IAN WONG

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EDUCATION

PhD **Caltech** 2013-2018
Planetary Science
Thesis advisor: Michael E. Brown

B.A. **Princeton University** 2008-2012
Independent concentration (*Linguistics; Major GPA: 4.00*)
Graduated *magna cum laude* (*GPA: 3.98*)

RESEARCH AND WORK EXPERIENCE

NASA Postdoctoral Program Fellow August 2021-present
NASA Goddard Space Flight Center

***51 Pegasi b* Postdoctoral Fellow** June 2018-July 2021
Department of Earth, Atmospheric and Planetary Sciences, MIT

Research adviser
- Shiqi Chen: *Undergraduate Research Opportunities Program*, MIT 2020-present
- Prajwal Niraula: *Graduate Generals Project*, MIT 2019-present
- Aakash Mishra: *Research in Science & Engineering*, Boston University Summer 2018
- Angelica Zhou: *Summer Undergraduate Research Fellowship*, Caltech Summer 2017
- Yixiao Yan: *Summer Undergraduate Research Fellowship*, Caltech Summer 2015

Member of Scientific Organizing Committee, 52nd Annual DPS Conference 2020
Referee, AJ, PSJ, A&A, Icarus 2016-present
Graduate research assistant, Caltech 2013-2018
Teaching assistant, Caltech 2014-2018
- Ge 103: Introduction to the Solar System
- Ge 108: Applications of Physics to the Earth Sciences

Work intern Fall 2012
- *Advanced Propulsion Laboratory*, NASA Marshall Space Flight Center

Research intern
- *Undergraduate Student Research Program*, Princeton University Summer 2012
- *Program in Plasma Science and Technology*, PPPL Summers 2010 & 2011

PUBLICATIONS

First- and second-author papers (25)

1. Wong I, Benneke B, Gao P, et al. "HST+Spitzer transmission spectra of two cool exoplanets: WASP-29b and WASP-80b". AJ in prep (2022).
2. Wong I, Shporer A, Vissapragada S, et al. "TESS revisits WASP-12: Updated orbital decay rate and constraints on atmospheric variability". AJ submitted (2022). arXiv:2201.0837
3. Wong I, Shporer A, Zhou G, et al. "TOI-2109: An ultrahot gas giant on a 16 hr orbit". AJ 162 256 (2021).
4. Wong I, Kitzmann D, Shporer A, et al. "Visible-light phase curves from the second year of the TESS primary mission". AJ 162 127 (2021).
5. Beatty T G, Wong I, Fetherolf T, et al. "The TESS phase curve of KELT-1b suggests a high dayside albedo". AJ 160 211 (2020).
6. Wong I, Shporer A, Daylan T, et al. "Systematic phase curve study of known transiting exoplanet systems from Year 1 of the TESS Mission". AJ 160 155 (2020).
7. Wong I, Shporer A, Kitzmann D, et al. "Exploring the atmospheric dynamics of the extreme ultra-hot Jupiter KELT-9b using TESS photometry". AJ 160 88 (2020).
8. Wong I, Benneke B, Gao P, et al. "Optical to near-infrared transmission spectrum of the warm sub-Saturn HAT-P-12b". ApJ 159 234 (2020).
9. Wong I, Benneke B, Shporer A, et al. "*TESS* phase curve of the ultra-hot Jupiter WASP-19b". AJ 159 104 (2020).
10. Wong I, Shporer A, Becker J C, et al. "The full *Kepler* phase curve of the eclipsing hot white dwarf binary system KOI-964" ApJ 159 29 (2020).
11. Benneke B, Wong I, Piaulet C, et al. "Water vapor and clouds on the habitable-zone sub-Neptune exoplanet K2-18b". ApJL 887 L14 (2019).
12. Wong I, Mishra A, & Brown M E "Photometry of active Centaurs: Colors of dormant active Centaur nuclei" AJ 157 225 (2019).
13. Wong I & Brown M E. "Multiband observations of a Patroclus-Menoetius mutual event: Constraints on surface inhomogeneity". AJ 157 203 (2019).
14. Shporer A, Wong I, Huang C X, et al. "*TESS* full orbital phase curve of the WASP-18b system" AJ 157 178 (2019).
15. Wong I, Brown M E, Blacksberg J, Ehlmann B L, & Mahjoub A. "*Hubble* ultraviolet spectroscopy of Jupiter Trojans". AJ 157 161 (2019).
16. Wong I, Brown M E, & Emery J P. "0.7-2.5 μm spectra of Hilda asteroids". AJ 154 104 (2017).
17. Wong I & Brown M E. "The bimodal color distribution of small Kuiper Belt objects". AJ 153 145 (2017).
18. Wong I & Brown M E. "The color-magnitude distribution of Hilda asteroids: Comparison with Jupiter Trojans". AJ 153 69 (2017).
19. Wong I & Brown M E. "A hypothesis for the color bimodality of Jupiter Trojans". AJ 152 90 (2016).
20. Wong I, Knutson H A, Kataria T, et al. "3.6 and 4.5 μm *Spitzer* phase curves of the highly irradiated hot Jupiters WASP-19b and HAT-P-7b". ApJ 823 122 (2016).
21. Wong I & Brown M E. "The color-magnitude distribution of small Jupiter Trojans". AJ 150 174 (2015).
22. Wong I, Knutson H A, Lewis, N K, et al. "3.6 and 4.5 μm phase curves of the highly irradiated eccentric hot Jupiter WASP-14b". ApJ 811 122 (2015).
23. Wong I, Brown M E, & Emery J P. "The differing magnitude distributions of the two Jupiter Trojan color populations". AJ 148 112 (2014).

