

Carl Rodriguez | Curriculum Vitae

Department of Physics – Carnegie Mellon University – Pittsburgh, PA

📞 318.469.1779 • ✉ carlrodriguez@cmu.edu • 🌐 bhdynamics.com

Education and Employment

Carnegie Mellon University <i>Pittsburgh, PA</i> Assistant Professor of Physics	Professor 2020-Present
Harvard University <i>Cambridge, MA</i> ITC Postdoctoral Fellow	Postdoc 2019-2020
Massachusetts Institute of Technology <i>Cambridge, MA</i> Pappalardo Postdoctoral Fellow	Postdoc 2016-2019
Northwestern University <i>Evanston, IL</i>	Ph.D. Physics 2010-2016
Reed College <i>Portland, OR</i>	B.A. Physics 2006-2010

Honors, Awards, and Fellowships

○ Kaufman Foundation New Investigator Award	2020
○ ITC Fellowship, Harvard University	2019-2020
○ MIT Spot Award	2017
○ MIT Pappalardo Fellowship	2016-2019
○ NSF Graduate Research Fellowship	2011-2016
○ NSF GK12 Fellowship	2013-2014
○ Illinois Space Grant Consortium Fellowship	2010-2011, 2015-2016
○ NSF STEM Scholar	2008-2010

Grants

The Lives and Deaths of Star Clusters, and the Gravitational Waves They Leave Behind <i>PI: C. L. Rodriguez; Kaufman Foundation New Investigator Grant (\$150,000)</i>	Foundation 2020
WoU-MMA: The Evolution, Destruction, and Gravitational-wave Sources of Dense Star Clusters in Cosmological Simulations <i>PI: C. L. Rodriguez; NSF Award AST-2009916 (\$434,393)</i>	NSF-AST 2020
Astrophysics and Cyberinfrastructure Initiatives for Decihertz Gravitational-Wave Missions <i>PI: A. Miguel Holgado, co-I: C. L. Rodriguez; McWilliams Seed Grant (\$10,000)</i>	CMU Grant 2020
Modeling Dense Star Clusters and their Gravitational-wave Sources from Cosmological Simulations <i>PI: C. L. Rodriguez, Co-I: Astrid Lamberts, Mike Grudić; 1.1M CPU Hours (\$20,140 Value)</i>	XSEDE 2018

Publications (with links)

A complete list of publications can also be found at the NASA ADS service [here](#).

Publication Metrics.....

As of August 2021:

- o All Publications (excluding LIGO collaboration papers) – **4134 citations, h-index of 36**

5 Most Cited Papers As Major Contributor (By Publication Year).....

- Post-Newtonian Dynamics in Dense Star Clusters: Highly-Eccentric, Highly-Spinning, and Repeated Binary Black Hole Mergers** **PRL**
2018
[172 Citations]
C. L. Rodriguez, P. Amaro-Seoane, S. Chatterjee, F. Rasio; Phys. Rev. Lett, **120**, 151101
- Articles in *Boston Globe*, *MIT News* (Links),
- Illuminating Black Hole Binary Formation Channels with Spins in Advanced LIGO** **ApJL**
2016
[163 Citations]
C. L. Rodriguez, M. Zevin, C. Pankow, V. Kalogera, F. Rasio; Astrophys. J. Lett., **832**, L2
- Binary Black Hole Mergers from Globular Clusters: Masses, Merger Rates, and the Impact of Stellar Evolution** **PRD**
2016
[340 Citations]
C. L. Rodriguez, S. Chatterjee, F. Rasio; Phys. Rev. D, **93**, 084029
- Binary Black Hole Mergers from Globular Clusters: Implications for Advanced LIGO** **PRL**
2015
[253 Citations]
C. L. Rodriguez, M. Morscher, B. Pattabiraman, S. Chatterjee, C.J. Haster, and F. Rasio; Phys. Rev. Lett. **115**, 051101
- Synopsis by APS in *Physics* (Link)
- The Dynamical Evolution of Stellar Black Holes in Globular Clusters** **ApJ**
2015
[166 Citations]
M. Morscher, B. Pattabiraman, C. L. Rodriguez, F. Rasio, S. Umbreit; Astrophys. J., **800**, 1, 21

Papers as Major Contributor or Primary Advisor.....

