

Hsiang-Chih Hwang

Curriculum Vitae / April, 2024

Institute for Advanced Study
School of Natural Sciences
ORCID: [0000-0003-4250-4437](https://orcid.org/0000-0003-4250-4437)
[Google Scholar link](#)

hchwang@ias.edu
<http://www.hwang-astro.me/>
Twitter: [@hc_hwang](https://twitter.com/hc_hwang)

Research Interests

Binary stars, triple stars, active galactic nuclei, binary quasars (binary supermassive black holes), Bayesian inference, machine learning

Employment

Institute for Advanced Study, independent postdoctoral fellow 2021 - present

Education

Johns Hopkins University, Ph.D. in Physics & Astronomy 2016 - 2021

Thesis advisor: Nadia L. Zakamska

Thesis: The birth and the fate of close and wide binary stars

National Taiwan University, BS in Physics and BE in Electrical Engineering 2010 - 2015

Awards

Gardner Fellowship, Johns Hopkins University 2018

Presidential Award, National Taiwan University 2011, 2015

Publications

(Total 38 papers. First-author: 11. Second-author: 13)

A. First-author publications:

[11] **Hwang, Hsiang-Chih**; Ting, Yuan-Sen; Cheng, Sihao; Speagle, Joshua:

[Dynamical masses across the Hertzsprung-Russell diagram](#)

2024, MNRAS, 528, 4272

<https://ui.adsabs.harvard.edu/abs/2024MNRAS.528.4272H/abstract>

[10] **Hwang, Hsiang-Chih**:

[The mystery in Gaia DR3 triples: occurrence rates, orientations, and eccentricities of wide tertiaries around close binaries](#)

2023, MNRAS, 518, 1750

<https://ui.adsabs.harvard.edu/abs/2023MNRAS.518.1750H/abstract>

[9] **Hwang, Hsiang-Chih**; El-Badry, Kareem; Rix, Hans-Walter; Hamilton, Chris; Ting, Yuan-Sen; Zakamska, Nadia L.:

[Wide twin binaries are extremely eccentric: evidence of twin binary formation in circumbinary disks](#)

2022, ApJ Letter, 933, L32

<https://ui.adsabs.harvard.edu/abs/2022ApJ...933L..32H/abstract>

Media mentions: [AAS Nova](#)

[8] **Hwang, Hsiang-Chih**; Ting, Yuan-Sen; Zakamska, Nadia L.:

[The eccentricity distribution of wide binaries and their individual measurements](#)

2022, MNRAS, 512, 3383

<https://ui.adsabs.harvard.edu/abs/2022MNRAS.512.3383H/abstract>

[7] **Hwang, Hsiang-Chih**; Ting, Yuan-Sen; Conroy, Charlie; Zakamska, Nadia L.; El-Badry, Kareem; Cargile, Phillip; Zaritsky, Dennis; Chandra, Vedant; Han, Jiwon Jesse; Speagle, Joshua S.; Bonaca, Ana: [Wide binaries from the H3 survey: the thick disk and halo have similar wide binary fractions](#)

2022, MNRAS, 513, 754

<https://ui.adsabs.harvard.edu/abs/2022MNRAS.513..754H/abstract>

[6] **Hwang, Hsiang-Chih**; Ting, Yuan-Sen; Schlafman, Kevin C.; Zakamska, Nadia; Wyse, Rosemary: [The non-monotonic, strong metallicity dependence of the wide-binary fraction](#)

2021, MNRAS, 501, 4329

<https://ui.adsabs.harvard.edu/abs/2021MNRAS.501.4329H/abstract>

[5] **Hwang, Hsiang-Chih**; Hamer, Jacob H.; Zakamska, Nadia L.; Schlafman, Kevin C.: [Very wide companion fraction from Gaia DR2: a weak or no enhancement for hot jupiter hosts, and a strong enhancement for contact binaries](#)

2020, MNRAS, 497, 2250-2259

<https://ui.adsabs.harvard.edu/abs/2020MNRAS.497.2250H/abstract>

[4] **Hwang, Hsiang-Chih**; Zakamska, Nadia L.:

[Lifetime of short-period binaries measured from their Galactic kinematics](#)

2020, MNRAS, 493, 2271-2286

<https://ui.adsabs.harvard.edu/abs/2020MNRAS.493.2271H/abstract>

[3] **Hwang, H.-C.**; Shen, Y.; Zakamska, N. L.; Liu, Xin:

[Varstrometry for Off-nucleus and Dual sub-Kpc AGN \(VODKA\): Methodology and Initial Results with Gaia DR2](#)

2020, ApJ, 888, 73

<https://ui.adsabs.harvard.edu/abs/2020ApJ...888...73H/abstract>

[2] **Hwang, H.-C.**; Barrera-Ballesteros, J.; Heckman, T. M.; Rowlands, K.; Lin, L.; Rodriguez-Gomez, V.; Pan, H.-A.; Hsieh, B.-C.; Sanchez, S.; Bizyaev, D.; Sanchez Almeida, J.; Thilker, D. A.; Lotz, J. M.; Jones, A.; Nair, P.; Andrews, B. H.; Drory, N.:

[Anomalously low metallicity regions in MaNGA star-forming galaxies: Accretion Caught in Action?](#)

2019, ApJ, 872, 144

<http://ui.adsabs.harvard.edu/abs/2019ApJ...872..144H>

[astrobites article](#)

[1] **Hwang, H.-C.**; Zakamska, N. L.; Alexandroff, R. M.; Hamann, F.; Greene, J. E.; Perrotta, S.; Richards, G. T.:

[Winds as the origin of radio emission in \$z=2.5\$ radio-quiet extremely red quasars](#)

2018, MNRAS, 477, 830-844

<http://ui.adsabs.harvard.edu/abs/2018MNRAS.477..830H>

B. Co-author publications: ((Co-)Advisee authors are indicated by an asterisk.)

- [27] Arseneau, Stefan; Chandra, Vedant; **Hwang, Hsiang-Chih**; Zakamska, Nadia L.; Adamane Pallathadka, Gautham; Crumpler, Nicole R.; Hermes, J. J.; El-Badry, Kareem; Rix, Hans-Walter; Stassun, Keivan G.; Gaensicke, Boris T.; Brownstein, Joel R.; Morrison, Sean:
[Measuring The Mass-Radius Relation of White Dwarfs Using Wide Binaries](#)
2024, accepted for publication in ApJ
<https://arxiv.org/abs/2310.19866>
- [26] Pallathadka, Gautham Adamane; Chandra, Vedant; Zakamska, Nadia; **Hwang, Hsiang-Chih**; Zenati, Yossef; Hermes, J. J.; El-Badry, Kareem; Gaensicke, Boris T.; Morrison, Sean; Crumpler, Nicole R.; Arseneau, Stefan:
[Discovery of a proto-white dwarf with a massive unseen companion](#)
2023, submitted to AAS journal
<https://arxiv.org/abs/2310.16313>
- [25] Inight, K.; Gänsicke, Boris T.; Schwöpe, A.; Anderson, S. F.; Badenes, C.; Breedt, E.; Chandra, V.; Davies, B. D. R.; Gentile Fusillo, N. P.; Green, M. J.; Hermes, J. J.; Achaica Huamani, I.; **Hwang, H.**; et al.:
[Cataclysmic Variables from Sloan Digital Sky Survey V -- the search for period bouncers continues](#)
2023, MNRAS, 525, 3597
<https://ui.adsabs.harvard.edu/abs/2023MNRAS.525.3597I/abstract>
- [24] Chen, Yu-Ching; Liu, Xin; Lazio, Joseph; Breiding, Peter; Burke-Spolaor, Sarah; **Hwang, Hsiang-Chih**; Shen, Yue; Zakamska, Nadia L.:
[Varstrometry for Off-nucleus and Dual Sub-kpc AGN \(VODKA\): Very Long Baseline Array Searches for Dual or Off-nucleus Quasars and Small-scale Jets](#)
2023, ApJ, 958, 29
<https://ui.adsabs.harvard.edu/abs/2023ApJ...958...29C/abstract>
- [23] Li, Junyao; Liu, Xin; Shen, Yue; Oguri, Masamune; Gross, Arran C.; Zakamska, Nadia L.; Chen, Yu-Ching; **Hwang, Hsiang-Chih**:
[Varstrometry for Off-nucleus and Dual sub-Kpc AGN \(VODKA\). SDSS J1608+2716: A Sub-arcsec Quadruply Lensed Quasar at \$z=2.575\$](#)
2023, ApJL, 955, L16
<https://ui.adsabs.harvard.edu/abs/2023ApJ...955L..16L/abstract>
- [22] Gross, Arran C.; Chen, Yu-Ching; Foord, Adi; Liu, Xin; Shen, Yue; Oguri, Masamune; Goulding, Andy; **Hwang, Hsiang-Chih**; Zakamska, Nadia; Ma, Yilun; Nolan, Liam:
[Varstrometry for Off-nucleus and Dual sub-Kpc AGN \(VODKA\): Investigating the Nature of J0823+2418 at \$z=1.81\$: a Likely Lensed Quasar](#)
2023, ApJ, 956, 117
<https://ui.adsabs.harvard.edu/abs/2023ApJ...956..117G/abstract>
- [21] Xu, Siyao; **Hwang, Hsiang-Chih**; Hamilton, Chris; Lai, Dong:
[Wide binary stars formed in the turbulent interstellar medium](#)
2023, ApJL, 949, L28
<https://ui.adsabs.harvard.edu/abs/2023ApJ...949L..28X/abstract>
- [20] Liu, Yiqi*; **Hwang, Hsiang-Chih**; Zakamska, Nadia L.; Thorstensen, John R.:
[CSS1603+19: a low-mass polar near the cataclysmic variable period minimum](#)
2023, MNRAS, 522, 2719

