Javier Roulet

Email: jroulet@caltech.edu
Phone: +1 908 3440660
DOB: September 11, 1992
Citizenship: Argentina, Italy, Switzerland, United States

Cahill Center for Astronomy and Astrophysics, Office 332
1216 E California Blvd
Pasadena, CA 91125, USA

Employment

California Institute of Technology — 2022 –
Sherman Fairchild Postdoctoral Scholar

Kavli Institute for Theoretical Physics
University of California, Santa Barbara — 2021 – 2022
Postdoctoral Scholar

Education

Princeton University — 2016 – 2021
Ph.D. in Physics
Thesis: *The Binary Black Holes of LIGO and Virgo*
Advisor: Prof. Matias Zaldarriaga

Universidad de Buenos Aires — 2011 – 2016
Licenciatura in Physics
Thesis: *Average Activities in Populations of Excitable Phase Oscillators*
Advisor: Prof. Gabriel B. Mindlin

Fellowships

Burke Fellowship, California Institute of Technology — 2022 – 2025
President's Fellowship, Princeton University — 2016 – 2017
Dean's Grant Research Allowance, Princeton University — 2016
CONICET Doctoral Fellowship — 2016

Publications

[1] Javier Roulet and Tejaswi Venumadhav (2024). *Inferring binary properties from gravitational wave signals.* arXiv:2402.11439 [gr-qc]. Accepted for publication in Annual Review of Nuclear and Particle Science.

[2] Digvijay Wadekar, Javier Roulet, Tejaswi Venumadhav, Ajit Kumar Mehta, Barak Zackay, Jonathan Mushkin, Seth Olsen and Matias Zaldarriaga (2023). *New black hole mergers in the LIGO–Virgo O3 data from a gravitational wave search including higher-order harmonics.* arXiv:2312.06631[gr-qc]

[3] Ajit Kumar Mehta, Seth Olsen, Digvijay Wadekar, Javier Roulet, Tejaswi Venumadhav, Jonathan Mushkin, Barak Zackay and Matias Zaldarriaga (2023). *New binary black hole mergers in the LIGO–Virgo O3b data.* arXiv:2311.06061[gr-qc]

[4] Digvijay Wadekar, Tejaswi Venumadhav, Ajit Kumar Mehta, Javier Roulet, Seth Olsen, Jonathan Mushkin, Barak Zackay and Matias Zaldarriaga (2023). *A new approach to template banks of gravitational waves with higher harmonics: reducing matched-filtering cost by over an order of magnitude.* arXiv:2310.15233[gr-qc]

[5] Hang Yu, Javier Roulet, Tejaswi Venumadhav, Barak Zackay and Matias Zaldarriaga (2023). *Accurate and Efficient Waveform Model for Precessing Binary Black Holes.* Physical Review D 108, 064059.

[6] Horng Sheng Chia, Thomas D. P. Edwards, Digvijay Wadekar, Aaron Zimmerman, Seth Olsen, Javier Roulet, Tejaswi Venumadhav, Barak Zackay and Matias Zaldarriaga (2023). *In Pursuit of Love: First Templated Search for Compact Objects with Large Tidal Deformabilities in the LIGO–Virgo Data.* arXiv:2306.00050 [gr-qc]

[7] Tousif Islam, Javier Roulet, Tejaswi Venumadhav (2022). *Factorized parameter estimation for real-time gravitational wave inference.* arXiv:2210.16278 [gr-qc]

[8] Javier Roulet, Seth Olsen, Jonathan Mushkin, Tousif Islam, Tejaswi Venumadhav, Barak Zackay, Matias Zaldarriaga (2022). *Removing degeneracy and multimodality in gravitational wave source parameters.* Physical Review D 106, 123015.

[9] Seth Olsen, Tejaswi Venumadhav, Jonathan Mushkin, Javier Roulet, Barak Zackay and Matias Zaldarriaga (2022). *New binary black hole mergers in the LIGO–Virgo O3a data.* Physical Review D 106, 043009.

