TARRANEH EFTEKHARI NASA EINSTEIN FELLOW, CIERA, NORTHWESTERN UNIVERSITY teftekhari@northwestern.edu \diamond www.tarraneheftekhari.com

Research Interests

I leverage radio, millimeter, and X-ray observations of energetic transients, including fast radio bursts, supernovae, and tidal disruption events, to answer key questions about their progenitors, outflows, and environments.

EDUCATION

 HARVARD UNIVERSITY Ph.D, Astronomy and Astrophysics Thesis: Unveiling the Transient Radio and Millimeter Sky Advisor: Edo Berger, Ph.D. 	2021
HARVARD UNIVERSITY M.A., Astronomy and Astrophysics	2017
UNIVERSITY OF NEW MEXICO B.S. , Astrophysics, Minor in Mathematics, Magna Cum Laude	2015
Related Employment	
NASA EINSTEIN FELLOW, Northwestern University	2022-Present
CIERA POSTDOCTORAL FELLOW, Northwestern University	2021-2022
CONTENT DEVELOPER, HarvardX	2017-2020
 University Chemistry: Molecular Foundations and Global Frontiers Reclaiming Argument: An Introduction to Logical Reasoning The FDA and Prescription Drugs: Current Controversies in Context Science of the Physical Universe 30: Super-Earths and Life Fundamentals of Neuroscience Part 3: The Brain 	
LABORATORY ASSISTANT, Harvard University Supervisor: Lincoln Greenhill, Ph.D.	2015-2016
TELESCOPE OPERATOR, Long Wavelength Array, University of New Mexico	2013-2015
Summer Research Assistant, ASTRON Supervisor: Richard Fallows, Ph.D.	2014
Teaching & Advising	
Co-Advisor, Yuxin Dong, Graduate Student, Northwestern University Potential Analogs of a Repeating Fast Radio Burst	2021–Present
TUTOR, Northwestern Prison Education Program Robert Boyd, Undergraduate Brian McClendon, Undergraduate	2022–Present
HEAD TEACHING FELLOW, Harvard University Course: Science of the Physical Universe 22: From the Big Bang to the Prof: Irwin Shapiro, Ph.D.	Spring 2017, 2018, 2019 Brontosaurus and Beyond

AWARDS

NASA Hubble Fellowship Program Einstein Fellowship	2022
ALMA Ambassador	2021
CIERA Postdoctoral Fellowship	2021
ALMA Cycle 7 Student Observing Support	2019
ALMA Cycle 6 Student Observing Support	2018
National Science Foundation Graduate Research Fellowship Honorable Mention	2017
Harvard University Bok Center Certificate of Distinction in Teaching	2017
La Serena School for Data Science Full Scholarship	2017
New Mexico Space Grant Consortium Scholarship	2014
University of New Mexico Undergraduate Research Award	2013

Telescope Time Allocations (as PI)

Very Large Array (VLA)	$427~{\rm hr}$
Including 286 hours through a VLA Large Program (24A-331)	
Atacama Large Millimeter/submillimeter Array (ALMA)	39 hr
Very Long Baseline Array (VLBA)	3 hr
Arecibo	$15 \ hr$
Chandra (Total Support Funding: \$186,746 USD)	289 ks
Submillimeter Array	7 tracks
Australia Telescope Compact Array	36 hours
XMM Newton	120 ks
Gemini (Large and Long Program)	$200 \ hr$

PROFESSIONAL SERVICE

Deputy Co-Chair, CMB-S4 Sources & Transients Working Group	2023–Present
Referee for ApJ, ApJL, & MNRAS	2019-Present
Liaison to CHIME/FRB, Fast and Fortunate for FRB Follow-up Collaboration	2021 - Present
Panel Member, NASA Review	2023
Seminar Coordinator, Astronomy Seminar, CIERA, Northwestern University	2022 - 2023
Coordinator, Journal Club, CIERA, Northwestern University	2022 - 2023
Panel Member, NRAO Annual Program Review, National Science Foundation	2022
Peer Review Facilitator, Chandra Cycle 19 Peer Review	2017
Telescope Operator, University of New Mexico	2013 - 2015

