Luke Zoltan Kelley

Curriculum Vitae
updated October 6, 2024

Assistant Adjunct Professor | UC Berkeley, Astronomy
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Berkeley, CA 94720

Research Interests

Understanding the origin and evolution of the most energetic objects in the universe. Theoretical and computational astrophysics at the interface of gravitational waves (GW), transients, and cosmological environments. Primary focus: multimessenger (GW + electromagnetic) signatures of supermassive black hole binaries, now detectable by pulsar timing arrays like NANOGrav.

Education & Positions

2022 – **Assistant Adjunct Professor**, UC Berkeley, Department of Astronomy

2020 – **Chair, Astrophysics Working Group**, NANOGrav Collaboration

2021 – 2022 **Cottrell Fellow**, CIERA, Northwestern University

2018 – 2022 **CIERA Lindheimer Fellow**, CIERA, Northwestern University

2018 **PhD, Harvard University**, Astronomy & Astrophysics
advisor: **Lars Hernquist** & Laura Blecha
Massive Black-Hole Binary Mergers: Dynamics, Environments & Expected Detections

2013 **MA, Harvard University**, Astronomy & Astrophysics
advisor: **Ramesh Narayan** & Alexander Tchekhovskoy
Tidal Disruption Events and Magnetic Flux Capture

2011 **BS with Honors, UC Santa Cruz**, Astrophysics
advisor: **Enrico Ramirez-Ruiz**
Coalescing Compact Binaries: implications for gravitational-wave observations
BS with Honors, UC Santa Cruz, Biology

Funding & Awards

2021 Cottrell Fellowships Award — The Research Corporation
ATP (Collaborator, 21-ATP21-0028) — NASA
Bridging the Gap from Galactic Scales to Black Hole Accretion Flows in a Multiphase ISM

2019 AAG (Co-PI, 1910209) — NSF
Impacts of massive black hole formation and evolution on Gravitational Wave sources
ATP (Collaborator, 19-ATP19-0031) — NASA
Probing the AGN/Galaxy Connection with a Novel, Explicit Feedback Implementation

2018 Lindheimer Prize Fellowship — Northwestern
CIERA Fellowship

2011 Smith Family Graduate Science and Engineering Fellowship — Harvard
Kenneth and Ann Thimann Scholarship — UCSC
Dean's Award, Chancellor's Award
Steck Award - *best undergraduate senior thesis*

References

advisor Claude-André Faucher-Giguère (Northwestern; postdoctoral mentor)
Lars Hernquist (Harvard; PhD advisor)
Enrico Ramirez-Ruiz (UC Santa Cruz; undergraduate advisor)

NANOGrav Scott Ransom (NRAO, U. Virginia) — Maura McLaughlin (West Virginia U.)

collaborator Vicky Kalogera (Northwestern) — Laura Blecha (U.Florida)
Wen-fai Fong (Northwestern) — Zoltan Haiman (Colombia)

Advising

graduate	Emiko Gardiner (UC Berkeley)	2023 –
	Bence Becsy (Montana State → Postdoc, Oregon State)	2021 – 2022
	Aneesh Sivasankaran (U. Florida)	2019 –
	Michael Zevin (Northwestern → Hubble Fellow, U.Chicago)	2019 – 2020
	Michael Bueno (Northwestern)	2019 – 2020
	Michael Katz (Northwestern → Postdoc, MPI/AEI)	2018 – 2019
	Magdalena Siwek (Harvard)	2018 –
	Mohammad Sayeb (U. Florida)	2017 – 2020
undergrad	Sophie Willis (UC Berkeley)	2023 –
	Katherine Cella (Vanderbilt)	2020 – 2022
	Megan Tillman (Texas A&M → Rutgers)	2018 – 2022
	Estephani TorresVillanueva (Northwestern REU → UW Madison)	Summer 2020
	Sophia Taylor (Northwestern REU)	Summer 2019
	Tenley Hutchinson (Harvard Banneker Institute → UC Santa Cruz)	Summer 2017
mentoring	graduate student mentor, Northwestern Physics & Astronomy	2018 – 2019
	summer student mentor, Harvard Banneker & Aztlan Institutes	2015 – 2016
	graduate student mentor, Harvard Astronomy & Astrophysics	2014 – 2016

