

Carl Rodriguez | Curriculum Vitae

Department of Physics and Astronomy – University of North Carolina, Chapel Hill

☎ 318.469.1779 • ✉ carl.rodriguez@unc.edu • 🌐 dynamics.unc.edu

Education and Employment

University of North Carolina

Chapel Hill, NC

Assistant Professor of Physics and Astronomy
Adjunct Professor of Computer Science

Faculty
2023-Present

Carnegie Mellon University

Pittsburgh, PA

Assistant Professor of Physics (2020-2022)
Adjunct Professor of Physics (2023)

Faculty
2020-Present

Harvard University

Cambridge, MA

Institute for Theory and Computation (ITC) Postdoctoral Fellow

Postdoc
2019-2020

Massachusetts Institute of Technology

Cambridge, MA

Pappalardo Postdoctoral Fellow

Postdoc
2016-2019

Northwestern University

Evanston, IL

Ph.D. Physics
2010-2016

Reed College

Portland, OR

B.A. Physics
2006-2010

Honors, Awards, and Fellowships

- AAS Helen B. Warner Prize for Astronomy 2024
- AAS Vera Rubin Early Career Award 2023
- Packard Fellowship for Science and Engineering 2022-2027
- Sloan Research Fellowship 2022-2024
- Kaufman Foundation New Investigator Award 2020-2022
- ITC Fellowship, Harvard University 2019-2020
- 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 S-STEM Scholar 2008-2010

Grants

As of December 2023:

- \$2.6M Total Funding (\$2.1M to UNC/CMU)

A new theoretical framework for globular cluster science with the Roman Wide-Field Imager

PI: R. Sanderson, co-I: T. Starkenburg, C. L. Rodriguez; Nancy Grace Roman Space Telescope Research and Support Participation Opportunities (\$326K; \$63K to UNC)

NASA
2023

Packard Fellowship for Science and Engineering

PI: C. L. Rodriguez; David and Lucile Packard Foundation (\$875K)

Foundation
2023

Sloan Research Fellowship <i>PI: C. L. Rodriguez; Alfred P. Sloan Foundation (\$75K)</i>	Foundation 2022
Stellar Dynamics and Stellar Collisions in Star-by-Star Models of Nuclear Star Clusters <i>PI: C. L. Rodriguez, co-I: H. Trac, F. Rasio, G. Fragione; NASA Astrophysical Theory Award 80NSSC22K0722 (\$746K; \$429K to UNC/CMU)</i>	NASA 2021
The Lives and Deaths of Star Clusters, and the Gravitational Waves They Leave Behind <i>PI: C. L. Rodriguez; Kaufman Foundation New Investigator Grant (\$150K)</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 (\$434K)</i>	NSF 2020
Astrophysics and Cyberinfrastructure Initiatives for Decihertz Gravitational-Wave Missions <i>PI: A. Miguel Holgado, co-I: C. L. Rodriguez; McWilliams Seed Grant (\$10K)</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 (\$20K Value)</i>	XSEDE 2018

Publications (with links)

A complete list of publications can also be found at the NASA ADS service [here](#) or on Google Scholar (which includes LIGO Collaboration Papers) [here](#).

Publication Metrics (via ADS)

As of December 2023:

- All Publications (excluding LIGO collaboration papers) – **6657 citations, h-index of 43**
- Major Contributor/PI Publications – **4066 citations**

