

# Tarraneh Eftekhari

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## EDUCATION

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| HARVARD UNIVERSITY   | <i>Expected May 2021</i> |
| <b>Ph.D.</b> , Astronomy and Astrophysics  |                          |
| <ul style="list-style-type: none"><li>• Thesis: Unveiling the Transient Radio Sky</li><li>• Advisor: Edo Berger, Ph.D.</li></ul>                                   |                          |
| HARVARD UNIVERSITY   | 2015–2017                |
| <b>M.A.</b> , Astronomy and Astrophysics   |                          |
| <ul style="list-style-type: none"><li>• Thesis: Radio Monitoring of the Tidal Disruption Event Swift J1644+57</li><li>• Advisor: Edo Berger, Ph.D.</li></ul>       |                          |
| UNIVERSITY OF NEW MEXICO   | 2010–2014                |
| <b>B.S.</b> , Astrophysics, Minor in Mathematics, <i>Magna Cum Laude</i>   |                          |
| <ul style="list-style-type: none"><li>• Honors Thesis: A Low Frequency Survey of Giant Pulses from the Crab Pulsar</li><li>• Advisor: Greg Taylor, Ph.D.</li></ul> |                          |

## RESEARCH EXPERIENCE

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|---|--------------|
| HARVARD UNIVERSITY  | 2015–Present |
| Graduate Research Assistant   |              |
| <ul style="list-style-type: none"><li>• Supervisor: Edo Berger, Ph.D.</li></ul>   |              |
| HARVARD UNIVERSITY  | 2015–2016    |
| Laboratory Assistant  |              |
| <ul style="list-style-type: none"><li>• Development of a Low-Noise Amplifier for the Large Aperture Experiment to Detect the Dark Ages</li><li>• Supervisor: Lincoln Greenhill, Ph.D.</li></ul> |              |
| UNIVERSITY OF NEW MEXICO  | 2013–2015    |
| Undergraduate Research Assistant  |              |
| <ul style="list-style-type: none"><li>• Supervisor: Greg Taylor, Ph.D.</li></ul>  |              |
| NETHERLANDS INSTITUTE FOR RADIO ASTRONOMY (ASTRON)  | 2014         |
| Summer Research Assistant   |              |
| <ul style="list-style-type: none"><li>• Heliospheric Faraday Rotation from the Crab Pulsar</li><li>• Supervisor: Richard Fallows, Ph.D.</li></ul>   |              |

## RELATED EMPLOYMENT

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|---|-----------|
| HARVARDX  | 2017–2020 |
| Content Developer   |           |
| <ul style="list-style-type: none"><li>• University Chemistry: Molecular Foundations and Global Frontiers</li><li>• Reclaiming Argument: An Introduction to Logical Reasoning</li><li>• The FDA and Prescription Drugs: Current Controversies in Context</li><li>• Science of the Physical Universe 30: Super-Earths and Life</li><li>• Fundamentals of Neuroscience Part 3: The Brain</li></ul> |           |
| LONG WAVELENGTH ARRAY RADIO TELESCOPE   | 2013–2015 |
| Telescope Operator  |           |

## TEACHING

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HARVARD UNIVERSITY Spring 2018, 2019  
Head Teaching Fellow

- Science of the Physical Universe 22: From the Big Bang to the Brontosaurus and Beyond  
Prof: Irwin Shapiro, Ph.D.

HARVARD UNIVERSITY Spring 2017  
Teaching Fellow

- Science of the Physical Universe 22: From the Big Bang to the Brontosaurus and Beyond  
Prof: Irwin Shapiro, Ph.D.