Teaching

lecturer	Northwestern University, Physics & Astronomy	
	Astr 329/429 - Cosmology and Extragalactic Astrophysics (guest lectures)	Fall 2021
	Harvard Banneker & Aztlan Institutes	
	Python For Astrophysics (week-long series)	Summer 2017
	Order of Magnitude Astrophysics (week-long series)	Summer 2016
assistant	Harvard University, Astronomy & Astrophysics	
	Bok Center, distinction in teaching award	Spring 2014
	Astr 16 - Stellar and Planetary Astrophysics (Prof. John Johnson)	Spring 2014
	Astr 17 - High Energy Astrophysics (Prof. Daniel Eisenstein)	Fall 2013
	UC Santa Cruz, Astronomy & Astrophysics	
	Astr 111 - Order of Magnitude Astrophysics (Prof. Enrico Ramirez-Ruiz)	Fall 2010

Professional Service & Community Impact

service	Thursday Lunch Talks organizer	2023 –
	Summer Session Committee	2022 –
	Chair, NANOGrav Astrophysics Working Group	2020 –
	Chair, Membership Management Team, LISA Consortium	2022 – 2023
	Admissions committee, UC Berkeley Astronomy	2022, 2023
	SOC: NANOGrav Fall Meeting	Oct. 2023
	AAS Climate Site Visit Team	2019 – 2021
	CIERA, astro-ph/arXiv discussion organizer	2018 – 2020
	Membership Management Team, LISA Consortium	2021 – 2022
	Northwestern, Physics & Astronomy Equity Committee	2020 – 2021
	SOC: COSPAR 2020, Sydney, Australia	Aug. 2020
	Volunteer: Adler After Dark / Astronomy on Tap Chicago	Aug. 2019
	SOC: NANOGrav Spring Meeting, UW Bothell	Mar. 2019
	CIERA, REU admissions committee	Jan. 2019; Jan. 2020
	LOC: Conf. for Undergrad Women in Physics (CUWiP), Northwestern	Jan. 2019
	NANOGrav Equity & Climate Committee	2018 – 2019
	University-wide Public Safety Committee, Harvard	2017 – 2018

	Harvard graduate student admissions committee	2015
	Harvard Observing Program for Undergraduates	2014 – 2015
reviewer	Nature Astronomy, ApJ, ApJ Letters, MNRAS, MNRAS Letters HST DDT, NASA FINESST, NASA LISA Preparatory Science	
data	Kinematically Offset Binary AGN data set (**Kelley 2020**; zenodo.4068485) Illustris & IllustrisTNG public data releases. Nelson **et al.** 2015, 2018	
software	*creator:* `kalepy` (**Kelley 2021**; 10.21105/joss.02784) | `holodeck` (**Kelley** ***in prep.***) *contributor:* `numpy`, `astropy`, `matplotlib`, and the `open supernova catalog` (Guillochon, Parrent, **Kelley** et al. 2017)	

Publications [ads link]

77 papers (*7363 citations*): 12 first-author (*918 citations*), 14 advised student-led papers

first/lead

[12] The NANOGrav 15 yr Data Set: Constraints on Supermassive Black Hole Binaries from the GW Background
Agazie et al., 2023. *ApJ Letters*, 952, 2. Aug, 2023

[11] Gravitational self-lensing in populations of MBH binaries
Kelley, D'Orazio, & Di Stefano, 2021. *MNRAS*, 508, 2. Dec, 2021

[10] Basic considerations for the observability of kinematically offset binary AGN
Kelley, 2021. *MNRAS*, 500, 3. Jan, 2021

[9] Multi-Messenger Astrophysics With PTAs
Kelley et al., 2019. *BAAS*, 51, 3. May, 2019

[8] Massive BH binaries as periodically variable AGN
Kelley, Haiman, Sesana, & Hernquist, 2019. *MNRAS*, 485, 2. May, 2019

[7] Single sources in the low-frequency GW sky: properties and time to detection by PTAs
Kelley et al., 2018. *MNRAS*, 477, 1. Jun, 2018

[6] The GW background from MBH binaries in Illustris: spectral features and time to detection with PTAs
Kelley et al., 2017. *MNRAS*, 471, 4. Nov, 2017

