Pramodh Senarath Yapa *PhD Student* Department of Physics, University of Alberta

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Education

University of Alberta — Edmonton, AB, Canada

Ph.D. – Theoretical Condensed Matter Physics (GPA : 3.83/4.00) — *2018 – Present*

Thesis: *Exotic Phases of Confined Superfluid ^3He*

(Co-supervised by Prof. Joseph Maciejko and Prof. Frank Marsiglio)

University of Victoria — Victoria, BC, Canada

M.Sc. – Condensed Matter Physics (CGPA : 8.14 / 9.00) — *2015 – 2017*

Thesis: *Non-Local Electrodynamics of Superconducting Wires: Implications for Flux Noise and Inductance*

(Supervised by Prof. Rogério de Sousa)

Carleton University — Ottawa, ON, Canada

B.Sc. – Honours Theoretical Physics (CGPA : 10.07 / 12.00) — *2010 – 2015*

Honours Thesis: *Supersymmetry Phenomenology*

(Supervised by Prof. Thomas Gregoire)

Research Experience

University of Alberta — Edmonton, AB, Canada

Ph.D. Student in Condensed Matter Theory Group — *Sep 2018 — Present*

Under Prof. Joseph Maciejko and Prof. Frank Marsiglio:

- Investigating novel quantum phases of superfluid Helium-3, and superconductors with confining boundaries.

University of Victoria — Victoria, BC, Canada

MSc. Student in Condensed Matter Theory Group — *Sep 2015 — Dec 2017*

Under Prof. Rogério de Sousa:

- Investigated the effects of non-local electrodynamics on the properties of superconducting qubits.

Simon Fraser University — Burnaby, BC, Canada

NSERC Undergraduate Student Researcher — *May 2015 — Aug 2015*

Under Prof. Karen Kavanagh :

- Used electron holography to investigate properties of Manganese Phosphide nanoclusters.

Carleton University — Ottawa, ON, Canada

Honours Project in Supersymmetry Phenomenology — *Sep 2014 — Apr 2015*

Under Prof. Thomas Gregoire:

- Investigated signatures of supersymmetric particles using simulated LHC collision data.

TRIUMF - Canadian Particle Accelerator Centre — Vancouver, BC, Canada

Research Assistant in UltraCold Neutron (UCN) Group — *Jan 2014 — Aug 2014*

Under Prof. Rüdiger Picker:

- Developed PENTrack, the UCN experiment's Monte Carlo simulation for UCN physics.

Awards

University of Alberta

Dr Isaac Yakoub Isaac Graduate Scholarship in Physics ($1,000: Department Level) — Sep 2020 - Aug 2021

↪ *Awarded for academic achievement, demonstrated leadership, and commitment to volunteer work*

Alberta Innovates Graduate Student Scholarship ($31,000/yr × 3 yrs: Provincial Level) — Jan 2020 - Dec 2022

Alberta Graduate Excellence Scholarship ($12,000: Provincial Level) — Sep 2019 - Apr 2020

Queen Elizabeth II Graduate Scholarship - Doctoral Level ($7,500: Provincial Level) — Sep 2018 - Dec 2018

Doctoral Recruitment Scholarship 2018 ($10,000: University Level) — Sep 2018 - Aug 2019

University of Victoria

Charles S. Humphrey Graduate Student Award ($2,500: University Level) — 2017

UVic Graduate Award ($4,000: Department Level) — Sep 2015 - Apr 2017

Carleton University

NSERC Undergraduate Student Research Award ($4,500: University Level) — May 2015 – Aug 2015

Carleton University Deans' Honour List — 2011 & 2015

Carleton University President's Scholarship ($8,000: University Level) — Sep 2010 – Apr 2012