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

Black Holes: The Next Generation – Repeated Mergers in Dense Star Clusters and their Gravitational-Wave Properties [227 Citations] <i>C. L. Rodriguez, M. Zevin, P. Amaro-Seoane, S. Chatterjee, K. Kremer, F. Rasio, S. Ye; Phys. Rev. D, 100, 043027</i>	PRD 2019
Post-Newtonian Dynamics in Dense Star Clusters: Highly-Eccentric, Highly-Spinning, and Repeated Binary Black Hole Mergers [250 Citations] <i>C. L. Rodriguez, P. Amaro-Seoane, S. Chatterjee, F. Rasio; Phys. Rev. Lett, 120, 151101</i> - Articles in <i>Boston Globe</i> , <i>MIT News</i> (Links),	PRL 2018
Illuminating Black Hole Binary Formation Channels with Spins in Advanced LIGO [248 Citations] <i>C. L. Rodriguez, M. Zevin, C. Pankow, V. Kalogera, F. Rasio; Astrophys. J. Lett., 832, L2</i>	ApJL 2016
Binary Black Hole Mergers from Globular Clusters: Masses, Merger Rates, and the Impact of Stellar Evolution [459 Citations] <i>C. L. Rodriguez, S. Chatterjee, F. Rasio; Phys. Rev. D, 93, 084029</i>	PRD 2016
Binary Black Hole Mergers from Globular Clusters: Implications for Advanced LIGO [326 Citations] <i>C. L. Rodriguez, M. Morscher, B. Pattabiraman, S. Chatterjee, C.J. Haster, and F. Rasio; Phys. Rev. Lett. 115, 051101</i> - Synopsis by APS in <i>Physics</i> (Link)	PRL 2015

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

- Great Balls of FIRE III: Modeling Black Hole Mergers from Massive Star Clusters in Simulations of Galaxies** 2023
T. Bruel, C. L. Rodriguez, A. Lamberts, Grudić, Z. Hafen, R. Feldmann; *Astron. & Astrophys.* (submitted)
- Modelling stellar evolution in mass-transferring binaries and gravitational-wave progenitors with METISSE** MNRAS 2023
P. Agrawal, J. Hurley, S. Stevenson, C. L. Rodriguez, D. Szecsi, A. Kemp; *Mon. Not. R. Astron. Soc.*, **521**, 033
- Young Star Clusters Dominate the Production of Detached Black Hole-Star Binaries** 2023
U. N. Di Carlo, P. Agrawal, C. L. Rodriguez, K. Breivik; *Astrophys. J.*, (submitted)
- Constraints on Cosmological Coupling of Black Holes from the Globular Cluster NGC 3201** ApJL 2023
C. L. Rodriguez; *Astrophys. J.*, **947**, L12
- Runaway and Hypervelocity Stars from Compact Object Encounters in Globular Clusters** ApJ 2023
T. Cabrera, C. L. Rodriguez; *Astrophys. J.*, **953**, 1
- Great Balls of FIRE II: The evolution and destruction of star clusters across cosmic time in a Milky Way-mass galaxy** MNRAS 2023
C. L. Rodriguez, Z. Hafen, Grudić, A. Lamberts, K. Sharma, C.A. Faucher-Giguère, A. Wetzel; *Mon. Not. R. Astron. Soc.*, **521**, 2
- Great Balls of FIRE I: The formation of star clusters across cosmic time in a Milky Way-mass galaxy** MNRAS 2023
M. Grudić, Z. Hafen, C. L. Rodriguez, D. Guszejnov, A. Lamberts, A. Wetzel, M. Boylan-Kolchin, C.A. Faucher-Giguère; *Mon. Not. R. Astron. Soc.*, **519**, 1
- Modeling Dense Star Clusters in the Milky Way and Beyond with the Cluster Monte Carlo Code** ApJS 2022
C. L. Rodriguez, N. Weatherford, S. Coughlin, P. Amaro-Seoane, K. Breivik, S. Chatterjee, G. Fragione, F. Kiroğlu, K. Kremer, N. Rui, S. Ye, M. Zevin, F. Rasio; *Astrophys. J. Supp.* **258**, 22
- On the Mass Ratio Distribution of Black Hole Mergers in Triple Systems** ApJ 2022
M. Martinez, C. L. Rodriguez, G. Fragione; *Astrophys. J.*, **937**, 2
- Compact Object Modeling in the Globular Cluster 47 Tucanae** ApJ 2022
S. Ye, K. Kremer, C. L. Rodriguez, N. Rui, N. Weatherford, S. Chatterjee, G. Fragione, F. Rasio; *Astrophys. J.*, **931**, 2, 84
- 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** ApJL 2021
A. M. Holgado, A. Ortega, C. L. Rodriguez; *Astrophys. J. Lett.*, **909**, L24
- Relativistic Three-body Effects in Hierarchical Triples** PRD 2020
H. Lim, C. L. Rodriguez; *Phys. Rev. D* **102**, 064033
- GW190412 as a Third-Generation Black Hole Merger from a Super Star Cluster** ApJL 2020
C. L. Rodriguez, K. Kremer, M. Grudić, Z. Hafen, S. Chatterjee, G. Fragione, A. Lamberts, M. Martinez, F. Rasio, N. Weatherford, S. Ye; *Astrophys. J. Lett.*, **896**, L10
- Post-Newtonian Dynamics in Dense Star Clusters: Binary Black Holes in the LISA Band** PRD 2019
K. Kremer, C. L. Rodriguez, P. Amaro-Seoane, K. Breivik, S. Chatterjee, M. Katz, S. Larson, F. Rasio, J. Samsing, S. Ye, M. Zevin; *Phys. Rev. D*, **99**, 063003

