

# Carl Rodriguez | Publication List

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## Publications (with links)

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

## Publication Metrics.....

As of February 2021:

○ All Publications (excluding LIGO collaboration papers) – **3422 citations, h-index of 32**

## 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 [147 Citations]** **PRL**  
2018  
*C. L. Rodriguez, P. Amaro-Seoane, S. Chatterjee, F. Rasio*; Phys. Rev. Lett, **120**, 151101  
- Articles in *Boston Globe*, *MIT News* (Links),
- Dynamical Formation of the GW150914 Binary Black Hole [147 Citations]** **ApJL**  
2016  
*C. L. Rodriguez, C.-J. Haster, S. Chatterjee, V. Kalogera, F. Rasio*; Astrophys. J. Lett., **824**, L8
- Binary Black Hole Mergers from Globular Clusters: Masses, Merger Rates, and the Impact of Stellar Evolution [301 Citations]** **PRD**  
2016  
*C. L. Rodriguez, S. Chatterjee, F. Rasio*; Phys. Rev. D, **93**, 084029
- Binary Black Hole Mergers from Globular Clusters: Implications for Advanced LIGO [226 Citations]** **PRL**  
2015  
*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 [147 Citations]** **ApJ**  
2015  
*M. Morscher, B. Pattabiraman, C. L. Rodriguez, F. Rasio, S. Umbreit*; Astrophys. J., **800**, 1, 21

## Papers as Main Contributor or Primary Advisor.....

- 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
- Dynamical Formation Scenarios for GW190521 and Prospects for Decihertz Gravitational-Wave Astronomy with GW190521-Like Binaries** **2021**  
*A. M. Holgado, A. Ortega, C. L. Rodriguez*; Astrophys. J. Lett, (submitted)
- Fast Multipole Methods for Simulating Collisional Star Systems** **2020**  
*D. Mukherjee, Q. Zhu, H. Trac, C. L. Rodriguez*; ApJ (submitted)

<b>Relativistic Three-body Effects in Hierarchical Triples</b> <i>H. Lim, C. L. Rodriguez</i> ; Phys. Rev. D <b>102</b> , 064033	PRD 2020
<b>GW190412 as a Third-Generation Black Hole Merger from a Super Star Cluster</b> <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> ; Astrophys. J. Lett., <b>896</b> , L10	ApJL 2020
<b>Black Holes: The Next Generation – Repeated Mergers in Dense Star Clusters and their Gravitational-Wave Properties</b> <i>C. L. Rodriguez, M. Zevin, P. Amaro-Seoane, S. Chatterjee, K. Kremer, F. Rasio, S. Ye</i> ; Phys. Rev. D, <b>100</b> , 043027	PRD 2019
<b>Post-Newtonian Dynamics in Dense Star Clusters: Binary Black Holes in the LISA Band</b> <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> ; Phys. Rev. D , <b>99</b> , 063003	PRD 2019
<b>Eccentric Black Hole Mergers in Dense Star Clusters: The Role of Binary-Binary Encounters</b> <i>M. Zevin, J. Samsing, C. L. Rodriguez, C. Haster, E. Ramirez-Ruiz</i> ; Astrophys. J. , <b>871</b> , 1	ApJ 2018
<b>Post-Newtonian Dynamics in Dense Star Clusters: Formation, Masses, and Merger Rates of Highly-Eccentric Black Hole Mergers</b> <i>C. L. Rodriguez, P. Amaro-Seoane, S. Chatterjee, K. Kremer, F. Rasio, J. Samsing, S. Ye, M. Zevin</i> ; Phys. Rev. D, <b>98</b> , 123005	PRD 2018
<b>Redshift Evolution of the Black Hole Merger Rate From Globular Clusters</b> <i>C. L. Rodriguez, A. Loeb</i> ; Astrophys. J., <b>865</b> , L5	ApJL 2018
<b>A Triple Origin for the Heavy and Low-Spin Binary Black Holes Detected by LIGO/Virgo</b> <i>C. L. Rodriguez, F. Antonini</i> ; Astrophys. J., <b>963</b> , 1, 7	ApJ 2018
<b>Precessional Dynamics of Black Hole Triples: Binary Mergers with near-zero Effective Spin</b> <i>F. Antonini, C. L. Rodriguez, C. Petrovich, C. Fischer</i> ; Mon. Not. R. Astron. Soc. Lett., <b>480</b> , 1, L58	MNRASL 2018
<b>A New Hybrid Technique for Modeling Dense Star Clusters</b> <i>C. L. Rodriguez, B. Pattabiraman, S. Chatterjee, M. Morscher, F. Rasio, A. Choudhary, W-K. Liao</i> ; Computational Astrophysics and Cosmology, <b>5</b> , 1	CompAC 2018
<b>Binary Black Holes in Dense Star Clusters: Exploring the Theoretical Uncertainties</b> <i>S. Chatterjee, C. L. Rodriguez, F. Rasio</i> ; Astrophys. J., <b>834</b> , 1, 68	ApJ 2017
<b>Dynamical Formation of Low-mass Merging Black Hole Binaries like GW151226</b> <i>S. Chatterjee, C. L. Rodriguez, V. Kalogera, F. Rasio</i> ; ApJL, <b>836</b> , L26	ApJL 2017
<b>Constraining Models of Binary Black Hole Formation with Gravitational-Wave Observations</b> <i>M. Zevin, C. Pankow, C. L. Rodriguez, L. Sampson, E. Chase, V. Kalogera, F. Rasio</i> ; Astrophys. J., <b>846</b> , 82Z	ApJ 2017
<b>Black Hole Mergers and Blue Stragglers from Hierarchical Triples Formed in Globular Clusters</b> <i>F. Antonini, S. Chatterjee, C. L. Rodriguez, M. Morscher, B. Pattabiraman, V. Kalogera, F. Rasio</i> ; Astrophys. J., <b>816</b> , 2, 65	ApJ 2016