Publications

5. Rudd, M. J., **Senarath Yapa, P.**, Shook, A.J., Maciejko, J., Davis, J. P. *Strong-coupling corrections to hard domain walls in superfluid ^{3}He-B*, Physical Review B **104**, 094520 (2021); arXiv:2106.02065 [cond-mat].
4. **Senarath Yapa, P.**, Boyack, R., Maciejko, J. *Triangular pair-density wave in confined superfluid ^{3}He* (2021) arXiv:2104.15125 [cond-mat] - Submitted to Physical Review Letters.
3. Shook, A.J., Vadakumbatt, V., **Senarath Yapa, P.**, Doolin, C., Boyack, R., Kim, P. H., Popowich, G. G., Souris, F., Christani, H., Maciejko, J., Davis, J. P. *Stabilized Pair Density Wave via Nanoscale Confinement of Superfluid ^{3}He*, Physical Review Letters **124**, 015301 (2020) – **Selected as Editor's Suggestion and reported on by Phys.org**; arXiv:1908.01779 [cond-mat].
2. **Senarath Yapa, P.**, Makaro, T., de Sousa, R. *Impact of Nonlocal Electrodynamics on the Flux Noise and Inductance of Superconducting Wires*, Physical Review Applied **11**, 024041 (2019); arXiv:1806.09705 [cond-mat].
1. **Senarath Yapa, P.**, *Non-local electrodynamics of superconducting wires: Implications for flux noise and inductance*, MSc. Thesis, University of Victoria Libraries (2017).

Presentations

Academic

11. "Triangular Pair-Density-Wave in Confined Superfluid ^{3}He" (Invited Talk), International Conference on Quantum Fluids and Solids 2021 (Online), August 2021.
10. "Triangular Pair-Density-Wave in Confined Superfluid ^{3}He", 2021 CAP Congress (Online), June 2021.
    ↪ ***Awarded 1st place in CMP Division Oral Presentation Competition.***
    ↪ ***Awarded 2nd place Overall in the Oral Presentation National competition.***
9. "(Near) 2D Helium-3 and Superfluid Crystals", University of Alberta Graduate Physics Student Association Symposium 2021, (Online), University of Alberta, AB, Canada, Jan 2021.
    ↪ ***Awarded 3rd place in Oral Presentation Competition.***
8. "Superfluid 3-He: Within the Confines" (Invited Talk), **Quantum Fluids in Isolation Seminar Series**, (Online) Nov 2020.
7. "Superfluid 3-He: Within the Confines", **TRU Virtual Physics Conference 2020**, Online, May 2020.
6. "Exotic Phases of Confined Helium-3: A Theoretical Study" (Poster), **International Conference on Quantum Fluids and Solids**, Edmonton, AB, Canada, August 2019.
5. "Exotic Phases of Confined Helium-3: A Theoretical Study" (Poster), **Quantum Alberta Workshop**, Edmonton, AB, Canada, July 2019.
4. "Impact of Non-Local Electrodynamics on Flux Noise and Inductance of Superconducting Qubits", **APS March Meeting 2018**, Los Angeles, CA, USA, March 2018.
3. "Topological Phase Transitions: The 2016 Nobel Prize in Physics", **UVic Professional Development Workshop for High School Physics Teachers**, Department of Physics and Astronomy, University of Victoria, Victoria BC, February 2017.
2. "Determining the Mean Inner Potential of MnP using Electron Holography", **NSERC Summer Student Poster Presentation**, Kavanagh Research Group, Simon Fraser University, Burnaby BC, August 2015.
1. "PENTrack, Field Folding and the MicroRoughness Model", **UltraCold Neutron (UCN) Collaboration Meeting, TRIUMF**, Vancouver, BC, August 2014

Outreach

7. Invited Keynote Speaker, **Sanofi Biogenius Canada High School Science Competition**, April 2021.
6. Invited Speaker on Physics as an Academic Career for High School Students, **Find Your STEM Career**, Morrin Centre, March 2021.
5. "Will You Take the Red P-Wave or the Blue P-Wave?", **Science Telephone Podcast**, (Invited Podcast Guest), Online, Nov 2020.
4. "Do Birds Understand Fluid Mechanics?", **NerdNite Victoria**, (Invited Talk), Victoria Events Centre, Victoria, BC, Oct 2020.
3. "Quantum Stuff Swirls for Days", **Nerdin' About Podcast**, (Invited Podcast Guest), Online, Aug 2020.
2. "History of Quantum Mechanics", **Science Literacy Week, St. Albert Public Library**, (Invited Talk), Edmonton, AB, Sep 2019.
1. "Fundamental Physics as a Torchlight to the Unknown", **TedxCarletonU**, (Invited Talk), Carleton University, Ottawa, ON, April 2015.