[5] MBH binary mergers in dynamical galactic environments
Kelley, Blecha, & Hernquist, 2017. *MNRAS*, 464, 3. Jan, 2017

[4] Tidal disruption and magnetic flux capture: powering a jet from a quiescent black hole
Kelley, Tchekhovskoy, & Narayan, 2014. *MNRAS*, 445, 4. Dec, 2014

[3] Electromagnetic transients as triggers in searches for GWs from compact binary mergers
Kelley, Mandel, & Ramirez-Ruiz, 2013. *PRD*, 87, 12. Jun, 2013

[2] The Distribution of Coalescing Compact Binaries in the Local Universe: Prospects for GW Observations
Kelley et al., 2010. *ApJ Letters*, 725, 1. Dec, 2010

[1] kalepy: a Python package for kernel density estimation, sampling and plotting
Kelley, 2021. *The Journal of Open Source Software*, 6, 57. Jan, 2021

student led

[14] Host Galaxy Demographics Of Individually Detectable Supermassive Black-hole Binaries with PTAs
Cella, Taylor, & Kelley, 2024. *arXiv e-prints*, *submitted*. Jul, 2024

[13] Signatures of Circumbinary Disk Dynamics in Multi-Messenger Population Studies of MBH Binaries
Siwek, Kelley, & Hernquist, 2024. *arXiv e-prints*, *submitted*. Mar, 2024

[12] MBH binary intruders: triple systems from cosmological simulations
Sayeb, Blecha, & Kelley, 2024. *MNRAS*, 527, 3. Jan, 2024

[11] Beyond the Background: GW Anisotropy and Continuous Waves from Supermassive Black Hole Binaries
Gardiner, Kelley, Lemke, & Mitridate, 2024. *ApJ*, 965, 2. Apr, 2024

[10] How to Detect an Astrophysical Nanohertz GW Background
Bécsy et al., 2023. *ApJ*, 959, 1. Dec, 2023

[9] A new discrete dynamical friction estimator based on N-body simulations
Ma, Hopkins, Kelley, & Faucher-Giguère, 2023. *MNRAS*, 519, 4. Mar, 2023

[8] Exploring Realistic Nanohertz GW Backgrounds
Bécsy, Cornish, & Kelley, 2022. *ApJ*, 941, 2. Dec, 2022

[7] Simulations of black hole fueling in isolated and merging galaxies with an explicit, multiphase ISM
Sivasankaran et al., 2022. *MNRAS*, 517, 4. Dec, 2022

[6] Running late: testing delayed supermassive black hole growth models against the quasar luminosity function
Tillman et al., 2022. *MNRAS*, 511, 4. Apr, 2022

[5] Astrophysics Milestones for Pulsar Timing Array GW Detection
Pol et al., 2021. *ApJ Letters*, 911, 2. Apr, 2021

[4] MBH binary inspiral and spin evolution in a cosmological framework
Sayeb et al., 2021. *MNRAS*, 501, 2. Feb, 2021

[3] The effect of differential accretion on the GW background and the present-day MBH binary population
Siwek, Kelley, & Hernquist, 2020. *MNRAS*, 498, 1. Oct, 2020

[2] Forward Modeling of Double Neutron Stars: Insights from Highly Offset Short Gamma-Ray Bursts
Zevin et al., 2020. *ApJ*, 904, 2. Dec, 2020

[1] Probing MBH binary populations with LISA
Katz et al., 2020. *MNRAS*, 491, 2. Jan, 2020

additional works

[51] The NANOGrav 15 yr Data Set: Running of the Spectral Index
Agazie et al., 2024. *arXiv e-prints*, *submitted*. Aug, 2024

[50] The NANOGrav 15 yr data set: Posterior predictive checks for GW detection with PTAs
Agazie et al., 2024. *arXiv e-prints*, *submitted*. Jul, 2024

[49] Growth of high-redshift supermassive black holes from heavy seeds in the BRAHMA cosmological simulations: implications of overmassive black holes
Bhowmick et al., 2024. *MNRAS*, 533, 2. Sep, 2024

[48] Bridging the micro-Hz GW gap via Doppler tracking with the Uranus Orbiter and Probe Mission: MBH binaries, early universe signals and ultra-light dark matter
Zwick et al., 2024. *arXiv e-prints*, *submitted*. Jun, 2024