**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*es (Link)

**Contributing Author Papers**.....

**Black Hole Mergers from Hierarchical Triples in Dense Star Clusters** **ApJ**  
2020  
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

**Populating the Upper Black Hole Mass Gap through Stellar Collisions in Young Star Clusters** **ApJ**  
2020  
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

**One Channel to Rule Them All? Constraining the Origins of Binary Black Holes using Multiple Formation Pathways** 2020  
M. Zevin, S. Bavera, C. Berry, V. Kalogera, T. Fragos, P. Marchant, *C. L. Rodriguez*, F. Antonini, D. Holz, C. Pankow; *Astrophys. J. Lett.*, (submitted)

**Intermediate-mass Black Holes from High Massive-star Binary Fractions in Young Star Clusters** **ApJL**  
2021  
E. González, K. Kremer, S. Chatterjee, G. Fragione, *C. L. Rodriguez*, N. Weatherford, S. Ye, F. Rasio; *Astrophys. J. Lett.*, (in press)

**Probing Multiple Populations of Compact binaries with Third-generation Gravitational-wave Detectors** 2020  
S. Vitale, W. Farr, K. Ng, *C. L. Rodriguez*; (to be submitted)

**Measuring the Star Formation Rate with Gravitational Waves from Binary Black Holes** **ApJL**  
2018  
S. Vitale, W. Farr, K. Ng, *C. L. Rodriguez*; *Astrophys. J. Lett.*, **886**, 1

**On the Rate of Neutron Star Binary Mergers from Globular Clusters** **ApJL**  
2020  
C. Ye, W.-F. Fong, K. Kremer, *C. L. Rodriguez*, S. Chatterjee, G. Fragione, F. Rasio; *Astrophys. J. Lett.*, **888**, 10

**Single-single gravitational-wave captures in globular clusters: Eccentric deci-Hertz sources observable by DECIGO and Tian-Qin** PRD  
2019  
*J. Samsing, D. D’Orazio, K. Kremer, C. L. Rodriguez, A. Askar; Phys. Rev. D* **101**, 123010

**COSMIC Variance in Binary Population Synthesis** ApJ  
2019  
*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

**Millisecond Pulsars and Black Holes in Globular Clusters** ApJ  
2019  
*C. Ye, K. Kremer, S. Chatterjee, C. L. Rodriguez, F. Rasio; Astrophys. J.* , **877**, 122

**The fate of binaries in the Galactic Center: The Mundane and the Exotic** ApJ  
2019  
*S. Alexander, S. Naoz, A. Ghez, M. Morris, A. Ciurlo, T. Do, K. Breivik, S. Coughlin, C. L. Rodriguez; Astrophys. J.* , **878**, 58S

**Predicting Stellar-mass Black Hole Populations in Globular Clusters** ApJ  
2018  
*N. Weatherford, S. Chatterjee, C. L. Rodriguez, F. Rasio; Astrophys. J.* , **864**, 13

**How initial size governs core collapse in globular clusters** ApJ  
2018  
*K. Kremer, S. Chatterjee, C. Ye, C. L. Rodriguez, F. Rasio; Astrophys. J.* , **871**, 38

**LISA Sources in Milky Way Globular Clusters** PRL  
2018  
*K. Kremer, S. Chatterjee, K. Breivik, C. L. Rodriguez, S. Larson, F. Rasio; PRL*, **120**, 19

**How Black Holes Shape Globular Clusters: Modeling NGC 3201** ApJL  
2018  
*K. Kremer, C. Ye, S. Chatterjee, C. L. Rodriguez, F. Rasio; Astrophys. J. Lett.*, **855**, 15

**Low-mass X-ray binaries ejected from globular clusters** 2018  
*K. Kremer, S. Chatterjee, C. L. Rodriguez, F. Rasio; Astrophys. J. (submitted)*

**Accreting Black Hole Binaries in Globular Clusters** ApJ  
2017  
*K. Kremer, S. Chatterjee, C. L. Rodriguez, F. Rasio; Astrophys. J.*, **852**, 29

**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**

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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

**Publications**

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