## AWARDS

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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
New Mexico Space Grant Consortium Scholarship	2014
University of New Mexico Undergraduate Research Award	2013

## ACCEPTED OBSERVING PROPOSALS (AS PI)

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*VLA: 37.1 hr; ALMA: 39 hr; VLBA: 3 hr; Arecibo: 15 hr; Chandra: 135 ks; SMA: 3 tracks*

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|---|------|
| 1. Potential Analogs of the First Repeating Fast Radio Burst<br>5.1 hours; Very Large Array, B-Priority; ID: 20B-228                        | 2020 |
| 2. Testing the Connection Between Fast Radio Bursts and SLSNe with ALMA<br>9 hours; ALMA, C-Priority; ID: 2019.1.01663.S                    | 2019 |
| 3. The First Radio Source Associated with a SLSN: Constraining the SED<br>6.75 hours; Very Large Array, A-Priority; ID: 19B-252             | 2019 |
| 4. The First Radio Source Associated with a SLSN: Resolving the Emission<br>3 hours; Very Long Baseline Array, B-Priority; ID: 19B-248      | 2019 |
| 5. ALMA Follow-Up of NS-NS/NS-BH mergers from LIGO/Virgo Observing Run 3<br>15 hours; ALMA, A-Priority, ID: 2019.1.01513.T                  | 2019 |
| 6. Testing the Origin of the First Radio Source Associated with a SLSN Using Chandra<br>30 ks; Chandra + 3.75 hours joint VLA, ID: 21500179 | 2019 |
| 7. A Search for Fast Radio Bursts from the Superluminous Supernova PTF10hgi<br>15 hours; Arecibo, ID: A3331                                 | 2019 |
| 8. Testing the Connection Between Fast Radio Bursts and Superluminous Supernovae<br>11 hours; Very Large Array, B-Priority; ID: 19A-295     | 2019 |
| 9. Exploring Relativistic Transients with the SMA<br>3 tracks; Submillimeter Array, ID: 2019B-S019  | 2019 |
| 10. A Joint Radio-Optical Search for the Host Galaxies of FRBs<br>4 hours; Very Large Array DDT, B- and C-Priority; ID: 18B-366             | 2018 |
| 11. ALMA Follow-Up of NS-NS/NS-BH mergers from LIGO/Virgo Observing Run 3<br>15 hours, ALMA, A-Priority, ID: 2018.1.01617.T                 | 2018 |
| 12. Late-time X-ray and Radio Observations of the Unique Relativistic TDE Sw 1644+57<br>50 ks; Chandra + 3 hours VLA; ID: 19700497          | 2017 |

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|---|------|
| 13. Late-time Radio and X-ray Monitoring of the Relativistic TDE Sw 1644+57<br>3 hours; Very Large Array + 55 ks joint Chandra, A-Priority; ID: 17B-198 | 2017 |
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## PROFESSIONAL SERVICE

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Referee for Monthly Notices of the Royal Astronomical Society	2020–Present
Referee for The Astrophysical Journal	2019–Present
Referee for The Astrophysical Journal Letters	2019–Present
Mentor to first-year graduate students, Harvard Astronomy	2019
Graduate student panelist, Smithsonian Astrophysical Observatory Solar Physics REU	2019
Poster Judge, National Collegiate Research Conference	2018
Peer Review Facilitator, Chandra Cycle 19 Peer Review	2017
Graduate student panelist, Wellesley College	2017
Mentor for Harvard University Women in Stem	2016

## PROFESSIONAL DEVELOPMENT

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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

## OUTREACH

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SEMINAR COORDINATOR, BEACON HILL SEMINARS	2018–2020
<ul style="list-style-type: none"> <li>Designed and coordinated the first astronomy course, <i>Unveiling the Cosmos</i>, for the Beacon Hill Seminars, a community-based program for lifelong learning</li> </ul>	
LOCAL ORGANIZING COMMITTEE, COMSCI CON	2018
<ul style="list-style-type: none"> <li>Reviewed applications for ComSciCon, a workshop on science communication for graduate students, by graduate students</li> <li>Organized the catering and food for 80 attendees for 3 days</li> </ul>	
VOLUNTEER, CAMBRIDGE EXPLORES THE UNIVERSE	2018
<ul style="list-style-type: none"> <li>Led demonstrations at the Chandra booth at yearly astronomy event for the public</li> </ul>	
SPEAKER CHAIR AND BLOG WRITER, HARVARD SCIENCE IN THE NEWS	2016–2019
<ul style="list-style-type: none"> <li>Selected and organized speakers for DayCon2017: Planet Earth, a free science conference for the public</li> <li>Wrote monthly short-form articles on popular science aimed at bridging the communication gap between scientists and non-scientists</li> </ul>	
MENTOR, SCIENCE CLUB FOR GIRLS	2016–2017
<ul style="list-style-type: none"> <li>Developed and taught several mini-lectures on computers and programming as part of <i>Wearable Tech Week</i></li> <li>Helped local high school girls develop their own hands-on educational activities for elementary students</li> <li>Served as mentor for <i>Tech Team</i>, where girls developed an app aimed at solving one of the United Nations' Sustainable Development Goals</li> </ul>	