OUTREACH

Tutor, Northwestern Prison Education Program (NPEP)	2021–Present
Co-chair, Academic Support Committee at Stateville Correctional Center, NPEP	2021 - 2022
Seminar Coordinator, Beacon Hill Seminars	2018 - 2020
Speaker Chair and Blog Writer, Harvard Science in the News	2016 - 2019
Mentor to first-year graduate students, Harvard Astronomy	2019
Graduate student panelist, Smithsonian Astrophysical Observatory Solar Physics REU	2019
Local Organizing Committee, ComSciCon	2018
Poster Judge, National Collegiate Research Conference	2018
Volunteer, Cambridge Explores the Universe	2018
Graduate student panelist, Wellesley College	2017
Mentor, Science Club for Girls	2016 - 2017
Digital Mentor, YouthAstroNet	2016 - 2017
Mentor, Harvard University Women in Stem	2016

PROFESSIONAL DEVELOPMENT

ALMA Ambassador Training	2022
GROWTH Astronomy School: Follow up of transients in the era of multi-messenger astronomy	2019
ICRAR/CASS Radio School	2019
Jerusalem Winter School in Theoretical Physics, The Physics of Astronomical Transients	2018
La Serena School of Data Science: Applied Tools for Data Driven Sciences	2017
NRAO Synthesis Imaging Workshop 2014, 2016	, 2022

INVITED TALKS

1.	Canadian Astrophysical Society 2024 Annual Meeting	Anticipated June 2024
2.	NASA Goddard Space Flight Center Colloquium	Anticipated May 2024
3.	University of Illinois Urbana-Champaign Colloquium	2023
4.	The Astrophysics of Fast Radio Bursts II, Flatiron Institute	2023
5.	UC Santa Cruz Colloquium	2023
6.	Multi-wavelength follow-up of FRBs in the era of routine (sub)arcsecond l of Toronto	localizations, University 2023
7.	University of British Columbia Colloquium	2023
8.	Herzberg Astronomy and Astrophysics Research Centre $Colloquium$	2023
9.	Kavli Institute for Cosmological Physics, University of Chicago Seminar	2023
10.	Florida State University Astrophysics Seminar	2022
11.	IAU Symposium 369: The Dawn Of Cosmology & Multi-Messenger Studies 2022	With Fast Radio Bursts
12.	Astrophysics with the CMB-S4 Survey – Part II: Source and Transient Scie	ence 2022
13.	Caltech Tea Talk	2022
14.	Pennsylvania State University Transients Group	2022
15.	CMB-S4 Spring 2021 Collaboration Meeting	2021
16.	The Astrophysics of Fast Radio Bursts, Flatiron Institute	2020
17.	Toronto FRB Day, CITA/Dunlap Institute	2019
18.	FRBs and their Possible Neutron Star Origins, Amsterdam	2019
19.	Columbia University, Department of Astronomy Pizza Lunch	2019
20.	Institute for Theory and Computation Luncheon, Harvard University	2019
Pub	lic Talks	
1.	Amateur Astronomers, Inc	2022
2.	Astronomical Society of the Palm Beaches	2022
3.	Gloucester Area Astronomy Club	2021
4.	New Hampshire Astronomical Society	2018