- Modeling Dense Star Clusters in the Milky Way and Beyond with the Cluster Monte Carlo Code** 2021
C. L. Rodriguez, N. Weatherford, S. Coughlin, P. Amaro-Seoane, K. Breivik, S. Chatterjee, G. Fragione, F. Kiroglu, K. Kremer, N. Rui, S. Ye, M. Zevin, F. Rasio; Astrophys. J. Supp. (submitted)
- On the Mass Ratio Distribution of Black Hole Mergers in Triple Systems** 2021
M. Martinez, C. L. Rodriguez, G. Fragione; Astrophys. J. (submitted)
- The Observed Rate of Binary Black Hole Mergers can be Entirely Explained by Globular Clusters** **RNAAS**
2021
C. L. Rodriguez, K. Kremer, S. Chatterjee, G. Fragione, A. Loeb, F. Rasio, N. Weatherford, S. Ye; Research Notes AAS, **5**, 19
- Fast Multipole Methods for Simulating Collisional Star Systems** **ApJ**
2021
D. Mukherjee, Q. Zhu, H. Trac, C. L. Rodriguez; Astrophys. J., **916**, 9

Dynamical Formation Scenarios for GW190521 and Prospects for Decihertz Gravitational-Wave Astronomy with GW190521-Like Binaries <i>A. M. Holgado, A. Ortega, C. L. Rodriguez</i> ; <i>Astrophys. J. Lett</i> , 909 , L24	ApJL 2021
Relativistic Three-body Effects in Hierarchical Triples <i>H. Lim, C. L. Rodriguez</i> ; <i>Phys. Rev. D</i> 102 , 064033	PRD 2020
GW190412 as a Third-Generation Black Hole Merger from a Super Star Cluster <i>C. L. Rodriguez, K. Kremer, M. Grudić, Z. Hafen, S. Chatterjee, G. Fragione, A. Lamberts, M. Martinez, F. Rasio, N. Weatherford, S. Ye</i> ; <i>Astrophys. J. Lett.</i> , 896 , L10	ApJL 2020
Black Holes: The Next Generation – Repeated Mergers in Dense Star Clusters and their Gravitational-Wave Properties <i>C. L. Rodriguez, M. Zevin, P. Amaro-Seoane, S. Chatterjee, K. Kremer, F. Rasio, S. Ye</i> ; <i>Phys. Rev. D</i> , 100 , 043027	PRD 2019
Post-Newtonian Dynamics in Dense Star Clusters: Binary Black Holes in the LISA Band <i>K. Kremer, C. L. Rodriguez, P. Amaro-Seoane, K. Breivik, S. Chatterjee, M. Katz, S. Larson, F. Rasio, J. Samsing, S. Ye, M. Zevin</i> ; <i>Phys. Rev. D</i> , 99 , 063003	PRD 2019
Eccentric Black Hole Mergers in Dense Star Clusters: The Role of Binary-Binary Encounters <i>M. Zevin, J. Samsing, C. L. Rodriguez, C. Haster, E. Ramirez-Ruiz</i> ; <i>Astrophys. J.</i> , 871 , 1	ApJ 2018
Post-Newtonian Dynamics in Dense Star Clusters: Formation, Masses, and Merger Rates of Highly-Eccentric Black Hole Mergers <i>C. L. Rodriguez, P. Amaro-Seoane, S. Chatterjee, K. Kremer, F. Rasio, J. Samsing, S. Ye, M. Zevin</i> ; <i>Phys. Rev. D</i> , 98 , 123005	PRD 2018
Redshift Evolution of the Black Hole Merger Rate From Globular Clusters <i>C. L. Rodriguez, A. Loeb</i> ; <i>Astrophys. J.</i> , 865 , L5	ApJL 2018
A Triple Origin for the Heavy and Low-Spin Binary Black Holes Detected by LIGO/Virgo <i>C. L. Rodriguez, F. Antonini</i> ; <i>Astrophys. J.</i> , 963 , 1, 7	ApJ 2018
Precessional Dynamics of Black Hole Triples: Binary Mergers with near-zero Effective Spin <i>F. Antonini, C. L. Rodriguez, C. Petrovich, C. Fischer</i> ; <i>Mon. Not. R. Astron. Soc. Lett.</i> , 480 , 1, L58	MNRASL 2018
A New Hybrid Technique for Modeling Dense Star Clusters <i>C. L. Rodriguez, B. Pattabiraman, S. Chatterjee, M. Morscher, F. Rasio, A. Choudhary, W-K. Liao</i> ; <i>Computational Astrophysics and Cosmology</i> , 5 , 1	CompAC 2018
Binary Black Holes in Dense Star Clusters: Exploring the Theoretical Uncertainties <i>S. Chatterjee, C. L. Rodriguez, F. Rasio</i> ; <i>Astrophys. J.</i> , 834 , 1, 68	ApJ 2017
Dynamical Formation of Low-mass Merging Black Hole Binaries like GW151226 <i>S. Chatterjee, C. L. Rodriguez, V. Kalogera, F. Rasio</i> ; <i>ApJL</i> , 836 , L26	ApJL 2017
Constraining Models of Binary Black Hole Formation with Gravitational-Wave Observations <i>M. Zevin, C. Pankow, C. L. Rodriguez, L. Sampson, E. Chase, V. Kalogera, F. Rasio</i> ; <i>Astrophys. J.</i> , 846 , 82Z	ApJ 2017