Eccentric Black Hole Mergers in Dense Star Clusters: The Role of Binary-Binary Encounters **ApJ**
M. Zevin, J. Samsing, C. L. Rodriguez, C. Haster, E. Ramirez-Ruiz; *Astrophys. J.*, **871**, 1
2018

Post-Newtonian Dynamics in Dense Star Clusters: Formation, Masses, and Merger Rates of Highly-Eccentric Black Hole Mergers **PRD**
C. L. Rodriguez, P. Amaro-Seoane, S. Chatterjee, K. Kremer, F. Rasio, J. Samsing, S. Ye, M. Zevin;
Phys. Rev. D, **98**, 123005
2018

Redshift Evolution of the Black Hole Merger Rate From Globular Clusters **ApJL**
C. L. Rodriguez, A. Loeb; *Astrophys. J.*, **865**, L5
2018

A Triple Origin for the Heavy and Low-Spin Binary Black Holes Detected by LIGO/Virgo **ApJ**
C. L. Rodriguez, F. Antonini; *Astrophys. J.*, **963**, 1, 7
2018

Precessional Dynamics of Black Hole Triples: Binary Mergers with near-zero Effective Spin **MNRASL**
F. Antonini, C. L. Rodriguez, C. Petrovich, C. Fischer; *Mon. Not. R. Astron. Soc. Lett.*, **480**, 1, L58
2018

A New Hybrid Technique for Modeling Dense Star Clusters **CompAC**
C. L. Rodriguez, B. Pattabiraman, S. Chatterjee, M. Morscher, F. Rasio, A. Choudhary, W-K. Liao;
Computational Astrophysics and Cosmology, **5**, 1
2018

Binary Black Holes in Dense Star Clusters: Exploring the Theoretical Uncertainties **ApJ**
S. Chatterjee, C. L. Rodriguez, F. Rasio; *Astrophys. J.*, **834**, 1, 68
2017

Dynamical Formation of Low-mass Merging Black Hole Binaries like GW151226 **ApJL**
S. Chatterjee, C. L. Rodriguez, V. Kalogera, F. Rasio; *ApJL*, **836**, L26
2017

Constraining Formation Models of Binary Black Hole Formation with Gravitational-Wave Observations **ApJ**
M. Zevin, C. Pankow, C. L. Rodriguez, L. Sampson, E. Chase, V. Kalogera, F. Rasio; *Astrophys. J.*,
846, 82Z
2017

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

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

Dynamical Formation of the GW150914 Binary Black Hole **ApJL**
C. L. Rodriguez, C.-J. Haster, S. Chatterjee, V. Kalogera, F. Rasio; *Astrophys. J. Lett.*, **824**, L8
2016

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

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

The Dynamical Evolution of Stellar Black Holes in Globular Clusters **ApJ**
M. Morscher, B. Pattabiraman, C. L. Rodriguez, F. Rasio, S. Umbreit; *Astrophys. J.*, **800**, 1, 21
2015