DIGITAL MENTOR, YOUTHASTRONET

2016–2017

- Supervised young middle school students nationwide as they collected and analyzed astronomical data using the MicroObservatory Robotic Telescope Network
- Answered students' astronomy questions on an online forum

TELESCOPE OPERATOR, UNIVERSITY OF NEW MEXICO

2013–2015

- Led weekly observatory nights for the public

## TECHNICAL SKILLS

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**Computer Languages**

PYTHON, L<sup>A</sup>T<sub>E</sub>X, HTML, CSS, MATLAB, Mathematica

**Astronomical Software**

CASA, CIAO, XSPEC, DS9, Genesys RF & Microwave Design

## INVITED TALKS AND CONFERENCE CONTRIBUTIONS

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1. Late-time Radio and Millimeter Observations of Superluminous Supernovae and Long Gamma-ray Bursts (*Poster*)  
*Royal Astronomical Society Early Career Poster Exhibition* 2020
2. Millimeter Transients with CMB-S4 (*Talk*)  
*CMB-S4 Spring 2020 Collaboration Meeting, Lawrence Berkeley National Laboratory* 2020
3. An Overview of FRB Environments (**Invited**)  
*The Astrophysics of Fast Radio Bursts, Flatiron Institute* 2020
4. Localizing Fast Radio Bursts and Their Host Galaxies (**Invited**)  
*Toronto FRB Day, CITA/Dunlap Institute* 2019
5. A Radio Source Coincident with a Superluminous Supernovae (**Invited**)  
*Institute for Theory and Computation Luncheon, Harvard University* 2019
6. Millimeter Transients in the Era of CMB Surveys (*Talk*)  
*Astrophysics with the CMB-S4 Survey, University of Chicago* 2019
7. A Radio Source Coincident with the Superluminous Supernova PTF10hgi (**Invited**)  
*Columbia University, Department of Astronomy Pizza Lunch* 2019
8. Identifying the Host Galaxies of Fast Radio Bursts (**Invited**)  
*FRBs and their Possible Neutron Star Origins, Amsterdam* 2019
9. Tidal Disruption Events and Fast Radio Burst (*Talk*)  
*Transients Group Meeting, CIERA Northwestern University* 2018
10. Uncovering the Mystery of Fast Radio Bursts (*Talk*)  
*New Hampshire Astronomical Society* 2018
11. Radio Monitoring of the Tidal Disruption Event Swift J1644+57 (*Poster*)  
*Jerusalem Winter School in Theoretical Physics, The Physics of Astronomical Transients* 2018
12. On the Association of Fast Radio Bursts and Their Hosts (*Talk*)  
*Workshop on Fast Radio Bursts, McGill University* 2017
13. Multi-wavelength Monitoring of the Relativistic TDE Swift J1644+57 (*Poster*)  
*American Astronomical Society 229th Meeting* 2017
14. Tidal Disruption Events: A Multi-Wavelength Approach (*Talk*)  
*Time-Domain Astrophysics in the American Northeast* 2016
15. A Low Frequency Survey of Giant Pulses from the Crab Pulsar (*Poster*)  
*American Astronomical Society 225th Meeting 2015* 2015

