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Sheng-Lung Hsueh (Steven Hsueh)

I am a current Master's student in McGill University with a research focus on extragalactic astronomy.

EDUCATION

McGill University, Montreal QC — *Master in Physics*
August 2024 - Present, McGill Downtown Campus

- Researching with a focus on extragalactic astronomy
- Primary focus of the project is a statistical analysis of Brightest Cluster Galaxies (BCGs) on their molecular gas content, star formation rate and star formation history
- Working with ALMA data (PI: Dr. Tracy Webb)

University of British Columbia, Vancouver BC — *Combined Honours in Physics and Astronomy*
September 2020 - May 2024, UBC Vancouver Campus

- Standard undergraduate physics knowledge and laboratory experience:
    - Astrophysics, Astronomical Instrumentations and Measurement, Astronomy Laboratory
    - Optics, Quantum Mechanics, Statistical Mechanics, Advanced Mechanics
- Astronomical instrumentations
- Computational experience, including numerical solutions of coupled differential systems and numerical integration techniques using Python and MATLAB
- Completed an honour thesis project in the field of gravitational waves
    - Research on gravitational waves evaluating the performance of a machine learning algorithm called *GSpyNetTree* for handling overlapping merger signals
    - First research experience with a faculty member affiliated with LIGO-VIRGO-KAGRA Scientific Collaboration, which provided me with experience working in large consortia and how professional research is conducted

SKILLS

- Computer Skills:
    - Programming experience: Python, MATLAB
    - Familiar with LaTeX and bash on an intermediate level
    - Familiar with telescope data analysis (ALMA, HST, JWST)
- Laboratory Skills:
    - Data and Statistical Analysis of machine learning performance using confusion matrices and training plots
    - Uncertainty Propagation and Analyzing Results
    - Technical Scientific Reports
- Specific Strength:
    - Able to confidently work effectively in research, independent and team settings
    - Excellent writing and spoken communication skills
    - Able to perform tasks calmly and work effectively in stressful situations
    - Logical problem solver with engineering design methods

RESEARCH EXPERIENCE

University of British Columbia, Vancouver, BC, Canada — *UBC WLIURA Summer Student*

July 2023 - December 2023

- UBC Work Learn International Undergraduate Research Award Summer Student

- Assigned project topic: *Charting the Growth of Galaxies*
- Supervised by Dr. Allison Man
- Characterizing selected quiescent galaxies such as molecular gas mass, gas fraction, and flux value
- Working with ALMA Band 6, HST, and JWST data for in dust continuum (individual and stacking)

Chalmers Tekniska Högskola, Göteborg, Sweden — *Summer Research Student*

May 2023 - July 2023 (Project is still being worked on)

- Attending the Chalmers Astrophysics & Space Sciences Summer (CASSUM) and Virginia Initiative on Cosmic Origins (VICO) undergraduate summer student research programs
- Assigned project topic: *Extreme Star Formation in the Galactic Centre*
- Supervised by Dr. Jonathan Tan and Dr. Maya Petkova, used ALMA Band 6 Continuum data
- An initial stipend of 30k SEK for living costs and the selected research position in Göteborg
- The presentation title: *Do Cores Have Kinematic Memories of Their Parent Clouds? - A Case Study of the Galactic Centre Brick*

NRC of Canada, Vancouver, BC, Canada — *Co-op Research Assistant*

January 2023 - May 2023

- Working with the Energy, Mining, and Environment Research Centre as a Co-op student
- provide much-needed technical support to the completion of experimental work related to the VRFB DPIP project milestones
- Assisting with electrochemical measurements, battery testing and membrane fabrication

National Center for Theoretical Science - Theoretical and Computational Astrophysics, Taipei City, Taiwan — *Summer Research Student*

July 2022 - August 2022

- Chosen topic: *Investigating the high-energy emission from violent, star-forming galaxies and the event of quenching in primordial galaxies*
- The project focuses on evaluating the behaviour of inflows of gas into primordial galaxies through the fueling of the intergalactic gas and how cosmic rays contribute to such events.
- Used computational software such as Python for the modelling
- Student Scholarship of 20k NTD for supporting the summer project
- The presentation was done at the end of the program
    - Title: *Circum-galactic Gas Dynamics and Fueling of Primordial Galaxies: The Impact of Cosmic Rays*

PROFESSIONAL ACTIVITIES & CLUBS

Department of Physics, McGill University Montreal — *Teaching Assistant*

September 2024 - Present

- Primarily responsible for laboratory activity in PHYS101 as well as lab report grading
- The main goal is to introduce students the concept and understanding of error propagation and elementary data analysis

UBC Physics and Astronomy Department, UBC Vancouver — *Teaching Assistant*

September 2022 - December 2022

- Helping students review first-year physical concepts through activity and worksheets during tutorials and holding office hours to answer student's questions
- The main goal is to prepare the students for homework and the exams
- I previously took PHYS100 (Introductory Physics), which I am currently a teaching assistant in the course

AWARD

- *Reinhardt C Fellowships in Physics* (McGill University)
- *Grad Excellence Award in Physics* (McGill University)