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

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

- Synopsis in *Astrobites* ([Link](#))

Contributing Author Papers

Weighing the Darkness. II. Astrometric Measurement of Partial Orbits with Gaia <i>J. Andrews, K. Breivik, C. Chawla, C. L. Rodriguez, S. Chatterjee</i> ; <i>Astrophys. J.</i> , 946 , 111	ApJ 2023
White Dwarf Subsystems in Core-Collapsed Globular Clusters <i>K. Kremer, N. Rui, N. Weatherford, S. Chatterjee, G. Fragione, F. Rasio, S. Ye, C. L. Rodriguez</i> ; <i>Astrophys. J.</i> , 917 , 28	ApJ 2021
Matching Globular Cluster Models to Observations <i>N. Rui, K. Kremer, N. Weatherford, S. Chatterjee, F. Rasio, C. L. Rodriguez, S. Ye</i> ; <i>Astrophys. J.</i> , 912 , 2	ApJ 2021
No Black Holes in NGC 6397 <i>N. Rui, N. Weatherford, K. Kremer, S. Chatterjee, G. Fragione, F. Rasio, S. Ye, C. L. Rodriguez</i> ; <i>Research Notes AAS</i> , 5 , 47	RNAAS 2021
Black Hole Mergers from Star Clusters with Top-heavy Initial Mass Functions <i>N. Weatherford, G. Fragione, K. Kremer, S. Chatterjee, S. Ye, C. L. Rodriguez, F. Rasio</i> ; <i>Astrophys. J. Lett.</i> , 907 , 25	ApJL 2021
Probing Multiple Populations of Compact binaries with Third-generation Gravitational-wave Detectors <i>S. Vitale, W. Farr, K. Ng, C. L. Rodriguez</i> ; <i>Astrophys. J. Lett.</i> , 913 , L5	ApJL 2021
One Channel to Rule Them All? Constraining the Origins of Binary Black Holes using Multiple Formation Pathways <i>M. Zevin, S. Bavera, C. Berry, V. Kalogera, T. Fragos, P. Marchant, C. L. Rodriguez, F. Antonini, D. Holz, C. Pankow</i> ; <i>Astrophys. J.</i> , 910 , 152	ApJ 2021
Intermediate-mass Black Holes from High Massive-star Binary Fractions in Young Star Clusters <i>E. González, K. Kremer, S. Chatterjee, G. Fragione, C. L. Rodriguez, N. Weatherford, S. Ye, F. Rasio</i> ; <i>Astrophys. J. Lett.</i> , 908 , 29	ApJL 2021
Modeling Dense Star Clusters in the Milky Way and Beyond with the CMC Cluster Catalog <i>K. Kremer, S. Ye, N. Rui, N. Weatherford, S. Chatterjee, G. Fragione, C. L. Rodriguez, M. Spera, F. Rasio</i> ; <i>Astrophys. J. Supp.</i> , 247 , 48	ApJS 2021
Black Hole Mergers from Hierarchical Triples in Dense Star Clusters <i>M. Martinez, G. Fragione, K. Kremer, S. Chatterjee, C. L. Rodriguez, J. Samsing, S. Ye, N. Weatherford, M. Zevin, S. Naoz, F. Rasio</i> ; <i>Astrophys. J.</i> , 903 , 67	ApJ 2020
Populating the Upper Black Hole Mass Gap through Stellar Collisions in Young Star Clusters <i>K. Kremer, M. Spera, D. Becker, S. Chatterjee, U. N. Di Carlo, G. Fragione, C. L. Rodriguez, F. Rasio, N. Weatherford, S. Ye</i> ; <i>Astrophys. J.</i> , 903 , 45	ApJ 2020
Measuring the Star Formation Rate with Gravitational Waves from Binary Black Holes <i>S. Vitale, W. Farr, K. Ng, C. L. Rodriguez</i> ; <i>Astrophys. J. Lett.</i> , 886 , 1	ApJL 2018
On the Rate of Neutron Star Binary Mergers from Globular Clusters <i>C. Ye, W.-F. Fong, K. Kremer, C. L. Rodriguez, S. Chatterjee, G. Fragione, F. Rasio</i> ; <i>Astrophys. J. Lett.</i> , 888 , 10	ApJL 2020
Single-single gravitational-wave captures in globular clusters: Eccentric deci-Hertz sources observable by DECIGO and Tian-Qin <i>J. Samsing, D. D'Orazio, K. Kremer, C. L. Rodriguez, A. Askar</i> ; <i>Phys. Rev. D</i> 101 , 123010	PRD 2019
COSMIC Variance in Binary Population Synthesis <i>K. Breivik, S. Coughlin, M. Zevin, C. L. Rodriguez, K. Kremer, C. Ye, J. Andrews, M. Kurkowski, M. Digman, S. Larson, F. Rasio</i> ; <i>Astrophys. J.</i> 898 , 71	ApJ 2019
Millisecond Pulsars and Black Holes in Globular Clusters <i>C. Ye, K. Kremer, S. Chatterjee, C. L. Rodriguez, F. Rasio</i> ; <i>Astrophys. J.</i> , 877 , 122	ApJ 2019

