Mike Y. M. Lau 劉睿明

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School of Physics and Astronomy, Monash University
OzGrav: The ARC Centre of Excellence for Gravitational Wave Discovery

Education

Sep 2019 – Present **Monash University**
Science PhD (Astrophysics), supervised by Ilya Mandel, Daniel J. Price, and Ryosuke Hirai.

Jan – Jun 2022 **Center for Computational Astrophysics (CCA), Flatiron Institute**
Research Analyst as part of the CCA Pre-Doctoral Program, supervised by Matteo Cantiello and Adam Jermyn.

Oct 2015 – Jul 2019 **The University of Oxford**
Master of Mathematical and Theoretical Physics with First Class (Parts A, B, & C)
Dissertation: *Detecting Double Neutron Stars with LISA* supervised by Ilya Mandel and Philipp Podsiadlowski

Research & Publications

Common envelopes in massive stars II: The distinct roles of hydrogen and helium recombination
Mike Y. M. Lau, Ryosuke Hirai, Daniel J. Price, Ilya Mandel
(arXiv:2206.06411; 2022). Submitted to *MNRAS*.

Common envelopes in massive stars: Towards the role of radiation pressure and recombination energy in ejecting red supergiant envelopes
Mike Y. M. Lau, Ryosuke Hirai, Miguel González-Bolívar, Daniel J. Price, Orsola De Marco, Ilya Mandel
MNRAS, Volume 512, Issue 4, pp.5462-5480 (2022).

Detecting Double Neutron Stars with LISA
Mike Y. M. Lau, Ilya Mandel, Alejandro Vigna-Gómez, Coenraad J. Neijssel, Simon Stevenson, Alberto Sesana
MNRAS, Volume 492, Issue 3, p.3061-3072 (2020).

Common envelope binary interaction simulations between a thermally-pulsating AGB star and a low mass companion
Miguel González-Bolívar, Orsola De Marco, **Mike Y. M. Lau**, Ryosuke Hirai, Daniel J. Price
Submitted to *MNRAS*.

Rejuvenated accretors have less bound envelopes: Impact of Roche lobe overflow on subsequent common envelope events
Mathieu Renzo, Emmanouil Zapartas, Stephen Justham, Katie Breivik, **Mike Y. M. Lau**, Robert J. Farmer, Matteo Cantiello, Brian D. Metzger
Submitted to *ApJ Letters*.

Astrophysics with the Laser Interferometer Space Antenna
Amaro-Seoane et al. (including **Mike Y. M. Lau**)
(arXiv:2203.06016; 2022). Submitted to *Living Reviews in Relativity*.

Rapid stellar and binary population synthesis with COMPAS
Team COMPAS: Jeff Riley et al. (including **Mike Y. M. Lau**)
ApJ Supplement, Volume 258, Issue 2, id.34, 30 pp (2022).

Neutron Star Extreme Matter Observatory: A kilohertz-band gravitational-wave detector in the global network
Ackley et al. (including **Mike Y. M. Lau**)
Publications of the Astronomical Society of Australia, Volume 37, article id. e047 (2020).

Two-Fluid Model of a Neutrino-Admixed Neutron Star
Research undertaken as part of the Summer Undergraduate Research Programme of The Chinese University of Hong Kong (CUHK) from Jun – Aug 2017, supervised by Professor Ming-Chung Chu.

Talks

Dec 2022	Gravitational Wave Physics and Astronomy Workshop (GWPAW, invited speaker)	*Melbourne*
24 Jun 2022	CCA Predoctoral Program Symposium	*CCA, Flatiron Institute*
3 Jun 2022	Physics and Astrophysics of Common Envelope	*Los Alamos National Laboratory*
10 Mar 2022	CCA Stars & Compact Objects Group Meeting	*CCA, Flatiron Institute*
3 Dec 2021	OzGrav Data/Astro Telecon	
1 Sep 2021	Common Envelope Physics and Outcomes (CEPO) 2021	*Virtual*
15 Jul 2021	ASA Annual Meeting 2021	*University of Melbourne*
1 Jul 2021	EAS Annual Meeting 2021	*Leiden, virtual*
19 Feb 2021	LISA Workshop (invited speaker)	*University of Auckland, remote*
1 Aug 2020	The 13th International LISA Symposium	*University of Auckland, remote*
6 Feb 2020	ANITA workshop and school 2020	*UNSW, Canberra*
10 Jan 2020	Gravitational Waves Group Meeting	*Cardiff University*
7 Jan 2020	Astrophysics Seminar	*University of Birmingham*
4 Dec 2019	2019 Stars in Melbourne	*Monash University*
17 Nov 2019	2019 OzGrav Annual Retreat	*Lorne, Melbourne*
1 Nov 2019	OzGrav Data/Astro Telecon	
16 Aug 2017	Summer Undergraduate Research Programme (poster)	*The Chinese University of Hong Kong*
30 Apr 2018	Physics Journal Club	*St Edmund Hall, University of Oxford*
29 Jul 2017	Cosmology Group Journal Club	*The Chinese University of Hong Kong*
13 Feb 2017	Second year physics presentations	*St Edmund Hall, University of Oxford*

