# CHAYAN CHATTERJEE

## CONTACT DETAILS


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## CURRENT POSITION

**A.I. for New Messengers Postdoctoral Research Fellow** December 2023 - present

Joint appointment with the Department of Physics and Astronomy, and Data Science Institute, Vanderbilt University, United States of America.

## EDUCATION

- **Doctor of Philosophy in Physics** February 2020 - November 2023
  The University of Western Australia, Australia
  **Thesis title:** Enabling rapid discovery of gravitational waves using machine learning.
  **Supervisors:** Prof. Linqing Wen, Prof. Amitava Datta.

- **Master of Science in Physics** 2016 - 2018
  Presidency University, Kolkata, India
  **Specialization:** Astrophysics and Cosmology
  **Thesis:** Dark matter self interaction and its impact on large scale structures.
  **List of Courses:** http://www.presiuniv.ac.in/web/Physics_MSc.pdf

- **Bachelor of Science (Hons) in Physics** 2013 - 2016
  Presidency University, Kolkata
  **Thesis:** The Hertzsprung-Russell diagram of stars in the SDSS Stripe-82 Catalog.
  **List of Courses:** http://www.presiuniv.ac.in/web/Physics_BSc_Major.pdf

## PUBLICATIONS

*Citations from Google Scholar*

1. *"Navigating Unknowns: Deep Learning Robustness for Gravitational Wave Signal Reconstruction"* - Chayan Chatterjee and Karan Jani (2024). [Astrophys. J, 973 112 ]
2. *"Reconstruction of binary black hole harmonics in LIGO using deep learning"* - Chayan Chatterjee and Karan Jani (2024). [Astrophys. J, 969 25 ] - *Citations: 1*
3. *"Pre-merger sky localization of gravitational waves from binary neutron star mergers using deep learning"* - Chayan Chatterjee and Linqing Wen (2023) [Astrophys. J, 959 76 ] - *Citations: 3.*
4. *"Rapid localization of gravitational wave sources from compact binary coalescences using deep learning"* - Chayan Chatterjee, Linqing Wen, Damon Beveridge, Foivos Diakogiannis, Kevin Vinsen (2023) [Astrophys. J, 959 42] - *Citations: 4.*
5. *"Rapid mass parameter estimation of binary black hole coalescences using deep learning"* - Alistair McLeod, Daniel Jacobs, Chayan Chatterjee, Linqing Wen, and Fiona Panther (2022). [ArXiv:2201.11126] - *Under review in Physical Review D.*

6. *"Extraction of binary black hole gravitational wave signals from detector data using deep learning"* - Chayan Chatterjee, Linqing Wen, Foivos Diakogiannis, Kevin Vinsen (2021) [Phys. Rev. D 104, 064046] - *Citations: 25.*

7. *"Enhancing gravitational-wave science with machine learning"* - Elena Cuoco et al. (2020) [2021 Mach. Learn.: Sci. Technol. 2 011002] - *Citations: 155.*

8. *"Using deep learning to localize gravitational wave sources"* - Chayan Chatterjee, Linqing Wen, Kevin Vinsen, Manoj Kovalam, Amitava Datta (2019) [Phys. Rev. D 100, 103025] - *Citations: 41.*

## SCHOLARSHIPS AND AWARDS

- **A.I. for New Messengers Postdoctoral Fellowship 2023** - *Postdoctoral Fellowship by Vanderbilt University (2023-2026).*
- **UWA Postgraduate Student Association Travel Award** - *for international academic visits and conference participation (2023).*
- **OzGrav Travel Award** - *for international academic visits and conference participation (2022).*
- **UWA Postgraduate Student Association Research Week Best Talk Award** - *Runner-Up (2022).*
- **J-P Macquart Best Student Talk Award - The Australian National Institute for Theoretical Astrophysics Conference** - *Runner-Up (2022)* and *Winner (2021).*
- **Australian Mathematical Sciences Institute Summer School - Best Student Talk Award** - *Winner (2022).*
- **OzGrav Outreach Superstar Award (UWA)** - *Winner (2021).*
- **The University of Western Australia Three Minute Thesis (3MT) Competition Award** - *Winner (2020)* and **People's Choice Award** - *Winner (2020).*
- **Scholarship for International Research Fees and International Living Allowance Scholarship for 2020** - Awarded by The University of Western Australia.

