Markham District High School.
- 2014 **Shad Valley Scholarship**, Shad Canada.

Teaching Experience

Teaching assistantship at the Department of Physics, Stanford University:

Fall 2022 **PHYSICS 61: Mechanics and Special Relativity.**

Winter 2022 **PHYSICS 23: Electricity, Magnetism, and Optics.**

Spring 2021 **PHYSICS 41: Mechanics.**

Academic Service

2021-2022 **SITP Journal Club Co-Organizer**, Stanford Institute for Theoretical Physics, Stanford University.

2021-2022 **SITP Mentorship Program Organizer**, Stanford Institute for Theoretical Physics, Stanford University.

Computing skills

○ Python ○ Java ○ Mathematica ○ High-Performance Computing