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Joel Ong Jia Mian
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Curriculum Vitæ

Education

2016–present **Yale University**, *Ph.D. in Astronomy*, in progress, anticipated Summer 2022.
- M.Sc. and M.Phil. en route to Ph.D., 2018
- PhD Thesis: Stellar Surfaces in the Time Domain
- Advisor: Prof. Sarbani Basu

2012–2016 **National University of Singapore (NUS)**, *B.Sc. (Hons) in Physics.*
- Highest Distinction (First-Class Honours equivalent)
- Honours Thesis: Fermi-Walker Transport and EPR Correlation Experiments on Second-Order Tangent Bundles
- Advisor: Assoc. Prof. Kuldip Singh

2004–2009 **Hwa Chong Institution (HCI)**, *Singapore-Cambridge GCSE A-Levels (Integrated Programme).*

Research Positions

2016–present **Graduate Research Assistant**, *Astronomy Dept.*, Yale University.
- Basu Group: various projects in both theoretical and observational asteroseismology
- Fischer Group: data reduction, calibration, velocimetry software for the EXtreme PREcision Spectrograph (EXPRES)

Summer 2014 **Research Intern**, *Defence Medical & Environmental Research Institute (DMERI)*, DSO National Laboratories.
Numerical simulations for various dissipation and transport phenomena (project classified).
Advisor: Dr. Mun Cheok Hong

2012–2013 **Undergraduate Researcher**, *Special Programme in Science*, NUS.
Numerical raytracing and optical design for astronomical instrumentation.
Advisor: Dr. Abel Yang Jiahui

Grants, Fellowships and Awards

2020 Tinsley Award for Best 2019 Student Paper, *Astronomy Dept.*, Yale
(for Ong & Basu, 2019b)

2019, 2020 Dean's Fund for Research Workshops, Seminars and Colloquia, Yale
(US$1000, for organising the Yale Exoplanet Seminar)

2019 TESS Guest Investigator Cycle 2, NASA
(US$50,000, PI: D. Fischer; Co-Is: J. **Ong**, R. Roettenbacher; G022092
"Contemporaneous Photometric/Spectroscopic Characterisation of Stellar Surfaces")

2018-2019 Henry A. Smith Fellowship in Astronomy, Yale

2017 Singapore National Academy of Science Award (Physics)

2016 Institute of Physics Singapore Medal

2012–2016 Dean's List, *Faculty of Science*, NUS

Fall 2015 Senior Honour Roll, *University Scholars Programme*, NUS

2013–2015 Jurong Shipyard Book Prize (Physics)

2015 Diamond Jubilee Student Exchange Award, *Faculty of Science*, NUS

2014 Arthur Rajaratnam Prize in Experimental Physics, *Faculty of Science*, NUS

2011–2016 NUS Undergraduate (Merit) Scholarship

Publications

Metrics $h = 8$ on 21 abstracts with 220 citations (via NASA ADS)

1st-3rd Author Publications

9. **Ong**, J. M. J., Basu, S., Lund, M. N., et al. 2021, ApJ, 922, 18. arXiv: 2108.07370,
Mixed Modes and Asteroseismic Surface Effects: II. Subgiant Systematics

8. **Ong**, J. M. J., Basu, S., & Roxburgh, I. W. 2021, ApJ, 920, 8. arXiv: 2107.03405,
Mixed Modes and Asteroseismic Surface Effects: I. Analytic Treatment

7. **Ong**, J. M. J., Basu, S., & McKeever, J. M. 2021, ApJ, 906, 54. arXiv: 2011.01957,
Differential Modeling Systematics across the HR Diagram from Asteroseismic Surface Corrections

6. **Ong**, J. M. J., & Basu, S. 2020, ApJ, 898, 127. arXiv: 2006.13313,
Semianalytic Expressions for the Isolation and Coupling of Mixed Modes

5. Petersburg, R. R., **Ong**, J. M. J., Zhao, L. L., et al. 2020, AJ, 159, 187. arXiv: 2003.08851,
An Extreme-Precision Radial-Velocity Pipeline: First Radial Velocities from EXPRES

4. **Ong**, J. M. J., & Basu, S. 2019, ApJ, 885, 26. arXiv: 1909.02580,
Structural and Evolutionary Diagnostics from Asteroseismic Phase Functions

3. Blackman, R. T., **Ong**, J. M. J., & Fischer, D. A. 2019, AJ, 158, 40. arXiv: 1906.01653,
The Measured Impact of Chromatic Atmospheric Effects on Barycentric Corrections: Results from EXPRES

2. **Ong**, J. M. J., & Basu, S. 2019, ApJ, 870, 41. arXiv: 1811.06996,
Explaining Deviations from the Scaling Relationship of the Large Frequency Separation