CONFERENCE CONTRIBUTIONS

Catching the Jet Shut Off in the Relativistic Tidal Disruption Event AT2022cmc(Talk) American Astronomical Society 243rd Meeting	2023
Elucidating the Origin of Fast Radio Bursts with Radio and X-ray Observations (Talk) NHFP Fellows Symposium	2022
Extragalactic Millimeter Transients in the Era of Next-Generation CMB Surveys (Talk) 3rd URSI Atlantic Radio Science Meeting	2022
Millimeter Transients in the Era of CMB Surveys (Talk) Spoken-WERRD Symposium	2021
Unveiling the Progenitors of Superluminous Supernovae with Radio and Millimeter Observations (Talk) Narayan Group Meeting, Center for Astrophysics Harvard and Smithsonian	2020
Unveiling the Progenitors of Superluminous Supernovae with Radio and Millimeter Observations (Talk) TUNA Talk, National Radio Astronomy Observatory	2020
Late-time Radio Observations of Superluminous Supernovae: Implications for Central Engines and Fast Radio Bursts (Talk) Compact Objects Group Meeting, Flatiron Center for Computational Astrophysics	2020
Late-time Radio and Millimeter Observations of Superluminous Supernovae and Long Gamma-ray Bursts (Poster) Royal Astronomical Society Early Career Poster Exhibition	2020
Millimeter Transients with CMB-S4 (Talk) CMB-S4 Spring 2020 Collaboration Meeting, Lawrence Berkeley National Laboratory	2020
Millimeter Transients in the Era of CMB Surveys (Talk) Astrophysics with the CMB-S4 Survey, University of Chicago	2019
Tidal Disruption Events and Fast Radio Burst (Talk) Transients Group Meeting, CIERA Northwestern University	2018
Radio Monitoring of the Tidal Disruption Event Swift J1644+57 (Poster) Jerusalem Winter School in Theoretical Physics, The Physics of Astronomical Transients	2018
On the Association of Fast Radio Bursts and Their Hosts (Talk) Workshop on Fast Radio Bursts, McGill University	2017
Multi-wavelength Monitoring of the Relativistic TDE Swift J1644+57 (Poster) American Astronomical Society 229th Meeting	2017
Tidal Disruption Events: A Multi-Wavelength Approach (Talk) Time-Domain Astrophysics in the American Northeast	2016
A Low Frequency Survey of Giant Pulses from the Crab Pulsar (Poster) American Astronomical Society 225th Meeting 2015	2015
	Catching the Jet Shut Off in the Relativistic Tidal Disruption Event AT2022cmc (Talk) American Astronomical Society 243rd Meeting Elucidating the Origin of Fast Radio Bursts with Radio and X-ray Observations(Talk) NHFP Fellows Symposium Extragalactic Millimeter Transients in the Era of Next-Generation CMB Surveys (Talk) 3rd URSI Atlantic Radio Science Meeting Millimeter Transients in the Era of CMB Surveys (Talk) Spoken-WERRD Symposium Unveiling the Progenitors of Superluminous Supernovae with Radio and Millimeter Observations (Talk) Narayan Group Meeting, Center for Astrophysics Harvard and Smithsonian Unveiling the Progenitors of Superluminous Supernovae with Radio and Millimeter Observations (Talk) TUNA Talk, National Radio Astronomy Observatory Late-time Radio Observations of Superluminous Supernovae: Implications for Central Engines and Fast Radio Bursts (Talk) Compact Objects Group Meeting, Flatron Center for Computational Astrophysics Late-time Radio observations of Superluminous Supernovae: Implications for Central Engines and Fast Radio Bursts (Talk) Compact Objects Group Meeting, Flatron Center for Computational Astrophysics Late-time Radio and Millimeter Observations of Superluminous Supernovae and Long Gamma-ray Bursts (Poster) Royal Astronomical Society Early Career Poster Exhibition Millimeter Transients with CMB-S4 (Talk) CMB-S4 Spring 2020 Collaboration Meeting, Lawrence Berkeley National Laboratory Millimeter Transients in the Era of CMB Surveys (Talk) Astrophysics with the CMB-S4 Survey, University of Chicago Tidal Disruption Events and Fast Radio Burst (Talk) Transients Group Meeting, CIERA Northwestern University Radio Monitoring of the Tidal Disruption Event Swift J1644+57 (Poster) Jerusalem Winter School in Theoretical Physics, The Physics of Astronomical Transients On the Association of Fast Radio Bursts, McGill University Multi-wavelength Monitoring of the Relativistic TDE Swift J1644+57 (Poster) American Astronomical Society 229th Meeting Tidal Disrup

PUBLICATIONS

I have been an author on 60 publications with > 10,000 citations, including **10 first-author publications**, and 2 second-author publications. A full listing of my publications can be found on the ADS.