Black Hole Mergers and Blue Stragglers from Hierarchical Triples Formed in Globular Clusters ApJ
2016
F. Antonini, S. Chatterjee, C. L. Rodriguez, M. Morscher, B. Pattabiraman, V. Kalogera, F. Rasio; Astrophys. J., 816, 2, 65

Distinguishing Between Formation Channels for Binary Black Holes with LISA ApJL
2016
K. Breivik, C. L. Rodriguez, S. Larson, V. Kalogera, F. Rasio; Astrophys. J. Lett., 830, L18

Illuminating Black Hole Binary Formation Channels with Spins in Advanced LIGO ApJL
2016
C. L. Rodriguez, M. Zevin, C. Pankow, V. Kalogera, F. Rasio; Astrophys. J. Lett., 832, L2

Million-Body Star Cluster Simulations: Comparisons between Monte Carlo and Direct N -body MNRAS
2016
C. L. Rodriguez, M. Morscher, L. Wang, S. Chatterjee, F. Rasio, R. Spurzem; Mon. Not. R. Astron. Soc. 463, 2109

Basic Parameter Estimation of Binary Neutron Star Systems by the Advanced LIGO/Virgo Network ApJ
2014
C. L. Rodriguez, B. Farr, V. Raymond, W. Farr, T. Littenberg, D. Fazi, V. Kalogera; Astrophys. J., 785, 2, 119

Inadequacies of the Fisher Information Matrix in gravitational-wave parameter estimation PRD
2013
C. L. Rodriguez, B. Farr, W. Farr, I. Mandel; Phys. Rev. D, 88, 8, 084013

Verifying the no-hair property of massive compact objects with intermediate-mass-ratio inspirals in advanced gravitational-wave detectors PRD
2012
C. L. Rodriguez, I. Mandel, J. Gair; Phys. Rev. D, 85, 6, 062002
 - Synopsis in *Astrobit*s (Link)

Contributing Author Papers.....