1. Viani, L. S., Basu, S., **Ong**, J. M. J., Bonaca, A., & Chaplin, W. J. 2018, ApJ, 858, 28. arXiv: 1803.05924,
Investigating the Metallicity-Mixing-length Relation

Other Co-authored Publications

12. Huber, D., White, T. R., Metcalfe, T. S., et al. 2021, accepted to AJ. arXiv: 2108.09109,
A 20-Second Cadence View of Solar-Type Stars and Their Planets with TESS: Asteroseismology of Solar Analogs and a Re-characterization of π Men c

11. Cunha, M. S., Roxburgh, I. W., Aguirre Børsen-Koch, V., et al. 2021, MNRAS, 508, 5864. arXiv: 2110.03332,
PLATO hare-and-hounds exercise: asteroseismic model fitting of main-sequence solar-like pulsators

10. Hill, M. L., Kane, S. R., Campante, T. L., et al. 2021, AJ, 162, 211. arXiv: 2107.13583,
Asteroseismology of iota Draconis and Discovery of an Additional Long-period Companion

9. Chontos, A., Huber, D., Kjeldsen, H., et al. accepted to ApJ. arXiv: 2012.10797,
TESS Asteroseismology of α Mensae: Benchmark Ages for a G7 Dwarf and its M-dwarf Companion

8. Lillo-Box, J., Ribas, Á., Montesinos, B., et al. 2021, A&A, 653, A40. arXiv: 2106.05011,
Uncovering the ultimate planet impostor. An eclipsing brown dwarf in a hierarchical triple with two evolved stars

7. Nielsen, M. B., Davies, G. R., Ball, W. H., et al. 2021, AJ, 161, 62. arXiv: 2012.00580,
PBjam: A Python Package for Automating Asteroseismology of Solar-like Oscillators

6. Ball, W. H., Chaplin, W. J., Nielsen, M. B., et al. 2020, MNRAS, 499, 6084. arXiv: 2010.07323,
Robust asteroseismic properties of the bright planet host HD 38529

5. Brewer, J. M., Fischer, D. A., Blackman, R. T., et al. 2020, AJ, 160, 67. arXiv: 2006.02303,
EXPRES I. HD 3651 as an Ideal RV Benchmark

4. Jiang, C., Bedding, T. R., Stassun, K. G., et al. 2020, ApJ, 896, 65. arXiv: 2005.00272,
TESS Asteroseismic Analysis of the Known Exoplanet Host Star HD 222076

3. Blackman, R. T., Fischer, D. A., Jurgenson, C. A., et al. 2020, AJ, 159, 238. arXiv: 2003.08852,
Performance Verification of the EXtreme PREcision Spectrograph

2. Chaplin, W. J., Serenelli, A. M., Miglio, A., et al. 2020, NatAs, 4, 382. arXiv: 2001.04653,
Age Dating of an Early Milky Way Merger via Asteroseismology of the Naked-eye Star ν Indi

1. Huber, D., Chaplin, W. J., Chontos, A., et al. 2019, AJ, 157, 245. arXiv: 1901.01643,
A Hot Saturn Orbiting an Oscillating Late Subgiant Discovered by TESS

In Preparation

1. **Ong**, J. M. J., Roettenbacher, R. M., Henry, G. W., et al. in prep.,
EXPRES IV: Imaging Stellar Surfaces with Contemporaneous Spectroscopy and Photometry

2. **Ong**, J. M. J., Lund, M. N., Basu, S., et al. in prep.,
Helium Abundances from Ensemble Asteroseismology of the TESS Southern Continuous Viewing Zone

3. **Ong**, J. M. J., & Basu, S. in prep.,
Asymmetric Rotational Splitting in Red Giant Mixed Modes

4. Campante, T. L., Li, T., **Ong**, J. M. J., & Corsaro, E. in prep.,
Detailed Asteroseismic Modeling of High-luminosity Red-giant Branch Stars: The Paradigmatic Cases of the Host Stars KOI-3886 and ι Draconis

Others

1. Gaudi, S., Blackwood, G., Howard, A., et al. 2019, Bulletin of the American Astronomical Society, 51, 232,
Extreme Precision Radial Velocity Working Group

Scientific Presentations

Seminars and Colloquia

01/2022 Monday Science Seminar, University of Wisconsin – Madison
12/2021 The Good Vibrations Seminar, LESIA, Paris Observatory
11/2021 Stars and Compact Objects, Centre for Computational Astrophysics
10/2021 Special Programme in Science Seminar, National University of Singapore
09/2021 Astronomy Department Seminar, American Museum of Natural History
02/2021 iSIMBA Seminar, Aarhus University