FIRST AUTHOR PUBLICATIONS

- Late-time X-ray Observations of the Jetted Tidal Disruption Event AT2022cmc: The Relativistic Jet Shuts Off
 T. Eftekhari, T. Tchekhovskoy, K. D. Alexander, et al. 2024, Submitted to ApJ, pp. 12 (arXiv: 2404.10036)
- An X-ray Census of Fast Radio Burst Host Galaxies: Constraints on AGN and X-ray Counterparts T. Eftekhari, W. Fong, A. C. Gordon, et al. 2023, ApJ, 958, 66, pp. 19 (arXiv: 2307.03766)
- Extragalactic Millimeter Transients in the Era of Next Generation CMB Surveys T. Eftekhari, E. Berger, B. D. Metzger, et al. 2022, ApJ, 935, 16, pp. 19 (arXiv: 2110.05494)
- Late-time Radio and Millimeter Observations of Superluminous Supernovae and Long Gamma-Ray Bursts: Implications for Obscured Star Formation, Central Engines, and Fast Radio Bursts
 T. Eftekhari, B. Margalit, C. M. B. Omand, et al. 2021, ApJ, 912, 21, pp. 23 (arXiv:2010.06612)
- Wandering Massive Black Holes or Analogs of the First Repeating Fast Radio Burst? T. Eftekhari, E. Berger, B. Margalit, B. D. Metzger, P. K. G. Williams 2020, Astrophysical Journal, 895, 98, pp. 10 (arXiv:2001.02688)
- 6. A Radio Source Coincident with the Superluminous Supernova PTF10hgi: Evidence for a Central Engine and an Analogue of the Repeating FRB121102?
 T. Eftekhari, E. Berger, B. Margalit, et al. 2019, Astrophysical Journal Letters, 876, L10, pp. 10 (arXiv:1901.10479)
- 7. Associating Fast Radio Bursts with Extragalactic Radio Sources: General Methodology and a Search for a Counterpart to FRB 170107
 T. Eftekhari, E. Berger, P. K. G. Williams, P. K. Blanchard 2018, Astrophysical Journal, 860, 73, pp. 9 (arXiv:1802.09525)
- Radio Monitoring of the Tidal Disruption Event Swift J164449.3+573451. III. Late-time Jet Energetics and a Deviation from Equipartition
 T. Eftekhari, E. Berger, B. A. Zauderer, et al. 2018, Astrophysical Journal, 854, 86, pp. 12 (arXiv:1710.07289)
- 9. Associating Fast Radio Bursts with Their Host Galaxies
 T. Eftekhari & E. Berger
 2017, Astrophysical Journal, 849, 162, pp. 7 (arxiv:1705.02998)
- A Low Frequency Survey of Giant Pulses from the Crab Pulsar
 T. Eftekhari, K. Stovall, J. Dowell, F. K. Schinzel, G. B. Taylor 2016, Astrophysical Journal, 829, 62, pp. 8 (arxiv:1607.08612)

Second Author Publications

- Mapping Obscured Star Formation in the Host Galaxy of FRB 20201124A
 Y. Dong, T. Eftekhari, W. Fong, A. Deller et al., 2023, ApJ
- Radio Monitoring of the Tidal Disruption Event Swift J164449.3+573451. IV. The Slow Fade Y. Cendes, T. Eftekhari, E. Berger, E. Polisensky et al., 2021, ApJ, 908, 125

PUBLICATIONS AS NTH AUTHOR

A non-repeating fast radio burst in a dwarf host galaxy
 S. Bhandari et al., 2022, arXiv:2211.16790