## COMMITTEE AND ACADEMIC SERVICES

1. **Co-judge** - *Visualize Your Thesis Competition, The University of Western Australia (2024).*
2. **Program Chair** - Gravitational Wave Inference Research Program, OzGrav - ARC Center of Excellence for Gravitational Wave Discovery (2023).
3. **Journal Referee** - *The Astrophysical Journal Letters, International Journal of Modern Physics D, Science China Physics, Mechanics and Astronomy.*
4. **Committee Member** - Australian National Institute for Theoretical Astrophysics (2021 - 2022).
5. **Early Career Researcher Representative** - OzGrav, University of Western Australia (2021 - 2022).
6. **Postgraduate Student Research Representative** - Postgraduate Student Association, University of Western Australia Student Guild (2020 - 2021).
7. **Mentor and Organizer of NASA Space Apps Challenge, Perth** (2021).
8. **Co-ordinator of Presidency University Physics League** - Official Physics club run by students of the Department of Physics, Presidency University (2015 - 2017).

## TEACHING/SUPERVISION

1. **Lecturer** - Gravitational Wave Astronomy (PHYS4420) at University of Western Australia. 2022-2023
2. **Teaching Facilitator** - Our Universe (SCIE1121) at University of Western Australia. 2020 - 2023.
3. **Research Supervision** - Summer Down Under Research Internship (SDURI), student dissertations at University of Western Australia. 2020 - 2023.

## INVITED TALKS

- *"Parameter Estimation of Gravitational Wave Sources Using Deep Learning"*
  University of Wisconsin-Milwaukee, USA - CGCA seminar talk October, 2021
- *"Denoising and Parameter Estimation of Gravitational Waves Using Deep Learning"*
  Western Sydney University, Australia - Department of Physics seminar talk
  Link: https://www.youtube.com/watch?v=GMDUwP15dKs August, 2021
- *"How do we detect and localize gravitational waves in real-time?"*
  Presidency University, Kolkata, India
  Link: https://www.youtube.com/watch?v=I-RKJfcTuJA December, 2020

## SELECTED INTERNATIONAL CONFERENCE PRESENTATIONS

1. Oral presentation, *"Real-time and pre-merger sky localization of gravitational waves from compact binary coalescences using deep learning"* at 241st American Astronomical Society (AAS) Meeting January, 2023.
2. Oral presentation, *"Real-time localization of gravitational waves from compact binary coalescences using deep learning"* at American Physical Society (APS) April Meeting April, 2022.
3. Oral presentation, *"Denoising and Localization of Gravitational Wave Sources Using Deep Learning"* at GW-MULL meeting July, 2021.
4. Oral presentation, *"Using Deep Learning to Localize Gravitational Wave Sources"* at LIGO-Virgo KAGRA (LVK) Collaboration Meeting September, 2020

## MEDIA RELEASES

- Invited guest at talk show - *Curiosity Killed the Rat* (2021)
- Invited guest at podcast - *Astrophiz: An Astronomy Podcast* (2021)
- Invited guest at science talk show - *The Uncertainty Principle Presents: Science After Dark* - Perth Fringe Festival (2021).
- Featured article - *"Algorithms now helping find Gravitational Wave sources"* - Space Australia (2019).

## SKILLS

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| **Languages** | Bengali (native), English (bilingual, fluent), Hindi (advanced). |
| **Programming Languages** | Python, FORTRAN, GNU Bash, LaTeX. |
| **Software Experience** | TensorFlow, PyTorch, LALInference, BILBY, GADGET2. |
| **Operating Systems** | Linux (Ubuntu), Windows. |