Anna Y. Q. Ho

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PRIMARY RESEARCH INTERESTS

Stellar death (supernovae, gamma-ray bursts), transients, time-domain astronomy, high-energy astrophysics, radio and sub-millimeter interferometry, large surveys

EDUCATION & APPOINTMENTS

2022–Present	Assistant Professor, Astronomy Department, Cornell
2020–2022	Miller Fellow, Astronomy Department, U.C. Berkeley
2020–2022	Affiliate, Lawrence Berkeley National Laboratory
2020	Ph.D., California Institute of Technology, Astrophysics
	• Thesis: *The Landscape of Relativistic Stellar Explosions*
	• Advisor: Prof. Shri Kulkarni
2017	M.S., California Institute of Technology, Astrophysics
2014–2015	Fulbright Scholar, Max Planck Institute for Astronomy, Heidelberg, Germany
	• Host: Prof. Hans-Walter Rix
2014	B.S., Massachusetts Institute of Technology, Physics

AWARDS & HONORS

2024	Alfred P. Sloan Research Fellow in Physics
	Annual award for early career researchers in recognition of distinguished performance and a unique potential to make substantial contributions to their field.
2021	Springer Thesis Prize
	In recognition of outstanding Ph.D. research in the physical sciences.
2020	AAS Rodger Doxsey Travel Prize
2014–2019	National Science Foundation Graduate Research Fellowship
2019	Keck Institute for Space Studies Affiliate
2017	TA Award, Caltech
	For being one of the highest rated TAs for the Spring 2017 term.
2017	France Cordova Graduate Fellowship—Gordon Garmire Scholarship, Caltech
	Annual award for an outstanding graduate student in Physics, Math, and Astronomy.
2014	MIT Karl Taylor Compton Prize
	The highest awards presented by the Institute to students...in recognition of excellent achievements in citizenship and devotion to the welfare of MIT.
2014	MIT Ida M. Green Fellowship (declined)
	For the MIT Graduate Program in Science Writing
2013	First Place, MIT DeWitt Wallace Prize for Science Writing for the Public
2012	MIT Burchard Scholar

SELECTED PUBLICITY

2024	**Cornell Chronicle**, *Cornell astronomers on newly approved UVEX NASA mission*
2024	**National Geographic**, *What is causing these massive, mysterious explosions in space?*
2023	**Nature News**, *Mysterious Tasmanian devil space explosion baffles astronomers*
2023	**CNN**, *Stellar corpse called 'Tasmanian devil' reveals phenomenon astronomers have never seen*

2023 **Cornell Chronicle**, *NASA selects Cornell astronomer for ULTRASAT observatory*
2023 **The New York Times**, *A Cow, a Camel and a Finch Exploded in Space. What Is Going On?*
2022 **Cornell Chronicle**, *UVEX NASA mission advances with Cornell astronomers on team*
2021 **Quanta**, *New Kind of Space Explosion Reveals the Birth of a Black Hole*
2020 Wrote the **Scientific American** cover article, *Extreme Supernovae*
2020 **Science News**, *A weird cosmic flare called the Cow now has company*
2020 **Science Daily**, *Astronomers discover new class of cosmic explosions*
2020 **Sky & Telescope**, *Two New Beasts for an Explosive Zoo*
2019 Wrote article for the **Submillimeter Array Newsletter**, *SMA Observations of AT2018cow: A Prototype for Millimeter Time-domain Astronomy*
2019 **Science News**, *The cosmic Cow may be a strange supernova*
2019 **The Washington Post**, *Scientists had never seen anything like this supernova*
2019 **WIRED**, *We may have finally spotted a star turning into a black hole*
2018 **Nature News**, *Holy Cow! Astronomers agog at mysterious new supernova*

PUBLICATIONS

h-index: first author 11; total 34
Total # publications: 73

First Author

[1] **Ho, A. Y. Q.** et al. 2023, *Minutes-duration Optical Flares with Supernova Luminosities*, Nature, **623**, 927 (arXiv:2311.10195)

[2] **Ho, A. Y. Q.** et al. 2023, *A Search for Extragalactic Fast Blue Optical Transients in ZTF and the Rate of AT2018cow-like Transients*, ApJ, **949**, 120 (arXiv:2105.08811)

[3] **Ho, A. Y. Q.** et al. 2022, *Cosmological Fast Optical Transients with the Zwicky Transient Facility: A Search for Dirty Fireballs*, ApJ, **938**, 85 (arXiv:2201.12366)