<https://ui.adsabs.harvard.edu/abs/2023MNRAS.522.2719L/abstract>

[19] Chen, Yu-Ching ; Liu, Xin ; Foord, Adi ; Shen, Yue ; Chen, Nianyi ; Holgado, Miguel ; Di Matteo, Tiziana ; Oguri, Masamune ; **Hwang, Hsiang-Chih** ; Zakamska, Nadia:

[A Close Quasar Pair in a Disk-Disk Galaxy Merger at \$z = 2.17\$](#)

2023, Nature, 616, 45

<https://www.nature.com/articles/s41586-023-05766-6>

Media mentions: [NASA](#), [ESA](#), [UIUC](#)

[18] Shen, Yue ; **Hwang, Hsiang-Chih** ; Oguri, Masamune ; Chen, Nianyi ; Di Matteo, Tiziana ; Ni, Yueying ; Bird, Simeon ; Zakamska, Nadia ; Liu, Xin ; Chen, Yu-Ching ; Kratter, Kaitlin M.:

[Statistics of Galactic-Scale Quasar Pairs at Cosmic Noon](#)

2023, ApJ, 943, 38

<https://ui.adsabs.harvard.edu/abs/2023ApJ...943...38S/abstract>

[17] Cañas, Caleb I.; Kanodia, Shubham; Bender, Chad F.; Mahadevan, Suvrath; Stefánsson, Guðmundur; Cochran, William D.; Lin, Andrea S. J.; **Hwang, Hsiang-Chih**; et al.:

[TOI-3714 b and TOI-3629 b: Two gas giants transiting M dwarfs confirmed with HPF and NEID](#)

2022, AJ, 164, 50

<https://ui.adsabs.harvard.edu/abs/2022AJ....164...50C/abstract>

[16] Fezenko, Gavin. B.* , **Hwang, Hsiang-Chih**; Zakamska, Nadia L.:

[Enhancement of Double-Close-Binary Quadruples](#)