White Dwarf Subsystems in Core-Collapsed Globular Clusters 2021
K. Kremer, N. Rui, N. Weatherford, S. Chatterjee G. Fragione, F. Rasio, S. Ye C. L. Rodriguez; Astrophys. J. (submitted)

Matching Globular Cluster Models to Observations ApJ
2021
N. Rui, K. Kremer, N. Weatherford, S. Chatterjee, F. Rasio, C. L. Rodriguez, S. Ye ; Astrophys. J., 912, 2

No Black Holes in NGC 6397 RNAAS
2021
N. Rui, N. Weatherford, K. Kremer, S. Chatterjee G. Fragione, F. Rasio, S. Ye C. L. Rodriguez; Research Notes AAS, 5, 47

Black Hole Mergers from Star Clusters with Top-heavy Initial Mass Functions ApJL
2021
N. Weatherford, G. Fragione, K. Kremer, S. Chatterjee, S. Ye ,C. L. Rodriguez, F. Rasio; Astrophys. J. Lett., 907, 25

Probing Multiple Populations of Compact binaries with Third-generation Gravitational-wave Detectors ApJL
2021
S. Vitale, W. Farr, K. Ng, C. L. Rodriguez; Astrophys. J. Lett., 913, L5

One Channel to Rule Them All? Constraining the Origins of Binary Black Holes using Multiple Formation Pathways ApJ
2021
M. Zevin, S. Bavera, C. Berry, V. Kalogera, T. Fragos, P. Marchant, C. L. Rodriguez, F. Antonini, D. Holz, C. Pankow; Astrophys. J., 910, 152

Intermediate-mass Black Holes from High Massive-star Binary Fractions in Young Star Clusters	ApJL 2021
<i>E. González, K. Kremer, S. Chatterjee, G. Fragione, C. L. Rodriguez, N. Weatherford, S. Ye, F. Rasio; Astrophys. J. Lett, (in press)</i>	
Black Hole Mergers from Hierarchical Triples in Dense Star Clusters	ApJ 2020
<i>M. Martinez, G. Fragione, K. Kremer, S. Chatterjee, C. L. Rodriguez, J. Samsing, S. Ye, N. Weatherford, M. Zevin, S. Naoz, F. Rasio; Astrophys. J., 903, 67</i>	
Populating the Upper Black Hole Mass Gap through Stellar Collisions in Young Star Clusters	ApJ 2020
<i>K. Kremer, M. Spera, D. Becker, S. Chatterjee, U. N. Di Carlo, G. Fragione, C. L. Rodriguez, F. Rasio, N. Weatherford, S. Ye; Astrophys. J., 903, 45</i>	
Measuring the Star Formation Rate with Gravitational Waves from Binary Black Holes	ApJL 2018
<i>S. Vitale, W. Farr, K. Ng, C. L. Rodriguez; Astrophys. J. Lett., 886, 1</i>	
On the Rate of Neutron Star Binary Mergers from Globular Clusters	ApJL 2020
<i>C. Ye, W.-F. Fong, K. Kremer, C. L. Rodriguez, S. Chatterjee, G. Fragione, F. Rasio; Astrophys. J. Lett., 888, 10</i>	
Single-single gravitational-wave captures in globular clusters: Eccentric deci-Hertz sources observable by DECIGO and Tian-Qin	PRD 2019
<i>J. Samsing, D. D'Orazio, K. Kremer, C. L. Rodriguez, A. Askar; Phys. Rev. D 101, 123010</i>	
COSMIC Variance in Binary Population Synthesis	ApJ 2019
<i>K. Breivik, S. Coughlin, M. Zevin, C. L. Rodriguez, K. Kremer, C. Ye, J. Andrews, M. Kurkowski, M. Digman, S. Larson, F. Rasio; Astrophys. J. 898,71</i>	
Millisecond Pulsars and Black Holes in Globular Clusters	ApJ 2019
<i>C. Ye, K. Kremer, S. Chatterjee, C. L. Rodriguez, F. Rasio; Astrophys. J. , 877, 122</i>	
The fate of binaries in the Galactic Center: The Mundane and the Exotic	ApJ 2019
<i>S. Alexander, S. Naoz, A. Ghez, M. Morris, A. Ciurlo, T. Do, K. Breivik, S. Coughlin, C. L. Rodriguez; Astrophys. J. , 878, 58S</i>	
Predicting Stellar-mass Black Hole Populations in Globular Clusters	ApJ 2018
<i>N. Weatherford, S. Chatterjee, C. L. Rodriguez, F. Rasio; Astrophys. J. , 864, 13</i>	
How initial size governs core collapse in globular clusters	ApJ 2018
<i>K. Kremer, S. Chatterjee, C. Ye, C. L. Rodriguez, F. Rasio; Astrophys. J. , 871, 38</i>	
LISA Sources in Milky Way Globular Clusters	PRL 2018
<i>K. Kremer, S. Chatterjee, K. Breivik, C. L. Rodriguez, S. Larson, F. Rasio; PRL, 120, 19</i>	
How Black Holes Shape Globular Clusters: Modeling NGC 3201	ApJL 2018
<i>K. Kremer, C. Ye, S. Chatterjee, C. L. Rodriguez, F. Rasio; Astrophys. J. Lett., 855, 15</i>	
Low-mass X-ray binaries ejected from globular clusters	2018
<i>K. Kremer, S. Chatterjee, C. L. Rodriguez, F. Rasio; Astrophys. J. (submitted)</i>	
Accreting Black Hole Binaries in Globular Clusters	ApJ 2017
<i>K. Kremer, S. Chatterjee, C. L. Rodriguez, F. Rasio; Astrophys. J., 852, 29</i>	