[10] Seth Olsen, Javier Roulet, Horng Sheng Chia, Liang Dai, Tejaswi Venumadhav, Barak Zackay and Matias Zaldarriaga (2021). *Mapping the Likelihood of GW190521 with Diverse Mass and Spin Priors.* Physical Review D 104, 083036.

[11] Javier Roulet, Horng Sheng Chia, Seth Olsen, Liang Dai, Tejaswi Venumadhav, Barak Zackay and Matias Zaldarriaga (2021). *Distribution of Effective Spins and Masses of Binary Black Holes from the LIGO and Virgo O1–O3a Observing Runs.* Physical Review D 104, 083010.

[12] Horng Sheng Chia, Seth Olsen, Javier Roulet, Liang Dai, Tejaswi Venumadhav, Barak Zackay and Matias Zaldarriaga (2022). *Signs of higher multipoles and orbital precession in GW151226.* Physical Review D 106, 024009

[13] Javier Roulet, Tejaswi Venumadhav, Barak Zackay, Liang Dai and Matias Zaldarriaga, (2020). *Binary Black Hole Mergers from LIGO/Virgo O1 and O2: Population Inference Combining Confident and Marginal Events.* Physical Review D 102, 123022.

[14] Liang Dai, Barak Zackay, Tejaswi Venumadhav, Javier Roulet and Matias Zaldarriaga (2020). *Search for Lensed Gravitational Waves Including Morse Phase Information: An Intriguing Candidate in O2.* arXiv:2007.12709 [astro-ph.HE].

[15] Yiwen Huang, Carl-Johan Haster, Javier Roulet, Salvatore Vitale, Aaron Zimmerman, Tejaswi Venumadhav, Barak Zackay, Liang Dai and Matias Zaldarriaga (2020). *Source Properties of the Lowest Signal-to-Noise-Ratio Binary Black Hole Detections.* Physical Review D 102, 103024.

[16] Barak Zackay, Liang Dai, Tejaswi Venumadhav, Javier Roulet and Matias Zaldarriaga (2019). *Detecting Gravitational Waves With Disparate Detector Responses: Two New Binary Black Hole Mergers.* Physical Review D 104, 063030.

[17] Barak Zackay, Tejaswi Venumadhav, Javier Roulet, Liang Dai and Matias Zaldarriaga (2019). *Detecting Gravitational Waves in Data with Non-Gaussian Noise.* Physical Review D 104, 063034.

[18] Tejaswi Venumadhav, Barak Zackay, Javier Roulet, Liang Dai and Matias Zaldarriaga (2020). *New Binary Black Hole Mergers in the Second Observing Run of Advanced LIGO and Advanced Virgo.* Physical Review D 101, 083030.

[19] Javier Roulet, Liang Dai, Tejaswi Venumadhav, Barak Zackay and Matias Zaldarriaga (2019). *Template Bank for Compact Binary Coalescence Searches in Gravitational Wave Data: A General Geometric Placement Algorithm.* Physical Review D 99, 123022.

[20] Barak Zackay, Tejaswi Venumadhav, Liang Dai, Javier Roulet and Matias Zaldarriaga (2019). *A Highly Spinning and Aligned Binary Black Hole Merger in the Advanced LIGO First Observing Run.* Physical Review D 100, 023007.

[21] Tejaswi Venumadhav, Barak Zackay, Javier Roulet, Liang Dai and Matias Zaldarriaga (2019). *A New Search Pipeline for Compact Binary Mergers: Results for Binary Black Holes in the First Observing Run of Advanced LIGO.* Physical Review D 100, 023011.

[22] Javier Roulet and Matias Zaldarriaga (2019). *Constraints on Binary Black Hole Populations from LIGO–Virgo Detections.* Monthly Notices of the Royal Astronomical Society. 484, 4216.