## FIRST AUTHOR PUBLICATIONS

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1. *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.  
Submitted to ApJ ([arXiv: 2010.06612](#))
2. *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  
Astrophysical Journal, 895, 98, 2020 ([arXiv:2001.02688](#))
3. *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.  
Astrophysical Journal Letters, 876, L10, 2019 ([arXiv:1901.10479](#))
4. *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  
Astrophysical Journal, 860, 73, 2018 ([arXiv:1802.09525](#))
5. *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.  
Astrophysical Journal, 854, 86, 2018 ([arXiv:1710.07289](#))
6. *Associating Fast Radio Bursts with Their Host Galaxies*  
**T. Eftekhari** & E. Berger  
Astrophysical Journal, 849, 162, 2017 ([arxiv: 1705.02998](#))
7. *A Low Frequency Survey of Giant Pulses from the Crab Pulsar*  
**T. Eftekhari**, K. Stovall, J. Dowell, F. K. Schinzel, G. B. Taylor  
Astrophysical Journal, 829, 62, 2016 ([arxiv:1607.08612](#))

## PUBLICATIONS AS NTH AUTHOR

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1. *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, Submitted to ApJ
2. *The Tidal Disruption Event AT 2018hyz II: Light-curve modelling of a partially disrupted star*  
S. Gomez et al., 2020, MNRAS, 497, 1952
3. *AT 2018cow VLBI: No Long-Lived Relativistic Outflow*  
M. F. Bietenholz et al., 2020, MNRAS, 491, 4735
4. *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
5. *A Galaxy-Targeted Search for the Optical Counterpart of the Candidate NS-BH Merger S190814bv with Magellan*  
S. Gomez et al., 2019, ApJ, 884, L55
6. *The Optical Afterglow of GW170817: An Off-axis Structured Jet and Deep Constraints on a Globular Cluster Origin*  
W. Fong et al., 2019, 883, L1

7. *Follow-up of the Neutron Star Bearing Gravitational Wave Candidate Events S190425z and S190426c with MMT and SOAR*  
G. Hosseinzadeh et al., 2019, 880, L4
8. *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
9. *Unveiling the Engines of Fast Radio Bursts, Super-Luminous Supernovae, and Gamma-Ray Bursts*  
B. Margalit et al., 2018, MNRAS, 481, 2407
10. *Spitzer Space Telescope Infrared Observations of the Binary Neutron Star Merger GW170817*  
V. A. Villar et al., 2018, 862, L11
11. *A Decline in the X-ray through Radio Emission from GW170817 Continues to Support an Off-Axis Structured Jet*  
K. D. Alexander et al., 2018, 863, 18L
12. *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
13. *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
14. *Design and characterization of the Large-Aperture Experiment to Detect the Dark Age (LEDA) radiometer systems* D. Price et al., 2018, MNRAS, 478, 4193
15. *Improved Constraints on  $H_0$  from a combined analysis of gravitational-wave and electromagnetic emission from GW170817*  
C. Guidorzi et al., 2017, ApJ, 851, 36L
16. *A gravitational-wave standard siren measurement of the Hubble constant*  
B. P. Abbott et al., 2017, Nature, 551, 85
17. *‘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
18. *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
19. *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
20. *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
21. *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. Alexander et al., 2017, ApJ, 848, L21
22. *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
23. *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
24. *Bifrost: a Python/C++ Framework for High-Throughput Stream Processing in Astronomy*  
M. D. Cranmer et al., 2017, JAI, 6, 1750007
25. *Empirical constraints on the origin of fast radio bursts: volumetric rates and host galaxy demographics as a test of millisecond magnetar connection*  
M. Nicholl et al., 2017, ApJ, 843, 84
26. *Bayesian Constraints on the Global 21-cm Signal from the Cosmic Dawn*  
G. Bernardi et al., 2016, MNRAS, 461, 3
27. *Digital Signal Processing using Stream High Performance Computing: A 512-input Broadband Correlator for Radio Astronomy*  
J. Kocz et al., JAI, 2015, 4 50003
28. *Pulsar Observations Using the First Station of the Long Wavelength Array and the LWA Pulsar Data Archive*  
K. Stovall et al., ApJ, 2015, 808, 156