Parameter estimation for compact binaries with ground-based gravitational-wave observations using the LALInference software library **PRD**
2015

*J. Veitch, V. Raymond, B. Farr, W. Farr, P. Graff, S. Vitale, B. Aylott, K. Blackburn, N. Christensen, M. Coughlin, W. Del Pozzo, F. Feroz, J. Gair, C.J. Haster, V. Kalogera, T. Littenberg, I. Mandel, R. O'Shaughnessy, M. Pitkin, C. L. Rodriguez, C. Röver, T. Sidery, R. Smith, M. Van Der Sluys, A. Vecchio, W. Vousden, L. Wade; Phys. Rev. D, **91**, 4, 042003*

Comparison of Gravitational Wave Detector Network Sky Localization Approximations **PRD**
2014

*K. Grover, S. Fairhurst, B. Farr, I. Mandel, C. L. Rodriguez, T. Sidery, A. Vecchio; Phys. Rev. D, **89**, 4, 042004*

Estimating parameters of coalescing compact binaries with proposed advanced detector networks **PRD**
2012

*J. Veitch, I. Mandel, B. Aylott, B. Farr, V. Raymond, C. L. Rodriguez, M. van der Sluys, V. Kalogera, A. Vecchio; Phys. Rev. D **85**, 104045*

Mock data challenge for the Einstein Gravitational-Wave Telescope **PRD**
2012

*T. Regimbau, T. Dent, W. Del Pozzo, S. Giampanis, T.G.F. Li, C. Robinson, C. Van Den Broeck, D. Meacher, C. L. Rodriguez, B.S. Sathyaprakash, K. Wójcik; Phys. Rev. D **86**, 122001*

Lateral alignment of InGaAs quantum dots as function of spacer thickness **APL**
2009

*Z. Wang, C. L. Rodriguez, S. Seydmohamadi, Y. I. Mazur, G. Salamo; Appl. Phys. Lett. **94**, 083107*

Controlling fluorescence intermittency of a single colloidal CdSe/ZnS quantum dot in a half cavity **PRB**
2008

*Y. Zhang, V. Komarala, C. L. Rodriguez, M. Xiao; Phys. Rev. B **78**, 241301(R)*

Collaboration Papers.....

Coauthor on 23 Collaboration Papers as Member of LIGO Scientific Collaboration
Click ([Here](#)) for Full List of Citations 2011-2015

- Characterization of the LIGO detectors during their sixth science run
- Searching for stochastic gravitational waves using data from the two colocated LIGO Hanford detectors
- Constraints on Cosmic Strings from the LIGO-Virgo Gravitational-Wave Detectors
- Application of a Hough search for continuous gravitational waves on data from the fifth LIGO science run
- Gravitational Waves from Known Pulsars: Results from the Initial Detector Era
- First Searches for Optical Counterparts to Gravitational-wave Candidate Events
- Search for long-lived gravitational-wave transients coincident with long gamma-ray bursts
- Directed search for continuous gravitational waves from the Galactic center
- Parameter estimation for compact binary coalescence signals with the first generation gravitational-wave detector network
- A first search for coincident gravitational waves and high energy neutrinos using LIGO, Virgo and ANTARES data from 2007
- Einstein@Home all-sky search for periodic gravitational waves in LIGO S5 data
- Search for gravitational waves from binary black hole inspiral, merger, and ringdown in LIGO-Virgo data from 2009-2010
- Swift Follow-up Observations of Candidate Gravitational-wave Transient Events
- Search for Gravitational Waves Associated with Gamma-Ray Bursts during LIGO Science Run 6 and