The fate of binaries in the Galactic Center: The Mundane and the Exotic <i>S. Alexander, S. Naoz, A. Ghez, M. Morris, A. Ciurlo, T. Do, K. Breivik, S. Coughlin, C. L. Rodriguez;</i> Astrophys. J. , 878 , 58S	ApJ 2019
Predicting Stellar-mass Black Hole Populations in Globular Clusters <i>N. Weatherford, S. Chatterjee, C. L. Rodriguez, F. Rasio;</i> Astrophys. J. , 864 , 13	ApJ 2018
How initial size governs core collapse in globular clusters <i>K. Kremer, S. Chatterjee, C. Ye, C. L. Rodriguez, F. Rasio;</i> Astrophys. J. , 871 , 38	ApJ 2018
LISA Sources in Milky Way Globular Clusters <i>K. Kremer, S. Chatterjee, K. Breivik, C. L. Rodriguez, S. Larson, F. Rasio;</i> PRL, 120 , 19	PRL 2018
How Black Holes Shape Globular Clusters: Modeling NGC 3201 <i>K. Kremer, C. Ye, S. Chatterjee, C. L. Rodriguez, F. Rasio;</i> Astrophys. J. Lett., 855 , 15	ApJL 2018
Accreting Black Hole Binaries in Globular Clusters <i>K. Kremer, S. Chatterjee, C. L. Rodriguez, F. Rasio;</i> Astrophys. J., 852 , 29	ApJ 2017
Parameter estimation for compact binaries with ground-based gravitational-wave observations using the LALInference software library <i>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;</i> Phys. Rev. D, 91 , 4, 042003	PRD 2015
Comparison of Gravitational Wave Detector Network Sky Localization Approximations <i>K. Grover, S. Fairhurst, B. Farr, I. Mandel, C. L. Rodriguez, T. Sidery, A. Vecchio;</i> Phys. Rev. D, 89 , 4, 042004	PRD 2014
Estimating Parameters of Coalescing Compact Binaries with proposed Advanced Detector Networks <i>J. Veitch, I. Mandel, B. Aylott, B. Farr, V. Raymond, C. L. Rodriguez, M. van der Sluys, V. Kalogera, A. Vecchio;</i> Phys. Rev. D 85 , 104045	PRD 2012
Mock data challenge for the Einstein Gravitational-Wave Telescope <i>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;</i> Phys. Rev. D 86 , 122001	PRD 2012

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

Mentoring

Postdocs.....

- Kerwann Tep, Postdoc Associate, UNC 2023-Present
- Ugo di Carlo, Postdoc Associate, Carnegie Mellon/UNC 2021-2023
- Poojan Agrawal, Postdoc Associate, Carnegie Mellon/UNC 2021-Present
- Miguel Holgado, McWilliams Fellow, Carnegie Mellon 2020-2022

Graduate Students (* indicates primary advisor).....

