

Samuel Lai

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Statement

I am an astrophysics researcher specialising in accretion onto compact objects. By combining high performance computing simulations of accretion discs with high quality spectroscopic observations, I develop novel ways of understanding the diversity of observable phenomena. My goal is to study multiwavelength data of ultraluminous black holes in the early universe to understand their cosmic history, how they continue to grow, and how they affect their host galaxies/environment.

Education

March 2021 – Present	Australian National University, Australia Research School of Astronomy & Astrophysics Website: https://www.anu.edu.au/ <ul style="list-style-type: none">Astrophysics PhD
Sept 2018 – Nov 2019	University College London, United Kingdom Department of Physics & Astronomy Website: https://www.ucl.ac.uk <ul style="list-style-type: none">Astrophysics MScDistinction, 87.85/100.00
Sept 2014 – June 2018	University of California – Los Angeles, United States College of Letters and Science Website: https://www.ucla.edu <ul style="list-style-type: none">Astrophysics BScMagna Cum Laude, 3.87/4.00 GPA

Research

Sept 2020 – Present	High-Redshift Ultraluminous Quasi-Stellar Objects Mentor(s): Dr. Christopher Onken, A/Prof. Christian Wolf, and Dr. Fuyan Bian
Nov 2015 – Sept 2020	Contaminated White Dwarfs with Infrared Excess Mentor(s): Dr. Siyi Xu (许偲艺), assistant astronomer at Gemini Observatory
Oct 2018 – Nov 2019	Emission from Black Hole Event Horizon Mentor(s): Dr. Ziri Younsi and Prof. Kinwah Wu Thesis Title: <i>Black Hole Jet Simulation and Images</i>
Jul 2017 – June 2018	Harmonic Analysis of Gravitational Wave Power in Binary System Simulation of Stochastically Driven Coupled Oscillator Grid Mentor(s): Prof. Kenneth Young, Emeritus Professor at CUHK Thesis Title: <i>Gravitational waves from a binary system: A detailed analysis of orbital decay</i>
Apr 2017 – Aug 2018	Galactic Morphology by Surface Brightness and Isophotal Contours Mentor(s): Dr. Michael Rich, research astronomer at UCLA

Relevant Work Experience

July 2022 – Present	Australian National University, RSAA Publications Officer ANU2.3m Time Allocation Committee Website: https://rsaa.anu.edu.au/research/publications
Aug – Oct 2021	European Southern Observatory, PhD Studentship Programme Website: https://www.eso.org/
Jan – June 2020	Gemini Observatory, Short-term Research Scholar Website: https://www.gemini.edu/
June – Aug 2013	Cluster Technology Limited, Software Trainee Website: https://www.clustertech.com <ul style="list-style-type: none">Project Management TeamSoftware Development Team
June – Aug 2012	

Talks/Presentations

July 2023	Sydney, Australia	Astronomical Society of Australia (ASA) Annual Science Meeting
June 2023	Hong Kong	Astrophysical Black Holes: A Rapidly Moving Field ¹
March 2023	Canberra, Australia	RSAA Journal Club
September 2022	Online	Gemini Observatory Journal Club
September 2022	Tucson, Arizona	University of Arizona Extragalactic Group
September 2022	Tucson, Arizona	Steward / NOIRLab Galaxy Group
September 2022	Sedona, Arizona	Giant Magellan Telescope Community Science Meeting
March 2022	Online	XQR-30 WP3
July 2022	Canberra, Australia	PhD Thesis Presentation
July 2022	Tasmania, Australia	Astronomical Society of Australia (ASA) Annual Science Meeting
February 2022	Online	European Southern Observatory TMT
November 2021	Online	Mt. Stromlo Student Seminars
September 2019	London, United Kingdom	MSc Thesis Defense

¹ Could not attend

Teaching and Outreach

2023	ASTR3002/ASTR6002 – Galaxies and Cosmology Course ESO Studentship Student: Yanina Bonilla Lopez ASTR3005 – Astrophysics Research Course Student: Ashley Hai Tung Tan ANU 2.3m Telescope Training Student: Neelesh Amrutha
2022	ANU 2.3m Telescope Training Students: Jemma Pilosof, Cassidy Grae Mihalenko ASTR3005 – Astrophysics Research Course Student: Zachary Steyn ASTR3002/ASTR6002 – Galaxies and Cosmology Course J1144-4308 NPR Radio Interview https://www.nprillinois.org/2022-06-16/scientists-unexpectedly-discover-the-fastest-growing-black-hole J1144-4308 Discovery e.g. https://cosmosmagazine.com/space/fastest-growing-black-hole-anu/
2020	Journey through the Universe 2020 – Gemini Observatory JWST Proposal Workshop ICS Alumni Newsletter
2019	ICS High School Astronomy Club ICS High School Chemistry

Actively-Maintained Public Codes

2023	PyQSpecFit: Python-based Quasar Spectral Fit Code Authors: Samuel Lai Purpose: Sensibly model emission features in rest-frame optical and ultraviolet quasar spectra. <i>GitHub/Zenodo</i> BADFit: Black hole Accretion Disc Fitting Code Authors: Samuel Lai Purpose: Model the large-scale multi-wavelength quasar spectral energy distribution with ray-traced thin and slim accretion disc synthetic spectra in order to constrain black hole properties. <i>GitHub/Zenodo</i> Personal Webpage https://samlaihei.github.io/ Authors: Samuel Lai Purpose: Share my work with the world. <i>GitHub Pages</i>
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Grants, Awards, and Prizes

2023	RSAA Travel Grant • \$1,200, Destination: Sydney RSAA Travel Grant • \$168, Destination: Kioloa	Australian National University Australian National University
2022	Community Science Meeting Travel Support • \$1,615, Destination: United States RSAA Travel Grant • \$3,620, Destination: United States RSAA Travel Grant • \$1,920, Destination: Siding Spring Observatory RSAA Travel Grant • \$1,400, Destination: Tasmania	GMTO Corporation Australian National University Australian National University Australian National University Australian National University
2021	Mt. Stromlo Student Seminars – Best Science Talk	Australian National University
2020	University Research Scholarship • \$34,000/annum, 3.5 years HDR Fee Remission Merit Scholarship • Full tuition, 4 years RSAA Supplementary Scholarship • \$5,000/annum, 3 years President's PhD Scholarship • Full tuition, \$26,420/annum, 3.5 years, not accepted Croucher Scholarship • Full tuition, \$30,300/annum, 3 years, not accepted	Australian National University Australian National University Australian National University Australian National University Imperial College London The Croucher Foundation
2019	Harrie Massey Prize – Best Overall Astrophysics MSc • \$150 Mathematical and Physical Sciences Dean's Commendation MSc with Distinction	University College London University College London University College London
2018	BSc – Magna Cum Laude Dean's List	University of California – Los Angeles University of California – Los Angeles
2017	Dean's List	University of California – Los Angeles

2016	Dean's List	University of California – Los Angeles
2015	Dean's List	University of California – Los Angeles
2014	Dean's List	University of California – Los Angeles
	Intermural Tennis Championship – Silver	International Schools Sports Federation
	Musicianship Service Award	International Christian School
2012	Outstanding Musician Award	International Christian School
	Intermural Tennis Championship – Bronze	International Schools Sports Federation