+44 07756 785454
St Andrews, Fife, UK
hhl1@st-andrews.ac.uk
hhl020797@gmail.com
hinleung622.github.io

HO-HIN **LEUNG**

EDUCATION

Expected 2024 | **PhD in Astrophysics – University of St Andrews**
Supervised by Prof. Vivienne Wild and Dr. Michail Papathomas

2020 | **Physics and Astrophysics Msci – University of Birmingham**
First Class Honours

PUBLICATIONS

[1] **H-H Leung**, Vivienne Wild, Michail Papathomas, Adam Carnall, et al. Chemical evolution of local post-starburst galaxies: Implications for the mass-metallicity relation, MNRAS, arxiv:2309.16626 (2023)

[2] Justin Otter, Kate Rowlands, Katherine Alatalo, **H-H Leung**, et al. Resolved Molecular Gas Observations of MaNGA Post-starbursts Reveal a Tumultuous Past ApJ, 941.1 (2022): 93

[3] Sara L. Ellison, Scott Wilkinson, Joanna Woo, **H-H Leung**, et al. Galaxy mergers can rapidly shut down star formation MNRAS:Letters, 917.1 (2022): 92-96

[4] Alexander J. Lyttle et al., including **H-H Leung** Hierarchically modelling Kepler dwarfs and subgiants to improve inference of stellar properties with asteroseismology MNRAS, 505.2 (2021):2427

EXPERIENCES

2020–present | **Postgraduate researcher at University of St Andrews**
Understanding galaxy evolution and quenching through fossil records in their spectra

- Low redshift MaNGA IFU data: rapidly quenching post-starbursts can explain the gap between the mass-metallicity relations of star-forming and quiescent galaxies → rapid quenching as a plausible quenching pathway for building the local red-sequence
- Improvement of Bayesian galaxy spectra fitting algorithms by introducing stellar metallicity evolution models, along with vigorous validation testing
- Speeding up computation by incorporating Gaussian Process for correlated noise estimations
- Developing Hierarchical Bayesian models for IFU spectra or populations of galaxies, pooling of data allows for direct study of population properties and obtaining key information from low SNR data
- Built a small interactive visualization tool for gaining better intuition of how changing galaxy properties affect their observed spectra (GitHub, paper)

2022–2023 **Research Assistant at IT Innovation Centre, University of Southampton**

- Developing Explainable AI to assist in blood glucose level monitoring for T1 Diabetes patients
- Reliability testing of machine learning models under the effects of data and concept drift
- Quantify the impact of data and concept drift on model predictions through Shapley values

2019–2020 **Masters year project**
Open Clusters' Stellar Ages through Bayesian Hierarchical Modelling and Machine Learning

- Replaced interpolation of stellar evolution grids with neural networks to predict stellar observables (e.g. $T_{\rm eff}$, luminosity) from fundamentals (e.g. mass, radius, age) for better generalization
- Bayesian hierarchical modelling of stars in open clusters to accurately measure both individual and population properties (age and metallicity)
- Incorporated Gaussian mixture models to account for binaries in open clusters

2019 summer **Short research project at University of Edinburgh**
Biases of estimating galaxy cluster mass with the velocity dispersion - cluster mass relation

- Quantify feasibility and biases of using the cluster mass – velocity dispersion relation to estimate cluster mass through the halo simulation "300 project"

2019 **Large team student-led research project**
Asteroseismology of Red Giants and Galactic Archeology with TESS Data

2018 summer **Internship at the Hong Kong Observatory**
Feasibility study of determining earthquake intensity based on public's reports

AWARDS

2023 | **Best long talk of the day**
DEX-XIX conference, Edinburgh, UK

ACADEMIC CONFERENCES AND CONTRIBUTIONS

Oct 2023 | **15-minute talk in Puerto de la Cruz, Tenerife**
At "A Life Devoted to Stellar Populations" conference

Jan 2023 | **12-minute talk in Edinburgh, UK**
At "DEX-XIX" conference

Sep 2022 | **Short contributed talk in Cambridge, UK**
At "Epoch of Galaxy Quenching" Conference, recording

POSTER PRESENTATIONS

May 2023	**The chemical evolution during the starburst and quenching of local post-starburst galaxies in MaNGA: Comparing quenching mechanisms through metallicity** At PhD Annual Assessment Conference, St Andrews, UK
Mar 2022	**Chemical evolution during starbursts: evidence for rapid build up of metallicity in MaNGA post-starburst galaxies** At Large-Volume Spectroscopic Analyses workshop, held online

---

TEACHING EXPERIENCE

2022	**Computational Astrophysics Lab Demonstrator** Third-year students, computational exercises and Fortran coding
2021	**Extragalactic Astronomy classwork Demonstrator** Python-based problem set on observational cosmology
2021 – 2023	**Astronomy Lab Demonstrator** First and second-year students, basic astronomy problem solving and python coding

---

PUBLIC ENGAGEMENT

2023	**Astronomy show assistant** St Andrews Science Discovery Day

---

TECHNICAL SKILLS

- Full spectral fitting of SEDs with both parametric and non-parametric model frameworks
- MCMC, Bayesian statistics, Nested sampling, Hierarchical Bayesian models
- Neural networks, Random forests, Gradient boosted models, Explainable AI
- Python, Fortran, Git, GitHub, Jupyter, LaTeX, HTML/CSS, Unix, Bash