[4] **Ho, A. Y. Q.** et al. 2022, *Luminous Millimeter, Radio, and X-ray Emission from ZTF20acigmel (AT2020xnd)*, ApJ, **932**, 116 (arXiv:2110.05490)

[5] **Ho, A. Y. Q.** et al. 2020, *ZTF20aajnksq (AT 2020blt): A Fast Optical Transient at $z \approx 2.9$ With No Detected Gamma-Ray Burst Counterpart*, ApJ, **905**, 98 (arXiv:2006.10761)

[6] **Ho, A. Y. Q.** et al. 2020, *SN2020bvc: a Broad-lined Type Ic Supernova with a Double-peaked Optical Light Curve and a Luminous X-ray and Radio Counterpart*, ApJ, **902**, 86 (arXiv:2004.10406)

[7] **Ho, A. Y. Q.** et al. 2020, *The Koala: A Fast Blue Optical Transient with Luminous Radio Emission from a Starburst Dwarf Galaxy at $z = 0.27$*, ApJ, **895**, 1 (arXiv:2003.01222)

[8] **Ho, A. Y. Q.** et al. 2020, *The Broad-lined Ic Supernova ZTF18aaqjovh (SN 2018bvw): An Optically-discovered Engine-driven Supernova Candidate with Luminous Radio Emission*, ApJ, **893**, 132 (arXiv:1912.10354)

[9] **Ho, A. Y. Q.** et al. 2019, *Evidence for Late-stage Eruptive Mass-loss in the Progenitor to SN2018gep, a Broad-lined Ic Supernova: Pre-explosion Emission and a Rapidly Rising Luminous Transient*, ApJ, **887**, 169H (arXiv:1904.11009)

[10] **Ho, A. Y. Q.** et al. 2019, *AT2018cow: a luminous millimeter transient*, ApJ, **871**, 73 (arXiv:1810.10880)

[11] **Ho, A. Y. Q.** et al. 2018, *iPTF Archival Search for Fast Optical Transients*, ApJL, **854**, 13 (arXiv:1712.00949)

[12] **Ho, A. Y. Q.** et al. 2017, *Masses and Ages for 230,000 LAMOST Giants, via Their Carbon and Nitrogen Abundances*, ApJ, **841**, 40 (arXiv:1609.03195)

[13] **Ho, A. Y. Q.** et al. 2017, *Label Transfer from APOGEE to LAMOST: Precise Stellar Parameters for 450,000 LAMOST Giants*, ApJ, **836**, 5 (arXiv:1602.00303)

Selected Co-author

[1] Corsi, A., **Ho, A. Y. Q.** et al. 2023, *A search for relativistic ejecta in a sample of ZTF broad-lined Type Ic supernovae*, ApJ, **953**, 179 (arXiv:2210.09536)

[2] Berger, E. et al. 2023, *Millimeter Observations of the Type II SN 2023ixf: Constraints on the Proximate Circumstellar Medium*, ApJL, 951, L31 (arXiv:2306.09311)

[3] Vink, J., Thomas, B. P., Wheeler, J. C., **Ho, A. Y. Q.** et al. 2023, *Searching for Supernovae in HETDEX Data Release 3*, ApJ, **946**, 31V (arXiv:2212.08444)

[4] Andreoni, I. et al. 2022, *A very luminous jet from the disruption of a star by a massive black hole*, Nature, **612**, 7940 (arXiv:2211.16530)

[5] Martsen, A. R. et al. 2022, *Radio Pulse Profiles and Polarization of the Terzan 5 Pulsars*, ApJ, **941**, 22 (arXiv:2204.06158)

[6] Yao, Y., **Ho, A. Y. Q.**, et al. 2022, *The X-ray and Radio Loud Fast Blue Optical Transient AT2020mrf: Implications for an Emerging Class of Engine-Driven Massive Star Explosions*, ApJ, **934**, 104 (arXiv:2112.00751)

[7] Yadlapalli, N., Ravi, V., & **Ho, A. Y. Q.** 2022, *Models of Millimeter and Radio Emission from Interacting Supernovae*, ApJ, **934**, 5 (arXiv:2206.03518)

[8] Margalit, B., Quataert, E., & **Ho, A. Y. Q.** 2022, *Optical to X-Ray Signatures of Dense Circumstellar Interaction in Core-collapse Supernovae*, ApJ, **928**, 122 (arXiv:2109.09746)

[9] Perley, D. A., **Ho, A. Y. Q.** et al. 2021, *Real-time discovery of AT2020xnd: a fast, luminous ultraviolet transient with minimal radioactive ejecta*, MNRAS, **508**, 5138 (arXiv:2103.01968)