24. Wong I, Knutson H A, Cowan N B, et al. “Constraints on the atmospheric circulation and variability of the eccentric hot Jupiter XO-3b”. ApJ 794 134 (2014).
25. Wong I, Grigoriu A, Roslund J, Ho T S, & Rabitz H. "Laser-driven direct quantum control of nuclear excitations". Phys. Rev. A 84 053429 (2011).

Other co-author papers (20)

1. Addison B C, Knudstrup E, Wong I, et al. “TOI-1431b/MASCARA-5b: A highly irradiated ultra-hot Jupiter orbiting one of the hottest & brightest known exoplanet host stars”. AJ accepted (2021).
2. Cabot S H C, Bello-Arufe A, Mendoça J M, et al. “TOI-1518b: A misaligned ultra-hot Jupiter with iron in its atmosphere”. AJ 162 218 (2021).
3. Levison H F, Olkin C B, Noll, K S, et al. “Lucy Mission to the Trojan asteroids: Science goals”. PSJ 2 171 (2021).
4. Guerrero N M, Seager S, Huang C X, et al. “The TESS Objects of Interest catalog from the TESS Prime Mission”. ApJS 254 39 (2021).
5. Daylan T, Günther M N, Mikal-Evans T, et al. “TESS observations of the WASP-121b phase curve”. AJ 161 131 (2021).
6. Crossfield I J M, Dragomir D, Cowan N B, et al. “Phase curves of hot Neptune LTT 9779b suggest a high-metallicity atmosphere with nonzero albedo”. ApJL 903 L7 (2020).
7. Dragomir D, Crossfield I J M, Benneke B, et al. “Spitzer reveals evidence of molecular absorption in the atmosphere of the hot Neptune LT9779b”. ApJL 903 L6 (2020).
8. Chachan Y, Jontof-Hutter D, Knutson H A, et al. "A featureless infrared transmission spectrum for the super-puff planet Kepler-79d". AJ 160 201 (2020).
9. Teske J, Días M R, Luque R, et al. "TESS reveals a short-period sub-Neptune sibling (HD 86226c) to a known long-period giant planet". AJ 160 96 (2020).
10. Huang C X, Quinn S N, Vanderburg A, et al. “*TESS* spots a hot Jupiter with an inner transiting Neptune”. ApJL 892 L7 (2020).
11. Mansfield M, Bean J L, Stevenson K B, et al. “Evidence for H_2 dissociation and recombination heat transport in the atmosphere of KELT-9b”. ApJL 888 L15 (2020).
12. Chachan Y, Knutson H A, Gao P, et al. “A *Hubble* PanCET study of HAT-P-11b: A cloudy Neptune with a low atmospheric metallicity” AJ 158 244 (2019).
13. Zhou G, Huang C X, Bakos G Á, et al. “Two new HATNet hot Jupiters around A stars, and the first glimpse at the occurrence rate of hot Jupiters from *TESS*” AJ 158 141 (2019).
14. Benneke B, Knutson H A, Lothringer J, et al. “A Sub-Neptune atmosphere with solar water abundance, strong methane depletion, and Mie-scattering aerosols”. Nature Astronomy 3 813 (2019).
15. Rodriguez J E, Quinn S N, Huang C X, et al. “An eccentric massive Jupiter orbiting a sub-giant on a 9.5 day period discovered in the *Transiting Exoplanet Survey Satellite* Full Frame Images”. ApJ 157 191 (2019).
16. Poston M J, Mahjoub A, Ehlmann B L, et al. “Visible near-infrared spectral evolution of irradiated mixed ices and application to Kuiper Belt objects and Jupiter Trojans”. ApJ 856 124 (2018).
17. Ingalls J G, Krick J E, Carey S J, et al. “Repeatability and accuracy of exoplanet eclipse depths measured with post-cryogenic *Spitzer*”. AJ 152 44 (2016).
18. Krick J E, Ingalls J, Carey S, et al. “*Spitzer* IRAC sparsely sampled phase curve of the exoplanet WASP-14b”. ApJ 824 27 (2016).
19. Beichman, C, Livingston, J, Werner W, et al. “*Spitzer* observations of exoplanets discovered with the *Kepler* K2 mission”. ApJ 822 39 (2016).
20. Buhler, P B, Knutson H A, Batygin, K, et al. “Dynamical constraints on the core mass of hot Jupiter HAT-P-13b”. ApJ 821 26 (2016).