Awards & Grants

28 Jun 2021	**Modelling radiation transport and convection in common-envelope evolution of massive stars, (lead chief investigator)** Granted 670 kSU on the NCI Astronomy Program for Q3/Q4, 2021, through the AAL Astronomy Supercomputer Time Allocation
23 Dec 2020	**Common-envelope evolution of massive stars (lead chief investigator)** Granted 544 kSU on the NCI Astronomy Program for Q1/Q2, 2021, through the AAL Astronomy Supercomputer Time Allocation

23 Oct 2019	J.L. William International PhD Scholarship	*Monash University*
18 Apr 2019	Research Training Program (RTP) Stipend	*Monash University*
18 Apr 2019	Monash International Tuition Scholarship (MITS)	*Monash University*
31 Jul 2019	Schools Prize	*St Edmund Hall, University of Oxford*
14 Aug 2017; 10 Sep 2018	Open Scholarship	*St Edmund Hall, University of Oxford*
13 Sep 2016	Open Exhibition	*St Edmund Hall, University of Oxford*
23 May 2016; 6 April 2017; 24 Apr 2018	Progress Prize	*St Edmund Hall, University of Oxford*
21 Aug 2015	Hong Kong Scholarship for Excellence (tuition)	*Hong Kong Government*
2010 – 2014	Academic Scholarship (full tuition)	*Renaissance College, Hong Kong*
27 Aug 2015	Chairman's Awards for Excellence	*English Schools Foundation*
2010 – 2014	Academic Excellence Award	*Renaissance College, Hong Kong*

Teaching

Nov – Dec 2021	Co-supervisor for summer student at Monash University
Feb – Jun 2021	TA for *ASP3051 Relativity and Cosmology*
Aug – Nov 2020	Tutor for *ASP3162 Computational Astrophysics and the Extreme Universe* under the Monash University Indigenous Academic Enhancement Program (IAEP)
Aug – Nov 2020	IAEP tutor for *ASP3012 Stars and Galaxies*

Aug – Sep 2020	Tutor for *MCD1180: Introductory Physics* under the Monash Indigenous Access Program (MIAP)
Apr – Jun 2020	IAEP tutor for *ASP3051 Relativity and Cosmology*
Apr – Jun 2020	IAEP tutor for *MAT9004 Mathematical Foundations for Data Science*
Feb – Jun 2020	TA for *ASP1010: Earth to Cosmos—Introductory Astronomy*

Outreach & Others

2022 – Present	Referee for The Astrophysical Journal Letters
Oct 2019 – Present	Organiser of weekly Whiteboard Sessions at Monash University School of Physics & Astronomy
6 Jul 2021	Dark Science holiday programme, Casey Tech School (Berwick)
4 Jul 2021	Black Hole Sunday, TwistED Science Centre, Echuca
16 Apr 2021	**OzGrav Interactive tech showcase, Bendigo Discovery Science and Technology Centre** Helper for space and gravitational wave-themed VR demonstrations
1 Dev 2019	**Monash Minimaker Faire** Helper for space and gravitational wave-themed VR demonstrations at an OzGrav booth in a science and technology fair
2018	Founder & organiser of St Edmund Hall Physics Journal Club
Aug 2017 – Present	**Academic and Scholarship Mentor at Project Access HK** Mentorship for talented, underprivileged students in Hong Kong who wish to read Physics at Oxford or Cambridge University and support for scholarship application.
Jun 2016 – May 2017	Treasurer of Oxford University Hong Kong Public Affairs and Social Services Society
Jul – Sep 2016	Admission Mentor at Norton House Education
Oct 2013 – Jun 2014	Tutor in the RCHK Young Math Talent Program

Software contributions

- Compact Object Mergers: Population Astrophysics and Statistics (COMPAS)
- PHANTOM: A smoothed particle hydrodynamics and magnetohydrodynamics code for astrophysics