Laura Elina Uronen

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Science Centre North Block, The Chinese University of Hong Kong, Shatin, HONG KONG

Research Interests

My research focuses on multi-messenger gravitational-wave lensing. Using Bayesian inference, I work mainly in identifying GW strong lensing and in building methods to combine dark siren GW observations with EM information for multi-messenger science.

Education

The Chinese University of Hong Kong 2023 – Present
Ph.D. in Physics
Supervised by Prof. Otto Hannuksela, Prof. Justin Janquart.

University of St Andrews 2018 – 2023
Integrated MPhys in Astrophysics (Hons), First Class
Supervised by Prof. Andrew Collier Cameron, Dr. Tom Wilson.
Thesis: *Partial eclipse of the heart for HD 181793.*

Experience

GOLUM Co-Lead 2023 – Present
LIGO Scientific Collaboration
Co-lead and analyst/developer for the GOLUM GW lensing parameter estimation pipeline.

- Run, verify and review GOLUM PE analyses of real LVK data in O4;
- Build, test and implement new features and handle code review process;
- Provide regular status and analysis reports to the working group;
- Manage day-to-day operations of the pipeline;
- Work closely with other pipelines and members of the Lensing working group to coordinate analysis efforts.

UG project mentor 2024 – Present
The Chinese University of Hong Kong
Mentor an undergraduate student through summer & final-year project on GW lensing.

Teaching Assistant 2023 – Present
The Chinese University of Hong Kong
Course: PHYS1110 Engineering Physics.

- Plan and teach weekly exercise and tutorial classes for 10-40 students, myself or in coordination with other TAs;
- Maintain weekly consultation hours and one-on-one student mentoring;
- Mark homework assignments;
- Assist with examination invigilation and marking.

Publications

Finding black holes: an unconventional multi-messenger Accepted
Laura Uronen, Tian Li, et al., Phil. Trans. A, *arXiv*.

What is the nature of GW230529? An exploration of the gravitational lensing hypothesis 2025
Justin Janquart **et al.**, *MNRAS*.

Dynamical mass determination and partial eclipses of the heartbeat star HD 181793 2024
Laura Uronen, Andrew Collier Cameron, Tom Wilson, *MNRAS*.

Skills

Languages: Native/fluent in Finnish, French, English; conversational in Spanish; basic Mandarin Chinese, German.
Coding languages: Python, FORTRAN, LaTeX.
Software/packages: Experience with GOLUM, bilby, lenstronomy, allesfitter, astropy.
Developer tools: VSCode, GitHub/GitLab.

Awards

Hong Kong PhD Fellowship Award 2023
Research Grants Council
Vice Chancellor's HKPFS Scholarship 2023
The Chinese University of Hong Kong
Student Staff Council Vacation Award 2023
University of St Andrews
Deans' List 2019 – 2021
University of St Andrews

Presentations

Contributed talks

- ***Finding black holes: an unconventional multi-messenger*** Mar 2024
  Royal Society Meeting for Gravitational Lensing, *Manchester, UK*
- ***Where's Waldo? A review of gravitational wave localisation*** Nov 2023
  Cosmic Frontiers Workshop, *HKSAR*

Posters

- Rubin Strong Lensing Workshop, *Oxford, UK* Mar 2024
- LVK F2F Meeting, *Toyama, Japan* Sept 2023

Seminars & other presentations
University of Amsterdam, Leiden University, UCLouvain, University of Glasgow, University of Portsmouth.

Outreach

- Organizing committee, CUHK Postgraduate Physics Society 2023 – Present
- Various roles, University of St Andrews Physics Society 2019 – 2023
- School Ambassador, University of St Andrews 2019 – 2023
- Physics Class Representative, University of St Andrews 2021 – 2022