OBSERVING EXPERIENCE

(PI programs, unless otherwise indicated)

Magellan Observatory

- 2019A+2019B+2020A+2021A (2.5 nights, IMACS/LDSS-3)
  "Colors of active Centaurs: A window into KBO formation and composition"
- 2020A+2021A (1 night, IMACS)
  "Probing the purported Ennomos collisional family in the Jupiter Trojans"
- 2019B+2020B (3 nights, PFS)
  "Exploring the desert: Precise radial velocity confirmation of TESS sub-Saturn candidates"

Cerro Tololo Inter-American Observatory (CTIO)

- 2022A (10 hours, CHIRON)
  "Radial velocity characterization of the massive outer companions in the TOI-618 and TOI-2488 systems"
- 2021B (10 hours, CHIRON)
  "Long-term RV monitoring of the benchmark multiplanet system TOI-618"
- 2019A+2019B+2020A (80 hours, CHIRON)
  "Exploring the desert: Precise radial velocity confirmation of TESS sub-Saturn candidates"

NASA Infrared Telescope Facility (IRTF)

- 2020B+2021B (4 nights; SpeX)
  "Constraining the composition and origin of Hilda asteroids: Exploring the 3-micron feature"
- 2016A & 2016B (7 nights; SpeX)
  "Near-infrared spectra of bright Hilda asteroids: Probing the Hilda-Trojan connection"

Hubble Space Telescope (HST)

- Cycle 25 GO-15249 (7 orbits; STIS)
  "An observational test of the dynamical instability hypothesis in the Solar System"

Palomar 200-inch Hale Telescope

- 2017A & 2017B (4 nights; LFC)
  "Colors and activity of Centaurs"
- 2018A (2 nights; WASP)
  "Photometric observations of mutual events of the Trojan binary Patroclus-Menoetius"

Co-I programs and other observing experience:
4 nights at Palomar 200-inch Hale Telescope (LFC), 3 nights at Subaru Telescope (SuprimeCam, Hyper SuprimeCam), 5 nights at Keck Observatory (NIRSPEC)