- Leah Vazsonyi, UNC *2023-Present
- Brian Cook, UNC *2023-Present
- Duncan Maclean, UNC *2023-Present
- Gina Chen, Carnegie Mellon *2021-2023
- Kuldeep Sharma, Carnegie Mellon *2020-Present
- Tomás Cabrera, Carnegie Mellon *2020-2023
- Diptajyoti Mukherjee, Carnegie Mellon 2020-2022
- Miguel Martinez, Northwestern University 2020-2022
- Halston Lim, MIT 2018-2020
- Michael Zevin, Northwestern University 2017-2018

Undergraduate Students.....

- Jiya Jolly, UNC 2023-Present
- Carson Faulkner, UNC 2023
- Tristen McLaurin, UNC 2023-Present
- Christopher Crow, UNC 2023-Present
- Dustin Macguire, UNC 2023-Present
- David Sanchez, Carnegie Mellon 2022-2023
- Inés Rodríguez-Hsu, Carnegie Mellon 2022-2023
- Christoph Gauffud, Carnegie Mellon 2021-2023
- Jason DiMasi, Carnegie Mellon 2022
- Jason Weng, Carnegie Mellon 2021
- Emily Sespico, Carnegie Mellon 2021
- Kevin Quigley, Carnegie Mellon 2021
- Sofi Martinez Fortis, University of Pittsburgh 2021
Now PhD Student in Physics at Vanderbilt University
- Alexis Ortega, Carnegie Mellon 2020-2021
Now PhD Student in Physics at Brown University
- Caitlin Fischer, MIT 2017-2018
- Joshua Fuhrman, Northwestern University 2016

Teaching

331 Numerical Techniques for the Sciences I

Instructor of Record; University of North Carolina, Chapel Hill, NC
Intro to Scientific Computing and Math Methods for Physics Majors

Lecturer
Fall 2023

33-121 Physics I for Science Students <i>Instructor of Record; Carnegie Mellon University, Pittsburgh, PA</i> Intro Physics for Non-majors	Lecturer <i>Spring 2022</i>
33-331 Physical Mechanics <i>Instructor of Record; Carnegie Mellon University, Pittsburgh, PA</i> Upper Divisional Classical Mechanics for Undergraduate Majors	Lecturer <i>Fall 2020-2022</i>
General Relativity <i>Guest Lecturer and TA; Northwestern University, Evanston, IL</i>	Lecture/TA <i>2015</i>
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)	High School <i>2013–2014</i>
Einstein and the 20th Century <i>Guest Lecturer and TA; Northwestern University, Evanston, IL</i>	Lecture/TA <i>2013</i>