Virgo Science Runs 2 and 3

- The characterization of Virgo data and its impact on gravitational-wave searches
- All-sky search for gravitational-wave bursts in the second joint LIGO-Virgo run
- Upper limits on a stochastic gravitational-wave background using LIGO and Virgo interferometers at 600-1000 Hz
- Search for gravitational waves from intermediate mass binary black holes
- First low-latency LIGO+Virgo search for binary inspirals and their electromagnetic counterparts
- Search for gravitational waves from low mass compact binary coalescence in LIGO's sixth science run and Virgo's science runs 2 and 3
- Implementation and testing of the first prompt search for gravitational wave transients with electromagnetic counterparts
- All-sky search for periodic gravitational waves in the full S5 LIGO data
- A gravitational wave observatory operating beyond the quantum shot-noise limit

Graduate Students

Tomás Cabrera Primary Advisor; Carnegie Mellon	Grad Student <i>2020-Present</i>
Xiaoqi Yu Primary Advisor; Carnegie Mellon	Grad Student <i>2020-Present</i>
Kuldeep Sharma Primary Advisor; Carnegie Mellon	Grad Student <i>2020-Present</i>
Miguel Martinez Primary Advisor for Project; Northwestern University	Grad Student <i>2020-2021</i>
Diptajyoti Mukherjee Co-advised on project with Hy Trac; Carnegie Mellon	Grad Student <i>2020-Present</i>
Halston Lim Co-advised on project with Scott Hughes; MIT	Grad Student <i>2018-2020</i>
Michael Zevin Co-advised on project; KSPI Summer Program	Grad Student <i>2017-2018</i>

Undergraduate Students

Alexis Ortega Gravitational-wave Captures in Dense Stellar Environments; Carnegie Mellon Now in Physics PhD Program at Brown University	Undergraduate <i>2020-2021</i>
Sofi Martinez Fortis Numerical Integrators for the Gravitational N -body problem; University of Pittsburgh	Undergraduate <i>2021</i>
Caitlin Fischer Spinning Black Hole Triples; MIT Undergraduate Research Opportunities Program	Undergraduate <i>2017-2018</i>
Joshua Fuhrman Merging Binary Black Holes in Open Clusters; Northwestern REU	Undergraduate <i>2016</i>

Teaching

33-331 Physical Mechanics <i>Instructor of Record</i> ; Carnegie Mellon University, Pittsburgh, PA Upper Divisional Classical Mechanics for Undergraduate Majors	Lecturer <i>2020</i>
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General Relativity <i>Guest Lecturer and TA; Northwestern University, Evanston, IL</i>	Lecture/TA 2015
GK12 Fellowship <i>Reach for the Stars; Highland Park, IL</i> Co-taught weekly in math department of Highland Park High School Developed mathematics lessons, visualizations, and applets for high-school students (Link)	Teaching 2013–2014
Einstein and the 20th Century <i>Guest Lecturer and TA; Northwestern University, Evanston, IL</i>	Lecture/TA 2013