[47] The NANOGrav 15 yr Data Set: Looking for Signs of Discreteness in the GW Background
Agazie et al., 2024. *arXiv e-prints*, *submitted*. Apr, 2024

[46] AGN feedback in isolated galaxies with a SMUGGLE multiphase ISM
Sivasankaran et al., 2024. *arXiv e-prints*, *submitted*. Feb, 2024

[45] Introducing the BRAHMA simulation suite: signatures of low-mass black hole seeding models in cosmological simulations
Bhowmick et al., 2024. *MNRAS*, 531, 4. Jul, 2024

[44] The NANOGrav 15 yr Data Set: Search for Transverse Polarization Modes in the GW Background
Agazie et al., 2024. *ApJ Letters*, 964, 1. Mar, 2024

[43] The NANOGrav 12.5 yr Data Set: A Computationally Efficient Eccentric Binary Search Pipeline and Constraints on an Eccentric Supermassive Binary Candidate in 3C 66B
Agazie et al., 2024. *ApJ*, 963, 2. Mar, 2024

[42] Representing low-mass black hole seeds in cosmological simulations: A new sub-grid stochastic seed model
Bhowmick et al., 2024. *MNRAS*, 529, 4. Apr, 2024

[41] How to Detect an Astrophysical Nanohertz GW Background
Bécsy et al., 2023. *ApJ*, 959, 1. Dec, 2023

[40] Comparing Recent Pulsar Timing Array Results on the Nanohertz Stochastic GW Background
Agazie et al., 2024. *ApJ*, 966, 1. May, 2024

[39] The NANOGrav 12.5-year Data Set: Search for GW Memory
Agazie et al., 2023. *arXiv e-prints*, *submitted*. Jul, 2023

[38] NANOGrav 15-year GW background methods
Johnson et al., 2024. *PRD*, 109, 10. May, 2024

[37] The NANOGrav 15 yr Data Set: Bayesian Limits on GWs from Individual Supermassive Black Hole Binaries
Agazie et al., 2023. *ApJ Letters*, 951, 2. Jul, 2023

[36] The NANOGrav 15 yr Data Set: Search for Anisotropy in the GW Background
Agazie et al., 2023. *ApJ Letters*, 956, 1. Oct, 2023

[35] The NANOGrav 15 yr Data Set: Search for Signals from New Physics
Afzal et al., 2023. *ApJ Letters*, 951, 1. Jul, 2023

[34] The NANOGrav 15 yr Data Set: Detector Characterization and Noise Budget
Agazie et al., 2023. *ApJ Letters*, 951, 1. Jul, 2023

[33] The NANOGrav 15 yr Data Set: Observations and Timing of 68 Millisecond Pulsars
Agazie et al., 2023. *ApJ Letters*, 951, 1. Jul, 2023

[32] The NANOGrav 15 yr Data Set: Evidence for a GW Background
Agazie et al., 2023. *ApJ Letters*, 951, 1. Jul, 2023

[31] Searching for continuous GWs in the second data release of the International Pulsar Timing Array
Falxa et al., 2023. *MNRAS*, 521, 4. Jun, 2023

[30] The NANOGrav 12.5 yr Data Set: Bayesian Limits on GWs from Individual Supermassive Black Hole Binaries
Arzoumanian et al., 2023. *ApJ Letters*, 951, 2. Jul, 2023

[29] Disentangling Multiple Stochastic GW Background Sources in PTA Data Sets
Kaiser et al., 2022. *ApJ*, 938, 2. Oct, 2022

[28] Observational Inference on the Delay Time Distribution of Short Gamma-Ray Bursts
Zevin et al., 2022. *ApJ Letters*, 940, 1. Nov, 2022

[27] Short GRB Host Galaxies. II. A Legacy Sample of Redshifts, Stellar Population Properties, and Implications for Their Neutron Star Merger Origins
Nugent et al., 2022. *ApJ*, 940, 1. Nov, 2022

[26] Probing the $z \gtrsim 6$ quasars in a universe with IllustrisTNG physics: impact of gas-based black hole seeding models
Bhowmick et al., 2022. *MNRAS*, 516, 1. Oct, 2022