Colloquia, Invited Talks, and Seminars

○ University of Oregon, Physics Colloquium	2023
○ SESTAS Seminar, Max Planck Institute for Astrophysics, Garching, Germany	2023
○ Astrophysics Seminar, SISSA, Trieste, Italy	2023
○ University of Washington, Astronomy Colloquium	2023
○ Nevada Center For Astrophysics workshop on Multi-messenger Astronomy, Las Vegas, NV	2023
○ University of North Carolina Physics Colloquium, Chapel Hill, NC	2022
○ Penn State Astrophysics Colloquium, State College, PA (Remote)	2022
○ AAS Division of Dynamical Astronomy, Invited Talk (Remote) “Dynamical Formation of LIGO’s Binary Black Hole Mergers”	2021
○ APS April Meeting, Invited Talk (Remote) “Merger Rates of Binary Black Holes across Cosmic Space and Time”	2021
○ California State University, Long Beach Physics Colloquium, Long Beach, CA (Remote)	2021
○ University of Texas, Dallas Physics Colloquium, Dallas, TX (Remote)	2021
○ Michigan State University Physics Colloquium, Lansing, MI (Remote)	2021
○ University of British Columbia Astrophysics Seminar, Vancouver, BC (Remote)	2021
○ University of Alberta Theory Seminar, Alberta, ON (Remote)	2021
○ University of Pennsylvania Astrophysics Seminar, Philadelphia, PA (Remote)	2021
○ Tel Aviv University Astronomy Seminar, Tel Aviv, Israel (Remote)	2020
○ University of Milwaukee Astronomy Seminar, Milwaukee, WI (Remote)	2020
○ Oregon State University Astronomy Colloquium, Corvallis, OR (Remote)	2020
○ Carnegie Observatories Astronomy Colloquium, Pasadena, CA (Remote)	2020
○ UC Berkeley Astronomy Colloquium, Berkeley, CA (Remote)	2020
○ ITC Colloquium, Center for Astrophysics Harvard and Smithsonian, Cambridge, MA (Remote)	2020
○ YITP Black Holes and Neutron Stars with Gravitational Waves, Invited Talk, Kyoto, Japan (Remote)	2019
○ Black Hole Initiative Colloquium, Harvard University, Cambridge, MA (Remote)	2019
○ KITP Merging Visions: Exploring Compact-Object Binaries with Gravity and Light, Invited Talk, Santa Barbara, CA	2019
○ UCLA Astrophysics Colloquium, Los Angeles, CA	2019
○ University of Colorado Astronomy and Planetary Science Colloquium, Boulder, CO	2019
○ Vanderbilt University Colloquium, Nashville, TN	2019
○ Syracuse Physics Colloquium, Syracuse, NY	2019
○ Carnegie Mellon Physics Colloquium, Pittsburgh, PA	2019
○ UIUC Gravitation Seminar, Urbana, IL	2019
○ UIUC Astronomy Colloquium, Urbana, IL	2018
○ Perimeter Institute Strong Gravity Seminar, Waterloo, ON	2018
○ Stanford KIPAC Cosmology Seminar, Palo Alto, CA	2018
○ University of Cambridge IoA Galaxy Discussion, Cambridge, UK	2018
○ University of Surrey Astrophysics Seminar, Guildford, UK	2018
○ Harvard-Smithsonian Center for Astrophysics Galaxy and Cosmology Seminar, Cambridge, MA	2018

- Caltech Astronomy Colloquium, Pasadena, CA 2018
- Harvard Particle Theory Seminar, Cambridge, MA 2018
- Columbia Astrophysics Colloquium, New York, NY 2017
- Invited Talk, Strong Gravity and Binary Dynamics with Gravitational Wave Observations Conference, Oxford, MS 2017
- Harvard ITC Lunch Seminar ([Link](#)), Cambridge, MA 2017
- UCSC Flash Seminar, Invited Talk, Santa Cruz, CA 2017
- APS April Meeting, Invited Talk, Washington, DC 2017
- JSI Fall Workshop: Astrophysics in the Era of Grav. Wave Observations, Invited Talk, Baltimore, MD 2016
- KITP Rapid Response Workshop on Gravitational Waves, Invited Talk, Santa Barbara, CA 2016
- KITP Rapid Response Workshop on Gravitational Waves, Invited Talk, Santa Barbara, CA 2016
- University of Chicago Compton Lecture Series Guest Seminar, Chicago, IL 2016
- Stellar N-body Conference, Invited Talk, Sexton, Italy 2014
- Georgia Tech Center for Relativistic Astrophysics, Invited Talk, Atlanta, GA 2011

Selected Contributed Talks/Posters

- Aspen Center for Physics: Dynamical Formation of Gravitational Wave Sources, Aspen, CO 2022
- APS April Meeting, Contributed Talk, New York, NY 2022
- Triple Evolution and Dynamics Trendy-2, Contributed Talk, Leiden, Netherlands 2018
- Aspen Center for Physics: Dawning Era of Gravitational-Wave Astrophysics, Aspen, CO 2017
- APS April Meeting, Contributed Talk, Salt Lake City, UT 2016
- APS April Meeting, Contributed Talk, Baltimore, MD 2015
- IAU Splinter Meeting, Contributed Talk, Beijing, China 2014
- AAS HEAD Meeting, Contributed Poster, Chicago, IL 2014
- LIGO Scientific Collaboration Meeting, Contributed Talk, Bethesda, MD 2013
- Gravitational-Wave Physics and Astronomy Workshop, Contributed Poster (3rd place award for best poster), Hannover, Germany 2012
- Gravitational-Wave Burst Workshop, Contributed Talk, Tobermory, Scotland 2012
- Gravitational-Wave Physics and Astronomy Workshop, Contributed Talk Milwaukee, WI 2012