Invited Talks/Seminars

AAS Division of Dynamical Astronomy <i>Remote Conference; Dynamical Formation of LIGO's Binary Black Hole Mergers</i>	Invited Talk 2021
APS April Meeting <i>Remote Conference; Merger Rates of Binary Black Holes across Cosmic Space and Time</i>	Invited Talk 2021
California State University, Long Beach Physics Colloquium <i>Long Beach, CA (remote)</i>	Colloquium 2021
University of Texas, Dallas Physics Colloquium <i>Dallas, TX (remote)</i>	Colloquium 2021
Michigan State University Physics Colloquium <i>Lansing, MI (remote)</i>	Colloquium 2021
Astrophysics Seminar, University of British Columbia <i>Vancouver, Canada (remote)</i>	Seminar 2021
Astrophysics Seminar, University of Pennsylvania <i>Philadelphia, PA (remote)</i>	Seminar 2021
Astronomy Colloquium, Carnegie Observatories <i>Tel Aviv, Israel (remote)</i>	Seminar 2020
Astronomy Seminar, University of Wisconsin, Milwaukee <i>Milwaukee, WI (remote)</i>	Seminar 2020
Astronomy Colloquium, Oregon State University <i>Corvallis, OR (remote)</i>	Colloquium 2020
Astronomy Colloquium, Carnegie Observatories <i>Pasadena, CA (remote)</i>	Colloquium 2020
Astronomy Colloquium, UC Berkeley <i>Berkeley, CA (remote)</i>	Colloquium 2020
ITC Colloquium, Center for Astrophysics Harvard and Smithsonian <i>Cambridge, MA (remote)</i>	Colloquium 2020
YITP Black Holes and Neutron Stars with Gravitational Waves <i>Kyoto, Japan</i>	Invited Talk 2019
KITP Merging Visions: Exploring Compact-Object Binaries with Gravity and Light <i>Santa Barbara, CO</i>	Invited Talk 2019
University of Colorado Astronomy and Planetary Science Colloquium <i>Boulder, CO</i>	Colloquium 2019
UCLA Astrophysics Colloquium <i>Los Angeles, CA</i>	Colloquium 2019

Vanderbilt Physics Colloquium <i>Nashville, TN</i>	Colloquium 2019
Syracuse Physics Colloquium <i>Syracuse, NY</i>	Colloquium 2019
Carnegie Mellon Astrophysics Colloquium <i>Pittsburgh, PA</i>	Colloquium 2019
UIUC Gravitation Seminar <i>Urbana-Champaign, IL</i>	Seminar 2019
UIUC Astronomy Colloquium <i>Urbana-Champaign, IL</i>	Colloquium 2018
Perimeter Institute Strong Gravity Seminar <i>Waterloo, Canada</i>	Seminar 2018
Stanford KIPAC Cosmology Seminar <i>Palo Alto, CA</i>	Seminar 2018
University of Cambridge IoA Galaxy Discussion <i>Cambridge, UK</i>	Seminar 2018
University of Surrey Astrophysics Seminar <i>Guildford, UK</i>	Seminar 2018
Harvard CfA Galaxy and Cosmology Seminar <i>Cambridge, MA</i>	Seminar 2018
CalTech Astronomy Colloquium <i>Pasadena, CA</i>	Colloquium 2018
Harvard Particle Theory Seminar <i>Cambridge, MA</i>	Seminar 2018
Columbia Astrophysics Colloquium <i>New York, NY</i>	Colloquium 2017
Harvard ITC Lunch Seminar <i>Cambridge, MA</i> (Link)	Seminar 2017
Strong Gravity and Binary Dynamics with Gravitational Wave Observations <i>Oxford, MS</i>	Invited Talk 2017
UCSC Flash Seminar <i>Santa Cruz, CA</i>	Seminar 2017
April APS Meeting <i>Washington, DC</i>	Invited Talk 2017
JSI Fall Workshop: Astrophysics in the Era of Grav. Wave Observations <i>Annapolis, MD</i>	Invited Talk 2016
KITP Rapid Response Workshop on Gravitational Waves <i>Santa Barbara, CA</i>	Invited Talk 2016
Compton Lecture Series <i>Chicago, IL</i> (Link)	Guest Seminar 2016
Stellar N-body Conference <i>Sexten, Italy</i>	Invited Talk 2014
Georgia Tech Center for Relativistic Astrophysics <i>Atlanta, GA</i>	Seminar 2011