[10] Dong, D. Z., et al. 2021, *A transient radio source consistent with a merger-triggered core collapse supernova*, Science, 373, 1125 (arXiv:2109.01752)

[11] Andreoni, I., et al. 2021, *Fast-transient Searches in Real Time with ZTFReST: Identification of Three Optically Discovered Gamma-Ray Burst Afterglows and New Constraints on the Kilonova Rate*, ApJ, 918, 63 (arXiv:2104.06352)

[12] De, K., et al. 2020, *The Zwicky Transient Facility Census of the Local Universe I: Systematic search for Calcium rich gap transients reveal three related spectroscopic sub-classes*, ApJ, **905**, 58 (arXiv:2004.09029)

[13] Perley, D. A., et al. 2020, ApJ, *The Zwicky Transient Facility Bright Transient Survey. II. A Public Statistical Sample for Exploring Supernova Demographics* , ApJ, **904**, 35 (arXiv:2009.01242)

[14] Duffell, P. C. & **Ho, A. Y. Q.** 2020, *How Dense a CSM is Sufficient to Choke a Jet?*, ApJ, **900**, 193

[15] Szkody, P., Dicenzo, B., **Ho, A. Y. Q.**, et al. 2020, *Cataclysmic Variables from the First Year of the Zwicky Transient Facility*, AJ, **159**, 198 (arXiv:2002.08447)

[16] Casey, A.R., **Ho, A. Y. Q.**, et al. 2019, *Tidal interactions between binary stars drives lithium production in low-mass red giants*, ApJ, **880**, 125 (arXiv:1902.04102)

[17] Graham, M. J. et al. 2019, *The Zwicky Transient Facility: Science Objectives*, PASP, 131, 078001 (arXiv:1902.01945)

[18] Bellm, E. C. et al. 2019, *The Zwicky Transient Facility: System Overview, Performance, and First Results*, PASP, 131, 018002 (arXiv:1902.01932)

[19] Ness, M., et al. 2015, *The Cannon: A data-driven approach to stellar label determination*, ApJ, **808**, 16 (arXiv:1501.07604)

FUNDING

2024–2026	Sloan Fellowship (**$75,000**)
2023–2026	NASA Ultraviolet Transient Astronomy Satellite Participating Scientists Program (PI; **$210,000**)
2023–2024	NASA *Swift* Cycle 19 (PI; **$36,000**)
2023	Cornell Roger and Mary Lou West Undergraduate Research Fellowship (for undergraduate mentee Maggie Li; **$6,500**)

PRINCIPAL INVESTIGATOR TELESCOPE PROPOSALS

Millimeter — 23 proposals: 11 SMA (444 hr), 8 NOEMA (135.1 hr), 5 ALMA (22.4 hr)

- SMA Regular: eight (18B, 19A&B, 20A&B, 21A&B, 22A&B), 38 tracks (≈ 228 hrs)
- SMA DDT: three (2×18A, 21B), 36 tracks (≈ 216 hrs)
- NOEMA Regular: seven (19B, 20B, 21A&B, 22B, 23A, 23B), 123.1 hrs
- NOEMA DDT: two (2×20A), 12.0 hrs
- ALMA Regular: one (Cycle 7), 9.7 hr
- ALMA DDT: four (Cycles 5 & 9×3), 2.6 hr, 5.6 hr, 2.4 hr, 2.4 hr

Radio — 18 proposals: 15 VLA (185 hrs), 2 VLBA (48 hrs), 1 GMRT (3 hrs)

- VLA Regular: 8 (13A, 19A, 2x20A, 20B, 21A, 21B, 22B, 23A, 23B) totaling 164.53 hrs
- VLA DDT: 6 (17A, 17B, 19B, 23A×3) totaling 20 hrs
- VLBA DDT: 2 (18A, 20A) totaling 48 hrs
- GMRT DDT: 1 (Cycle 36), totaling 3 hrs

Optical — 6 proposals: 4 Gemini (20.9 hrs), 2 Palomar 60-inch (11.95 hrs)

- Gemini: four (21A, 22A, 22B, 24A), 17.3 hr GMOS-S & 8.4 hr GMOS-N
- Palomar 60-inch: two (2019, 2020), totaling 11.95 hrs

X-ray

Swift GI proposal (Cycle 19, 42 ks)
52 *Swift* ToO observations (each 3–5 ks; total ≈ 200 ks)
3 *Chandra* DDT proposals (Cycle 21, 22, 23) totaling 80 ksec