- The Jet Opening Angle and Event Rate Distributions of Short Gamma-ray Bursts from Late-time X-ray Afterglows
 Rouco Escorial et al., 2022, arXiv:2210.05695
- Chronicling the Host Galaxy Properties of the Remarkable Repeating FRB 20201124A W. Fong et al., 2021, arXiv:2106.11993
- The emergence of a new source of X-rays from the binary neutron star merger GW170817 A. Hajela, et al., 2021, arXiv:2104.02070
- Probabilistic Association of Transients to their Hosts (PATH) K. Aggarwal, et al., 2021, ApJ, 911, 95
- 6. A Late-Time Galaxy-Targeted Search for the Radio Counterpart of GW190814
 K. D. Alexander, et al., 2021, Accepted to ApJ
- Radio Observations of an Ordinary Outflow from the Tidal Disruption Event AT2019dsg
 Y. Cendes, et al., 2021, Accepted to ApJ
- 8. The Broad-band Counterpart of the Short GRB 200522A at z=0.5536 : A Luminous Kilonova or a Collimated Outflow with a Reverse Shock?
 W. Fong et al., 2020, Accepted to ApJ
- The Tidal Disruption Event AT 2018hyz II: Light-curve modelling of a partially disrupted star S. Gomez, M. Nicholl, P. Short, R. Margutti, K. D. Alexander, P. K. Blanchard, E. Berger, T. Eftekhari, et al., 2020, MNRAS, 497, 1952
- AT 2018cow VLBI: No Long-Lived Relativistic Outflow
 M. F. Bietenholz, R. Margutti, D. Coppejans, K. D. Alexander, M. Argo, N. Bartel, T. Eftekhari, D. Milisavljevic, G. Terreran, E. Berger, 2020, MNRAS, 491, 4735
- Two years of non-thermal emission from the binary neutron star merger GW170817: rapid fading of the jet afterglow and first constraints on the kilonova fastest ejecta
 A. Hajela et al., 2019, ApJ, 886, L17
- A Galaxy-Targeted Search for the Optical Counterpart of the Candidate NS-BH Merger S190814bv with Magellan
 S. Gomez, G. Hosseinzadeh, P. S. Cowperthwaite, V. A. Villar, E. Berger, T. Gardner, K. D. Alexander, P. K. Blanchard, R. Chornock, M. R. Drout, **T. Eftekhari**, et al. 2019, ApJ, 884, L55
- The Optical Afterglow of GW170817: An Off-axis Structured Jet and Deep Constraints on a Globular Cluster Origin
 W. Fong, P. K. Blanchard, K. D. Alexander, J. Strader, R. Margutti, A. Hajela, V. A. Villar, Y. Wu, C. S. Ye, E. Berger, R. Chornock, D. Coppejans, P. S. Cowperthwaite, **T. Eftekhari**, et al. 2019, ApJL, 883, L1
- 14. Follow-up of the Neutron Star Bearing Gravitational Wave Candidate Events S190425z and S190426c with MMT and SOAR
 G. Hosseinzadeh et al., 2019, ApJL, 880, L4
- An embedded X-ray source shines through the aspherical AT2018cow: revealing the inner workings of the most luminous fast-evolving optical transients
 R. Margutti et al., 2019, ApJ, 872, 18
- Unveiling the Engines of Fast Radio Bursts, Super-Luminous Supernovae, and Gamma-Ray Bursts B. Margalit et al., 2018, MNRAS, 481, 2407
- Spitzer Space Telescope Infrared Observations of the Binary Neutron Star Merger GW170817
 V. A. Villar, P. S. Cowperthwaite, E. Berger, P. K. Blanchard, S. Gomez, K. D. Alexander, R.