Teaching Experience

University of Alberta — Edmonton, AB, Canada

Teaching Assistant (TA) for Undergraduate Physics Courses — *Fall 2018 - Winter 2019*

- Taught 1st year laboratory course and worked in the Physics Tutorial Center

University of Victoria — Victoria, BC, Canada

Teaching Assistant (TA) for Undergraduate Physics Courses — *Fall 2015 - Winter 2017*

- Graded assignments in 4th year Quantum Mechanics course and taught 1st year laboratory courses

Tutor with UVic Learning Assistance Program — *Sep 2016 – Aug 2018*

- Tutored undergraduate students with learning disabilities in Physics and Math.
- Created personalized lesson plans and learning strategies tailored to each student.

Leadership and Outreach Experience

Graduate Physics Student Association (GPSA) — University of Alberta

President — *Nov 2019 - Present*

Vice President Academic — *Dec 2018 - Nov 2019*

- Developed Graduate Student Mentorship Program to pair incoming and current graduate Physics students.
- Primary organizer for the Graduate Physics Symposium, an annual graduate research showcase and Public Lecture involving over 100 researchers and 300 members of the public.

Science Graduate Student Association Council (SGSAC) — University of Alberta

Executive Secretary and Department Representative — *Nov 2018 - Present*

- Initiated meetings with the Dean of Science and Associate Deans of Graduate studies and EDI regarding supervision policy. This has led to new policies and committees being formed within the Faculty of Science.
- Organized social events for graduate students in different Departments within the Faculty of Science to socialize.

Equity, Diversity and Inclusion Committees — University of Alberta

Graduate Student Representative — *Sep 2020 - Present*

- Representative on EDI committees at the Faculty of Science and the Department of Physics levels, as well as on the leadership team of the UAlberta Physicists for Justice + Equity + Diversity + Inclusion group.
- Helping develop policy for creating an equitable environment within the Faculty of Science and Department of Physics, and creating resources for EDI efforts.
- Organizing talks and events to highlight EDI issues and promote marginalized groups in Science, such as Wikipedia-Edit-A-Thons to create Wikipedia articles for Canadian Physicists from marginalized communities.

ComSciConCAN 2020 and 2021 National and Western Canadian Conferences

Lead Organizer and Advisory Board Member — *Oct 2019 - Present*

- Organizer of a 3-day Science Communication Conference for Canadian STEM graduate students, held virtually, July 2020, and lead organizer for the Western Canadian chapter conference held in November.
- Fundraised $9,000 from Western Canadian Universities; organized multiple workshops on Science Storytelling, Canadian Outreach and Equitable Science Communication.

TRU Virtual Physics Conference 2020

Lead Organizer — *May 2020*

- Organized an international, multidisciplinary online Physics conference, with 11 Plenary speakers + 28 Graduate Students from across North America and Europe.

Royal Canadian Institute of Science Instagram Takeover

Science Communicator — *August 2020*

- Took over the RCIScience Instagram account for a week to teach concepts in Condensed Matter Physics to the general public.

Pint of Science Edmonton

Organizer — *May 2020 - Present*

- Helped organize and was a host for Pint of Science Canada 2020, a virtual Science Public Outreach event event, with multiple professors from the University of Alberta.
- Currently organizing and moderating a panel on Quantum Technology for the Pint of Science 2021 virtual event.

EQUS Quantum Art Award - 2nd Place — Sep 2020

- Created a hip-hop song about low-temperature physics and plasma physics along with another University of Alberta Graduate Student.
- Chosen as the runner-up by ARC Centre of Excellence for Engineered Quantum Systems at their Quantum Art competition.

Dance Your PhD 2018 Winner — Feb 2019

- Created a 10 minute mini-musical depicting low-temperature physics through the medium of swing dancing, seen by over 90,000 people.

- Chosen as the overall winner by Science Magazine and the American Association for the Advancement of Science from over 50 entries in a global competition.

Physics & Astronomy Graduate Student Society (PAGSA) — University of Victoria
Academic Chair — *Sep 2016 - Apr 2018*

- Organized monthly graduate student seminar series, career development workshops and developed Graduate Student Mentorship program.

Carleton University Physics Society (CUPS) — Carleton University
Chief Administrator — *Sep 2014 - Apr 2015*

- Organized seminar series featuring department researchers and a field trip to the SNOLAB research laboratory.

Let's Talk Science National Science Outreach Organization
Graduate Volunteer — *Sep 2014 - Aug 2017*

- Developed and delivered particle physics workshop to over 200 middle and high-school students.
- Judged Science Olympics event with middle-school students from multiple schools on Vancouver Island.