Public Lectures/Outreach

- Carnegie Science Center** **Public Talk**
Conversations with Carnegie Mellon Physicists; Pittsburgh, PA 2021
- MIT Independent Activities Period** **Public Talk**
The era of Gravitational-wave Astronomy; Cambridge, MA 2017, 2018
- Compton Lecture Series** **Guest Seminar**
Dense Star Clusters as Binary Black Hole Factories ([Link](#)) 2016
Chicago, IL
- TEDxNorthwesternU** **TEDx Talk**
Listening to Einstein's Final Symphony ([Link](#)) 2016
Evanston, IL
- Conversations with an Astronomer** **Lecture Series**
Series of Public Lectures at Adler Planetarium 2011–2016
Chicago, IL
- Film Submission: Jackson Hole Science Media Festival** **Short Film**
Black Holes and Globular Clusters ([Link](#)) 2014
- Mentoring Telescope Interns** **Mentoring**
Teaching High School Summer Interns at Adler Planetarium; Chicago, IL 2013
- Science Club Mentor** **Mentoring**
Weekly after-school science program at Boys and Girls Club; Chicago, IL 2012–2013
- Visualization Creation** **Visualizations**
Produced for Adler Planetarium Space Visualization Lab and; Chicago, IL 2011–2016

Black Hole Dynamics in Core of Globular Cluster N-Body Simulation ([Link](#))
Binary Black Holes Emitting Gravitational Waves ([Link](#))

Perseid Meteor Shower **Public Talk**
Illinois Science Council in coordination with Chicago Parks Department 2013
Chicago, IL

Public Lecture at North Central Purdue University **Public talk**
Catching Gravitational Waves with LIGO 2011
Westville, IN

Service Work

Dynamical Formation of Gravitational Wave Sources **Organizer**
Proposed, organized, and chaired session at 19th AAS HEAD Meeting 2022
Pittsburgh, PA

2021 Multiband Gravitational-Wave Science Workshop **Co-Organizer**
Workshop on future and proposed gravitational-wave detectors 2021
Carnegie Mellon University, Pittsburgh, PA (remote)

**Black Holes, Neutron Stars, and Gravitational Waves:
The New Era of Multi-Messenger Astronomy** **Organizer**
Proposed, chaired, and spoke at session at SACNAS (national conference for diversity in STEM) 2019
Honolulu, HI

Committee Work at University of North Carolina: **Committee Service**
- - Graduate Admissions Committee 2023

Committee Work at Carnegie Mellon: **Committee Service**
- McWilliams Postdoctoral Fellowship Committee 2019-2020, 2021-2022*
 · * Committee Chair
- Colloquium Committee 2020-2021, 2021-2022
- Equity, Diversity, and Inclusion Committee 2020-2021, 2021-2022
 · Organized APS Site Visit to CMU, March 2022

Peer Reviewer for: **Referee**
- Physical Review Letters 2015-Present
- Physical Review D
- Astrophysical Journal Letters
- Astrophysical Journal
- Monthly Notices of the Royal Astronomical Society
- Nature
- Nature Astronomy

Proposal Reviewer for: **Reviewer**
- NSF Graduate Research Fellowship Program 2023
- NSF Astronomy and Astrophysics Research Grants 2021
- NASA Astrophysical Theory Program 2019
- US-Israel Binational Science Foundation 2018

IAP Co-Organizer **Organizer**
MIT Independent Activities Period; Cambridge, MA 2017

Astronomy On Tap – Boston **Co-Organizer**
Public Outreach Event at Local Pubs 2016-2018
Cambridge, MA