LEADERSHIP & PROFESSIONAL SERVICE

Scientific leadership and membership roles

2023–Present	Ultraviolet Transient Astronomy Satellite (ULTRASAT; Participating Scientist)
	• (2023–Present) Co-chair, Gamma-ray Bursts (GRB) Working Group
2023–Present	Atacama Cosmology Telescope (Senior Member)
2023–Present	Simons Observatory (Senior Member)
2022–Present	CCAT Observatory
	• (2022–Present) Co-lead, Time-domain astrophysics working group
2022–Present	CMB-S4 (Senior Member)
	• (2021–2023) Co-chair, Sources & Transients Working Group
2021–Present	UltraViolet EXplorer (UVEX) Mission (Co-I). *NASA MIDEX: launch 2030*
2020–2023	Dark Energy Spectroscopic Instrument (DESI; member 2020–2022; continuing collaborator 2022–2023)
2018–Present	Zwicky Transient Facility (ZTF; Member)

Invited positions for service external to Cornell

2023–Present	Member, ZTF Publication Board
2023–Present	Member, ZTF Science Steering Committee
2022–Present	Member, Science Advisory Council, DSA-2000
2019–Present	Referee/reviewer for ApJ, ApJL, MNRAS, Nature Astronomy
2023–2024	Member, SOC, Workshop on Fast Extragalactic Transients, Bormio, Italy
2023	Co-author, Gamma-ray Transient Network Science Analysis Group Report
2023	Co-author, CfA Decadal White Paper, *Time-domain Astrophysics with the Submillimeter Array*
2023	Co-author, PRIMA General Observer Science Book
2023	Review Panelist, NASA ROSES Program
2023	Reviewer, James Webb Space Telescope DD proposal
2023	Reviewer, Hubble Space Telescope DD proposal
2023	Member, SOC, CMB-S4 Collaboration Meeting
2022–2023	Member, Science Organizing Committee, "Scientific Frontiers and Synergies for the DSA-2000 Radio Camera" Conference
2022	Member, Miller Annual Symposium Organizing Committee
2022	Member, SOC, CMB-S4 Collaboration Meeting
2022	Member, SOC, Workshop on "Astrophysics with the CMB-S4 Survey"

Other external service

2021–2022	Co-organizer, Theoretical Astrophysics Center Seminar Series, UC Berkeley
2021–2022	Organizer, Explosive Astronomy Seminar Series, UC Berkeley
2021	Member, Chandra Time Allocation Committee
2021	Member, Gemini Time Allocation Committee
2021	Co-organizer, Session on Transients with CMB-S4, CMB-S4 Summer Workshop
2021	Reviewer, NASA FINESST Program
2021	Time Allocation Committee: Gemini, Chandra, ALMA
2021	Co-organizer, Cal-URSA Research Program
2021	Organizer, Workshop on Status of Millimeter-Transient Searches (virtual)

TEACHING AND MENTORING

Student Mentoring

2023–Present	Supervisor for Cornell GS Jason Sevilla (1st year)
Summer 2023	Supervisor for Wesleyan UG Joshua Grajales (Cornell REU Program)
Aug. 2022–Pr.	Supervisor for Cornell UG students Maggie Li (2023 Roger & Mary Lou West Fellow; Senior Thesis) and Jada Vail (Nexus Scholar; McNair Scholar; Senior Thesis)
2022–2023	Supervisor for Cornell UG student Kailai Wang
2022–2023	Supervisor for UC Berkeley undergraduate student William Hohensee
Summer 2022	Supervisor for UC Berkeley undergraduate student Mary Gerhart
Summer 2021	Co-supervisor (with Peter Nugent) for three UC Berkeley undergraduate students: Alexis Andersen, Autumn Awbrey, Ruby Wong
Summer 2021	Supervisor for Northern Arizona University undergraduate student Caitlin King, DOE Science Undergraduate Laboratory Internship (SULI) program
2016–2020	Mentor for Caltech graduate students Lee Rosenthal and Yuhan Yao

University Teaching

Fall 2023 — ASTRO 2211 (undergraduate course, "Stars, Galaxies, and Cosmology")

- 41 students. Course rating: 4.79/5. Instructor rating: 4.87/5

	Supervisor for PHYS 2298 (undergraduate independent study; 1 student)
Spring 2023	ASTRO 7683 (graduate course, "Seminal Papers in Astronomy and Planetary Science") • 10 students. Course rating: 5.00/5. Instructor rating: 5.00/5
	Supervisor for ASTRO 4940 (undergraduate independent study; 2 students)