CONFERENCE AND SEMINAR TALKS

1. "TOI-2109b: The shortest period gas giant yet discovered", *CHAMPS Early Career Highlight Seminar, 2022, online conference*.
2. "Observational confirmation and characterization of the Ennomos collisional family", *53rd DPS Meeting, 2021, online conference.*
3. "TOI-2109b: The shortest period gas giant yet discovered", *TESS Science Conference 2, 2021, online conference*.
4. "Ultra-hot Jupiters in the era of TESS", *JPL Exoplanet Journal Club, 2021.* [invited talk]
5. "Exoplanet phase curves from TESS: Results from the Primary Mission and future prospects", *AAS Meeting #237, 2021, online conference.*
6. "Exoplanet phase curves from TESS: Results from the Primary Mission and future prospects", *52nd DPS Meeting, 2020, online conference.*
7. "Icy bodies in the middle and outer Solar System: Tracers of planetary migration", *Star and Planet Formation Colloquium, October 2020, University of Michigan.* [invited talk]
8. "Systematic phase curve study of known transiting systems from the TESS Primary Mission", *Exoplanet III, 2020, online conference.*
9. "Phase curve studies of known transiting systems with TESS", *TESS Science Conference 1, 2019, Cambridge, Massachusetts.*
10. "UV spectroscopy of Jupiter Trojans", *50th DPS Meeting, 2018, Knoxville, Tennessee*.
11. "The Trojan-Hilda-KBO connection: An observational test of solar system evolution models", *The Transneptunian Solar System, 2018, Coimbra, Portugal.* [invited talk]
12. "The Trojan-Hilda-KBO connection: An observational test of solar system evolution models", *AGU Fall Meeting, 2017, New Orleans, Louisiana*.
13. "The Trojan-Hilda-KBO connection: An observational test of solar system evolution models", *49th DPS Meeting, 2017, Provo, Utah*.
14. "Near-infrared transmission spectra of three cool giant gas exoplanets", *ExSoCal 2016, Pasadena, California.*
15. "Multiband *Spitzer* phase curves of three highly-irradiated hot Jupiters", *AAS Meeting #227, 2016, Kissimmee, Florida.* [invited talk]
16. "The color-magnitude distribution of small Kuiper Belt objects", *47th DPS Meeting, 2015, National Harbor, Maryland.*
17. "Multiband *Spitzer* phase curves of three highly-irradiated hot Jupiters", *11th Rencontres du Vietnam, Planetary Systems: A Synergistic View, 2015, Quy Nhon, Vietnam.*
18. "Sub-populations among the Jupiter Trojans", *Asteroids, Comets, and Meteors, 2014, Helsinki, Finland*.

CONFERENCE POSTERS

1. "Exoplanet phase curves from TESS: Results from the Primary Mission and future prospects", *TESS Science Conference 2, 2021, online conference*.
2. "TESS in the Solar System: Refining asteroid light curves with long-baseline photometry", *EPSC-DPS Joint Meeting, 2019, Geneva, Switzerland.*
3. "Phase curve studies of known transiting systems with TESS"*, Extreme Solar Systems IV, 2019, Reykjavik, Iceland.*
4. "A comparison of Hildas and Jupiter Trojans using photometry, spectroscopy, and size distributions", *48th DPS Meeting, 2016, Pasadena, California.*
5. "Near-infrared transmission spectra of three cool giant gas exoplanets", *ExoClimes 2016, Squamish, Canada.*
6. "The color-magnitude distribution of small Jupiter Trojans", *46th DPS Meeting, 2014, Tucson, Arizona.*

PUBLIC TALKS

1. "Opening a new chapter of exoplanet science with JWST", *Edelman Planetarium, Rowan University, 2021.*
2. "Opening a new chapter of exoplanet science with JWST", *Brown Planetarium, Ball State University, 2021.*

COMPUTER AND OTHER SKILLS

Programming: Python, IDL, MATLAB, FORTRAN
Applications: GitHub, LaTeX, Microsoft Office, ArcGIS, LabVIEW
Laboratory skills: basic machine shop skills, laboratory electronics, lasers

REFERENCES

Michael Brown
Professor of Planetary Astronomy
Division of Geological and Planetary Sciences
California Institute of Technology
1200 E California Blvd
Pasadena, CA 91125 USA
mbrown@caltech.edu
Relationship: PhD thesis adviser and collaborator on solar system small bodies research

Heather Knutson
Professor of Planetary Science
Division of Geological and Planetary Sciences
California Institute of Technology
1200 E California Blvd
Pasadena, CA 91125 USA
hknutson@caltech.edu
Relationship: Graduate research adviser and collaborator on exoplanet characterization

Avi Shporer
Research Scientist
MIT Kavli Institute
Massachusetts Institute of Technology
77 Massachusetts Ave.
Cambridge, MA 02139 USA
shporer@space.mit.edu
Relationship: TESS Science Team member and collaborator on exoplanet phase curve research

Richard Binzel
Professor of Planetary Sciences
Department of Earth, Atmospheric and Planetary Sciences
Massachusetts Institute of Technology
77 Massachusetts Ave.
Cambridge, MA 02139 USA
rpb@mit.edu
Relationship: NASA Lucy Mission Science Team member and former postdoctoral fellowship supervisor

Stefanie Milam
Research scientist
Astrochemistry Laboratory (Code 691)
NASA Goddard Space Flight Center
Greenbelt, MD 20771
stefanie.n.milam@nasa.gov
Relationship: Current NPP supervisor