[25] Radio Analysis of SN2004C Reveals an Unusual CSM Density Profile as a Harbinger of Core Collapse

DeMarchi et al., 2022. *ApJ*, 938, 1. Oct, 2022

[24] The International Pulsar Timing Array second data release: Search for an isotropic GW background
Antoniadis et al., 2022. *MNRAS*, 510, 4. Mar, 2022

[23] The NANOGrav 12.5-year Data Set: Search for Non-Einsteinian Polarization Modes in the GW Background
Arzoumanian et al., 2021. *ApJ Letters*, 923, 2. Dec, 2021

[22] Impact of gas spin and Lyman-Werner flux on black hole seed formation in cosmological simulations: implications for direct collapse
Bhowmick et al., 2022. *MNRAS*, 510, 1. Feb, 2022

[21] Probing the progenitors of spinning binary black-hole mergers with long gamma-ray bursts
Bavera et al., 2022. *A&A*, 657. Jan, 2022

[20] Impact of gas-based seeding on supermassive black hole populations at $z \geq 7$
Bhowmick et al., 2021. *MNRAS*, 507, 2. Oct, 2021

[19] Searching for GWs from Cosmological Phase Transitions with the NANOGrav 12.5-Year Dataset
Arzoumanian et al., 2021. *PR Letters*, 127, 25. Dec, 2021

[18] Seeds don't sink: even MBH 'seeds' cannot migrate to galaxy centres efficiently
Ma et al., 2021. *MNRAS*, 508, 2. Dec, 2021

[17] The NANOGrav 11 yr Data Set: Limits on Supermassive Black Hole Binaries in Galaxies within 500 Mpc
Arzoumanian et al., 2021. *ApJ*, 914, 2. Jun, 2021

[16] The NANOGrav 12.5 yr Data Set: Search for an Isotropic Stochastic GW Background
Arzoumanian et al., 2020. *ApJ Letters*, 905, 2. Dec, 2020

[15] Multimessenger GW Searches with PTAs: Application to 3C 66B Using the NANOGrav 11-year Data Set
Arzoumanian et al., 2020. *ApJ*, 900, 2. Sep, 2020

[14] The NANOGrav 12.5 yr Data Set: Wideband Timing of 47 Millisecond Pulsars
Alam et al., 2021. *ApJS*, 252, 1. Jan, 2021

[13] The NANOGrav 12.5 yr Data Set: Observations and Narrowband Timing of 47 Millisecond Pulsars
Alam et al., 2021. *ApJS*, 252, 1. Jan, 2021

[12] Modeling the Uncertainties of Solar System Ephemerides for Robust GW Searches with Pulsar-timing Arrays
Vallisneri et al., 2020. *ApJ*, 893, 2. Apr, 2020

[11] The NANOGrav 11 yr Data Set: Limits on GW Memory
Aggarwal et al., 2020. *ApJ*, 889, 1. Jan, 2020

[10] The NANOGrav 11 yr Data Set: Evolution of GW Background Statistics
Hazboun et al., 2020. *ApJ*, 890, 2. Feb, 2020

[9] Supermassive Black-hole Demographics &Environments With PTAs
Taylor et al., 2019. *BAAS*, 51, 3. May, 2019

[8] The NANOGrav 11 yr Data Set: Limits on GWs from Individual Supermassive Black Hole Binaries
Aggarwal et al., 2019. *ApJ*, 880, 2. Aug, 2019

[7] The IllustrisTNG simulations: public data release
Nelson et al., 2019. *Computational Astrophysics and Cosmology*, 6, 1. May, 2019

[6] The astrophysics of nanohertz GWs
Burke-Spolaor et al., 2019. *A&A Reviews*, 27, 1. Jun, 2019

[5] Testing the Binary Hypothesis: Pulsar Timing Constraints on Supermassive Black Hole Binary

Candidates
Sesana, Haiman, Kocsis, & Kelley, 2018. *ApJ*, 856, 1. Mar, 2018

[4] An Open Catalog for Supernova Data
Guillochon, Parrent, Kelley, & Margutti, 2017. *ApJ*, 835, 1. Jan, 2017

[3] Recoiling black holes: prospects for detection and implications of spin alignment
Blecha et al., 2016. *MNRAS*, 456, 1. Feb, 2016