Workshops

2018	Instructor, ZTF Summer School
2016	Lead Instructor, Gemini Observatory Workshop on Data-Driven Modeling of Spectra

SELECTED RECENT INVITED TALKS

2024	Colloquium, Princeton/IAS, Princeton NJ
2023	Plenary Talk, 32nd Texas Symposium on Relativistic Astrophysics, Shanghai China
2023	Colloquium, MIT Astrophysics, Cambridge MA
2023	Colloquium, UVA/NRAO, Charlottesville VA
2023	Talk, The Transient and Variable Universe Conference, UIUC, Illinois
2023	Talk, CMB-S4 Spring Collaboration Meeting (virtual)
2023	Colloquium, Columbia University, New York NY
2023	Review Talk on X-ray and Radio Observations of LFBOTs, MIAPbP "Interacting Supernovae" Workshop, Garching, Germany
2023	Colloquium, University of Toronto, Toronto ON
2022	Colloquium, Caltech, Pasadena CA
2022	Talk, Time Domain and Multi-Messenger Astrophysics NASA Workshop
2022	Plenary Talk for the Sources & Transients Working Group, CMB-S4 Collab. Meeting
2022	Talk, AAS Special Session on "An Update on Astrophysics and Cosmology from Cosmic Microwave Background Measurements in the Next Decade"
2022	Colloquium, Radboud University, Nijmegen, Netherlands
2022	Colloquium, Carnegie Observatories, Pasadena CA
2022	Talk, APS April Meeting, Cecilia Payne-Gaposchkin Dissertation Award Finalist
2022	CCAT-Prime/FYST Collaboration Meeting (virtual)
2022	Tor Vergata Astrophysics Seminar (virtual)
2022	Special Physics & Astronomy Seminar, Northwestern University, Evanston IL
2022	Colloquium, U.T. Austin, Austin TX
2022	Colloquium, Cornell University, Ithaca NY
2021	Colloquium, Max Planck Institute for Astronomy, Heidelberg, Germany (virtual)
2021	Colloquium, U.C. Santa Cruz
2021	Talk, SuperVirtual (virtual)
2021	Seminar, Kavli Institute for Cosmological Physics, U. Chicago
2021	Astro Seminar, Center for Cosmology and Particle Physics, NYU
2021	Colloquium, Jodrell Bank Centre for Astrophysics (virtual)
2021	Seminar, Princeton Gravity Initiative (virtual)
2021	Colloquium, Centre of Astrophysics and Supercomputing, Swinburne University of Technology (virtual)
2021	Talk, BigBoom, University of Arizona (virtual)

COMMUNITY ENGAGEMENT

2024	Lecture for North Jersey Astronomical Society
2023	Interviewed for Hotel Mars CBS Eye On The World podcast
2023	Interviewed for Science Review magazine, American School in London
2023	Member, Career Panel, 4-H Camp at Cornell

2023	Interviewed for graduate student podcast *Cosmos Crusaders*
2022	Keynote Speaker, Annual Cray User Group Meeting, Monterey CA
2017–2022	Interviewer, MIT Admissions
2021	Compass Lecture, UC Berkeley
2021	Speaker, Riverside Astronomical Society (virtual)
2019	Speaker, Greenway Talk Series, Palomar Observatory
2019	Speaker, Owens Valley Radio Observatory Lecture Series
2019	Speaker, Caltech Graduate Research Spotlight
2019	Speaker, Ventura County Astronomical Society
2019	Speaker, Greenway Talk Series, Palomar Observatory
2018	Contributing Writer, Caltech Letters
2018	Speaker, College of the Canyons Star Party
2018	Visitor, 8th-grade class, St. Philip the Apostle School, Pasadena CA
2017	Volunteer, Orbit Deep Learning Days, Huntington Library, Pasadena CA
2017	Speaker, Astro on Tap, Pasadena CA
2017	Speaker, Riverside Astronomical Society
2017	Speaker, Ventura County Astronomical Society
2017	Speaker, High School Summer Camp, Culver City CA
2016	Speaker, Santa Monica Astronomy Club
2016	Volunteer, Field Trip, iChicas After-school Program
2015	Speaker, St. Philip Reverse Science Fair, Pasadena CA
2015	Volunteer, Webster Elementary Science and Stargazing Night, Pasadena CA
2015-2020	Volunteer, Caltech Astronomy Outreach program
2014–2015	Volunteer, Center for Astronomy Education and Outreach, Heidelberg, Germany
2014	AAS Astronomy Ambassadors Workshop, AAS 223rd Meeting
2012–2013	Volunteer, McCormick Public Observatory, Charlottesville VA