2022, MNRAS, 511, 3881

<https://ui.adsabs.harvard.edu/abs/2022MNRAS.511.3881F/abstract>

[15] Chandra, Vedant ; **Hwang, Hsiang-Chih** ; Zakamska, Nadia L. ; Blouin, Simon ; Swan, Andrew ; Marsh, Thomas R. ; Shen, Ken J. ; Gänsicke, Boris T. ; Hermes, J. J. ; Putterman, Odelia ; Bauer, Evan B. ; Petrosky, Evan ; Dhillon, Vikram S. ; Littlefair, Stuart P. ; Ashley, Richard P.:

[The SNIa Runaway LP 398-9: Detection of Circumstellar Material and Surface Rotation](#)

2022, MNRAS, 512, 6122

<https://ui.adsabs.harvard.edu/abs/2022MNRAS.512.6122C/abstract>

[14] Chen, Yu-Ching ; **Hwang, Hsiang-Chih** ; Shen, Yue ; Liu, Xin ; Zakamska, Nadia L. ; Yang, Qian ; Li, Jennifer I.:

[Varstrometry for Off-nucleus and Dual sub-Kpc AGN \(VODKA\): Hubble Space Telescope Discovers Double Quasars](#)

2022, ApJ, 925, 162

<https://ui.adsabs.harvard.edu/abs/2022ApJ...925..162C/abstract>

[13] Chandra, Vedant ; **Hwang, Hsiang-Chih** ; Zakamska, Nadia L. ; Gaensicke, Boris T. ; Hermes, J. J. ; Schwobe, Axel ; Badenes, Carles ; Tovmassian, Gagik ; Bauer, Evan B. ; Maoz, Dan ; Schreiber, Matthias R. ; Toloza, Odette F. ; Inight, Keith P. ; Rix, Hans-Walter ; Brown, Warren R.:

[A 99-minute Double-lined White Dwarf Binary from SDSS-V](#)

2021, ApJ, 921, 160

<https://ui.adsabs.harvard.edu/abs/2021ApJ...921..160C/abstract>

[12] Petrosky, Evan*; **Hwang, Hsiang-Chih**; Zakamska, Nadia L.; Chandra, Vedant; Hill, Matthew J.:

[Variables, periodic variables and contact binaries in WISE](#)

2021, MNRAS, 503, 3975

<https://ui.adsabs.harvard.edu/abs/2021MNRAS.503.3975P/abstract>

[11] Luo, Yuanze; Heckman, Timothy; **Hwang, Hsiang-Chih**; Rowlands, Kate; et al.:
[Evidence for the Accretion of Gas in Star-Forming Galaxies: High N/O Abundances in Regions of Anomalously-Low Metallicity](#)

2021, ApJ, 908, 183

<https://ui.adsabs.harvard.edu/abs/2021ApJ...908..183L/abstract>

[10] Shen, Yue; Chen, Yu-Ching; **Hwang, Hsiang-Chih**; Liu, Xin; Zakamska, Nadia; Oguri, Masamune; Li, Jennifer I-Hsiu:

[A hidden population of high-redshift close quasar pairs unveiled by astrometry](#)

2021, Nature Astronomy, 5, 569

<https://ui.adsabs.harvard.edu/abs/2021NatAs...5..569S/abstract>

Media mentions: [Hubble](#), [NOIRLab](#), [Nature Blog](#), [JHU](#), [UIUC](#)

[9] Chandra, Vedant*; **Hwang, Hsiang-Chih**; Zakamska, Nadia L.; Cheng, Sihao:

[A Gravitational Redshift Measurement of the White Dwarf Mass-Radius Relation](#)

2020, ApJ, 899, 146

<https://ui.adsabs.harvard.edu/abs/2020ApJ...899..146C/abstract>

Media mentions: [JHU Hub](#), [Science News](#), [Space Daily](#), [Today Headline](#), [Nerdist](#)

[8] Chandra, Vedant*; **Hwang, Hsiang-Chih**; Zakamska, Nadia L.; Budavári, Tamás:

[Computational Tools for the Spectroscopic Analysis of White Dwarfs](#)

2020, MNRAS, 497, 2688-2698

<https://ui.adsabs.harvard.edu/abs/2020MNRAS.497.2688C/abstract>

[7] Shen, Y.; **Hwang, H.-C.**; Zakamska, N. L.; Liu, Xin:

[Varstrometry for Off-nucleus and Dual sub-Kpc AGN \(VODKA\): How Well-centered Are Low-z AGN?](#)

2019, ApJL, 885, L4

<https://ui.adsabs.harvard.edu/abs/2019ApJ...885L...4S/abstract>

[6] Lee, C.-F.; Kwon, W.; Jhan, K.-S.; Hirano, N.; **Hwang, H.-C.**; Lai, S.-P.; Ching, T.-C.; Rao, R.; Ho, P. T. P.