[2] Swift J1644+57 gone MAD: the case for dynamically important magnetic flux threading the black hole in a jetted tidal disruption event
Tchekhovskoy, Metzger, Giannios, & Kelley, 2014. *MNRAS*, 437, 3. Jan, 2014

[1] The NANOGrav 12.5 yr Data Set: Search for GW Memory
Agazie et al., 2024. *ApJ*, 963, 1. Mar, 2024

Talks & Presentations

53 invited talks (**), 69 presentations

2024	[69] ** European Astronomical Society, Summer Meeting	Padua, Padova	Jul 01
	[68] ** American Physical Society, April Meeting	Sacramento, CA	Apr 03
2023	[67] ** Unravelling the Universe with Pulsar Timing Arrays	Pittsburgh, PA	Nov 30
	[66] ** HEP/Astro Seminar, CERN LHC	remote	Nov 16
	[65] ** Physics Seminar, Princeton Gravity Initiative	Princeton, NJ	Nov 06
	[64] ** Physics Colloquium, UC Santa Cruz	Santa Cruz, CA	Nov 02
	[63] ** Astronomy Colloquium, UC Berkeley	Berkeley, CA	Oct 26
	[62] ** Physics Colloquium, UN Las Vegas	Las Vegas, NV	Oct 13
	[61] ** Physics Colloquium, LBNL	Berkeley, CA	Oct 12
	[60] ** LISA Astrophysics Working Group Meeting	Milano-Bicocca, Italy	Sep 14
	[59] ** Cosmology Conference, Mainz ITP	Mainz, Germany	Aug 15
	[58] ** SCIPP seminar, UC Santa Cruz	Santa Cruz, CA	Apr 25
	[57] ** American Physical Society, April Meeting	Minneapolis, MN	Apr 16
	[56] American Physical Society, April Meeting	Minneapolis, MN	Apr 15
	[55] NANOGrav Spring Meeting, Oregon State	Corvallis, OR	Mar 28
	[54] ** DSA-2000 Meeting, Caltech	Pasadena, CA	Mar 20
	[53] ** Astronomy Colloquium, Rochester Institute of Technology	remote	Feb 06
2022	[52] Astronomy Lunch Talk, UC Berkeley	Berkeley, CA	Oct 26
	[51] ** Astronomy Seminar, Neils Bohr Institute	Copenhagen, Denmark	Oct 12
	[50] ** Astronomy Seminar, UC Berkeley	Berkeley, CA	Jun 09
	[49] ** Astronomy Seminar, U.Chicago	Chicago, IL	May 03
	[48] ** Astronomy Colloquium, Penn State	State College, PA	Apr 06
	[47] ** Physics Seminar, Oregon State	remote	Mar 08
	[46] ** Physics Colloquium, Oregon State	remote	Mar 07
	[45] ** Physics Colloquium, Montana State	Bozeman, MT	Mar 04
	[44] ** Physics Seminar, Montana State	Bozeman, MT	Mar 03
	[43] ** Astronomy Seminar, Dartmouth	remote	Feb 02
	[42] ** Physics Colloquium, Dartmouth	remote	Feb 01
	[41] ** Astrophysics Seminar, Northwestern	Evanston, IL	Jan 25
	[40] Aspen Winter Conference	Aspen, CO	Jan 05
2021	[39] NANOGrav Fall Meeting, Vanderbilt	Nashville, TN	Oct 13
	[38] NANOGrav Spring Meeting	remote	May 21
	[37] ** Transients Group Meeting, UCSC+UCLA	remote	Mar 30
	[36] ** Physics & Astronomy Seminar, Purdue	West Lafayette, IN	Mar 09