Margutti, R. Chornock, **T. Eftekhari** G. G. Fazio, J. Guillochon, J. L. Hora, M. Nicholl, P. K. G. Williams, 2018, ApJL, 862, L11

- A Decline in the X-ray through Radio Emission from GW170817 Continues to Support an Off-Axis Structured Jet
 K. D. Alexander, R. Margutti, P. K. Blanchard, W. Fong, E. Berger, A. Hajela, T. Eftekhari, et al., 2018, ApJL, 863, 18L
- A Precise Distance to the Host Galaxy of the Binary Neutron Star Merger GW170817 Using Surface Brightness Fluctuations
 M. Cantiello et al., 2018, ApJ, 854, 31L
- The Binary Neutron Star event LIGO/VIRGO GW170817 a hundred and sixty days after merger: synchrotron emission across the electromagnetic spectrum
 R. Margutti et al., 2018, ApJ, 856, 18L
- 21. Design and characterization of the Large-Aperture Experiment to Detect the Dark Age (LEDA) radiometer systems D. Price et al., 2018, MNRAS, 478, 4193
- 22. Improved Constraints on H0 from a combined analysis of gravitational-wave and electromagnetic emission from GW170817
 C. Guidorzi et al., 2017, ApJ, 851, 36L
- 23. A gravitational-wave standard siren measurement of the Hubble constant B. P. Abbott et al., 2017, Nature, 551, 85
- 24. The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/VIRGO GW170817.
 II. UV, Optical, and Near-IR Light Curves and Comparison to Kilonova Models
 P. S. Cowperthwaite et al., 2017, ApJ, 848, 17L
- The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/VIRGO GW170817. III. Optical and UV Spectra of a Blue Kilonova From Fast Polar Ejecta M. Nicholl et al., 2017, ApJ, 848, L18
- The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/VIRGO GW170817. IV. Detection of Near-infrared Signatures of r-process Nucleosynthesis with Gemini-South R. Chornock et al., 2017, ApJ, 848, L19
- 27. The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/VIRGO GW170817.
 V. Rising X-ray Emission from an Off-Axis Jet
 R. Margutti et al., 2017, ApJ, 848, L20
- The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/VIRGO GW170817. VI. Radio Constraints on a Relativistic Jet and Predictions for Late-Time Emission from the Kilonova Ejecta
 K. D. Alexender et al. 2017, ApJ, 848, L21
 - K. D. Alexander et al., 2017, ApJ, 848, L21 $\,$
- The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/VIRGO GW170817. VII. Properties of the Host Galaxy and Constraints on the Merger Timescale
 P. K. Blanchard et al., 2017, ApJ, 848, L22
- The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/VIRGO GW170817. VIII. A Comparison to Cosmological Short-duration Gamma-ray Bursts
 W. Fong et al., 2017, ApJ, 848, L23
- Bifrost: a Python/C++ Framework for High-Throughput Stream Processing in Astronomy M. D. Cranmer, B. R. Barsdell, D. C. Price, J. Dowell, H. Garsden, V. Dike, T. Eftekhari, et al., 2017, JAI, 6, 1750007

- Empirical constraints on the origin of fast radio bursts: volumetric rates and host galaxy demographics as a test of millisecond magnetar connection
 M. Nicholl, P. K. G. Williams, E. Berger, V. A. Villar, K. D. Alexander, T. Eftekhari, B. D. Metzger, 2017, ApJ, 843, 84
- Bayesian Constraints on the Global 21-cm Signal from the Cosmic Dawn
 G. Bernardi, J. T. L. Zwart, D. Price, L. J. Greenhill, A. Mesinger, J. Dowell, T. Eftekhari, S. W. Ellingson, J. Kocz, F. Schinzel, 2016, MNRAS, 461, 3
- Digital Signal Processing using Stream High Performance Computing: A 512-input Broadband Correlator for Radio Astronomy
 J. Kocz, L. J. Greenhill, B. R. Barsdell, D. Price, G. Bernardi, S. Bourke, M. A. Clark, J. Craig, M. Dexter, J. Dowell, T. Eftekhari, et al., JAI, 2015, 4 50003
- Pulsar Observations Using the First Station of the Long Wavelength Array and the LWA Pulsar Data Archive
 K. Stovall, P. S. Ray, J. Blythe, J. Dowell, **T. Eftekhari**, A. Garcia, A.; T. J. W. Lazio, M. McCrackan, F. K. Schinzel, G. B. Taylor, ApJ, 2015, 808, 156