[23] Javier Roulet and Gabriel B. Mindlin (2017). *A Diagrammatic Representation of Phase Portraits and Bifurcation Diagrams of Two-Dimensional Dynamical Systems.* International Journal of Bifurcation and Chaos. 27. 1730045. 10.1142/S0218127417300452

[24] Javier Roulet and Gabriel B. Mindlin (2016). *Average Activity of Excitatory and Inhibitory Neural Populations.* Chaos: An Interdisciplinary Journal of Nonlinear Science. 26. 10.1063/1.4962326

Talks

Talk, XVII Latin American Regional IAU Meeting	2023
Talk, ARC Centre of Excellence for Gravitational Wave Discovery (OzGrav), Swinburne University of Technology	2022
Invited panel discussion, Gravitational Wave Physics and Astronomy Workshop 2022	2022
Invited seminar, Perimeter Institute for Theoretical Physics	2022
Invited seminar, International Center for Theoretical Sciences, Tata Institute of Fundamental Research	2022
Talk, American Physical Society April Meeting 2022	2022
Invited seminar, Department of Applied Math and Theoretical Physics, University of Cambridge	2022
Invited seminar, Caltech–LIGO seminar, California Institute of Technology	2022
Local's Friday blackboard talk, Kavli Institute for Theoretical Physics	2021
Talk, Gravitational Wave Physics and Astronomy Workshop 2021	2021
Poster, Workshop III: Source Inference and Parameter Estimation in Gravitational Wave Astronomy, Institute for Pure and Applied Mathematics, University of California, Los Angeles	2021
Talk, American Physical Society April Meeting 2021	2021
Institute for Advanced Study / Princeton University Bahcall Lunch	2021
Invited talk, Astrophysics Coffee, Weizmann Institute of Science	2020
Invited talk, Brown Bag Lunch, MIT Kavli Institute	2020
Invited seminar, Max Planck Institute for Gravitational Physics (Albert Einstein Institute)	2020
Talk, American Physical Society April Meeting 2020	2020
Invited talk, High Energy Physics Journal Club, Princeton University	2020
Talk, 22nd International Conference on General Relativity and Gravitation – 13th Edoardo Amaldi Conference on Gravitational Waves	2019
Invited seminar, Institut de Ciències del Cosmos, Universitat de Barcelona	2019

	Talk, JSI Workshop 2018: Gravitational Wave Physics and Astronomy Workshop	2018
Teaching	Assistant in Instruction Princeton University, USA Courses: Physics for Future Leaders, Advanced Electromagnetism, Introduction to General Relativity, Advanced Physics, Introduction to the Quantum Theory, General Physics, Biophysics	2017 – 2021
	Teaching Assistant Universidad de Buenos Aires, Argentina Courses: Fluid Dynamics, Wave Mechanics, Physics for Biologists	2015 – 2016
Mentoring	Tousif Islam (graduate student)	2021 – 2022
	Cuishan Liu (undergraduate student)	2021 – 2022
Outreach	Volunteer at solar annular eclipse viewing and star party Bryce Canyon National Park, UT	2023
	Talk at Astronomy on Tap. Grand Canyon Lodge, North Rim, AZ	2023
	Panelist at Stargazing in Spanish, California Institute of Technology	2023
	Science communicator at International Astronomy day at Santa Barbara Santa Barbara Museum of Natural History | Astronomical Unit	2023
	Poster, Princeton Research Day, Princeton University	2017
Software	`cogwheel`, a code for parameter estimation of gravitational wave sources implementing several original methods for efficiency.	
Organizer of	Giambiagi Winter School on Cosmology International Center for Theoretical Physics | Universidad de Buenos Aires	2023
Referee for	Astronomy & Astrophysics	
	Astrophysical Journal	
	Astrophysical Journal Letters	
	Chaos, Solitons and Fractals: the Interdisciplinary Journal of Nonlinear Science, and Nonequilibrium and Complex Phenomena	
	Monthly Notices of the Royal Astronomical Society	
	Physical Review D	
	Physical Review X	