Selected Contributed Talks/Posters

Black Holes, Neutron Stars, and Gravitational Waves: The New Era of Multi-Messenger Astronomy <i>Honolulu, HI</i> <ul style="list-style-type: none">- Proposed, chaired, and spoke at session at SACNAS (national conference for diversity in STEM)	Chair 2019
Triple Evolution and Dynamics Trendy-2 <i>Leiden, Netherlands</i>	Talk 2018
Aspen Center for Physics: Dawning Era of Gravitational-Wave Astrophysics <i>Aspen, CO</i>	Talk 2017
APS Meeting <i>Salt Lake City, UT</i>	Talk 2016
April APS Meeting <i>Baltimore, MD</i>	Talk 2015
IAU Meeting <i>Beijing, China</i>	Talk 2014
AAS Head Meeting <i>Chicago, IL</i>	Poster 2014
LIGO Scientific Collaboration Meeting <i>Bethesda, MD</i>	Talk 2013
Gravitational-Wave Physics and Astronomy Workshop <i>Hannover, Germany</i> <ul style="list-style-type: none">- 3rd place award for best poster	Poster 2012
Gravitational-Wave Burst Workshop <i>Tobermory, Scotland</i>	Talk 2012
Midwest Relativity Meeting <i>Urbana, IL</i>	Talk 2011
Gravitational-Wave Physics and Astronomy Workshop <i>Milwaukee, WI</i>	Talk 2011

Public Lectures/Outreach

MIT Independent Activities Period <i>The era of Gravitational-wave Astronomy; Cambridge, MA</i>	Public Talk 2017, 2018
Compton Lecture Series <i>Dense Star Clusters as Binary Black Hole Factories</i> (Link) Chicago, IL	Guest Seminar 2016
TEDxNorthwesternU <i>Listening to Einstein's Final Symphony</i> (Link) Evanston, IL	TEDx Talk 2016
Conversations with an Astronomer Series of Public Lectures at Adler Planetarium Chicago, IL	Lecture Series 2011–2016
Film Submission: Jackson Hole Science Media Festival <i>Black Holes and Globular Clusters</i> (Link)	Short Film 2014
Mentoring Telescope Interns Teaching High School Summer Interns at Adler Planetarium; Chicago, IL	Mentoring 2013

Science Club Mentor Weekly after-school science program at Boys and Girls Club; Chicago, IL	Mentoring 2012–2013
Visualization Creation Produced for Adler Planetarium Space Visualization Lab and; Chicago, IL Black Hole Dynamics in Core of Globular Cluster N-Body Simulation (Link) Binary Black Holes Emitting Gravitational Waves (Link)	Visualizations 2011-2016
Perseid Meteor Shower Illinois Science Council in coordination with Chicago Parks Department Chicago, IL	Public Talk 2013
Public Lecture at North Central Purdue University <i>Catching Gravitational Waves with LIGO</i> Westville, IN	Public talk 2011

Service Work

Committee Work at Carnegie Mellon: - - McWilliams Postdoctoral Fellowship Committee - Colloquium Committee - Equity, Diversity, and Inclusion Committee	Committee Service 2019-2020 2020-2021 2020-2021
Peer Reviewer for: - Physical Review Letters - Physical Review D - Astrophysical Journal Letters - Astrophysical Journal - Monthly Notices of the Royal Astronomical Society - Nature - Nature Astronomy	Referee 2015-Present
Proposal Reviewer for: - NSF Astronomy and Astrophysics Research Grants - NASA Astrophysical Theory Program - US-Israel Binational Science Foundation	Reviewer 2021 2019 2018
2021 Multiband Gravitational-Wave Science Workshop Workshop on future and proposed gravitational-wave detectors Carnegie Mellon University, Pittsburgh, PA (remote)	Co-Organizer 2021
Black Holes, Neutron Stars, and Gravitational Waves Proposed, chaired, and spoke at session at SACNAS (conference for diversity in STEM) SACNAS, Honolulu, HI	Chair 2021
IAP Co-Organizer MIT Independent Activities Period; Cambridge, MA	Organizer 2017
Astronomy On Tap – Boston Public Outreach Event at Local Pubs Cambridge, MA	Co-Organizer 2016-2018