Conference Presentations

01/2022 *Stellar Surfaces in the Frequency Domain* (dissertation); AAS 239
11/2021 *Asteroseismology* (invited panellist); Transport in Stellar Interiors, KITP
08/2021 *Helium Abundances from Subgiant Ensemble Asteroseismology* (contributed); TESS SciCon II, MIT
07/2019 *Structural and Evolutionary Diagnostics from Asteroseismic Phase Functions* (contributed); TASC V, MIT
07/2018 *Deviations from the Scaling Relation of the Large Frequency Separation* (contributed); TASC IV, Aarhus

Posters

10/2021 *Mixed Modes and the Asteroseismic Surface Term*; PLATO Conference 2021
08/2021 *Asteroseismology of the Red-giant Hosts KOI-3886 and ι Draconis*; Campante et al., TESS SciCon II
08/2021 *Red Giant Seismology: Seismic Signatures of Convective Overshoot*; Lindsay et al., TESS SciCon II
08/2019 *An EPRV Pipeline for EXPRES*; ERES V
01/2019 *PSF Modelling and Spectro-perfectionism for RV Spectrographs*; Petersburg et al., AAS 233
01/2019 *The Measured Impact of Chromatic Atmospheric Effects on Barycentric Corrections: Results from EXPRES*; Blackman et al., AAS 233
08/2018 *Diagnosing PPNU with a Laser Frequency Comb on EXPRES*; ERES IV
08/2017 *Effects of PPNU on Extreme Precision Wavelength Calibration with a LFC*; EPRV III and ERES III

Outreach Talks

2020 "Hearing Stars Like the Sun" — Astronomy On Tap New Haven
2019 "On the Discovery of Exoplanets" — Hwa Chong Institution, Singapore

Observing Experience

2019 Lowell Discovery Telescope (LDT, 4.3 m) with EXPRES

Teaching Experience

Fall 2020, 2018 **ASTR 550, Stellar Astrophysics**, Yale.
(graduate class) lectures, programming tutorials, and office hours, taught by Sarbani Basu

Summer 2020 **ASTR S120, Galaxies in the Universe**, Yale.
grading and discussion sections, taught by Robert Zinn

Fall 2019 **ASTR 210, Stars and their Evolution**, Yale.
grading and office hours, taught by Sarbani Basu

Spring 2018 **ASTR 180, Introduction to Relativity**, Yale.
grading and office hours, taught by Charles Bailyn

Fall 2017 **ASTR 255, Research Methods: Astrophysics**, Yale.
grading, programming tutorials (Python 3), and office hours, taught by Marla Geha

Spring 2017 **ASTR 160, Frontiers and Controversies in Astrophysics**, Yale.
grading, discussion sections, and homework help, taught by Marla Geha

Fall 2016 **ASTR 130, Origins and the Search for Life in the Universe**, Yale.
grading, discussion sections, and homework help, taught by Debra Fischer

Spring 2016 **SP3176, The Universe**, *Special Programme in Science*, NUS.
discussion sections, taught by Dr. Lim Zhi Han.

Fall 2015 **SP2174, Atoms to Molecules**, *Special Programme in Science*, NUS.
laboratory teaching and discussion sections, taught by Dr. Chammika Udalagama.

Fall 2015 **PC1142, Physics II**, *Laboratory Assistant*, NUS.
laboratory teaching and grading duties.

Research Supervision

Yale David Saunders (undergraduate, Fall 2020–); Chris Lindsay (Masters, Spring 2021–)

Service and Other Activities

Professional Service

2020– **Yale Stellar Astrophysics Journal Club**, *Organiser*.

2019– **Reviewer**, *A&A, YURJ*.

2018–2021 **Yale Exoplanet Seminar**, *Co-organiser*.

2020–2021 **Telescope Time Allocation Committee**, *Graduate Student Representative*, Yale Astronomy Dept.

2017 **ERES III**, *Scientific and Local Organising Committee*.

Institutional Service and Outreach

2018–present **Astronomy on Tap New Haven**, *Volunteer Treasurer and Presenter*.

2016–present **Ezra Stiles College**, *Graduate Affiliate*.

2018–2021 **Yale Astronomy Sibs**, *Co-founder, Organiser, and Mentor*.

2016–2019 **Leitner Family Observatory and Planetarium**, *Student Presenter*.

2017–2018 **Graduate Student Assembly**, *Department Representative*.

2015–2016 **University Scholars Programme, NUS**, *USP Peer Mentor*.

2014–2015 **NUS Astronomical Society**, *Academic Consultant*, NUS.

2015 **YHack CodeBlue**, *Student Instructor*, Yale University.

2014 **Asian Physics Olympiad 2014**, *Academic Committee Liaison*, Singapore.

2012 **International Biology Olympiad 2012**, *Team Liaison*, Singapore.

Military Service

2015–2016 **Singapore Armed Forces**, *Armoured Reconnaissance Trooper (Reservist)*.

2010–2012 **Singapore Armed Forces**, *Armoured Reconnaissance Trooper (Full-time National Service)*.