[A Pseudodisk Threaded with a Toroidal and Pinched Poloidal Magnetic Field Morphology in the HH 211 Protostellar System](#)

2019, ApJ, 879, 101

<https://ui.adsabs.harvard.edu/abs/2019ApJ...879..101L/abstract>

[5] Sánchez-Menguiano, L.; Sánchez Almeida, J.; Muñoz-Tuñón, C.; Sánchez, S. F.; Filho, M.; **Hwang, H.-C.**; Drory, N.

[Characterizing the local relation between star formation rate and gas-phase metallicity in MaNGA spiral galaxies](#)

2019, ApJ, 882, 9

<https://ui.adsabs.harvard.edu/abs/2019ApJ...882....9S/abstract>

[4] Lee, C.-F.; **Hwang, H.-C.**; Ching, T.-C.; Hirano, N.; Lai, S.-P.; Rao, R.; Ho, P. T. P.:

[Unveiling a magnetized jet from a low-mass protostar](#)

2018, Nature Communications, 9, 4636

<http://ui.adsabs.harvard.edu/abs/2018NatCo...9.4636L>

Media mentions: [Liberty Times Net](#), [ALMA Kids](#)

[3] Rowlands, K.; Heckman, T.; Wild, V.; Zakamska, N. L.; Rodriguez-Gomez, V.; Barrera-Ballesteros, J.; Lotz, J.; Thilker, D.; Andrews, B. H.; Boquien, M.; Brinkmann, J.; Brownstein, J. R.; **Hwang, H.-C.**; Smethurst, R.:

[SDSS-IV MaNGA: spatially resolved star formation histories and the connection to galaxy physical properties](#)

2018, MNRAS, 480, 2544-2561

<http://ui.adsabs.harvard.edu/abs/2018MNRAS.480.2544R>

[2] Lee, C.-F.; **Hwang, H.-C.**; Li, Z.-Y.:

[Angular momentum loss in the envelope-disk transition region of HH 111 protostellar system: evidence for magnetic braking?](#)

2016, ApJ, 826, 213

<http://ui.adsabs.harvard.edu/abs/2016ApJ...826..213L>

[1] Lee, C.-F.; Rao, R.; Ching, T.-C.; Lai, S.-P.; Hirano, N.; Ho, P. T. P.; **Hwang, H.-C.**:

[Magnetic field structure in the flattened envelope and jet in the young protostellar system HH 211](#)

2014, ApJ, 797, L9

<http://ui.adsabs.harvard.edu/abs/2014ApJ...797L...9L>

Successful PI Proposals

P. I.: Hsiang-Chih Hwang

Co-I.: Nadia L. Zakamska, Vedant Chandra

Gemini Observatory, Program: GN-2020A-FT-103, GS-2020A-FT-101

“Discovery of mass-dependent gravitational redshifts in white dwarfs”

P. I.: Hsiang-Chih Hwang

Co-I.: Nadia L. Zakamska, Yue Shen, Xin Liu

Hubble Space Telescope Cycle 27, Program: 15900

“Discovery of Sub-kpc Dual Active Galactic Nuclei from Gaia”

P. I.: Hsiang-Chih Hwang

Co-I.: Nadia L. Zakamska

Gemini Observatory, Program: GN-2018B-FT-115

“A nearby candidate of type Ia supernova progenitor?”