	[35] ** Energy extraction from supermassive blackholes, COSPAR 43	remote	Feb 01
	[34] ** Special Session, American Astronomical Society	remote	Jan 13
2020	[33] ** Physics & Astronomy Seminar, Vanderbilt	Nashville, TN	Oct 30
2019	[32] ** CGCA Seminar, UWM	Milwaukee, WI	Oct 04
	[31] ** TAPIR Seminar, Caltech	Pasadena, CA	Jun 13
	[30] ** NANOGrav Meeting, U.W.Bothell	Bothell, WA	Mar 29
	[29] ** Astrophysics Seminar, U.Florida	Gainesville, FL	Feb 27
	[28] Astrophysics with GW Populations	Aspen, CO	Feb 12
	[27] ** Brown Bag Seminar, Northwestern	Evanston, IL	Jan 29
	[26] AAS Thesis Talk	Seattle, WA	Jan 07
2018	[25] ** LISA Consortium Special Seminar	remote	Oct 09
	[24] Joint Galaxies Meeting, U.Chicago	Chicago, IL	Sep 14
	[23] LISA Symposium	Chicago, IL	Jul 12
	[22] ** Astronomy Seminar, U.Connecticut	Storrs, CT	Apr 25
	[21] ** Theoretical Astrophysics Seminar, U.Florida	Gainesville, FL	Apr 18
2017	[20] NANOGrav Meeting, Lafayette	Lafayette, PA	Nov 09
	[19] Kavli Meeting, Niels Bohr Institute	Copenhagen, Denmark	Aug 14
	[18] HPC Meeting - keynote lecture, U.Mass Amherst	Amherst, MA	May 25
	[17] CosmoFest, Harvard CfA	Cambridge, MA	May 22
	[16] NANOGrav Meeting, WVU	Morgantown, WV	Apr 21
	[15] ** ITC Luncheon, Harvard CfA	Cambridge, MA	Apr 13
	[14] ** ITC Seminar, Harvard CfA	Cambridge, MA	Mar 01
	[13] The Dawning Era of GW Astrophysics	Aspen, CO	Feb 09
2016	[12] ** TAPIR Seminar, Caltech	Pasadena, CA	Dec 02
	[11] ** Astronomy Lunch Talk, UC Berkeley	Berkeley, CA	Dec 01
	[10] ** Cosmology Group Seminar, LBNL	Berkeley, CA	Nov 29
	[09] ** Kavli Seminar, MIT	Cambridge, MA	Nov 07
	[08] ** Astrophysics Seminar, Columbia	New York, NY	Sep 29
	[07] ** Astrophysics Luncheon, IAS	Princeton, NJ	Aug 27
	[06] ** HEAD Seminar, Harvard CfA	Cambridge, MA	Aug 14
	[05] ** Radio/Millimeter/Submillimeter Science Futures II	Baltimore, MD	Aug 04
	[04] ** NANOGrav Meeting, CalTech	Pasadena, CA	Mar 17
2013	[03] ** Astrophysics Seminar, University of Birmingham	Birmingham, UK	Aug 15
2012	[02] ** LIGO (LSC) Special Seminar	remote	Sep 28
2011	[01] ** Astrophysics Seminar, MIT Kavli	Cambridge, MA	Jan 24

Public Outreach

talks	Supermassive Black Holes from the Rumble of Gravitational Waves UC Berkeley, Basic Science Lights the Way	Berkeley, CA	Mar 21, 2024
	The Gravitational Wave Sky Mount Diablo Astronomical Society	Walnut Creek, CA	Jul 25, 2023
	The new gravitational wave window into the Universe Harvard ASTR-35: Fundamentals of Contemporary Astronomy	remote	Jul 11, 2023
	The NANOGrav 15yr Data Set Panelist at NSF press event & YouTube Live	Alexandria, VA	Jun 29, 2023

The Arecibo Observatory CIERA Live	YouTube Live	Jan 29, 2021
The Astrophysics of Supermassive Black Holes NANOStars, Undergraduate Telecon	remote	Nov 20, 2020
Supermassive Black Holes, Active Galactic Nuclei & Quasars Astronomy on Tap Chicago	Evanston, IL	Dec 12, 2019
Active Galactic Nuclei: the Fire at Galaxy Centers Chicago Astronomical Society, Adler Planetarium	Chicago, IL	Oct 08, 2019
What is Astronomy and being an Astronomer? Jouett Middle School (*AVID classrooms*)	Charlottesville, VA	Sep 22, 2019
The New Era Of Gravitational Wave Astrophysics Pint of Science	Boston, MA	May 23, 2016
The Era of Gravitational Wave Astrophysics Society of Physics Students, UMass Boston	Boston, MA	Apr 07, 2016