P. I.: Hsiang-Chih Hwang

Co-I.: Nadia L. Zakamska

Apache Point Observatory, Program: 1Q2019-JH02

“Search for type Ia supernova progenitors and exotic binaries”

P. I.: Hsiang-Chih Hwang

Co-I.: Nadia L. Zakamska, Andy Goulding

XMM-Newton telescope, Program: 84325

“The mysterious IR emitter around a magnetized white dwarf”

P. I.: Hsiang-Chih Hwang

Co-I.: Nadia L. Zakamska, John Thorstensen

Gemini Observatory, Program: GN-2019A-Q-322

“The mysterious infrared emitter around a white dwarf”

P. I.: Hsiang-Chih Hwang

Co-I.: Kirsten Hall, Nadia L. Zakamska

Apache Point Observatory, Program: 4Q2018-JH02

“Search for compact WD-WD binaries and other exotic stellar systems”

Undergraduate Mentorship

Katherine Song	2022
Stefan Arseneau	2022 – 2023
Yiqi (Andrew) Liu (1 paper published)	2021 – 2023
Brandon Stride	2020 – 2022
Vedant Chandra (2019 Dean's Undergraduate Research Award, 3+ papers published)	2018 – 2021
Evan Petrosky (1 paper published)	2019 – 2021
Gavin Fezenko (1 paper published)	2020 – 2022
Matt Kleiman	2020
Mansha Kapur	2020
Carsten Langholm	2020
Shuchen Zhang	2019

Talks, Conferences, and Workshops

Liverpool Virtual Seminar Series on Data Intensive Science, <i>invited speaker</i>	Dec 2023
Thunch at Princeton University, <i>speaker</i>	Nov 2023
Gaia Tutorial workshop, ASIAA, Taipei, <i>invited speaker</i>	Sep 2022
Seminar at Institute for Advanced Study, Princeton, <i>speaker</i>	Apr 2022
53 rd Annual Meeting of Division on Dynamical Astronomy, New York, <i>speaker</i>	Apr 2022
Bahcall lunch at Institute for Advanced Study, Princeton, <i>speaker</i>	Sep 2021
Open dissertation, virtual, <i>speaker</i>	Jul 2021
Talk at STScI HotSci, virtual, <i>speaker</i>	Jun 2021
SDSS-V Milky Way Mapper Hack Day, virtual, <i>participant</i>	Feb 2021
Dissertation talk at 237 th AAS, virtual, <i>speaker</i>	Jan 2021
Invited talk at NTNU, Taipei, <i>speaker</i>	Dec 2020
Invited talk at NTHU, Hsinchu, <i>speaker</i>	Dec 2020
Lunch talk at ASIAA, Taipei, <i>speaker</i>	Dec 2020
Gaia EDR3 sprint, virtual, <i>participant</i>	Dec 2020
Wine and Cheese seminar at JHU, Baltimore, <i>speaker</i>	Dec 2019
Galread at Princeton University, Princeton, <i>speaker</i>	Oct 2019
Bahcall lunch at Institute for Advanced Study, Princeton, <i>speaker</i>	Oct 2019
Lunch talk at ASIAA, Taipei, <i>speaker</i>	Jun 2019
TESS data workshop, Baltimore, <i>participant</i>	Feb 2019
Annual Eastern Coast Quasar Day, Philadelphia, <i>speaker</i>	Feb 2019
Wine and Cheese seminar at JHU, Baltimore, <i>speaker</i>	Sep 2018
Joint meeting of the NASA/ESA LISA Study Team, Baltimore, <i>participant</i>	Aug 2018
Gaia DR2 exploration lab, Madrid, <i>participant</i>	Jun 2018
Science with Precision Astrometry, Baltimore, <i>participant</i>	Mar 2018
MaNGA collaboration meeting, Campeche, <i>speaker and poster presentation</i>	Dec 2017
MaNGA SciCon, virtual, <i>speaker</i>	Nov 2017
Astro Con DC, DC, <i>speaker</i>	Jul 2017
Annual Eastern Coast Quasar Day, Baltimore, <i>speaker</i>	Feb 2017
TIARA Summer School on Numerical Astrophysics, Taipei, <i>participant</i>	Jul 2015
TIARA Winter School on Cosmology, Taipei, <i>participant</i>	Feb 2014